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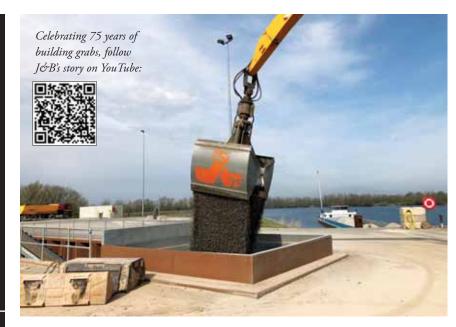
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APRIL 2020 issue

featuring...



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DRY CARGO International

Positive signs for grain and soya trade

rospects for commodity import demand around the world this year are now much harder to assess. Adverse effects amid government measures implemented to control the coronavirus pandemic may eliminate overall growth in global seaborne dry bulk trade in 2020, and potentially could cause a substantial downturn.

Forecasts of world economic activity this year have become more gloomy. Enforced population lockdowns in many countries are likely to result in a widespread severe recession. Several weeks ago the OECD organization suggested that one possible outcome is a halving of global GDP growth in 2020, compared with last year, to 1.5%. But there is huge uncertainty. While the severity of the coronavirus pandemic is now clearer, the duration of heavily disrupted economic activity is unclear.

GRAIN & SOYA

Although grain and soya trade will not be unaffected by the coronavirus pandemic, import demand for these and other agricultural commodities may be well supported. World trade in wheat, corn and other coarse grains during the current 2019/20 crop year is likely to be about 4% higher, and early tentative indications for the year approaching point to further growth.

In the soyabeans and meal segment, positive influences are also visible. As shown in table 1, US Department of Agriculture forecasts show global soya trade in the 2019/20 marketing year

ending September rising by about 6mt (million tonnes) or 3% to 215mt, after decreasing in the previous twelve months. This envisaged increase mostly reflects a 5mt (7%) upturn in China's estimated imports to 88mt, amid consumption strengthening after pig herds recover from the swine fever outbreak.

IRON ORE

In recent weeks the outlook for global iron ore trade has become more hazy. A flat or declining volume in 2020 as a whole now seems quite likely, given the adverse effects on steel production in numerous countries of shutdowns in consuming industries, such as car and vehicle manufacturing.

But some analysts still have a positive view. Updated forecasts published last month by the Australian Government's industry ministry showed world iron ore trade (mainly seaborne, including land movements) growing slightly in 2020. A 15mt (1%) increase is expected this year, elevating the total to a calculated 1,775mt. European imports may be flat, accompanied by 1% rises in China and Japan and 3% growth in Korea.

COAL

A possibility that coal trade could remain on an upwards trend during 2020, albeit with only limited growth, seems to be fading. Energy usage, at least in the first half of this year, probably will be greatly reduced in many regions by coronavirus pandemic effects. Coal consumption could also be weakened in some countries by tougher price competition with lower gas prices.

The outlook for steam coal imports in Europe appears especially weak. Seaborne volumes received by the European Union and UK have fallen steeply in the past two years, following previous declines. The estimated 2019 total fell below 80mt and a further marked reduction looks likely in the current year. Power generation switching from coal to gas, and the growth of renewable energy supplies are the main factors having a negative impact.

MINOR BULKS

Global movements of a number of dry bulk commodities related to construction or manufacturing activity could be adversely affected by the economic downturn now unfolding. A recovery from the coronavirus shutdown in top minor bulk importer China followed later by revival elsewhere, could assist in limiting negative effects.

BULK CARRIER FLEET

Uncertainty has intensified about bulk carrier newbuilding deliveries and scrapping volumes in 2020. Table 2 shows a possible outcome in the Panamax (65–99,999dwt) segment, comprising one quarter of the entire world bulk carrier fleet. Growth in the Panamax category this year could slacken to about 4%.

TABLE 1: WORLD SOYABEANS AND SOYAMEAL IMPORTS (MILLION TONNES)										
	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20*				
European Union	33.5	34.3	32.2	32.9	33.7	33.9				
China	78.4	83.3	93.6	94.1	82.6	88.0				
Other Asia	32.3	34.2	35.0	35.3	37.1	38.3				
Others	40.8	43.3	43.5	51.5	55.1	54.3				
World total	185.0	195.1	204.3	213.8	208.5	214.5				
% change from previous year	+8.3	+5.4	+4.7	+4.7	-2.6	+3.0				
source: US Dept of Agriculture, 10 March 2020 October/September marketing years * forecast										

TABLE 2: PANAMAX (65			<u> </u>			
	2015	2016	2017	2018	2019	2020*
Newbuilding deliveries	9.9	9.4	8.9	5.6	11.1	12.0
Scrapping	6.8	8.4	3.6	0.1	0.3	3.0
Losses	0.1	0.0	0.0	0.1	0.1	0.0
Plus/minus adjustments	-0.2	-0.1	0.0	0.0	0.1	0.0
World fleet at end of year	195.2	196.1	201.4	206.8	217.6	226.6
% change from previous year-end	+1.5	+0.5	+2.7	+2.7	+5.2	+4.1





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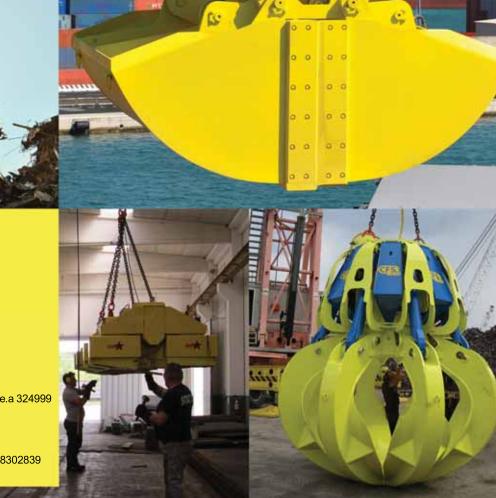
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Asia's coal imports

now harder to predict



Recent attempts to assess the ongoing trend of coal imports into Asia through 2020 have been complicated by uncertainty surrounding the impact of the coronavirus pandemic emerging in the early months of this year. Adverse effects on economic activity and energy demand around the world are a prominent aspect. The Asian region's role as a coal importer is the main focus of attention, although its role as an export supplier is also a significant feature.

While short-term import demand is overshadowed by negative signs, some positive influences likely to provide continued firm support are still prominent. Yet the extent of potential restraints on Asia's coal imports growth is becoming clearer, and there are more indications of a possibly longer-term impact.

Nevertheless, rising coal consumption, often dependent on imported supplies, remains a favoured option in a number of Asian countries, amid economic progress and accompanying increases in energy usage. An offsetting influence, especially in the larger economies, is the steps being taken by governments to reduce pollution

by shifting towards cleaner energy sources. This environmental influence is expected to progressively restrain the coal imports trend.

Asia's volumes are by far the biggest regional import category within global seaborne coal trade, comprising four-fifths. Hence the region is closely watched for any indications of changing patterns evolving. China, India and Japan are the largest individual importing countries, while South Korea and Taiwan are major importers. A group of smaller importers has become more prominent also. In the past few years an upwards trend in the regional annual volume was unfolding, but there are doubts about this trend persisting through 2020.

ECONOMIC DRIVERS

Until the first few weeks of this year solid economic growth continued to drive energy use, especially electricity consumption, among Asian countries. Contrasting features were evident, with Japan and South Korea having reached mature economy status where energy demand had stabilized. But in China, India

and numerous smaller economies energy demand has been growing rapidly amid relatively fast expansion of national economic output.

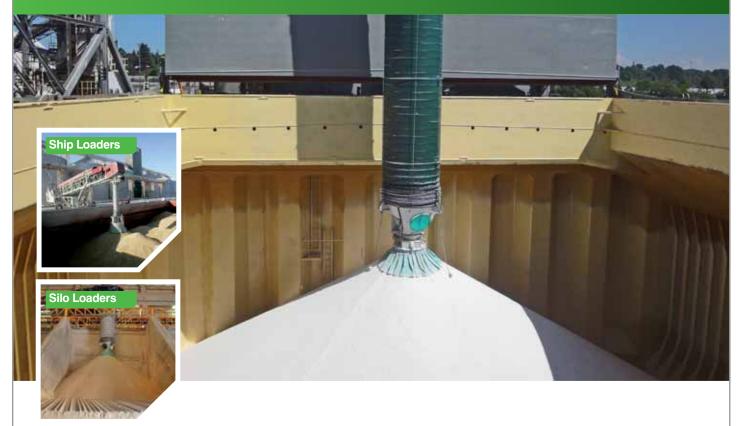
During the past couple of months the outlook for economic growth changed dramatically. This change resulted from the sudden emergence of the coronavirus pandemic, and the effects of government measures put in place to tackle the health crisis, severely curtailing commercial activity. Reflecting these constraints, the latest Asian Development Bank update published in early April suggests that gross domestic product growth in the 'developing Asia' category (which excludes Japan, but includes China, South Korea and Taiwan) could plummet to an extremely low 2.2% this year, well under half of last year's rate.

In 2019 economic performance in developing Asia slackened. GDP growth was about a half percentage point below the previous year's result at 5.2%. Slowing growth was seen in China, from 6.7% in the previous year to 6.1%, while India experienced a reduction of just over one percentage point to 5.0%. South Korea saw

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ASIA COAL TRADE — MAIN IMPORTERS (MILLION TONNES)										
	2016	2017	2018	2019	2020*	2020 % change**				
China	200	217	237	255	240	-6				
Japan	184	187	183	180	175	-3				
India	199	203	230	250	255	+2				
South Korea	125	141	141	135	130	-4				
Taiwan	65	69	69	71	70	-1				
Other importers	110	125	149	169	185	+9				
Total	883	942	1,009	1,060	1,055					
% change	3.2	6.7	7.1	5.1	-0.5					

^{*} forecast ** 2020 forecast compared with previous year source: Clarksons Research, Bulk Shipping Analysis 2020 forecasts and calculations

a reduced 2.0% increase. In Japan, not included in this grouping, GDP growth improved but remained low at 0.7% according to OECD estimates.

Prospects for the regional economy in 2020 and, in turn, for energy consumption in general and coal in particular, are now much harder to foresee. The Asian Development Bank comments that the evolution of the coronavirus outbreak, and hence the outlook for economic growth are "highly uncertain". After the steep deceleration to the estimated 2.2% developing Asia regional GDP increase this year, a pick up could follow with a rebound to 6.2% in 2021. But ADB economists observe that "outcomes could be worse than forecast and growth may not recover as quickly".

The consequences for coal of this suddenly modified outlook are not yet entirely clear. Usually, weakening economic growth trends imply a restraining influence on overall energy demand and coal usage. Competition among energy sources is also a relevant factor. Effects vary among countries, depending on market

characteristics and commercial decisions, and also resulting from government policy changes which are not always predictable.

COAL IMPORTS TREND

In recent years seaborne coal imports into Asia have seen robust expansion, as shown by the table, after an earlier downturn. Annual volumes rose by a cumulative 204mt (million tonnes) in the past four years to an estimated 1,060mt in 2019, averaging 5.5% annual growth. The pattern among importers was not uniformly strong, however.

During 2019 a 51mt or 5% increase in Asian regional imports followed a 67mt (7%) increase in the preceding twelve months, based on Clarksons Research calculations. Last year's total was boosted by 8-9% increases in China and India, accompanied by a 13% rise in a group of smaller importing countries. Taiwan's volume was 3% higher. By contrast both Japan and South Korea recorded decreases.

Looking at the trend and patterns revealed in the table above, the relative stability of imports into Japan and Taiwan is

a feature. Elsewhere in other importing countries an upwards trend prevailed, with China and India providing substantial The smaller importers momentum. category, including Malaysia, Pakistan, Philippines, Thailand and Vietnam also greatly boosted the expansion.

Four-fifths of Asia's seaborne coal imports, the largest proportion, comprises steam (or thermal) coal grades chiefly used in the electricity generation industry. Additionally, sizeable consumers are cement production and manufacturing industries. Coking coal, the remaining one-fifth, is used in the steel industry by mills employing blast furnace technology to make pig iron as the intermediate product converted into steel.

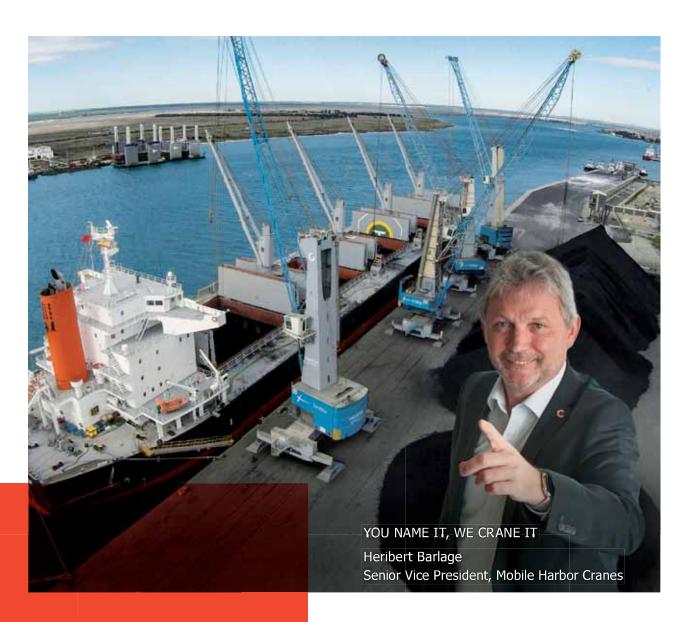
Both types of imports are needed by Asia's largest coal buyers — China, Japan, India, Korea and Taiwan — and some others. Purchases result from a lack of domestic supplies, or domestic mines' inability to supply sufficient quantities of the required grades. When delivered prices for foreign purchases are lower than domestic prices, imports may be affected.



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In India and China domestic coal production is enormous, satisfying a large part of the national market, while Japan, Korea and Taiwan rely extensively on imported supplies.

Changes in electricity generation and steel production trends, and developments in other energy consuming industries, greatly affect flows of coal imports into Asia. The impact of other changes also can be substantial. Large increases or decreases in domestic coal production and supplies, and domestic coal price fluctuations, are sometimes prominent variables. Alternative energy supplies — hydro-power, natural gas, renewable energy from wind or solar sources, and nuclear — often vary, visibly affecting the power generation markets of many countries.

CHANGES AMONG IMPORTERS

At the end of last year China's coal imports weakened abruptly, but the 2019 total was higher than seen in the previous twelve months. As shown by the table, seaborne imports last year (excluding overland movements, mostly from Mongolia) are estimated at 255mt, an 18mt (8%) increase. This total followed large increases in the preceding years and was the biggest among Asian buyers.

One major influence in China, coal consumption, rose by 1% in 2019 although coal's share of the national energy mix continued to fall, by 1.5 percentage points from the previous year, to just below 58%. Another influence, production from domestic coal mines, rose by 4% to reach 3.750mt. Government policy placed sustained emphasis on anti-pollution measures designed to improve air quality in cities, restraining the Chinese coal market. Cleaner energy sources comprised a larger share of the energy mix, rising by 1.3 percentage points to 23.4%. These changes restricted coal imports.

In India a 20mt (9%) coal imports expansion was seen in 2019, raising the total to an estimated 250mt. Rising consumption was accompanied by an apparent decrease in the country's domestic coal production, although rail transport capacity for moving coal was augmented. Major users are the electricity generation, steel and other industries. Power generation at coal-fired plants reportedly decreased by about 2.5% last year, limiting coal usage but industries such as cement have become bigger consumers.

The third largest Asian coal buyer is Japan, where imports were about 2% lower at 180mt last year, slightly below the range seen in recent years. Heavy reliance on

coal, as well as some other power station fuels, has continued since the nuclear power station disaster nine years ago which resulted in plants of this type being closed. Nuclear plant reopenings have been limited, because of safety checks and political opposition. The steel production trend has weakened, affecting coking coal purchases.

South Korea's coal imports were 6mt (4%) lower in 2019 at 135mt. Environmental aspects, especially air pollution reduction, is being prioritized by the government, which is attempting to cut the country's dependence on coal and shift towards the cleaner alternatives of natural gas and nuclear power generation. Taiwan's coal imports last year were about 3% higher at 71mt, but a move towards using more gas and renewables for power generation is a policy aim.

Several smaller importing countries have become a rapidly expanding part of the Asian region's coal trade in the past few years. Higher imports into the group comprised of Malaysia, Pakistan, Philippines, Thailand and Vietnam raised the 'other Asian importers' total by about 20mt or 13% to an estimated 169mt in 2019, after previous large annual increases. New coalfired power stations are being introduced, enlarging dependence on foreign supplies.

FORWARD-LOOKING POINTERS

When this year began, cautiously positive views of Asia's seaborne coal imports suggested that further growth was likely in 2020. Since then the unfolding coronavirus pandemic spreading around the world, resulting in a severe setback for economic activity in most countries, has pointed to a flat or possibly lower annual coal imports volume into Asia. The outcome depends greatly on the currently unknown severity of the pandemic and its unpredictable duration.

An ongoing aspect continuing to complicate analysis of the outlook for Asia's imports is the governmental policy influences related to environmental issues, which may outweigh decisions based on commercial influences, in some countries. Consumption of coal is a central issue for policymakers seeking to reduce air pollution to acceptable levels, and also to cut greenhouse gas emissions in the longer term. While changes in policy affecting coal imports are foreseeable as general possibilities, the extent and timing of changes and what effects these might have are not so easily predictable. Some energy policy modifications may not be foreseen.

In recent years China and India have

been a particular focus of attention because of identified political decisions with a major impact on coal imports, or the potential for that to happen. Together these two major importers received over 500mt last year, almost half of the Asia total, and doubts about the expansionary trend are evident. A large change in foreign purchases, upwards or downwards, could have a big impact, especially if abrupt and unexpected.

India's target of greatly reducing or eliminating coal imports, announced several years ago, was recently confirmed as a medium-term aim. While such a target appears difficult to achieve, even gradual progress could substantially weaken seaborne coal movements.

In China, repercussions for coal imports from a wide range of government policy measures affecting coal consumption, domestic production and the market are usually hard to predict. This difficulty is compounded by these imports providing a large slice of global seaborne trade, while forming a small proportion of China's domestic market. Relatively minor domestic market changes have disproportionate effects on foreign purchases.

TENTATIVE FORECASTS

Firm forecasts of Asia's coal imports are especially questionable in the current circumstances of the global economic and trade upheaval caused by the coronavirus pandemic. Additionally there is wide potential for political decisions related to environmental factors to have unpredicted effects on coal trade, in addition to the normal commercial imponderables surrounding all seaborne commodity movements. Thus there is reliance on 'informed' guesswork.

Very tentative calculations for 2020 coal imports into Asian countries are shown in the table. At present the direction of the annual change in regional volume this year seems more likely to be flat or down than up. These estimates show a marginal 5mt or under 1% decrease to 1,055mt but a larger fall could occur. Individual country forecasts include a speculative element.

Arguably positive prospects for some smaller importers seem more solidly based, not only for the year immediately ahead but quite possibly into the longer term as well. Expectations for Asia's incremental coal imports in 2020 are concentrated within this group, which could see a 16mt or 9% rise, to 185mt. Signs of rising volumes this year are evident, especially in Malaysia, Pakistan, Philippines and Vietnam.



Illustrating this trend, Vietnam has been a relatively minor importer which is now more significant. Seaborne coal imports are estimated to have grown over the past few years, from a minimal 2mt five years ago to reach about 38mt in 2019. Continuing brisk expansion is predicted this year and further ahead. Although Vietnam produces large coal volumes in the

northern part of the country, most newer coal-fired power stations are located in the south, mainly using imported material.

Advantages derived from participation in Asian coal import trades, by the world fleet of bulk carriers, are limited by many short-haul movements. These require less transport capacity for a given cargo volume and time period than needed with longer

voyages. In particular, within the region major supplier Indonesia is in close proximity to importing countries. Reports suggest that last year Indonesia exported steam coal exceeding 450mt, purchased mostly by neighbouring buyers. Exports to China were massive, including low-grade lignite. Some forecasts indicate a flat or lower overall export total this year.

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Agribulk in Asia

self-sufficiency must go hand in hand with effective storage and distribution systems



Between China and India, the world's two most populous countries, they have over 2.7 billion mouths to feed. In both the countries, urbanization has taken strong roots, more so in China than in India. As ambitious young men and women not willing to be engaged in farming, unlike their forefathers, continue to migrate to urban centres for education and livelihood, the dietary pattern in the two countries continues to change more on the lines of the West. This is having a profound positive impact on the quality of foodgrains they grow, so far noticed more in China than India and their growing focus on animal husbandry and dairy sectors. The swelling ranks of urbanites with money and aware of what healthier diets could do to their wellbeing are the reason for slow but sure kind of a permanent change in agribulk trade in the region.

"I'm not surprised that Beijing is encouraging Chinese enterprises to acquire farmland and food companies in the US, Europe, Africa and South America. This particular kind of business wanderlust will come to China's aid in promoting security of certain kinds of food, the demand for which in urban centres will be growing at a fast rate for a long time. Refer to the Boston Consulting Group (BCG) survey, you will find China, particularly its expanding urban centres to be the world's most health conscious country. The principal motive to acquire Western food companies is to come to grips with technologies of high kind employed in making foods. At the same time, China being the world's largest market for food and beverages, foreign investment there will continue to grow, albeit in the face of strong competition from local brands," says

farm expert Om Prakash Dhanuka.

Giving a call to the farmers in 2013, the Chinese President Xi Jinping said:"Our rice bowl should be mainly loaded with Chinese How is this pronouncement suggesting self-sufficiency in staple grains be reconciled with growing demand for more nutritious Western kind of dietary from urban dwellers? "Here you have one more example of Chinese dialectics in play. China is always driven by fear of political isolation and therefore, the urgings by its political establishment for basic food selfreliance. At the same time, as it continues to happen in other areas of the economy, the Chinese regime will also allow room for growth of Western kind of food and high levels of food quality and safety demanded by population in tier I and 2 cities," says Dhanuka.

India, which had quite a few occasions

Bumper basmati crops lead to high exports

Helped by demand surge in 2019/20 final quarter (January to March) linked to stocking up by importing countries to beat Covid-19 linked shipments uncertainty in India, the country could export over 4.4mt (million tonnes) of Basmati rice last year. In 2018/19 too, India's exports of the long, aromatic rice were 4.415mt fetching earnings of \$4.71bn.

Vinod Kaul, director of All India Rice Exporters Association, said extra Ramadan linked buying by Middle Eastern countries in the fourth quarter aided exports.

Exports, however, suffered hiccups in the first half of 2019/20 due to the hostilities between the US and Iran. AIREA informs that during April to October, shipments on a year-on-year basis were down 10%. November onwards, exports to destinations such as Saudi Arabia, Iraq, Iran, Jordan, Kuwait and the US gained in momentum. India



could ship up to 30% extra Basmati rice to traditional major buyers Saudi Arabia and Iraq. Had not shipments come to a near halt in the final week of March, thanks to transport dislocations due to comprehensive lockdown, 2019/20 exports would have exceeded that of 2018/19

AIREA now urges New Delhi not to

put restrictions on exports of non-basmati rice. Besides comfortable buffer stock, the country is experiencing bumper production of 117.47mt of the cereal this season.

Non-Basmati rice exports, down 41% last year to about 4.5mt, will not in any way hit government programme to feed the poor.

since its Independence in 1947 when it lived from ship to plate, coinciding with failures in foodgrains production, acutely felt the need for self-reliance in food through good and bad monsoon years, irrigation command area being limited. Then in 1965, the country had the first green revolution with introduction of highyielding varieties of wheat and also rustresistant strains of the Breakthroughs in wheat cultivation were followed by revolution in rice cultivation with the use of IR-8 semi-dwarf rice variety. Besides the right varieties of seeds for Indian conditions, gradually increasing the use of irrigation water, agro-chemicals and application of farm equipment such as tractors underlined the success of green revolution. From the brink of mass famine in 1961, India's non-basmati rice exports in recent years ranged from a low of 6.4mt (million tonnes) in 2015/16 to a high of 8.6mt in 2017/18.

According to trade officials, two factors have crimped competitiveness of Indian rice in the global market: (a) the annual increase in government recommended minimum support price (MSP) for paddy and (b) the withdrawal of 5% export incentive. Then, Bangladesh, which with imports of 1.87mt in 2017/18 became India's single largest market for non-basmati rice raised the land under rice

cultivation leading to reduction in its import dependence. India, as a result, found its rice exports to Bangladesh falling sharply by 70% to 480,567 tonnes in 2018/19. Asia's top rice exporter India has to contend with growing competition from Thailand, Vietnam, Pakistan, Cambodia and Myanmar. In a drive to ensure security of food supply, particularly to vulnerable sections of society in times of natural calamities, New Delhi has wisely practised maintenance of sufficiently large buffer stocks of wheat and milled rice. High production and government funded largescale procurement at MSP to help farmers earn a decent return for their efforts have on occasions led to the food inventory becoming much bigger than the 'strategic reserve' norms. In recent years, India had over 70mt of wheat and rice in government funded stocks in July 2013 and then now in July 2019, the inventory is further up at 74.25mt.

In the absence of a credible liquidation policy of buffer stock when silos and godowns start overflowing with wheat and rice, the country pays dearly in terms of exposure to nature making large quantities of foodgrains becoming inedible over a period of time, says Dhanuka underlining the need for sufficient investment to build food storage infrastructure across the country. It will not be denied that India

invited criticism locally and also globally for letting food rot in godowns while millions of poor go hungry. China and India both have successfully overcome the challenge of becoming self-reliant in food by subsidizing farming, supporting food prices to benefit growers and maintaining buffer stock for rainy times. At the same time, subsidization of farming in China and India has invited inquiries by the World Trade Organization.

Who could have anticipated in December that coronavirus (Covid-19) that first emerged in Wuhan, capital of China's Hubei province, will be spreading its deadly fangs in the rest of Asia and then in Europe and Americas killing thousands of people? At the time of writing, in excess of 210,000 people have died from the virus worldwide.

China and India, like many other countries, practised comprehensive lockdown throwing the logistical challenge of making food available in every part of the two large countries. Thanks to their holding more than sufficient buffer of wheat, rice, pulses and sugar, China and India, which house large numbers of migrant workers and poor people, could keep the hunger at bay.

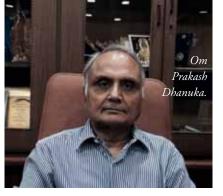
Take India, where wheat grown during the winter is harvested and procured between April and early parts of June. But this being an exceptional year, the focus of

the government procurement agency, Food Corporation of India, has shifted from buying wheat from farmers to reach wheat and rice already there from the earlier season to deficit states such as Bihar, Uttar Pradesh and West Bengal. An Agriculture Ministry official says: "We are tasked to ensure distribution of twice the amount of foodgrains than is normally the case through the public distribution system so that 800m poor don't go hungry during the lockdown and immediately beyond."

The world's second-largest economy China, and India whose economy is ranked fifth in the global table, have some common built-in drawbacks to be overcome to have a prosperous agricultural sector that provide gainful employment to a significant percentage of the population. China has around 21% of global population but it has to do with only 6% of the world fresh water. It has 334m acres of arable farmland but of which around 37m acres require restoration for cultivation. The country also has to contend with the reality that over 90% of all farms are less than 2.5 acres in size.

What about India? A country with a population of 1.3bn plus has only 4% of global water resource. Experts suggest that linking of rivers will mitigate water shortage to a great extent as over 1,200bn cubic metres of rainwater find its way to the sea every year and in the process also damages the top soil in many places. India's arable land is marginally bigger than China's. But it too has to contend with small holdings which stand in the way of farm mechanization and limits productivity improvement. According to the tenth agricultural census, the average operational holding in India shrank to 1.08 hectares in 2015/16 from 1.15 hectares in 2010/11.

"The challenge then for the two most populous countries in the world where the growing percentage of urban population is migrating to dietary habits found in the West is not only to produce cereals, fruits, vegetables, dairy products and meat in growing volumes but also to add value in downstream. I'm aware of commentators describing Chinese farmland as patch work against single ownership of vast tracts of farmlands found in the US and European countries. In this respect, India also resembles China. Farm collectivization is not possible either in democratic India or in single party ruled China for political, economic and social reasons. But because of the introduction of farm equipment suitable for small plots, development of high-yielding seeds that allow plants to survive and grow in difficult conditions and



effective farm extension programmes, productivity of land both in China and India has continued to improve. Moreover, both Beijing and New Delhi recognize farmers must be adequately rewarded for food security," says Dhanuka.

Giving an example how financial incentive motivates farmers to target a particular crop, agricultural economist Atul Kasbekar says quoting from China's Bureau of Statistics that the country managed to harvest a 13% higher soybean production at 18.1mt during 2019 following Beijing offering generous subsidies to farmers to bring more land under the bean. The incentive expectedly led farmers to grow soybean on an additional 11% land. The provocation for China beefing up production of soybean likely to be continued in the coming years was its trade war with the US that was much in evidence for most parts of last year. China, the world's largest importer of soybean, has in the US its second-largest import source.

As tensions between the two largest economies of the world grew over trade issues, China made it a point to buy larger quantities of soybean from Brazil at the expense of US growers. This could not have been otherwise after it slapped 25% retaliatory tariffs on US exports of beans. Reliance on Brazilian imports was further heightened by Argentinean growers withholding beans as a hedge against currency depreciation due to election uncertainty. High levels of beans shipments to China led to (a) fall in Brazilian inventory and (b) rises in premiums that buyers needed to pay for produce of Brazil.

Interestingly, as trade relations between Beijing and Washington started thawing in the final weeks of 2019, China's soybean imports from the US in December jumped to 3.09mt, that is as much as 44 times the level a year ago. However, December imports from the US in 2017 and earlier years were 6m tonne plus. China's 2019 total imports of soybean at 88.51mt were marginally up from 88.03mt the year before. Domestically grown soybean is mainly used as food, while the imported stuff is crushed into meal to feed China's

The spurt in soybean production helped

China in achieving a 0.9% growth in 2019 food crop production to close to 664mt. Wheat output rose 1.6% to 133.59mt. The country is pursuing the programme of growing more high quality wheat and phasing out production in unsuitable centres such as parts of northern China groundwater is already overexploited. An identical strategy is followed with corn where in spite of a fall of 2% in planted area, mainly in northern region, output was up 1.4% to 260.77mt. In its pursuit of gradually phasing out production of low quality and low efficiency early rice varieties, the country saw production of the cereal being down 1.2% in 2019 on 2018 output of 212.13mt. China's focus in farming is gradually shifting to high value cash crops such as soybean, rapeseed, peanuts and vegetables in attempts to free lands where indifferent quality wheat, rice and corn are grown.

In the meantime, the south-west monsoon during June to September yielding 10% more rains than the long period average followed by beneficial cold wave conditions along with winter rains helped India to harvest bumper crops during both the summer and winter growing seasons. The Indian crop year runs from July to June. The agriculture ministry in its second estimate says India will have a record foodgrain production of 291.95mt during 2019-20 crop year, including the summer yield of 142.35mt and winter produce of 149.60mt. India's foodgrain production in 2018/19 was 285.21mt.

An agriculture ministry official says the combination of benign weather and more land under tillage should help India once again record a year-on-year rise in 2019/20 wheat production to 106.21mt from previous record of 103.60mt in 2018/19. In rice too, the current season's production will be a record 117.47mt, higher by 9.67mt than the earlier five years' average production of 107.80mt. Even while the government has used steps such as rising MSP and high levels of official procurement to incentivize farmers to step up production of protein rich pulses, a daily must for Indian plate, India still remains dependent on imports. The country had a pulses production target of 26.30mt for the current season, but it now appears the actual output will be 23.02mt. Being a sensitive commodity, New Delhi in an attempt to keep the prices under check has sanctioned an import quota of 700,000 tonnes for 2020/21 financial year (April to March). A trade official says, imports will be made from South Africa, Mozambique, Malawi and Myanmar. DCi

Production of Alfa Laval PureBallast 3 systems remains strong under exceptional circumstances

Aalborg, Denmark, is the production site for Alfa Laval PureBallast 3 ballast water treatment systems. Having quickly adapted to the ongoing COVID-19 pandemic and lockdown measures from the Danish government, the factory continues to meet global production demands — and has even surpassed expectations.

"While the world has slowed down, the implementation of the ballast water management convention remains unchanged," says Peter Sahlén, Head of Alfa Laval PureBallast. "We simply must continue meeting our customers' needs, regardless of the obstacles."

Considering that PureBallast 3 has a prominent market position and many orders outstanding, those obstacles have been large indeed. The Aalborg facility normally bustles with manufacturing teams, customers, class society representatives and visitors. Nevertheless, Alfa Laval is securing customer deliveries, even with far fewer people on the factory floor.

WORKING TOGETHER WHILE KEEPING APART

Alfa Laval's approach has been a combination of rapid response and innovative thinking. The company took swift action to implement protective measures for employees, but also to secure components and materials that would be needed in the coming months. When the Danish government imposed a strict lockdown on 11 March, the factory in Aalborg was well prepared.

"We moved quickly from two shifts to three shifts, working in smaller teams that can easily maintain a safe distance," says Søren Nord Larsen, who manages the factory in Aalborg. "There's no contact between shifts. So, if one of our workers should be infected, we can lift the entire shift out without impacting the others or any customer deliveries."

Even meals and breaks are taken individually, at different times. Tools are carefully handled and disinfected regularly, and support functions like purchasing and production planning are managed digitally to the greatest extent possible.

"It's tough to change so quickly and dramatically, but colleagues have really taken the situation with a positive attitude and adapted to the new routines," says Larsen. "Many come with their own ideas for improving things, because everyone wants this to happen for our customers."

RECORD PRODUCTION DESPITE THE CHANGES

The success of these efforts is undeniable, especially as Alfa Laval has managed to increase production during the same period. "We've proven that this can be done, and we're not simply maintaining the status quo," says Larsen. "In March we set a record of 400 systems produced for the quarter, and our deliveries for the quarter were yet another all-time high."

For Sahlén, the high productivity in Aalborg builds on Alfa Laval's long-term planning. "We've made extensive preparations for ramp-up in the last two years, and that readiness has served us well in this unusual situation," Sahlén says. "We already had a systematic overview and allocated resources, which made it easier to recalibrate. Together with our

customers we will make it through this situation — and our production will be even stronger on the other side."

ABOUT ALFA LAVAL PUREBALLAST

PureBallast, which was the first commercially available ballast water treatment solution, is a chemical-free technology sold and serviced by Alfa Laval. A vital component of PureBallast is the enhanced UV reactor, which was developed jointly by Alfa Laval and Wallenius Water based on Wallenius Water technology. All PureBallast systems are available with both IMO and U.S. Coast Guard type approvals.

THIS IS ALFA LAVAL

Alfa Laval is active in the areas of Energy, Marine, and Food & Water, offering its expertise, products, and service to a wide range of industries in some 100 countries. The company is committed to optimizing processes, creating responsible growth, and driving progress — going the extra mile to support customers in achieving their business goals and sustainability targets.

Alfa Laval's innovative technologies are dedicated to purifying, refining, and reusing materials, promoting more responsible use of natural resources. They contribute to improved energy efficiency and heat recovery, better water treatment, and reduced emissions. Thereby, Alfa Laval is not only accelerating success for its customers, but also for people and the planet. Making the world better, every day. It's all about Advancing betterTM.

Alfa Laval has 17,500 employees. Annual sales in 2019 were SEK 46.5 billion (approximately €4.4 billion).

Alfa Laval PureBallast 3 reactor family.



Going hybrid and electric: merchant shipping's sustainable route-finder

ero-emission operation dry cargo ship enabled by hybrid and electric solutions — distant dream or commercially viable proposition? Discuss.

Electric, digital and connected solutions provide a direction of travel for dry cargo vessels towards greater efficiency and lower emissions using proven technology, writes Michael D. Christensen, Vice President, Global Sales, Dry Cargo Vessels. In this, it is the ship's electrical propulsion system that acts as the key enabler for the integrated automation and control systems that can deliver transformative operations.

In recent years, ABB has built a significant presence in the dry cargo vessel market, with an increasing number of vessels specified with electric or hybrid propulsion solutions for OPEX and CAPEX reasons, as well as for environmental impact.

Between 55–60% of the world shipping fleet (in gross tonnes) are container ships, Ro-Ro and RoPax vessels, pure car and truck carriers, bulk carriers and other dry cargo types, according to research company Clarksons. Given that these ships also consume over 50% of maritime fuel every year, more electric and/or hybrid propulsion solutions clearly represent a significant part of the answer to the industry's greenhouse gas emissions challenge.



Based on operational needs, Germany's largest bulk carrier company Oldendorff Carriers ordered two first ever self-unloading bulk carriers to feature ABB's Azipod® electric propulsion. Each of these ships will include a pair of 1.9MW electric propulsion units plus diesel-electric power plant and power management from ABB. Both Azipod® propulsion and diesel-electric power management are more responsive to load variations, which will make these self-unloaders more manoeuvrable in shallow waters, better able to hold station and more power-efficient during frequent loading/unloading operations.

Efficiency gains are also behind the selection of electric solutions by other mainstream dry cargo shipowners, as demonstrated by ferry operator DFDS. The Danish owner is already operating the first two of six new freight ships featuring shaft generators from ABB. Used in combination with variable frequency drives, shaft generators improve fuel efficiency by optimizing the performance of main



engines, auxiliary engines and propeller pitch no matter what the vessel speed. They also support vessel power during manoeuvring in harbors.

Shaft generators are not new, of course, but their use in the marine setting in combination with variable frequency drives and battery application enables power to be created more cheaply than what is possible using an auxiliary diesel generator set. Their use also means the number of auxiliary engines — to run reefer plant on a container ship, for example — can be minimized, bringing not only environmental and day-to-day OPEX gains, but CAPEX and maintenance savings.

WIDE-RANGING POWER

Recent years have also seen ship efficiency gains enabled by DC-based or DC-linked distributed networks which improve power management by allowing systems to draw on a variety of energy sources on a single line-up, including shaft generators, batteries or even fuel cells. The power and energy management system and variable frequency

drive is integral in any such solution and therefore offers dry cargo operators a further and decisive signpost towards hybrid-electric solutions in order to move to their 2050 obligations.

Within distributed networks, ABB believes battery power as a source of spinning reserve, peak load shaving or providing hotel load will become an accepted fuel efficiency optimization technology aboard mainstream dry cargo vessels. Following the adoption of the International Maritime Organization's 2020 sulphur cap regulation, even advocates of heavy fuel oil might agree that the exhaust gas scrubber is the sort of power-hungry device that would also benefit from peak load shaving.

ABB is working with a range of stakeholders to address the hard targets for greenhouse has emissions set out by the IMO. Supported by its experiences over the last 30 years in particular, ABB believes that intelligent electrical systems that enable optimized ship design and operation will be central, in either case.

HFW assists Abu Dhabi Ports on ship purchase with remote closing by video conference

HFW, a global, sector-focused law company assisted Abu Dhabi Ports on its purchase of bulk carrier *NIKI*.

HFW also provided completion services to all parties on the transaction, which was closed remotely via video conference due to Covid-19.

Participants logged in from 11 different locations in Greece and Abu Dhabi, and all documents were signed electronically, presented and exchanged by video and email.

The HFW team was led in Piraeus by Kalliopi Karaiskaki and included Anna Papadopoulou, Ben Partridge and Lila Zerva

HFW was recently named by Lloyd's List as the world's leading shipping and maritime law company, and has been serving clients in the industry for more than 135 years.

The company has over 200 shipping lawyers and Master Mariners across the Americas, Europe, the Middle East and Asia-Pacific, specializing in dry shipping, admiralty and crisis management, and transactional work.

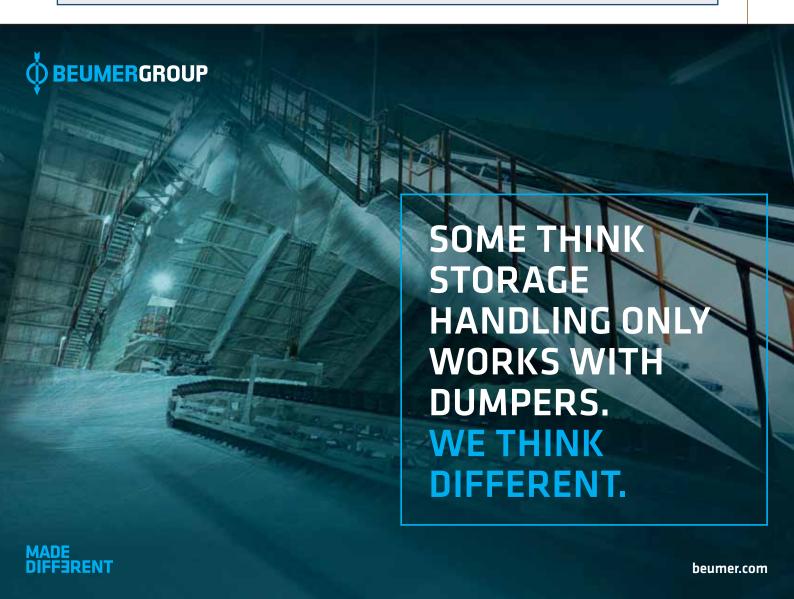
It represents the full spectrum of those involved in the industry, including shipowners and charterers, P&I Clubs, banks, international agencies, shipyards, marine insurance underwriters, governments and brokers across the entire shipping life cycle, from design to recycling.



ABOUT HFW

HFW is a major global law company in the aerospace, commodities, construction, energy and resources, insurance, and shipping sectors. The company has more than 600 lawyers, including 185 partners, based in offices across the Americas, Europe, the Middle East and Asia-Pacific. HFW prides itself on its deep industry expertise and its entrepreneurial, creative and collaborative culture.

HFW is Holman Fenwick Willan LLP, which is a limited liability partnership registered in England and Wales and is authorized and regulated by the UK Solicitors Regulation Authority.



Thinking outside the cargo hold: using innovation to

When a US cement producer purchased a large ship from a manufacturer in the Middle East, it did so without full awareness of the conditions or content of the ship, writes Nathaniel Miller of Mole • Master™ Services Corporation. Only when the newly purchased vessel was docked at a New York City terminal were the contents of its holds fully assessed. One of the cargo ship's holds contained approximately five thousand tonnes of decades-old powdered cement. The pneumatic conveying system required to move the cement had been non-functional for an undetermined length of time and the air pads were in need of repair or replacing. Before any such action could take place, it was necessary to remove the entirety of the dry cement from the hold.

AN EMPHASIS ON SAFETY

Mole•Master Services Corporation, Ohio, USA, was contracted to resolve the issue. The firm's silo and bin cleanout experience spanning more than three decades uniquely positioned the company to meet the challenges the project entailed. All Mole•Master technicians receive extensive safety training, including U.S. Mine Safety and Health Administration Part 48 and Part 46 certification, but they also receive the appropriate Transportation Worker Identification Credentials to work on a port. Mole•Master's comprehensive



policies covering confined space entry help ensure the safety of every project in which potentially hazardous human entry is required.

MATERIAL MATTERS

In addition to confined space entry, other key issues for the project in the New York terminal included the objective to salvage as much cement as possible, and removing the cement while avoiding the need to place it on a separate vessel. The ultimate

goal was returning the hold to full capacity. The ship's location in a densely populated harbour meant that minimizing disruption to traffic flow was crucial. Fortunately, other holds on the ship were fully functional, which eliminated the need for an additional vessel to take on the powdered cement. However, without a functioning pneumatic conveying system, material flow was possible only with an operationally impractical natural angle of repose.



solve dry goods shipping problems

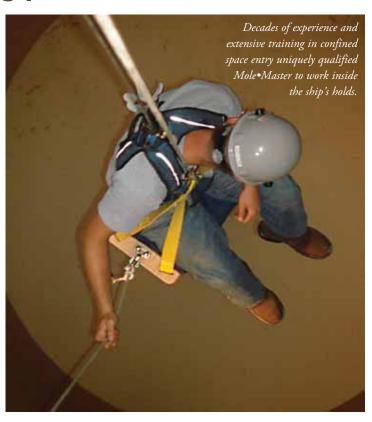
REPAIR AND RECOVERY

Mole*Master technicians assembled an alternate onboard conveying system for the project. A portable pneumatic vacuum conveying system was installed that worked in conjunction with rotary valves and hoppers to efficiently move the powdered cement and load it into another hold on the ship. Large chunks of hardened cement were broken up and removed. Although the powdered cement had been in the hold for nearly 30 years, the majority of the 5,000 tonnes of material was salvaged.

Once the material was removed from the hold, the pneumatic conveying system and air pads were fully accessible for evaluation and replacement by a separate contractor. Solid strategic planning and the exploration of alternative solutions resulted in the successful completion of a challenging project with virtually no disruption to commerce and minimal environmental impact.

ABOUT THE AUTHOR

Nathaniel Miller is a Project Manager/Business Operations Manager for Mole•Master Services Corporation, Marietta, Ohio, USA. He specializes in the planning and execution of industrial cleanout projects throughout North America and beyond.



ClassNK grants world-first AiP to Imabari Shipbuilding for its concept design of a 180,000dwt LPG dual fuelled bulk carrier

Major classification society ClassNK granted an Approval in Principle (AiP) to Imabari Shipbuilding Co., Ltd. for its concept design of a 180,000dwt LPG dual-fuelled bulk carrier developed in cooperation with Mitsubishi Shipbuilding Co., Ltd.

The AiP was granted to the concept design based on the Society's Guidelines for Ships Using Low-Flashpoint Fuels(*1) and its Rule Part GF (regulation for ships using low-flashpoint fuels) incorporating "International Code of Safety for Ships using Gases or other Low-flashpoint Fuels (IGF Code), the current IMO Res. MSC.391(95) and the MSC.458(101) revision planned for release in 2024. This was the first LPG dual fuelled bulk carrier in the world to be granted an AiP.

The main features of the design

announced by Imabari Shipbuilding are as

"As one of the merits of this design, it eliminates the necessity for special consideration of boil off gas with this design handling LPG at room temperature and high pressure, which makes the ship's operation easier. In addition, the ship has been designed with extensive consideration towards cost competitiveness by eliminating to use low-temperature materials such as stainless steel and cryogenic insulation. LPG tank is planned/designed to be installed in the aft area of the bridge and with round-trip distance capacity between Japan and Australia. And, as for supplying LPG to the ship, nowadays, LPG supply bases and infrastructure facilities are globally more developed and

improved, which makes the ship's operation more flexible. This is another motivation to create this design."

(*1) Alternative fuels besides LNG (Methanol/Ethanol/LPG) have lower flashpoints compared to traditional fuels, therefore particular attention needs to be given to ensuring adequate safety precautions when using low-flashpoint fuels in order to decrease the potential risk of fire and explosions that may arise as a result of fuel leakage onboard the ship. International safety requirements for lowflashpoint fuels have been discussed at IMO and as a result, the International Code of Safety for Ships using Gases or other Low-flashpoint Fuels (IGF Code) has been adopted and enforced. The current code however, does not address specific regulations for alternative fuels other than LNG. Accordingly, in 2019 ClassNK released guidelines that outline safety requirements for other viable alternative fuels besides LNG, based on the latest technology and regulation trends in order to promote the design of alternative fuelled

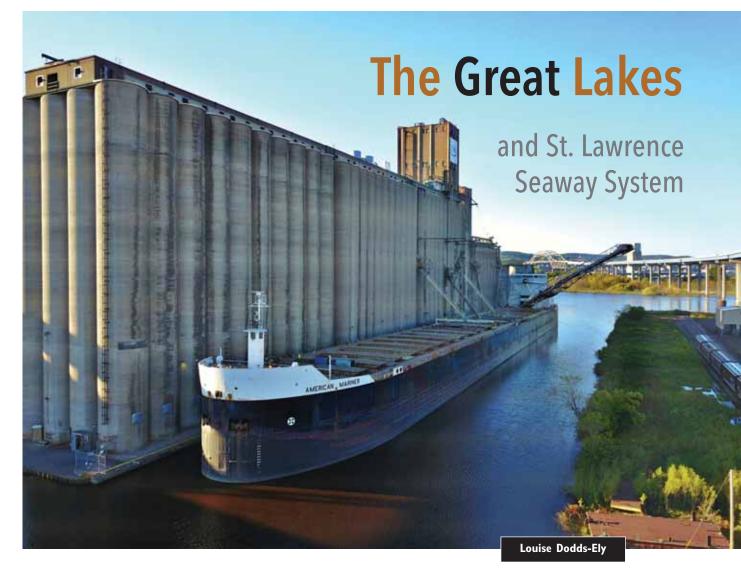
COVID-19: NORDEN remains fully operational

At NORDEN, all necessary precautions in relation to COVID-19 are being taken, and the safeguarding of the company's crew and employees is paramount. All employees, who can perform their duties remotely, are

working from home, and NORDEN has suspended crew changes for its seafarers to contain the spread of the virus and keep its seafarers safe. NORDEN continues to follow guidelines and recommendations

from governments and authorities. NORDEN 's fleet remains fully operational and ready to meet the needs of customers. NORDEN continues to be fully operational and is open for business as usual





The Great Lakes St. Lawrence Seaway System is a deep draught waterway extending 3,700km (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;
- cement, salt and stone aggregates for agriculture and industry; and
- components for the wind power industry.

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

Opened to navigation in 1959, the St. Lawrence Seaway part of the system has moved more than 2.5 billion metric tonnes of cargo in 50 years, with an estimated value of more than \$375 billion. Almost 25% of this cargo travels to and from

overseas ports, especially Europe, South America, the Middle East, and Africa. From Great Lakes/Seaway ports, a multi-modal transportation network fans out across the continent.

More than 40 provincial and interstate highways and nearly 30 rail lines link the 15 major ports of the system and 50 regional ports with consumers, products and industries all over North America

MANAGEMENT OF THE SEAWAY

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

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

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US SAINT LAWRENCE SEAWAY DEVELOPMENT CORPORATION (SLSDC)

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

The mission of the Corporation is to serve the US intermodal and international transportation system by improving the operation and maintenance of a safe, reliable, environmentally responsible deepdraught waterway, in co-operation with its

Canadian counterpart. The SLSDC also encourages the development of trade through the Great Lakes Seaway System, which contributes to the comprehensive economic and environmental development of the entire Great Lakes region.

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

CANADIAN ST. LAWRENCE SEAWAY MANAGEMENT CORPORATION (SLSMC)

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

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

SLSMC: new season, exceptional times for this essential waterway

Today, cargo moving through the combined Great Lakes/Seaway System supports over 227,000 jobs in Canada and the US.

While these numbers impressive, the St. Lawrence Seaway can contribute even more to the North American economy. The existing Seaway locks and channels have the capacity to handle double the present shipping volume, and reach 80mt (million tonnes) of cargo annually.

SEAWAY DEMONSTRATES RESILIENCE IN

The St. Lawrence Seaway Management Corporation (SLSMC) announced in mid-January this year that tonnage on the Seaway during the 2019 navigation season

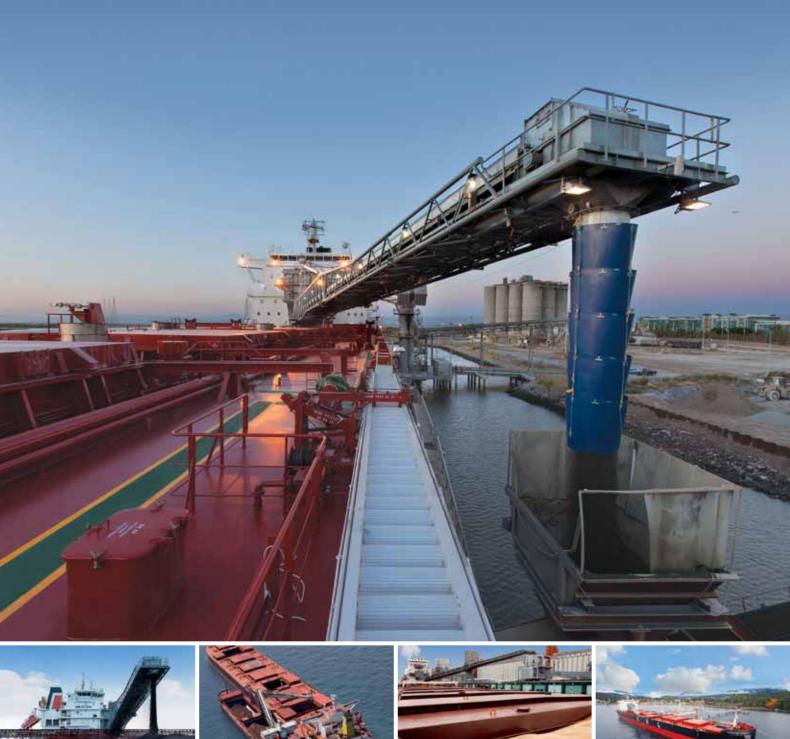
totalled 38mt (million tonnes).

Throughout 2019, high water levels on Lake Ontario and the St. Lawrence River made the navigation season very challenging. The SLSMC, in concert with the SLSDC, worked quickly and collaboratively to support the IJC's International Lake Ontario St. Lawrence River Board efforts to grant shoreline

Traffic summary 2019

TRAFFIC AND REVENUE	ST, LAWRENCE SEAWAY			SECTION			WELLAND CANAL SECTION		
TRAFFIC	Tonnes and Transits	% of Total	Variance 2018%	Tonnes and Transits	% of Total	Variance 2018%	Tonnes and Transits	% of Total	Variance 2018%
Cargo Tonnes by Toll Classification:	0.500000000	J010-01	100	Orea caracteria	0.00	70.00	11500000	- and the	-
Bulk (1)	23,660,310	61.7	2.5	16,989,625	58.5	4.5	16,392,708	57.4	0.1
Coal	2,391,464	6.2	- 6.0	98,060	0.3	- 64.2	2,391,464	8.4	- 6.0
Grains	10,471,588	27.3	- 14.8	10,121,415	34.8	- 14.9	8,721,461	30.5	- 7.5
Government Aid	100000000000000000000000000000000000000	4		1 100		11000	* 2 * CONT. T CO CO.		
Containers	93,680	0.2	48.1	93,680	0.3	48.1	9,540	0.0	10.8
General Cargo	1,579,277	4.1	- 30.5	1,579,277	5.4	- 30.5	983,060	3.4	- 31.8
Steel Slabs	178,739	0.5	-76.2	178,739	0.6	-76.2	79,051	0.3	- 74.6
Total Cargo Tonnes	38,375,058	100.0	- 6.4	29,060,796	100.0	- 7.8	28,577,284	100.0	-5.1
Gross Registered Tonnage:									-
Cargo Vessels	53,096,424	98.8	- 0.9	38,396,635	98.9	-26	43,676,925	98.8	1.8
Non-Cargo Vessels	289,532	0.5	- 3.3	182,284	0.5	2.2	260,402	0.6	-0.7
Passengers	363,836	0.7	59.1	229.502	0.6	85.8	285,810	0.6	38.2
Total Gross Registered Tonnage	53,749,792	100.0	- 0.7	38,808,421	100.0	-23	44,223,137	100.0	2.0
Vessel Transits:					5 - P 172 (CHI)	-		773.5977	
Loaded Cargo Vessels	2,361	57.1	- 2.9	1,862	64.1	-3.4	1,660	52.1	- 0.9
Ballast Cargo Vessels	1,184	28.6	2.5	720	24.8	3.0	1,091	34.2	9.3
Non-Cargo Vessels	591	14.3	- 26.4	325	11.2	- 33.9	435	13.7	-8.2
Total Vessel Transits	4,136	100.0	- 5.8	2.907	100.0	-6.8	3,186	100.0	1.2
Additional Information:	Number	- XXX	7. 7.47	Number	o transfer	2.50	Number	-02-77	
Passengers (Number)	12,052	114	34.0	7,327	1 6	58.0	7,748	¥.)	22.1
Pleasure Craft Lockages	10,693	. 72	1.8	7,389		10.3	3,304	. 3	- 13.2
REVENUE (2)	Revenue	% of Total	Variance 2018%	Revenue	% of Total	Variance 2018%	Revenue	% of Total	Variance 2018%
Traffic Revenue (\$) by Toll Classification	S			\$	1 1 1 1 1 1		s		
Bulk (1)	30,622,542	41.4	4.0	18,195,461	53.0	5.8	12,427,081	31.4	1.6
Coal	1,928,991	2.6	- 9.5	61,258	0.2	- 62.4	1,887,733	4.7	-5.1
Grains	13,910,462	18.8	- 10.5	7,110,071	20.7	- 13.7	6,800,392	17.2	-6.8
Government Aid	4	1/4						1.2	
Containers	75,408	0.1	60.5	69.486	0.2	66.7	5,922	0.0	11.9
General Cargo	5,431,769	7.3	- 30.8	4,226,461	12.3	- 30.6	1,205,308	3.0	- 31.3
	516,750	0.7	- 75.7	446.007	1.3	- 75.9	70,743	0.2	+74.3
Steel Slabs				10.000000000000000000000000000000000000		- 0.7	7,738,773	19.6	2.3
		16.1	1.2	4.180.415	12.2				
Gross Registered Tonnage	11,919,188	16.1	1.2 36.5	4,180,415 57,420	12.2			1.00000	
Desired State of the Control of the		16.1 0.2 12.6	1.2 36.5 2.9	4,180,415 57,420	0.2	72.7	105,642 9,337,910	0.3	22.6

(1) Bulk, as per previous years, includes domestic general and domestic steel slabs, as per the definition of domestic in the Tariff of Toils.
(2) Traffic revenue from commodities and vessels which transited the Seaway during the current shipping season.











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DCi

Great Lakes bulk cargo update: COVID-19 lockdown effects still unfolding



Aided by relatively minimal ice cover, United States and Canadian Coast Guard icebreakers made quick work of opening Great Lakes shipping lanes this spring, which led to a promising start for bulk cargo movement. Initial cargoes included coal, concrete, iron ore, limestone, salt and stone, which supplied power generation, steel manufacturing and construction projects throughout the Great Lakes region and beyond. Then COVID-19 tightened its grip on North America and much of the continent shuttered to inhibit spread of the novel coronavirus.

This led to a cascade of negative outcomes throughout the Great Lakes as automobile manufacturing halted, electricity usage diminished and project budgets evaporated. Demand for many of the aforementioned cargoes plummeted, leading to speculation about shrinking

tonnages on the Great Lakes in 2020.

Several iron ore mines idled across northern Minnesota and Michigan and the same fate befell coal facilities, leaving lake freighters to briskly haul earlyseason stockpiles, then wait and wonder.

A brighter story played out in the early season grain movement from Thunder Bay (Canada) and the American port of Duluth-Superior at the westernmost tip of Lake Superior. After a delayed opening of the St. Lawrence Seaway due to high water levels and dangerously high outflows through the Moses-Saunders Dam, oceangoing vessels streamed across the Great Lakes for loads of wheat destined for locations still in the grips of COVID-19. Duluth's celebrated first saltie of the season, the Federal Churchill, arrived April 8 to load approximately 23,000 short tonnes of durum wheat bound for Italy. Two days

later, Thunder Bay welcomed its first saltie of the season, *Tufty*, which also loaded durum wheat for Italian markets. Demand for wheat from the US and Canadian heartland continues to grow as consumers stockpile foods during lockdowns. The evidence of this consumption pattern was obvious as oceangoing vessels, sailing amidst heightened COVID-19 precautions, called early and often on the Great Lakes' western ports.

"Commercial shipping across the Great Lakes is an essential component in the North American supply chain, and a critical component for the world, so the industry is doing all it can to overcome the challenges of COVID-19," said Deb DeLuca, executive director of the Duluth Seaway Port Authority in Minnesota. "But there's no doubt that it will be a challenging year."

communities the greatest possible relief from high water levels.

As the IJC's Board set water flows at 10,400 cubic metres (sufficient to fill four Olympic sized swimming pools per second) for a record setting length of time, the SLSMC was able to safely sustain navigation thanks to implementation of special mitigation measures, including the imposition of reduced speed limits and the implementation one-way of navigation in certain portions of the river. "From farmers eager to realize the sales of their crops to municipalities dependent upon ships for the supply of road salt, the Seaway demonstrated its ability to serve as a sustainable and reliable transportation artery for a vast array of clients. Thanks to the diligence of SLSMC employees, ship captains and pilots, the season ended on schedule and without any serious incidents" said Terence Bowles, President and CEO of the SLSMC.

The 2019 tonnage results on the Seaway reflect the more challenging conditions encountered last year as compared to 2018, in which Seaway tonnage was at a ten-year high. Trade tensions, difficult navigational conditions due to very high water flows within the St. Lawrence River. combined with adverse weather conditions impacting grain harvests, all served to restrain total cargo volumes. "There is little doubt that trade tensions certainly were felt within the shipping industry, and we earnestly hope that the forthcoming implementation of the USMCA will be one of several improvements within the global trading arena, providing for a better cargo outlook in 2020," said the SLSMC's Bowles [*Mr Bowles was speaking before the devastating effects of the COVID-19 virus became apparent].

Within the Montreal/Lake Ontario Section, the 2019 navigation season's last commercial transit occurred on December 31st with the tug Océan Serge Genois clearing the St. Lambert Lock at 5:13am. Within the Welland Canal, a pilot project was in place to extend the season and provide ships with the opportunity to transit the canal until 8 January. Thanks to this initiative, 16 commercial transits were completed after 31 December, with







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Commodity summary 2019

SUMMARY OF MAJOR COMMODITIES	ST. LAWRENCE SEAWAY			MONTREAL - LAKE ONTARIO SECTION			WELLAND CANAL SECTION		
SUMMARY OF MAJOR COMMODITIES	Tonnes	% of Total	Variance 2018%	Tonnes	% of Total	Variance 2018%	Tonnes	% of Total	Variance 2018%
Agricultural Products:									
Wheat	6,167,275	16.1	-02	5,986,924	20.6	-0.3	6,001,723	21.0	0.9
Corn	684,399	1.8	- 61.1	672,847	2.3	- 61.7	73,076	0.3	- 87.5
Rye				0000	200	-	1307307		-
Oats			+100.0	- 2		- 100.0			- 100.0
Barley		+						- 5	
Soybeans	1,981,613	5.2	- 36.0	1,956,616	6.7	- 35.3	1,009,467	3.5	- 38.2
Flaxseed	33,958	0.1	- 30.1	33,958	0.1	- 30.1	33,958	0.1	- 30.1
Canola (Rapeseed)	1,262,985	3.3	80.7	1,129,712	3.9	107.9	1,262,985	4.4	80.7
Other Grains	341,358	0.9	- 30.0	341,358	1.2	- 30.0	340,252	1.2	- 30.0
Total Grains	10,471,588	27.3	- 14.8	10,121,415	34.8	- 14.9	8,721,461	30.5	- 7.5
Other Agricultural Products			-						
Total Agricultural Products	10,471,588	27.3	- 14.8	10,121,415	34.8	- 14.9	8,721,461	30.5	-7.5
Mine Products:			-						7
Iron Ore	6,910,169	18.0	-7.4	5,149,164	17.7	-7.0	5,140,104	18.0	- 8.3
Coal	2,391,464	6.2	- 6.0	98,060	0.3	- 64.2	2,391,464	8.4	- 6.0
Coke	1,461,008	3.8	9.1	996,125	3.4	7.4	1,451,255	5.1	14.8
Stone, Ground, Crushed, or Rough	421,521	1.1	- 22.6	55,275	0.2	+ 45.0	366,246	1.3	-21.2
Salt	3,853,173	10.0	10.7	2,231,591	7.7	27.4	2,602,907	9.1	- 9.7
Other Mine Products	1,766,129	4.6	7.3	1,504,551	5.2	9.6	1,119,816	3.9	6.0
Total Mine Products	16,803,464	43.8	- 1,3	10,034,766	34.5	0.7	13,071,792	45.7	- 5.4
Processed Products:									
Iron and Steel	1,478,618	3.9	- 33.6	1,477,858	5.1	- 33.6	915,569	3.2	- 34.5
Steel Slabs	178,739	0.5	-76.4	178,739	0.6	-76.4	79,051	0.3	- 74.6
Petroleum Products	3,380,022	8.8	5.3	3,300,183	11.4	4.9	2,377,383	8.3	14.8
Chemicals	831,509	2.2	- 0.9	784,118	2.7	- 0.3	159,042	0.6	- 9.2
Other Processed Products	5,191,380	13.5	11.5	3,123,979	10.7	14.6	3,229,933	11.3	10.8
Total Processed Products	11,060,268	28.8	-5.4	8,864,877	30.5	- 8.1	6,760,978	23.7	- 1.6
Miscellaneous Cargo:	70,000		ment on the	10.00			The stands	7	7 707.53
Forest Products	33,607	0.1	1,401.7	33,607	0.1	1,401.7	23,053	0.1	930.1
Animal Products	6,131	0.0	25.8	6,131	0.0	25.8	54		
Total Miscellaneous Cargo	39,738	0.1	458.9	39,738	0.1	458.9	23,053	0.1	930.1
GRAND TOTAL	38,375,058	100.0	-6.4	29,060,796	100.0	+7.8	28.577.284	100.0	-5.1

the G3 Marquis performing the last commercial transit of the Welland Canal on 7 January, clearing Lock I at 7:45pm.

SEAWAY OPENS BRINGING VITAL GOODS TO MARKET

The SLSMC) marked the opening of the Seaway's 62nd navigation season on 24 March, with the transit of the *NACC Argonaut* through Lock 8 on the Welland Canal.

"With the COVID-19 outbreak, we are living in exceptional times. We witnessed a tremendous response by our employees

and members of the broader marine community in overcoming a range of obstacles to ensure that the Seaway can open," said Terence Bowles, President and CEO of the SLSMC. "The St. Lawrence Seaway provides an essential transportation service that literally feeds nations around the world, including Canada and the US, and supplies the inputs which keep many of our industries operating. We will strive to do our part during this difficult period. We are implementing recommended preventive measures to protect the health of our employees, including working from home where possible."

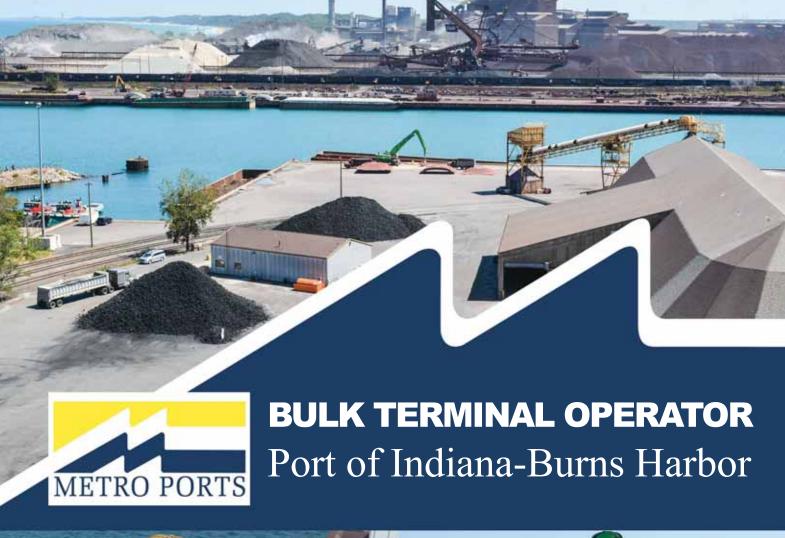
Craig H. Middlebrook, Deputy Administrator of the U.S. SLSDC said, "Every navigation season brings opportunities and challenges and the 2020 season will be no different. While the opportunities and challenges change each year, what remains constant are the safety, reliability, efficiency and environmental performance advantages of waterborne transportation. The Seaway Corporations continue working every day to ensure that these advantages are realized as fully as possible in our binational waterway."

On I April, the SLSMC marked the opening of its Montreal/Lake Ontario section, with the transit of the CSL Baie St. Paul through the St. Lambert Lock. This

hybrid approach respected the desire of the International Joint Commission to move record volumes of water out of Lake Ontario in order to provide relief to lakeshore communities battered by high water levels.

The SLSMC continues to work closely with Transport Canada, Public Health Agency of Canada (PHAC), and many other authorities. A series of comprehensive practices and procedures are in place to manage risk and minimize all non-essential interactions between personnel in view of COVID-19.







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Port of Bécancour: response to the growing demand

Société du parc industriel et portuaire de Bécancour — SPIPB — is known for its strategic location on the south shore of the St. Lawrence River in Bécancour, midway between Québec and Montréal. Aiming to be a worldrenowned leader in the accommodation investments and the development of responsible industrial and port activities, the SPIPB promotes the economic development of the province of Quebec by developing and operating an auto-financed industrial park and port facilities.

The SPIPB is mandated by the Quebec government and the Ministère de l'Économie et de l'Innovation to be in charge of the enforcement of its incorporating Act. It has the objective to promote the establishment of new companies and to provide the infrastructure needed to the implementation of

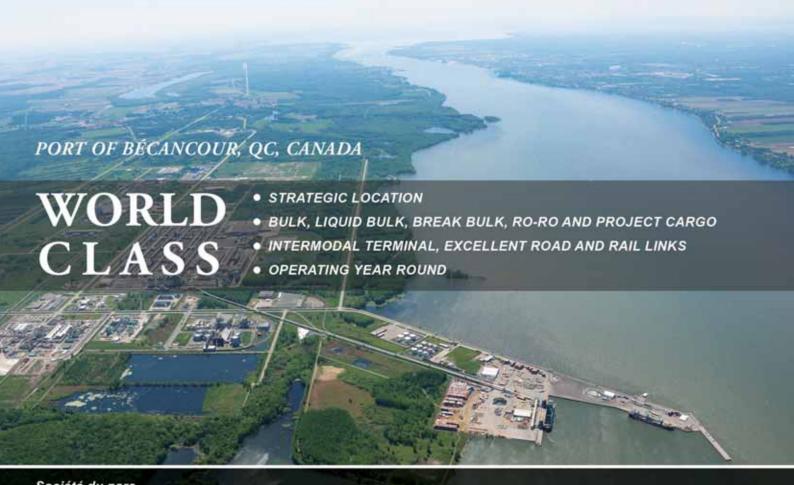


significant scope companies.

Emphasizing its values to offer high grade customer services, sustainable development and environmental protection, partnerships and commitment to excellent, the SPIPB articulates to support to the implementation of new companies and existing ones regarding construction, environmental standards and

rules, site selection, technical data and information related to business assistance programs, work force, transportation and demography.

It also provides services related to the implementation of the business, maintenance and operation of the port facilities, buildings and industrial park infrastructure (road, aqueduct, sewer and



industrial water networks).

The Port of Bécancour has recently refined its strategic planning, thus to strengthen its position of world class logistic hub. Currently working on expansion projects, artificial intelligence implantation for port entry logistic and on the efficiency of all its intermodal services, the SPIPB has developed ways to response to the growing demand for the use of its port infrastructures with a concern for sustainable development.

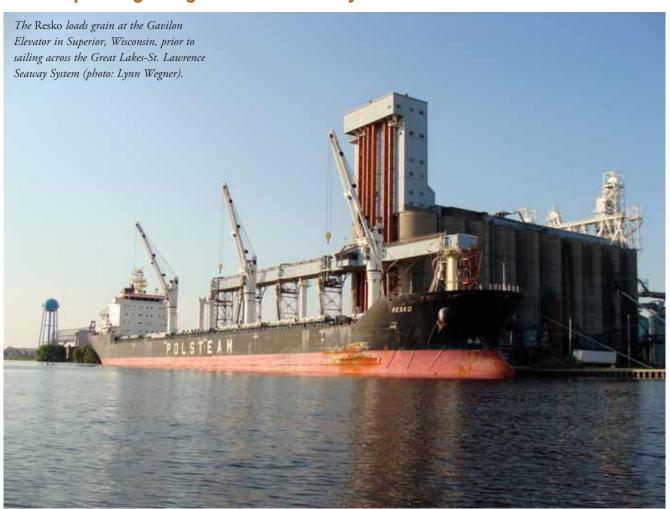
As a major industrial park, the SPIPB builds and maintains its own road network

meeting the special heavy transportation standards. Moreover, highway 30 passes through the Industrial Park and junctions with highways 20, 40 and 55 thus linking Montreal and Quebec City. These multilane highways provide access to the whole North American road network. From a marine perspective, the Port of Bécancour is accessible and functional year round. It can be accessed by ship requiring 35 feet (10.67 metres) of water depth. In addition to its jetty, divided into five berths for a total of 1,130m including a Ro-Ro ramp, port facilities provide 175,000m² of

available storage space. Many other maritime services are available like unloading, towing, customs, marine agency, potable water, electricity and communications.

The SPIPB is also serviced by the Canadian National (CN) railway network which allows the merchandises to cross the continent from east to west, and from north to south. It gives access to the ports on the Atlantic Coast as well as the Pacific Coast. It is also linked to the Kansas City Southern (KCS) railway network which provides access to Mexico.

Lake Superior grain gains belie Seaway totals in 2019



Trade conflicts, wet weather and extreme outflows hampered grain movement through the St. Lawrence Seaway in 2019, dropping tonnage 15% compared to 2018. But the Seaway's westernmost terminus, the Port of Duluth–Superior, sailed contrary to those headwinds, posting its best grain tonnage total since 2016.

More than 1.3mt (million metric tonnes) of grain departed Duluth-Superior during the 2019 season, a campaign that extended into 2020 with the final shipment of spring wheat leaving January 2.

"Grain is our No. I export cargo, which

isn't surprising for a world port located 2,340 miles inland in the heart of North America's breadbasket," said Deb DeLuca, executive director of the Duluth Seaway Port Authority. "But we also move grain that doesn't qualify as an overseas export. It stays within the Great Lakes region instead, feeding domestic consumers, and that's part of why Duluth-Superior's grain tonnage trends don't always reflect the Seaway trends."

Durum and spring wheat topped Duluth-Superior's grain ledger in 2019, followed by beet pulp pellets and canola. In

total, the port's grain tonnage ranked as a 20% season-over-season increase and a 12% improvement on the five-season average.

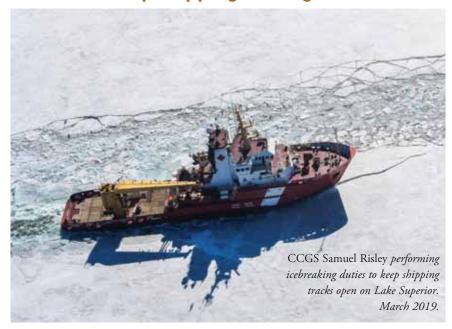
Looking ahead to 2020, the outlook is cautiously optimistic for grain movement through the Great Lakes–St. Lawrence Seaway System.

Recent international trade agreements reduced some of the uncertainty that plagued markets last season, and if weather is more conducive to robust crops and normal lake levels, it could be a recipe for better results in 2020.

Canadian Coast Guard's icebreakers keep shipping moving in winter

The Canadian Coast Guard provides icebreaking support, escort, and ice management services to support the safe and efficient movement of people, ships, and goods across Canadian waters. Shipping on the Great Lakes remains active during the winter months, and the Canadian Coast Guard supports the shipping industry to keep cargo moving.

Although the St. Lawrence Seaway, Welland Canal and Sault Ste. Marie Locks are closed during the winter months, shipping is still active on the Great Lakes and connecting waterways, including Lake Erie, Detroit River, Lake St. Clair, St. Clair River, Lake Huron, St. Marys River, and Georgian Bay. The Canadian Coast Guard has two icebreakers assigned to the Great Lakes for the entire winter season: the





The Canadian Coast Guard works closely with the shipping industry requesting icebreaker assistance and the United States Coast Guard to plan icebreaking operations.

The Canadian Coast Guard's icebreaking programme extends to the skies over the Great Lakes. Its helicopters allow crews to conduct ice reconnaissance missions. The information gathered from the flights assists both Coast Guards and the shipping industry in planning their routes and schedules.

Last season alone, both Coast Guards directly assisted 522 ship transits on the Great Lakes.

CCGS Griffon and CCGS Samuel Risley. They are also supported by additional Coast Guard vessels during the icebreaking season.

Coast Guard icebreaking service is an economic enabler. Icebreaking is an important government service that helps the Canadian and United States economies.

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

The United States Coast Guard District 9 and Canadian Coast Guard, Central and Arctic Region have developed a longstanding partnership in building an inter-operable, bi-national Coast Guard service in the Great Lakes.



Record year for the Port of Toronto

The Port of Toronto, one of Canada's largest major inland ports, is situated on the northwest shore of Lake Ontario. Located minutes from Toronto's downtown core, the Port of Toronto has served as Toronto's gateway to the St. Lawrence Seaway and to marine ports around the world since 1793.

Serving primarily as a bulk cargo destination, the port boasts a seamless network of cost-effective intermodal links to road, rail and air transportation, serving as a unique and crucial piece of the city's economic infrastructure.

In addition to moving cargo, the port also welcomes cruise ships and passengers from around the globe through the Cruise Ship Terminal.

In addition to its economic impact, imports through the port have a positive impact on the environment and traffic congestion. In 2019 approximately 54,000 40-tonne trucks were taken off Toronto's already congested roads and highways through cargo being moved by ship. The Port of Toronto is a vital connection to the world, not only boosting tourism and trade, but also helping to lower Toronto's carbon footprint.

The Port of Toronto is an essential asset for the city. PortsToronto, formerly known as the Toronto Port Authority, is responsible for the management of the harbour of Toronto, Ontario, Canada, and the Billy Bishop Toronto City Airport.

Says Geoffrey Wilson, PortsToronto CEO, "From supplying salt for our roads, sugar for our food and beverage sector and essential supplies such as cement and steel to support the Greater Toronto Area's booming construction industry, the goods delivered through the Port of Toronto are part of an important supply chain that supports Canada's largest city. 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. For more than 100 years, the Port of Toronto has served as Toronto's gateway to the St. Lawrence Seaway and to marine ports around the world. In 2020 and beyond, the Port will continue to provide Canadian and international businesses with a convenient, sustainable and cost-effective way to bring





goods, and people, into the heart of the city."

HIGHLIGHTS

- The year 2019 was a record one for the Port of Toronto which moved 2.3mt (million metric tonnes) of cargo, marking the highest recorded cargo levels in 15 years. In addition, the port saw a record year in cruise ship activity as the number of cruise ships visiting Toronto more than doubled in 2019. This record year in both marine imports and cruise ship activity highlights the important role the port plays in Toronto's economic infrastructure.
- The number of ships visiting the Port of Toronto increased by nearly 20 per cent, with 213 ships visiting the Port of Toronto in 2019 versus 179 ships in 2018.
- In 2019, the Port of Toronto welcomed approximately 12,000 visitors to the city via 36 cruise ships, highlighting the importance of the ever-growing Great Lakes cruise ship business and the role it plays in contributing to the city's recordbreaking tourism industry.
- Through its mixed-use facilities, the Port also plays a role in supporting Toronto's \$2 billion film industry by providing a production hub for industry giants like Cinespace and Netflix. 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.

In addition to its economic impact, increased imports through the port has a positive impact on the environment given the 2.3mt of cargo delivered by ship last year took approximately 54,000, 40-tonne trucks off Toronto's congested roads and highways.

TONNAGE

Overall, the port moved 2,297,029 metric tonnes of cargo, bringing road salt, sugar, cement, aggregate and steel directly into the city's core. With the Greater Toronto Area's construction industry showing no

signs of slowing down, cement cargo imports increased by close to 10% with more than 656,000 metric tonnes delivered through the Port of Toronto last year. The port also recorded the highest salt cargo levels in nearly 15 years with more than 876,000 metric tonnes imported, while sugar cargo imports from Central and South America remained consistent with 2018 levels at approximately 572,000 metric tonnes. In addition, the Port saw steel products such as rebar, steel coils, steel plate, beam and mesh totalling more than 44,000 metric tonnes and recorded approximately 14,000 metric tonnes in warehousing storage.



Toledo-Lucas County Port Authority receives \$16 million port infrastructure development grant from MARAD

On 14 February this year, the Toledo-Lucas County Port Authority received a \$16 million grant awarded through the United States Maritime Administration (MARAD) Infrastructure Development Grant Program. These grant funds will allow the Port Authority to reconstruct and upgrade the dockwall at the Port of Toledo's General Cargo Dock, operated by Midwest Terminals, and will also be used to construct a liquid transloading facility at the site.

"This grant will allow us to continue to improve and modernize a valuable asset in Northwest Ohio," said Thomas J. Winston, President and CEO of the Toledo-Lucas County Port Authority. "Our existing dockwall has served us well since the late 1950s; however, it has exceeded its useful life and is deteriorating. These funds will allow us to address this critical component of our seaport's infrastructure positioning the facility to serve vessels from around the world for decades to come. The grant funds will also allow us to pursue new business related to the transfer of liquids between transportation modes at the seaport."

An additional \$4 million local match will be added to the \$16 million grant to fund both components of the \$20 million project, which are part of a ten-year master plan to upgrade current connections from multi-modal to an integrated intermodal port transportation network.

Letters of support for this grant were received from US Senator Sherrod Brown; US Senator Rob Portman; US Congresswoman Marcy Kaptur; US Congressman Bob Latta; Lucas County Commissioner Tina Skeldon Wozniak, Lucas County Commissioner Pete Gerken and Lucas County Commissioner Gary Byers; City of Toledo Mayor Wade Kapszukiewicz; the Ohio Department of Transportation; the American Great Lakes Ports Association; the St. Lawrence Seaway Management Corporation; Cleveland-Cliffs, Inc.; CSX Transportation, Inc.; and the Toledo Metropolitan Area Council of Governments.

ABOUT THE PORT OF TOLEDO

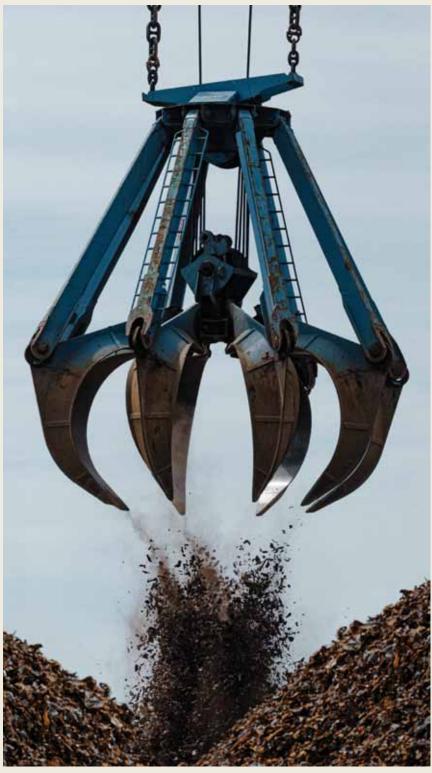
The Great Lakes St. Lawrence Seaway System marine shipping industry supports nearly 238,000 jobs in the US and Canada and generates \$35 billion in economic activity. The System moves 143.5 million in metric tonnes of cargo annually. The Port of Toledo supports \$669 million in economic activity and more than 7,000 jobs in our region.

The mission of the Toledo-Lucas County Port Authority is to develop expertise and assets that drive and grow the region's transportation and logistics infrastructure and its economic prosperity for all.









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As the COVID-19 pandemic confines people to their homes, the Port is working tirelessly to keep everyone connected to vital goods and services. This involves ensuring the health and safety of all involved, from sailors

and longshoremen to our employees, delivery personnel, and clients. We are going above and beyond government safety guidelines on all our sites. Rest assured, we will sail through this crisis together.

Lake Carriers' Association gives an update on Great Lakes Shipping in 2020

The year 2019 was a strong one for taconite (iron ore) and limestone. Taconite was up nearly 8.5% over 2018 at 49.7mt (million net tonnes) and 11.7% over the five-year average. Limestone was up 9.7% over 2018 at 24.1mt and 10.2% over the five-year average. Coal continues its steady decline as coal-fired power plants close and energy production switches to natural gas and other alternative sources. In 2019, coal deliveries dropped 4% from 2018 and 23% from the five-year average. Overall,

major dry bulk cargoes carried by the U.S.-flag Great Lakes fleet (i.e., taconite, limestone, coal, cement, salt, sand, and grain) were up 7.5% over 2018 and 4.6% over the five-year average.

Two new U.S.-flag Great Lakes vessels, known as 'lakers', are currently under construction at Fincantieri Bay Shipbuilding in Sturgeon Bay, Wisconsin. One is a 740-foot self-unloading barge as a part of an articulated tug-barge (ATB) unit being built for VanEnkevort Tug and Barge of Escanaba, Michigan. The ATB will be sailing this summer. The other vessel is a 639-foot self-propelled and self-unloading vessel being built for The Interlake Steamship Company of Middleburg Heights, Ohio. The first cut of steel was in August 2019 and she is expected to sail by mid-2022.

Record high water levels in all five Great Lakes have provided opportunities to carry record amounts of cargoes but at the same time have made navigating some of the river docks in the lakes challenging. A 1,000-foot laker, colloquially referred to as a 'footer', carried over 76,000 net tonnes through the locks at Sault Ste. Marie, Michigan (Soo Locks) last summer breaking a two-year old record. However, reaching docks upstream in rivers such as the Cuyahoga in Cleveland, Ohio where ArcelorMittal's mill is 5.5 miles from Lake Erie was sometimes hampered by high flows that prevented vessels from safely navigating the river. With big storms, sediment has been quickly accumulating in federally-maintained navigation channels. The year 2020 is again set to shatter high water marks on all five Great

The 2019/2020 ice season coverage on the Great Lakes, typically mid-December to mid-April, was significantly lower than in



recent years. In fact, the lower lakes, Ontario, Erie, and the lower halves of Michigan and Huron saw little to no ice at all. Ice did cover Green Bay, the Straits of Mackinac, St. Marys River, Whitefish Bay, and western Lake Superior ports. Despite an atypical year of low ice coverage, the U.S. and Canadian Coast Guards still struggled to maintain open channels early in the The fleet of six 140-foot icebreaking tugs are 40+ years old. Of the three other U.S. Coast Guard icebreaking assets, only the 240-foot Mackinaw is truly capable of breaking heavy ice. The Canadians have two breakers but they are ageing out, as well. Of the three new icebreakers that the Canadian Coast Guard is bringing online, none will end up in the lakes. More and more, keeping the Great Lakes waterways and ports, both U.S. and Canadian, is falling mostly into the hands of the U.S. Coast Guard. In February 2020, the lakes peaked at about 17% coverage. In February 2019, it was 67%. When the Soo Locks opened on March 25th, total ice coverage was barely 6%. Typically, the fleet can expect 41% coverage when they sail. When just a few hot spots in the Great Lakes have ice, it is frustrating that the combined resources of the U.S. and Canadian Coast Guards can not open and consistently maintain the waterways for commerce.

The year 2020 was expected to be another strong one on the Great Lakes and indeed has started off strong to replenish stockpiles depleted during winter layup. But the emergence of COVID-19 and the economic impacts that state and federal self-quarantining and limitations set by what is considered 'essential' businesses in the commercial, agricultural, and manufacturing sectors are shaping a different season than

expected. As of April 14, the majority of the fleet has set sail following normal winter layups from January 15 to March 25 when the locks at Sault Ste. Marie, Michigan are closed for winter maintenance and rehabilitation Integrated steel mills in the Great Lakes are idling blast furnaces and downstream users of steel are curtailing operations, including the 'Big Three' auto manufacturers, Ford, General Motors, and Fiat Chrysler. The full impacts of COVID-19 are not yet fully defined.

A new large lock at the Soo is finally becoming a reality. First proposed in 1986 and later reauthorized in 2007, budget considerations and flawed economic studies stalled its construction for decades. However, renewed pressure from state and federal elected officials, interest by state and federal agencies, and direction from the White House, the new lock, built to the same dimensions as the Poe (1,200 feet by 110 feet and 32 feet deep) is now back on track. The first phase of construction, deepening of the upstream approach channel, is commencing in spring of 2020. The next phase is currently on track which includes construction of the approach walls and completion of the design of the lock chamber itself will take place in 2021. So far, appropriations and additional funding from the U.S. Army Corps' of Engineer's discretionary work plan funds are fully funding the projected capacity for design and construction each year. With this 'efficient funding' continuing, the new lock could be complete in seven years.

Cleveland Cliffs is nearing completion on a hot-briquetted iron (HBI) plant in Toledo, Ohio. The HBI plant is expected to consume about 2.4mt of taconite and produce I.9mt of HBI each year that will go to electric arc furnaces as opposed to the traditional taconite consumer, large integrated steel mills primarily located on the Great Lakes.

LAKE CARRIERS' ASSOCIATION:

Since 1880, Lake Carriers' has represented the U.S.-flag Great Lakes fleet, which today can move over 90mt of cargos annually that are the foundation of American industry, infrastructure, and power: iron ore, stone, coal, cement, and other dry bulk materials such as grain, salt, and sand.

Hamilton-Oshawa Port Authority reports on recent activities

The vast majority of the cargo — roughly 90% or 9mt (million metric tonnes) on average — that comes through the Port of Hamilton annually is dry bulk. This cargo supports major local industries such as steel-making (iron ore), agriculture (crop inputs, grain, beans, sugar, and salt) and construction (aggregates, like gypsum, quartz, sand and stone).

Continued investment in agri-food operations at the port of Hamilton over the past decade has helped grow this sector into a \$1 billion business locally. With over C\$350 million in private sector investment, the Hamilton-Oshawa Port Authority (or HOPA Ports) has expanded storage, berthing space and export capacity for terminal operators, manufacturers and logistics companies that carry dry bulk. In 2020 alone, new storage space and marine infrastructure for sugar and grain at Pier 10 will provide 225,000 tonnes of additional grain export capacity per year, while also taking thousands of trucks off the road. New food-grade warehousing at Pier 15 will also allow for more efficient storage and handling of bulk cargo and food products, in close proximity to the US/Canada border.

HOPA Ports has successfully reconfigured its real estate assets to bring together complementary bulk/agri-food businesses in clusters along its port lands, increasing connectivity and efficiency for its partners. Now that it has amalgamated with Oshawa, the team is working on



developing a land use plan to guide a similar, integrated growth and business development on the other side of Lake Ontario.

There is room for industrial growth in Oshawa, and HOPA Ports is actively seeking new business opportunities. "We're exploring many new opportunities for dry bulk commodities and other cargo types in Oshawa," Michael Peace, Business Development Analyst. "We are currently working on a port development plan will help provide a framework for new projects and future economic development, and the case for major infrastructure upgrades.

There are a lot of exciting things happening in Durham, and Oshawa's port is a key gateway to the most densely populated area of Southern Ontario and international markets through the St Lawrence Seaway."

Dry bulk makes up just over half of the cargo that moves through the port of Oshawa every year. It has been a popular destination for salt and cement and we see both having room to expand. However, a new grain terminal by Sollio Ag and QSL built last autumn has now added direct export capacity for farmers across Durham region.



St. Lawrence Seaway – gateway to South America

Doing business between continents is a very common endeavour and has become a necessity for the continued viability of many businesses. We rarely reflect on the huge logistics involved in these cross continent transactions. "At Triodetic we don't give it a second thought to quote projects in faraway places such as Kuwait or South America." says Luis Gattorno, V.P. Global Dome Operations. These transactions however involve a great amount of effort and planning on the part of many participants in the process of bringing goods from Canada to other continents.

A great example of such a shipping effort involved a recent project Triodetic completed for the SSR Mining Company, Mina Pirquitas in Argentina. This mine is an open pit silver-lead-zinc facility. The anticipated consolidated production in 2020 is estimated to be six million ounces of silver, 21 million pounds of lead and seven million pounds of zinc. Triodetic was

involved in covering a coarse ore stock pile. During mining operations materials are brought by overland conveyor to the plant and are dropped from a height of 30 metres to form a cone shaped stock pile. Dropping rock from great heights in a windy environment creates a lot of dust 24 hours a day. A dome-shaped cover was required to contain and manage the dust.

The Triodetic dome is 64 metres in diameter and has a height of 27 metres. The main components making up the dome structure are structural tubes and connectors. The tubes are mechanically joined in the field using connectors to form the dome shape. The dome structure is then covered with pre-curved corrugated metal panels. The entire structure weighs 150 metric tonnes. All materials were packaged to fit in ten shipping

containers of 12 metres in length.

The shipping route from the city of Ottawa in Canada to the mine in the Jujuy Province of Argentina covers a distance in excess of 13,000km.

The journey starts in Ottawa where shipping containers are loaded and travel by land to the Port of Montreal, Canada. In Montreal harbour, the containers are loaded onto the designated ship and travel along the St. Lawrence River for about 1,400km to exit in the Atlantic Ocean. From there the freight route takes the ship south past Florida into the Caribbean Sea towards the Panama Canal. At the canal, the ship reaches its two-third mark of the journey when it traverses into the Pacific

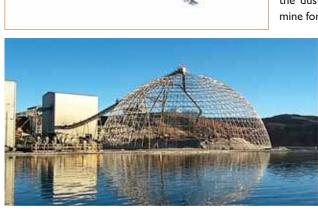
The ten containers holding the dust cover for the Pirquitas mine form part of the one million

containers per week that pass through the Panama Canal. Once through the canal, the remaining sea voyage is another 3,400km to the Port of Antofagasta in Chile and then 800km overland to its final destination in the North West of Argentina.

At the mine site, containers are unloaded and installation begins. The assembly process is very fast. The tubular components are mechanically joined using the Triodetic connectors. Each tube has a distinct number and when assembled in the proper sequence the dome shape is achieved. Once the tubular assembly process has been completed the precurved metal decking panels are attached. The entire assembly can be accomplished while the mine is in operation and materials are being dropped into the dome area.

After a remarkable journey all the way from Canada the ultimate goal of mitigating airborne dust at a mine site in Argentina comes to a successful conclusion.









Abu Dhabi Ports expansion into the dry bulk transhipment market

SAFEEN, Abu Dhabi Ports' maritime service arm, has announced a successful acquisition of a Post Panamax bulk carrier, making it largest vessel ever to join its inventory. (In view of the current health crisis, this carrier was acquired using remote conferencing facilities to keep all parties safe — for more info, please see 'HFW assists Abu Dhabi Ports on ship purchase with remote closing by video conference' on p15 of this issue.)

Built in Romania and in service since 2006, the vessel will operate under the name *HAFEET* and will initially undergo an extensive conversion, prior to commencing operations. The refitting will include state-of-the-art cranes and conveyor system, which, when combined with other design parameters, will render the vessel a potent and efficient transshipment platform, enabling SAFEEN to provide solid bulk cargo transhipment services.

Once its conversion is fully complete in the latter part of 2020, HAFEET will be based at Musaffah and will be tasked with supporting Emirates Steel's transshipment requirements. Commencing its operations in January 2021, the vessel will assist in discharging bulk iron ore bound for Emirates Steel from incoming bulk carriers more efficiently, thereby economizing the turnaround time for the large ocean going vessels.

Captain Adil Banihammad, Head of Maritime Cluster & Chief Executive Officer, SAFEEN – Abu Dhabi Ports, said: "The



acquisition and the eventual commissioning of HAFEET marks a significant step for our SAFEEN team as it greatly enhances our ability to serve our customers and provide them with world-class maritime services. Even more importantly, however, the vessel is part of a larger expansion strategy by Abu Dhabi Ports aimed at broadening our portfolio of services, and taking our experience and service excellence to the wider bulk transshipment market. We firmly believe that by challenging ourselves and looking beyond our horizons, we will benefit not only our current and future customers, but also our broader emirate as well."

Boasting a summer deadweight of up to 101,648 metric tonnes and diesel engines capable of generating up to 15,200

horsepower, HAFEET includes a total of seven holds for cargo storage, making it a natural fit for the delivery of efficient transshipment services.

Aside from being fitted with four advanced cranes and a conveyor system needed for cargo handling, the vessel will receive new hoppers, grabs, and additional generators to support its increased power requirements.

As the largest vessel in SAFEEN's inventory, it bears the name of Jabal Hafeet, the sole mountain in the Emirate of Abu Dhabi, which overlooks the UAE's border with Oman. Standing at a height of 1,240 metres, the mountain is the highest peak in the Emirate. The mountain was officially incorporated into the Sheikh Zayed Network of Protected areas in 2018.

Delays hit Argentina's bulk ports

Dry bulk ports and terminals in Argentina report that they are suffering delays because of preventive measures introduced by the government to deal with the coronavirus pandemic. Argentina has closed its borders to foreigners for a limited period to prevent the spread of Covid-19.

However, despite the fact that the new regulations do not prevent the free movement of freight, there has been some confusion among port workers, who have threatened strike action over possible health issues from continuing to work alongside vessel crew. This has forced the Ministry of Transport to issue a circular that explains how preventive

measures affect crew members, upon who the new measures have been focused, and stresses that no prohibition has been placed on the movement of cargo consignments.

The various difficulties in the ports have occurred at a time of reduced activity in Argentina, since farmers have only just started harvesting export corn while it will still be several weeks before the soya bean harvest commences.

Earlier, the union of grain handlers (URGARA) reported that anti-contagion measures were not being followed in port areas and that if there wasn't a unification of control criteria its

members would cease activities.

Following the issuing of the government circular, the grain exporting and processing companies' association acknowledged that this had gone some way towards clarifying the situation. Nevertheless, there remained some confusion within grain ports, and that cargo handling activity was still not proceeding wholly normally.

Argentina remains the world's leading exporter of soya bean oil and soya bean flour, with the port of Rosario being the leading outlet. It is also the third largest global producer of oilseed and corn, and a significant exporter of wheat.

Barry Cross

Port of Antwerp tests smart bracelet to prevent corona infection on the workfloor



Port of Antwerp is teaming up with the tech company Rombit to prevent corona infection on the workfloor. Rombit has developed the Romware Covid Radius, a digital bracelet that ensures social distancing and permits contact tracing. Port of Antwerp will be the first to use this innovative bracelet.

Antwerp Port Authority is first to test

To produce this armband Rombit has added new functions to its existing safety bracelet, the Romware ONE. This will help employees to observe the strict precautions laid down by the World Health Organization (WHO) while respecting the privacy of the wearer. The initiative is also a response to the call by the Flemish Government to create digital solutions for helping society through the current corona crisis. Port of Antwerp, which recently

introduced a project with the Romware ONE safety bracelet, will be the first to make use of the Covid functions.

SOCIAL DISTANCING AND CONTACT TRACING

The new Covid bracelet is aimed in the first place at social distancing. Whenever employees come too close to one another they first get a warning signal. However privacy is guaranteed: the Covid Wearable never passes on the location or other sensitive information to the employer.

At the same time the bracelet permits contact tracing: if someone happens to be infected then a health advisor or trusted confidant can check which work colleagues the person has come in contact with, in order to prevent further infection.

Port of Antwerp CEO Jacques Vandermeiren: "Innovation and digitization are crucial in times of crisis such as these.

It is essential to keep the port operational, and to ensure that our employees can work safely. We therefore see great potential in this solution and will shortly start trials with a team of operatives."

Rombit CEO John Baekelmans: "The new '1.5 metre economy' depends on reliable aids. We are therefore making huge efforts to get the modified bracelet onto the mass market in large quantities, so that we can contribute towards getting the economy safely restarted. There is already great international interest."

ABOUT ROMBIT

Rombit makes ports and industrial companies more efficient, safe and dynamic. The technology company develops integrated software- and hardware solutions, based upon its specific market knowledge and vast technical expertise. Rombit founded was Headquartered in Antwerp, it now employs 60 people and it supports customers such as Port of Antwerp, Deme, PSA, Brabo, Zuidnatie and the City of Antwerp. In 2017 Rombit acquired the security company Sercotec. At the end of 2019, Rombit carried out its second capital increase. At the beginning of April 2020, founder Jorik Rombouts passed the torch to John Baekelmans (CEO Rombit) and Wouter De Geest (Chairman of the Board of Directors) and Rombit acquired the training company Drivity.



Vysotsk grain terminal to become a reality

The Russian Federation's government has signed a decree to include a project at the Port of Vysotsk, in the Leningrad Region, in part of its land use programme. The facility will handle 4mt (million tonnes) of grain per year.

Vysotsk Grain Terminal will be situated on a 410,000m² site in Bolshaya Pikhtovaya Bay, close to Vyborg. When it opens in 2022, it will have a capacity of 4mt, broken down into 3.5mt of exports and 0.5mt of imports. Investment required will be in the

order of \$94 million.

A second-phase development has already been identified. This will involve construction of a facility to process wheat, with production of wheat gluten, native starch, glucose-fructose syrup and supplementary feeds of up to 200,000 tonnes per year. This is due to enter service in 2023 at a cost of more than \$80 million.

Behind the project is Technotrans LLC, which has been operating in the grain and

oil seed transport market since 2006. It is already one of Russia's three leading grain wagon operators, moving cargo in excess of three million tonnes per year.

According to Aleksandr Drozdenko, governor of the Leningrad Region, "The project doesn't just consist of a maritime terminal, but also a facility for the advanced processing of wheat. That will not only allow capacity to increase [...] at Vysotsk but shift grain cargo from the ports of Baltic States to Russia."

Sea Commercial Port Yuzhny sets new cargo handling records

In April 2020, Sea Commercial Port Yuzhny in Ukraine handled 1,981,700 tonnes of cargo. This figure exceeded the historical maximum — 1,773,300 tonnes (March 2020) — by 204,400 tonnes. The main cargo is traditionally iron ore. There has been an 88% increase in processing Capesize vessels.

Compared with April 2019, the volume of export cargo increased by 58% and amounted to 1,432,000 tonnes. The public stevedoring company increased iron ore handling by 82%. A total of 241,800 tonnes of imported cargo (mainly coking coal) passed through Sea Commercial Port Yuzhny.

At the berths of the stevedoring company Yuzhny, 13 large bulk carriers were handled last month. Since the beginning of the year, the company has welcomed 49 Capesize vessels, which is a twofold increase in comparison with the same period last year.

The railcar discharging daily capacity is also increasing. On April 10, the state stevedoring company established an all-time record in railcar handling — 1,011



units per day, taking into account loading. The average daily rate of the month is 766 railcars. Sustainable improvement of current production technologies and effective co-operation with JSC Ukrzaliznytsia ensure productivity growth.

"This spring is a difficult time for Ukraine and the world. The work of the company is carried out in a non-standard and intense environment. In a short calendar month, we reached the level of

I,981,800 tonnes thanks to competent co-ordination of cargo handling and key operations optimization of the production process. We only move forward, we are proud of our results and raise the bar", said acting director of SE STP "Yuzhny" Oleksandr Oliinyk.

"Sea Commercial Port Yuzhny is located on the north-west coast of the Black Sea in the non-freezing Adzhalyksky estuary and it is the deepest port in Ukraine.

The company provides a wide range of loading and unloading services, storage and related works; it handles bulk, general and breakbulk cargoes. Scheduled cargo delivery and cargo handling are effectively performed due to the convenient location of the railroad station Beregova, developed infrastructure of the road and railways. The company operates five deep-water berths, two of which are dedicated to the handling of Capesize vessels up to permissible tonnage. Annual cargo turnover of the company is 15.07 million tonnes.



Tarragona remains leading agri-food port in Mediterranean

The Port of Tarragona remains the leading handler of agri-food products both within Spain and across the Mediterranean. In 2019, for example, it handled more than 6mt (million tonnes) of these commodities, which was a rise of 4.5%.

In terms of products, it handles cereals, cereal flour, soya beans, fruit, vegetables, legumes, and vegetable oils, as well as feed and fodder. It has a storage capacity of up to 1.3mt.

However, as the coronavirus pandemic has begun to impinge on trade, the port authority has advanced payments to suppliers to inject €1.49 million liquidity into the system.

In addition, it plans to make further advanced payments of €1.2 million in early April. In total, 222 different companies will have benefited.

"In these moments of slowdown in economic activity, companies suffer

problems coping with the payment of payrolls, suppliers, etc. With this shortening of the payment period, the port is contributing to the mitigation of the negative effects of the pandemic," said the port authority in a statement.

Work continues as normally as possible, with a degree of the workforce now working from home. However, most financial and administrative functions are now being processed electronically. *BC*

Plunging water levels on the Paraná River prompt vessel lightening

Decreasing water levels on the Paraná river are giving cause for concern at ports on South America's Atlantic coast. At the Argentinian Port of Rosario, for example, vessels are now being forced to cut 10–12% of their volume in order to access facilities.

The Argentinian parliament has asked the government to speak to its counterparts in Brazil will a view to mitigating the crisis by regulating the flow of water from dams feeding the river. The situation was expected to get even worse over a four-week period given the scarcity of rain forecast, with

no respite in site.

Analysts suggest that the historic decrease in water levels would negatively impact on the export logistics of grains and by-products. Indeed, the situation at Rosario is the worst seen in the past 30 years, prompting calls for extreme caution in respect of pilotage to avoid vessels being stranded.

At one point, the dispatch draught on the river between Timbúes and San Lorenzo was down as low as 9.32 metres and at Rosario itself at 9.45 metres. Translated, this means that a 60,000–65,000dwt Panamax bulk carrier loses around 0.9 metres of draught, forcing it to carry 6,000–7,500 tonnes less.

In addition to vessel stranding alerts, there have also been delays of 10–15 days on barged soybeans from Paraguay, as well as possible delays in the loading of oilseed. Export soy flour consignments have additionally been held up.

This is leading to a back up in shipments, which could negatively affect the maize export season, which lasts through until the end of May, because of a lack of storage capacity.

BC

As Chinese industry resumes, slowdown hits South America

While port terminals and shipping companies suffered a downturn in traffic earlier in the year as the Chinese shut down part of their export economy, the lock down in both Europe and the Americas is adding to that problem.

Vessels leaving China for Brazil, for example, are already reporting reduced load factors. This is mostly been driven by a drop in Brazilian demand, brought about

by the closure of the manufacturing and retail sectors across the country.

The exchange rate fluctuation in recent times has also hit imports, with significant variations being seen even over the course of a month, thereby creating insecurity.

In March, there were significant falls in traffic at the ports of Santos Itajaí, Navegantes and Suape, with the situation becoming increasingly worse in April, which

is expected to generate a drop in imports from Europe in the order of 40%.

Nevertheless, while import traffic is weak, Brazilian exports remain strong, due mainly to a record grain harvest and the high dollar. Agribulk exports tend to be more recession proof than other sectors. However, some impact on exports of bulk to both Europe and North America are expected in the coming months.

Verbrugge Terminals starts new scheduled service between Sweden and North Sea Port

The new weekly service between Sweden and Terneuzen will dock at Verbrugge Terminals in Terneuzen every Saturday. The roro ships transport paper, trailers, containers and project cargo. This is a boost for North Sea Port in these coronavirus times.

The cargo consists of rolls of paper for magazines, newspapers and other printed matter. These rolls are unloaded at Terneuzen every Saturday and delivered to the various printers, with Verbrugge's transport company Verbrugge Internationale Wegtransporten playing an important role. The Verbrugge terminal in Terneuzen has been a hub for paper and cardboard for decades. Verbrugge also has the technology to cut rolls of paper to size, label them and repackage them.

The scheduled service further strengthens the link between Terneuzen and Sweden. Wagenborg has been operating weekly sailings carrying ro-ro cargo from Terneuzen to Sodertalje and Pitea for some time.

Container Rotation Systems: wide range of commodities can be handled



Australian company Container Rotation Systems (CRS) is renowned for its container-emptying system, which offers an efficient solution to the problem of unloading bulk from containers.

This is a concept that is gaining in popularity worldwide, and is in use internationally handling cargoes of vastly different properties, from alumina to coal.

The company is now offering customized solutions for a range of specific commodities, optimizing operations for the use — each commodity has different properties and behaves in a slightly different way.

The commodities served include:

- coal: for coal, CRS has developed its Rotainer® Eurospec 38, with rotating headframe. Each container carries a load of 32 tonnes, and the Rotainer® Eurospec 38 can achieve up to 38 cycles per hour, resulting in a capacity of 1,200tph (tonnes per hour).
- zinc: for zinc, the Rotainer® Eurospec 38, with the CRS low-profile headframe, is ideal. It can be set up for 1,450mm

half heights, and 1,800 three-quarter heights. Both are available with automated lid lifting, and can be used in combination with a mobile harbour crane.

copper: for copper, CRS's Rotainer H.D. heavy duty 360 unit can be used. Each container carries a load of 32 tonnes, and the Rotainer HD can handle generic 2,200mm containers. The CRS automated lid lifting is helpful, and the unit can be operated using a Gottwald mobile harbour crane, or similar.

Also for copper, CRS can handle I,900mm heavy duty containers with flat lids and automated lid lifting. The unit has a low-profile head frame, and direct connection.

The Rotainer HD can also handle heavier 2,200mm (38 tonnes gross weight) containers, also with automated lid lifting. This unit is diesel-powered, and can work with, for example, a Liebherr mobile harbour crane.

mineral sands: for mineral sands, the Rotainer HD is ideal in combination with a mobile harbour crane. It can handle 2,200mm generic half-heights for 32 gross weight, and can be modified to include the CRS automated lid lifting system.

- * aluminium: for aluminium, the Rotainer Eurospec 32 is perfect for more challenging conditions, this can be equipped with CRS's arctic pack for ship's gear.
- ❖ iron ore: CRS's Rotainer® HD 360 comes into its own when handling iron ore. Container capacities of up to 32 tonnes can be handled, and the unit rotates at 35 cycles per hour, offering a capacity of 1,120tph using one ship-to-shore crane.
- sugar: for sugar, the Rotainer® HD 360 is again a good choice, With three shipto-shore cranes, handling containers of 38 tonnes, it can achieve 350 cycles per hour and a capacity of 2,700tph.
- grains: for grains, the Rotainer® Eurospec 38 with low-profile headframe is popular. It can handle 32 tonnes per container, with 35 cycles per hour in combination with a mobile harbour crane.

BEUMER Group presents data analytics for sortation technology

COLLECT, ANALYSE, OPTIMIZE

What are the benefits that big data and data analytics can generate for intralogistics? The system provider presents an intelligent data analytics solution that can be used to examine large amounts of data generated, for example, during sorter operation and visualize the results. With the information collected this way, processes can be optimized, and maintenance measures can be scheduled in advance at an optimum time.

BEUMER Group presents its new BG Sorter Compact CB. This cross-belt sorter features a small design and increases throughput. Among other things, this is ensured by the possibility of data analytics. "With data analytics, we can collect large amounts of data on our sorters and evaluate them in a targeted manner, which then shows us where there is potential for improvement, for example," explains Thomas Wiesmann, Director Sales Logistic Systems at BEUMER Group in Beckum, Germany.

Among other things, the information gained can be used to continuously improve the operation of the system, to identify maintenance requirements at an early stage or to optimise system management. This has a positive impact on product life-cycle costs.

Data analytics enables BEUMER Group to increase the availability and performance of its sorters, keyword 'machine learning'. "The decisive factor is continuous access to real-time data from every system area," explains Wiesmann. With the help of a digital twin, it is possible to monitor material flows or even the routing of the system in every detail.

This is supported by the visualization of results. The operator can use colour codes, for example, to make bottlenecks visible or use time filters to include historical data for the analysis.

MAINTENANCE ONLY WHEN REQUIRED

With the support of data analysis, it is possible to identify actual operating hours and loads. Thus, maintenance cycles can be adjusted based on the actual load. For example, service personnel will only replace a component when it is really necessary and not according to a fixed cycle.

"Data-driven analysis will continue to increase," Wiesmann is sure. After all, sensors are already part of every system and able to generate and process huge amounts of data. Based on this acquisition of information, further services may be added in the long term. Wiesmann is thinking of video coding for machine learning. He also envisages cloud-based optical character recognition to convert scanned images with text into machine-readable text.

WHERE WILL THE JOURNEY TAKE US?

"Some of our customers already rely on data analytics," reports Wiesmann. "They use it to reliably monitor their systems and see in time when an error is going to occur. This enables them to maintain their system at the perfect time." The more intensively a company knows the operating conditions of the system, the better they can benefit from this opportunity. This is because the machine will learn to learn, and instead of just recognizing that something is wrong, it will also find out the cause, supported by the information obtained. "This will enable the system to independently generate a perfectly fitting maintenance plan in the future," predicts Wiesmann.

Data analytics is currently based on existing operational data, but even more sensors and other systems that can collect much more data will be used in the future. The sorter will then be able to continuously make processes smarter and increase the level of automation. A clear competitive advantage for every plant operator.

ABOUT BEUMER

The BEUMER Group is an international manufacturer of intralogistics systems for conveying, loading, palletizing, packaging, sortation, and distribution. With 4,500 employees worldwide, the BEUMER Group has annual sales of about €950 million. BEUMER Group and its subsidiaries and sales agencies provide customers with high-quality system solutions and an extensive customer support network around the globe and across a wide range of industries, including bulk materials and piece goods, food/non-food, construction, mail order, mail and airport baggage handling.



Bat Booth® 2.0 reduces on-site virus transmission risk



Bat Booth® 2.0, from Australian company Mideco, uses temperature checks to help protect workers from viral infections and heat stress, while reducing the risk of dust diseases such as coal workers pneumoconiosis, silicosis and farmer's lung.

The intelligent device has been raced into production by Melbourne-based Mideco and Newcastle-based technology company Pulse Mining Systems, in a rapid response to the coronavirus pandemic threatening lives and economies around the world.

"We realized time was of the essence in fighting this pandemic; it's like going to war," Mideco managing director Melton White said.

White, who has a background in minesite maintenance, conceived the Bat Booth® to minimize the health hazards of respirable dust particles on clothing and protective equipment while reducing heat stress among mining, quarrying and

manufacturing employees. The Bat Booth® is also used at grain processing sites, where it is used to protect employees in the grain-quarantining process that is required by the stringent regulations that Australia has in place when it comes to the import of any foodstuffs.

In the face of the advancing coronavirus threat, the two partners ramped up their collaboration to combine technologies that were easy to use, easy to manage and offered a real boost to occupational health and

safety (OHS) managers' capability, according to Pulse managing director Ash Bosworth.

"We pivoted our development teams to work on this because it matters to people and industries all around the world. It may make the difference in some areas for mining and manufacturing to continue," Bosworth said.

The product is streamlined for efficiency, taking just 15 seconds from the time an employee enters the booth and triggers an automatic recognition system and infra-red camera that logs temperature. Workers appreciate the cooling effect, with usage data showing they typically use the booth four times per shift.

If a temperature check shows an anomaly, the digital unit sends an instant alert to the user and offsite managers. The data also goes to individual employees' health records and can be used to measure and compare the employer's safety

performance.

Bat Booth® 2.0 comes as mines and other worksites across Australia and around the world are trying to avoid shutdown by adopting strict travel and safety measures, especially affecting fly-in, fly-out (FIFO) workers and mining communities where a coronavirus outbreak could wreak havoc.

Federal Resources Minister Keith Pitt warned last week that curbs on the FIFO workforce, numbering more than 50,000 workers in Australia's mining and energy sector, could become permanent.

"I think the way our workforce is distributed and located post-corona will be very different to the pre-corona environment," he said. "I think you will have a lot more residential workers in the future than we have had in the past."

In response to the pandemic, industry giants such as BHP and Rio Tinto are investing millions to keep workers safe and maintain coal, iron ore and other mining

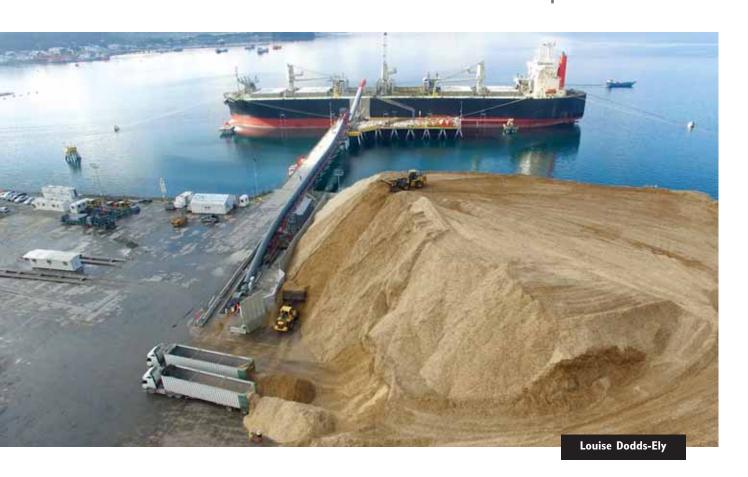
activities that are essential drivers of the Australian economy. Normally, the minerals and energy sector contributes \$260 billion in exports per year.

Mideco is in discussions with industries in Australia and abroad where Bat Booth® 2.0 can make a difference to OHS practice, workers' health and data management, including mining and energy, agriculture, food processing, glass manufacture, stone cutting and engineering.



Mobile systems keep cargo moving smoothly

efficiency and cost-effectiveness remain paramount



Telestack rapid deployment solution enables Oxxean to use existing infrastructure and minimize on capital expenditure

Telestack recently installed a TB58 Export Radial Telescopic Shiploader to Oxxean in Chile which is proving a critical part of the logistics chain in Chincui Port, located in the developing industrial zone of Puerto Montt. The unit is currently fed directly from a woodchip stockyard and is used to load woodchips onto Panamax vessels in Chincui Port at loading rates of 600tph (tonnes per hour) at 0.3 tonnes m³, destined for China where they will be used to feed power stations.

Oxxean Puerto Chincui was formed to

maximize the unloading and loading of solid bulks in the region. At the start of this project, Oxxean's primary objective was to achieve an efficient woodchip export business. Telestack's solution, which was custom-designed specific to the parameters of the existing jetty, meant that Oxxean could utilize the current infrastructure without major capital investment, planning approval or civil construction. The immediate savings achieved by selecting the Telestack solution, compared to a fixed infrastructure or

mobile harbour crane, meant that Oxxean could redeploy its capital investment in other areas of their operation. The lower cost per tonne also ensured that Oxxean maximized on efficiency. The flexibility of the Telestack unit also future-proofed the equipment meaning that the quay is now more flexible when handling any dry bulk and can be adapted quickly and efficiently to load different commodities. Furthermore the flexibility to use the unit in any type of shiploading, unloading or stacking means that the TB58 unit can be





maximized along any part of the logistics chain. The investment in the TB58 Telescopic Shiploader also reduced the timeframe of the project significantly with the system fully operational in six to seven months from order.

A key requirement for Oxxean when considering its shiploading solution, was to minimize the capital investment and to utilize the existing jetty as much as possible. The existing finger jetty was limited in size so it was important that the TB58 Telescopic Shiploader was capable of operating within these restricted parameters. The capabilities of the equipment allows the operator to have ultimate flexibility whilst shiploading and

when in storage position, compared to fixed-length shiploaders, as minimal space is needed for storage. The site is used as a multicargo jetty for shiploading, shipunloading and breakbulk so the mobility of the shiploader was a key consideration as it was an important that the shiploader could be moved easily off the jetty when required.

International Sales Manager for Telestack, Carl Donnelly explains "Telestack have been providing solutions for over 35 years and we are experienced in working within the parameters of existing infrastructures. Mobile equipment often helps reduce initial CAPEX as they are typically significantly cheaper to purchase

and operate than mobile harbour cranes and stationary conveyor systems without the civil construction requirement. The mobile equipment also means there are typically significantly lower civil engineering and infrastructure costs, and can easily link into existing material handling systems. The customer can very quickly be generating revenue streams with this mobile 'rapid deployment solution' which was critical to the Oxxean Project in Chile. Typically designed to not require any on-site welding, a standard shiploading unit can be transported in several 40ft containers and operational within a very short space of time — all with limited/no planning requirements or restrictions as found with





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stationary solutions. Moreover, costs operating significantly less than traditional systems as mobile solutions are continuously loading as opposed to grabs/wheel loaders/trucks coming back empty in the cycle. The ease of use means that all machines are simple to operate, maintain and troubleshoot as there are no complicated electrics/electronics to manage, and hydraulics can be kept to a minimum. Overall, this has been a very successful project both for Telestack and the customer Oxxean and we look forward to developing this relationship further in Chile and South America."

The radial and telescopic features of the mobile Telestack solution allowed the operator to easily and safely work within the constraints of the site. Fitted with a Telestack telescopic Telechute with 360° trimmer, the radial telescopic features allows for trimming of the hold. Each Telestack unit is custom-designed and as part of the design brief, will take into consideration the maximum free-board heights, beam and quayside widths, production rates, relevant vessel characteristics as well

commodity composition. The design in this case also had to consider the flow-ability of the product and Telestack's direct loading solution ensured that the material could be transferred from stockyard to vessel as efficiently as possible, eliminating the double handling of material and maximizing the integrity of the product.

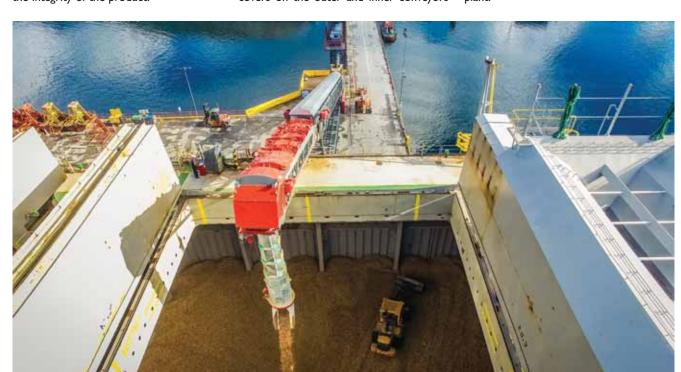
The TB58 Telescopic shiploader has an extended 58m (190ft) length conveyor which allows the unit to reach the centre of each of the holds easily. The integration of an 8m (27ft) telescopic discharge chute with 360° trimmer increases flexibility during the trimming process. The dust covers on the outer and inner conveyors

also controls any dust and contributes to the environmental benefits.

This system is fully supported by Telestack's long term dealer Komatsu Chile. Komatsu Chile (KCH) is the local unit of Japanese mining and construction equipment manufacturer Komatsu Limited. The company provide equipment, services and parts for the construction, mining and forestry industries. Komatsu Chile is an established long-term partner of Telestack's who provide excellent pre-sale and ongoing aftersales support of all Telestack systems in Chile. Telestack understand and appreciate the importance of local partnerships in business to create a successful brand. Reputation is critical in any business and our dealers assist us in developing trust with our clients. The integrity of all three stakeholders is central to past and future success.

Telestack, a specialist in the complete design, manufacture, installation and commissioning of mobile, bulk material handling systems, have a global proven record in a range of applications including mining and quarrying, stockyard management, ports & inland terminals, power stations, rail yards, steel mills, cement kilns

and many other bulk material handling industries. Telestack has matured into two clear divisions — Telestack Aggregates and Mining and Telestack Ports and Inland Terminals and offers a range of solutions and reference sites along the logistics chain from pit to port, pit to plant and port to plant.







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Konecranes wins order in Rotterdam for mobile harbor crane – Powered by Ecolifting



In the last quarter of 2019, Rhenus Logistics B.V. (Rhenus) ordered an eco-efficient Konecranes Gottwald Model 6 mobile harbour crane for its operations at the Rhenus Deep Sea Terminal, Maasvlakte in Rotterdam, the Netherlands. With commissioning planned for May and handover by June 2020, the crane will handle general, heavylift & project cargo and expand the terminal's container handling capacity. Equipped with an external power supply, it brings Konecranes' Powered by Ecolifting to a new market.

At 40km long, the Port of Rotterdam is Europe's largest port, with access to ship, train and road connections, as well as river transport all the way to France and Switzerland. As a major global logistics provider, the Rhenus Group operates multiple terminals at this key location. The Rhenus Deep Sea Terminal, situated on the Maasvlakte extension into the North Sea, functions as a hub between long-distance cargo and short sea shipping, with unobstructed nautical access. Rhenus decided to invest in a new mobile harbour crane to extend and modernize its fleet of three Konecranes Gottwald cranes.

"We've been very pleased with our Konecranes equipment," says Peter van der

Steen, Managing Director of Rhenus Logistics B.V. "When we took over this terminal some years ago, there were already two 100-tonne Konecranes Gottwald mobile harbour cranes in operation. They've been excellent, so four years ago, we bought our first 125 tonner, Model 6, a high-performance crane that gives us the flexibility to handle any kind of cargo. For this new order, we wanted something similar, but with even better energy efficiency, to correspond with the Rhenus Group's commitment sustainability and to our ambition in Rotterdam for further electrification."

Their fourth Konecranes Gottwald crane is like their previous purchase, a Model 6 mobile harbour crane in the G HMK 6507 variant.

It gives Rhenus a second option for handling up to 125 tonnes of general and heavy project cargo as well as containers. In twin-lift with its sister it can lift up to 187.5 tonnes. One difference is that the new crane uses a 690V external power supply, which will lower operating costs, while reducing noise and exhaust emissions at the same time. The first Model 6 crane has built-in readiness for an external power supply, so Rhenus will be able to connect it to the

harbour mains as well, at a later stage.

"This is the first mobile harbour crane in the Netherlands to be delivered with an external power supply," says Hans-Juergen Schneider, Regional Sales Manager, Konecranes Port Solutions. "We are excited to see the growing enthusiasm for the Konecranes Powered by Ecolifting approach in the Benelux region. Ecoefficient solutions like this are essential to modern long-term business investment."

This is part of Powered by Ecolifting, Konecranes' vision to minimize the footprint and improve the handprint of equipment for container terminals. From eco-optimizing diesel drives, to hybridization and fully-electrified fleets, we will continue to do more with less.

ABOUT KONECRANES

Konecranes is a world-renowned group of Lifting Businesses[™], serving a broad range of customers, including manufacturing and process industries, shipyards, ports and terminals. Konecranes provides productivity enhancing lifting solutions as well as services for lifting equipment of all makes. In 2018, group sales totalled €3.16 billion. The group has 16,100 employees in 50 countries.

Movable equipment: the utility knife for flexible transshipper design

The commodities and offshore transshipment markets have seen ups and downs in recent years, with fluctuations in prices and demand, writes Luca Condini.

Nowadays, accurate planning for long-term projects is very difficult and long-term contracts of ten or more years are no longer the norm.

Moreover, the sudden outbreak of the Covid-19 virus has badly impacted the global market with a reduction in demand and disruption of the supply chain. Most of the logistics projects which were already under development have been put on stand-by and many of them have been cancelled.

With the world in turmoil at present, it is a logical next step that transshipment equipment has to be designed to provide a flexible response. Flexibility is the key in delivering a vessel that is designed to meet various scenarios including a reduction of handled volumes and prices.

Can portable equipment help achieve the required flexibility?

When we think of portable equipment in the bulk handling market, most of the times dozers are the first machinery that comes to mind. Dozers are widely used in barges during the barge-to-OGV (ocean going vessel) loading operations to accumulate the cargo towards the cranes; they are also used to clean the cargo holds during bulk carrier discharging operations. And without dozers, coal blending operations with two barges in a quadruple banking arrangement with the transshipper and the OGV would not be possible.

But dozers are just one of the types of movable equipment that comes in handy in this case. Mobile harbour cranes, mobile shiploaders and excavators are other examples of such items.

At Shi.E.L.D. Services, the company has already received requests from clients for flexible solutions and short lead times, and that's when it came up with the modular design of transshippers, which allows for fast delivery for a basic layout and the possibility for future improvements with limited impacts in terms of cost and time.

Although the modular design has been developed with traditional bulk handling equipment, it is also the perfect platform for employing movable and portable equipment.

Mobile harbour cranes can be used in lieu of the traditional pedestal-mounted cranes, a design solution Shi.E.L.D. Services





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has already verified with manufacturers and classification societies. Furthermore, the cranes can even be replaced by long-arm excavators to take the cargo from barges. Even though their performance is much lower compared to cranes, excavators can be easily procured also on the second hand market and installation on board is extremely easy.

The same concept applies for the conveyor system where a mobile shiploader, or a series of mobile conveyors, can be installed on board in a shorter time compared to a tailor-designed conveyor system.

When speaking about portable equipment, Shi.E.L.D. Services likes to include in this category also containerized gensets and accommodation modules, which are not literally bulk handling equipment but are necessary for its modular design.

Containerized gensets and accommodation modules are usually realized in standard dimension containers, easy to

transport and to install. They are also scalable and can be added or replaced as necessary.

The use of portable equipment in Shi.E.L.D. Services' modular design brings the following advantages:

- lower cost and lead time;
- easier installation, due to standardized dimensions;
- lower overall capital investment and operating costs; the advantage is even greater in case of a fleet of transshippers of similar design, because the pieces of machinery can be transferred among the various units as needed;
- scalability, in case the project calls for higher performances; and
- in case the equipment is not needed it can be more easily sold or employed in other projects, because it is suitable for harbour operations, on jetties and industrial plants

Portable bulk handling equipment can therefore be efficiently employed also

outside its traditional field of use and can bring added value to offshore logistic projects.

Luca Condini is Technical Director at Shi.E.L.D. Services.

ABOUT SHI.E.L.D. SERVICES SRL

Born as a spin-off of Coeclerici Logistics, Shi.E.L.D. Services provides a complete range of services for the logistics and transshipment sector, including feasibility studies, definition, and development of the most suitable logistics solution, vessel design, supervision of new-building construction and vessel conversion, technical, crew and operational management. The headquarters is in Milan with a branch office in Balikpapan (Indonesia).

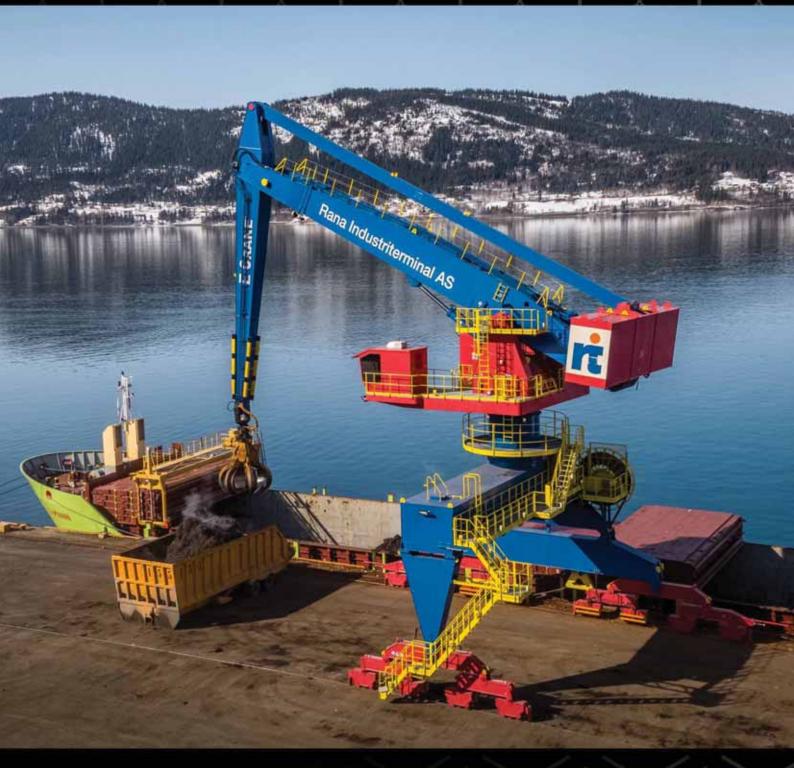
Shi.E.L.D. Services is currently the technical and crew manager of five transshipment vessels in Indonesia, owned by major mining and shipping companies in East Kalimantan, and of one transshipper in Guinea

Recent contracts are the design for LDPL, a subsidiary of Louis Dreyfus Armateurs, for the conversion of a Supramax vessel into a transshipper and the feasibility study for Dynamic Mining for the exportation of bauxite from Kamsar, Guinea. Shi.E.L.D. Services is also working for RINA Consulting on a logistic project in the Middle East for the importation of coal for a newly built coal-fired power plant.

Shi.E.L.D. Services is the winner of the prestigious International Bulk Journal Awards 2019 in the 'Bulk Logistics Excellence' category.



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First port of call for dust control

orts worldwide are working to reduce dust and spillage to comply with increasingly strict environmental regulations. Page Macrae Engineering, a New Zealand-based company, provides solutions for both

One of Australia's busiest ports, based in Victoria, is currently working with the company on a dust control solution for its operation.

Product including fertilizer, wood chip and break-bulk cargo flows through the port at the rate of 11 million tonnes annually, boosting the port's trade to over A\$7 billion.

Environmental protection guidelines worldwide commonly require the ports and their operators to do everything in their power to reduce dust emissions and spillage from contaminating the local environment.

The port approached Page Macrae Engineering to provide a solution to replace its existing equipment to ensure it could continue to meet its obligations.

Peter Swan, General Manager of Sales and Marketing at Page Macrae Engineering, says the company needed a versatile solution, as the port services many different customers and materials. It required equipment to load out to trucks or switch to conveyors filling the port's warehouses.

"We have worked with the port for many years and began drawing up several concept designs, informed by site visits," he says.

"After evaluating different options with the client, we settled on a proposal for two, rail-mounted dust-controlled port hoppers



with a bespoke rotating discharge conveyor arrangement."

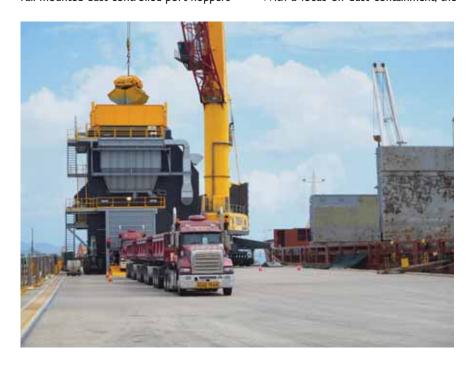
With a focus on dust containment, the

hoppers include robust dust control and filtration systems to minimize airborne dust emissions and spillage onto the wharf. Our strong focus is ensuring our hopper design enables the port to be highly productive while meeting its environmental requirements.

Designed to be easy to clean, and rugged enough to handle dusty and abrasive materials, the hoppers will integrate into their versatile operation. They will be able to be purposed to foodgrade products, mineral concentrates, animal feed and fertilizer.

A key feature of the hopper is a built-in radio link, enabling the hoppers to communicate with the existing port receiving conveyors managing the feeding process. Swan points out that a lot of effort will go into training the operators on how to properly control the equipment.

"We make sure our team are on hand to train the operators the ins and outs of the system, and what to do while a vessel is



being unloaded," he says, "We've found that most operators prefer this one-on-one hands-on learning."

Based in New Zealand, Page Macrae Engineering has equipment in many major ports throughout Australia, Canada, South America and with some further afield.

With such a large international client base, it is kept busy helping them with solutions best suited to their operations.

Bruce Ennis, Business Development Manager – Product Solutions at Page Macrae Engineering, says listening first-hand to our client is the first step for our engineers, as it helps them get a good grasp of the issues at hand from those on the front line.

"Most of the time, the site staff and operators know what the issues are and what is needed to fix them," Ennis says, "On other occasions, our clients' rely on our experience to find the way forward."

Since 1955 Page Macrae Engineering has been providing engineering solutions to ports and related industries, having initially started as ship repairers to the marine industry.

Working with ports around the world



has enabled the company to develop a robust knowledge base supported by a range of product solutions. The most popular products being dust controlled hoppers and bulk grabs — each product has been designed in consultation with the people who operate and manage the discharge and handling of bulk cargoes.

For operators who are looking to

maximize productivity while keeping operating costs low, the company provides a selection of mechanical wire and chain and diesel-hydraulic grabs.

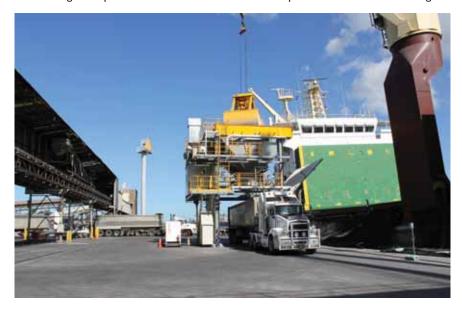
Designed with a low centre of gravity, the grabs minimize the risk of rollover on steep cargo profiles, allowing for a safer and more productive discharge.

Overlapping blade seals and serrated bucket teeth on the grabs ensure product loss and dust emissions are minimized, making them ideal for cargoes such as fertilizer and soda ash which are typically difficult to handle.

Ennis says customers mostly value simplicity when it comes to the company's product development.

"We value listening to our clients to find insights to inform our product development," he says.

"We've learned they're looking for machines that are simple to operate, clean and maintain. They want dust control and want to minimize operating costs. This is why we are focusing on providing efficient dust control outcomes without interruption to business."









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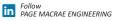
Page Macrae Engineering are designers and manufacturers to the dry bulk industry.

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Mastering peak efficiency: it's all in the material handling details

Achieving peak efficiency levels is an everyday feat of engineering and teamwork at the Geneva Rock Products Point-of-the-Mountain site Utah, USA. The facility has long been lauded for its commitment to sustainability, energy savings, and safety which is well illustrated by a unique energygenerating downhill overland conveyor system that was commissioned more than five years ago. This much-touted material handling system (which according to the company had paid for itself in under three years) transfers up to 2,750 tonnes of material per hour from a mountain of upper-ledge rock to ground-level processing operations — while generating enough electricity to power the entire facility.

As to the latter, most folks would say that Geneva Rock has indeed reached its peak performance; however, the company continues to climb higher and higher with ongoing improvements to each circuit and system, and to every transfer point, belt, pulley, idler, and more. For Geneva Rock, truly mastering peak efficiency is all in the material handling details.

DESEGREGATED RECYCLE STOCKPILING

One of the facility's most recent upgrades was revamping material handling methods in its asphalt recycling operations. When specifications for the use of recycled asphalt became far more stringent in Utah, the operation needed to avoid segregation not only in the materials but also in the oil content of the recycled asphalt. "When the rules of the game change, we need to change with them," says Geneva Rock Aggregates Production Manager Ed Clayson, an industry veteran with more than 45 years of service.

Once again, Clayson says that his company consulted with Superior Industries, a single-source provider of aggregate processing equipment and material handling systems and components. "Superior Industries had designed and manufactured our downhill overland conveyor, which has performed flawlessly since we put it into operation," he says.

Superior recommended the use of a 46m TeleStacker® Conveyor, a telescoping radial stacking conveyor which eliminates material segregation by stockpiling materials in windrows to ensure that the stockpiled material meets specifications.

"There is quite a variance in the oil content between the chunk asphalt and the milled asphalt that's hauled into our facility



for recycling," says Clayson. He explains that previous to the use of the new TeleStacker Conveyor, they had used a standard radial stacker to stockpile the recycled asphalt, and then they would try to blend the material with the use of a dozer — and even with additional material handling, there was too much discrepancy in the specs.

"The TeleStacker has eliminated these costly issues as we introduce the material back into our HMA plant," he says. "We're getting more uniform gradations in our pile and have not had any specification issues to date. Due to the way the unit is programmed, we get a much better blend of material, and the product is the same on one end of the pile as it is on the other," says Clayson.

LATEST DESIGN ADVANCEMENTS

Superior Industries designed and manufactured the very first telescopic radial stacker in 1997, and over the years, feedback from the field has led to numerous innovations in their design.

"The latest design advancements to the TeleStacker Conveyor make it the best value for the money," says Clayson. He adds that his team particularly likes the new FD Auto Level technology, which automatically maintains a level head pulley while in radial travel mode — an important factor since an uneven conveyor structure is one of the leading causes of belt mistracking on radial telescopic conveyors. "In the location where we're stockpiling, it's not like we can build a concrete pad or runway to keep it perfectly level, so the







- · Portable equipment quickly moves in and out of position.
- Minimize feed point moves increases flow of material and uptime.
- Lower capital purchase and faster lead times than fixed infrastructure.
- Pre-assembled or quick installations on small footprints.

BULK LOADING BULK UNLOADING TRUCK UNLOADING BULK TRANSLOADING MOBILE OR FIXED

auto-levelling feature is a really big deal that ensures the integrity of the belt and structure," he says.

Equally important, says Clayson, is the addition of a material flow sensor (the SonicScout™ Material Sensor) which causes the telescopic conveyor to stop radial travel should there be a stoppage in feed material. "With recycle, there is often some contamination in the material that may stop material flow. If there is no feed material hitting the conveyor, the sensor causes the conveyor to stop its travel, preventing the potential of gaps in the stockpile," he explains.

Lastly, Clayson says that the unit's PilePro™ Automation programme is userfriendly, easy to operate, and easy to





troubleshoot via one call to Superior's inhouse automation team. The zoning technique of the program allows Geneva Rock to build a higher volume stockpile on a limited footprint. "We need to stockpile as much as we can in our designated area. During the winter, we'll build a 27,215-tonne stockpile that will feed the asphalt plant all summer long," he says.

HIGH-QUALITY COMPONENTS

A big advantage in working with Superior, says Clayson, is the fact that it is one of very few manufacturers to design and build both the conveyor systems and the components. "I have been around conveyors and components throughout my entire career and I am a firm believer that Superior offers the best components on the market. We maintain a large inventory of their pulleys and idlers, and over the years, they have delivered significant cost-per-ton savings due to increased wear life and belt protection."

One of the standouts of the component line, he stresses, is the Chevron® Pulley, a

V-shaped wing pulley that extends belt and pulley life by preventing rocks and debris from becoming trapped between the pulley's wings. Versus a conventional wing pulley, the V-shaped pulley deflects material far more effectively, while providing smooth

operation with less vibration, less belt wear, less of an impact and load on the bearings, and less noise.

Superior is also providing custom idlers for Geneva Rock in a few locations. "We have two existing overland conveyors built by other conveyor manufacturers, and the components on them do not offer the quality we require. To eliminate the potential of costly downtime and belt damage, we are changing out the idlers on those conveyors with the custom components provided by Superior," says Clayson.

PARTNERING FOR SUCCESS

"When we need a solution, we don't just buy the equipment, but we also buy the service and support that goes with it," stresses Clayson. "We're very lucky to have the highest calibre of support from Superior Industries. I've learned over time that you can't do this by yourself. Having the right solutions and the right support makes us successful," he says.





Since 1899 lifting and handling your needs









Webster Griffin mobile bagging systems prove their worth in Rotterdam



UK company Webster Griffin is dedicated to the manufacture of top quality packaging machinery, and is renowned for engineering complete solutions.

The company supplies bulk bag handling and sack packing machinery, palletizing and pallet conveying units, pallet wrapping and stretch hooding equipment to all industrial sectors including food and beverages, equine and animal feeds and petfood, chemicals and plastics, waste water processing, minerals, special cements and aggregates, warehousing and logistics.

The experience that the company has gained over the past 45 years means it can provide its customers with a system tailored specifically to their individual needs.

Webster Griffin's range of equipment comprises bulk bag filling and jumbo bag loading machines, supersack packing, form fill seal (FFS) packaging machines, sack packing installations, bag palletizers, carton, case and bundle palletizers, automatic pallet stretch wrapping systems, pallet stretch hooding machines, pallet roller conveyor systems and automatic pallet handling systems.

The company's capability encompasses

the engineering of integrated powder handling installations, complete bag filling lines, conveying and palletizing plants, turnkey conveying & box palletizing systems — all including PLC control panels and integration with its customers' upstream manufacturing processes and information gathering systems.

MOBILE BULK BAG/BIG BAG FILLING SYSTEMS

Webster Griffin's mobile bulk bag /big bag filling systems are installed worldwide for bagging plastic chips, granular fertilizer and various commodities like salt, sugar and chemicals.

It has installed over 280 high-speed bulk bag filling lines in the past 30 years, for a majority of the world's major chemical, plastics and fertilizer producers

The bulk bag/big bag /FIBC (Flexible Intermediate Bulk Container) — with a capacity of 1,000kg, 1,500kg or 2,000kg — provides the optimum unit load for distribution to companies which consume the packed commodity as part of their manufacturing process.



CASE STUDY: INDORAMA VENTURES EUROPE BV

Webster Griffin's mobile machines are employed to 'bag from bulk silos'. One of the company's notable users is the Indorama Logistics Centre in Rotterdam, where PET (polyethylene terephthalate) bottle grade chips and PTA (purified terephthalic acid) are manufactured, stored and distributed to clients throughout



northern Europe by road tanker and in 1.25-tonne big bags.

They are installed under the silo farms within large logistics centres – either at port locations and within large petrochemical plants.

The portable machine is of the 'Mono-Block' design. It is an automated self-contained bulk bag weigh-fill system, which runs on a railway track under the silos — or on a large trolley which is towed into position behind a tractor.

For Indorama Venture Europe BV, the mobile unit is built on a special road trailer manufactured by Dutch Company Buiscar.

Indorama has three big silo farms at Rotterdam, and Webster Griffin's portable big bag filling unit is towed into position under the silo holding the grade of PET which it wants to ship out to the client.

- bagging PET/plastic bottle-grade chips;
- bagging rate 40–50tph (tonnes per hour);
- filled bulk bag weight 1.0-1.5 tonnes;
- bagging operation: 24 hours/day, five days/week
- special feature: build standard for corrosive, exposed marine location.

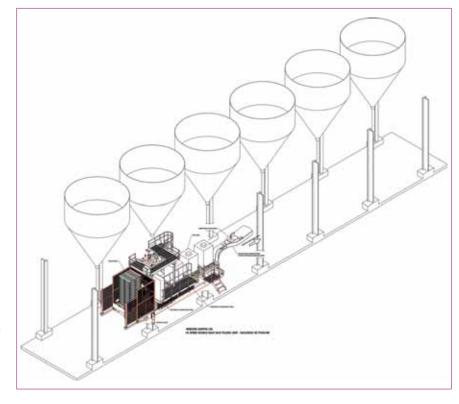
Webster Griffin is a major supplier of

equipment to Indorama. Among its other notable deliveries is its jumbo bag filler to Indorama's SSP (solid state polymerization) plan in Port Harcourt in Nigeria. Indorama has previously purchased bulk bag filling machines for its PET plans in Indonesia (three lines), Thailand (four lines), the UK, India and Lithuania.

The challenge was to achieve reliable,

high-speed bagging in an inhospitable tropical environment, ensuring that Indorama can provide continuity of supply to its customers. The solution was the IBC-PF4 high-speed bag filling system with ergonomic features and patented 'semi-suspension' weigh-fill technology assuring production is maintained around the clock.

Advantages of the high-speed IBC-PF4

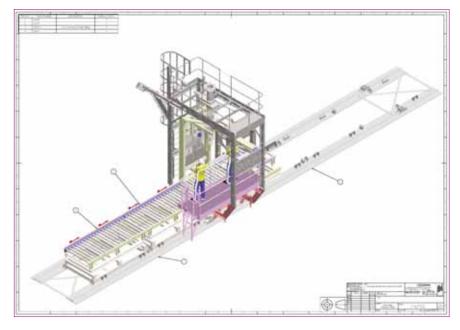


big bag filling line for Indorama Ventures include:

- future proof: high-speed IBC-PF4 big bag filling line means Indorama can satisfy customer demand well into the future;
- efficient automated operation enables Indorama to run a 30–40tph bagging line with one operator;
- tailor-made solution: standard modules are integrated into a system to suit the customer's exact requirements;
- traceability: printed ticket provides batch and bag identification.

Indorama Eleme Petrochemicals Limited concluded the project on schedule and successfully commenced operation of new 75,000tpa PET SSP facility in Nigeria for bottle-grade PET chips.

Indorama Corporation is one of Asia's leading chemical holding companies. Today, Indorama manufactures a multitude of polyethylene, products including polypropylene, nitrogen fertilizers, phosphate fertilizers, polyester, polyester feedstocks, textiles, and medical gloves. It is the largest producer of polyolefins in West Africa, the largest producer of fertilizers in Sub-Saharan Africa, and one of the largest producers of synthetic disposable gloves in the world. It is also a geographically



diversified producer of spun yarns.

Along with its affiliate Indorama Ventures in Thailand, Indorama operates more than 70 manufacturing sites in over 30 countries and employs over 30,000 people worldwide. Indorama Ventures is the largest producer of polyester products in the world with plants in five continents and also one of the biggest producers of polyester feedstocks. In addition to polyester, Indorama Ventures also

manufactures intermediates such as IPA and performance materials made from fibres such as polypropylene, nylon, viscose, and aramids.

CASE STUDY: RELIANCE INDUSTRIES INDIA

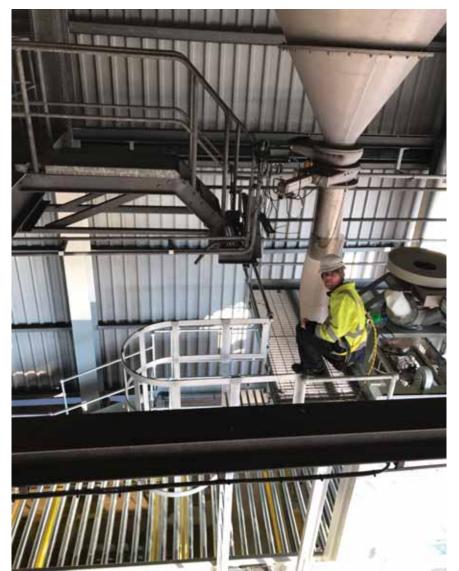
A Webster Griffin mobile machine is installed at the integrated petrochemical plant of Reliance Industries in Jamnagar, India

This Hi Speed Jumbo Bag Filling Machine is mounted on a chassis with flanged steel wheels which run on a railway track bolted to the floor beneath the silos. (see drawing above)

- bagging special polymers and plastic resin pellets (multiple grades);
- bagging rate not disclosed (fast);
- filled bulk bag weight 0.75-1.5 tonnes;
- bagging operation 24 hours/day, seven days/week; and
- special features: Hazardous area Certification ATEX, 'tool-free' cleaning between grades, 'pin point' weighing technology — minimizes product giveaway.

This machine is one of 13 (thirteen) jumbo bag filling lines which Webster Griffin has supplied to Reliance since 1996, for bagging a wide range of powdered chemicals, resin chips and plastics pellets.

Reliance Industries India offers a wide range of grades of polymers for diverse applications across sectors such as packaging, agriculture, automotive, housing, healthcare, water and gas transportation, and consumer durables. Products are also exported to more than 60 countries. Driving growth is the Polymer Research and Technology Centre (PRTC), which addresses the diverse needs of Reliance's customers and facilitates value-added performance.



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A TEREX BRAND

CASE launches new B-Series compact track loaders and skid steers



Next-generation CASE loaders feature industry-leading visibility, updated operator interface and controls, simple start-up and operation, and powerful breakout force and auxiliary hydraulics for optimal productivity.

CASE Construction Equipment has launched its next generation of compact track loaders (CTLs) and skid steers with the introduction of the B-Series. The five CTL and nine skid steer models span radial and vertical lift patterns, as well as numerous horsepower and size classes, giving operators the equipment choices best suited to their jobsite.

"Through the B-Series. CASE CTLs and skid steers have been enhanced to deliver a new and intuitive operating experience while also standing up to the rigours of heavy earthmoving and attachment use," said Egidio Galano, Europe Compact Product Manager, CASE Construction Equipment Europe. "The B-Series retains the frame and styling of previous CASE loaders, but with critical operational systems re-engineered for greater performance. These have been fully integrated with new control and operator interfaces to give contractors a powerful match of productivity, efficiency and convenience."

A SIMPLE OPERATOR EXPERIENCE

New CASE B-Series skid steer and compact track loaders feature a completely redesigned operator interface, including new left and right-hand posts on all models, combined with simple ignition, push-button start, easy throttle control and intuitive switches for all core machine functions. Operators can also choose between mechanical and electro-hydraulic controls when specifying a machine. An all-new eight-inch LCD multi-function display with backup camera comes with all electrohydraulic models. In addition, the electrohydraulic models provide the additional simplicity of switching between ISO and H operating patterns at the push of a button.

The new eight-inch LCD multi-function display serves as the command centre for the machine. It includes the industry's only backup camera visible in a split screen display with machine data. The camera is operational in both forward and reverse and enhances the B-Series' industry-leading visibility with even greater jobsite perspective and awareness. It also provides operators with the most fully functioning operator experience ever found in a CASE CTL or skid steer, including:

new electro-hydraulic control performance: operators can set total machine responsiveness to low,

- moderate or aggressive, or independently set tilt, lift and drive speed, as well as loader arm and drive control to best meet the demands of the job;
- new 'Creep Speed' capability: Creep Speed allows operators to set machine speed at a consistent/slow 'creep' while independently setting attachment speed via the throttle for optimal use of highcapacity hydraulic attachments such as cold planers and rock wheels;
- new operator profiles: operators can store and recall specific setting profiles to match either individual operator preference or job types.
- new economy mode and engine protection settings: new CASE B-Series skid steers and CTLs feature engine shutdown, ignition timeout and engine protection features that extend the life and performance of the engine, battery and other critical systems.
- new automotive-style information display: from basic operational information such as engine hours and fluid levels to 'trip meters' and utilization data that provide fleet managers and operators greater insight into machine performance, all new B-Series models improve total operational intelligence;
- new and improved fault codes and

troubleshooting: new fault codes with descriptive text help better identify specific issues the machine may be going through and make it easier to communicate with the dealer to determine next steps, if necessary.

HIGH VISIBILITY

CASE CTLs and skid steers feature excellent 360° visibility — enhanced by the new backup camera as well as a cab-wide rearview mirror that is standard on the full range. The low entry threshold and large front window provide excellent visibility to the front of the machine and down to the attachments. Large side windows and a large curved rear window allow for great sightlines to the sides and the rear of the machine. Rear visibility is further aided by low sloping rear hoods, and an extremely low-profile H-Link on vertical-lift models that gives greater visibility compared with competitive equipment.

A MORE COMFORTABLE OPERATOR EXPERIENCE

The extremely low entry threshold built into each machine allows for easy entry and exit from the cab. CASE features one of the widest skid steer and CTL cabs in the industry, providing excellent space for more comfort and operator positioning. Joysticks on electro-hydraulic models have been designed with a narrower, more comfortable grip, closer switch layout and a

smaller head size for easier operation. The electro-hydraulic pods on each joystick have also been made smaller to give operators more legroom.

Mechanically controlled models of the SR210B and larger models also feature servo-assisted joysticks for easier operation and reduced operator fatigue.

The cupholder and storage areas in select models have also been repositioned to provide even more legroom, and options such as a Bluetooth radio further improve total operator comfort.

More than 50 years of power and productivity

CASE has been producing skid steer loaders for more than 50 years, and new B-Series CTLs and skid steers leverage that experience to provide extremely powerful breakout forces, a range of auxiliary hydraulic options that allow each machine to run hundreds of attachments, and highly stable wheel and track bases that allow operators to work with confidence across any type of terrain. The full range of vertical and radial-lift machines provide excellent options for every application from concentrated groundwork and grading to truck loading and material handling.

As it relates to attachment use, the CASE B-Series provides either standard, high-flow or enhanced high-flow auxiliary hydraulics with pressures up to 276 bar for

running high-capacity hydraulic attachments such as cold planers and mulchers. All models also feature a connect under pressure manifold design that allows for quick and tool-less removal of hydraulic lines. Additional optional features such as Ride Control and self-levelling further improve overall operator performance and efficiency.

MAINTENANCE-FREE ENGINES AND EASY SERVICING

All B-Series models except the SR160B feature either a cooled exhaust gas recirculation (CEGR) design with a diesel oxidation catalyst (DOC) that requires no fluids or lifetime filter maintenance, or a CEGR design with selective catalytic reduction (SCR) after-treatment (on 90 horsepower/67KW units) that requires no lifetime filter maintenance and just filling with diesel exhaust fluid (DEF) as needed.

Daily checks on all models are simple, with regular service points and checks easily grouped at the rear of the machine. Fleet managers can further expand the simplicity of maintaining B-Series models with the addition of an optional CASE SiteWatch™ telematics subscription that provides additional insight into operational data, service intervals and total machine performance. CASE dealers can be granted access to that data to further build proactive service and support plans around each machine.





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STRADDLE

Borghi Assali: problem solving on the ground keeps cargo moving



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

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

TECHNICAL PROWESS

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

FORKLIFT EXPERTISE

Steering axles - hydraulic and electrical

Borghi Assali was the first to realize that it would be possible to create a forklift fourwheel able to steer like a normal three-wheel forklift. From this insight, an ingenious steering system was developed — Total steering. It allows a high steering angle, over 100°, so that the centre of rotation of the vehicle coincides with the centre line of the front axle. In this way, the maximum dimensions during steering

coincide with the dimensions of the cart. Furthermore, this total steering allows the rolling of the rear wheels of the carriage even when the wheels are steered with the machine stopped.

PROBLEM SOLVING — BMC CRANES TURN TO BORGHI ASSALI

STEERING AXLE 052010000

In this project, Borghi Assali solved a tricky problem for BMC, which wanted to produce a heavy duty fork crane with the same steering capacity of the classic warehouse forklifts. Borghi Assali created an axle with high load capacity (16 tonnes.) and with a steering angle around the 100°. Problem solved.

KEEPING PORT CRANES MOBILE

Borghi Assali's drive wheels are widely used in the port environment, and are especially useful to keep cranes mobile — a huge bonus in terms of flexibility and cost-effectiveness.

An example of the company's abilities is the EBo1450.000C (electric horizontal drive wheel). This wheel was assembled on a port crane of 520 tonnes in weight, and its movement is guaranteed by 14 groups of Borghi's EBo 1450 with 36 tonnes of load capacity each. For these groups, eight have been produced with both traction and steering and six have been created with only the steering. Taking into account the environment in which these machines operate, it was necessary to provide them with special treatments against the saline

mist for all of the components that are not painted.

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



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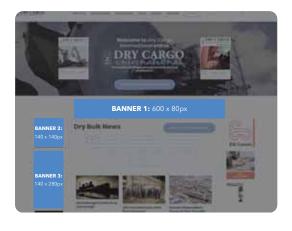
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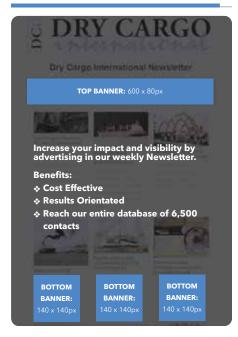
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TTS confirms - stay mobile, stay flexible

The world is changing. The current situation is affecting each and every person and each and every business area. Tomorrow will be different and TTS is continuing to say something that it has been saying for a long time, which perfectly fits today's uncertain times — stay mobile, stay flexible. Stevedores always think twice before investing money in new material handling equipment, and now they will think thrice.

Long before today, TTS's motto was 'bulk handling goes mobile' and these words are heavily backed up by the evident advantages of portable bulk handling equipment. Mobile machines can be switched over to use with a different type of cargo. It can be rebuilt by minimal means to have additional or different parameters. It can be resold. And of course, very importantly, it can be relocated.

TTS's latest projects prove that stevedoring companies are ever more voting in favour of portable solutions instead of choosing the stationary ones. Here are some of these projects:

- It all started here Port of Vysotsk, Russia. Before this project, TTS's main focus for many years was stationary conveying systems, but this job ignited a new approach to material handling that TTS has been following for many years now. There are eight mobile 25m-long coal stackers from TTS operating in the port at the present moment.
- Port of Tornio, Finland. Handling of lime. The system needs to ensure cargo reception from vessel with subsequent delivery to the designated point. The





process is handled by the mobile hopper and three 25m-long link conveyors. Emission of dust must be brought to zero, therefore all units are encapsulated and equipped with aspiration, the hopper is equipped with 'flex-flap' grid.

• Riga Central Terminal, Latvia. Mobile turn-key solution for coal terminal. TTS designed, produced and installed: two receiving hoppers with feeders, collecting conveyor equipped with magnetic separator, one 14m-long, two

- 40m-long stackers and containerized automation, control and power supply centre.
- Multifunctional transshipment complex, Ust-Luga, Russia. Mobile system for coal handling consisting of five mobile 40m-long link conveyors, two radial 40m-long mobile stackers and one radial self-propelled mobile stacker/shiploader with telescopic boom, ranging from 30 to 50m.
- RUSAL Alumina Terminal, Russia. Design, production and installation of four-section mobile hopper for the transfer of alumina from cargo vessels to railroad cars with implemented aspiration and weighing systems.
- Not only in sea ports TTS's portable radial stacker also servicing an iron ore plant in Russia where it complements a stationary conveyor line and provides flexible loading in trucks.

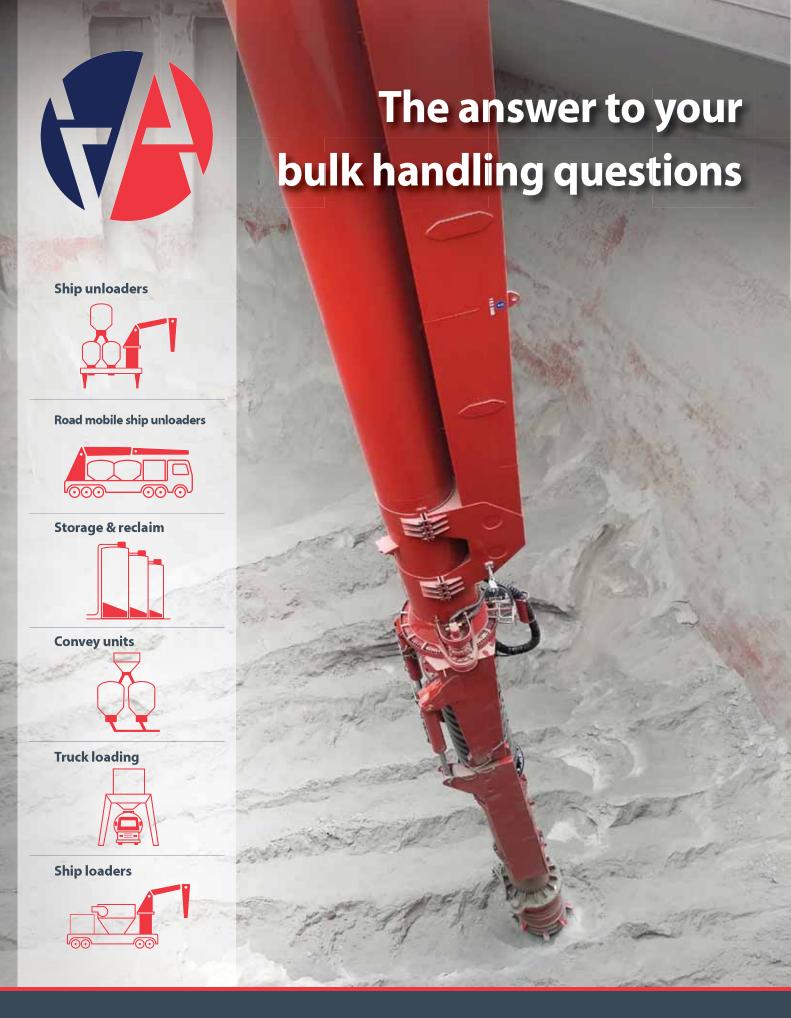
At present, two new machines are being built in the TTS workshops. These are a 27m-long mobile shiploader and mobile hopper with feeder and boom conveyor, both for operation in Finland.

Today's new environment marks flexibility and simplicity as defying factors while choosing bulk handling equipment. Portable machines embrace these characteristics, while TTS engineers are bringing to life customers' most challenging ideas.











Mobile ship-unloaders from Van Aalst Bulk Handling



Van Aalst Bulk Handling specializes in the design and supply of equipment for dust-free pneumatic bulk handling of dusty abrasive products. Materials that are handled are cement, fly ash, alumina, china clay, limestone, granulated slag and borax.

Van Aalst delivers custom-made equipment to customers all around the world. The company is specializes in the design and manufacturing of pneumatic ship-unloaders, conveying units, shiploading systems, storage facilities, dome floors and reclaiming equipment.

Pneumatic ship unloaders are manufactured with capacities of up to 800tph (tonnes per hour), suitable for a range of ship and barge sizes. A pneumatic ship-unloader is capable of unloading material from the hold of a ship and simultaneously discharging material through a pipeline to a receiving facility.

The material is drawn into a filter receiver through a rotating nozzle that is mounted at the end of a suction arm. The suction arm consist of multiple booms with different lengths that are mounted on a rotating base. This makes it possible to move the suction nozzle efficiently through the hold of the ship. The suction arm is operated by a remote control.

From the filter receiver kettle, the material falls down by gravity into a

discharge kettle. A ship-unloader is typically equipped with two or four discharge kettles. When a discharge kettle is full, the material will be discharged to the storage facility, simultaneously another discharge kettle is being filled.

For the discharge process, air conveying compressors are installed. The vacuum for the suction process is generated by vacuum pumps. The compressors and vacuum pumps can be diesel-driven or electric-driven, depending on the customer requirements.

The suction and discharge process are an enclosed system, resulting in dust-free material handling.

MOBILE UNLOADING

Pneumatic ship-unloaders are manufactured in both stationary and mobile versions. A mobile unit has all the necessary equipment installed for unloading a ship and discharging the material to a receiving facility.

The discharge pipeline to the receiving facility requires multiple connection points at the unloading positions for the pneumatic ship-unloader. When the unloading process at a particular position has finished, the operation can be continued at the next connection point.

A mobile unit can be left at a designated

parking position creating valuable space for other activities on a jetty or dock area. The main advantage of a mobile pneumatic shipunloader is that the cargo-carrying barge or vessel does not have to be shifted during the unloading process. The fact that the vessel can stay moored provides a significant reduction in operational costs.

The Van Aalst mobile pneumatic shipunloaders are divided into the following categories: road-mobile, dock-mobile, gantry-mounted and barge-mounted.

ROAD-MOBILE SHIP-UNLOADER

Ships up to 5,000dwt can be unloaded by a road-mobile ship-unloader with a maximum unloading capacity of 250tph. All necessary equipment is mounted on a trailer. The road-mobile ship-unloader is permitted to be transported on public roads as regulations regarding size and weight are met.

The base of road-mobile ship-unloader is relatively small compared to a typical stationary ship-unloader. Therefore hydraulically operated jacks are installed to ensure sufficient stability during the unloading process.

The vacuum pump, air conveying compressor and auxiliary air compressor are installed inside a sound-proof machine enclosure at the front of the trailer.

DCi

Exhaust and intake silencers are installed to minimize noise emissions.

For the suction and discharge process two discharge kettles are installed at the centre of the trailer, each with an integrated filter system. The filter system is located in a dome on top of the discharge kettle. The dome is positioned off centre to create sufficient space for the suction arm in transport mode. The suction arm and a hydraulic power unit are installed at the back of the

Only a short amount of time is needed to make preparations for unloading after transport. It

is therefore an ideal solution when multiple plants or terminals have to be served.

DOCK-MOBILE SHIP-UNLOADER

The dock mobile ship-unloader is mounted on wheel sets and is self-propelled. For steering purposes, the wheel sets can turn. The wheels can be electrically or hydraulically driven. The number of wheels



that are installed depends on the maximum allowable wheel loads on the unloading area. Hydraulically operated jacks are installed if necessary to ensure sufficient stability during the unloading process.

The dock-mobile ship-unloader can be easily manoeuvred at the unloading area and stowed away at a parking position when it's not in operation.

GANTRY-MOUNTED SHIP-UNLOADER

The gantry-mounted ship-unloader is equipped with rail wheels and can travel back and forth on a rail. A cable reel is installed to wind and unwind the power supply cables.

The number of wheels is determined by the maximum allowable loads on the rail and the maximum allowable loads on





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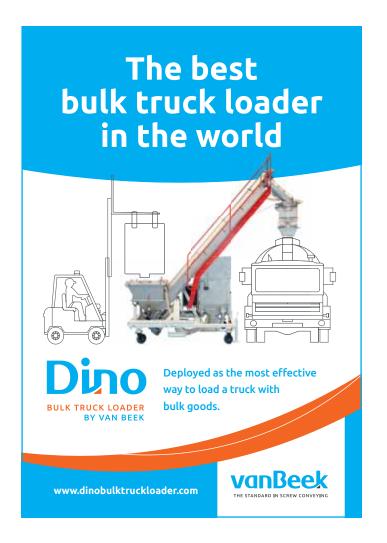
the unloading area.

The gantry-mounted ship-unloader can be parked at the end of the rail, creating space for other machinery using the same rail.

BARGE-MOUNTED SHIP-UNLOADER

A barge-mounted ship-unloader has all the equipment installed on a barge. The barge will naturally rise and fall with any tides. Because of this, the suction arm can be kept

relatively short, which is beneficial for the efficiency of the suction process. A bargemounted ship-unloader can be used at different plants and terminals if these are connected by suitable waterways.



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RB Intermodal uses Dinos worldwide

The Dino bulk truck loader from Van Beek is deployed worldwide as a highly effective way to load a truck with bulk goods. It is available in four models, in order to handle a variety of cargoes. These are:

- Dino Light;
- Dino Silverline:
- Dino Cement: and
- Dino Atex.

The Dino can also be customized to meet the customer's precise requirements.

At four strategic locations around the world, the Dinos at RB Intermodal form an important and valuable link in the transport process for bulk goods. This international and innovative supply chain service provider, specializing in dry solids, offers logistics solutions in particular for the chemical and mining industry. Dedicated co-operation between RB Intermodal and Van Beek is creating ground-breaking opportunities.

"We have invested in Dinos because this turn-key machine is simple to operate and can easily be extended with all sorts of options," explains Onno Sturme of RB Intermodal. "Furthermore the Dino is a safe solution for loading 25kg to 1,000kg big-bags. Apart from the fact that you are investing in an excellent quality machine, Van Beek is always ready for us with customer-specific knowledge and good fast service."

CUSTOM MADE

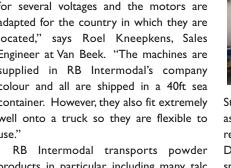
The DR 300 stainless steel Dinos for RB Intermodal have a capacity of 45m3 per hour, a loading bellows on the outlet side and a dust filter which is integrated into the base frame. The Dinos are also fitted with a removable expansion rim as a result of



which a bigger quantity of the product can be poured through bigger buffering. "In addition these bulk truck loaders are made for several voltages and the motors are adapted for the country in which they are located," says Roel Kneepkens, Sales Engineer at Van Beek. "The machines are supplied in RB Intermodal's company colour and all are shipped in a 40ft sea container. However, they also fit extremely well onto a truck so they are flexible to use."

products in particular, including many talc powders. In Oman raw materials for the oil industry are loaded. Sturme says: "There are different grades of powders but it is not necessary to clean the Dinos in between. For our applications, with four to five consignments a day, the Dino is perfect. Apart from one small fault we have not yet had any problem with the Dinos."

The strength of the Dino, according to





Sturme, lies in the fact that it can be assembled to suit the customer's specific requirements. "Van Beek designs for us the Dinos we have in mind, for example with special extraction," says Sturme. "With other companies this is often not possible."

AMBASSADOR

In 2013 Sturme saw the Dino at work for the first time at another company and this was how he came into contact with Kneepkens. "At a visit to Van Beek in October 2013 the technical matters were discussed and the basis for the four Dinos for RB Intermodal was largely laid," says Kneepkens. "At present we are co-operating on a project for new loading stations for filling and unloading containers. The co-operation with RB Intermodal runs smoothly and at the same time they also profile themselves as an excellent ambassador. Through them companies can now also find Van Beek."

Sturme adds: "Van Beek is characterized by a high level of involvement where a suitable solution is offered with short lines of communication. They help us to think things through and we can at all times count on their help and support. The expertise of Van Beek, with their knowledge of our business processes, fits in seamlessly with our wishes and those of our customers."



Konecranes to deliver a new mobile harbor crane to Ho Chi Minh City

At the end of 2019, Saigon Port JSC ordered another eco-efficient Konecranes Gottwald mobile harbour crane for its operations at Tan Thuan Port in southern Vietnam. The crane will expand capacity at the port by handling all types of cargo.

Located in the Vietnamese metropolis Ho Chi Minh City, with a history dating back to 1860, Saigon Port has long been a key transport and commercial hub, providing essential import, export economic services for the entire southern region of the country. As port facilities rapidly developed in the 1990s and into the 2000s, Saigon Port ordered several mobile harbour cranes and forklifts from Konecranes, all of which have proven their durability and low cost of ownership throughout their entire service life. With an increase in business, Saigon Port took the step to equip its terminal Tan Thuan with a new, eco efficient and highly versatile Konecranes Gottwald mobile harbour crane which can handle containers, bulk and breakbulk — in other words, whatever comes through the harbour.

"Konecranes equipment is very reliable," says Huynh Kim Tay, Deputy Technical Manager of Saigon Port. "It

always meets the demanding heavy workload we face in the port 24 hours a day, 365 days a year. We decided on Konecranes again because we wanted a compact, high-performance crane that would give us a lot of flexibility while fulfilling the technical requirements of the port. And this crane does exactly that."

Saigon Port's new Konecranes Gottwald mobile harbour crane will be a Model 3 in the G HMK 3405 variant. With a working radius of 46m and a maximum lifting capacity of 100 tonnes, the crane handles containers and general cargo. Equipped with a motor grab it handles bulk materials as well. Web reporting provides relevant



usage data to improve both performance and serviceability. The crane will have built-in readiness for an external power supply, so connection to the harbour mains will be easy when resources allow. The crane also fulfills the criteria set out in Vietnam's Maritime Code and Environment Law, with strict rules for reducing noise and emissions.

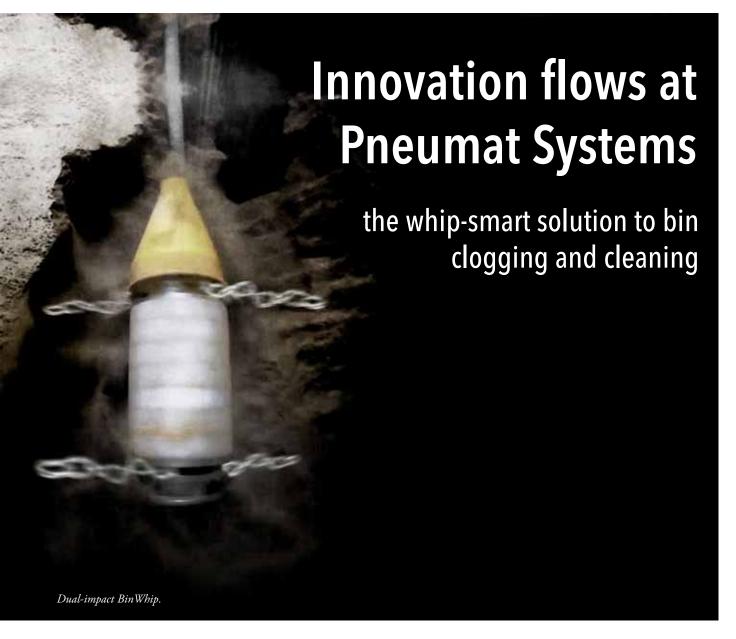
"It's been rewarding to see Saigon Port develop over many years, with ever higher productivity and constantly increasing cargo handling rates," says Mike Green, Regional Director Sales APAC for Konecranes Port Solutions.

"We wish Saigon Port great success and

look forward to continuing our long and loyal partnership well into the future," he added.

ABOUT KONECRANES

Konecranes is a world-renowned group of Lifting Businesses™, serving a broad range of customers, including manufacturing and process industries, shipyards, ports and terminals. Konecranes provides productivity enhancing lifting solutions as well as services for lifting equipment of all makes. In 2019, group sales totalled €3.33 billion. Including MHE-Demag, the group has around 18,000 employees in 50 countries.



The recent rise in grain bin accidents and fatalities has highlighted the serious challenges faced by those handling and transporting bulk commodities. Increasingly, bulk flow professionals are finding solutions in the heart of the American Midwest, where one company has been on a four-decade mission to deliver safer, more effective silo clean-out and bulk flow technologies to the world.

Pneumat Systems, Inc. entered the bin cleaning business in 1980, when it was called on by General Mills to assist in emptying and extinguishing a massive silo fire. This eventually led to the development of Pneumat's flagship product, the BinWhip®. Described by company president Greg Nelson as a "weed eater on steroids", the whip head is lowered into clogged bins on an articulating arm through an access hole, eliminating the need for confined space entry or other hazardous activities by workers. The hydraulically-driven motor rotates a spark-proof flail or

chain at high speeds to blast through material that has hardened due to excess moisture, insect infestation, or other reasons. Over the years, Pneumat has found it to be an effective cleaning method on bulk materials of all types, from grain and feed ingredients to fertilizer, sand, cement, coal, ores, fly ash, petcoke, and countless more.

By providing contract cleaning services or selling equipment for customers to use themselves, three generations of Nelsons have helped their family business keep bulk flowing in every state of the US and over 20 countries. Industrial & International Sales Manager Dustin Williams is proud of how the Mankato, Minnesota-based company maintains both a global reach and strong personal connections with their customers. "Since we design, build, and use the products that we sell, we're able to offer unmatched service, support, and training."

Pneumat currently has a crew in Chicago clearing ten large silos at a grain

processing facility that was recently purchased after sitting dormant for years. "The old material that's been sitting inside those bins is rock-hard. It's been a great opportunity to put our new Dual Impact BinWhip® to the ultimate test," said Field Supervisor & Safety Manager Robert Duffee

The Dual Impact BinWhip is a recent advancement to Pneumat's original bin whip technology, and is quickly making waves in the bin-cleaning world. The patented design includes a double set of whips that spin in opposite directions for increased hitting force. The counterrotational forces generated also stabilize the unit, giving the operator more control. "We can clean bins up to 40% faster," said Duffee. "The success of the Dual Impact BinWhip really speaks to Pneumat's philosophy of continuous problem-solving and innovation."

Over the years, Pneumat's growing expertise in the bulk flow industry has led





them to develop additional tools for handling bulk materials. These include the RailSpreader™, a system for safely loading railcars to 100% capacity without manual shoveling. Transportation and logistics operations have saved hundreds of dollars per car from the increased efficiency, whether moving soybean or corn gluten meal, clinker, pelletized plastic, or other bulk product. "The return on investment is

undeniable," said Nelson. "If you can get 10% more product into a railcar, every tenth car ships for free."

When Pneumat became aware of the challenge companies handling dried distillers grains (DDGs) have unloading this difficult product from truck trailers and rail cars, it seized on the opportunity and developed the HopperPopper™. This system allows operators to drive a blast

probe into the hopper compartment using wireless controls, safely clearing bridges and hang-ups with precise blasts of air. "It eliminates unsafe banging, pounding, and poking that costs our industry so much in terms of injuries and employee turnover," says Williams. "Truckers will drive far out of their way to reach unloading stations equipped with the HopperPopper because they know how much more quickly they'll

be able to dump their load."

Other bulk flow equipment developed by Pneumat includes the $BinDrill^{TM}$, a portable drilling rig that is typically used in conjunction with the BinWhip to create an opening in bridged product, and the Cardox CO2 Blaster™ system, which is used to break up rock-hard materials lodged inside bins and vessels. "Non-detonating gas expansion systems have become invaluable for certain types of bulk material flow, especially in the cement industry," says Williams. "There are a number of providers, but we believe our Cardox system is the safest and most user-friendly on the market."

Sales Manager Sam Cebula



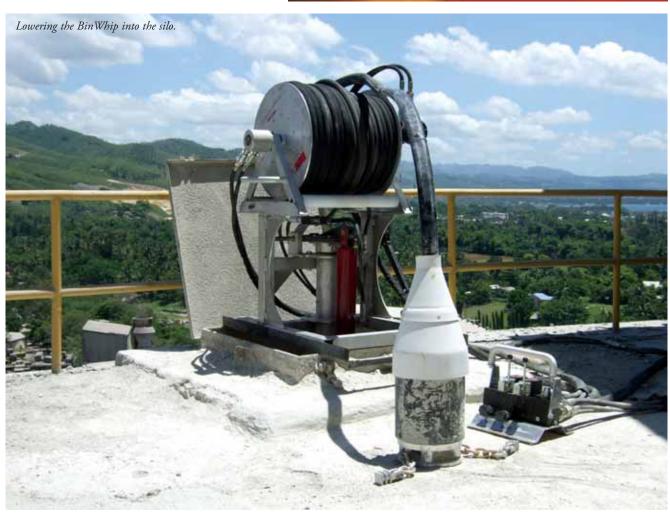


hints at some exciting new products that are currently under development, adding, "I'm proud of Pneumat's ability to deliver practical solutions that have a direct impact on our customers' bottom lines. Our team has more experience evaluating, troubleshooting, and solving bulk flow issues than anyone. We have an arsenal of specialized equipment, and the ability to develop new solutions if existing ones are inadequate."

Despite changes and uncertainty in global bulk product markets, Pneumat has experienced accelerating growth in recent years and remains optimistic about the future. It attributes its competitive advantage to a strong safety focus, experienced team, and willingness to tackle the difficult flow problems that no one else can solve.

"Pneumat exists to create a safer world, free from bulk flow issues," says President Greg Nelson, "Whatever changes are ahead, we'll be here pursuing that goal."







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- Radial and telescopic features allows Operator to easily and safely work within the constraints of the jetty
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- Mobile solution perfect for multi- cargo berth (Multiple Use)
- Customised shiploading system designed specifically for the application



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Stockyards under scrutiny

technology marches apace

Polish bulk materials industry shows confidence in AUMUND products

Hopper discharge and crusher feeding with AUMUND arched plate conveyors have a long and successful tradition in the Polish bulk materials industry, writes Peter Heberle, Sales Engineer, AUMUND Fördertechnik GmbH, Germany. When suitable discharge systems are to be selected for applications in the cement, lime and gypsum industry, or in other key industries where bulk materials are conveyed, three principle criteria are considered: the properties of the material itself, the shape of the silo or hopper and the requirements of the process technology. In all three areas the AUMUND arched plate conveyor type BPB in its various designs is rated as a technically excellent and cost-effective piece of equipment.

The industry contacts of AUMUND

Fördertechnik in Poland go right back to the year 1978. At that time AUMUND supplied eight arched plate conveyors for the Port of Świnoujście (Swinemünde) to extract coal from hoppers installed under the wagon tippler equipment. These arched plate conveyors are still in operation today and running without any problems. Two further arched plate conveyors were supplied in 2012, as the first to the cement industry, at Cementownia Rudniki, CEMEX Polska, near to the famous Polish pilgrim destination, Częstochowa/ Tschenstochau, for the extraction of clinker and natural gypsum from hoppers.

AUMUND ARCHED PLATE CONVEYORS FOR HOPPER DISCHARGE

AUMUND was able to continue the

success story of arched plate conveyors in the Polish cement industry at Cementownia Warta, when its hopper system was modernized. In 2015 this company was the first in Poland to choose an AUMUND arched plate conveyor type BPB for hopper discharge. Since the hopper modification, AUMUND conveying technology has not only facilitated the transportation of clinker, but more importantly of sticky raw materials such as natural gypsum, limestone and slag.

AUMUND ARCHED PLATE CONVEYORS FOR CRUSHER FEEDING

One year later AUMUND supplied a second arched plate conveyor to Cementownia Warta. This one was of the type BPB-SF, SF denoting a specially

ear	BPB/BPB-SF	Application	Material/Capacity	Customer/Plant
978	8 BPB	Hopper discharge	Coal	Port of Swinoujscie
012	2 BPB	Hopper discharge	Clinker, Natural Gypsum	Cementownia Rudniki
2015	1 BPB	Hopper discharge	Clinker, Natural Gypsum, Limestone, Slag	Cementownia Warta
016	1 BPB-SF	Crusher feeding	Limestone	Cementownia Warta
2017	1 BPB-SF	Crusher feeding	Limestone	Transkom
2018	1 BPB-SF	Crusher feeding	Limestone	Zaklady Wapiennicze Lhoist in Tarnow Opolski





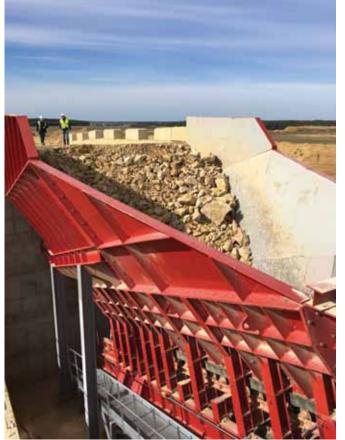




Photo gallery: AUMUND arched plate conveyor in the Transkom quarry near Tarnow Opolski in Southern Poland (photos AUMUND).

reinforced heavy-duty design, to feed limestone to the crusher at a conveying capacity of 1,500tph (tonnes per hour).

In 2017 the general contractor Budkrusz ordered a heavy-duty AUMUND arched plate conveyor type BPB-SF for limestone, with a conveying capacity of up to 750tph, on behalf of Transkom, a company located near Tarnow Opolski in Southern Poland, which operates quarries in that area. In 2018 a third heavy-duty AUMUND arched plate conveyor with a conveying capacity of 1,000tph of limestone was supplied to the mineral and lime

producer Zaklady Wapiennicze Lhoist for its plant in Tarnow Opolski. At the beginning of September 2019, the official commissioning of the AUMUND conveyor took place on the occasion of the opening ceremony of the Lhoist's Izbicko limestone quarry.

APPLICATIONS AND DESIGN VARIATIONS

An integral part of the success strategy in all projects for AUMUND Fördertechnik is its technical advice and support to the customer, which starts at the very beginning of the planning stage and carries on through implementation to the commissioning of the new or upgraded equipment.

These examples of applications in the Polish bulk materials industry show the different uses of AUMUND arched plate conveyors and how the technical design of the machine is adapted according to each alternative. The product type BPB is predominantly used for sticky raw materials such as gypsum, anhydrite, clay and clay-marl mix. The conveyor itself has an arched cross section and forms a rounded surface at the chain wheel in the

discharge area. A cleaning scraper can be installed here in order to remove sticky material from the plates. A drive unit combined with a frequency converter allows the speed of the conveyor to be regulated, to achieve the conveying capacity at a defined velocity.

Heavy-duty arched plate conveyors of the type BPB-SF are primarily arranged under tipping stations, for example where trucks unload, and convey un-crushed raw materials, such as limestone and natural gypsum with dimensions of up to 1,500mm, to the crushing plant.

The thickness of the plates, which themselves have a flat profile, depends on the particle sizes of the material, the throughput and the dimensions of the hopper funnel. To accommodate these requirements, thicknesses and widths of up to 3,000mm are available. Accordingly the track chains have breaking loads of up to 2 x 4,200kN.

The BPB-SF design features heavy-duty, fixed, slide-bearing rollers, as used in crawler undercarriages, which are arranged underneath the track chains. In addition, AUMUND arched plate conveyors are

supplied with a spillage conveyor to remove fines without the need for manual cleaning.

ABOUT THE AUMUND GROUP

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

The global conveying and storage technology business is spearheaded through a total of 19 locations in Asia, Europe, North and South America and a total of five warehouses in Germany, USA, Brazil, Hong Kong and Saudi Arabia.

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Safety first: Duro Felguera prioritizes the wellbeing of its staff and clients

The safety and well-being of all employees, customers, suppliers, and their families is of utmost importance to Duro Felguera (DF).

The world entered a period of uncertainty due to the coronavirus pandemic. In these challenging times, those at DF are doing their best to maintain maximum business continuity. It is doing so in an environment of challenging and ever tightening restrictions mandated by governments and public health authorities on national and local levels in a still increasing number of countries all around the globe.

To mitigate virus risk, DF is taking strict and dynamically updated measures. These include remote working from home for office employees; providing personal protection equipment to all employees at construction sites and workshops; and reminding and following up cleaning standards and protocols, etc. DF will continue to monitor the outbreak and issue further restrictions and requirements as the situation warrants. Everything that the company is doing is to safeguard the good health of all parties involved in its business and lives.

In addition, each and every project or opportunity has been analysed to implement risk mitigation actions.

Whoever is now working from home, including the engineering department, is fully operational thanks to DF's contingency plans which enable it to smoothly work on a remote basis applying the latest tools for video communication, file sharing, document management and control, etc.

Since 1858, when the company was set up by founder Pedro Duro who invested on modern metalworking factories, blast furnaces, coke ovens, rolling mills, etc. the company has been based on developing state-of-the-art expertise, as in bulk material handling which is one the expertise niches of the above-mentioned engineering team.

A diversified group of draughtsmen, engineers and discipline leaders, counting hundreds years of experience all together, are capable of developing innovative solutions and adapt all kind of yard machines to customer needs, not only in terms of throughput, dimensions or investment, but also taking into consideration key aspects such as:

- fatigue and durability;
- operational costs;
- maintenance, minimizing shutdowns and corrective needs;
- safety parameters; and



 environmental factors like dust emissions, noise levels, component recycling, etc.

DF's machines are recognized as reliable and robust, and most of its references have lasted more than twice the expected design life.

DF is a global solutions provider to the bulk material handling, minerals processing and beneficiation industries, offering tailormade and innovative technological solutions as well as commodity knowledge.

Moreover, in addition to lump sum turnkey projects, DF also provides the full range of services, from project feasibility studies, engineering and design, fabrication and construction to supervision and commissioning as well as spare parts and aftersales support. Inspection, maintenance and debottlenecking are other areas of DF

DF's broad portfolio of references for storage yards, both lineal and circular, includes several types of machines like:

- stackers
- bucket wheel (BW) reclaimers;
- combined stacker & BW reclaimers
- bridge reclaimers: single or double BW and drum type;
- bridge scrapers;
- portal and semi-portal scrapers; and
- circular stacker/reclaimers.

Of course, DF also has experience in the design and supply up and downstream systems like port machines (shiploaders and unloaders), train loading and unloading stations, etc as well as all infrastructure and associated auxiliary systems: firefighting, dust control/suppression, remote monitoring, warehousing, etc.

The in-house ability and knowledge for manufacturing complex steel structures/ pressure equipment and DF's established

construction, operation and maintenance capability, provide a unique 360° view of customer needs. The involvement of DF's construction personnel does not begin at site, but rather at the design concept period, also supported by the feedback of DF's operation and maintenance staff who work continuously running some of its projects. Therefore, issues such as machine constructability and maintainability are incorporated into the design from the very beginning.

A key lesson learned during recent years is how critical and relevant it is to properly define at a very early stage the lay out, together with the overall and single capacity of each and every component/machine.

Based on the enormous diversity of machines, solutions, automation and control systems, the added value on a future project could vary drastically, up to the level of drastically destroying the feasibility of a project or improving enough to get the approval of the financial analysis of an investment, even more under current circumstances of a volatile and pressured market.

Among other recent projects, DF has developed imaginative solutions for port expansions under severe restrictions of non-stopping operation, applying flexible construction planning to minimize impact of a live terminal or modular design and fabrication to optimize the time required for onsite construction as well as maximize factory acceptance tests (FAT) or trial assemblies to avoid costly and time consuming incidents at final destiny.

DF will be always side by side with its customers and partners/vendors looking for the best available solutions, not only from an economical point of view, but for sure from social, environmental and sustainability angles.

Enclosed stockyards: highest performing SCHADE semi-portal reclaimer for iron ore

Environmental concerns have become the top priority for the largest steel producer in Taiwan, CSC (China Steel Corporation), as it currently completes a project in its Kaohsiung plant, in the planning since 2012, to reduce environmental impact by stockyards. enclosing SCHADE Lagertechnik GmbH is going to supply, via China Steel Machinery Corporation, four semi-portal reclaimers with rail spans of over 52m for enclosed stockyards, and China Dragon Steel, which also belongs to CSC, will take delivery of two further semiportal reclaimers with rail spans of around 67m.

FOUR SCHADE SEMI-PORTAL RECLAIMERS FOR CHINA STEEL CORPORATION

Two of the four SCHADE Reclaimers have a reclaim capacity with a peak performance of over 3,000tph (tonnes per hour) of iron ore, which puts them among the highest performing SCHADE semi-portal reclaimers for applications in iron ore. These reclaimers are also equipped with special two-way chutes to load two conveyors. The two other semi-portal reclaimers are designed for a reclaim



Example: SCHADE Semi-Portal Reclaimer in operation at Ha Tinh Steel, Vietnam (photo SCHADE).

capacity of over 1,200tph of coal. Delivery of the machines will start in the middle of this year.

TWO SCHADE SEMI-PORTAL RECLAIMERS FOR CHINA DRAGON STEEL

China Dragon Steel also operates a steel plant in Taiwan. This CSC Group company ordered two semi-portal reclaimers each with a rail span of almost 67m and a reclaim capacity of over 1,200tph coal from SCHADE. Back in 2019, China Dragon Steel had commissioned two tripper cars

and two semi-portal reclaimers from SCHADE.

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Stockyard conveyors optimized with Standard Industrie's LIFTUBE®



LIFTUBE® CASE STUDIES

Standard Industrie International is a global designer and manufacturer of specialized bulk handling equipment. The company has, among other things, developed the LIFTUBE®: a high-performance solution for belt conveyors to optimize their tightness and safety. This system ensures a reduction in dust emissions, material losses, maintenance time and guarantees operator safety. Safety and efficiency are vital in a bulk handling stockyard. The following case studies demonstrate the value of installing LIFTUBE® on belt conveyors.

Avoiding material loss in a cement plant in Spain

Application: grinding area.

Customer's problem: the recovery belt of the ground product in a tunnel of several marl and limestone falls for a homogeneous density of 1.8g/m³ generates several issues:

- emission of dust
- significant loss of material during the transfer of material;
- impossibility of access to the tunnel during operation of the conveyor belt; and

too much time spent on maintenance due to obsolescence of equipment.

The operators have had to accept that they can no longer clean in the area when the belt is in operation.

Solution: the installation of 1,000mm-wide, 18-metre-long 2T10 LIFTUBE® belts, with extra-flat to pass under structures, drastically reduces dust emissions and material losses, which in turn reduces cleaning and personnel costs.

LIFTUBE® allows easy access to the

tunnel and control of the belt wear

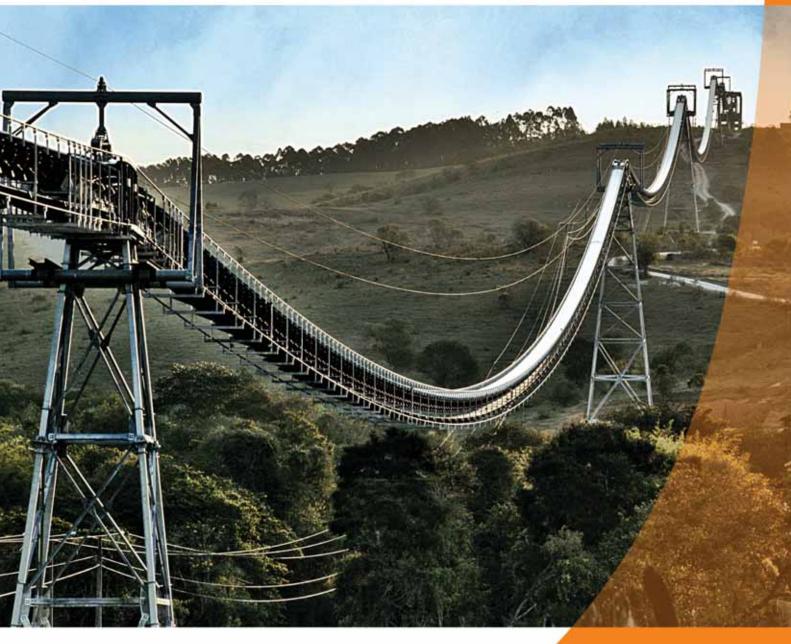
Result: in this way, the maintenance of the 2T10 belt has been optimized so that it can operate continuously during the first 12 months, with only visual inspection, without the need for any maintenance.

Operational maintenance costs for the maintenance of the mats represent 60% of the overall budget.

Operational maintenance cost for a carpet: about 70K€/year (three people;



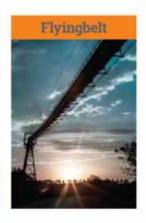
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eight hours per day; four days per week; shutdown two to four weeks per year; 15 €/HT per hour per person).

The need for an easier approach in terms of element handling and stock rationalization was obvious to the user. This makes it possible to make a saving of around I0K€ HT per year and to concentrate the maintenance teams on other areas of the plant.

REDUCING DUST EMISSIONS IN A CEMENT PLANT IN SAUDI ARABIA

Application: loading limestone and gypsum. Customer's problem: after homogenization, the silos allow for buffer loading of the material before loading.

The gypsum or limestone arrives separately on the two-way conveyor to fill each silo. When the product falls onto the raw silo loading belt, it causes dust emissions throughout the plant and a significant loss of material.

The consequences are various: higher maintenance routine, increased cleaning of the plant, more difficult working conditions. **Solution:** three 10- to 13-metre sections of the LIFTUBE® hooding system were installed on the overall loading area above

Result: the LIFTUBE® device has enabled









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The UK glass factory before the installation of the LIFTUBE®.

All the original rollers and skirts were removed and taken out of the tunnel in

The LIFTUBE® parts were then transported by hand and installed on the original conveyor frame.

The installation was completed two days ahead of schedule and the customer was therefore more than satisfied.

This is proof that the LIFTUBE® is also very easy to install.

Result: since the installation of the LIFTUBE®, the customer has eliminated all spills from its conveyor line that reduced access for clean-up operators.

Thus, the risk of accidents during the weekly interventions to clear the overflow of glass has been eliminated.



the cement plant to drastically reduce dust emissions and material losses and, as a result, its cleaning and maintenance costs have decreased considerably.

REDUCING THE RISKS DURING MAINTENANCE IN A **UK** GLASS FACTORY

Application: conveying broken glass.

Customer's problem: this customer produces premium glass containers and packaging. Material spills during the conveying of broken glass (production scrap) were the main problem.

Solution: it was decided to modify the existing strip and install 32m of LIFTUBE® 2-500.

During a short production stoppage, which was only possible during the Christmas period, the LIFTUBE® was installed on a conveyor running in a tunnel of approximately 1,500mm wide and 30m long.

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 Reclaimers
 And Bulk Conveyor
 Systems

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A.E. Engineers operates from four offices around the world. A.E. Automotion Pvt. Ltd. is in Chennai, India; Ability Engineering LLC. is in Portland, Oregon, USA; Arah Edar (M) Sdn. Bhd. is in Selangor in Malaysia; and A.E. Engineers (S) PTE. LTD. is in Singapore.

The group specializes in material handling system solutions for power plants, port handling, coal mining, stockpile storage

and retrieval, coal blending, barge loading and unloading, cement plants, woodchip handling and paper mills, and so forth.

A.E. Engineers has wide experience dealing with international consultants and industries, and all its projects are carried out to the highest standards.

Many of the company's systems are widely used in stockyards around the

world, including: belt conveyors, screw conveyors, reclaimers, bucket elevators, chain conveyors, screw conveyors apron feeders, belt scale, weigh feeders, sampling plants, metal detectors, magnetic separators, scavenging conveyors and more.

It can manufacture, supply and service idler rollers, pulleys, belt, belt cleaners, drive



parts, screw take up, impact pads, skirt sealing etc.

A.E offers electrical and instrumentation systems for the stockpile, blending and port etc. with SCADA /DCS controls.

A.E. Engineers also offers a selection of weighing and sampling systems, including: weigh feeders, sampling, on line belt weighing system, magnetic separators, metal detectors, vibrating screens, crushers, vibratory feeders, and feed hoppers.

A.E. Engineers' mission is to develop and maintain a high level of industry knowledge for the benefit of its customers. It meets its customers' expectations by providing solutions with the flexibility to meet their budgets, to the highest quality standards, and to maintain on-time delivery.

Its turnkey material handling system solutions include: feasibility study, consultancy, concept design, detail design, manufacture, supply, site supervision, installation, testing and commissioning of



bulk material handling and unit material handling systems.

Commodities handled by A.E. Engineers

products include: coal, fertilizer, iron ore, slag, cement, gypsum, clinker, mud, wood chips, wood logs, sugar, silica sand.

The capacities of its products reach as high as 9,000tph (tonnes per hour) handling coal at a speed of 9m/sec and belt width up to 2,400mm.

The company adheres to the following standards: AISI ASD 9th edition, AISC LFRD 3rd edition, ASCE 07-02, IBC 2000/2003, UBC97, SBC97, British code of practice for steel design-BS 5950, Code of practice for general construction in MS-IS800 and other local standards as per client needs.





Keeping conveyor belts moving in the stockyard with Almex Group systems

Almex Group provides a comprehensive range of conveyor belt monitoring, rip detection and steering gear products to bulk material handling customers in the industry. Each of these products is in the forefront in technology and performance in their respective areas.

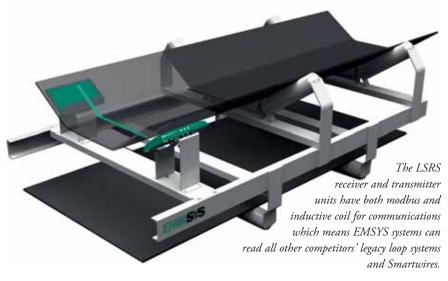
With comprehensive service teams located globally, Almex Group is a world leader in Almex equipment servicing, and conveyor belt services such as installation and splicing. Almex and the Almex Global Service team support its users' conveyor systems with custom equipment such as splicing stations with air brakes and clamps with built-in redundancy, scanning and monitoring solutions and services and expert staff available to come on-site. The Almex Group line of EMSYS products for conveyor belt monitoring, rip detection and steering gear is a core competency of Almex group, available globally.

In 2017 Almex group acquired EMSYS of Marl Germany. The company had a 20-year history of innovating in electrical and mechanical solutions for conveyor belt problems with a focus on conveyor belt rip detection and material monitoring with sensors, scales and debris conveyors. The EMSYS group had expertise in Software, processors and mechanical solutions making it an ideal addition to the Almex group product portfolio. Since that time, Almex has invested substantially in the EMSYS product evolution, advancing the solutions for rip detection and eliminating some of the issues with the existing rip detection solutions in the marketplace.

Today's rip detection systems rely on old analogue technology utilizing thin wire antennas formed into large panels, which when installed in the conveyor belt are subject to false positive signalling and premature failure via regular conveyor belt wear and tear. These antennae are difficult to troubleshoot if a signal is intermittent from a loose connection, which make them costly to service and replace given their footprint in the conveyor Maintenance and service calls often result in continuous adjustments to the system, such as skipping a faulty antenna, which can lead to increased false positive alerts and decreased monitoring capability.

EMSYS LSRS — LOOP SENSING RECEIVER WITH SMARTWIRE

The EMSYS LSRS is a digital solution consisting of a receiver unit, a transmitter unit and RFID 'Smartwire' placed at intervals within the conveyor belt at fixed



intervals.

The EMSYS LSRS receiver and transmitter units are larger, have more powerful data processing capability, and read a larger area of the belt than competitor receivers. This larger field area and the built-in protocols enable the units to read both Smartwires and competitor loops even if belt is misaligned.

The LSRS receiver and transmitter units have both modbus and inductive coil for communications which means EMSYS systems can read all other competitors' legacy loop systems and Smartwires. No one other system can read both types. The processors are built into the transmitter and receiver units for faster data processing and sampling read rates of the data from the loops. The monitoring, reporting and alerting data can be retrofit into any existing system; such as Conti, Phoenix, Fenner, Coal Control, Rema, Becker mining, Bridgestone or Bando.

SMARTWIRE

Smartwires are constructed of a Kevlar® braided core for impact resistance and strength. They are made of a silver-coated copper wire wound around the Kevlar® core which is then stitched in a Z pattern





to breaker fabric for resistance to breakage. The solder joints and RFIDs are encased in epoxy to prevent breakage and ensure the longevity of the signal. Each





Mechanical and Pneumatic Systems for grain handling and port facilities

Designed, engineered and built in italy with 90 years of experience and evolution

Golfetto Sangati, part of GEA Group, designs, builds and installs turnkey equipment for grain handling and milling. The company fulfills the market demand in a competitive way and with state-of-the art technologies based on research, experience and in-depth technical knowledge. The company designed and built more than 60 port systems all over the world and plays a primary role in technological advancement from the first pneumatic ship unloader to the more advanced mechanical loaders and unloaders. The company supplies a large range of handling, processing and storage, loading and unloading systems on tires or rail



Smartwire has a power tag and an antenna RFID and the tags can be programmed with information such as: unique ID codes to map to the position in the belt, the date of installation, maintenance dates, etc. Smartwires are warrantied for one year from failure and will not impact the performance of the belt or lead to belt failures.

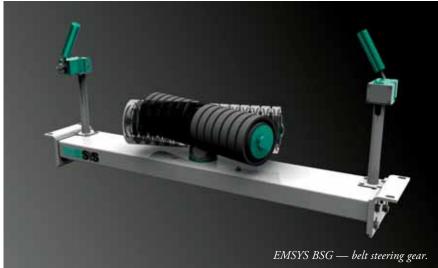
Smartwires are placed within the belt, during manufacture or as a 35-minute retrofit for existing conveyor belts, at regular intervals for monitoring the length of the belt. Smartwires are also manufactured in house at Almex facilities and have short lead times the orders. They do not require special shipping or handling such as refrigeration, because they don't contain any uncured rubber and are flexible by design. In fact, they can be delivered by courier due to the flexibility and lightweight construction.

EMSYS WSR — WIDTH SENSING RECEIVER

The EMSYS WSR allows the monitoring of any belt type by monitoring the width of the belt compared to a learned baseline and alerting to any changes in that width for a given tolerance and distance, as would occur for rip in the belt with a spreading or shearing effect. RFID tags are embedded in the belt to provide reference points and then the two telescoping arms read the belt width every few inches. The conveyor belt is run on an initial few rotations for the system to memorize the entire belt. Ongoing readings are compared to the baseline and any deviation can alert operators and/or bring the belt to the stop.

The monitoring principle is based on identifying changes in the belt width caused by belt rips. This width monitoring approach also detects belt misalignment and edge damage. The EMSYS WSR can be integrated into an existing monitoring system communication or comes with its





own control and display options.

EMSYS BSG — BELT STEERING GEAR

The EMSYS BSG is the most advanced and functional belt steering system in the industry for steering a misaligned belt onsite or remotely from anywhere in the world via a tablet or smart phone.



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Laidig Systems reclaiming systems benefit from strong ports expertise

Laidig Systems, Inc. is a global designer and manufacturer of reclaim systems that automate the unloading of dry bulk materials from storage silos and domes, writes John Koorn, International Sales Manager, Laidig Systems. Laidig excels in developing large capacity reclaim systems that are critical components to the operational efficiency of any port facility. Laidig also understands the challenges that port facilities encounter as it relates to the bulk storage and reclaim of hard-to-handle materials, such as meals, cement, wood chips, biomass, recycled materials, mined products, chemicals, and powders.

As agricultural commodity producing countries (Brazil, Argentina, Russia, Ukraine, USA and Australia) continue to address the world's need and desire for high protein products such as soybean meal, there is also a tremendous need required to automate these protein products at the export port facilities. The reliability, flexibility, and sophistication of Laidig's reclaim systems have proven to be invaluable for industrial, process-driven applications in industries all over the world. With almost 60 years of storage, handling and reclaiming experience, Laidig provides port facilities with innovative and efficient solutions that are capable of handling various materials in a variety of conditions.

Laidig designs, engineers, manufactures and tests fully automated large diameter bulk storage and reclaim systems for large capacity storage silos and domes. Both the Laidig Track-Drive and Laidig X-Traktor reclaim systems have been designed to meet the specific needs and requirements of port facilities, addressing the most evolving market criteria that include:

- Safety: employee confined space issues are solved with 'zero entry' for easy service access and safety.
- Automation: 'push button' control, and no rolling stock in the facility.
- Labour: minimal labour required in an automated and safe employee work environment.



Faster facility throughput: as the population grows (by 2050, the Earth will have an estimated ten billion people to feed), there is an increased amount of pressure on export facilities to feed people. Getting product out quickly and efficiently has an impact on the bottom line (time = money).

Laidig's reclaim systems also add significant value to the overall port facility operations, while providing solutions to the most common material handling issues such as:

- First-in-first-out (FIFO) inventory control
- Elimination of bridging and ratholing.
- Controlling product infestation.
- Controlling product contamination.

Laidig's Track-Drive series offers superior performance and dependability for a wide range of hard-to-handle materials, especially meals. The Track-Drive reclaim system is designed and engineered to provide a fully-automated, near-total clean out, while also promoting a first-in- first-out (FIFO) material distribution. The advance track-drive system ensures a positive auger and material advance, and the uniquely designed self-cleaning shoe assembly firmly grips the ductile iron track,

that keeps the auger in place as it undercuts the stored materials, and its reinforced shield features a lubrication system allowing for the greasing of the end bearing even while the silo is filled with material. The Track-Drive system is also equipped with Laidig's proprietary track advance technology to advance the reclaimer effectively and efficiently.

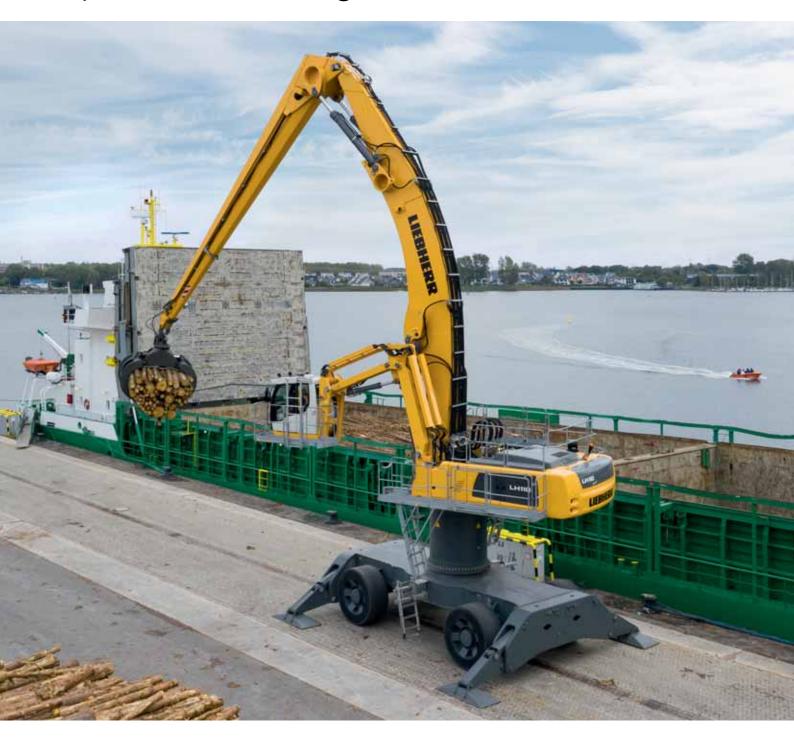
The Laidig X-Traktor reclaim system is another valuable solution for the storage and reclaim of materials at port facilities. The X-Traktor is customized to a wide variety of port facility applications in both silos or in domes, and is available in either cantilever or trolley-supported systems.

The Laidig X-Traktor has been engineered for industrial applications that require the ability to reclaim materials that have poor flow characteristics or other properties that make it difficult to handle — such as meals. The X-Traktor offers port facilities operational efficiency through maximum storage and automated delivery with its push-button operation. This is Laidig's largest, most powerful reclaimer, designed specifically for dependability and low maintenance — both vital factors for a port facility's success and efficiency.

Laidig's custom-engineered material-handling systems offer proven performance to port facilities that is second to none. Laidig is recognized as an industry leader in developing innovative, state-of-the-art technology to provide customized solutions for the most difficult applications. With over a half of a century of experience in hard-to-handle and semi-flowable materials, Laidig is uniquely positioned to address the storage and reclaim of meal as it applies to port facilities well into the 21st century.



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- Ergonomic workspace for consistent high performance



DemcoTECH delivers environmentally-friendly sulphur handling system for Petronas RAPID project



The storage and homogenization of bulk materials is a complex process, and, if not optimized, can have a significant negative impact on the efficiency of the overall bulk material handling process operation, says materials handling and niche process plant specialist, DemcoTECH Engineering.

According to DemcoTECH General Manager, Paul van de Vyver, the many challenges inherent in running efficient stockyards include ensuring a fully integrated design process between the stacker and the reclaimer to ensure suitable stockpile design for both the





stacking and reclaiming operations. An efficient stockyard must have sufficient amounts of product available with a suitable volume distribution across the stockpiles in order to avoid compromising the reclaiming operation.

Such challenges highlight the importance, both of taking a holistic view to the design of a stockyard as an integral and critical part of the entire materials handling chain, as well as equipping it with the appropriate technology, adds van de Vyver.



With more than 20 years local and international experience in bulk materials storage and handling design, South African-based DemcoTECH has been responsible for stockyard projects across a range of bulk materials industries, from the mining through to the fertilizer sector.

"Our long track record in developing stockyard facilities now covers Africa, the Far East and Eastern Europe," says van de Vyver. "With our extensive design expertise, strength in powerful simulation techniques, FEA analysis and range of advanced technologies, we provide a customized solution tailored to the client's needs. Such solutions include both enclosed and open stockyards, conveying materials on open and enclosed conveyor systems, mobile conveyors and stackers and ancillary equipment such as dust suppression and controls."

The design of a 30,000-tonne sulphur stockyard and associated handling system was at the heart of a recent complex EPC granular sulphur handling contract awarded to DemcoTECH by the SYS & McConnel Dowell joint venture (SMJV). The contract for the sulphur handling system at the refinery and petrochemical integrated development (RAPID) project and associated facilities in Pengerang, Southern Johor, Malaysia, called for the design of a system that could serve the export requirements of solid products for the overall RAPID facility.

The RAPID project is being developed by Malaysian oil and gas company Petroliam Nasional Berhad (Petronas), through a project called Pengerang Integrated Complex (PIC). Southern Johor was chosen as the location for the project due to its proximity to deepwater port facilities and regional demand centres. The location enables easy transport of finished products

to the market.

"DemcoTECH was responsible for the design and engineering, international



RAPID project: shiploader with telescopic chute minimizes dust generation.

procurement, manufacture, fabrication, construction and commissioning of the entire system," says van de Vyver. "The scope commenced from the offloading of sulphur, followed by controlled loading onto a stockyard conveyor stacker arrangement which stockpiled the material. The sulphur is then reclaimed, conveyed and loaded into 15,000dwt vessels."

The main equipment supplied as part of DemcoTECH's turnkey solution included a sulphur loading facility; a rail mounted tripper/stacker and a rail mounted portal scraper reclaimer; and the entire conveyor system, including the yard belts and the quayside shiploader conveyor feeding the rail mounted ship loader. The equipment was fully integrated with the jetty design.

"The design of the sulphur handling system had stringent environmental regulations," says van de Vyver. "We therefore incorporated dust suppression on all transfer points, as well as including a multi-curved 2.2km-long pipe conveyor providing a fully enclosed conveying system for both the carrying and return sides of the conveyor along the entire open jetty."

"Besides the major environmental benefit of enclosed conveying to prevent mutual contamination of the product and the environment, the pipe conveyor resulted in the reduction in the number of transfer points."

"The state-of-the-art telescopic chute on the shiploader eliminates spillages and dust generation."

While the project posed various challenges such as language barriers, monsoon weather conditions and inclement weather patterns, a major risk to the engineering phase was sourcing the correct structural members in the region to suit the structural design of the equipment.

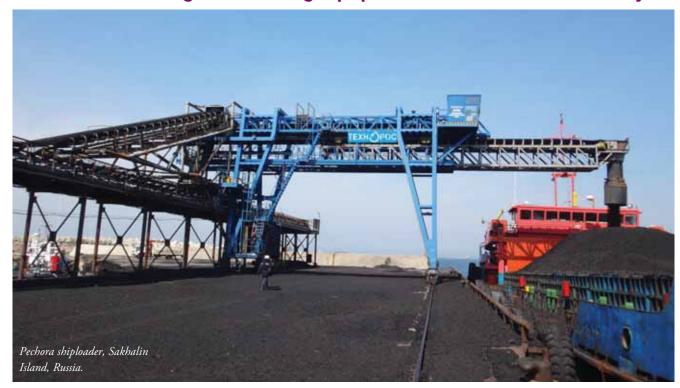
"We also followed a global procurement strategy in order to optimize cost-effectiveness without compromising on quality, with components and portions of equipment being sourced from five different countries," adds van de Vyver. "In line with the requirement of the client, we maximized the use of local labour during the erection of the plant."

DemcoTECH's extensive track record in stacking and stockyard projects includes the mobile tailings disposal systems at Letšeng and Liqhabong Diamond Mines in Lesotho, and the Grindrod multi-product terminal at the port of Richards Bay and the manganese ore stockyard and reclaim system for Assmang works at Cato Ridge in South Africa. Further afield, DemcoTECH completed the detailed engineering of the entire materials handling system for a multi-product import terminal project at the Port of Ploce in Croatia and completed a major materials handling contract for the multimillion-dollar iron-ore import/export facility for VALE in Lumut, Perak, Malaysia.

ABOUT DEMCOTECH

DemcoTECH Engineering is a specialist bulk materials handling and niche process plant company, offering services from concept design through to project completion to the power generation, cement, mining, metallurgical, manufacturing and port handling industries. Services include conceptual design, feasibility studies, design, engineering, procurement, expediting, construction and commissioning. Plant supplied by DemcoTECH includes troughed conveyors, air-supported conveyors, pipe conveyors, rail-mounted slewing boom stackers, pivot boom conveyors and mobile conveyors. 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.

Tehnoros: wide range of handling equipment in and around the stockyard



ABOUT TECHNOROS

Russian manufacturer Tehnoros was established in 1991, and designs and manufactures complex materials handling equipment. Since its establishment, the company has carried out over 100 unique and complicated projects for a range of companies in the industries including: oil & gas; mining; metallurgical; chemical & nuclear power industries; shipbuilding; military industrial complex; as well as providing equipment for transport and logistics infrastructure. All equipment is sold to both domestic and international markets.

Tehnoros's major customers: include EuroChem, EVRAZ, Gasprom, Rosneft, NLMK, Nornickel and others.

The range of rail-mounted bulk material handling equipment includes:

- I. shiploaders for oceangoing cargo;
- reclaimers for open storage areas and closed warehouses:
- portal cranes for a variety of harbours and open storage areas; and
- 4. gantry and bridge grab reloaders for open and closed warehouses.

All types of equipment can operate at extreme temperatures, from -50 °C to +50°C.

1. SHIPLOADERS

SHIP LOADERS FOR COAL AND EQUIPMENT FOR LOADING LOW-TONNAGE VESSELS

For loading coal on low- and medium-

tonnage bulk carriers (up to 40,000dwt), Tehnoros offers its Pechora and Don shiploaders with capacities ranging from 400tph (tonnes per hour) to 2,500tph.

Pechora shiploader

The Pechora shiploader is equipped with a telescopic boom which has a discharging arm with a regulated swinging radius to enable easy access to all points of the ship's hold

It is important to have a significant boom radius in a shiploader, to make it possible to service vessels in ports that are a long distance away from the berth wall. The maximum unloading distance is 26 metres, and the conveyor speed can travel at up to 8m/min.

Don shiploader

The rotating boom is one of the Don shiploader's special features. This boom, together with the machine travelling along the mooring, makes it possible to feed the material in each sector of the ship's hold. The rotation of the boom is carried out by means of using a rotation crown and a counterweight.

The maximum angle of the boom's rotation is 210°, which is enough to load even long vessels equally.

SHIP LOADERS FOR LOADING LARGE-CAPACITY VESSELS

Large vessels with a large cargo capacities are serviced in special sea terminals with a low water level and a wide berth.

The main requirements for equipment for loading bulk carriers with large displacement include:

- a boom with wide range of lifting and lowering angles;
- a telescopic discharging device with changeable height of lowering.

Neva shiploader

The Neva shiploader is equipped with a boom which can change lifting angle (from -6° up to 75°). It is also equipped with a shuttle which travels along the boom. Travel length of the shuttle is 30m. Lowering depth of discharging device is 10m.

The capacity of the shiploader is from



400 to 2,500tph.

SHIPLOADERS FOR MINERAL FERTILIZERS

Mineral fertilizers have a high chemical activity, which negatively affects both the metal structure and the mechanisms and electrical equipment of the shiploader.

In order to prevent the corrosion and fast wear of the main transportation units, Tehnoros uses stainless steel and special plastics in the manufacturing process.

The configuration of the Neva and Don machines is suitable for the efficient transshipment of all types of mineral fertilizers.

The conveyors of the described shiploading machines are sheltered from precipitation and wind, which saves the material during transportation.

SHIPLOADERS FOR GRAIN

The handling of grain cargoes such as wheat, rye, corn, sunflower, and rape requires compliance with strict safety rules.

Dust generated during grain handling is explosive. To prevent explosive situations, Tehnoros supplies shiploading equipment with aspiration systems, antistatic protection and explosion relieve valves.

Kuban shiploader

This type of machine is intended to load grain on to bulk carriers of tonnages up to 120,000dwt. Operating capacity is up to 1,600tph. One notable aspect of this shiploader is its rotating configuration. The rotating boom is located on a high or low portal, depending on the location of the mooring conveyor.

The angle of the machine boom rotation is 210°. By having such a configuration, the Kuban is able to serve the vessels from two sides of the mooring. Another special feature of the Kuban shiploader is the availability of the elevator for vertical





feeding of grain to the conveyor, as well as the variable angle of inclination of the discharging device which provides the equal tight loading of grain inside the ship's hold.

The Pechora and Don shiploaders can also be used for grain handling in sea ports

and terminals.

2. RECLAIMERS FOR OPEN STORAGE AREAS AND CLOSED WAREHOUSES

Tehnoros designs and manufactures boom reclaimers which are intended for taking bulk cargoes from the stockpiles of open or closed warehouses and continuous cargo handling on technological lines.

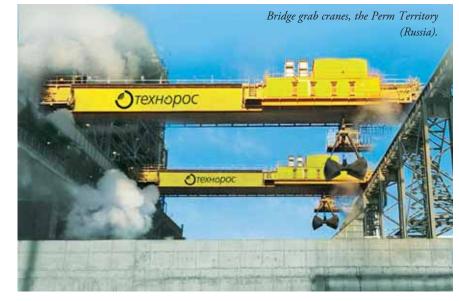
The reclaimers are optimally suited for the transportation of coal, limestone, ore, hot-briquetted iron, sulphur and mineral fertilizers.

SCRAPER-RECLAIMERS

Portal scraper-reclaimers

Portal scraper-reclaimers are usually used at enclosed storage facilities. The advantage of portal execution is there is no need for a load carrying capacity to be designed in to the equipment, as ground-type crane tracks are the foundation of the scraper-reclaimer.

As opposed to semi-portal reclaimer, a portal one differs by offering bigger productivity thanks to the possibility of



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sophisticated parts of the reclaimer were also supplied by Tehnoros.

The reclaimer's overall length is 83.8m, the height from the rail level is 36m and the total weight is 1,075 tonnes.

Hard European environmental requirements for dusting and noise level apply to the equipment.

ADVANTAGES OF WORKING WITH TEHNOROS:

extensive experience: Tehnoros's production association has a rich experience in designing, manufacturing and installing conveyor equipment for

installing of additional booms as well as the application of two conveyor belts for taking the cargo from the warehouse.

Semi-portal scraper-reclaimers

Semi-portal scraper-reclaimers, in contrast to portal ones, are characterized by a lower cost, since they are designed to work in warehouses of low capacity with low productivity.

Cantilevered scraper-reclaimers

Thanks to easy installation and the lack of need for load-carrying capacity in the construction design, a cantilevered scraper-reclaimer can be used with similar efficiency either at open or at low-volume enclosed warehouses.

A cantilevered reclaimer can be equipped with buckets for taking non-free-flowing materials.

Gantry bucket reclaimers

Gantry bucket reclaimers are intended to take the material from the homogenization stockpile and transfer it to the belt conveyor. The special feature of this reclaimer is the function of pouring the material back onto the stack.

3. PORTAL CRANES FOR DIVERSE HARBOURS AND OPEN STORAGE AREAS

Zubr portal cranes

The new line of swivel cranes with articulated boom is designed for handling bulk and piece cargoes. Cranes perform lifting operations in hook and grab modes. The lifting capacity of the crane can reach 120 tonnes in high-load mode, and the boom reach is 45m. Also, Zubr portal cranes can be used in installation operations.

4. GANTRY AND BRIDGE GRAB RELOADERS FOR OPEN AND CLOSED WAREHOUSES

Tehnoros designs and manufactures special grab bridge and gantry cranes for lifting and



transporting bulk cargoes using a rope or mounted electromechanical or electrohydraulic grab.

The load capacity of such cranes in the grab mode is up to 32 tonnes.

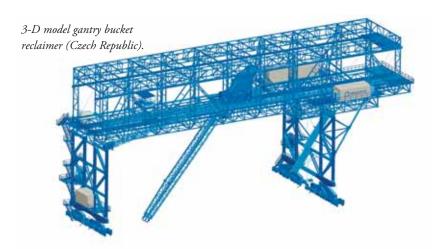
Gantry and bridge grab reloaders are widely used in the coal, energy, oil refining and metallurgical industries, in particular in charge departments and in the slag yards of open-hearth workshops, as well as in enterprises processing ferrous and nonferrous metals and cement plants when working with raw materials.

CURRENT PROJECTS

Currently, a portal bucket reclaimer with a capacity of 1,200tph, designed by Tehnoros, is being installed at a metallurgical plant in the Czech Republic. The main

handling and storage of bulk cargoes. The company's design bureau consists of more than 60 highly qualified engineers with extensive experience.

- reliable partner: Tehnoros manufactures equipment using components from leading industrial enterprises around the world specializing in the production of chain, conveyor equipment and electronics.
- flexible solutions: Tehnoros produces equipment that meets the requirements and production conditions of the customer.
- high reliability and extended warranty: Tehnoros's equipment is designed for a service life of 20 years.
- favourable financial conditions: down payment – from 10%.



Heyl & Patterson offers durable custom-designed stacker/reclaimers

Heyl & Patterson has been engineering bulk material handling solutions since 1887. In the early 1960s Heyl & Patterson shifted its focus to the exponential growth of the coal and iron industries. Heyl & Patterson identified the need for stacking equipment and started manufacturing stacker/reclaimers to aid in the effective management of coal and iron ore stockpiles.

Stacker/reclaimers are often ideal machines for terminals, coal yards or transfer sites dealing with the stockpiling of dry bulk materials. With the ability to convey, stack, and even blend, a stacker/reclaimer is a versatile tool. With extensive experience, Heyl & Patterson engineers outdoor stacker/reclaimers custom designed to meet the specific needs of any site. Capacity requirements, yard limitations and environmental

conditions are crucial factors in the design of a stacker/reclaimer.

Customization of equipment is important to optimize the efficiency of the material handling process, as no two sites are quite the same. Working alongside a sites' operations team, H&P's engineers design booms that can span from 50 to more than 200 feet. The entire machine travels along a yard rail, which can vary in dependent on customer requirements. Tailoring the design to the needs of the operator is crucial to the success of implementing new equipment. Heyl & Patterson stacker/reclaimers can be designed with numerous optional features, including a collapsible tripper, which reduces the length of conveyor needed and the amount of chute work required to transfer coal.

While Heyl & Patterson refers to its units as light to medium duty stacker reclaimers, as they process between 2,000-4,000tph (tonnes per hour). However, they are heavy duty in terms of durability and longevity. Heyl & Patterson equipment often reaches lifespans measurable in decades. Heyl & Patterson installed its very first stacker for a steel mill on the shores of Lake Michigan circa 1966; stacking at 2,500tph and reclaiming at 660tph, transporting iron ore pellets from pile to blast furnace. A testament to the machines' endurance, this unit is still in use 54 years later.

In 1972 Heyl & Patterson fabricated a 4,000tph bucketwheel stacker/reclaimer, allowing for the stacking and reclaiming of



coal for an America-based power plant. Today, more than 45 years later, this stacker/reclaimer is still operational and continues to stack and reclaim coal off the Ohio River. Although still in use, this machine had surpassed its useful life. Ageing coal yard equipment can be seen across the United States, with many plants lacking the capex budget to invest in new equipment. Heyl & Patterson's solution to this predicament was to refurbish the existing equipment, bringing it back to life and improving its capabilities efficiencies along the way. The refurbishment this seasoned involved stacker/reclaimer improvement of mechanical, electrical and structural systems.

After a thorough inspection and analysis of the existing machine, salvageable mechanisms and structures were reconditioned for use within the new machine, providing a great cost saving to the end user.

Many of the machines critical components were improved, including a newly designed slew brake, and the addition of a new machine-mounted operator's cabin. The new cab enables a single operator to govern all functions of the machine, including; luffing, slewing and travel, all while maintaining a bird's eye view. As coal build-up was identified as a problem with the existing machine, frames on travel trucks, equalizers and bogies, were all upgraded to an enclosed design where possible, to prevent spilled material from piling up on the flat surfaces on the

refurbished unit.

The highlight of this recertification project was the electrical upgrades to improve automation. The original stacker/reclaimer was controlled using an Allen Bradley SLC500 PLC and hardwired relay control panels. The control system was modernized using an Allen Bradley ControlLogix PLC and PanelView HMIs in the operator cab and the electrical room. Ethernet remote I/O was utilized to reduce the amount of cabling required on the refurbished machine.

The field devices were updated to allow for expanded automation capabilities. The old machine was dependent on the operator to perform the stacking and reclaiming functions. New field devices (pile height laser, boom inclinometer, and a radar positioning system) were integrated during the refurbishment which allow the machine to automatically stack and reclaim material without operator involvement. With the new field devices, the auto stack/reclaiming parameters can be modified and adjusted to suit the specific needs of the site.

The newly commissioned machine is now in use. Its custom upgrades are suited to meet the requests of the end user. While the stacker/reclaimer maintained several of its existing structures and components, the stacker/reclaimer now operates as a new with automation controls that bring an innovative set of functions to the machine. Heyl & Patterson delivers a stacker/reclaimer that will be an asset to this site for decades to come. DC:



Lindø port of Odense receives Verstegen grab for its Liebherr LHM 800

Earlier this year the orange peel grab for the largest mobile harbour crane in the world left Verstegen's factory. Towards the start of April it arrived at the customer, Lindø port of Odense, to handle shredded metal scrap on its new Liebherr LHM 800 crane.

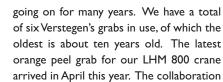
In open state, the grab has a height of more than 7.5 metres and a diameter of almost eight metres, which roughly corresponds to the length of a minibus and the height of a two-storey house.

The grab arrived at Lindø port of Odense in separate parts. Normally Verstegen Grabs sends an engineer over to assist with the assembly, but due to the strict COVID-19 regulations, this was impossible. With the help of clear drawings and step-by-step instructions provided by Verstegen, the staff at Lindø port of Odense was able to perform the assembly themselves.

The grab is suitable for crane load up to 70 tonnes and can pick up more than 35 tonnes of shredded scrap per cycle.

Lindø port of Odense's supervisor, Thomas Boysen, commented on the collaboration between the port and Verstegen Grabs, saying: "At Lindø port of Odense, we appreciate the co-operation with Verstegen Grabs, which has been Lindø port of Odense's new Verstegen orange peel grab during assembly (below) and in operation (above).







has worked smoothly and we can always expect a high quality service from Verstegen Grabs. We look forward to continuing the co-operation in the years to come".

Vertical cylinder clamshell grabs from Negrini

Excavator buckets are designed to handle a wide range of materials, including grain. They operate by loading and unloading these cargoes. They are mounted on crawler excavators, self-propelled wheeled excavators and trucks equipped with cranes. Excavator buckets are used widely in the agricultural and forestry sectors.

Grab manufacturer Negrini does not limit itself by only selling a standard type of clamshell equipment for the agricultural sector. Close study of customers' needs, including the analysis of loads and the type of operation that the equipment will have to perform, are an integral part of the company's approach, which ensures the construction of a high-quality, useful and durable bucket.

The company distinguishes between its equipment with the abbreviations LM (light material), GP (general purpose) and HD (heavy duty). Negrini takes into account the weight to be handled and the work shifts to which the bucket mounted on the excavator will be subjected. Light buckets are used for handling brushwood and agricultural products, heavy buckets for loading and unloading waste or building materials.

THE MAIN STRENGTHS OF THE HYDRAULIC CLAMSHELL GRAB WITH VERTICAL PISTON ARE:

- high opening speed provided by the structured hydraulic system;
- option to use the bucket in longitudinal or transverse orientations;
- almost complete absence of boxed areas limits the buoyancy effect;
- option to use high pressure for enhanced speed and power; and
- easy low-cost maintenance.

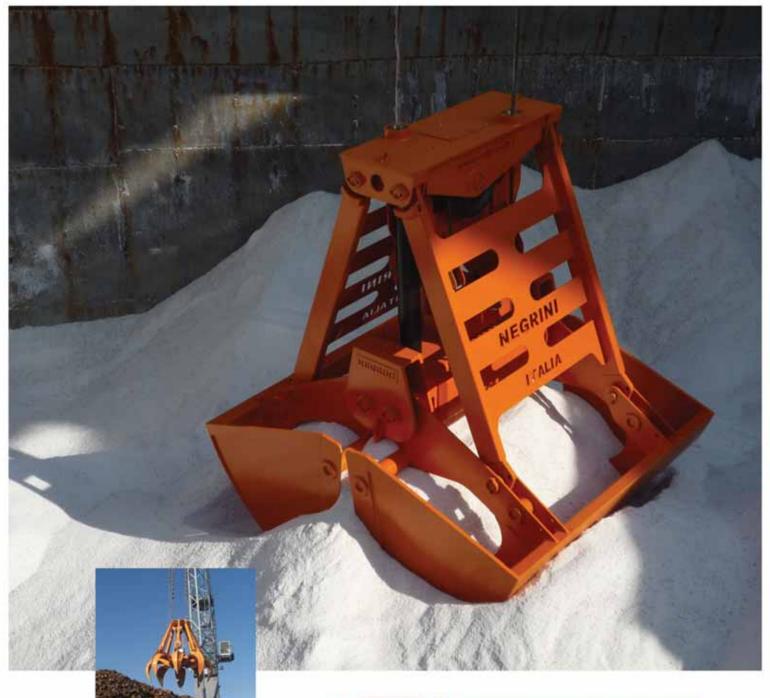
OTHER IMPORTANT AREAS INCLUDE:

- the shape of the new shell allows for the transit of materials without obstacles and helps continuous release when unloading, without sudden surges of material;
- the bucket is smaller in height and can be raised higher than traditional buckets:
- the bucket can be fitted with a free or motorized 360° rotator. The free rotator allows for natural adaptation of the bucket orientation. This rotator permits free rotation of ±50° with automatic return to the original position by exploiting the weight of the bucket. Extensions can be fitted if required;





- the shortness of the blade makes it possible to apply a highly concentrated force, giving the buckets high pressure per linear millimetre for maximum closing force — this allows for more effective filling and limits bucket lifting with a marked cutting effect on the terrain upon bucket closure, facilitating extraction;
- when possible, Negrini carries out operating tests using electronic
- instruments fitted to the bucket in order to check the evolution of flow rates, pressures, back pressures, and good general operation; and
- the piston rod is located in the upper part of the bucket where it is protected from the material and remains clean. The hydraulic fluid passes through the rod and drives the jack, the flexible supply pipes are in the upper part of the bucket and remain within a safe area.









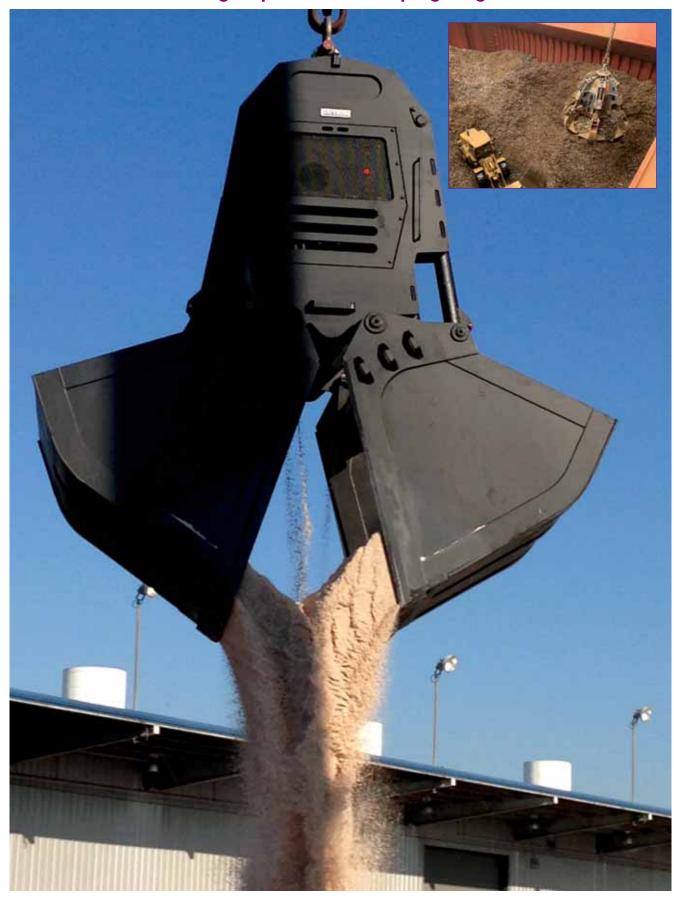
Negrini company, established in 1967, specializes in engineering and manufacturing a comprehensive range of grabs and buckets for rope machines and crawler mounted cranes; they are employed to do many jobs. Negrini buckets and grabs are very well-known for quality as well as for the very accurate and 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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Bateman Manufacturing – specialists in ship's gear grabs



With more than 30 years of experience manufacturing grapples and attachments for the demolition, recycling and maritime sectors, Bateman Manufacturing is located on the Niagara Peninsula, just North of

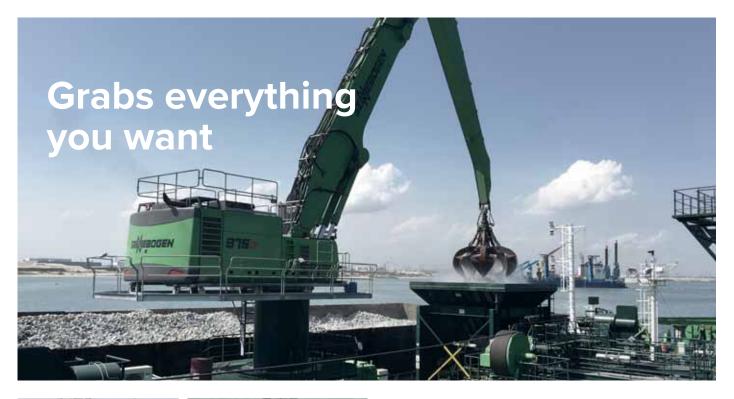
Toronto, Ontario.

In addition to being a leader in heavy equipment attachments, Bateman Manufacturing is a global innovator of self contained, diesel hydraulic ship's grapples

and clam shell grabs. This specialized product line delivers a highly efficient hookand-go solution to port facilities and ship owners alike.

With applications in the maritime















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!

J&B Grabs The Netherlands





industry, Bateman Manufacturing grapples handle millions of tonnes of scrap steel, rock, and raw steel products annually.

Mark Vandenberg, General Manager, explains, "We are able to custom engineer specific to our clients' requirements. Our quick release feature allows for the same grapple to be fitted with rock tines, high capacity — light material tines or heavy duty tines reinforced to tackle dense cargoes such as pig iron".

Much like the grapples, the Bateman clamshell grabs are self-contained, diesel hydraulic units and can be ordered in a variation of capacities to handle the client's specific material density. The cutting edges are fabricated from AR-450 steel, so whether the grab is digging salt or coal cargoes, to free-flowing fine fertilizers, the cutting edges will ensure a leak-free seal.





Credeblug: quality, reliability and cost-effectiveness in action

Since 1965, Spanish company Credeblug has been a major provider of bulk handling equipment. The company offers a global approach providing reliable solutions for multiple applications in the most demanding sectors of the world's grabs market.

Over more than 50 years, and through many successful projects carried out in 56 countries, Blug grabs have gained a well-deserved reputation for high quality. Due to its focus on geographical expansion, in 2019, Credeblug's exports were 70% of its output in 2019, and this figure is expected to rise to 80% this year.

Credeblug specializes in designing and manufacturing grabs. Its product offering ranges from 50 litres up to 45m³ capacity. Further, Credeblug develops customized to meet specific customer requirements.

Credeblug's technical team co-operates closely with engineering companies and respected research centres. Its engineers are continuously developing the most efficient and cost-effective units, which helps companies achieve a high return on investment (ROI).

Credeblug is respected worldwide as a grab manufacturer, and offers a quality rope-operated, hydraulic and electro-hydraulic or motor grab catalogue.

SUCCESSFUL PROJECTS

In the last few months, Credeblug has been focusing on grabs for scrap, mineral and urban solid waste handling applications, providing electrohydraulic orange peel grabs between 4m³ and 8m³ capacity for the solid waste industry for the UK, Greece, Germany, Spain — among other markets.



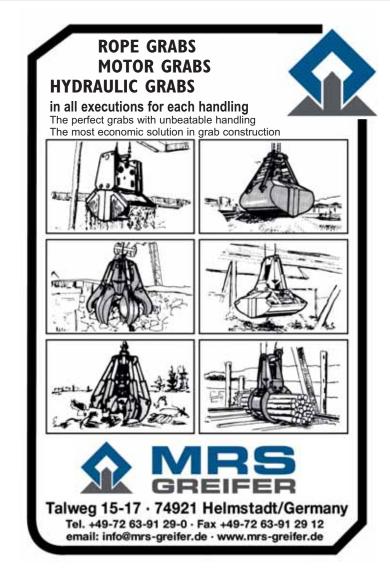


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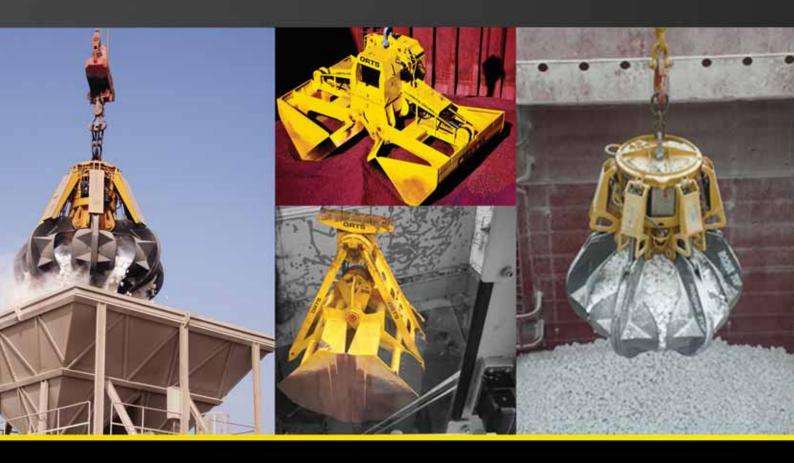
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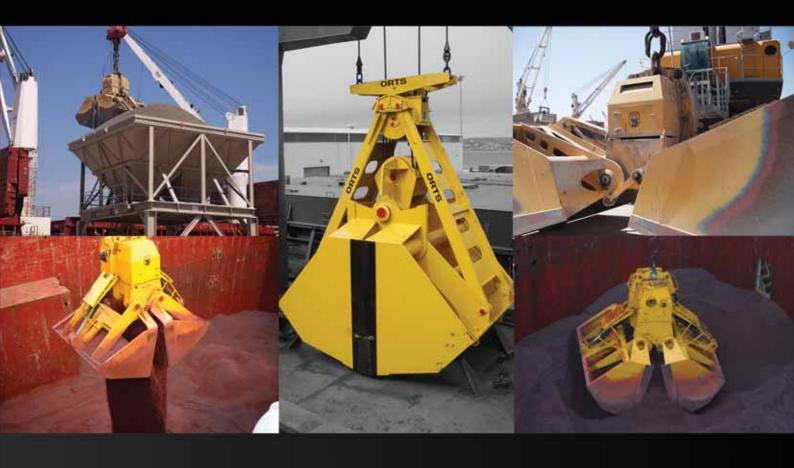




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the best link between ship and shore



Nearby Lübeck, close to the Baltic Sea, you will find a specialist for grabs and handling equipment.

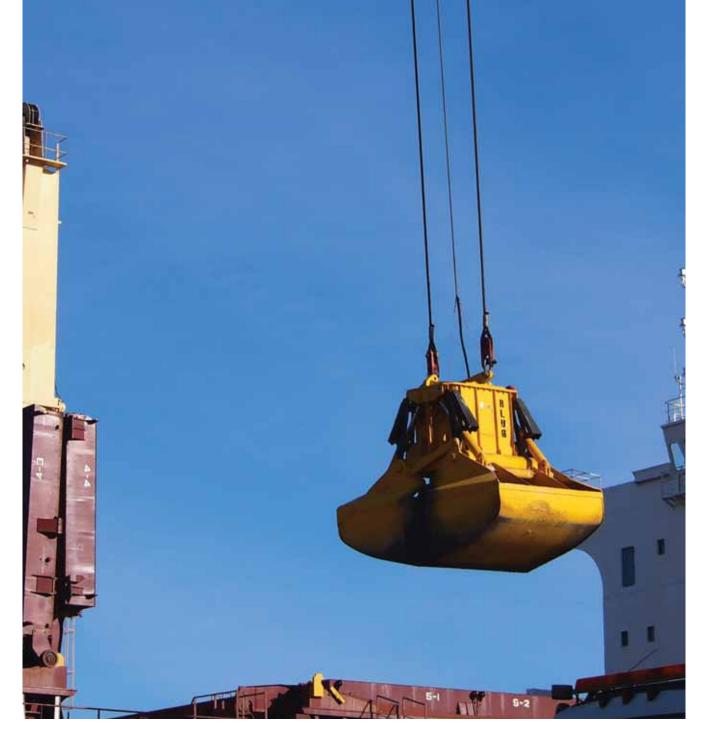
The grabs of ORTS GmbH Maschinenfabrik are in operation around the world, on all continents and all oceans.











In the coming months, Blug grabs will be working on prestigious mobile harbour cranes, handling coal and mineral material in reputed ports such as Morocco, Romania, Algeria and among other locations, handling material with grabs from 5m³ up to 19m³ capacity.

ENERGY SAVING

Credeblug's grabs are part of an important energy saving project. The company's ecologically friendly range has been specially developed over recent years as energy efficiency has become a very important point to reduce customers' operating costs and to optimize the environmental impact of the grabs. Blug's electrohydraulic range includes a standard variable flow piston pump operated hydraulic unit. This kind of system adapts

and continuously optimizes a grab's developed power during opening and closing operations and reduces the electrical demand by more than 40% comparing it with fixed flow hydraulic systems. According to Blug's estimations based on its grabs' electrical demand certified measurements, 25 tonnes of CO₂ emissions are saved per medium-size grab each working year.

ΟιιΔιΙΤΥ

Credeblug's maintenance book is designed to guide the client about operational aspects and specific details for the good behaviour of the grab. It is based on critical keys that condition the profitability of the grabs. Credeblug has also developed an increased R&D activity related with 4.0 technology to improve Blug grabs'

connectivity, remote access and maintenance actions' reporting.

GIITS wireless system and Blug Remote platform are two important examples of this intensive activity.

ORIGINAL SPARE PARTS

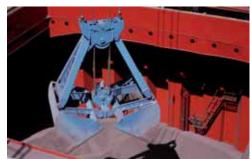
Original spare parts for preventative and corrective maintenance are available. These guarantee that the grabs retain their original reliability and durability. The spare parts are immediately available to customers, minimizing any downtime during emergency stops.

Blug's electro-hydraulic grab range includes own made and 100%-tested hydraulic cylinders with a special design that allows for the protection of the rods and increases the lifetime of these critical parts.









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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SSA Pacific doubles up for versatility with Mack 20-yard crane bucket at busy Stockton Terminal



"When it comes to helping companies solve logistical problems, we'll roll up our sleeves alongside you and work until we've got a solution." This from Mack Manufacturing. As case in point, the company relates its most recent

collaboration with Yara US at the Stevedoring Services of America Loading Facility.

By the time his customer signed off on their new 20-yard (18m) clamshell, Brandon Baumann was pretty pleased with the end results. Pleased enough, in fact, that he ordered another bucket just like it for his own operation at Stevedoring Services of America (SSA-Pacific).

Baumann had co-ordinated the design and purchase of the first bucket from Mack Manufacturing on behalf of Yara Fertilizer's Stockton Gateway Terminal. The Yara terminal is co-located at the SSA loading facility, where Baumann and his team provide the fertilizer company's stevedoring services.

"Yara receives a wide range of agricultural products at this dock," Baumann explains. "They wanted a new bucket that would adapt to the different loads, moving maximum weights of materials with very different densities. That's the challenge we presented to Mack."

ONE BUCKET, MULTIPLE SIZES

Mack responded with a remote-controlled, diesel powered bucket with spill plates to provide optional capacities at 20 yards (18m), 18 yards (16m) and 16 yards (15m). The size was a good match to the facility's 30-tonne crane, and its weight would be



enough to dig well into denser materials to grab a full load.

But Baumann asked Mack to go back to the drawing board. "For Yara's heaviest materials, such as urea, the optimum size would really be in the 9.5-yard (8.7m) range. So we asked Mack to take another look."

Matt Davidson, VP of Sales at Mack, took the problem to his General Manager, Nevin McElderry. As a third-generation owner of the family-run business, McElderry has a lifetime of experience solving problems for crane attachments. Working with his engineering team he was able to bring back the solution needed.

BUILDING A BETTER BUCKET

According to Davidson, "the challenge for us was to maintain the structural integrity of the bucket, while still being able to open up the structure to offer a wide range of capacities. We also had to account for the variable heaping characteristics of that range of materials, and the different operating modes of the cranes."

Mack met Baumann's targets through the use of circular openings of the spill plates, instead of longitudinal openings that run the width of the bucket. This approach preserved enough metal throughout the structure to maintain the integrity of the bucket in any configuration. "The change in the weight with or without the spill plates is minimal," says Davidson. "So the bucket still has enough mass to dig into the load. Moving urea really needs that impact — especially if the load's been wet and gets hardened in the hold."

The range of material that Baumann handles with SSA's bucket is even greater. From one ship to the next, bulk loads can range from rice and corn to garnet sand. The versatility built into the bucket would also be ideal matching SSA's crane to the material of the day. With the arrival of the second bucket, identical to the first, Baumann looks forward to years of highly productive service.

TRUSTED DEPENDABILITY

"I took the order to Mack in the first place because I know their bucket will hold up better, with less maintenance." With 16 years of port experience behind him, Baumann, Assistant Plant Manager, says he's seen most bucket brands in service.

SSA's Stockton facility also has a 22-yard (20m) single-line Mack bucket in its equipment fleet. Baumann prefers the

diesel models for their longer times between service intervals. The facility operates two shifts per day and, with the remote-operated diesel bucket, the 20-yard (18m) bucket bypasses the routine wire replacements required by the single line model.

"I've learned to rely on Mack. I've been using them for years. They're the most dependable make in the industry. We even have a smaller Mack bucket here, 9 yards (8m), that's been in service for 30 years now, and it's still operational."

ABOUT MACK MANUFACTURING

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



Longer life, increased productivity, reduced operating costs. It all begins with quality. And for industrial material handling attachments, quality means Mack.



Our crane grapples are custom designed to suit your needs. Mack is the home of the first five-tine pulpwood crane grapple and continues to bring the best new ideas for customers to life.



Mack completes every step from drawings to finishing under one roof to ensure we build every custom clamshell bucket to one consistent standard for every customer.

Cylinderless re-handling with the C40HPX clamshell bucket

For more than 45 years, Kinshofer GmbH has been manufacturing high quality attachments for truck-mounted cranes and it is now producing excavator attachments worldwide as well. In the last two decades, Kinshofer has become more and more interested in the re-handling market, producing large orange peel grabs (P-Series) for excavators with an operating weight of up to 200 tonnes and re-handling clamshell buckets (C-Series) for excavators and carriers with an operating weight from 18 tonnes up to 80 tonnes. Now Kinshofer proudly presents a new re-handling clamshell bucket for excavators with 40 tonne operating weight — with shells moved by Kinshofer's revolutionary HPXdrive.

If you want to handle bulk material on industrial or harbour sites in large amounts, it highly depends on the kind of 'mass' you want to grab when choosing the right attachment for the job. Wherever giant cranes, pneumatic vacuum elevators (grain blowers) or conveyors are not available or possible, the classical grabbing devices will always be first choice. Attached to an excavator, their mobility makes them extra attractive. These grabs are all available at Kinshofer's one-stop-shop.

A CLOSER LOOK AT THE NEW C40HPX

In contrast to conventional hydraulic grabs, with the HPXdrive for carriers up to 40 tonnes/88,000 lbs,the torque is generated by two pistons, which run opposed and have four helix threads. The force is delivered to two shafts, on which the shells are mounted. These advantages of the HPXdrive-technology provide an extended service life and higher efficiency.

Furthermore, the HPXdrive features a shell exchange system. For the C40HPX, there are shells in different widths and with different volumes available.

Very interesting, especially when handling e.g. grain or other light weight materials, are the closed shell versions for the C40HPX. The shells are not open on top as are normal clamshell buckets but closed. Furthermore, as there are no hydraulic hoses, for the HPXdrive is a closed unit, there is no risk of hose breakage and so the grain will not be polluted. It is protected inside the shell while handled. The C40HPX can even be used underwater and is especially popular in environmentally sensible areas and situations.

A high and constant closing force, torsion-resistant shells with an optimal



The C40HPX is Kinshofer's most innovative re-handling clamshell bucket - with a volume up to 6,000 litres. Ideal for excavators with an operating weight of up to 40 tonnes.



loading due to the high volume, and precise positioning provided by the integrated rotation with sturdy slewing ring and sealed swivel and bevel are more features of the C40HPX.

The HPXdrive and its integrated

rotation form a very compact unit with absolutely no protruding components. There are no greasing points, as the interior parts of the HPXdrive run in a permanent oil bath. Low maintenance means less downtime.











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A look at the Nemag Clamshell grab[™]

Taking into consideration the very unusual global economic circumstances, "NEMAG still has a well filled orderbook," says Riny Stoutjesdijk, sales manager at Nemag, "and so far the company is operating satisfactorily."

"An important reason for this is the introduction of new grab types and models during last year, such as NemaX (guaranteed 10% improvement of productivity) and lately, our next generation Nemag Clamshell grab™." adds Stoutjesdijk.

The Nemag Clamshell grab^M is the result of input from Nemag's customers combined with its team's experience and drive for continuous improvement, all supported by state-of-the-art design and simulation tools.

Nemag wanted to create a highly productive clamshell grab that would keep investment and operational costs as low as possible.

THE BENEFITS TO CUSTOMERS ARE:

- optimal productivity;
- reduced, simplified maintenance;
- standardized design using first-class materials and high-end standardized components;
- rapid delivery times; and
- * attractive and competitive price

Nemag's continuous improvement philosophy means the company has

The company has

Nemag clamshell equalizer from above.

As can be seen in the image, the holding rope equalizers are more accessible by means of an open design. This makes maintenance a lot easier.

examined its design and has implemented a number of improvements as follows:

- the grabs can be fully assembled and disassembled by means of simple hand tools; and
- no welding equipment required

CONTINUOUS OPERATIONS DURING GLOBAL COVID-19 PANDEMIC

Nemag's continuous innovation has opened up new product-market combinations and attracted new customers.

"In addition and as an example, various OEMS have discovered the advantages of using NemaX on their cranes/unloaders to increase the performance of their cranes, hence increasing their competitive edge, simply by using NemaX," explains Stoutjesdijk.

Nemag launched the new type of iron ore grab NemaX last year and successful deliveries have been made to big stevedoring companies such as Associated Terminals in the USA (63 tonnes SWL for handling iron ore), ERShip and Grupo Nogar in Spain (50 tonnes SWL repeat order for NemaX for handling copper concentrate), TATA Steel in the Netherlands, Sea Invest Group and many

According to Stoutjesdijk the first orders have been received for the coal version of NemaX from reputable



Completely open sheave box of a clamshell grab. The lower sheave box and girder feature a very open and rounded design that greatly decreases the risk of material blocking the pulleys and reduces spillage from the grab whilst travelling to and from the receiving hopper. The benefit: enhanced environmental efficiency.



companies such as Oldendorff Carriers, for a new floating terminal project in Asia.

He adds that "Current grab projects increasingly involve the application of our grabs on mobile harbour cranes and Nemag is rather successful at the moment in this specific part of the market.

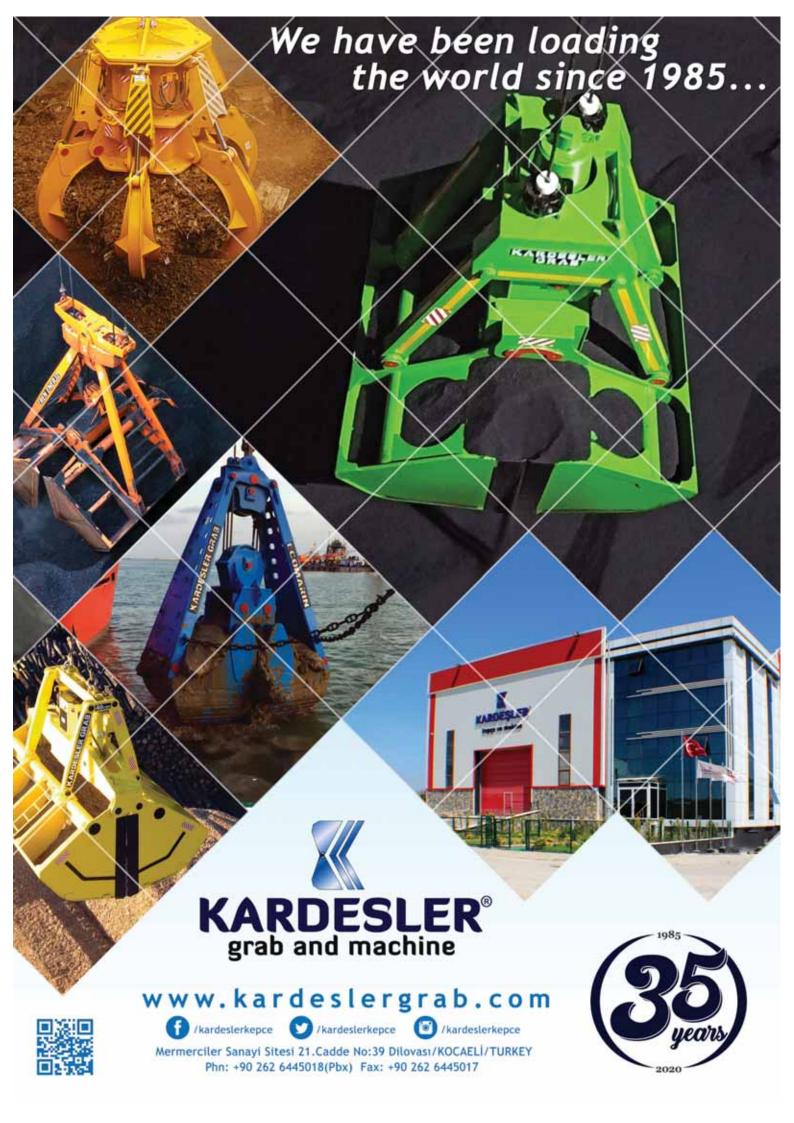
"Although we feel concerned about the impact of the crisis, Nemag feels confident that our flexibility, customer driven approach and drive for continuous improvement and innovation will make the difference.

"First and foremost however, we hope medication will be developed to fight the COVID-19 virus and the health situation will normalize."



Nemag Clamshell synchronizing system up close. The big advantage of the Nemag design concept – the synchronizing system – has remained unchanged. It is at the heart of the company's clamshell grab's superior performance, guaranteeing 100% symmetrical closure, reduced stress levels in the grab construction and improved digging performance by the grab.

DCi



Efficient ship-unloading in Japan

with Bühler's Portalink mechanical ship-unloader



Konan Futo operates one of the largest and most strategic port terminals in the southern part of Japan, and has been doing so for 50 years, writes Vincent van der Wijk, Product Manager at Bühler. When its unloaders were nearing the end of their life, the company set out to find the most efficient replacement available on the market — and Bühler proved to be the obvious choice.

"Konan Futo wanted to have a state-ofthe-art mechanical ship-unloader," says Senior Technology Manager at Bühler, Felix Hutter. "After an intensive evaluation phase, Konan Futo selected the Portalink ship-unloader as the solution which best fits their needs, and so Bühler has been appointed as the preferred partner for this CAPEX project."

The Portalink I100/27RK not only combines continuous, high-efficiency unloading with sustainable, low energy consumption, it also significantly cuts running costs. Bühler's Portalink has an unloading capacity of I,100tph (tonnes per hour), ideal for Konan Futo's main products of wheat, rapeseed, soybean and raw sugar. The low-speed conveying of the products means that wear-and-tear and therefore product damage can be reduced significantly. Since the ship-unloader is able to move along the jetty, ship hatches can be reached without any restrictions.

Konan Futo was looking for an unloader

that could efficiently handle a variety of grains and raw sugar, but the decision process was based on more than just selecting new machinery. It was essential to find a partner capable of offering exceptional project management and customer service throughout the whole execution process. "The in-depth assessment process in respect of potential suppliers prior to any sales decision is unique and in line with Japanese business culture," says Sales Manager for Bühler Yokohama, Masakatsu Ohkawa. "Bühler has been able to convince the customer of best-in-class product and services in every

It was crucial that the final installation



time for the Portalink was kept as short as possible.

Co-ordination of all the stakeholders involved was key during the entire execution process, and required dynamic engagement from all parties.

It goes without saying that such a significant CAPEX project has drawn a great deal of attention. Several customers of Konan Futo as well as other port operators have visited the installed and commissioned Portalink to get a glimpse of what the future could look like at their facilities.

"We selected Bühler's Portalink because of its efficiency, running cost are less than a

quarter compared against the two unloaders that were removed. Bühler proved highest flexibility and the close co-operation throughout the entire project led to success", says Yutaka Fukuda, President of Konan Futo Grain Terminal.

ABOUT BÜHLER

Every day, billions of people come into contact with Bühler technologies to cover their basic needs for food and mobility. Two billion people eat food produced on Bühler systems every day. One billion people travel in vehicles whose parts were produced on Bühler machines. Countless people wear glasses, use smartphones and

read newspapers and magazines produced using Bühler's process technologies and solutions. This global relevance spurs the company on to transform the global challenges of the age into a sustainable business. Bühler wants everyone to have access to healthy food. It contributes to climate protection through energy-efficient cars, buildings and machinery. The company's motto is 'Innovate for a better world.'

Bühler invests up to 5% of its sales revenues in research and development. The Swiss family business is active in 140 countries worldwide and has a global network of 30 production sites.



Steel & iron ore

market steels itself for uncertain future



Whoever could think that coronavirus (Covid-19) — leading to severe acute respiratory syndrome (SARS-CoV) which first appeared in Wuhan, the capital city of China's Hubei province in December would, in three months, spread its fangs across the globe killing close to over 210,000 people? asks Kunal Bose. As the attention of administrations in every major country is focused on containing the spread of virus, industrial and business operation of steel to every other metal and raw materials that go into their making has been thrown out of gear. No one is sure how quickly the world will be able to get rid of the virus and as long as the scare remains steel trade in and outside China will be marked by uncertainty and price volatility. Look at the discount at which shares of leading steel companies are

trading, confirming investor loss of

The focus of any discussion on steel will necessarily be on China which raised production by 8.3% in 2019 to 996.3mt (million tonnes), giving it a share of 53.3% of the world production of 1.870bn tonnes. The domestic demand remaining strong on Beijing back supporting infrastructure and house building activities at elevated levels as part of economic stimulus, incentive for exports was limited. China's steel exports last year were down 7.3% to 64.3mt, the lowest since 2013 and a fourth consecutive drop from a high of 2015 when it was 112m tonnes.

That was the time when all the importing countries and groups of nations from the US to the European Union started crying foul complaining about

Beijing subsidizing export sales in contravention of World Trade Organization (WTO) rules.

The world in any case is reconciled to China's overwhelming dominance of the world steel industry and also its ability to leverage its production and exports to affect the working of industry in other regions. Therefore, when this happened in the recent past, the US, the EU and India got in motion trade action measures in the form of erecting high tariff barriers to ensure that they are not overwhelmed by China-made steel flooding their markets leading to low capacity use, job losses and falls in steel prices in importing markets.

Remember a major plank of Donald Trump's campaign for the office of US President in 2016 was to do whatever was required to save the steel industry facing



imports onslaught, particularly from China. Trump as President put 25% tariff on steel imports in late March 2018 alongside 10% duty on aluminium imports.

In the race to the President's office in November 2020, Trump will, however, find it difficult to justify his last year's claim that "they [steel mills] were doing very poorly when I took office, and now they're doing very well... Our steel industry was dying, and now it's very vibrant." Then again at a 'Made in America' event at the White House, the effervescent President made the claim that "if I haven't been elected, you would have no steel industry right now. It would be gone." He would claim the industry is thriving once again because of "my putting a little thing called a '25% tariff' on all of the dumped steel all over the country. And now your business is thriving."

Will Trump now be able to say that all his claims relating to be benefits to the steel industry because of his tariff action have been redeemed? The answer is both yes and no. According to American Iron & Steel Institute, while the period of Trump presidency is marked by several announcements of building, expansion and reopening of mills, not many new jobs have been created in the process, thanks to reliance on greater degrees of automation and introduction of new technologies. In fact, employment in the US steel industry at this point is lower than it was four years ago. What also is a fact that manufacturing

industries from automobiles to farm equipment to engineering products, which benefited from cheap imports are not happy about steel related restricted trade practices. High tariff also means denial to steel using industries the benefit of access to cheaper metal resulting from low duty barrier and therefore, greater competition in the market.

Nonetheless some credit could be claimed by Trump for arresting the decline of the US steel industry and put it on revival track, which operating at a healthy capacity rate of 82% raised production on a year over year basis by 1.1% to 14.48mt through 22 February. Steel being a globally traded commodity subject to influences such as world growth rate, down and clouded by fears over coronavirus and how steelmaking ingredients iron ore, scrap and metallurgical coal in particular behave, its prices will never remain constant over a period of time. US steel prices like elsewhere have flattened out of late after a stretch of upward mobility in November.

No other steel group in the world has as much geographic diversification in production and sales of steel products as ArcelorMittal. About 49% of its crude steel production of close to 90mt in 2019 was in Europe and another 37% was in the Americas. Being present in so many regions in four continents with different steel use characteristics, its analysis of global demand in near and medium terms commands global attention. For a decade

and a half, demand dynamics in China has had an important bearing on global steel business. Chinese steel demand which grew by an estimated 3.2% in 2019 will this year move within a range of nil to 1% as the country's economic activities have been impacted by Covid-19, says ArcelorMittal.

But ArcelorMittal's caveat here is: "This may be revised downward due to the impact of the Coronavirus on Chinese demand and the knock-on impact elsewhere. However, demand is eventually expected to decline as infrastructure spending has been front-loaded and real estate demand structurally weakens due to lower levels of rural-urban migration. If this does not coincide with renewed capacity closures, this is expected to have a negative impact on steel prices and spreads." In the meantime, China took the world by surprise by raising January year on year crude steel production by a hefty 7.2% to 84.3mt.

This is because the Chinese Lunar New Year falls in January. That month this year was exceptional with Covid-19 rapidly engulfing the country. Moreover because of holidays and the winter at its peak, manufacturing and construction activities go into low gear. Reports say steel demand in China during February when January production was to be sold fell to about one-third of the pre-coronavirus level. A senior Indian industry official puts the question: "What do you expect Chinese

steelmakers, starved of domestic inquiries to do when inventories of finished products rise sharply on the back of high production? They are under tremendous pressure to export as much as possible." No wonder Chinese steelmakers are offering price discounts, described by many as market disruptive, to become early sellers particularly in south-east Asian markets. Vietnam is among the principal Asian markets targeted by Chinese steel exporters.

China's export aggression in the face of flattening domestic demand and rising inventories with steelmakers has implications for India also facing growing coronavirus scare. Spread of the virus in India and slowing of the economy to its lowest in more than six years have led Credit rating agency ICRA, a Moody's outfit, to downgrade the country's estimated steel demand during 2020/21 financial year from 6.5% in November to 4.5%. This is to happen when India in its march to nearly double steelmaking capacity to 300mt by 2030 is commissioning a good volume of new capacity every year. Therefore, pressure is building up on Indian steelmakers to ship larger quantities of steel products. India's exports of finished steel advanced 40% in the ten months to January to 7.2m tonnes, according to the steel ministry.

Much before the world faced the new killer virus, steel minister Dharmendra Pradhan wanted India to become a sustainable net exporter of steel. Pradhan himself has taken the lead to open new export markets for Indian steel in Africa and some West Asian countries and with success. Disruptions in China by way of steel downstream sectors not able to work to capacity because of quarantine-related difficulties in mobilizing workers and port operations in many cases still not

normal have opened export opportunities for India-made steel. Marketing director of JSW Steel Jayant Acharya told Bloomberg: "There are opportunities in certain markets where China is not able to supply because ports are blocked and movement to the ports is also pretty impacted." Acharya thinks Indian steelmakers stand to gain from March onward in south-east Asia and West Asia as supply gap emerges owing Chinese dispatch problems. ArcelorMittal Nippon Steel India chief marketing officer Ranjan Dhar believes that there could be considerable reluctance to buy from coronavirus-hit China and that might generate incremental import demand from India.

What will be China's thrust on exports in future will depend much on production levels in future — reports are there the country forced by the health-related emergency has started exercising restraint beyond January (World Steel Association will release February production figures in March third week). Experts say steel will have a real bumpy ride if Covid-19 is not firmly controlled by this month end. India Ratings & Research (Ind-Ra) says in a report that "the China steel market would continue to witness a demand-supply imbalance, which could result in price fluctuations continuing over March-May 2020 in the range of \$30-40 per tonne."

The virus has since spread to over 90 countries, including South Korea (quite intensely), Japan, the US and India and the development, according to Ind-Ra, would keep steel prices depressed even in the second half of 2020. Moreover, the combination of virus and slow economic growth could lead to a global surplus of around 40mt. China Iron & Steel Association says there is thinning of steel orders for mills from domestic consumption sectors as inventories with

mills and at spot market continue to rise. In the market tumult pressuring prices down, steel margins already under pressure prior to breakout of Covid-19 will further shrink. The near to mediumterm outlook for steel shares, therefore, is negative.

The prevailing situation once again brings to light if China, which between mid 2016 and early 2018 shuttered more than 150mt of legal but inefficient blast furnace capacity and also an estimated 120mt of illegal polluting induction furnaces should go for another round of capacity downsizing. A lesson learnt from Lakshmi Mittal of the benefits of capacity consolidation, China set itself a target of ten groups owning at least half the capacity by 2015. Though this is yet to happen, some good consolidation progress has occurred since. Take Baowu Steel Group resulting from the merger of Bao Steel and Wuhan Steel in 2016 to which was added Masteel in September 2019. As a result, the Group's crude steel production in 2019 at 95.22mt was ahead of Arcelor Mittal's 89.8mt, says a Xinhua report.

India too is experiencing consolidation of steel capacity by way of takeover of bankrupt steel groups, some with large production facilities. The major acquirer in India last year was ArcelorMittal which teaming up with Nippon Steel acquired the assets of Essar Steel with nameplate capacity of 10mt. Among the others who picked up bankrupt capacity through open bidding are Tata Steel, ISW Steel and Vedanta. Expect Lakshmi Mittal who after making several attempts to build greenfield steel mills in Indian states of Orissa, Jharkhand and Karnataka has finally been able to get started in India to expand India business where steel demand will spurt after the present demand meltdown passes



Virus slashes Brazilian exports to China

Brazil's exports to China have fallen sharply because of coronavirus and prospects for the economy have been cut as a result, writes Patrick Knight.

With almost a third of Brazil's exports destined for China — a much higher proportion than that for key commodities such as iron ore, soya beans and crude oil, Brazil is being seriously affected by the slow down of the Chinese economy, following the outbreak of corona virus there. Since early February, the Brazilian currency, the Real, has lost 16% of its value, falling to its lowest level ever, while the prospects for growth this year have fallen from the hoped for 2.5%, to less than 1.5%.

The value of the shares of many leading exporting companies, notably Vale, Petrobras, the Suzano pulp and paper company, as well as several steel companies, have fallen sharply. The total losses on Brazil's stock exchange amounted to US \$12 billion in the first two months of the year. Brazil depends on the import of components for many of the motor vehicles assembled there, as well as electronic and electrical goods. Some factories in Brazil have been forced to halt production because of the interruption of supply.

The drastic measures taken to halt the spread of the virus by the Chinese government, which no other country seems able to repeat, caused many ports, as well as mills and factories in that country, to virtually close. Huge quantities of goods remained stuck, either aboard ships, or in storage, at least until early March, when the first efforts to get the economy moving again began to be taken

by the Chinese authorities.

fact so many containers, particularly refrigerated ones, vital for the export of Brazilian meats, notably beef, poultry and pork, remain unloaded in China, let alone flowing back to countries such as Brazil, is a serious obstacle to the return to normality in trade. In 2019, China was the destination for 220mt (million tonnes) of iron ore, 50mt of soya beans and meal and 5mt of crude oil. About two thirds of Brazil's exports of crude oil have been sold to China in each of the past two years, but since the outbreak of the corona virus, consumption of oil in China has fallen by about a third, or four million barrels a day.

In addition, 4.6mt of market pulp went to China in 2019, but it is noted that despite the recent losses of the value of the Suzano company, demand remains high. Most of the pulp going to China, is converted into tissue there, and this is greatly sought during the outbreak of the

A total of 2.4mt of food, the great majority of that meat, was also sold to China in 2019. Demand for pork was particularly strong, following the outbreak of swine fever in China, which has forced a major reduction in the size of the Chinese herd, by far the world's highest. This outbreak, and the consequent need for less feed, had caused the world price of soya to fall slightly. But this has been ameliorated by the fact the US soya crop has been below average. More grain than usual is needed in Brazil itself, where the output of pork has been ramped up to meet the increased demand from China.

More than a million tonnes of wood and the same amount of sugar was exported to China in 2019, as well as 600,000 tonnes of both animal feeds, mostly soya meal and vegetable oil. Oil giant Petrobras, two thirds of whose fast-growing exports of crude has been going to China in recent years, is looking round for other customers. Petrobras has also been hurt by the sharp fall in the price of crude, caused mainly by the slowdown in demand in China, something which has been so significant as to cause a measureable reduction in air pollution in China's cities. Petrobras depends on stability in three Asian countries hit by the outbreak of the virus, Japan and Singapore as well as China, because several very large production platforms are under construction there. Each platform has the capacity to produce 150,000 barrels of oil a day, and if they are not ready on time, Petrobras will suffer financially.

A relatively small number of individuals have been affected by the virus in Brazil, whose population, it must be remembered, is formed of descendants from several parts of the world, as well as 'mother' country Portugal. Sao Paulo, whose population exceeds 15 million, reputedly contains the second largest number of people of Japanese descent in the world, and there are many thousands of Chinese, and South Koreans as well. Millions of migrants travelled from Italy to Brazil in the last century, as well as many from countries in the Middle East, and Eastern Europe. Regular flights connect the country's major cities with most cities in Europe, so keeping the virus out is proving difficult. DCi



Special delivery for the Port of Vancouver USA

longest wind blades to date



he vessel Star Kilimanjaro delivers 27 wind turbine blades and other components for wind project in Canada; an additional five ships to follow including longest wind turbine blades ever imported to North America.

On 3 May, the Port of Vancouver USA received a shipment of nine wind turbines including the longest wind turbine blades it has handled to date. The delivery is a joint effort between the turbine manufacturer Goldwind and the wind project owner Potentia Renewables.

"During the COVID-19 pandemic the port continues to operate to keep the supply chain and commodities moving," said CEO Julianna Marler. "The port has proven our unique ability to handle these types of large projects," she added. "Customers know our heavy lift mobile cranes, acres of laydown space, highly-skilled workforce, and dedication to

renewable energy make the Port of Vancouver the perfect port for receiving wind energy components."

"During an extremely trying time globally we are grateful for our partners including ILWU Local 4, Local 40, Local 92, river and bar pilots who are still at work making it possible for us to handle this cargo," said Chief Commercial Officer Alex Strogen. "We also thank Jones Stevedoring, Totran Transportation Services and the ship Star Kilimanjaro operated by G2 Ocean. Their talented staff and crews, expertise and hard work are integral to the port's continued commercial success."

The blades for Goldwind's GW136/4.2 megawatt (MW) turbines, each 67 metres in length (220ft), were manufactured in and shipped from China. Goldwind Americas, the company's North American subsidiary headquartered in Chicago, IL, specializes in the sales, supply, operations and

maintenance of Goldwind's Permanent Magnet Direct Drive (PMDD) wind turbine generators. Globally Goldwind has 60 gigawatts, approximately 35,000 wind turbine units, operating in 24 countries on six continents.

"Goldwind Americas is pleased to be working with the Port of Vancouver USA with their expertise in the receiving and movement of large-scale wind turbine components, which now includes our 4S megawatt model blades," said David Sale, CEO of Goldwind Americas. "Goldwind's expanding portfolio of turbines continues to push the technology envelope and define what is possible in the wind industry. This allows our customers to maximize project economics with larger turbine nameplate designs and rotor diameters."

The wind turbine blades and components will travel to Assiniboia, Saskatchewan, Canada to Potentia's Golden



South Wind Energy Project located on 34,000 acres of leased-agricultural land. Potentia is a Toronto-based developer, owner and operator of solar and wind energy assets. The Golden South Wind Project will utilize Goldwind's latest PMDD turbines and will generate approximately 900,000 megawatt-hours of electricity and will significantly reduce CO₂ emissions compared to a coal-fired plant. The carbon reduction is equivalent to eliminating the pollution from half the vehicles in Regina or Saskatoon, Saskatchewan. The project broke ground in 2019 and is expected to open in 2021.

"We are very excited to see the project progress from the current preparatory construction efforts to the arrival of the wind turbine equipment at the site this summer," stated Jeff Jenner, Chief Executive Officer of Potentia Renewables Inc. "We thank everyone at the port and others involved in the transportation and handling of this equipment for their efforts during these unusual times."

Once unloaded from the ship, the wind turbine blades (27 in total) and components will be moved to laydown space at the port's Terminal 2 and Terminal 5. From there, they will be transported by Totran Transportation Services over the span of 21 weeks to Saskatchewan, Canada.

The port will eventually handle a total of 50 full turbines, a combination of the GW 136/4.2 and GW 155/4.2 MW models, moving through the port bound for the Golden South Wind Project. A complete turbine includes three blades, nacelle, generator, hub, five to six tower sections, and other sub-components. Additional ships carrying turbines will arrive later this summer including blades measuring 76.2 metres (250ft) — which will be the longest blades ever imported into any port in North America.

The Port of Vancouver USA has long been a leader in the port industry in supporting renewable energy projects and is one of the West Coast leaders in the movement of wind energy components to support new and existing wind energy projects.

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

ABOUT POTENTIA RENEWABLES INC.

Potentia Renewables Inc. is a rapidly growing and fully integrated developer, owner, and operator of solar and wind energy assets. Potentia's portfolio of assets includes almost 1,000MW of wind and solar assets in operations, under construction and under long-term government offtake contracts in Canada, the United States and the Dominican Republic. It is 100% owned by Power Energy Corp., a wholly owned subsidiary of Power Corporation of Canada, traded on the TSX under the ticker POW.

ABOUT GOLDWIND AMERICAS

Goldwind Americas, a wholly-owned subsidiary of Xinjiang Goldwind Science & Technology Co., Ltd (SZSE: 002202) (HK: 2208), is a world-respected wind turbine technology and energy solutions provider. Goldwind's revolutionary Permanent Magnet Direct Drive (PMDD) technology is shaping a new standard in wind energy. Goldwind offers a full suite of innovative renewable energy solutions, including equipment sales, service, and capital. Goldwind Americas is a tradename of Goldwind USA, Inc.



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