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- Turnkey Solutions
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featuring...

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Grain and soya trade growth limitations

Influences restraining commodity imports into many countries have become more prominent recently. As a consequence, over the remainder of this year and into 2020 global seaborne dry bulk trade may see only limited growth.

The outlook for the world economy and industrial activities affecting trade has deteriorated. Yet estimates of gross domestic product growth in the first quarter of 2019 for the G20 group of countries showed a slight pickup compared with the previous quarter. Whether this improvement was maintained in the quarter just ended is not clear, however. Forecasters are mostly cautious, given potentially unfavourable factors which have emerged.

Grain & soya

As the new July/June 2019/20 crop year begins, prospects for grain trade suggest a fairly flat outcome. The latest International Grains Council forecast, summarized in table 1, shows world trade in wheat plus corn and other coarse grains edging upwards by 2mt (million tonnes), to 370.2mt. Similarly, in the year which has just ended, the total was almost flat at an estimated 368.4mt.

Among grain importers, the biggest change expected in the crop year ahead is a sharp downturn in European Union purchases amid an improved domestic grain harvest this summer. EU grain production may be 7% higher at 370mt, reflected in imports falling by 7mt or 22% to 24.3mt. Turkey also could see an imports reduction. These negative elements are predicted to be offset by increases in numerous other countries including Iran, China and Morocco.

Iron ore

Reduced global seaborne iron ore trade in 2019 is becoming a more plausible idea. Steel production in many of the main raw materials importing countries is providing only limited support for iron ore consumption and imports. Even In China, where steel output has been evolving strongly, purchases of ore from foreign suppliers have been weaker in recent months.

During the first five months of this year, China's iron ore imports (which comprise over two-thirds of the world's total) fell by 24mt or 5% to 424mt, compared with last year's same period. Despite a 10% expansion of steel production in that period, iron ore supply problems were encountered, and these were reflected in falling stocks at Chinese ports. The annual ore imports total now seems likely to be lower also.

Coal

While the global coal trade outlook often seems predominantly downbeat, figures published last month emphasized positive market features still evolving. The BP annual statistical review revealed that world coal consumption in 2018 grew by 1.4%, double the ten-year average growth rate. Expansion was led by India and China. Global coal production rose by 4.3% last year.

These indicators of underlying support for coal usage may not automatically improve prospects for additional import demand in the short term. However, in some countries rising coal consumption, especially in the power generation sector, is directly resulting in expanding imports. India is a prominent example, although by contrast in China extra output from domestic mines is satisfying requirements.

Minor bulks

International seaborne movements of fertilizers comprise mainly phosphate rock, potash, sulphur and urea together with processed phosphates. After reaching almost 170mt last year according to estimates, this large global trade volume could continue on an upwards trend in 2019.

Bulk carrier fleet

The Handysize fleet of vessels in the 10–39,999 deadweight tonnes category forms about 12% of the entire world bulk carrier fleet, carrying a broad range of cargoes on a wide variety of routes. As shown in table 2, capacity in this fleet segment increased by 2.5% last year and seems likely to see growth of around 2% in 2019. Newbuilding deliveries may be lower in the current period, but scrapping seems likely to remain quite limited.

TABLE 1: GLOBAL WHEAT & COARSE GRAINS IMPORTS (MILLION TONNES)

	2014/15	2015/16	2016/17	2017/18	2018/19*	2019/20*
Asia (excluding Japan)	89.0	95.0	99.7	99.1	92.3	95.6
Japan	21.9	22.1	23.1	23.6	23.8	23.7
Middle East	56.7	55.8	54.0	61.3	61.0	60.1
Africa	67.1	76.3	75.4	76.6	74.1	79.2
Others	87.4	96.5	100.6	108.2	117.2	111.6
world total	**322.1**	**345.7**	**352.8**	**368.8**	**368.4**	**370.2**

*source: International Grains Council, 27 June 2019 *forecast July/June crop years*

TABLE 2: HANDYSIZE 10-39,999 DWT BULK CARRIER FLEET (MILLION DEADWEIGHT TONNES)

	2014	2015	2016	2017	2018	2019*
Newbuilding deliveries	5.4	6.5	4.6	3.4	2.9	2.5
Scrapping (sales)	4.2	5.2	3.2	1.7	0.6	0.5
Losses	0.0	0.0	0.0	0.0	0.0	0.0
Plus/minus adjustments	0.0	0.0	0.0	0.0	0.2	0.0
World fleet at end of year	**91.7**	**93.0**	**94.4**	**96.1**	**98.6**	**100.6**
% change from previous year-end	+1.3	+1.3	+1.4	+1.9	+2.5	+2.0

*source: Clarksons (historical data) & Bulk Shipping Analysis 2019 forecast *forecast*

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Indian government considers giving fertilizer subsidies directly to farmers

The Indian government is attempting to dissuade farmers from the overuse of chemical fertilizers, so is relying on cash incentives to achieve this aim. Under current plans, the government will transfer money directly to the farmers' bank accounts, which can only be used to buy soil nutrients.

This direct transfer of cash is a significant change in policy as, to date, monies have been transferred only to manufacturing and retailing companies. Direct payments to farmers (direct benefit transfer [DBT] scheme) are seen as a better way to ensure delivery of subsidies to the end-user.

In October 2017, the first phase of fertilizer DBT was rolled out, under which subsidy is being transferred to companies after checking retail sales data captured through the Point of Sale (PoS) machines.

The Modi government had introduced DBT for fertilizer subsidy payments to producers on a pilot basis in 2016, and it was rolled out nationwide in 2018. Under the current system, 100% subsidy on various grades is released to the fertilizer companies, on the basis of actual sales made by the retailers to the beneficiaries.

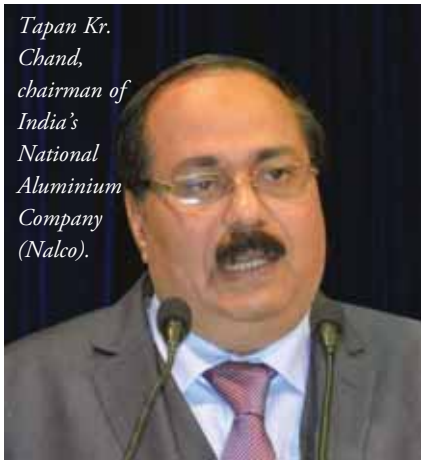
The government paid a fertiliser subsidy of Rupees 74,000 crore during 2018-19 fiscal. About Rupees 78,000 crore has been budgeted for paying fertilizer subsidy in the current 2019-20 fiscal.

Aluminium's disappointing performance partly due to big Chinese exports in early 2019

India's three major aluminium groups have performed well in the last year

In the aluminium industry value chain covering bauxite in the downstream base to smelter feedstock alumina in the middle and then to metal in the upstream, each has its own pricing dynamics influenced by conditions in local producing centres and global demand and supply considerations, *writes Kunal Bose*. At the same time, extraordinary developments such as the current trade tensions between the world's two most powerful economies, which inevitably collaterally affect the rest of the nations, mines and natural disasters and China in an environment-cleansing drive has put nearly 5mt (million tonnes) of smelting capacity offline in last three years. This will have an impact in varying degrees on three segments of the aluminium value chain. In contrast, primary aluminium — when it gets value added into products — becomes largely immune to price fluctuations on London Metal Exchange (LME).

The world aluminium industry was in a comfort zone in April–June, the first quarter of 2018/19 when the average silvery white metal price was $2,259 a tonne. At that price level, smelters irrespective of their sources of energy — hydel, natural gas and thermal — were in the black, of course in varying degrees. Tapan Kr. Chand, chairman of India's 52% government-owned National Aluminium Company (Nalco) says as all the smelters belonging to the three Indian groups — namely, Vedanta Aluminium, Hindalco and



Tapan Kr. Chand, chairman of India's National Aluminium Company (Nalco).

Nalco — use coal-based electricity, so they are at a cost disadvantage *vis-à-vis* their peers in Canada, Europe and the Middle

East which use electricity derived either from hydel resource or gas. Because of their dependency on thermal power, electricity alone has a share of around 40% of total production cost of Indian smelters. Even so, riding on good prices for most of 2018/19, the three Indian groups returned good performances.

Against Indian smelters' total dependence on thermal electricity, China, the world's largest producer of the metal which made a record production of 35.8mt in 2018, up 7.4% from the previous best in 2017 sources 90% energy from coal based power plants. Hydel happens to be the cheapest source of power for smelters. This is the reason why Rusal, which is now only 10% dependent on nuclear- and gas-based electricity, will be completely switching over to renewable hydro-electricity by 2020.

According to consultancy AZ China, China's production surge in 2018 was helped by commissioning of 3.8mt of smelting capacity while nearly 2.8mt of ageing capacity was shut due to environmental and price factors. Compare this with the global industry's weakest production performance since 2009 when output rose only 1.5% to 64.34mt in 2018 and that too happened mostly in the first half. Explaining why low aluminium prices are not proving to be a deterrent for smelters to likely lift output by at least 5% in 2019 is because falls in prices of alumina are allowing most of them to break even. Moreover, the newly commissioned smelters in China must generate enough cash flow to pay back their loans.

But in the final quarter (January–March) of the last financial year, the average metal price was down to $1,859 a tonne and that rang an alarm bell for thermal power-based smelters in China, India and elsewhere. The market was sent into turmoil in April 2018 when the US Administration slapped sanctions on Rusal, the world's largest producer outside China and its oligarch owner Oleg Deripaska.

Winding down of US sanctions that led LME to once again keep Rusal-produced metal in its warehouses and allow its members to "freely enter into contracts with Rusal and its affiliates" meant a surge in supplies from an important source. Extraordinary developments produce extraordinary results. If fears of a supply squeeze on announcement of sanctions sent LME aluminium to a seven-year high, then freeing Rusal of tough penalties involved in sanctions led to metal price weakness.

Yet another reason for the disappointing performance of aluminium this year is big Chinese exports in January and March. Take the US, for instance, where fears of introduction of countervailing duty and anti-dumping measures led importers to bring in and build stocks of common alloy sheet. Consultancy CRU reports: "2019 started off with a bang, with January imports of ex-China common alloy sheet posting a record of nearly 88,000 tonnes. February imports dipped slightly... A wave of late deliveries seemingly hit the US in March as such imports nearly reached 98,000 tonnes." The consequence will be destocking through 2019 as the market, once anticipating of supply shortage, is now grappling with oversupply.

Hindalco managing director Satish Pai.

But things are changing on China front. Fresh Beijing stimulus measures designed to prop up construction and house building work and perhaps also do good to the world's largest automakers now subject to demand contraction could make local aluminium use outstrip supply this year. Moreover, as Chand points out with aluminium prices on Shanghai Futures Exchange staying firm while LME remains becalmed, the export arbitrage earlier enjoyed by Chinese exporters has rapidly thinned. There was an occasion in May for Shanghai prices to lift with news of production shutdown at a big smelter fuelled worries about supplies from top producer China. Hindalco managing director Satish Pai says: "The gap between LME and SHFE prices has narrowed to around $20 a tonne from a high of $275 a tonne through 2019."

The country becoming increasingly restrictive about aluminium scrap imports for use by secondary producers before putting a ban in 2020 will consequently result in additional domestic demand for primary metal. The Chinese scrap import squeeze has sent shivers down the spine of Indian aluminium makers. Already smarting heavily under growing imports of metal, scrap and value added products, those exporting scrap to China will inevitably target India, which charges a low import duty of 2.5% on scrap. CRU in a report says the Chinese arbitrage development is working to the advantage of "domestic Indian producers in downstream industries as they report higher order enquiries from traditional importers."

June was a cruel month for LME aluminium when on a couple of days the cash price sank below $1,720 a tonne. But then in anticipation of US President Donald Trump and his Chinese counterpart XI Jinping would in their trade talks during G-20 summit meeting in Osaka would be able to avert for now an escalation in their multi-billion dollar trade war that has roiled global markets and give negotiations another chance, LME cash price looked up to climb marginally beyond $1,800 a tonne at one point and then settled lower. Chand says prices below $1,800 a tonne turns a good portion of global smelting capacity unviable and this is particularly so for smelters fed by thermal electricity.

Asked about his price expectation in the second half of 2019, Chand says: "I have a feeling that global economic concerns that we are aware of aside, aluminium prices should start doing better August onwards. My understanding is by year-end, price will move in a band of $1,800 and $1,900 a tonne." No doubt Chand, like many in the industry, is inspired by the US economy growing more than expected at 3.2% in the first quarter — the best Q1 growth in four years — and thereby putting to rest recession fears. GDP of the 19-member Eurozone has too performed better in Q1 with Germany's overall economic feat catching Chand's attention.

However, what must not be overlooked is the posting by *Financial Times* and *Bloomberg* that the global economy has moved into a "synchronized slowdown," which will be difficult to reverse in 2019. In confirmation Robin Bhar of Societe Generale says: "The global economy appears to be hitting a soft patch and that is going to hit demand for aluminium." This is leading funds to lighten their aluminium portfolio. Taking note of trade tensions, which for the time being though have eased following Trump-Xi Xingping meeting and other economic uncertainties in different parts of the world, the International Monetary Fund has scaled down global

growth estimate for 2019 at 3.3% from the previous year's 3.6%. Growth both in China and India, the two important centres of aluminium use, is undergoing moderation requiring of their central banks to liberalize monetary policy to boost consumption as well as investment.

In a recent conference call with investors, Pai said "global aluminium consumption growth continues to moderate in 2019 to around 2% from 3% in the previous year and as much as 6% in 2017." Attempts are made by Beijing through stimulus programme to ensure that domestic aluminium demand grows between 2% and 3%. Pai said consumption growth in the rest of the world was to slide from around 2% in 2018 to sub 1% in 2019. What is, however, encouraging for future prices is that the global market this year will remain in deficit in the range of 1.5mt to 1.7mt. China's share in that deficit would be anything up to 100,000 tonnes. Moreover, inventories, according to Pai, may soon hit the low of pre-financial crisis. Chand and Pai are in agreement that combination of all these positives should give a boost to LME prices in this year's second half.

In terms of demand growth, India tops the chart of major aluminium using countries. Describing 9.7% Indian consumption growth during the year ended March 2019 against 9.9% in 2017/18 as "robust," Pai said the sectors contributing to the rise mainly were transportation, construction, consumer durables and electrical. Notwithstanding the headwinds the economy are encountering in the current financial year by way shrinkage in consumer spending and private sector investment, aluminium use in the country should be recording a growth of around 8% in the current year.

The encouraging demand scene in India should not distract attention from the gnawing concern of imports, particularly

Vedanta Aluminium CEO Abhijit Pati.

scrap growing at a rapid pace, says Vedanta Aluminium CEO Abhijit Pati. Imports rising by as much as 20% to 2.3mt in 2018/19 from 2mt in the year before claimed a share of 58% of the India domestic market. Pati and his industry colleagues think what New Delhi has done to the steel industry — i.e. several tariff measures to discourage imports in the face of growing domestic investment for new capacity creation — should find replication in aluminium.

What aluminium makers basically want the government to do is to raise import duty on primary aluminium products to 10% from 7.5%. At the same time, the absurdly low 2.5% duty on scrap imports must also be changed to 10%, says Pati. He argues that in other non-ferrous metals, no such distinction is made. Indian industry wants customs duty on downstream products in the range of 10% to 12.5%, which will create ideal conditions for rapid growth of the value-added sector.

The infinitely recyclable metal finding application in growing quantities in traditional and new areas with more and more alloys being developed locally will, according to Chand, see its annual demand in India growing from the current level of 3.6mt to 9–10mt by 2030. Such expected rapid growth in demand to be unleashed by an ambition to achieve a very high degree of self-reliance — this is what prime minister Narendra Modi's 'Make in India' programme means — and also at the same time become a factory to the world, albeit in a smaller degree than China, will require of New Delhi to formulate an aluminium policy as it has done for steel in 2017. At the same time, all the three local groups will be required to grow capacity using both brownfield and greenfield routes.

It will be recalled that alumina prices remained unusually strong last year on two negative developments — Rusal coming under the US Administration's comprehensive sanctions glare and second, directed by the Brazilian government Hydro-owned Alunorte refinery, which in 2017 produced nearly 6.4mt of alumina amounting to 10% of global production outside China was taken completely offline. No wonder at one stage last year alumina price rocketed to almost $700 a tonne. But Alunorte production now being ramped up rapidly and also with additional refinery ramp-ups elsewhere, the price of smelter feedstock will remain under pressure in near term. Alumina is now trading in a range of $333 and $340 a tonne.

Steady decline of Brazil's primary aluminium continues

With the Brazilian economy stalled, and with unemployment high and rising, there is little prospect of Brazil's beleaguered primary aluminium industry, in sharp decline for the past six years, starting to recover any time soon, *writes Patrick Knight.*

A total of 130,000 tonnes less primary aluminium was made in 2018 compared with the previous year, which itself registered a total of 644,000 tonnes less than in 2013. Only 280,000 tonnes of primary aluminium was exported last year compared with the previous year, 240,000 tonnes less than was exported in 2013. These exports were all long-term contracts, so are virtually compulsory.

To meet demand, even if it is slowing, 174,000 tonnes of primary more had to be imported last year than in 2018, 371,000 tonnes more than in 2013. Imports of primary aluminium now cost Brazil more than the $2.5 billion exports of bauxite and alumina earn each year. If it were not for the fact that companies are able to sell surplus electricity, at a time when electricity prices are high, the industry would be making large losses. No new primary smelters have been built in Brazil for 25 years now, and with numerous smelters closed down, output has fallen from 1.5mt (million tonnes) at its peak 15 years ago, to little more than a third of that now. With Brazilian aluminium now more costly to make than what is available on the world market, mothballed mills are thought to have deteriorated to the point that it will not be possible to re-start them. At its peak, each Brazilian consumed about 7.5kg of aluminium a year, already low by

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PRIMARY ALUMINIUM, TONNES

Year	Production	Exports	Imports
2018	660,000	280,000	706,000
2017	790,000	398,000	532,000
2016	802,000	495,000	531,000
2015	772,000	452,000	615,000
2014	962,000	456,000	637,000
2013	1,304,000	520,000	335,000

Source: Abal, Brazilian Aluminium Association.

PRODUCTION, EXPORTS AND DOMESTIC CONSUMPTION OF BAUXITE, '000 TONNES

Year	Production	Exports	Imports
2017	38,123	8,970	28,757
2016	39,244	10,450	28,015
2015	37,057	9,335	24,786

Source: Abal.

PRODUCTION AND EXPORTS OF ALUMINA, '000 TONNES

Year	Production	Exports
2017	11,047	8,762
2016	10,907	8,779
2015	10,452	8,468

Source: Abal.

international standards, but the *per capita* consumption has now fallen to less than 6kg a year. Twenty-five per cent of the aluminium used to be used by the motor industry, which a decade ago was attracting investment from motor companies all around the world, anxious to be a part of an industry in a country where the *per capita* of cars was well below average, but where there was seen to be great potential. Now, only 17% of the aluminium is used by the motor industry, which is only utilizing half its car-making capacity. Thirty-seven per cent of it is used by the packaging industry, itself slightly smaller than a few years ago, because the long recession means that fewer drinks are being consumed.

Brazil, like most countries is making plans to switch to electric cars, and it is still unclear whether this move will mean the same, or less, aluminium will be used to make them. At the moment, most of the aluminium used by the car manufacturers, goes in engines and gear boxes, and this is likely to decline as electric cars advance. But the need to make cars ever lighter, means more aluminium may be used for bodywork.

The past three years have seen Brazil's once very buoyant civil construction industry, which once took about 15% of aluminium in extruded form for windows and doors, slow sharply, and thousands of unsold properties still weigh on the market. Construction's share has now fallen to 12%, while the consumer durables industry, badly affected by the high unemployment, now takes only 9% of a smaller cake.

Brazil is the world's fourth-largest producer of bauxite, of which almost 40mt is now mined each year, the great majority in very large mines located in the Amazon region, easy to extract and get to market, so very competitive. About 11mt of alumina a year is now made, about 9mt of that exported. Both industries are growing steadily, if not greatly.

Back in the 1970s, when the military regimes ruling Brazil published a series of long-term plans, with the National

Development Bank used to finance them, the aluminium industry was an obvious priority, given the abundance of good quality easily accessible bauxite. To allow new smelters to be built close to where the bauxite was mined, and where alumina could easily be made, Brazil's second-largest hydroelectric power station, the 4,000MW-capacity Tucurui plant, was built in Amazonia.

The huge Alunorte alumina plant, the largest in the world, was built, and the Albras aluminium smelter was put up close by. The state-owned Vale do Rio Doce company, CVRD, now Vale, mining company, was a major shareholder in both projects, and in many bauxite mines. In the south, Brazil's largest conglomerate, the Votorantim group, established the Brazilian Aluminium Company, the CBA. This company, which at its peak made 475,000 tonnes of primary aluminium, decided that it should be self-sufficient in electricity, the cost of which forms at least half the cost of making aluminium, so invested in a series of relatively small scale hydroelectric plants near its Sao Paulo mills.

CVRD took a lead share in developing the Mineraco Rio de Norte, Trombetas bauxite plant, with an annual output of about 18mt, a mine which is still Brazil's leading bauxite producer, and also had a share in the alumina and aluminium sectors. But CVRD, now Vale, has since been privatized and has exited the aluminium industry entirely, and now concentrates almost exclusive on iron ore. Most of its aluminium complex interests were sold to the Norsk Hydro Company, which itself now produces about 12mt of bauxite at its Paragominas mines.

Six years ago, Alcoa opened the Juruti bauxite mine, located conveniently close to the banks of the main Amazon river, and output there has risen fast to more than 6mt a year since then. Anticipating fast growth in the civil construction industry, the CBA invested massively in extrusion facilities, but now only about half of these are in use, and its output of primary aluminium has fallen from the peak of 475,000 tonnes, reached after a series of incremental increases, to 325,000 tonnes.

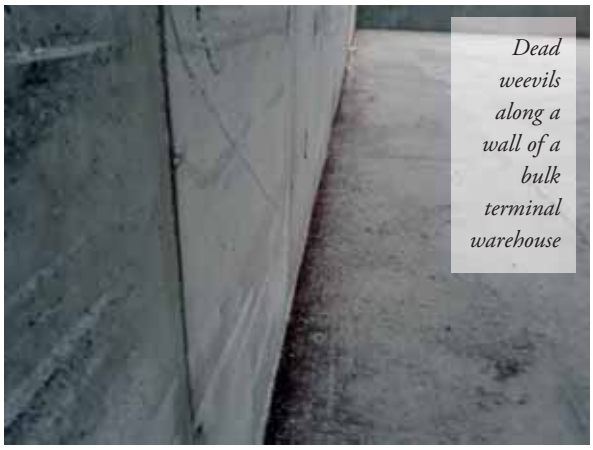
At its peak, the CBA exported a third of its output of primary, but exports have now entirely ceased. If the market was attractive, CBA could return to investing, as the sale by its parent company Votorantim of the Fibria pulp mills, means it has a large cash mountain. CBA, whose low quality bauxite is mined in elderly mines in Minas Gerais state, had been contemplating building a large new alumina plant in the Amazon region for the future. But this seems unlikely to go ahead in the present climate, and Votorantim now seems more likely to concentrate its investments in developing sources of alternative energy, which are abundant in Brazil, where solar power is widely available and where strong winds blow endlessly in the North East.

Two things have sealed the fate of the primary aluminium in Brazil. The surge in the amount of primary aluminium produced by China, where 30mt is now made, which has forced the world price down, and resulted in the failure of many companies, and also because Brazil has not kept pace with the fact that demand for electricity there shot ahead of supply. Electricity even had to be rationed early this century. In this situation, favourable treatment for aluminium, which benefited from subsided power in the early years, had to be phased out. The industry itself is largely kept in profitability, but only by the sale of surplus electricity. DCi

Fumigation not fully effective in controlling certain grain cargo pests

The fumigation of grain cargoes using certain pesticides, namely plant protection products, may not be effective in controlling insect larvae, resulting in cargo damage or loss.

Javier Quintero Saavedra, head of HSE at Terminales Marítimos de Galicia (TMGA), an operator of bulk terminals in Galicia, Spain, and Chairman, Dry Bulk Cargoes Working Group, ICHCA, said: "We are finding that the pupae and larvae inside maize kernels in various consignments, and which were subjected to in-transit fumigation, are not affected by phosphine or phosphine generating fumigants and growing into weevils while cargoes are in storage."



Dead weevils along a wall of a bulk terminal warehouse

Weevils remaining in the port warehouse after the lot has been transported to its ongoing destination is a real issue for terminal operators, particularly if they have only been accustomed to handling grain, meal or feedstocks that are not prone to such infestations.

Saavedra, who will present a case study relating to the pest control challenges facing terminal operators at the Association of Bulk Terminal Operator's (ABTO) annual conference this October, explained that while consignees had arranged for cargo fumigation both in transit and during storage upon discharge, "insects plagued our silos," resulting in the extensive cleaning; space treatment with contact insecticide (silos in empty condition) and restoration of silo walls to prevent further infestation.

"Bulk terminals need to implement a fully integrated pest management plan. Operators must monitor silo temperatures and moisture and be able to spot insect and larvae infestations in large storage premises. They should also carry out regular cleaning of empty stores and better understand the use of different pesticides and their effects."

ABTO CE Simon Gutteridge said: "While grain cargoes are usually fumigated at origin or in-transit if larvae survive and evolve it can be a real issue for terminal operators. It can write-off the whole consignment. There is obviously a strong case for fumigating cargoes stored in silos at discharge ports, especially where maize kernels are stored, but this is not without its own problems."

The fumigant typically used is phosphine or a phosphine generating product, which is a well-documented health and safety risk in the seaborne transportation of grain. Exposure to this gas has resulted in acute intoxication, hypoxia, asphyxiation and seafarer fatalities; and the risk in shore storage premises is that the fumigant leaks to adjacent ones.

Methyl bromide, another pesticide widely used in the containerized transportation of grain, has also been attributed to intoxication-induced fatalities. It is however banned in a number of countries as it is a well-known ozone depleting substance.

"There are IMO guidelines for the use of pesticides in-transit, but the rules governing their use in storage facilities ashore is at national level. Although the European Commission oversees the approval of active substances, it is the individual state that decides whether to allow their use or not," said Saavedra. "What the bulk terminals industry needs is more globally-focussed best practice guidelines, an initiative supported both by ICHCA and ABTO."

Richard Brough O.B.E., Head of ICHCA International, said: "We are delighted that the Chairman of our Working Group on Dry Bulk Cargoes (an important grouping from its International Technical Panel -ITP) is able to make this presentation. ICHCA is now an integral part of the annual ABTO Conference and pleased to be fully involved in this event."

Javier Quintero Saavedra will present his case study on the pros and cons of port-side fumigation at BULK TERMINALS 2019, which takes place in October, in Amsterdam, the Netherlands.

'K' Line takes delivery of 22nd 'Corona' series coal carrier

Kawasaki Kisen Kaisha, Ltd., Tokyo, ('K' Line) has announced the delivery of *Corona Zenith* an 88,000dwt-type special coal carrier at Marugame Shipyard of Imabari Shipbuilding Co., Ltd., Japan on 25 July 2019.

Corona Zenith is same type as 'K' Line's specialized fleet for transport of thermal coal known as the '*Corona-series*'. The *Corona-series* consists of epoch-making coal carriers equipped with wide beam and shallow draught, the most suitable type to enter ports of domestic thermal power stations to discharge cargo.

Corona Zenith is equipped with latest energy saving and ecological technology such as WAD (Weather Adapted Duct) which promotes her propeller efficiency and ballast water management system which protect the marine ecosystem.

With this new latest deployment, the *Corona-series* now consists of 22 carriers. 'K' Line takes pride that its *Corona-series* has been so favourably evaluated for always providing customers steady and reliable thermal coal transport service with maximum safety.

VESSEL SPECIFICATIONS

LOA 229.98 M	Deadweight tonnes 88,810 MT
Beam 38.00 M	Gross tonnes 49,737 T
Depth 19.90 M	Net tonnes 28,505 T
Full draught 13.904 M	Hold/Hatch 5/5

Thordon's emergency inflatable seal prevents sinking after catastrophic shaft failure

Activation of Thordon Bearings' revolutionary inflatable emergency seal prevented a 70ft (21m)-long workboat from certain sinking in February, following multiple shaft failures that damaged the vessel's primary shaft seal.

The crew of the 2002-built twin-screw workboat activated Thordon Bearing's TG100's secondary seal during operations in the lower Mississippi River, when the vessel suffered catastrophic tailshaft failure in shallow waters north of New Orleans, USA. The incident resulted in one of the tailshafts being pulled clear of the gearbox and almost completely out of the boat.

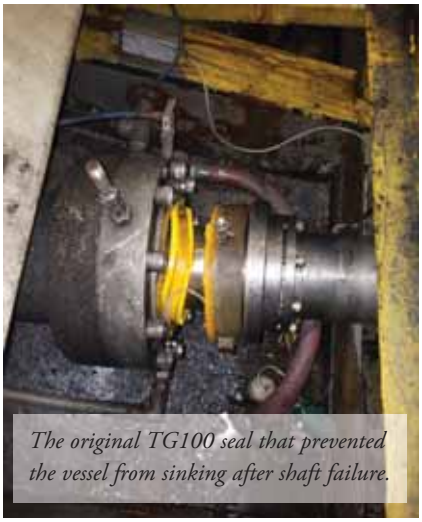
Jim Bright, Sales Manager, Thordon Bearings, said the situation was sudden and with no warning. "The starboard coupling bolts were sheared off, leaving the tailshaft with nowhere to go but out the back of the boat. Thankfully, the TG100 clamp ring prevented the shaft from being pulled any further back."

Unlike other shaft seal designs that are prone to slipping on the shaft, the TG100 wedge design increases its holding capability in situations like this.

With the starboard shaft's primary TG100 seal heavily damaged and the vessel taking on water, the crew managed to activate the TG100's emergency secondary seal, which inflated as designed to re-seal the shaft.

The vessel was the very first workboat to be fitted with a TG100 seal in 2011.

"The primary seals performed flawlessly from the first day they went into service and we can now claim the same for the secondary emergency seal," said Bright. "Despite the calamity going on, the emergency seal functioned as it should, preventing further water ingress and allowing the crew to safely manage the damage. The safe-return-to-port function almost certainly prevented this vessel from sinking."



The original TG100 seal that prevented the vessel from sinking after shaft failure.

The new TG100 seal installed.

Following the incident, the owner, a large provider of marine transportation services in the USA, with a fleet of more than 120 line-haul vessels, inland towing vessels, barges and tugs, needed to get the vessel back into service quickly. TG100 seals were once again specified.

"The incident was so violent we needed to replace the whole seal on the starboard side," said Bright. "The owner decided to also upgrade the portside shaft with the current TG100 seal."

The scope of supply also included the retrofitting of ThorPlas-Blue rudder and tiller bushings and Thordon RiverTough tailshaft bearings.

"The original cutlass bearings were found to be placing a tremendous amount of strain on shaft couplings due to very high wear rates, which could have been the root cause of the problem," said Bright.

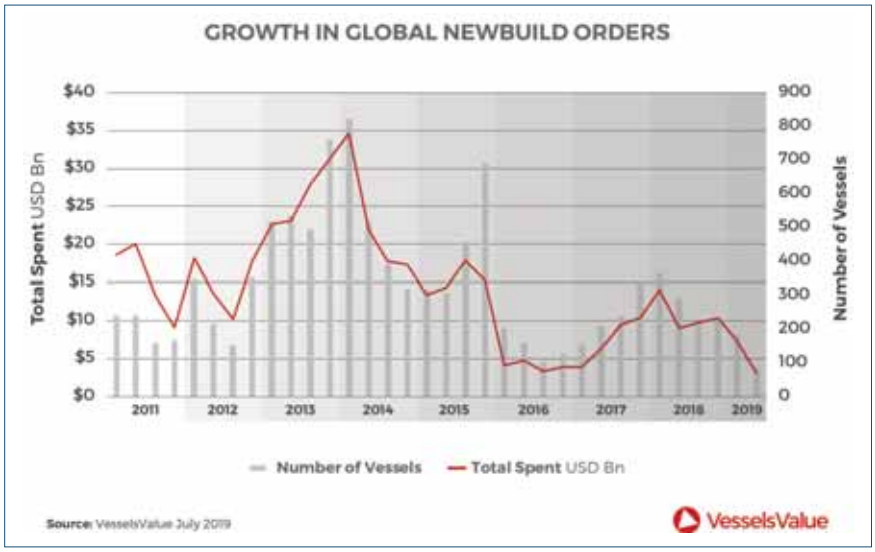
Commenting on the success of the TG100 seal in the US market, Scott Groves, Thordon Bearings' Regional Manager, Americas, said: "The TG100 has an excellent performance record with hundreds of units now in service. It really is an important component to vessel safety, protecting not only the lives of the crew but also the vessel. The revolutionary design allows you to return safely to the nearest port if your primary seal is ever damaged.

"A number of Inland Towing companies have been replacing competitor products with the Thordon solution over the course of the past 12 months to reduce operational and maintenance costs," said Groves. "The TG100 seal requires no replacement parts over its service life."

Record low newbuild orders placed in Q2 2019

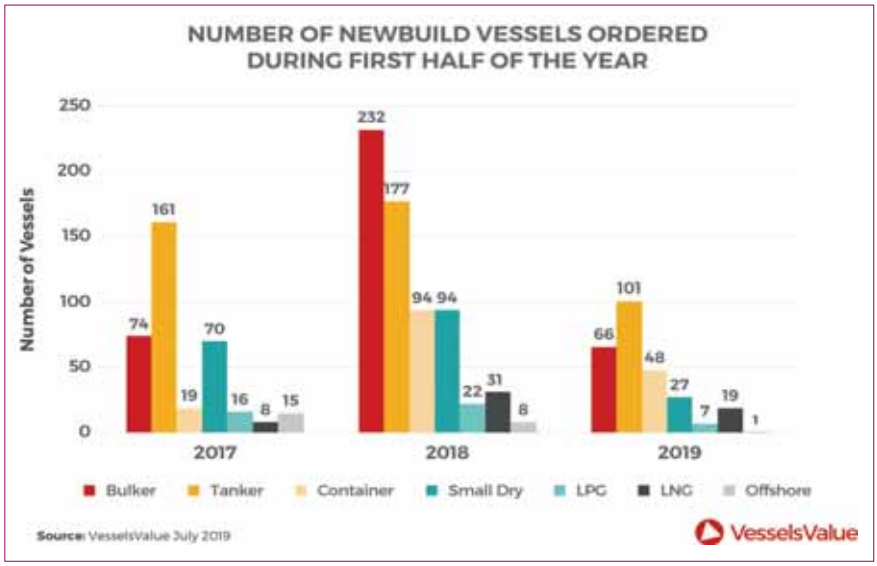
Newbuilding orders dropped to record lows in Q2 2019. VesselsValue's Head Cargo Analyst, Olivia Watkins, reviews which yards have received orders and which vessel types have been popular purchases.

Orders for container vessels fell a significant 49%, year on year, and LNG newbuilds by 39%. LPG newbuilds fell even further, by 73%, and only one offshore newbuild order was placed in the first six months of 2019.



Bulkers

The total number of bulker newbuild orders is down 73% for the first half of 2019 compared to the same period in 2018. So far this year, Panamaxes have been the most popular size to order with an interesting order placed by Klaveness Combination carriers for two Panamax CABUs (83,600dwt, 2020, Jiangsu New Yangzijiang) which will increase the global fleet to a total of 19 caustic soda/bulk carriers. 17 of these are owned by Klaveness.



Despite the low earnings seen earlier this year across the Capesize sector, 13 orders were placed by COSCO bulk for 208,000dwt vessels at COSCO Shipping HI for US$54 million each.

In comparison to the 45 orders this time last year for Capesizes, the 13 seems minimal.

Fednav takes delivery of a new vessel with a historic name

On 27 June at the Oshima Shipyard in Japan, Fednav Limited took delivery of the *Federal St Laurent*, its latest Great Lakes-suitable Handysize vessel. The ceremony was attended by officials from both Fednav and Oshima together with Denisha Lubiani of Alcoa, the godmother of the vessel.

The *Federal St Laurent* is a 34,500dwt international ice-class bulk carrier, flagged in the Marshall Islands. Built to trade in the St. Lawrence River and the Great Lakes, the vessel is certified by DNV GL. It emits 30% less greenhouse gases than similar vessels built 20 years ago and is equipped with an Optimarin ultraviolet ballast water treatment system. Named in honour of the river that flows along the company's headquarter city, Montreal, and to celebrate Fednav's 75th anniversary, the vessel is the fourth *Federal St Laurent* in Fednav's history. The name has always represented the company's special bond to the St. Lawrence River (St. Laurent in French) and its maritime community.

"For our 75th anniversary we wanted to recognize our hometown river, and to reflect its significance for our family, our employees, and our partners" said Paul Pathy, President and CEO of Fednav. "This vessel is anchored in the history of Fednav, but more importantly, it represents the strong links between the Great Lakes, the Seaway, the St. Lawrence River and the rest of the world."

About Fednav

Fednav Limited is Canada's largest international bulk shipping company. Its fleet is comprised of more than 100 bulk carriers trading worldwide, 64 of these are owned.

From offices on four continents, the company operates the largest fleet of Great Lakes-suitable oceangoing vessels, the largest fleet in the world of ice-class bulk carriers, and three ice-breaking cargo ships that service the Arctic twelve months a year.

Fednav partners with CargoMetrics Technologies

On 17 June, Fednav Limited announced that it has entered into a Development Services Agreement with CargoMetrics Technologies LLC, a maritime innovation company.

Under this agreement, the two companies will work in collaboration to build systems and tools to optimize Fednav's dry bulk fleet. Drawn from the CargoMetrics performance framework, data and signals used to inform chartering decisions will be generated, thereby providing a desired distribution of the Fednav fleet across sea routes.

Paul Pathy, President and CEO of Fednav Limited, remarked: "We are very excited to be partnering with CargoMetrics, who will be a major accelerator of our digital transformation and key contributor to our future success through data analytics and platform optimization."

Celebrating its 75th anniversary this year, Fednav Limited is privately owned and Canada's largest international bulk shipping company. Its fleet is comprised of more than 100 bulk carriers trading worldwide, 63 of these are owned.

From offices on four continents, the company operates the largest fleet of Great Lakes-suitable oceangoing vessels, the largest fleet in the world of ice-class bulk carriers, and three ice-breaking cargo ships that service the Arctic twelve months a year. Additionally, the company operates 11 maritime terminals in North America.

CargoMetrics Technologies LLC delivers transformative quantitative investing and maritime shipping solutions, anchored in its proprietary platform that tracks all seaborne cargoes and vessels. Its evidence-based, systematic, and uncertainty-aware approach fuses satellite, port, ship, and other data to produce both micro and macro views of global supply and demand. The company's team of scientists, engineers, and maritime specialists is based in Boston, MA, USA.

Cargotec's MacGregor wins clearance to acquire TTS Group assets

Cargotec's MacGregor has received clearance from the Chinese competition regulator for the acquisition of the marine and offshore businesses of TTS Group

MacGregor, part of Cargotec, has received a clearance decision from the Chinese competition regulator, SAMR, for the company's acquisition of the marine and offshore businesses of TTS Group ASA. Based on revised estimates, potential cost synergies are estimated to be around €25–30 million on annual level.

MacGregor now has all the regulatory approvals needed to be able to complete the transaction, which was announced on 8 February 2018. Closing of the transaction is expected to take place 31 July 2019. MacGregor previously announced approval from the German regulator on 6 November 2018, and approval from the South Korean authority on 27 December 2018.

The Chinese competition authority approval includes temporary requirements relating to the terms and conditions of certain new equipment business undertaken in China, and the need to hold certain new equipment businesses separately for a period of two years.

Based on revised estimates, potential cost synergies are estimated to be around €25–30 million on an annual level and are expected to be reached within 3 years from closing. In the stock exchange release on 8 February 2018, the potential cost synergies were estimated to be around €30–35 million on annual level and were expected to be reached within three years from closing. The revised cost synergy estimate is lower than the earlier estimate, as the closing was delayed from the original target and both parties have already executed some of the cost savings.

Cargotec reiterates its outlook published on 8 February 2019 and expects its comparable operating profit for 2019 to improve from 2018 (€242.1 million).

About Cargotec

Cargotec enables smarter cargo flow for a better everyday with its cargo handling solutions and services. Cargotec's business areas Kalmar, Hiab and MacGregor are pioneers in their fields. Through their unique position in ports, at sea and on roads, they optimize global cargo flows and create sustainable customer value.

Cargotec's sales in 2018 totalled approximately €3.3 billion and it employs around 12,000 people.

Indian Register of Shipping takes over chairmanship of IACS

Arun Sharma, Executive Chairman of the Indian Register of Shipping (IRClass), has been elected as the new Chairman of the International Association of Classification Societies (IACS) in a recent Council meeting held in Busan, Korea.

Sharma took over as chair on 1 July and has outlined his key priorities during his year long tenure which includes IACS to take a larger role in industry matters with a view to provide value added services to owners on the implementation of regulatory requirements.

He stressed the need to continuously strengthen the systems within IACS towards maintaining and enhancing quality operations. He is also keen to enhance interaction with stakeholders towards affirming its relevance to the industry.

Sharma highlighted that IACS recognizes the importance of good data in decision-making to guide its policy decisions and work has commenced on the formulation of IACS data driven policy. This would be "a very important step and will be one of the main priorities in the coming year," he said.

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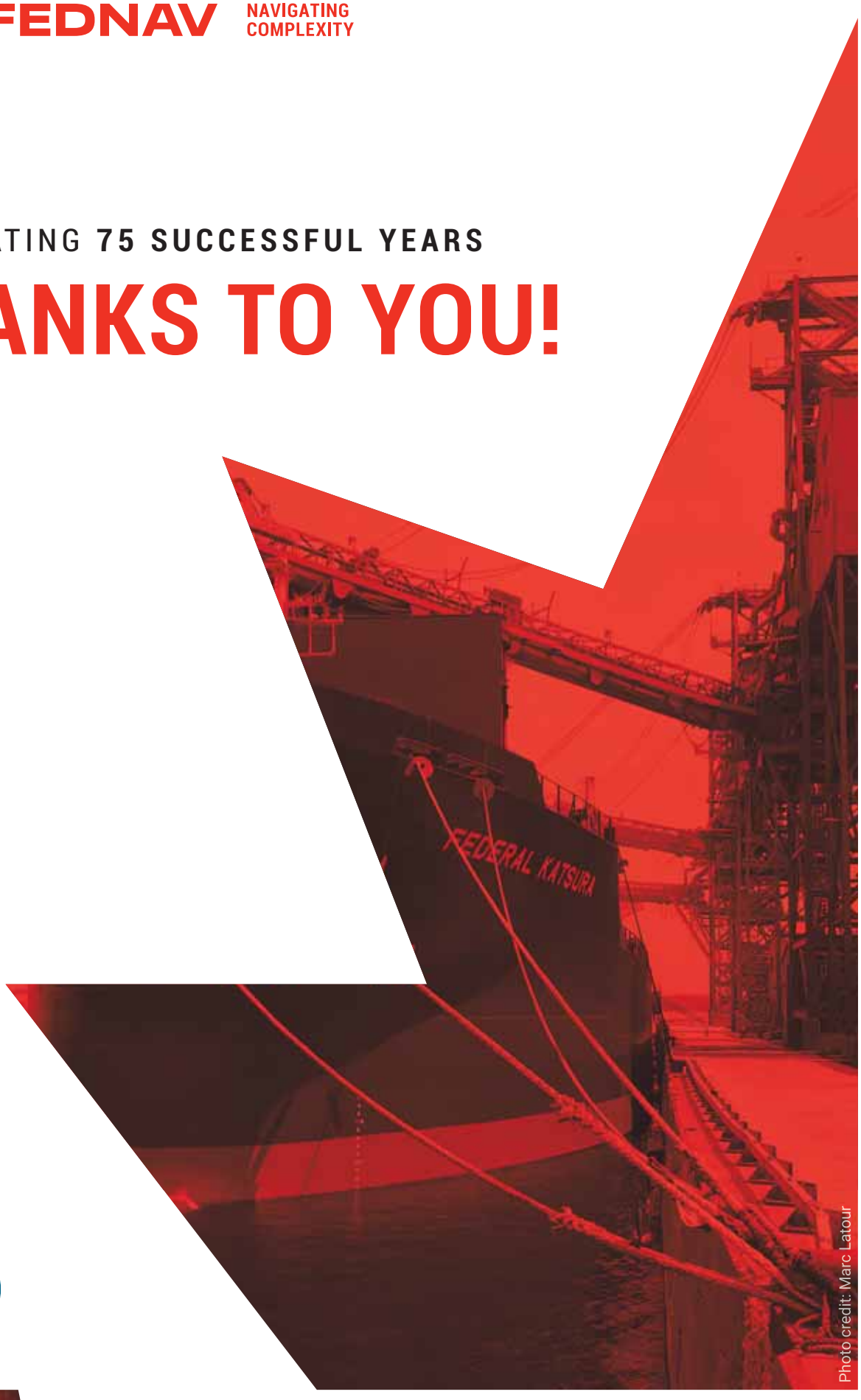

Photo credit: Marc Latour

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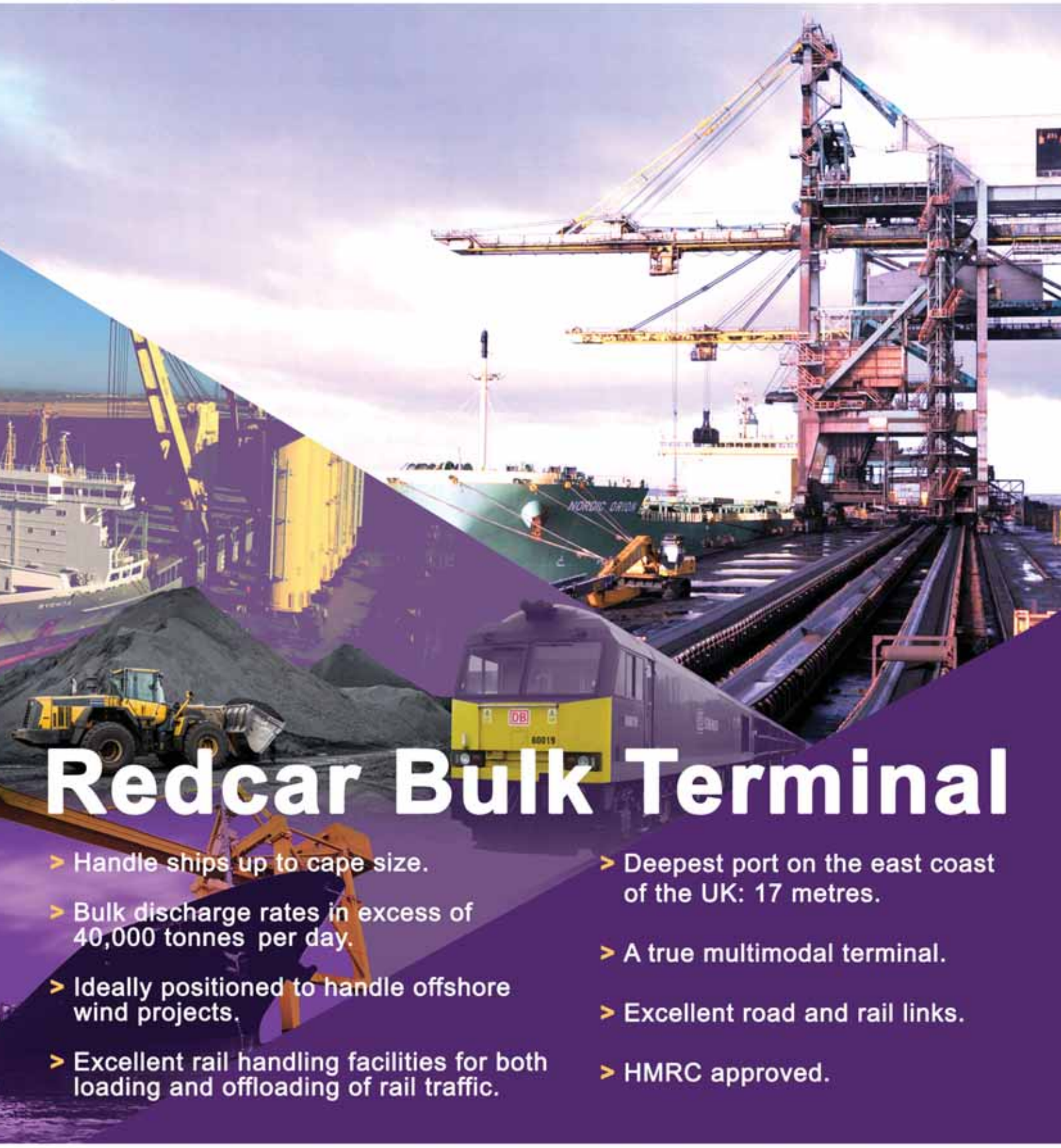

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Laying rail track.

Moving cargoes inland

rail and barge transportation is as important as ever

Renewed threats of truckers strikes a spur to speeding rail completions in Brazil

With demand for a steadily widening range of Brazilian commodities continuing to grow fast, as demand for its minerals, farm products, processed foods — such as meats and forest products — increases, the problem of getting the goods to ports is becoming ever more ever acute, *writes Patrick Knight.* Almost three quarters of Brazilian exports are now taken to ports in trucks. For the time being, the use of rail is confined to the movement of the 400mt (million tonnes) of iron ore Brazil exports each year, plus a small proportion of the 100mt of grains which are exported. A steadily increasing proportion of the fast - growing amount of soya and maize grown in the northerly state of Mato Grosso, is taken to the port of Itaqui by rail, along tracks operated by Vale, but most of the rest goes by truck, often very long distances.

Under pressure from strikes and rising costs, efforts are under way to speed up the completion of several railways on which work started more than a decade ago, as well as getting regular operations going along the whole of the key 'North–South' line, on which work began more than 30 years ago. A problem for the North–South line is that it does not itself reach any port, so the use of the tracks of other companies has to be negotiated for the final part of every journey, never an easy matter. Devising new formulas to get work completed far more rapidly on other new lines than has proved possible so far, when bureaucratic or financial obstacles have been insurmountable, is going on.

Fuel is a major component of the cost of operating trucks. A sharp rise in the price of diesel in 2018 provoked truck drivers to strike last year, when road transport was virtually paralysed for about three weeks. With exports of the huge range of commodities Brazil now exports delayed or halted, the government finally intervened, and the price of diesel was reduced, a very controversial decision.

This intervention provoked the resignation of the chief executive of the state owned oil company, Petrobras, Pedro Parente. He had been instrumental in restoring the troubled company — victim of large-scale corruption — to somewhere near health. Following this debacle, efforts were made to negotiate a new formula for freight rates which would be satisfactory to all parties. The responsibility for changing fuel prices, determined by changes to the world price of crude, reverted to Petrobras, and a new formula for calculating freight rates was also devised.

Brazilians elected a new president at the end of last year and the surprise choice was Jair Bolsonaro, a man with military background. Although Bolsonaro had served in congress for more than 20 years, he had no administrative experience, which might have tempered the strong right wing views he holds.

Bolsonaro is not afraid to express his opinion on almost all subjects and to a great degree models himself on the outspoken US president, Donald Trump, often taking snap decisions without consulting experts. He denies the importance of climate change, for example, wants to remove all constraints on the clearance of the Amazon rainforest, proposing that all the restrictions on clearance introduced in the past 20 years should be scrapped. He wants many of the health and safety regulations introduced in the past few years to be scrapped.

He is hostile to China, ignoring the fact that in recent years, this country has become Brazil's leading trading partner, overtaking the United States in the process. Chinese companies have also become leading investors in infrastructure

projects such as railways and ports in Brazil.

Truck drivers as a group had strongly supported Bolsonaro's efforts to be elected to the presidency, so when they threatened to strike again earlier this year, after Petrobras had introduced one of its routine price increases, Bolsonaro intervened in his usual impetuous way, ordering the rise to be scrapped. He had to change course very quickly, however, after the move caused the value of Petrobras shares, which had recovered steadily in recent years, fell dramatically. Following this, Bolsonaro reversed his policy, stating that Petrobras continued to have the right to change prices, after a strong protest by the company's new chief executive, Roberto Rio Branco, a man Bolsonaro himself had appointed.

The current somewhat precarious political situation in Brazil, where the economy is stagnating, and unemployment is at a record high, is encouraging those who wish for a series of rail projects — which because of excess bureacracy have become bogged down for many years — to be completed as soon as possible. Most of the dozens of new terminals and loading facilities built at ports in recent years have been financed and built entirely by private companies, independent of the state-run authorities which administer the port as a whole.

In contrast, virtually all of Brazil's railways, which were privatized about 30 years ago, use a concession system. An operator wins a concession which typically runs for 30 years, during which time he undertakes to makes investments aimed at improving the performance of the system he runs. But as these concessions draw towards a close, however, as many have been in the past few years, faced with the loss of the concession, companies often cut back on investments. They usually make it a condition of resuming work, that the concession they hold will be renewed automatically.

This is not always the ideal solution, as a new competitor might offer better terms. In addition to the 2,500km-long North–South line, only a small proportion of which is fully operational, even though work on building the system started 35 years ago, the concession to operate which has now been awared to a consortium in which Chinese investors have a majority share.

Two other systems starting at ports in the East of the country, have fared little better. The Transnordestina line is formed of two legs: one starts at the port of

Transnordestina line.

Pecem, in the northerly state of Ceara and runs south; the other runs west from a new port close to the city of Recife. The two legs meet at the town of Seabra before continuing west to eventually link with the North–South line. This line was planned to carry 40mt of grains to ports, as well as distributing large amounts of fertilizer, petroleum products, and general cargo, as return loads. The concession to build this system was awarded to the CSN steel company, which has persistently failed to meet its targets, and which is now threatened with losing the concession as a result.

A second line in the north East, the East–West Integration Railway, FIOL, which will run from the a new port near Ilheus in Bahia state, west through to the important grains producing region of Barreiras, has fared only a little better so far. However, resurrected plans to open a new iron ore mine at a point on its route, may bring it back to life.

Concerned that the planned 'Ferrograu' line — which will run about 1,500km from the leading soya and maize-producing areas of Mato Grosso state, to the riverside port of Mirituituba, and which has the backing of four of Brazil's largest grains traders and exporters (Amaggi, Bunge, Cargill and Dreyfus) — will be similarly delayed, a group of congressmen has proposed that a more flexible system to the consortium one should be adopted to get this route built. They propose that a loan of £2.5 billion should be guaranteed by the government for the companies willing to build this line.

The tracks will run parallel to the BR 163 road, which despite being started 40 years ago, is still not complete. About 20mt of the soya beans grown in Mato Grosso is now taken by truck to Mirituituba, from where it is taken by barge to the Amazon river ports of Santarem or Santana, which is near Belem, each year. This road is single track, and still not completely paved, usually becoming impassible for several days, even weeks, at a time during the long rainy season. Trucks get stuck in the mud, so cannot get through, which means major demurrage payments have to be made at ships waiting to load at deep water ports. Such ships sometimes have to be moved south to Santos or Parangau to load the grains they had contracted to load in the north.

The difficulties Vale is having to supply customers with iron ore from its mines in Minas Gerais, following the collapse of two dams there, with the loss of life and the restrictions imposed at ten other mines, will cut up to 100mt from Vale's exports this year. Spurred by this, a consortium led by the Chinese Commodities Construction Company, CCCC, plans to open a 20mt 'Pau de Ferro' iron ore mine, at Caitite, which is adjacent to the partly built FIOL line, in Bahia. This $2.5 million project includes works at the new mine, whose output will be destined for mills in China, as well as new mills in the Middle East. This will cost about $1 billion.

Another $1 billion will be needed for a new 'Porto Sul' port, which will have facilities for loading 20mt of ore, and is also planned to ship 7mt of grains, and 1.5mt of the cotton, grown in Bahia state, which is now exported to China, mainly from Santos each year.

Ten mines have been closed as a precautionary measure in Minas Gerais state, which is causing immense logistical problems. Most of Brazil's steel mills, in Minas, Rio de Janeiro, or Sao Paulo state, normally get their ore from mines in Minas Gerais, being delivered by rail. But they are having to obtain ore from the Carajas mine instead at the moment.

This means that facilities at the Tubarao port, which were originally designed exclusively to load ore for export, are having to be modified to handle imports instead. Instead of unloading ore, trains are having to load it, wherever rail is feasible, but trucks are often having to be resported to instead. The threat of collapse of a third dam, in the wake of that of Brumadinho, has forced Vale to halt traffic on its key Vitoria-Minas railway, at one point, interrupting the traffic of trains carrying ore, as well as of passengers.

Most of the mills which make millions of tonnes of pig iron each year are located in Minas Gerais, and these mills are having to switch to using much higher grade and expensive Carajas ore, which together with the greatly increased cost of transport, is is adding greatlky to the cost of producing this product, much of which is exported.

For the time being, Vale is benefiting from the fact that because of the shortage, the price of ore has shot to near $100 a tonne. But it will almost certainly be sued for millions of US dollars by customers forced to make costly substitute arrangements.

GB Railfreight is helping the UK government to meet its emissions targets

GB Railfreight is the UK's fastest growing major rail freight company, employing circa 900 people across the UK, and is expected to exceed a turnover of £200 million in 2019.

Through delivering a consistently reliable service, a commitment to innovation, strong client partnerships, and being seen as the industry's trusted carrier, GBRf is leading the way in the rail freight sector.

The fact that businesses are increasingly looking to improve their sustainability, and the government has agreed ambitious new targets for the UK to be net zero emission by 2050, provides new opportunities for the rail freight sector. It is one of the greenest ways to transport goods.

The figures on emissions savings by using rail freight speak for themselves — CO_2 emissions are 76% lower than using road (per tonne carried) and an average freight train removes 60 HGV journeys from roads.

The rail freight business has changed significantly over recent years. Once dominated by the transportation of coal and steel, the sector has adapted to changes to the UK economy. This has provided an opportunity to rethink the role of rail freight in the UK and to expand into other markets.

Examples include intermodal services for retailers bringing containerized goods from ports to distribution centres and an increase in the distribution of construction materials such as aggregates. Sectors such as petrochemicals and the transportation of new cars are increasing. Rail freight has also moved into new sectors such as biomass.

Delivering this innovation has required significant new investment. One example is GBRf's new partnership with Lynemouth Power to transport biomass to its power station in the north east of England. GBRf has leased 50 lidded hopper wagons which can carry up to 70 tonnes of biomass each to meet the demands of the plant.

Last month, GBRf celebrated the naming of *The Cemex Express*, a Class 66 Locomotive, which will travel between Dove Holes Quarry, Derbyshire, carrying premium aggregate for CEMEX's Readymix and asphalt plants, and external customers throughout the UK.

Trains are formed of up to 26 hopper wagons, that bottom discharge directly into the plant's conveyors. A single trainload can deliver up to 2,000 tonnes of material in one trip and will make circa 250 trips with one wagon set for CEMEX each year; the equivalent of over 25,000 truckloads. Contracts such as this are demonstrative of the role rail freight has to play in helping the UK to cut carbon emissions and to improve air quality.

An expansion into new markets has increased the demand for freight train drivers. As part of GBRf's investment in the future of the sector, it has invested a total of £900,000 in two new state-of-the-art simulators which will form part of a new training school at Peterborough.

New and existing drivers will be able to use the simulators for basic training, advanced training as part of the Driver rules exam, Mentor and Instructor training, and post incident reconstruction.

While rail transport is significantly greener than moving goods by road, GBRf has also been working to reduce its emissions. This has involved working with the University of Derby's Institute for Innovation in Sustainable Engineering (IISE), to research how locomotives can be reengineered to improve their sustainability.

Alongside this work, earlier this year GBRf partnered with Electro-Motive Diesel on a new repower project. This will involve sixteen locomotives being re-engineered, with more power, reduced fuel consumption and improved emissions. Re-engineering locomotives is also helping to address the shortage of locos currently available in the UK.

There are huge future opportunities for rail freight. Through being an innovative and environmentally conscious business, GBRf is expanding into new areas, meeting growing customer demands, and upskilling the valuable people working in the sector. Rail freight will play a central role in the railways' future as a result of shifting goods worth billions of pounds per year and helping the UK become more productive and sustainable.

60095 working 6N85 Lynemouth-Tyne Dock, at Pelaw on 5 June 2019 (photo: Ken Short).

Barging: a valuable resource in multimodal transportation of dry bulk materials

Despite the development of modes of transportation such as railways and airborne transportation, barging today remains one of the most economical ways of moving large volumes of cargo over long distances on natural waterways.

Barges can be designed to carry almost any kind of cargo, including containers, liquids and dry bulk materials. Depending on the cargo, dry bulk barges may be open or covered. They can also be self-propelled or towed or pushed by tugs.

Barging is, in some cases, the only feasible mode of transportation when other infrastructures, such as railroads or ports, are not present or not sufficiently developed because of the morphology of the territory. Barging plays also an important role in the multimodal transportation of dry bulk materials where the cargo is hauled to or away from the loading terminal by truck, rail or conveyor.

Indonesia is a good example of such a scenario. As one of the world's largest coal producers, the Kalimantan area in Indonesia is characterized by loading terminals where large vessels are not able to enter due to depth restrictions. Coal is hauled from the mine to the loading terminal by truck or rail and is then shipped by barge to an offshore location where transshipment terminals would transfer the cargo into oceangoing vessels.

One of the main drawbacks of barge transportation is that it requires transshipment facilities at the loading and discharging terminals but the transshipment service can also be outsourced to specialized companies thus reducing the initial investment.

Case study: exportation of bauxite in Guinea

Shi.E.L.D. Services has a long experience in logistics projects where the 'last mile' of the seaborne transportation of dry bulk materials is usually by barge.

Luca Condini, Technical Director at Shi.E.L.D. Services, explains the company's approach to this matter.

"In our view barge transportation is not just moving the cargo from point A to point B. It is an equally important part of the logistic chain as port loading and offshore transshipment. In order to optimize the logistic chain and to increase the offshore loading performance the barge transport cycle has to be carefully planned.

"The barge design has to be carried out taking into consideration several factors, including the type and quantity of cargo to be transported, the layout of the loading berth, the depth restrictions at the berth and on the waterway, the sailing distance, the metocean conditions, the size of the ocean going vessel to be loaded, the requested throughput.

"In order to support our clients during the project definition process we always consider every link of the logistic chain as part of the whole project. We take into account the interactions between the various parts and we don't think of them as independent parts to be simply connected together.

"We have recently carried out a feasibility study for the transshipment of bauxite in Guinea where barge transportation is required from the loading berth, located on the river bank about 20 nautical miles from the coast, to the transshipment site located about 30nm offshore. We have simulated various scenarios in order to find those barge characteristics which would optimize the barging cycle, thus increasing the cargo handling performance, and minimize the cost of transport.

"The simulation included both self-propelled and the more traditional dumb barges towed by tug.

The biggest restrictions are the river

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

constraints, mainly the depth, which in this case limit the loaded draught of the barges to a specific value. Barges with loaded draught exceeding this value could have tidal restrictions during loading which could reduce the total quantity of cargo transported.

"The result of the simulation is the definition of a specific barge type with those dimensions and capacity that, within the above mentioned restrictions, maximize the quantity of cargo transported and reduce the waiting times both at the loading berth and the transshipment facility, therefore leading to the optimization of the whole logistic project.

"As for the procurement of barges one opportunity of cost saving is represented by the second hand market where available barges with similar characteristics might be found.

"Should they not be available within the required timeframe they have to be built as new. The initial investment will be higher but it will be repaid in the short-medium

East Kalimantan, barges loaded with coal waiting at anchorage.

Barge towed to the transshipment facility.

period by the optimization of the whole chain. This is especially true for long-term contracts."

About Shi.E.L.D. Services srl

Born as spin-off of Coeclerici Logistics, Shi.E.L.D. Services is now a consolidated reality in the off-shore logistics of dry bulk materials and vessel technical and crew 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.

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. The company 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 provides a complete range of services for the logistics and transshipment sector including feasibility studies, definition and development of the most suitable logistic solution, vessel design, supervision of new-building construction and vessel conversion, technical, crew and operational management.

Barge being discharged during transshipment operations.

Managing sources of variability in the planned BHP Jansen potash logistics chain

Abstract

In their previous publication (for more details, please see the November 2018 issue of *Dry Cargo International*), Sylvie C. Bouffard of BHP Billiton Canada Inc. and Bryan Monk of Wood Canada Ltd. identified that the planned Jansen potash logistics chain would be subject to the variable frequency at which Jansen customers would place potash orders. They reported on the substantial benefits of better scheduling orders and better management of potash inventory. Together, these controls would reduce by 87% the time vessels at the port terminal would wait for potash to fulfill orders.

In this publication, Bouffard and Monk analysed other sources of variability affecting the upstream segment of the planned Jansen potash logistics chain. Using simulation modelling, they showed that the planned storage capacity at the mine and at the port terminal would be sufficient to manage the variability of the time at which trains and vessels arrive at the port terminal.

Business context

BHP is developing the Jansen Potash Project in Saskatchewan, Canada. Jansen is being designed as a conventional underground mine with a first stage of approximately 4mt (million tonnes) of potash per annum, with the potential for three further expansions of another 4mt of potash per annum each. At the time of publication, Jansen is in the feasibility study stage and subject to approval by the BHP Board.

Potash is intended to be mined underground, hoisted to the surface, crushed, ground, floated, dried, screened, and compacted before being stored in a stockpile and later dispatched. Potash would be railed to North American markets and to an export port terminal located on the North American West coast.

The Jansen logistics chain would have fixed assets (e.g. mine storage building, port terminal storage building, train loadout, shiploader) and mobile assets (railcars). The size of the storage buildings, the number of railcars, and the shiploader rate are design choices that determine capital costs. Operating costs associated with managing a fleet of trains and managing the arrival of vessels at the port terminal are also important considerations. The Jansen Project team used the DICE model (Bouffard et al., 2018) to minimize capital and operating costs without compromising on customer satisfaction and potash revenues.

Objectives

This paper is a continuation of a previous investigation (Bouffard and Monk, 2018) into the ability of the planned Jansen logistics chain to deal with sources of variability. In this work, we have modelled the sources of variability in the rail network and at the port terminal. The interested reader can browse the publication of Bouffard and Boggis (2018) to understand how the planned Jansen production chain would deal with sources of variability in mining, hoisting, and processing.

Literature review

The resources industry, to which the Jansen Potash Project belongs, has published little on the subject of variability in mine-to-market chains. Specifically, in the modelling arena, publications are lacking one or more components of the chain, either the production area, the logistics area, or the marketing component (Everett, 2001; Howard and Everett, 2008; Sagan and King, 2011). Because of this limited view of the chain, when the subject of variability is discussed, the effects of variable demand do not propagate far enough up the chain to fully quantify the extent of its impact.

The Jansen Potash Project and the resource industry share common traits with other industries that manage the flow

TABLE 1

Effect of the sources of variability on the increase to the percentage of trains incurring demurrage, the percentage of vessels incurring demurrage, and the average port pile inventory. Simulation type A: 2^3 factorial simulations. Simulation type B: one-at-a-time simulation.

Simulation type	Factor tested	Increase of the percentage of trains incurring demurrage	Increase of the percentage of vessels incurring demurrage	Increase to the average port inventory
A	Increasing # vessel classes	-1%	-10%	6%
	Increasing # customers	2%	-12%	6%
	Adding variable frequency of order placement	5%	+15%	-7%
	Doubling # product types	0%	-18%	+35%
B	Adding 20% variability to train transit time	7%	0%	Not available
	Adding variability to the vessel arrival time	+2%	+12%	Not available
	Adding 20% variability to loading time	-1%	-1%	Not available
	More weather interruption	-2%	0%	Not available

of goods and services across their chain. Theirs is commonly and broadly referred to as a supply chain; these industries use intermediate inventories and other measures to manage variability. There are many publications on the subject of variability in supply chains and even more publications on the theme of supply chain. We reviewed this broad literature in search of publications most relevant to the Jansen Project. Our review highlighted the dominance of demand variability on perturbing the stability of a supply chain. We identified frequency of order placement as the most significant source of variability for Jansen. The former can be controlled with ordering policies (Cachon, 1999), lead time (Chen *et al.*, 2000), and stock management (Schuster Puga *et al.*., 2017). There are also examples (e.g. Dittfeld *et al.*, 2018) of variability on the supply side of the chain rather than on the demand side of said chain. The next section discusses the sources of variability in rail and port terminal operations.

Sources of variability in the Jansen logistics chain

Potash orders, vessel calls, and train dispatches are highly interconnected. At the port terminal, vessels wait for berth availability prior to approaching the berth and commencing in-terminal cycle activities (draught surveys, paperwork, wait for shiploader activation). The loading of a vessel can be interrupted by precipitation and random equipment failure events. The number of vessel classes, vessel arrival times, vessel loading rate, and third-party vessel congestion also cause variability. In this work, we assessed the effects of multiple vessel classes, vessel arrival times, weather, and loading rate. Vessel classes (i.e. from Handy to post-Panamax classes) are particularly important because, together with the number of products to store before sale, they determine the size of the product storage building.

In the rail network, an accepted order triggers a vessel call, which triggers one or more train calls. At the Jansen site, a number of rail sidings are planned to hold trains, whether in an empty state until loading begins or in a full state until ready to dispatch to the port terminal. During transit to the port terminal, a train can experience delay(s) due to bad weather, failure of the locomotives, failure of the railcars, and third-party rail congestion. Other sources of variability originate from the number of railcars per train (e.g. manifest trains vs unit trains), train transit time, pre-loading delay, loading rate, post-loading delay, pre-unloading delay, unloading rate, and post-unloading delay. This work focused on the effects of transit time and loading rate.

Methodology

We used the DICE model to perform all simulations. Each simulation was replicated ten times, and each time, ran for 20 years of operation. Statistical robustness was further enhanced by using random number seeding for all distribution sampling. All simulations were configured with one berth and one shiploader at the port terminal. We applied the key learning from our previous work (Bouffard and Monk, 2018) to all simulations: potash orders were scheduled.

The conditions that changed between simulations were the train transit time, number of vessel classes, vessel arrival time, train and vessel loading rate, weather interruptions, number of customers, number of product types, and frequency of order placement.

Four factors (number of vessel classes, number of customers, number of product types, and frequency of order placement) were organized in two (2) factorial designs of the 2^3 type. Each factor was tested at two levels (i.e. without variability vs with variability): 1 or 4 vessel classes, 1 or 5 customers, 1 or 2 products, and 1 or 10 order schedules. The first lot of eight (8) simulations was performed with one product type, the second lot used two product types, for a total of 16 simulations. These 16 simulations were labelled type A.

The main output metrics from each simulation were:

- the percentage of trains which incur demurrage;
- the percentage of vessels which incur demurrage; and
- the ratio of the average port terminal inventory to the port terminal storage capacity.

For each factor tested, the difference between the average result of the eight simulations without variability and the average result of the eight simulations with variability was calculated. For example, for the metric of train demurrage, the average percentage of trains incurring demurrage for the four simulations without variability was compared to the average percentage of train incurring demurrage for the four simulations with variability.

Five factors (train transit time, number of vessel classes, vessel arrival time, train

and vessel loading rate, weather interruptions) were tested in simulations labelled type B. Type B simulations are one-at-a-time simulations, in which only one input element is changed from being not variable to being variable. One-at-a-time simulations require a base simulation for comparison purposes. The base simulation used these inputs: two product types, five customers, ten order schedules, constant rail transit time, four vessel classes, constant vessel arrival, constant loading rate, and no weather interruption.

Key findings

The reader should note that the data presented in Table 1 is not representative of the planned operation of the Jansen logistics chain; the expected metrics for the planned operation are too sensitive to share at this time in the feasibility study stage of the project. The trends from these present simulations are nonetheless insightful.

In simulations of type A, the percentage of trains incurring demurrage increased by no more than 5% under all conditions with variability. This result is not surprising given that the factors tested are not directly related to the trains. They are indirectly related to the trains via the train calls. In the following sequence (order accepted → vessel call → train call), train calls are one layer removed from the vessel class factor and two layers removed from orders in the form of customer count, order placement, and product type.

Vessel demurrage was modestly affected (i.e. less than 20% change) by each of the four factors. Vessel calls are directly influenced by the vessel class factor and one layer removed from the three order-related factors: number of customers, number of products, and number of order schedules. As a result, the effect of variability on vessel demurrage is more evident than seen with train demurrage.

Port terminal inventory increased by 35% when adding one more product, but otherwise was very modestly affected (i.e. less than 10%) by the other two order-related factors: number of customers and number of order schedules. Inventory was directly influenced by the product type factor.

In simulations of type B, the variability of the train transit time increased the percentage of train incurring demurrage by 7% but did not change the percentage of vessel incurring demurrage. This is because the port terminal holds enough inventory to enable the loading of a vessel without being impacted by a late train.

Muriate of potash.

Variability on the vessel arrival time increased the percentage of vessels incurring demurrage by 12%, but had minimal effect on the percentage of trains incurring demurrage. Here too, these trends are intuitive. A vessel arriving early might have to wait for product. One arriving late might also have to wait because the inventory planned for the arriving vessel might have been loaded on another vessel already at anchor. The management of product inventory levels and vessels ensures the port terminal stockpile does not get full, causing undesirable train demurrage.

Variability due to weather, vessel loading rate, and railcar loading rate had very minimal effect on train or vessel demurrage because the train loadout station and the port terminal berth were found to be not significantly committed (i.e. utilized).

Conclusions

Jansen plans to deliver potash by rail to a port terminal from where potash would be loaded onto vessels delivering to worldwide customers. A discrete-event simulation model of the integrated Jansen production and logistics chain was used to optimize the product storage capacity at the mine and at the port terminal. The optimization focused on managing the inventory of two potash products and the variability in train and vessel transit time. In these proxy simulations, not exactly representative of the planned Jansen operation, at most 7% more trains would incur demurrage when inventory at the mine site would not be sufficient to load early-arriving trains or late-arriving trains. When inventory at the port terminal would not be sufficient to load early-arriving or late-arriving vessels, at most 15% more vessels would incur demurrage. Therefore, in these proxy simulations, the storage capacity at the mine site and at the port terminal was adequate to store two products and to deal with the variability in the train transit time and vessel arrival time. Other factors (weather, number of vessel classes, number of customers, railcar loading and unloading rate, and shiploader loading rate) were less influential.

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References

- Bouffard, S. C. and Boggis, P., 2018. Stochastic optimization of the Jansen potash production and logistics chain, Min. Proc. & Extract. Metall. Review, Published online on 30 Oct 2018, https://doi.org/10.1080/08827508.2018.1528974, 11.
- Bouffard, S.C, Boggis, P., Monk, B.G., Pereira, M., Quan, K., and Fleming, S, 2018. Discrete-event simulation modeling unlocks value for the Jansen potash project, Interfaces, 48(1), 45-56.
- Bouffard, S.C. and Monk, B., 2018. BHP optimizes its planned potash logistics chain to manage variability from customer demand, Dry Cargo International, no 219, 52-54.
- Cachon, G.P., 1999. Managing supply chain demand variability with scheduled ordering policies, Management Science, 45(6), 843-856.
- Chen, F., Drezner, Z., and Ryan, J.K., 2000. Quantifying the bullwhip effect in a simple supply chain: the impact of forecasting, lead times, and information, Management Science, 46(3), 436-443.
- Dittfeld, H., Scholten, K., and van Donk, D., 2018. Burden or blessing in disguise: Interactions in supply chain complexity, International Journal of Operations & Production Management, 38(2), 314-332.
- Everett, J. E., 2001. Iron ore production scheduling to improve product quality, European J. of Operational Research, 129(2), 355-361.
- Howard, T. J., & Everett, J. E. 2008. Maintaining product grade from diverse mine sites at BHP Billiton Iron Ore Newman Joint Venture, Mining Technology, 117(1), 12-18.
- Sagan, A. & King, H., 2011. Modelling the mine-to-port supply chain, Port Technology International, Edition 48, 64-66.
- Schuster Puga, M., Minner, S., and Tancrez, J.-S., 2017. Two-stage supply chain design with safety stock placement decisions. CORE Discussion Papers 2017001, Université catholique de Louvain, Center for Operations Research and Econometrics (CORE), 25.

Inspiring rail solutions with Captrain Deutschland

Green. Innovative. Ahead.

Germany's Captrain Deutschland is a prominent European rail logistics company. With many years of experience and access to the most modern technology available, the company develops innovative transportation concepts. Its solutions and services do not end at the factory gates, but are optimally integrated into its customers' production processes. Captrain Deutschland does the things that it does best: it moves goods — with passion and commitment.

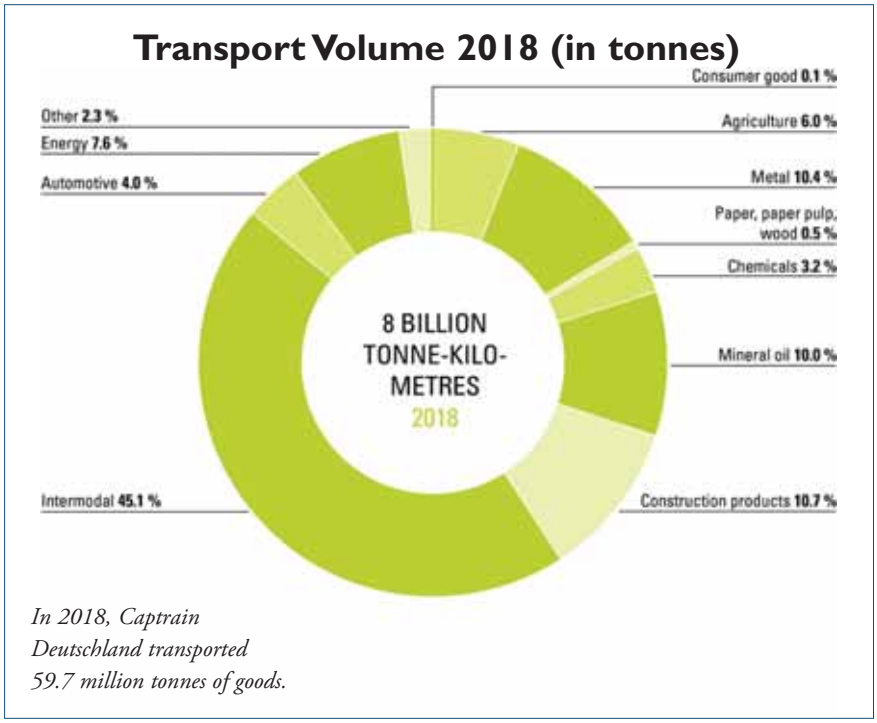
Green

Green is the company's corporate colour. At Captrain, the colour represents ongoing development, growth, sustainability and, of course, environment. The railway is the most environmentally friendly type of transport.

Innovative

Captrain is continually developing its logistics solutions. Under the name SmartRail Logistics, it has founded a joint venture with a partner company that optimally combines railway traffic with road traffic.

Up until now, this is a unique model and the foundation for bringing an additional flow of goods to the rails.



In 2018, Captrain Deutschland transported 59.7 million tonnes of goods.

Ahead

Captrain is dealing with the topics of the future and has the courage to make innovations and move in new directions. Therefore, its products and solutions are already innovative today. However, that is not enough. Captrain wants to be a pioneer in terms of making railway logistics ready for the future.

Working throughout Europe

Captrain's offices are located throughout Germany. In this way, it is able to guarantee that its contact person has regional expertise. Beyond this, the company is also present throughout Europe — with sites in the Netherlands, Poland and licences in Austria, Switzerland and the Czech Republic. In co-operation with affiliates in

Belgium, France, Italy and Spain, Captrain can offer its customers countless possibilities.

Resources

Workshops

Captrain has seven of its own workshops that it uses for inspections or repairs. That lowers costs and ensures a high level of availability. Therefore, it is able to guarantee the highest degree of safety and continuous deployment.

Infrastructure

With its expertise in railway infrastructure, Captrain is an ideal partner in the industrial railway sector. It designs efficient shunting options to ensure smooth operation. Aside from the planning and the construction, Captrain also handles the service and maintenance, including all related aspects — from signal operation and emergency management to legal matters.

Certificates

Captrain's logistics services have been certified. For this reason, it also works in accordance with the worldwide recognized quality management system ISO 9001. With the European-wide Safety and Quality Assessment System (SQAS), Captrain also fulfils the requirements for the transport of dangerous goods.

Energy efficiency

Captrain makes its decisions fully aware of their impact on society as well as on the environment. Therefore, increasing the energy efficiency and minimizing the use of energy are the main components of its operational activity.

Captrain's fleet consists of 200 locomotives and 2,500 freight cars.

Even for large-scale projects, it can provide the most suitable resources. Depending on the mode of transport, its freight wagons are optimally aligned to meet the needs of its clients. In this way, Captrain ensures a high capacity utilization, short loading times, and a safe and reliable transport.

Good for customers' goods

Captrain can meet any challenge on the rails and will find the optimum solution, whether international traction, industrial railway operation or holistically integrated logistics solutions. The greatest challenges inspire Captrain to find a solution. It therefore works pragmatically. Captrain believes that solutions must remain simple and reliable, even when the challenges are complex. Its clients will be integrated into the process from the very beginning. This way, Captrain creates transparency and can continuously optimize its services.

Services

Shunting services

Site deliveries, industrial shunting service, train composition.

Transport capacity

Optimization, provisioning, loading consultation.

Individual customer service

Personal, holistic, continuous.

Train services

Execution, operational monitoring, incident management.

Infrastructure

Planning, operation, maintenance.

Value-added logistics services

Pre- and post-carriage lorry, loading and unloading, storage logistics.

Custom solutions

Traction services

With Captrain's railway services, goods are transported quickly, safely and reliably from one loading place to another, whether in regional traffic or in international long-haul transport. Reliability, safety and quality are the foundations for this. Complete information as well as delivery services or management of damaged wagons round-off Captrain's offer. Thereby, it always focuses on optimally using both its customers' resources and its own, thereby minimizing the costs.

Integrated logistics

Local infrastructure management, provision of wagons, shunting operation, railway as well as accommodating services: as a full-service provider, Captrain Deutschland provides single-source solutions that have been individually aligned to meet customers' requirements. Captrain combines factory logistics with regional and long-distance routes into borderless railway transportation systems — locally, regionally and across Europe.

Industrial railway operations

Captrain Deutschland is a specialist for the operation of industrial railways, from planning and operation to the maintenance of the infrastructure as well as providing and maintaining vehicles. Captrain offers the complete service for rail-bound production logistics on its customers' factory premises.

A strong group

Outside of France, Captrain is the face of the SNCF. SNCF Logistics is the transport and logistics division of the French Société Nationale des Chemins de fer Français (SNCF). SNCF Logistics offers intermodal transport solutions — across Europe and worldwide, with a network that spans across more than 120 countries. In 2018, the group achieved sales of € 9.9 billion. This means that the company is one of the largest transport and logistics companies in the world. DCi

Bulker classification

DCi talks societies, safety and certification

The new Ultramax bulk carrier design meets the IMO 2030 environmental targets.

Jay Venter

Wärtsilä, Oshima & DNV GL joint development project produces Bulk Carrier design to meet IMO 2030 environmental targets

The technology group Wärtsilä, Japanese shipbuilder Oshima Shipbuilding, and the classification society DNV GL have delivered the first results of their joint industry development project. At the recent Nor-Shipping exhibition held in Norway, the project partners announced a next-generation 62,000dwt Ultramax bulk carrier design that is optimized according to actual operating profiles, and that will meet coming emissions legislation. The design demonstrates that emission levels from conventional merchant vessels can be significantly reduced in line with International Maritime Organization (IMO) targets.

The project goals included the achievement of low emission levels, both at sea and in port, the fulfilment of the IMO's requirements to reduce CO_2 emissions per ship's capacity-mile by at least 40% by 2030, and zero emissions during waiting time. A further aim of the project has been to create a new standard that maximizes the return on investment (ROI) for the owner. A key objective was to minimize greenhouse gas (GHG) emissions through the application of currently available technologies.

"Our smart marine initiative emphasizes collaboration between the various stakeholders, and this project is a prime example of how effective such collaboration can be. The design is based on actual operating profile data from Ultramax bulk carriers and it incorporates an LNG-fuelled Wärtsilä 31DF dual-fuel main engine connected to a power take out (PTO) shaft generator and controllable pitch propeller (CPP), and the result outperforms all existing designs in terms of efficiency and sustainability," says Stein Thorsager, Director, Merchant and Gas Carrier, Wärtsilä Marine.

"To help the industry meet the ambitious GHG reduction targets set by the IMO, the industry needs to come together to advance ship design. This design halves the EEDI (Energy Efficiency Design Index) of comparable vessels, and sets a new standard for low emission bulk carriers," says Trond Hodne, Director of Sales & Marketing at DNV GL.

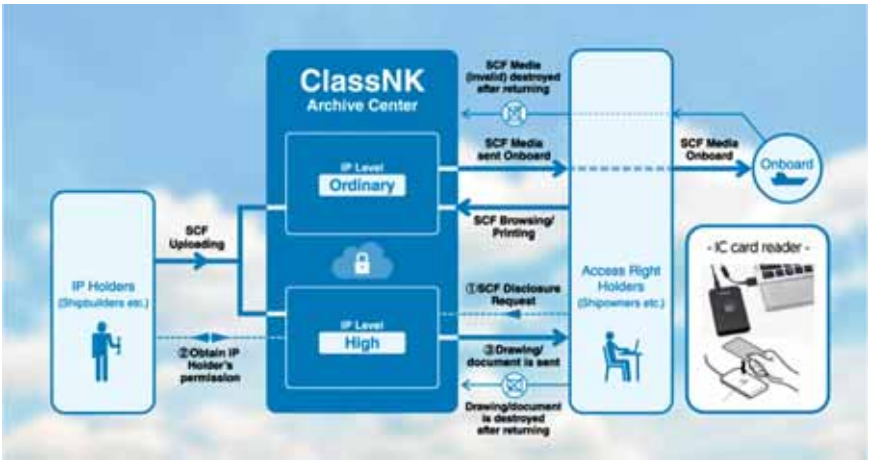
"Greater efficiency and better environmental performance has been made possible through collaboration with Wärtsilä and DNV GL. Oshima alone could not have come up with this new innovative design, which includes optimized propulsion, energy storage and solar panels. It represents a future proof solution that will enable bulk carrier owners to comply with legislation while also lowering operating costs," says Eiichi Hiraga, President at Oshima Shipbuilding.

The high efficiency of the propulsion solution reduces the EEDI by 50 percent compared to standard vessels of this size and type. The EEDI provides a specific figure for an individual ship design, expressed in grams of carbon dioxide (CO_2) per ship's capacity-mile

Other benefits include the ability to operate in an environmental mode while in port through the main use of solar panels, the installation of an LNG tank that is dimensioned based on the capacity needed for the operating profiles and the availability of LNG bunkering infrastructure, an optimized hull shape, and the option to also install a hard sail to generate extra propulsion. The hard sail system is being developed jointly by Oshima Shipbuilding and Mitsui O.S.K. Lines.

ClassNK sets new standards

New initiatives from ClassNK to protect safety and the marine environment



In order to reduce atmospheric pollution caused by sulphur oxides (SOx) and particle matter (PM) found in vessel emissions, enforcement of shipping's environmental regulations is becoming ever stronger.

However, with Greenhouse Gasses now also within the sights of regulators, LNG's ability to reduce CO_2 emissions by 10% to 20% compared to conventional oil fuels bring a new dimension to the future viability of a marine fuel that is already Sulphur-free.

Recently, ClassNK granted Approval in Principle (AIP) based on its Rule Part GF which adopts IGF Code (regulation for ships using low-flashpoint fuels). The development supports various joint projects on the concept design of LNG-fuelled bulk carriers led by companies such as NYK Line/Japan Marine United and Kawasaki Heavy Industries.

But perhaps ClassNK's most remarkable recent safety initiative, especially for dry cargo ships, is the establishment of ClassNK Archive Center (NKAC). As international regulations are requiring the industry to enhance the safety of highly sensitive design and construction information, ClassNK's world-first and only viable onshore Archive Center provides an essential service, enabling both shipowners and shipbuilders to comply with new IMO Global Based Standards (GBS) — Ship Construction Files (SCF) and the related industry standard. In October 2018, NKAC stored its first Ship Construction Files fully in line with IMO-GBS.

To encourage design transparency throughout the life of vessels for ensuring safety, the SOLAS regulation II-1/3-10 entered into force in 2012, requiring an SCF complying with IMO GBS to be provided by the shipyard on a new ship's delivery and kept on board and/or ashore.

The SCF provides the vessel design and construction information needed to ensure the safety of the ship throughout its operational life. According to the SCF guidelines, this information must be stored on board. Other information, including the high-level intellectual property (IP) drawings belonging to the shipyards such as the yard plan, lines and detailed structural calculations, is kept confidential and does not need to be carried on board.

To supplement the regulation, the Industry Standard was also developed by a cross-industry group including the Shipbuilders' Association of Japan (SAJ) and other organizations such as CANSI, CESA, KOSHIPA, SCA, ICS, INTERCARGO, INTERTANKO, BIMCO, OCIMF and IACS.

As of June 2019, no service other than NKAC has announced the storage of GBS-SCF. Although the necessity to have SCF onboard to improve the safety of ships is unquestionable, at the same time SCF is an intellectual property developed by Shipbuilders. In order to tackle this conflict between the players, ClassNK has utilized innovative and secure cloud-based technology to develop NKAC for the storage and management of SCF and other electronic documents.

NKAC simplifies the storage of important files by offering a paperless, user-friendly way to manage drawings, thus enabling effective communication between shipbuilders, shipowners and ship management companies by bringing them all under one umbrella and providing a central resource through which files can be exchanged.

To ensure confidentiality of IP, shipbuilders can set the desired IP security levels for each drawing. High IP-level drawings such as the lines plan are only stored ashore in NKAC and, as a rule, the shipowner is required to ask NKAC for permission to access these files. The NKAC then notifies the IP-holder (shipbuilder and/or equipment manufacturer) of the request.

IMO's regulations are applicable to bulk carriers and oil tankers of 150m in length and above, with a building contract placed on or after 1 July 2016. In the absence of a building contract, the regulations apply to keels laid on or after 1 July 2017, or delivery made on or after 1 July 2020. This means that the requirement will be applied to many ships that are going to be delivered and eventually to all bulk carrier and oil tankers of 150m. Today, NKAC is the only solution to comply with and realize the scope of IMO's safety initiative.

Indian Register of Shipping takes over chairmanship of IACS

Arun Sharma, Executive Chairman of the Indian Register of Shipping (IRClass), has been elected as the new Chairman of the International Association of Classification Societies (IACS) in a recent Council meeting held in Busan, Korea.

Sharma took over as Chair on 1 July and has outlined his key priorities during his year long tenure which includes IACS to take a larger role in industry matters with a view to provide value added services to owners on the implementation of regulatory requirements. He stressed on the need to continuously strengthen the systems within IACS towards maintaining and enhancing quality operations.

He is also keen to enhance interaction with stakeholders towards affirming its relevance to the industry.

Sharma highlighted that IACS recognizes the importance of good data in decision-making to guide its policy decisions and work has commenced on the formulation of IACS data driven policy. This would be "a very important step and will be one of the main priorities in the coming year," he said.

Staying compliant with The Korean Register

The Korean Register (KR) classification society was established in 1960 with the purpose of promoting safety of life, property and the protection of the marine environment. KR currently classes an international fleet of 3,050 vessels totalling 68 million GT.

It is headquartered in Busan, South Korea and operates a network of 66 offices around the world. It is authorized to perform statutory and certification services in 80 countries.

KR conducts joint development project for LNG dual fuel 180K bulk carriers

KR is actively conducting R&D into ship technologies for LNG (liquefied natural gas). In November 2018, KR signed an MOU for a joint development project (JDP) with Hyundai Heavy Industries to develop the technology for risk assessment of the LNG dual fuel propulsion on recently designed 180K bulk carriers.

Under the JDP, the safety verification of the LNG fuelled ship design will be established using risk assessment procedures and techniques, which are then applied to the actual ship design. As the JDP uses quantitative analyses of accident scenarios, it is expected that improved methods of risk assessment will be secured than would be achieved by just using conventional qualitative methods. Moreover, the LNG fuel gas supply system, which is verified through this JDP, is expected to be used as a standard for LNG fuelled ships constructed in the future, thereby enhancing the safety of LNG fuelled ships moving forward.

KR supports world's first use of high manganese austenitic steel for bulk carrier LNG fuel tank

The interim guidelines for applying high manganese austenitic steel to LNG storage and fuel tanks were approved by the International Maritime Organization's (IMO) 100th Maritime Safety Committee (MSC).

High manganese austenitic steel was developed by POSCO, South Korea's largest steel maker for use in LNG storage and fuel tanks in 2013. But until the MSC's approval, only four types of material — 9% nickel steel, aluminium alloy, stainless steel and Invar — were authorized for use in the building of LNG tanks by the IMO.

KR has worked to develop interim guidelines in close cooperation with the Ministry of Oceans and Fisheries (MOF) of Republic of Korea and POSCO. The draft was agreed at the 5th Sub-Committee on the Carriage of Cargoes and Containers in September 2018, with final approval secured at the 100th MSC.

The first vessel to use high manganese austenitic steel for its LNG fuel tank was constructed at Hyundai Mipo Dockyard in July 2016. It is a 50,000dwt LNG-fuelled bulker constructed in accordance with Harmonized CSR and classed by KR.

KR conducted intensive analysis to assess the safety of the base metal and welds, to ensure the safety of this vessel and to develop the exact specification for the high manganese austenitic steel. The completed vessel has been chartered by POSCO to transport limestone cargoes in the Korean coastal trade.

Moving forward, KR is working to develop a high manganese austenitic steel that complies with the IGC Code (International Code for the Construction and Equipment of Ships carrying Liquefied Gases in Bulk) and the IGF Code (International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels).

KR develops new Kamsarmax bulk carrier design

Two main issues interest stakeholders when it comes to ship design — fuel efficiency and compliance with rules and regulations.

Some industry commentators have said that it may not be possible to secure further fuel savings but strong demand for better ships and changes in market conditions are driving shipyards, ship designers and class to develop ever more competitive ship designs. Furthermore, stringent environmental regulations for CO_2, NO_x and SO_x as well as H-CSR mean space and structural reinforcement are required to comply with regulations, but with minimal payload loss.

KR has successfully conducted a joint development program with Hyundai Mipo dockyard for the design of a new Kamsarmax bulk carrier, balancing fuel saving and compliance with rules and regulations. The JDP focused on two areas with the aim of maintaining the same payload — hull form optimization and structural optimization.

As a result, of the JDP, KR developed new design of Kamsarmax bulk carrier offering an overall fuel efficiency saving of 22% compared to a traditional design. Twelve per cent of the fuel saving derived from hull optimization, about 7% from main engine and propeller optimization, and about 3% from the Mewis duct installation, all of which was achieved without any cargo-load loss.

SeaTrust-HullScan software supports better CSR-H design

KR's SeaTrust-HullScan is a dedicated software package developed for the structural strength analysis of bulk carriers based on KR's Rules and the Harmonized CSR. It is recognized by the industry for its excellent application to CSR-H design. As a result, since the launch of the first version, it has been widely adopted by major shipyards, marine research institutes, design companies and universities.

First released in 2012, SeaTrust-HullScan was upgraded in 2018 incorporating direct feedback from users in shipyards and design firms.

The Rule aspects of the software have been upgraded and software response speeds dramatically enhanced, the time needed to modify models and verify large amounts of data has been reduced and time taken to calculate DSA Buckling and Fatigue is significantly faster.

KR has developed a new function to simplify and enhance the creation of high-quality fine mesh using a FE (Finite Element) automatic model creation for Fine Mesh and Very Fine Mesh. The new software can now create an FE model with a single click for locations that require intensive modelling such as openings, brackets and slots.

KR has enhanced user convenience by improving the functions for the generation of longitudinal members and the definition of the compartments. The rule calculations are faster and easier when creating a transverse member model for plane bulkhead, corrugated bulkhead and web sections.

In addition, through the development of a model interface for NAPA STEEL which is used in domestic and overseas shipyards, rule calculations and direct strength evaluations can now be performed using accurate 3D shape models of ships.

The updated software is more innovative, reduces design costs, increases user convenience, while quickly and accurately producing and evaluating data, clearly demonstrating KR's commitment to supporting better CSR-H design through the provision of faster and more accurate software.

Liberian Registry cements position on Paris MoU and Tokyo MoU White Lists

The Liberian Registry has once again been included on the White List of low-risk flags in the 2018 Annual Report of the Paris Memorandum of Understanding (MoU) on Port State Control, covering the European region.

It has been white-listed by the Paris MoU now for almost 20 years. Liberia was also recently included on the White List of another leading Port State Control performance indicator, the Tokyo MoU, which covers the Asia-Pacific region, as well as on the United States Coast Guard's QUALSHIP 21 roster.

White List inclusion donates a quality flag with a consistently low detention record, and Liberia has been on the Paris and Tokyo MoU White Lists since their inception in 1999 and 2002 respectively. Alfonso Castillero, Chief Operating Officer of the Liberian International Ship & Corporate Registry (LISCR), the US-based manager of the Liberian Registry, says, "Thanks to Liberia's highly trained global staff, as well as its proactive, automated Detention Prevention system, action is taken on a daily basis to help owners and operators manage their fleets safely and efficiently, intervening when necessary to help resolve issues before they can become points of contention upon arrival in port.

"Liberia's unwavering White List status not only proves that these efforts make a difference, but is also testament to Liberia's quality clients, who put in the same level of effort in order to meet these exacting standards. Any flag, such as Liberia, which consistently qualifies for inclusion on PSC White Lists while increasing its tonnage to record levels must clearly be meeting the expectations of owners and managers in terms of both safety and commercial efficiency."

The Liberian Registry has a long-established track record of combining the highest standards of safety for vessels and crews with the highest levels of responsive and innovative service to owners. Moreover, it has a well-deserved reputation for supporting international legislation designed to maintain and improve the safety and effectiveness of the shipping industry and protection of the marine environment.

Palau is approved by IMO as STCW White List member state

Palau International Ship Registry (PISR) has been recognized by the International Maritime Organization (IMO) as to fully comply with the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW).

At the IMO headquarters in London (June 10) Secretary-General Kitack Lim's proposal was approved by the Maritime Safety Committee (MSC) giving PISR's white list status under STCW Convention 1978.

The STCW Convention as amended sets minimum qualification standards for masters, officers and watch personnel on seagoing merchant ships and large yachts and was adopted in 1978 by the IMO and came into force in 1984. Palau is the latest ship registry to be approved to offer maritime training under the Convention and Panos Kirnidis, CEO of PISR, sees this as another credible step in the registry's strong growth.

"We have been working with the IMO on a number of issues and this white list approval is yet another example of how far we have come as a registry in this most competitive of maritime sectors. Everything we have accomplished over the past few years has been another step forward in refining our services and credibility as a responsible, technologically advanced and diligent ship registry.

"The 1978 STCW Convention was the first to establish minimum requirements in training, certification and watchkeeping for seafarers on an international level. As with many elements in the maritime world, these standards were variably implemented depending on the country involved. We are now able to offer maritime training to a uniform standard which is an important part of the IMO's drive to raise the standards in global shipping. Our training credentials are under constant review, as regulations change and new opportunities open up for seafarers. Using our own IT designed applications and qualified staff we have been providing services for our fleet personnel for many years and this new approval will further enhance our training provisions. As one of the world's leading smart registries we are not only the fastest-growing in the industry but also a registry that adopts the latest provisions in training to help seafarers on Palau-registered ships."

ICS to push for rapid action on further CO_2 reduction by international shipping

2019 AGM Faroe Islands: Representatives of the world's national shipowners' associations met last week to review the priorities of the global shipowners' association, the International Chamber of Shipping (ICS).

The ICS Annual General Meeting was overshadowed by the attacks against two oil tankers in the Gulf of Oman and the very serious threat this presents to the lives of seafarers and maritime trade.

Action on CO_2 Reduction

ICS agreed a suite of actions in support of the UN International Maritime Organization (IMO) strategy to decarbonize international shipping in line with the United Nations 1.5° climate change goal.

Speaking from the Faroe Islands, ICS Chairman, Esben Poulsson said: "It is imperative that IMO Member States adopt a new global regulation to mandate further short term CO_2 reduction measures at the next session of the Marine Environment Protection Committee in 2020. This should deliver further CO_2 reductions by 2023 to help us meet the IMO target set for 2030. We will work with a broad coalition of governments to produce a comprehensive proposal that can be submitted to IMO in September this year."

Poulsson continued: "The core of this proposal will be the Super SEEMP concept, whereby shipping companies globally will have to demonstrate they are doing absolutely everything possible to reduce fuel consumption, strictly enforced via flag state audits of Ship Energy Efficiency Management Plans. But we also agreed to incorporate elements of the many other good proposals made by governments at the last round of IMO discussions on CO_2 reduction in May."

Poulsson added, "By coming forward with an early proposal for immediate adoption we wish to support continuing IMO leadership on GHG emissions and quickly incentivize further action by shipping companies. We do not wish to limit proper consideration of other ideas such as speed reduction or the use of new CO_2 reduction technologies." The ICS

AGM also confirmed the vital importance of research and development of zero-carbon fuels and propulsion systems that will be necessary to achieve the ambitious IMO target of cutting shipping's total GHG emissions by 50% by 2050 regardless of maritime trade growth, and continuing to work with other industry stakeholders to explore how R&D can best be rapidly accelerated.

2020 Global Sulphur Cap

ICS members reiterated their commitment to the successful implementation of the IMO global sulphur cap from 1 January 2020, noting ICS's plans to revise its comprehensive guidance to shipowners on ensuring compliance, to take account of recent IMO decisions. This is notwithstanding continuing uncertainty about the worldwide availability of safe and compliant low sulphur fuels, and the operational challenges associated with using new 0.5% max. sulphur blends.

Poulsson said: "Our meeting welcomed the decision of the IMO Maritime Safety Committee last week, at which ICS led shipowner representation, to adopt an MSC Resolution addressing safety and fuel quality issues associated with the sulphur cap."

This MSC Resolution on 'Recommended Interim Measures to Enhance the Safety of Ships Relating to the Use of Oil Fuel' means that bunker suppliers will be 'encouraged' by maritime administrations to provide only low sulphur fuels that meet the latest ISO Standard, i.e. ISO 8217:2017 plus the ISO Publicly Available Specification (PAS 23263) which is currently still under development. In addition, the Resolution should result in administrations taking action against fuel suppliers whenever failures to provide safe fuel take place, with instances to be reported to IMO.

ICS remains concerned about continuing delays with the publication of the latest ISO Publicly Available Specification for low sulphur fuels, and related quality and safety issues where control depends on these standards being quickly finalized and distributed, given that the industry is only six months away from full global implementation.

Poulsson added "It is vital that everyone concerned including governments, ISO, oil producers and bunker suppliers redouble their efforts to ensure that safe and compatible fuels — including 0.5% blends for those ships that choose to use them — will be available in every port worldwide."

Alpha Ori Technologies secures ClassNK certification for Smartship™

Ship classification society, ClassNK, has confirmed type approval certification for SMARTShip™, the patented digital shipping solution developed by Alpha Ori Technologies (AOT) which is now enjoying rapid uptake across the maritime sector.

SMARTShip, an Internet of Things (IoT) platform that enables the onboard operation of multiple systems with varying degrees of autonomy, has already been installed on more than 30 vessels. A further 60 ships are at various stages of the set-up process.

ClassNK's certification for SMARTShip approves the solution as a 'Computer Based System' which conforms to the Class Society's rules governing a product performing 'Remote Monitoring and Diagnostics', 'Situational Awareness' and 'Decision Support Systems', both onboard and ashore.

Hourai Maru, a mid-sized gas carrier delivered on 11 March 2019, was the first ship certified with a ClassNK-approved SMARTShip.

Captain Rajesh Unni, Co-CEO of AOT and CEO and Founder of leading Singapore-based ship manager Synergy Group, welcomed the certification of SMARTShip by ClassNK.

"ClassNK is renowned globally for its exceptional quality," he said. "Its approval provides quality and reliability assurance for our SMARTShip solutions, especially to Japanese clients but also to our many maritime customers located around the world.

"Technology is transforming our industry. AOT's approach to tackling pain points and enabling rules-based decision-making gives clients added transparency and delivers multiple operational, financial and environmental benefits."

AOT's SMARTShip platform takes a holistic approach to solving maritime pain-point issues for every stakeholder in the logistics value chain - Ship Owners, Ship Managers, Ship Operators, Port Management, Surveyors, Ship Registries, P&I Clubs and Shipbuilders. Data is collected from all parts of the ship to create a platform which connects disparate systems. This enables the continual monitoring and collection of data, helping crew and managers make rules-based decisions.

"SMARTShip leverages AOT's proprietary hardware and software and cloud-based infrastructure to collect and transmit more than 5,000 data points from various systems onboard," said Captain Unni.

"It utilizes the data collected to create value for stakeholders, often including additional information such as weather overlay, statutory and regulatory information etc.

"The front-end user experience includes intuitive applications which facilitate monitoring and diagnostics of operational issues."

SMARTShip has already been critically acclaimed by industry leaders. Martin Ackermann, CEO of BW LPG, a leading client of AOT, commented: "With digitalization disrupting entire industries, we seek to realize the competitive advantage it can bring to BW LPG and, in turn, our customers. The SMARTShip, solution from Alpha Ori Technologies enables us to combine our vessel's operational data with a range of external data so that in real-time we can optimize performance on single vessels and across our entire fleet.

"We see great potential in improving safety, reducing costs and enhancing performance for the benefit of all our stakeholders"

Capt. Rajeeva Mathur, COO of Southern Pacific Holding Corporation C/O Kumiai Senpaku Co., Ltd, also praised the performance improvements yielded by SMARTShip.

"Alpha Ori Technology's SMARTShip system has introduced a whole new vision in the approach to ship operations for us at Kumiai Senpaku," he said.

"We certainly feel that its transparency and the reliability of information it gives us makes it a very efficient and effective tool in improving commercial and operational enhancement. Our expectations have also been met on fuel optimization and predictive maintenance programmes. Our charterers and managers will continue to benefit from this."

Features such as the optimization of total fuel consumption and the creation of intelligent alerts and leading indicators are an integral part of SMARTShip. For example, a quick visualization dashboard for critical assets and their parameters is available with drill-down options showing all related information in list and graph views.

"SMARTShip's Remote Monitoring &

Diagnostics provides clients with the capability to troubleshoot remotely," added Captain Unni. "This generates huge savings on the usual cost required to send a service engineer to the actual location of the ship for troubleshooting."

SMARTShip's Situational Awareness Decision Support System (DSS) incorporates applications including SMARTAlert notifications for preventing incidents, TFOC (Total Fuel Oil Consumption) fuel optimization application and ASSET AI predictive maintenance applications.

"AOT has deployed these systems on 30 vessels as in date and we have commitments for another 60 more in the pipeline for this year," said Captain Unni.

"By installing these systems, clients have seen improved operational efficiency via greater transparency, reduced repair and maintenance costs — preventing breakdowns, increasing time between overhauls etc. — and optimized fuel use."

The Polish Register of Shipping weighs in on bulker safety issues

The random nature of the ocean, wave conditions, a wide variety of shipping operations, indiscriminate loading conditions, arbitrary shipping routes and decisions by the crew are all contributing factors to the safety of a vessel and its seafarers, *writes Dr Jan Jankowski, PRS (Polish Register of Shipping)*. The case of VLOCs (very large ore carriers), another major factor is probably the impact of high loading rates on structural safety. This can affect the structure in ports, and wave loads can often cause further failure of the structure, leading on occasion to marine casualties.

The traditional approach to ship safety criteria is often such that new safety regulations are triggered by casualties, which can result in the proliferation of regulations.

In reaction to this regulation culture, the IMO (International Maritime Organization) Maritime Safety Committee has developed its Goal Based Standards (GBS), which deal with the goals and functional requirements that define the required safety level for bulk carriers and oil tankers. The role of classification societies within the regime of GBS is to develop rules that transpose the functional requirement into ships.

The classification societies associated in IACS (International Association of Classification Societies) developed such rules — the Common Structural Rules for Bulk Carriers and Oil Tankers (CSR), which significantly increase the required safety level of these ships structures and which will significantly reduce the bulk carrier loses due to the hull structure failure in the future.

The CSR also provide criteria for the allowable thickness diminution of ships' hull structures which require to:

- assess local and global corrosion during the operational life of ships (the span life of 25 years is the functional requirement of GBS); and
- measure the hull structures thickness which should be assessed against the new-building requirements incorporating corrosion additions.

The assessment is not required during the operational life of ships, provided that the measured thickness of any structural members remain greater than the renewal thickness specified in the Rules. This approach, determined by CSR, improves the safety of dry bulk carriers during their operation due to the appropriate regime imposed on the vessels maintenance.

Although current rules provide a high level of safety for hull structures, there are still some issues that need to be improved. The most important is the probability distribution of sea state occurrence in the North Atlantic (the North Atlantic wave environment is the functional requirement of GBS). The distribution was developed by IACS for the northernmost zones of North Atlantic through:

- fitting the theoretical distributions to the average data of zones 8, 9, 15 and 16 of Global Wave Statistics (British Marine Technology. 1986), in the first step; and then
- the use of the fitted distribution to determine the probability distribution of sea state occurrence (presented in 'IACS Rec. 34, Standard wave data').

The recommendation of International Ship Structures Congress (Lyngby, 1988) that the observed, measured or hindcasted wave data should be smoothed and extrapolated to more extreme, less frequently occurring conditions, was incorporated into the fitting the theoretical distributions.

The Global Wave Statistics wave data is based on visual observations of waves collected from ships in normal service; however, the "eye concentrates on the near, steeper waves, while the visually observed wave periods tend to be shorter than instrumentally observed periods" (WMO Guide to Wave Analysis and Forecasting).

The visual observations of waves and their extrapolation causes that long term predictions of vertical bending moments are greater by about 15% than required by "IACS Unified Requirement S11 Longitudinal Strength Standard" which well assures longitudinal strength of hull girder.

This conclusion implies that Rec 34 should be updated to reflect the reality. However, there are problems how to do that because satellite data is not fully accepted due to lack of knowledge about their accuracy. The wave hindcast data generated by the wave spectral model are global today, but there are large discrepancies in prediction offered by different databases, the measured wave data limited to the coastal areas etc.

The wave hindcast data generated by the wave spectral model seems the only way to solve the problem of wave data. However, to determine the nonlinear energy transfer through the wave spectrum it is necessary to solve strongly non-linear wave problem derived by Prof. Zakharov in 1968.

Simplifying assumptions introduced allowed for better understanding of the physics at the cost of a strict mathematical solution. Despite the simplifications introduced, the evaluation of the nonlinear energy transfer, caused by four resonantly interacting waves, requires an enormous amount of computation of integrals in six-dimensional space. Therefore, the proper solution of this problem still is a challenge for the industry.

PRS collaborates with professors of mathematics from Gdansk University in solving the problem in strict mathematical manner. At this stage, PRS is testing the solution of the problem for first, second, third, etc., order of nonlinearities.

What is it about speed that upsets the shipping industry?

You won't find many — if any — who disagree that the higher the speed of a ship, the higher the level of greenhouse gas emissions, writes Lars Roberts Pederson, Deputy Secretary General at BIMCO.

So why would I argue that, while imposing speed limits may have a popular ring to it, it is not the answer as the industry seeks to cut emissions? After all, our mission is to do exactly that: cut emissions.

The important question is not whether a speed limit should be introduced to cut emissions, but how it would be checked. Before vouching for an argument, one must lock at whether it can be done.

What looks good on paper does not always work in practice. Enforceability is a very important aspect of any meaningful regulation. Can authorities check for compliance? Is the regulation meaningful if it can't be checked?

Only one option would work in practice

I can think of four possible options, but only one works when it comes to implementing a solution that can be measured and checked accurately, and that correlates to emissions:

- A limit for speed through water. This cannot be checked accurately, but correlates closely to emissions.
- A limit for speed over ground. This can be checked accurately, but there is a much lower correlation to emissions.
- A limit for average speed (over ground or through water). It may be possible to check this, but there is also a much lower correlation to emissions.
- Limits for propulsion power. This is the only option that can be checked accurately and has a close correlation to emissions.

To understand why this last option is the best solution, we must get technical.

Most people have an intuitive understanding of what speed means, and that is usually derived from personal observations when we move on the ground. If you move 7km in one hour, your average speed is 7km per hour. Short and simple.

What is less simple is recognizing that, when we move on the ground, there is no slip. The wheels on our car turn one revolution, and the car has moved exactly the distance equal to the circumference of the wheel.

It is different at sea — and, for that matter, when we talk about movement in the air.

Measuring a ship's speed through water is not accurate

When a ship moves, it moves through water. It also moves over ground — and so does the water in which the ship sails. Observing a ship's speed over ground is really an observation of the ship's speed through water plus or minus the current at any given time.

The problem is, we do not know the current at any given time, and measuring a ship's speed through water directly is not very accurate, either.

When a ship is new, and the shipyard measures its speed/power curve, it does so by conducting a very precisely measured double run between two fixed positions: there and back. This eliminates the influence of current and results in an average speed over ground that accurately reflects the ship's speed through water.

When a ship is in operation, it is impractical to measure in this way. The shipping company still wants to keep an eye on the ship's performance, and this is often done by observing propeller revolutions and factoring in an average slip percentage for the ship.

Slip is the relationship between the observed movement of the ship when the propeller turns one revolution in water and the propeller's theoretical movement of the ship had the water been a solid material.

Some ships have doppler speed logs, which use advanced techniques to measure the speed of the water column below the ship relative to the ship itself Still, the water flow is not laminar close to the ship hull and such devices need frequent adjustment to produce accurate results.

In summary, measuring a ship's speed through water is not a precise exercise.

Low correlation between emissions and speed over ground

If you measure a ship's speed over ground and try to correlate this to the emissions or the power of the engine, you would get a very large scatter. This is because the current changes try time and location — and it changes significantly. The difference between favourable currents with a ship and unfavourable currents against a ship may be as large as 50P/0 of the speed observed over ground.

So there is a low correlation between a ship's emissions and its speed over ground.

Cutting average speed — where is the emissions connection?

When we look at average speed — the third option, above — we need to bear in mind how speed through water and power correlates for a ship to understand if this could work. Remember the rule of thumb: power = constant x speeds.

A ship travelling between two locations, sailing at constant speed, emits 100% COa. A ship travelling between the same two locations — sailing the first half distance at 50% higher than the average speed, and the second half distance at half of that higher speed — would emit 141% COv. These two scenarios give the same average speed for the ship.

So there is no correlation between average speed through water and emissions. Averaging speed over ground just make things even more arbitrary.

Emissions are driven by power of the engine

All this may seem unimportant, but emissions are driven by the power of the engine that turns the ship's propeller. There is very good correlation between emissions and power of the engine.

There is also a reasonably good correlation between a ship's emissions and its speed through water, as mentioned in the first option. We must keep in mind, however, that two ships with the same cargo-carrying capacity — but different efficiency — would have different emissions. So the correlation between many ships travelling at the same speed and their emissions is not good.

We can continue to talk about speed limits for ships, but if we forget to ask ourselves the fundamental question of whether it helps cut emissions, we are heading in the wrong direction on our way to the industry's 2050 greenhouse gas emission targets.

Limiting emissions via a ship's power to the propeller not only gets us in the right direction, it encourages innovation around more efficient ships — and helps us assure a level competitive playing field on our way there.

Counting down to sulphur 2020: limiting air pollution from ships; protecting human health and the environment

Participants at the roundtable discussion on the consistent implementation of the 0.50% sulphur limit agreed on the need to continue to raise awareness of the requirement.

New requirements for ships to cut sulphur oxide emissions enter into effect on 1 January 2020, marking a sea change in fuel used by ships, globally, which will significantly reduce air pollution from ships with positive benefits for human health and the environment.

IMO has been preparing ahead of the implementation date. From 1 January 2020, under IMO's MARPOL convention for the prevention of pollution from ships, the sulphur content of fuel oil used by ships operating outside designated emission control areas shall not exceed 0.50% — representing an 80% cut from the current 3.50% limit.

At a roundtable industry meeting hosted by IMO at its London Headquarters (21 June), participants were updated on the latest guidance, treaty amendments and other instruments emanating from IMO to support the implementation of the "sulphur 2020" rule. All of these have been developed by Member States working through IMO, in collaboration with stakeholders, recognizing the need for cooperation in order to develop and deliver technically robust instruments for international shipping.

Industry participants* from the shipping, oil refinery and bunker industries welcomed with appreciation the effort made by IMO to address concerns and reviewed progress towards implementation.

The IMO Secretariat highlighted the latest decisions emanating from IMO's Marine Environment Protection Committee (MEPC 74), including adoption of guidelines on consistent implementation, port State control and other guidance; and from the Maritime Safety Committee (MSC 101), including the adoption of Recommended interim measures to enhance the safety of ships relating to the use of oil fuel.

Industry participants reported on their work, including the latest version of the ICS Guidance to Shipping Companies and Crews on Preparing for Compliance with the 2020 'Global Sulphur Cap' which will be published in the first week of July 2019; a Joint Industry Project developing industry guidelines with a focus on safety to support implementation, including training; updated charter clauses developed to address sulphur 2020 and fuel issues; investment by the oil refining industry in new blends of fuel oil to meet the limit; and potentially linking sulphur 2020 provisions with current ship inspection programmes.

Participants recalled that 1 January 2020 is now less than six months away and expressed their commitment to enhancing collaboration, including further information sharing among stakeholders, as appropriate, to make a smooth transition to the 0.50% limit, recognizing the benefits for human health and the environment.

Availability of compliant fuel oil

Views were exchanged on the general availability of fuel to meet the 0.50% limit, with ships expected to begin taking on 0.50% low sulphur blended fuels from October/November onwards, in order to be ready for 1 January 2020. A forecast from the International Energy Agency (IEA), in April 2019 forecasts that the refineries will have capacity to make the compliant fuel oil available. Compliant fuel oil has already been made available for testing by some ships.

The roundtable participants urged the need for the oil refinery and bunker industry to continue, and strengthen where possible, their efforts to provide sufficient compliant fuels as early as possible to allow more ships to test trial for experience gaining. There was also a need for more information on the new fuel products to be made widely available.

Fuel oil safety

Potential safety issues with new blends of fuel oil have been recognized and IMO guidelines provide advice on steps to take to address those risks.

It was noted that the International Organization for Standardization (ISO) has been developing a Publicly Available Specification (PAS) related to the 0.50% limit. The PAS will provide additional guidance on the application of the existing ISO 8217 specification for fuels for use in marine diesel engines and boilers, for example, compatibility and stability of new blends of fuel oil.

The roundtable participants highlighted the need to provide further information on arising safety issues and to enhance crew training in anticipation of the new fuels being made available before the end of 2019, and to highlight the safety aspects in particular.

Enforcement and compliance

Consistent enforcement by port State control was recognized as essential to ensure a level playing field and ensure the shipping market would not become distorted. Participants acknowledged the adoption of relevant 2019 Guidelines for port State control under MARPOL Annex VI chapter 3. The IMO Sub-Committee on Implementation of IMO Instruments (III 6) meets 1–5 July and could provide an opportunity for information sharing by port State control regimes.

Reporting to IMO and information sharing

Participants recognized the need to further improve reporting and information sharing through the IMO Global Integrated Shipping Information system (GISIS). MARPOL Annex VI requires information to be provided, including on fuel oil availability, incidents of non-availability of compliant fuel oil and fuel oil quality. Work is already under way to review the current MARPOL Annex VI module to provide greater scope for data entry and to make the module more user friendly.

Raising awareness

Participants agreed on the need to continue to raise awareness about sulphur 2020.

An open source free to access e-learning course is being developed through the joint industry project, for use by seafarers and others. The course will offer three modules, the first will focus on IMO Guidance on the development of a ship implementation plan for the consistent implementation of the 0.50% sulphur limit under MARPOL Annex VI (MEPC.1/Circ.878).

A new IMO leaflet outlines the requirement, answers the most frequently asked questions about the rule and provides a list of the instruments supporting implementation, best practice guidance, Port State control and sampling guidelines and others.

IMO will publish a compilation of all related guidance, best practices and so on, as a single IMO publication (hard copy and electronic formats) later this year. DCi

Major investment by ADM in Santos

ADM is to invest $18.55 million in its Santos terminal, in Brazil.

The purchase of equipment and upgrading work at the terminal will begin immediately, with the company forecasting that this will have been completed by May 2020.

One of the main works will be a dust suppression system that will be deployed around the new dump site for rail wagons.

In addition, ADM is to acquire a fully automated solution from Germany to haul wagons within the terminal; this is a first in Brazil. Two of these systems are fully electric and two are diesel-electric. The former will tow empty wagons and the latter haul loaded ones.

An ADM spokesperson explains that the company wants to deploy this technology to enable it to remove all diesel locomotive movement within the terminal replacing them with sustainable alternatives.

The company is also intent on removing loading conveyors, because of their associated dust problems.

As a means of enhancing dust suppression, ADM will install a brand new suppression system similar to that it currently uses in Warehouse 39. At the same time, the fire fighting system will be upgraded to modern standards.

Security at the Santos terminal is to be upgraded, too, through the introduction of a new gate system at the Ponta da Praia access. The idea is to reduce the impact of HGVs having to cross Mário Covas Avenue to enter the terminal.

In future, the gate will be set further back into the terminal, so no HGVs overhang into the road when they stop at the access gates.

ADM has also added a further 3,000 square metres to its operating concession. However, this is not new operational area, but rather roads that cross the actual terminal. These were acquired since the port authority could no longer afford to pave them and provide drainage. ADM will now finance the paving with concrete and install a brand new drainage system.

Barry Cross

Gdansk Shipyard at the Central Port

In early July, representatives of the Port of Gdansk Authority and the Gdansk Shipyard signed a letter of intent. The Shipyard is interested in investing in the production areas at the Central Port.

The Central Port will be one of the largest and most modern seaport investments in Europe. Deepwater terminals, including container, general cargo, passenger, and LNG terminals, will be constructed over an area of more than 400ha of reclaimed land. In May, the PGA presented the finished concept for the development and adaptation of the new infrastructure. The premises of the Central Port will also include sections intended for the shipbuilding industry. And it is this opportunity that the Gdansk Shipyard wants to take.

"We have been holding talks with potential partners who would like to locate their businesses at the Central Port for months now. We have been meeting representatives of the largest companies from the maritime and logistics sector from all over the world. The letter of intent signed with the Gdansk Shipyard shows that serious entrepreneurs, also from Poland, are interested in our offer," explains Lukasz Greinke, President of the PGA.

The Port of Gdansk is currently the fourth largest port in the Baltic Sea. Reaching this position was possible thanks to record transshipments — in 2018, Gdansk's terminals and quays handled over 49 million tonnes of cargo.

The construction of the Central Port is supposed to double the annual transshipment volume.

"The strategy of the Gdansk Shipyard, Baltic Operator, and GSG Towers companies involves diversification of production, which secures us against short-term fluctuations in demand in the market. Given the involvement of the Shipyard Group in the performance of an increasing number of contracts in the shipbuilding, offshore, wind energy, and infrastructure construction industries and taking into consideration the planned investments, we expect that within the next decade, our production area on the Ostrów Island may turn out to be insufficient, which is why we took note of the PGA's plans concerning the inclusion of a shipbuilding section in the Central Port concept with such interest," says Wojciech Peret, President of the Board of the Gdansk Shipyard, Baltic Operator, and GSG Towers.

The Central Port will include a basin covering about 1,400ha and a reclaimed area covering 410ha. The project involves the construction of nine terminals. Four turning areas and three approach fairways will also be built.

The construction of the Central Port in its final form presented in the concept will cost about PLN 12 billion, including expenditures on the part of the maritime administration — on the construction of new breakwaters, turning areas, and approach fairways. The Port Authority intends to carry out the investment as a public-private partnership. The first terminals may be ready as soon as 2029.

Fog cannon for Tubarão port

Brazilian mining, railway and port terminal operating company Vale has installed a 'fog cannon' at its facilities at the Port of Tubarão. This releases water vapour into the atmosphere to reduce the number of iron ore particles escaping into the atmosphere over the Greater Vitória area.

Vale's mining activities have recently led to disastrous land slips at both Mariana and Brumadinho, so the measures at Tubarão were greeted with enthusiasm by local dignitaries.

State Governor Renato Casagrande said, "I think everyone […] understands this agenda of air pollution." He noted that both Vale and Arcelor are making significant investments in this area, but stressed that, "We will not totally solve the pollution [problem], but we will soften it a lot." In addition, he said that, "The state needs to move forward in air quality policy."

Every six months, the state government will hold meetings to follow up and analyse the results, with the governor confident that there would be a reduction of airborne particles and higher air quality in the Metropolitan Region. *Barry Cross*

Spanish ports see significantly lower dry bulk traffic this year

In figures just released for the first four months of the current year, there have been notable falls in dry bulk traffic at Spanish ports.

In April, while liquid bulk tonnage declined by 5.76%, dry bulk traffic plummeted 20.19% to 6.761mt (million tonnes) compared to the same period in 2018.

In terms of the accumulated traffic for the year, bulk liquids were down 0.32% while dry bulk was down 5.29% to 31.187mt.

Port of Gijón.

Port of Ferrol.

As ever, the northern Port of Gijón was the leading Spanish bulk port. In April, it registered traffic of 1.117mt (million tonnes), some 26.53% down on April 2018. Ferrol, which handled 0.613mt in April, was 34.85% down month-on-month.

Bucking the trend was Cartagena, up 4.37% to 587,438 tonnes.

Another of the big hitters, Tarragona, handled 583,703 tonnes, down 27.34%, while Almeria was up 24.58% to 520,135 tonnes.

The trend in bulk solids traffic continued into May, too, resulting in Spain's ports handled a combined 38.462 million tonnes for the five month period, down 7.04%. *Barry Cross*

Vale to provide relief for Ponta da Madeira

As of 2020, Brazilian mining company Vale is to double production at its mines in the Serra Sul de Carajás, in the state of Pará, to 150 million tonnes of iron ore per year.

As a result, it has recently announced that it is to build both a rail link and port in the state to absorb this additional production.

The line will link the existing Carajás Railway (EFC) to the Port of Vila do Conde and provide much-needed relief for Vale's Port of Ponta da Madeira, in Maranhão, which is handles output from the company's largest mine.

This positive news contrasts with Vale's activities in the state of Minas Gerais, where several operations have been suspended due to the state of dams.

Vale is also to set up a steel mill in Pará at Marabá, following an agreement signed with China Communications Construction Company (CCCC). Output will probably be handled by the new rail line for export.

Barry Cross

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Best half-year ever for North Sea Port freight transshipments

North Sea Port sea freight transshipments in the first half of 2019 totalled 36.6mt (million tonnes). With its limited growth of 2% compared to the same period in 2018, this is once again the best semester ever.

The 2% growth in the first semester of this year is in line with expectations and the budget. North Sea Port is a true bulk port. Bulk cargo makes up three-quarters of sea freight. The dry bulk sector saw the highest growth. Container handling also greatly improved.

Bulk goods and containers

In terms of tonnage, dry bulk accounts for the largest part of cargo volume with 17.5mt. Its growth of 9% reflects the strong building construction sector (sand) and iron ore.

With an increase of 550,000 tonnes (81%), container transshipment once again showed very strong growth and reached 1.2mt. Some companies in North Sea Port managed to attract new shipping services in the past two years, which has a positive

effect on the transshipment figures.

After a strong increase in the previous year, liquid bulk has fallen by 4%, mainly with respect to petroleum fuels and energy gases. The liquid bulk segment comes to a total of 10.4mt.

The transshipment of general cargo falls by 10% to 5.6mt. More and more goods in the food sector and other sectors are transported by container, which reduces the share of general cargo. Transshipments of rolling cargo (ro/ro) declined by 11% (total 1.7mt).

Forecast

North Sea Port is slightly optimistic about the prospects for the second half of the year.

About North Sea Port

North Sea Port is the 60km cross-border port area from Vlissingen and Borsele and Terneuzen in the Netherlands to Ghent 32km in the Flemish/Belgian inland. Since 1 January, North Sea Port has been the merged port of Dutch Zeeland Seaports (with Vlissingen and Terneuzen) and the Flemish Port Authority of Ghent.

Volumes up at the Port of Thunder Bay

The Port of Thunder Bay is reporting strong cargo volumes at the end of June. Shipments of Prairie grain, the port's primary commodity, remained ahead of last year's pace in June, continuing a three-month trend.

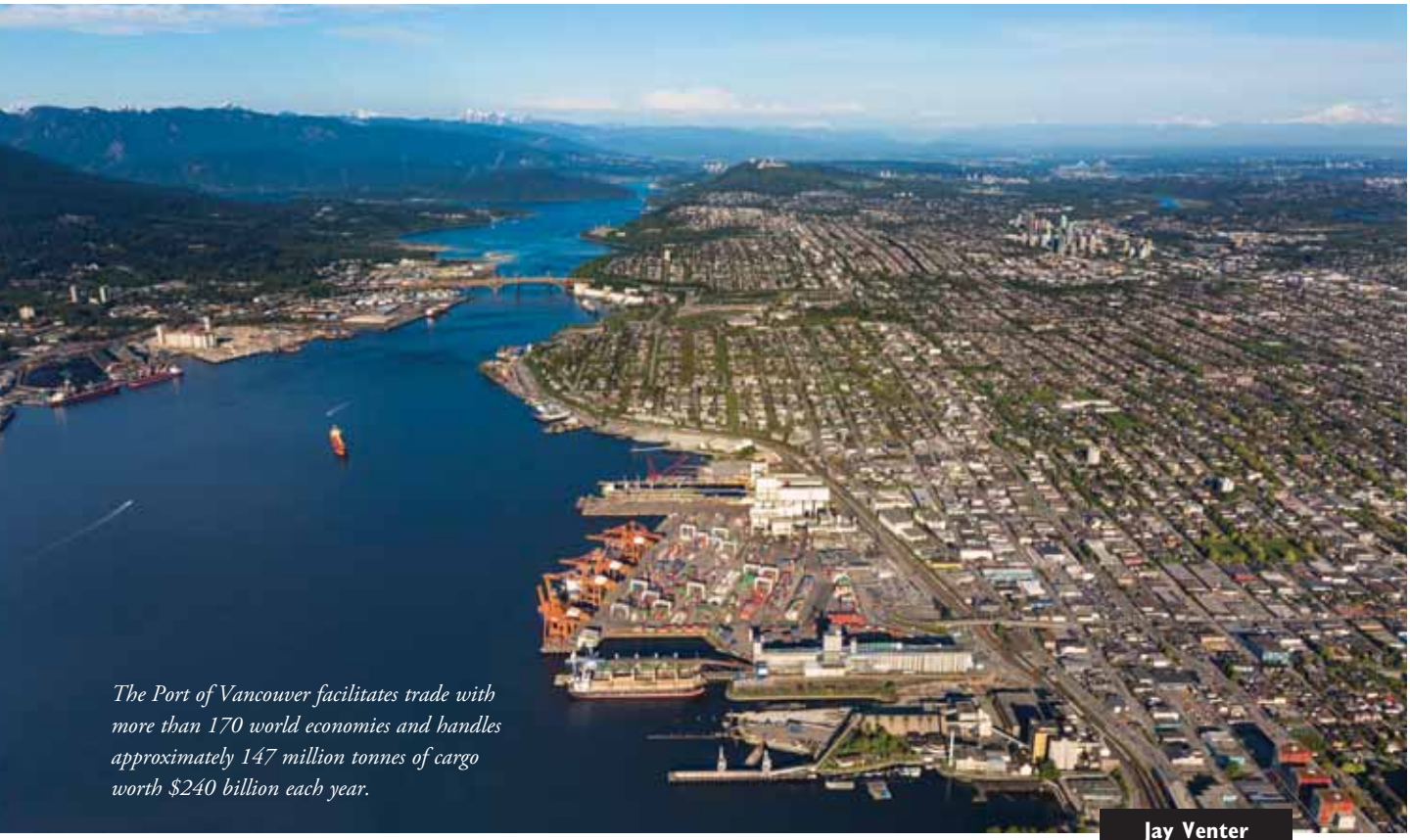
Year-to-date grain volumes of 2.5mt (million metric tonnes) are 9% higher than the same period last year. This is largely attributable to a ten-fold increase (+200,000 tonnes) in canola exports through the port this season. Canola exports from Thunder Bay to Europe and Latin America have surged since China, Canada's largest canola customer, closed its doors to Canadian shipments of the commodity. Canola shipped to China moves through the West Coast ports of Vancouver and Prince Rupert.

As Western Canada's most efficient grain port, Thunder Bay is equipped to handle grain surges with relative ease. The port has the fastest railcar and ship turnaround times and the largest operating grain storage capacity.

Other cargoes crossing the docks in Thunder Bay during June included coal and potash mined in Western Canada, liquid calcium chloride for local consumption and an inbound shipment of pulp and paper mill equipment. Overall cargo volumes are 7% higher than last year as of June 30.

West Side Story

North American West Coast bulk handling activities



The Port of Vancouver facilitates trade with more than 170 world economies and handles approximately 147 million tonnes of cargo worth $240 billion each year.

Jay Venter

Port of Vancouver benefits from ongoing infrastructure investments

About the Vancouver Fraser Port Authority

The Vancouver Fraser Port Authority is responsible for the stewardship of the federal lands and waters of the Port of Vancouver on behalf of Canadians and in support of national trade objectives.

The Authority is a non-shareholder corporation established by the Government of Canada in January 2008, pursuant to the Canada Marine Act, and is accountable to the federal minister of transport. Like all Canada Port Authorities, it is financially self-sufficient, collecting rental income from terminals and other tenants as well as various commercial fees. The profits it makes are reinvested in port-related infrastructure and services.

About the Port of Vancouver

As Canada's largest and North America's most diversified port, the Port of Vancouver facilitates trade with more than 170 world economies and handles approximately 147mt (million tonnes) of cargo worth $240 billion each year.

The Port of Vancouver's 27 marine cargo terminals are served by three Class-I railways, CN, CP and BNSF, which provide direct-access to key North American markets, and are supported by a well-established network of transload and warehousing facilities.

Supporting a long-established Asia market presence, the port has a Chief Representative and dedicated office in Shanghai, further highlighting its importance as a key corridor for goods movement in the Asia-Pacific gateway.

Collaboration among supply-chain partners has delivered improved operational performance. The Vancouver Gateway offers sustained investment in terminal capacity expansion and transportation infrastructure, and leading reliability initiatives that together result in greater supply chain consistency, transparency and predictability.

Bulk terminal upgrades and new builds

G3 Global Holdings Limited | Lynnterm West Gate | G3 Terminal Vancouver

On 30 May 2016 a project permit was issued to G3 Terminal Vancouver Limited Partnership (formerly G3 Global Holdings Limited – G3) to build G3 Terminal

Vancouver on federal lands managed by the Vancouver Fraser Port Authority at 95 Brooksbank Avenue in North Vancouver, British Columbia.

The proposal includes removal of existing buildings and facilities, site preparation, and construction of a new grain terminal including buildings, grain storage silos, and a new berth for vessel loading. Annual throughput is estimated at 8mt (million metric tonnes). The proposed terminal will consist of steel buildings, conveying systems, and concrete structures, the highest of which is the cleaning building at 80m (264ft.) above grade. Forty-eight proposed concrete grain storage silos are 42m (140ft.) in height. A rail loop is proposed to be able to accommodate three trains of up to 150 cars each per day.

Pacific Coast Terminals | Potash Handling Facility Project

K+S Potash Canada and Pacific Coast Terminals (PCT) commissioned the opening of a state-of-the-art potash handling and storage facility at PCT's Port Moody terminal in late-2017. Work included modifications to PCT's existing facility as well as the construction of a new potash storage building on the site, a 263-metre-long storage warehouse with capacity for 160,000 tonnes of product.

Construction of the potash handling facility is complete and will result in rail deliveries of 177 car unit trains, approximately one train every three days. At an assumed vessel size of 50,000 metric tonnes, the proposed project would result in 44 additional vessel calls to the terminal per year.

Fraser Grain Terminal Ltd. | Grain Export Facility Project

On November 9, 2018 a project permit was approved for Fraser Grain Terminal Ltd. to build a grain export facility at 11041 Elevator Road in Surrey, British Columbia on federal lands managed by the Vancouver Fraser Port Authority.

The Applicant proposes to construct a grain export facility to ship up to 4mt per annum of bulk grain products including wheat, barley, oil seeds, pulses and other speciality grains on the Fraser River via an existing berth at Fraser Surrey Docks. The project would add 3.5mt per annum of grain capacity, with the remaining 0.5mt per annum coming from the existing Joint Venture grain facility at FSD. The proposed Project includes the construction of 25 above ground steel storage silos, three fixed stationary shiploaders, a semi-loop rail track, container loading facility and storage yard, rail and truck loading facility and other associated terminal infrastructure.

The terminal would receive grain by rail which would then be transferred to storage silos, or directly loaded onto ocean-going vessels at Fraser Surrey Docks should a vessel be waiting at the dock. From the storage silos, most of the grain would be loaded onto vessels, and any remaining product transferred into containers, rail cars or trucks. Containers for export would be trucked to other container terminals, such as Deltaport and Centerm. A small amount of agri-product would be distributed to customers in the Fraser Valley via rail and trucking.

PORT OF VANCOUVER STATISTICS OVERVIEW 2018

Metric tonnes	2016	2017	2018	% change*
Auto **	393,280	429,875	424,985	–1%
Breakbulk	16,240,034	16,626,857	18,209,032	10%
Bulk	93,846,874	98,991,989	101,794,797	3%
Containerized	25,057,225	26,018,829	26,664,685	2%
Total tonnage	135,537,413	142,067,550	147,093,499	4%
Auto (units)**	393,280	429,875	424,985	–1%
Containers (TEUs)	2,929,585	3,252,220	3,396,449	4%
Cruise passengers	826,820	842,928	889,162	5%
Foreign vessel arrivals	3,105	3,219	3,145	-2%

** For the remainder of this report, "% change" refers to change between 2017 and 2018 figures*

*** 1 Vehicle Unit = 1 Metric Tonne*

Import/Export figures:

Port of Vancouver handled 147mt of cargo in 2018, up 4% from the previous year's 142mt (see table for more details).

Ongoing successes in securing collaborative infrastructure funding

Vancouver to benefit from more than $300 million in federal funding for key goods-movement infrastructure projects

On June 22, 2018, Canada's federal government announced $167 million in funding for three projects that will reduce traffic congestion, improve goods movement, and enable more efficient transportation corridors.

This, combined with $55.8 million previously announced for four other critical infrastructure projects in the region brings the total funding amount through Transport Canada's National Trade Corridors Fund to more than $200 million.

"Today, it's my great pleasure to thank Minister Garneau and his government for the significant investment in critical road and rail projects that will both support Canada's growing Trans-Pacific trade and protect the livability of local communities," said Robin Silvester, president and chief executive officer at the Vancouver Fraser Port Authority.

The National Trade Corridors Fund is part of Transport Canada's Transportation 2030, a strategic vision to support a safe, secure, green, innovative and integrated transportation system that better moves products to markets and grows Canada's trade.

After extensive study, nearly 40 priority infrastructure projects were identified for the Lower Mainland region and close to half were submitted for funding through the National Trade Corridors Fund. The list was compiled through the collaborative efforts of the port authority, Transport Canada, B.C.'s Ministry of Transportation and Infrastructure, TransLink and the Greater Vancouver Gateway Council, culminating in an infrastructure strategy called Greater Vancouver Gateway 2030 designed to ensure the roads and railways that lead to the Port of Vancouver are ready to manage Canada's growing trade.

These investment in infrastructure will provide national, provincial, regional, and local benefits. Key among these benefits is the alleviation of transportation bottlenecks, which will greatly increase the efficiency of moving commodities, such as grain, through the Port of Vancouver. These improvements will enable Canadian companies to get their products to market faster, while also reducing congestion on the roads for local communities.

"Together with our local members of Parliament, municipalities, Indigenous groups, and our industry stakeholders, we look forward to continuing to work on these and future projects that prepare our region and the Port of Vancouver for Canada's expanding trade opportunities," continued Silvester.

Government of Canada invests in transportation infrastructure at the Port of Vancouver to move goods to market

The quality of Canada's transportation infrastructure and the efficiency of the country's trade corridors are key to the success of Canadian companies in the global marketplace.

The Government of Canada invests in infrastructure projects that create quality, middle-class jobs and support economic growth.

On 23 July, the Honourable Marc Garneau, Minister of Transport, announced a major investment of $102 million for five projects that will increase efficiency at the Port of Vancouver and move Canadian goods to international markets.

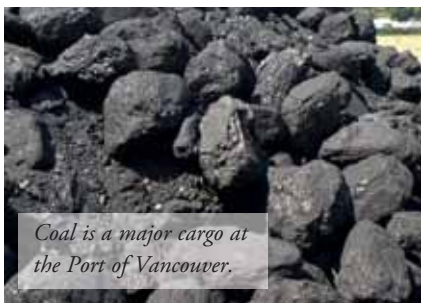
The projects are:

- $42.7 million to consolidate the operations of the Annacis Auto Terminal and the Richmond Terminal to accommodate the growing Asian automobile market and improve rail operations in the area;
- $12.2 million to improve road and rail traffic operations and develop new rail-serviced bulk export marine terminals within the Fraser Surrey Port Lands;
- $39.4 million to improve traffic flow and reduce congestion in the Portside/Blundell corridor in Richmond;
- $1.6 million to explore ways to handle increased trade volumes by evaluating the viability of short sea shipping in Greater Vancouver; and
- $6 million to develop a real-time dashboard for the Ports of Vancouver and Prince Rupert to measure end-to-end performance of the supply chain for all cargo moving through both ports.

These investments are expected to have important economic and employment benefits for the region by creating an estimated 2320 jobs in the region during construction. They will allow the Port of Vancouver to remain competitive now and in the future.

The Government of Canada is supporting infrastructure projects that contribute most to Canada's success in international trade. Trade diversification is a key component of the National Trade Corridors Fund, funding projects that:

- improve the fluidity and performance of the transportation system to increase the value and volume of goods exported from Canada to overseas markets; and
- generate new overseas trade as a result of the investment.



Coal is a major cargo at the Port of Vancouver.

Quick facts

- Canada's western ports exported approximately $55 billion of goods in 2018. With respect to volumes, the Port of Vancouver is Canada's largest port and the third largest in North America. It handled 147.1mt (million tonnes) of cargo handled in 2018 (2.8mt per week). The port moves many of Canada's key export commodities including coal, grain, forest products, chemical, metals and minerals and fertilizers.
- The Government of Canada is making investments that help Canadian exporters accelerate their presence in new markets, and take advantage of the new opportunities that exist because of the trade agreements the Government has secured in the past three years. By investing in export-intensive industries, the Government is committed to the creation of well-paying jobs and strengthening Canada's economy.
- Through the Investing in Canada infrastructure plan, the Government of Canada is investing more than $180 billion over 12 years in public transit projects, green infrastructure, social infrastructure, trade and transportation routes, and Canada's rural and northern communities.

Port of Prince Rupert offers ready access to global markets

The Port of Prince Rupert provides a Canadian trade solution to the challenge of global market access. Its bulk export business ensures its high-performance terminals can provide quality, competitive services to their shipping customers.

Access to global markets

The Port of Prince Rupert is a global gateway, exporting bulk commodities from Canada to destinations all over the world. The shortest Pacific route to Asia offers a shorter sailing time to strategic markets. While primary destinations for bulk cargo are China, Japan and Korea, others include Southeast Asia, the Americas, North Africa, the Middle East and Europe. Ridley Coal Terminal transports metallurgical coal for making steel in growing Asian economies. Prince Rupert Grain moves wheat and barley for food production in North Africa, the Middle East and the Americas. Westview Terminal transports wood pellets to be used as biofuel in Europe and elsewhere.

Proximity to natural resource production in Western Canada

The Port of Prince Rupert provides ready access for Western Canada's natural resource producers and exporters. CN's network in BC and the Prairies provides single line access from mines and fields and forests to the Port. Prince Rupert provides a strategic export gateway for bulk commodities from BC, Alberta, Saskatchewan and Manitoba.

Reliability reduces uncertainty

Part of what makes Prince Rupert ideal for exporting bulk commodities is the fluidity of the gateway. CN's northern mainline to Prince Rupert avoids urban congestion and ensures a fast, fluid transit of cargoes to the terminals. Port terminals and workforce are world leaders in productivity, ensuring goods are moved from rail and onto ships at industry leading performance rates.

Safe harbour for large bulkers

The Port of Prince Rupert is a deep, sheltered harbour making it ideal for loading and unloading large vessels. Prince Rupert has the deepest harbour in North America, is ice-free year round, and can accommodate the largest vessels in the shipping trade. The harbour's short and direct access to international shipping lanes requires only a two-hour pilotage and offers ample room for anchorages.

Ridley Coal Terminal

Ridley Terminals Inc. owns and operates one of the most advanced bulk commodity terminals, handling metallurgical coal, thermal coal and petcoke from primarily British Columbia and Alberta. The terminal has recently completed an extensive modernization program, increasing annual shipping capacity to 18mt (million tonnes) and improving efficiency and productivity rates.

Prince Rupert Grain Terminal

Prince Rupert Grain owns and operates Canada's largest grain terminal on the west coast, handling primarily wheat, barley, and canola from the Canadian prairies. It has an annual export capacity in excess of 7mt tonnes, offering the highest throughput rate of any grain terminal in Canada.

Westview Wood Pellet Terminal

The Westview Wood Pellet Terminal is a wood pellet receiving, storage and shipping facility. It receives wood pellets from railcars, stores pellets in metal silos, and loads wood pellets into bulkers bound for markets in Western Europe and Asia.

Diverse cargoes: the Port of Longview's key to successful operations

The Port of Longview has been handling an incredibly diverse mix of cargo since its establishment in 1921. Port leaders realized from the beginning that having a varied cargo portfolio would be an important way to offset any reductions from one particular commodity. This decades-old strategy allowed the port to be less reliant on any one type of cargo. It also led to the port becoming the third-largest in the state, attracting commodities of all kinds while creating thousands of local jobs.

In the first nine months, the port demonstrated its cargo plan by moving 72,000 tonnes of mixed freight. Lumber was an important first commodity, as was sugar (see photo above), grains, steel, paper products and automobiles. By 1927 the port fully realized the benefit (and stability) diverse cargoes could bring when 246,000 tonnes of cargo moved across the docks — more than tripling the total of the first year.

By making significant investments in infrastructure and equipment over the years the port was able to aggressively pursue new types of cargo, never losing sight of the flexibility its cargo handling model could provide.

From sacks of sugar in the 1920s to wind energy components today, the port's versatility is critical to its success.

Today, wind energy components traverse the port on trucks and rail, heavy lift project cargo takes up regular residency on the docks and grain exports have surged to an all time high. All of this cargo activity at the port has resulted in a record 10 million metric tonnes of cargo moved in 2018, a nearly 14,000% increase from its humble beginning.

From lumber and sugar in the 1920s to state-of-the-art wind energy equipment and facilities today, the port's cargo handling versatility continues to set it apart from competing ports on the West Coast. No matter the cargo, the Port of Longview is well equipped and committed to future growth and economic prosperity for the local community.

The port's Manager of Business Development, Laurie Nelson-Coole adds that what sets the port even further apart from other Columbia River ports is its location, "We are the first, full-service operating port on the deep-draught Columbia River. Now add almost 100 years of versatile cargo handling experience and you have a very attractive package. We also have an outstanding labour force that complements our cargo handling services perfectly. Our on-dock rail system, storage options, cargo berths and access to mainline rail and highway make the Port of Longview a top choice among our customers."

Dust control in mobile equipment

Over the last few years we have seen an increased interest for providing dust control to mobile equipment or stationary equipment located in isolated places, *writes Gonzalo Campos Canessa, CEO, The Raring Corp.*

'The Road Sprayer' controls the dust in mining roads, where regular trucks can not access.

This has happened in different industries and territories. Situated in Vancouver, Washington, most of the Raring Corp's 35 years' experience has been in the designing, manufacturing, commissioning and maintenance of dust suppression systems in stationary equipment inside industrial facilities. Nevertheless, there are many remote and mobile applications where the dust control hasn't been addressed successfully, mainly because of the lack of utilities and its intensive use. As part of the Raring Corp's innovation programme, the company is open to work with its clients and distributors to develop new equipment for these new applications.

A good example of a new research and development product is what the company has called 'The Road Sprayer'. TRC's Distributor in Chile, Pimasa, found an opportunity to control the dust in mining roads, where the regular trucks can not access. Pimasa also represents Quaker Chemical, a US Chemical company that offers chemical products to control dust generation, in Chile. Pimasa already had the chemical product to treat the roads but not an equipment to spray it, so they came to us, explained what they where trying to achieve, TRC presented Pimasa the conceptual equipment, built a prototype in few weeks, tested the Road Sprayer in Raring's shop in Vancouver WA and shipped air down to Chile.

This prototype equipment consist on a stand-alone skid capable to store, dose and spray the required amount of solution, both to the ground and the slopes on both sides of the road and the most important thing, it is light enough and small enough to fit on the back of a pick-up truck and does not blocks the rear mirror's visibility.

Pimasa's field team went on site to use the prototype and came back with a list of problems they did deal with in the field. They shared this information with TRC, which brain stormed internally, did some more tests in its shop and came up with the modifications required to successfully spray the roads at the copper mine site. TRC implemented those modifications and Pimasa went back to the field and did a great job spraying the Quaker solution. The client was happy and satisfied with the second test and it is interested in trying this equipment in other areas of the facility. This is a good example on how TRC can innovate, first understanding what the client is looking for (a need), brainstorming, prototyping, testing, learning from the failures, iterate and come up with a solution for the problem. TRC is willing to work close to its clients and help them solve their dust problems. DCi

SENNEBOGEN builds new customer service centre

Over 25 million investment in new location in Steinach/Lower Bavaria

SENNEBOGEN is investing in a new location in the municipality of Steinach/Landkreis Straubing. With the new Customer Service Center, it is further developing its growth and service strategy. In future, SENNEBOGEN will bundle its service activities in the areas of spare parts, customer service and SENNEBOGEN Vertriebs GmbH & Co. KG. By the end of 2020, two office buildings, spacious halls and a state-of-the-art spare parts warehouse will be built on 87,000m² of land. SENNEBOGEN Maschinenfabrik GmbH is thus investing over €25 million in a further location in Lower Bavaria, conveniently located at the intersection of the A3 motorway and the B20 federal highway. In the course of the new building, around 50 new jobs will be created in the region in the medium term.

With the new Customer Service Center near Straubing, SENNEBOGEN is emphasizing its service philosophy. With the spare parts centre, the customer service and the SENNEBOGEN Vertriebs GmbH & Co KG, all customer- and service-oriented divisions are bundled at one location, synergy effects can be exploited. Due to the location directly at the intersection of the A3 and B20, best accessibility for rental and used machines is offered. An optimum connection for international spare parts logistics and a strategically favourable location between the SENNEBOGEN plants in Straubing and Wackersdorf are also important locational advantages.

"With the new Customer Service Center in Lower Bavaria, we are underscoring our service philosophy and bundling all customer- and service-oriented divisions at one location." Erich and Walter Sennebogen managing directors, SENNEBOGEN

Spare parts management benefits from a highly modern logistics environment with an automation of warehouse technology and optimized logistics processes. In the fully automated spare parts warehouse with up to 30,000 articles there is space for 5,300 pallets and 37,400 small parts containers. In the 28m-high large parts cassette warehouse, components weighing up to 20 tonnes can be stored and managed.

Space is created at the site for state-of-the-art technologies and new jobs

With the new building, the building structure can be designed to meet the technological requirements of a modern, logistically optimized storage and shipping process. The other company locations in Straubing focus on the production and assembly of large and special machines. Any space freed up can be used for the expansion of production. In the course of the new location, around 100 jobs will move from Straubinger Hebbelstraße to Steinach. In the medium term, a further 50 jobs are to be created there with qualified specialists, in particular agricultural and construction machinery mechanics as well as technicians and engineers, for state-of-the-art telemetry and remote diagnosis techniques in an attractive working environment.

SENNEBOGEN Customer Service will move from its previous location in Straubinger Hebbelstraße to the office buildings with the most modern working environment, especially for digitized support solutions, and will have well-equipped workshop halls. SENNEBOGEN customer service will continue to be available to customers worldwide in the form of telephone and online support with experts. The latest remote support and remote diagnostics are used for machine monitoring and remote maintenance. At the same time, the SENNEBOGEN experts provide support if required, also worldwide with our own on-site service.

SENNEBOGEN Vertriebs GmbH & Co. KG. (SVG) is responsible for the international rental and used machine business and the direct sales of material handlers and telescopic loaders. In concrete terms, this means that with the Rental & Used offer, SENNEBOGEN supports the existing sales and service partners with an interesting portfolio of material handlers and cranes, either as used machines or for hire.

Furthermore, used machines are processed directly by the manufacturer in the REMAN (Remanufacturing) programme. As a second field of activity, SVG takes care of the direct sales of all SENNEBOGEN material handlers and telescopic loaders in Lower Bavaria and Upper Palatinate.

FLSmidth wins contract for new cement plant in Morocco

FLSmidth has won a contract to deliver a greenfield cement plant to a new customer in Morocco. The contract is worth DKK 335 million.

FLSmidth together with Société Générale des Travaux du Maroc (SGTM) signed a contract in June with TEKCIM S.A. to co-deliver a full cement plant with a capacity of 3,600 tonnes per day. The plant will be built in Ouled Ghanem in Morocco's El-Jadida province and is scheduled to be fully operational in the third quarter of 2022. FLSmidth's share of the turnkey contract amounts to DKK 335 million.

This is the first business cooperation between FLSmidth and TEKCIM. The process leading to the agreement has involved the African Development Bank as well as local commercial banks, and the parties involved have set very high standards in terms of quality and sustainability.

"The project includes state-of-the-art equipment that will provide TEKCIM with a very efficient cement plant. It also demonstrates FLSmidth's ability to support customers where financing is involved, which has been a key aspect to be awarded this project. The plant will fulfil strict international standards which is a clear statement that we as a premium player in the industry are following suit on our agenda of delivering sustainable productivity," said Jan Kjaersgaard, President, Cement, FLSmidth.

The contract scope includes engineering, supply of a full range of equipment from crushing to packing and loadout, supervision, commissioning and training of a local workforce.

The order is effective immediately and has been recognized in the order intake for Q2 2019.

About FLSmidth

FLSmidth delivers sustainable productivity to the global mining and cement industries. It delivers high-quality engineering, equipment and service solutions to its customers enabling them to improve performance, drive down costs and reduce environmental impact.

The company's operations span the globe and our 11,400 employees are present in more than 60 countries. In 2018, FLSmidth generated a revenue of DKK 18.8 billion.

Liebherr L 586 XPower® wheel loaders with adaptive working lighting

Dowideit is impressed by the low fuel consumption and high reliability of the new L 586 XPower®.

- Liebherr L 586 XPower® wheel loaders are used for the recycling of building rubble;
- low fuel consumption was a deciding factor for the investment;
- adaptive working lighting supports operators during poor light conditions;
- Dowideit Recycling GmbH already has two XPower wheel loaders.

A Liebherr L 586 XPower® wheel loader was recently put into operation at the Dowideit Recycling GmbH machine park in Wustermark. The company was impressed by the benefits of XPower wheel loaders, which combine fuel efficiency, high

Dowideit Recycling GmbH will also rely on Liebherr wheel loaders in the future. From left to right: Marcus Morgner (LBV Berlin sales representative), Thomas Dowideit (Dowideit managing director) and Ulrich Klar (LBV Berlin branch manager).

for Dowideit Recycling GmbH

performance, durability and comfort. The adaptive lighting, an intelligent lighting control system for XPower wheel loaders, ensures even greater levels of safety on the company's premises. Positive experiences with an L 580 XPower® already in operation at the machine park also influenced the purchasing decision.

Dowideit uses the new L 586 XPower® for recycling building rubble, soil preparation and composting. The wheel loader weighs almost 34 tonnes and has a considerable tip load of 23,500kg. It is in operation for around ten hours a day and consumes an average of 14.8 litres of fuel per operating hour when loading.

Safety is of paramount importance at the Dowideit recycling centre. Poor light conditions in the operating area pose difficult challenges to wheel loader operators when working. This is particularly the case in winter when shift work begins at dawn and ends at dusk. To counter this problem, the new L 586 XPower® is equipped with adaptive working lighting. This consists of an intelligent lighting control system which Liebherr offers as an option.

The adaptive working lighting features an additional LED headlight which optimizes the light conditions in the front section when the working attachment is raised. The result is an ideally illuminated operating area. Glare, reflections and shadows are reduced for the machine operator. The adaptive working lighting also features four dimmable working headlights on the upper edge of the cab (LED or halogen) and two standard driving headlights (LED or halogen), providing good light conditions and ensuring a high degree of safety.

"Thanks to the adaptive working lighting, the wheel loader operating area is completely illuminated. There is now a better overview of shaded areas and other areas which are difficult to see during loading. This increases safety on our site and makes daily work easier for my machine operators," explains managing director Thomas Dowideit enthusiastically.

The company located in Wustermark, in the state of Brandenburg, is a reliable partner for the civil engineering, demolition, recycling and transport industries. It also has a company branch specializing in the sale of soil material to customers who use the processed materials for road construction and in horticultural and landscaping projects. The new Liebherr L 586 XPower® wheel loader plays a central role in the preparation process.

The adaptive working lighting is available to customers upon request for all medium and large Liebherr wheel loaders. The additional LED headlight on the front section improves light conditions when the working attachment is raised.

Mantsinen invests over 12 million in its Ylämylly factory in Finland

From Finnish Lakeland to global markets

Mantsinen Group, specializing in material handling machines and logistic services, will invest over €12 million in its factory facilities and equipment. The investment will be focused at a new production and office space, milling boring centre and surface treatment line. This will be the most extensive one-time investment in production technology the company has made.

The main reason behind the investment is the rapid growth rate of sales of material handling machines during the previous years. Moreover, the company forecasts to double the turnover in the following decade, 2020s. Heavy material handling machines and hydraulic harbour cranes have been gaining market from traditional solutions, thus speeding up the growth of Mantsinen sales. Over 80% of the production is exported worldwide.

"Our goal is to become a very significant supplier of material handling solutions globally. New investment on production technology allows the growth of production capacity and increasing the production efficiency, as well as increases our competitiveness on the market. This is an extensive investment for us, but on the other hand, only one phase of our comprehensive investment programme," says Mia Mantsinen, CEO of the company.

This type of investment is made for the long run, and investment needs to adapt to future needs for decades to come. Modern equipment and spaces also add to the safety and ergonomic of the employees, and therefore hopefully to the well-being at work.

"[The] new milling boring centre and surface treatment line will meet both the existing and future needs in regards to size, capacity and functionality. Over 3,000m^2 (32,000ft^2) of new production space will be built, encompassing an assembly space in addition to the equipment. This relates to a growth of over 30% in our current production spaces," Mia Mantsinen notes.

Mantsinen has recruited over 30 new people in the last years, and the organizational growth is expected to continue along with the investment. Even now, the company is seeking skilled persons for multiple positions from production to customer service to management.

Strong both locally and globally

The construction will start this coming autumn and the project is due to finish in the autumn of 2020. The intensity of the project schedule is fitting for a company that has always wanted to challenge itself. With the intense growth, the roots of the company increases in meaning. "Our people have an amazing spirit of doing. We do this with a passion and we are strongly committed to continuously create new solutions to material handling community. On our way to a global influencer, we want to maintain the same spirit of entrepreneurship we have had for over 50 years. It is important for me that we continue to stay devoted to our values and our way of doing this in the future."

About Mantsinen

Mantsinen Group is a family business established in 1974. The group specializes in material handling machines and logistic services. It manufactures material handling machines and associated accessories at Ylämylly, Liperi and Rauma in Finland, and exports them globally through its partnership network. The logistic services are available in Finland and Russia. Mantsinen Group has over 500 employees.

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Arctic contract for Siwertell

Yara takes Siwertell ship-unloader to the world's furthest reaches

Bruks Siwertell has completed the on-time installation and successful performance tests of a new 600tph (tonnes per hour) Siwertell ship-unloader at Yara International's Norwegian fertilizer terminal in Glomfjord; 5km into the Arctic Circle and home to some of the most tightly-controlled environs in the world.

"Yara International is very satisfied and impressed that, just 18 months from the order being placed, it now has a new machine up and running and meeting the stringent environmental standards of the company and the site, without a single day of delay," says Peter Goransson, Sales

Manager and Senior Advisor, Siwertell.

Delivered from Bruks Siwertell's southern-European production facility and transported fully-assembled via heavy-lift ship, the Siwertell ST-490M ship-unloader has been successfully mounted onto its rails and intensive training and commissioning work is now complete. It is already being used to offload various types of rock phosphate from vessels of up to 20,000dwt and will also handle potash fertilizers.

"Yara is well aware that it can expect a lifespan of many decades from its new unloader, thanks to a previous Siwertell installation for the company that has been in service since 1980," continues Goransson. "It also knows that it can trust the operational and environmental performance of Siwertell technology."

The Glomfjord site is exposed to prevailing high winds, as well as very cold temperatures. It is subject to stringent environmental legislation, which protects the coastline from harmful emissions from shipping, and must also meet enhanced regulations by virtue of being within the Arctic Circle.

Industrial activities in these areas are therefore under intense environmental scrutiny. Yara's production plant, the world's northernmost fertilizer facility, is no exception and comprises four production units. It also has its own harbour with installations for unloading ammonia, as well as storage, packaging and dispatch systems for fertilizer products.

"In a country that leads the world in environmental legislation, it is little wonder that Yara took the future-proof step of making Siwertell screw-type ship unloaders its equipment of choice — especially for handling sensitive dry bulk material like phosphates," notes Goransson.

"The Siwertell screw-type ship unloader was not only chosen for its ability to safely handle these materials, and for its environmental credentials, which include high levels of efficiency, and a totally-enclosed conveyor system, eliminating dust emissions and spillage, but also for its impressive through-ship capacity," he says.

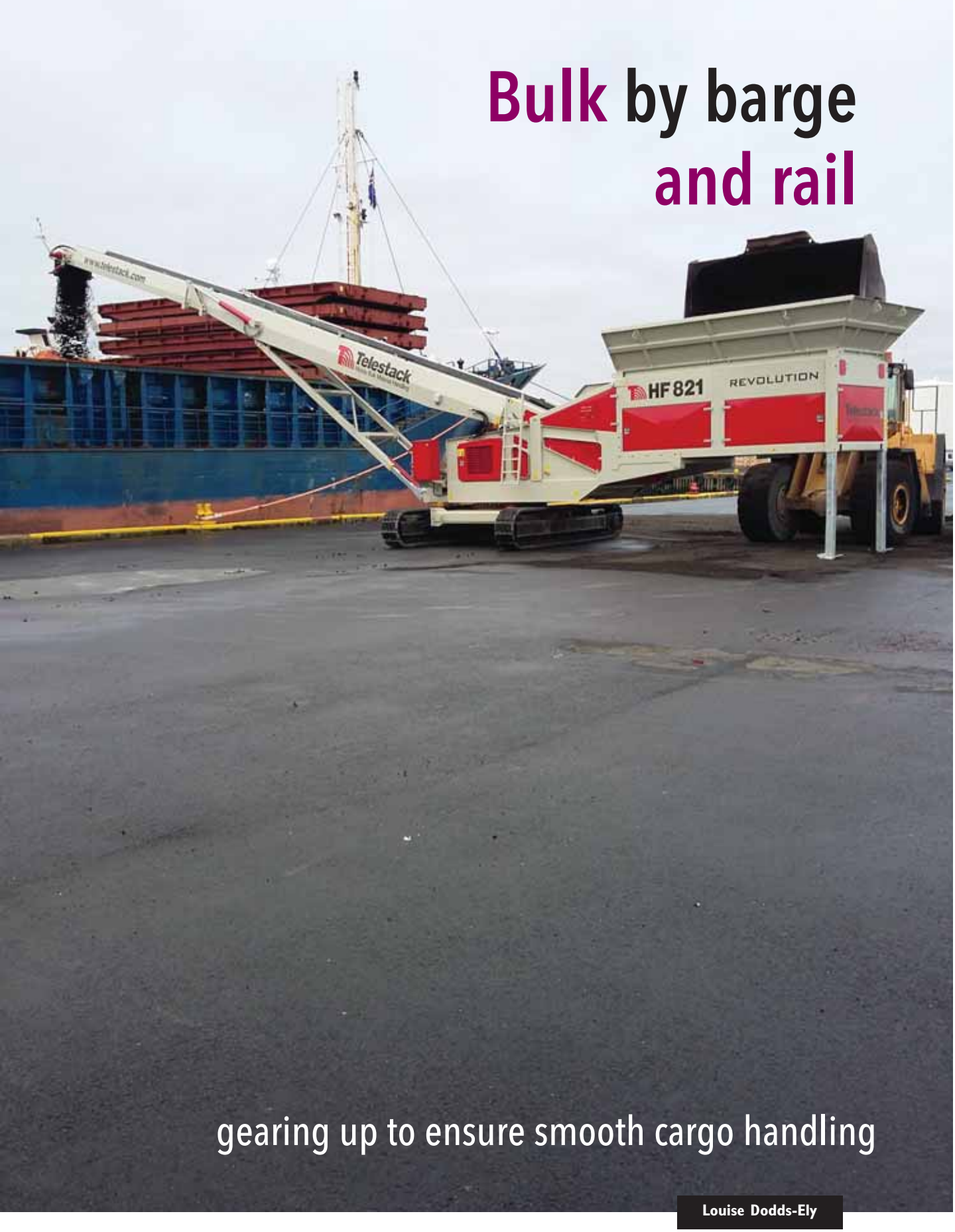
"We are delighted to have once again been Yara's choice for this uniquely demanding application," he adds. "We look forward to continuing our long and fruitful collaboration."

About Bruks Siwertell

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

Siwertell is part of Bruks Siwertell Group. DCi

Bulk by barge and rail



gearing up to ensure smooth cargo handling

Louise Dodds-Ely

HF821 revolutionizes Icelandic coaster loading application

Three common requirements from terminal operators are speed, efficiency and dust free loading. Hatch cover removal and reset are typical time consumers when loading barges. Telestack understands the characteristics of bulk material handling products and has experience in handling difficult and complex materials. Materials such as cement and alumina can have a splash effect that can cause unwanted dust production. Telestack has the experience and knowledge to provide a flexible solution to terminal operations, no matter what the location and surrounding environmental conditions. Telestack

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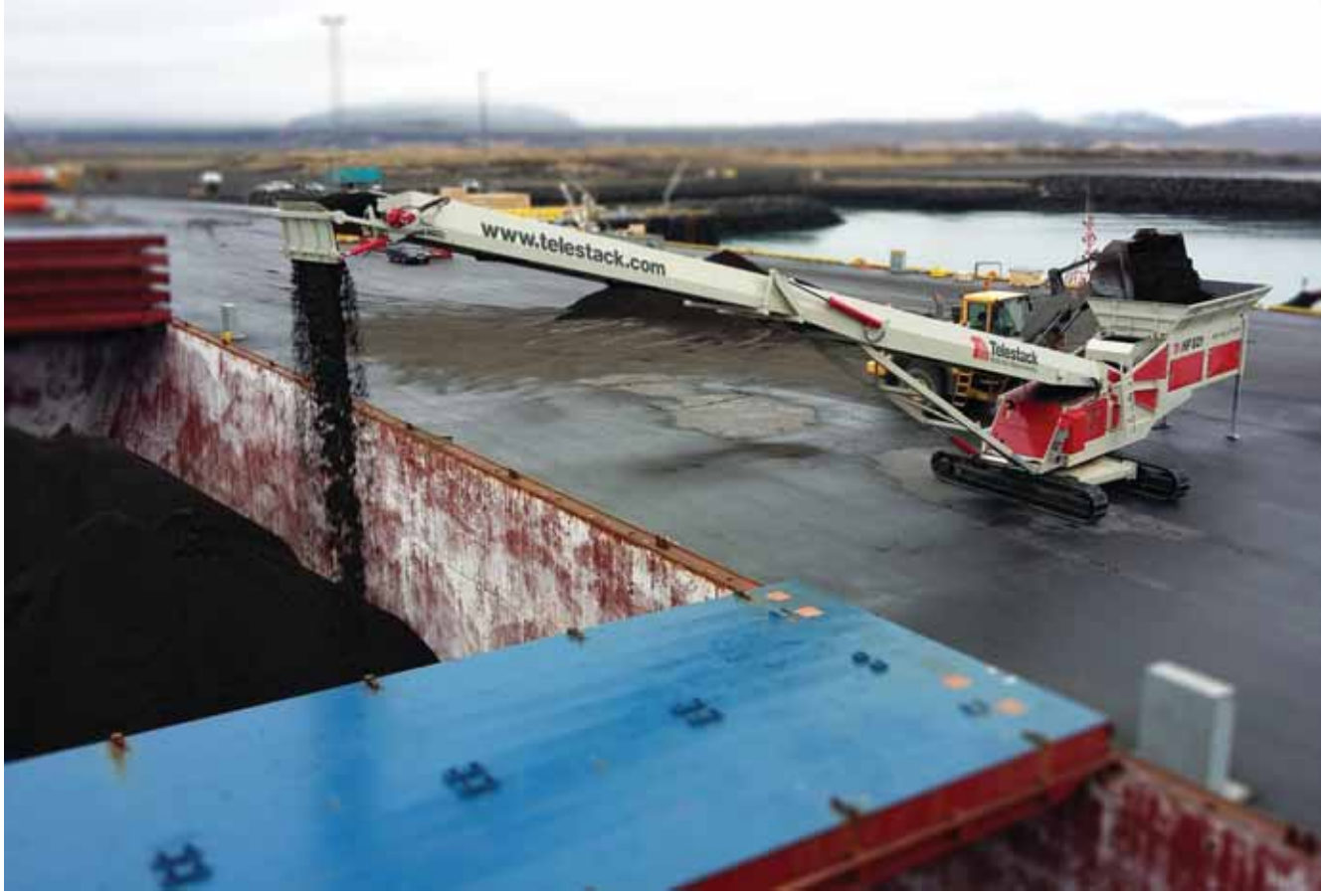

coaster-loading equipment allows operators to directly feed the equipment from wheel loaders and/or grab cranes in the port/inland terminal to eliminate the double handling of material.

As one of the key quarry producers in Iceland, Alexander Olafsson identified a market for exporting aggregate to mainland Europe. In 2015 alone, €2,263 millions worth of products relating to the manufacturing sector were exported from Iceland — a staggering 52.9% of the total country exports! The trend has continued and Alexander Olafsson looked to Telestack to help it become more efficient in its operations. The scope of supply was ample — Alexander Olafsson needed to achieve efficiency, flexibility and generally reduce operational costs throughout. This was aided by the introduction of an HF 821 Revolution Mobile Hopper Feeder which was introduced to its operation to load coaster vessels with aggregates as well as stockpiling.

Prior to the Telestack installation, Alexander Olafsson considered many options to load its coaster vessels. After much consideration and research, particularly against the traditional mobile grab, the Telestack Hopper Feeder was chosen simply because of its flexibility, its throughput rate, low maintenance cost and ability to maintain the product integrity by reducing the number of times the product is handled.

The Telestack HF821 Hopper Feeder is designed to hold a buffer of material within the hopper and in turn allows a regulated flow of material to travel onto the main incline conveyor. Fed by a wheel loader, the hopper has a 12m³ capacity with a 1,200mm wide belt feeder. The hopper is fully lined with 6mm Abro 400 wear liners to minimize wear and protect the paint finish. The feeder and incline conveyor speeds are controlled by a flow control valve to regulate the conveyor belt speed which was required to accommodate the variety of materials that Alexander Olafsson managed. The variable speed drive also enabled the operator to run the belt speeds as slow as possible thus minimizing dust creation at the transfer points.

One of the main attractions of the Telestack equipment was its multi-faceted nature. The fact that the same equipment can be used to load the coasters as well as stockpile on the quayside or stockyard was a key purchasing decision. The initial CAPEX investment is vastly reduced with the purchase of one piece of equipment rather than potentially two. The mobility of the unit also means that the equipment can be relocated quickly and easily across different sites so that it can be used throughout the stockyard, ensuring a high-production capacity and a 30% increase in

HF Revolution loading coaster vessels (and above).

stockpile capacity on the same footprint, in comparison to fixed length/height conveyors. The flexible nature of the unit also meant that it has been used to feed an existing separate CDE washer plant and Metso crushing & screening line.

A unique feature of the HF 821 is the Revolution feature — a centre-mounted slew bearing that enables 360° rotation of the hopper and boom. Ideal for barge loading and unloading, rail loading, rail unloading and stockpiling, the parallel travel feature enables the operator to manoeuvre the unit parallel to the vessel removing the need to reposition the unit, thus enhancing loading rates and efficiency.

Telestack TC421 stockpiling coal.

The Revolution feature improves site movement and paired with the custom rubber track pads that are fitted to tracks allows movement on concrete/ asphalt ensures a fuss-free product. The Revolution option is available on all HF/LF models and has enhanced the Telestack product offering considerably.

Due to the extreme temperature variances in Iceland (–10° to +40°) Telestack had to also incorporate a few bespoke features to ensure that the Hopper Feeder would be fully functioning at both extremes.

The HF 821 Revolution is part of the mobile hopper feeder range that can be used to stockpile material, feed auxiliary equipment, reclaim to other conveyors, directly load ships, trucks, rail wagons etc. at production rates of up to 2,500tph. Central to the hopper feeder range is the ability to discharge directly from wheel loaders/ grab cranes and excavators in a 'controlled', manner thus eliminating the double handling of material and helping to ensure a better quality of product.

After purchasing the HF821 and seeing results and benefits to its application. Alexander Olafsson further invested in a Telestack TC421 Tracked Conveyor to complement its crushing and screening operation. This investment enabled it to further reduce the use of the wheel loader when building stockpiles therefore reducing labour, fuel costs, and carbon footprint as well as maintenance costs.

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GB Railfreight and CEMEX launch new branded locomotive

In mid-June this year, GB Railfreight (GBRf) and global building materials supplier CEMEX presented the new CEMEX-liveried locomotive at a dedicated naming ceremony held at Dove Holes Quarry, Buxton.

The new locomotive is called the *Cemex Express*. The name was unveiled at the event by record producer and rail enthusiast Pete Waterman. Resplendent in the white, blue and red colours of the CEMEX brand, the vehicle recognizes the partnership between GBRf and CEMEX, which has now been in place for one year.

The Cemex Express, a Class 66 Locomotive, will travel typically between Dove Holes quarry, carrying premium aggregate for readymix and asphalt plants, and external customers throughout the UK. It will pull 22 to 26 hopper wagons that discharge their loads from underneath directly onto the plant's conveyors. A single trainload can deliver up to 2,000 tonnes of material in one trip and will make over 200 trips for CEMEX each year; the equivalent of over 20,000 truckloads.

John Smith, Managing Director of GBRf, said: "We are delighted to unveil this fantastic Class 66 locomotive, painted in the CEMEX livery and representing our two organizations' ongoing partnership. This contract is demonstrative of the role rail freight has to play in helping the UK to cut carbon emissions and to improve air quality.

On average, one gallon of fuel will move one tonne of goods 246 miles on the rail network, while the same amount will only get you 88 miles by road. Rail freight's CO_2 emissions are 76% lower than road's, per tonne carried. An average freight train removes 60 HGV journeys from the roads and the largest up to 160. When this is combined with rail's advantageous performance in terms of nitrous oxide and particulate matter emissions, rail freight demonstrates a clear contribution to the challenge of meeting the UK's carbon-cutting targets."

David Hart, CEMEX's Supply Chain Director for UK & France, commented: "The transport of our product by rail is of ever-increasing importance to CEMEX as we look to make our operations as sustainable as possible. Rail is a far more environmentally friendly method of transport than trucks on the road, as a train burns significantly less fuel per tonne-mile than road vehicles, saving around 50% in CO_2 emissions.

CEMEX UK currently transports 2.6 million tonnes of aggregate by rail each year which equates to approximately 100,000 trucks off the road; enough to build 40,000 houses; and we want to continue to build on this. We are very proud of our partnership with GBRf and hope that together we will be able to transport more and more by rail safely whilst reducing the number of truck movements."

Lex Russell, Managing Director for UK Materials North at CEMEX, added: "Dove Holes is one of CEMEX's most important quarries and generates several million tonnes of limestone aggregates every year, as well as asphalt, readymix, concrete products and dry silo mortar. By rail we then supply many locations across the UK including key cities such as Manchester, Liverpool, Leeds, Sheffield, Birmingham and London. It was therefore the perfect location to unveil the new *Cemex Express* locomotive and take the opportunity to thank those in our team and at GBRf for their hard work and dedication to our rail partnership."

Railway wagons and tall containers easy to fill with new Dino XXL

Goods can now be screened at the last moment before transfer

Two new versions of the Dino® bulk truck loader now make it easier to load taller (square) storage silos such as railway wagons and containers. These XL and XXL Dinos from Van Beek were initially developed at the request of two customers. They do however seem to be the solution that so many customers were looking for that the Dinos have been added to the standard range.

The XL and XXL Dinos are an extended version of the Dino that Van Beek has been producing for some time. The standard Dino has a delivery height of 4.2 metres, but the XL can reach up to 5 metres and the XXL even to 6 metres. It is now also possible to screen a product after passing the outlet side. Because of the extra height obtained there is in fact also room to fit a vibrating screen or rotary screen.

Filling tall square silos an interesting challenge

The new Dinos were developed to meet two customer requests. A site of Katoen Natie in the US needed a mobile loader of this type to load plastic granule pellets into railway wagons. The cube shape of the wagons meant that the frame of the inclined feed screw of the normal Dino would collide with the upper edges of the wagon. For this reason a higher outlet of the Dino was needed. The parent company, Katoen Natie in Antwerp, has had good contact with Van Beek for many years and asked if they could come up with a solution.

This was an interesting job for Van Beek. "Dinos were already used for loading for example square containers, but never in this specific application, which requires a greater delivery height," explains Roel Kneepkens, Sales Engineer at Van Beek. The XL Dino ensures that the wagons can now be loaded without problems. This Dino is also suitable for loading other taller tanks or silos.

The different power grid in the US was not a challenge for Van Beek. The company has already supplied hundreds of Dinos worldwide and so knows what they are doing when it comes to making adjustments for a different power grid. The XL Dino is supplied with a gear motor that is suitable for the American power grid (575V 60Hz).

As for the XXL Dino, the extra height is achieved by extending the screw. The frame with the wheels on which the construction stands can as a result remain

low on the ground, so these Dinos are just as accessible, easy to clean and easy to maintain as their smaller brothers.

High, higher, highest

The XXL Dino was developed for Nuttens Services in France, a service provider in the area of packaging, processing and transporting food in powder form. Nuttens wanted a screen with several screen layers, a vibrating screen, to use on the outlet side. By suspending a screen under the Dino the ultimate discharge point is lowered. To keep the discharge point at the same height, the Dino therefore had to be raised.

"By fitting this screen as late as possible in the loading process you know for sure that no foreign bodies can get into the bulk wagon", explains Kneepkens. The XXL Dino is used to load gluten and the screen must remove any impurities that do not belong there. "This may be anything from nails and pieces of wood to cigarettes."

Because the Dino would fall over due to the weight of the screen, a separate bridge-shaped platform has been developed for the screen that is connected to the Dino. The whole assembly is still mobile and the operator can also stand on this platform to check the top of the bulk wagon and open manholes.

Big loading capacity and easy to clean

Both machines have a loading capacity of 40 m³ per hour and are made from SS304. If required, the seals and sealing rings can be FDA approved. The Dinos then meet the requirements of the food industry. A cover on the top of the screw makes inspection and cleaning of the inside very easy. Extension rims enable a big bag to be placed on it directly so that the fork life truck driver can immediately go off to fetch a new big bag.

Warm welcome for new Dinos

Van Beek expects the new members of the Dino family to get a warm welcome. "Anyone who wants a screen on the outlet side is best to use an XL or XXL," says Kneepkens. "That also applies for users who are not loading round bulk wagons but containers or railway wagons. They are nice reliable machines for transferring loads from big bag, bagged goods or shovel (bulk) to bulk wagons or containers."

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Wagon Tippler Train Unloading System from Ashton Bulk Ltd

Early planning assures a turn for the better

As a long-standing designer and engineer of train unloading systems, Ashton Bulk Ltd always advocates that the selection of train unloading system equipment for ports, power plants, metals processing facilities or other automated handling operations is one of the most important choices for what is a critical part of any plant. Any disruption or downtime to unloading processes can be costly and availability and reliability are essential.

The life of the equipment also needs to be taken into consideration because the replacement of these machines is costly and can interrupt production for several weeks. Foresight and planning of the train unloading system is therefore as important as any other piece of plant in a port bulk system.

This has led to Ashton Bulk being a first point of contact when planning new systems, optimizing current operations and maximizing throughput in a consistent and reliable manner.

Each and every aspect of the facility and client's requirements need to be addressed during, as close to, the feasibility stage of a project and, wherever possible, with direct interaction between designers and the key stakeholders, including the plant operational staff.

Case studies

Compagnie des Bauxites de Guinée (CBG), Kamsar Expansion Project, Guinea, West Africa

CBG has operated two Strachan & Henshaw Ltd tipplers since the 1970s, aided by Ashton Bulk in recent years. When a significant upgrade was required to its operations, Ashton Bulk and Tenova-Takraf were selected as the preferred designers and supplier. Throughput of up to 25m tonnes per annum were required utilizing a twin tippler unit train unloading system. A system with a life requirement of over 4m operating cycles has been supplied, with backup offered by the twin tippler arrangement and spare capacity provided within the positioner drive system.

Particular challenges arose from the port operator requiring the system to handle new rotary coupled rolling stock as well as the existing wagon fleet that was not originally designed for a unit train rotary coupled installation.

Ashton Bulk, CBG, Tenova-Takraf, the Fluor Corporation and Systra-Canarail engaged together to address the developments and the changes to the system design and operational requirements were implemented by Ashton Bulk.

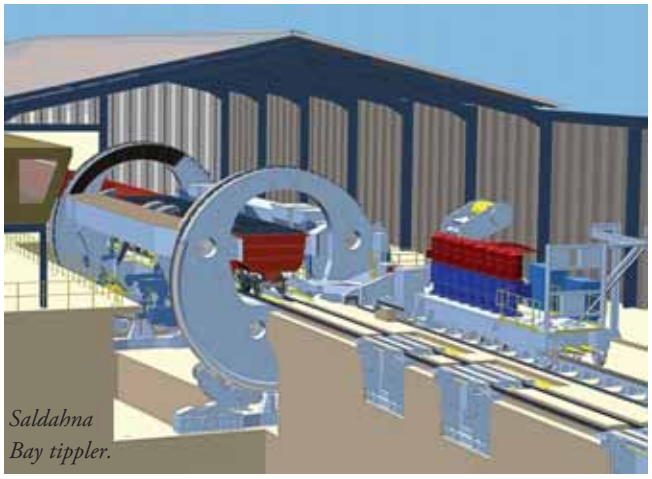
These alterations were possible because of the modular nature of Ashton Bulk design train unloading systems, together with several decades of the company's experience in adapting to its clients' evolving requirements.

Ultimately, the system operated at and above the original throughput requirements. The plant will now be able to function flexibly, handling both old and new rolling stock within the same train.

Transnet Group Capital, Saldanha Bay Phase 3, South Africa

A long-term operator of unit train unloading systems, a significant upgrade to facilities was required in 2016. Ashton Bulk and Tenova-Takraf were selected as the preferred designer and supplier. First and foremost in the engineering challenges was to design the equipment in accordance with the latest international design code of practice, EN 13001 – General Principles of Crane Design. In addition, the brief included supplying equipment to achieve in

The twin tippler unit train unloading system provided to Compagnie des Bauxites de Guinée, as part of the Kamsar Expansion Project in Guinea, West Africa.


Saldahna Bay tippler.


Five-million-cycle linked cage tippler.

excess of 4m design life cycles.

Following experiences of shortfalls in the existing plant meeting these conditions, Transnet engaged Logan Engineering Consulting (LEC) Pty of Brisbane Australia to audit the design of all Ashton Bulk-engineered equipment. This integrated process led to the development of an industry-leading design of a tandem tippler cage structure incorporating a linked method of construction.

Although 'pin-jointed' machines have been developed in the past by Strachan & Henshaw (UK) with the intention of reducing points of stress concentration and structural fatigue cracking in large tippler cage structures, the design only partially achieved these objectives with structural repair required prior to the operational design life being achieved. The engineers engaged in the design and audit of the Ashton Bulk Tandem Linked Cage Tippler® confirmed a minimum design life for the new Saldanha Phase 3 tippler at 4.8m design life cycles, which has since been improved for future projects to a minimum of 5m cycles. This type of machine will be the basis of all tandem rotary type tipplers offered by Ashton Bulk and Tenova-Takraf for port and other types of installation in the future because rigid cage and the historic type of pin-jointed cages for large, high duty tipplers have proven not to achieve their operating cycle and design life predictions.

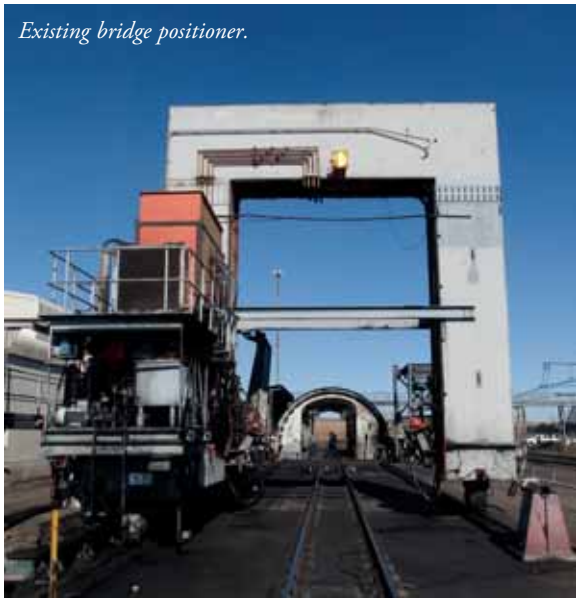
The train positioner also incorporates features that assist in preventing events such as overload of the machine due to unplanned train brake applications. If incidents do occur, the arrangement of the machines is such that major structural and mechanical parts remain intact with only replacement of secondary equipment being required, thus reducing potential downtime and minimizing aftermarket costs.

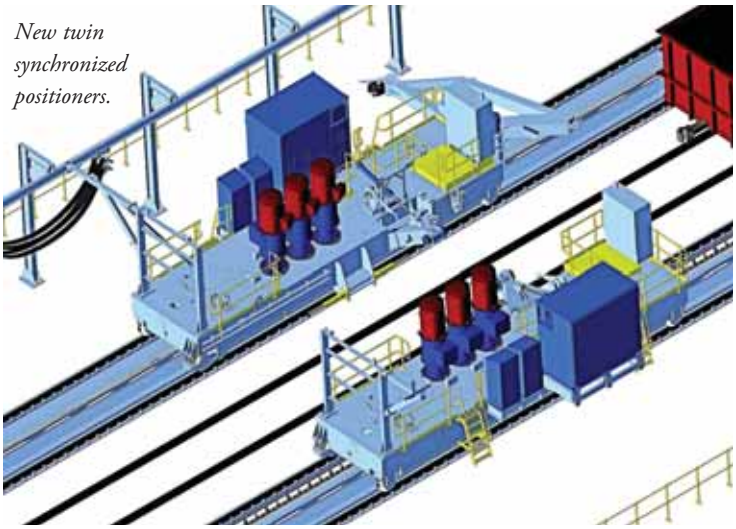
Electricity Supply Commission: (ESKOM), Majuba Power Station, Mpumalanga, South Africa

The unit train unloading system at ESKOM's power plant at Majuba has underperformed since its installation in the 1980s, related primarily to the design of the train positioner. The wagons utilized at the plant rely on the train positioner pushing the train using the pushing pads located at each corner of the wagons. The existing positioner relied on a bridge structure to straddle the train and engage on either side of the wagons. The flexible nature of the bridge placed too much load on one side of the train and the associated parts of the positioner, resulting in localized overloads, part failures and a significant shortfall in equipment availability. These factors resulted in coal needing to be delivered to the plant by 700 road trucks per day to make up the shortfall.

Ashton Bulk, having worked with the consulting engineers DemcoTech at the feasibility stage of the project, was engaged with Tenova-Takraf to design and supply new train positioners and train holding equipment and undertake an engineering audit of the existing wagon tipplers. With the advent and development of AC-variable speed drives, Ashton Bulk, together with its partner company IAC (UK), developed a drive system that permitted two train positioners to be used, one on each side of the main line track, for hauling the trains instead of the previous bridge system. The positioners are fully synchronized to ensure equal load sharing to avoid any of the overloading experienced previously. This type of system is now a ready replacement for previously installed bridge type train positioners and for use with wagons with corner pusher pads.

At mid-point in the design process, Eskom requested different wagons from


Existing bridge positioner.


New twin synchronized positioners.

those originally specified. Based on this request, Ashton Bulk revised the control system handling methodology and the manner in which the positioners and train holding equipment physically engaged with the trains. These revisions were undertaken in accordance with strict time limits.

Points to consider

The following rules and steps are recommended for early consideration whenever a train unloading system is to be included in a port facility:

- standardized and 'off-the-shelf' train unloading systems are not a realistic approach on which to embark on the design and engineering process given the high number of variables and the bespoke nature of train handling and unloading;
- a modular approach to a train unloading system design and a range of adaptable designs and proven engineering principles provides the customer with the most reliable, flexible and long-term cost-effective solution;
- the key to a tailored solution for a port operator's particular requirements is early involvement of fully experienced train unloading system engineers and maintaining access to that expertise throughout the project;
- the design life of the equipment, particularly fatigue life, should be specified at a level that pertains to the operator's true required throughput. Where 20 to 25 years' design life before replacement is required, the number of stress cycles should be specified at no lower than 4m and targeted at 5m or more;
- ensure that designers and suppliers provide the train unloading system in accordance with the required design life and have adhered to recognized design codes of practice. Independent audit of designs should be a key requirement of any requests for quotation, either to be undertaken during the project design phase or by having the supplier offer a pre-audited or part-audited design with their bid documents to substantiate the technical viability of the proposal.

Essentially, in the era of 'cut and paste', the provenance and suitability of any train unloading system specification should always be established before implementation.

Ashton Bulk operates as an independent engineering and design company specializing in the supply of train unloading system designs to clients, including Tenova-Takraf GmbH on a worldwide basis and Larsen & Toubro in India.

From train to truck with help from Superior Industries

US-based aggregate transloading facility boosts productivity with unloading system

Transloading is defined as transferring a shipment from one mode of transportation to another. At the L.G. Everist transloading facility in Sioux City, Iowa, high-quality aggregate is unloaded from a 60- to a 100-car train each day, before being stockpiled and loaded onto short-haul trucks for delivery to the region's construction sites. Transloading provides significant cost-savings and flexibility in transporting aggregate products where and when they are needed — especially when a facility's unloading and material handling systems are designed for maximum efficiency and productivity.

Founded in 1876, L.G. Everist, Inc. specializes in a wide range of rail transloading services. Currently celebrating 140 years in business, this fifth-generation, family-owned business operates seven transloading facilities, and 14 aggregate processing operations. The company owns one of the largest fleets of railroad equipment of any aggregate producer in North America. Today, its Sioux City facility unloads up to 100 railcars per day, and stockpiles up to 30 different aggregate products with the use of a new unloading and material handling system manufactured by Superior Industries.

In previous years, the facility had struggled with an older, smaller unloading system that took a lengthy shift, plus overtime, to unload a 60-car train. "To meet demand, we needed to stockpile more material within our compact footprint, and significantly shorten the unloading time of each railcar. With our new system, we have done that," says Lee Saude, equipment resources/project manager for L.G. Everist. Looking back, Saude says that with the need to expand, the choices were to repair the old system or to upgrade to a larger, more efficient system. "We went with the upgrade, as basically, we knew we needed some big conveyors, and we needed to move material fast," he adds.

Replacing a single-hopper system that could unload via only one door of a railcar, the new system provides a three-hopper system that can unload each of three doors of a pneumatic railcar simultaneously. The material conveying systems are designed to

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allow for fast, and flexible in-pit moves to quickly adjust to the different products being stockpiled — and importantly, the use of telescoping radial stacking conveyors allow higher-volume stockpiling within a tight footprint.

The design of the system was initiated by the L.G. Everist engineering team, and then continued in consultation with Superior Industries and its regional dealer, General Equipment. "We chose them based upon our very positive experience with both the factory, and the local dealer over the years," says Saude. With on-site assistance from Superior Industries, start-up began in April of this year, followed by a bit of fine-tuning to meet all desired requirements. Saude says he is excited to monitor productivity gains and costs of ownership throughout the seasons to come.

Managing growth

The Sioux City transloading facility is serviced by the D & I (Dakota & Iowa) Railroad, which is a wholly-owned subsidiary of L.G. Everist. The D & I rail service operates from Dell Rapids, South Dakota, (home of the company's largest facility) to the Sioux City, Iowa site.

"When the rail system was developed in the early 1980s, it was a new-found freedom," says Sioux City Plant Superintendent Mark Bowden, an industry veteran who started with the company in 1979. "At that time, if we could unload 20 railcars per day and stockpile only eight or so different products, that was a big day for us," he adds.

Over the decades, the operation grew to unloading 60 to 80 railcars per day. With its older, smaller unloading system, the operation could unload a maximum of five to six cars per hour — or about 450 tonnes per hour into its single hopper system. "In the past, a 60-car train would take us more than 12 hours to unload, and then we had maintenance to do as well," says Bowden.

With the new system, Bowden says that the crew can unload a 100-car train in less than ten hours, which almost doubles past capacities; and allows for maintenance after the shift. From an approximate 30 stockpiles, the operation loads out anywhere from 3,500 to 9,000 tonnes of aggregate onto trucks; or 300 to 500 truckloads per day.

System design

Bowden explains that the operation utilizes pneumatic railcars, each with three doors. Within the yard, the locomotive is operated remotely from a mobile controller box to advance the train as needed. One by one, railcars are unloaded over an under-track, three hopper system. With the push of a button, the three railcar doors open, and material from each bin unloads onto three inclined (914mm belt) conveyors. "To adjust to changing materials, we can vary the speed of the conveyors coming out of the hoppers, or adjust the gates to affect material flow — opening them up more for denser materials or shutting them down a bit for lighter materials to avoid overflow," he explains.

From the inclined conveyors, material is conveyed to a transverse (1,220mm belt) conveyor which transports material either to the east or west depending upon the product type. Portable jump conveyors transfer material to the telescoping radial stacking conveyors. The jump conveyors allow flexibility as units can be easily added or extracted depending upon the ever-changing volume levels of the stockpiles. "We can pull out, put in, or move the conveyors very quickly. Where it used to take us from one to two hours to adjust between products — now it takes us mere minutes. It saves us so much time," says Bowden.

As the telescoping radial stacking conveyors provide increased stacking capacity over standard radial stackers, the operation can stockpile up to 30% more material under each stacker. Bowden says that's important within their limited footprint. Even more important is the benefit that TeleStacker® conveyors allow them to avoid costly material segregation by stockpiling in very thin lifts or layers, with each layer consisting of a series of windrows of material. "In our business, segregation and material degradation is an issue you have to overcome, and with these conveyors, we can eliminate that completely," he says.

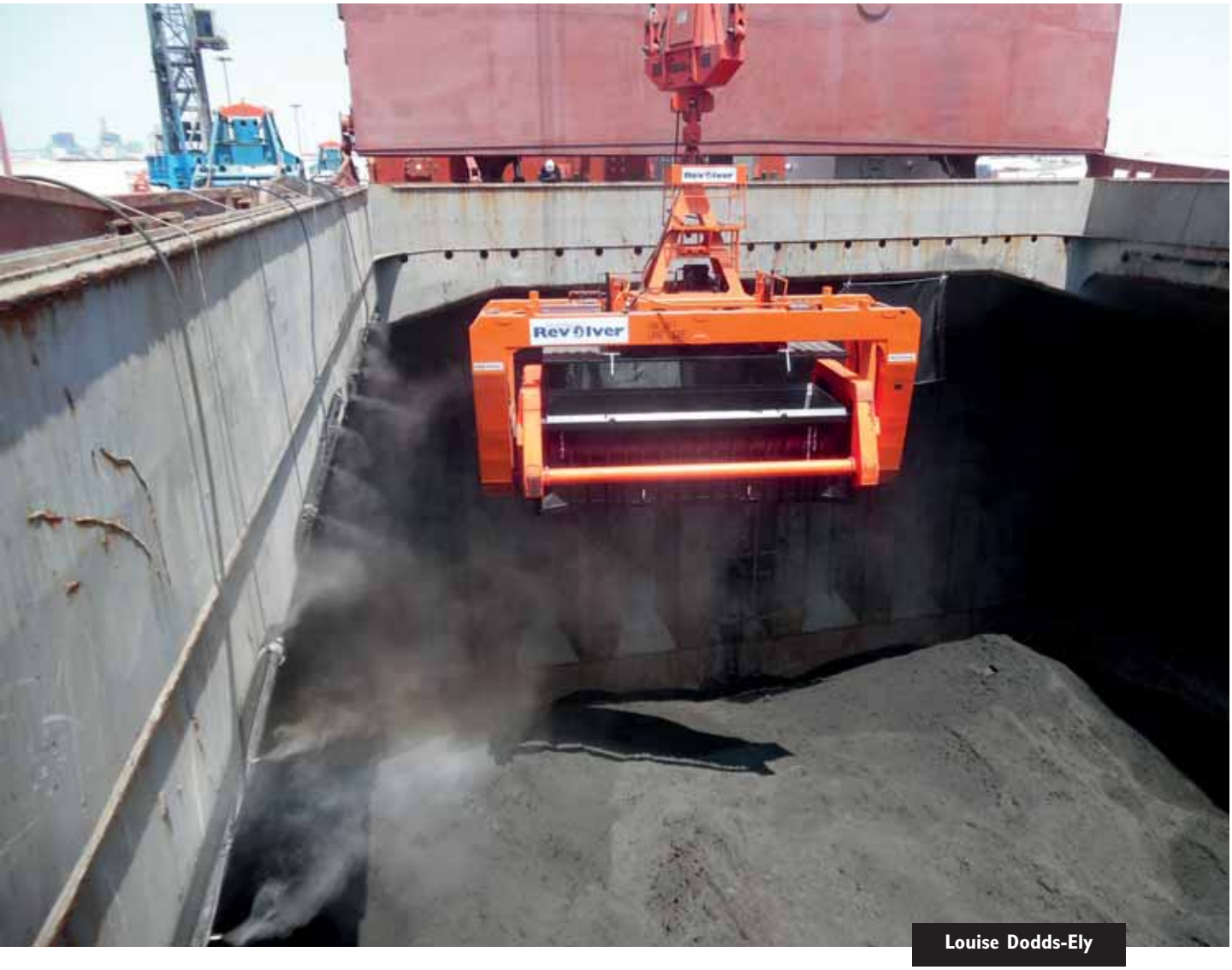
As to maintenance issues thus far, Bowden says it's minimal. "The system is heavy-duty, and reacts well to abrasive material. Its design is pretty straightforward with all components being standardized, so that we don't have to inventory a lot of different parts. The conveyors are also equipped with belt cleaners and scrapers, so that we can protect our belts – and keep our pit clean."

Moving forward

More than 35,000 railcars serve the US aggregate industry; and efficient transloading facilities are a key factor in cost-effective material transport. Automated and integrated unloading, loading, and stockpiling systems continue to streamline operations at railcar facilities, as well as at barge and marine distribution centres worldwide. DCi

Boxing clever?

containerized bulk handling continues to grow in popularity



Louise Dodds-Ely

RAM Spreaders Revolver® gains customers worldwide

RAM Spreaders is a major name in the handling of bulk in containers. The company's ancestral roots reach back to 1876, when it began as Ed Mills & Son, a blacksmith company in Liverpool, England. The Mills family ran the business successfully, and during the 1970s, further diversified its business interests into container handling equipment with the then Director of Ed Mills & Son, Robert A.Mills.

The name RAM represents the initials of Robert A.Mills whilst being synonymous with strength, power and reliability.

In 1992, NSL Engineering (NSE), a subsidiary of NSL Ltd, acquired RAM Spreaders as part of the company's business diversification. Over the years, RAM Spreaders has successfully established itself as a reputable brand name in the container handling industry through strategic market penetration and innovative product development. Currently, RAM products are present in more than 65 countries, across all continents.

In May 2015, NSL's RAM spreaders business merged with the grab business of Salzgitter Maschinenbau AG (a globally renowned cargo grab manufacturers and shipboard crane grab builder) under a joint venture arrangement through PEINER SMAG Lifting Technologies GmbH.

The merger gives birth to a highly respected lifting accessories supplier in both bulk cargo and container handling industries. The group's business include lifting equipment and accessories for container terminals, bulk ports, bulk cargo

vessels, waste to energy incineration plants, scrap metal yards, steel mills, marine dredging and mining businesses, where it is able to offer a full spectrum of bulk cargo and container lifting solutions to port operators and crane manufacturers worldwide; with strong production, storage and global after sales service support.

RAM Spreaders was therefore ideally placed to offer its expertise in the handling of bulk cargo in containers, a practice that is growing in popularity worldwide. It developed its RAM Revolver, which has proven to be a highly effective tool in container bulk handling (CBH), and is available in the following variations:

- RAM Revolver — STS cranes;
- RAM Revolver for mobile harbour cranes;
- RAM Revolver for ship cranes;
- RAM Revolver for reachstackers;
- RAM Revolver for bridge cranes.

Environmental benefits

One very important aspect of the CBH approach is the significant environmental benefits that it offers. These include:

- Zero loss of commodity, no contamination of commodity and zero fugitive dust, due to the commodity transported in sealed containers. The commodity only sees the light of day when tipped into the ships hatch by the RAM Revolver.
- The clever lid lifting system on the RAM Revolver removes the lid from the container just before Revolver rotates the container through a controlled 360° rotation, tipping the commodity at the bottom of the hatch, adding very little energy to the bulk commodity and producing less dust.
- A hatch-mounted dust suppression system also stops any small amounts of dust from rising.
- For ports and terminals located close to residential areas, this system is an ideal solution for them to handle bulk through their terminal without environmental concerns.

RECENT PROJECTS

Below are just a few of the projects in which the RAM Revolver has proved to be a successful solution to a bulk handling conundrum.

Port Elizabeth Container Terminal

Following the introduction of Containerized Bulk Handling at Port Elizabeth Container Terminal (PECT) in South Africa, Transnet Port Terminals (TPT) placed a repeat order with RAM spreaders of four units of the RAM Revolver® bulk handling spreader. TPT handles large volumes of bulk exports annually at its Port Elizabeth Container Terminal and has recently turned to CBH as a solution. The terminal invested in four units of the RAM Revolver, to help it service its base of customers better.

CBH allows for easy handing of bulk materials with a simple spreader change on the cranes. The cost of the CBH system is a fraction of the cost of new bulk loaders.

Speaking at the handing over ceremony of the Revolver's, RAM Spreaders Cameron Hay commented "Since the first order of Revolvers in PE more than five years ago the CBH system has grown significantly. These new revolvers will allow TPT to ensure environmental compliance"

A Route to market for miners

Mining companies are now able to find a new route to market using CBH for exporting bulk through standard container terminals, which until now has only been possible with heavy investment and an expensive infrastructure.

Clean and green

PECT is located near to the main town of Port Elizabeth and like all cities dust is a sensitive issue. The CBH system, using a

hatch misting system is the greenest loading system in the world with zero fugitive dust emissions.

Dust Free Loading in Port Elizabeth

Delivery of four Revolver spreaders helps Transnet Port Terminals commit to its sustainability agenda and reduce dust.

Riga Universal Terminal

Riga Universal Terminal (RUT), part of the Portek Group in Latvia, wanted to expand its biomass logistics to a more efficient and environmentally safe operation. After serious considerations of other solutions — and looking beyond the traditional way of bulk handling — it decided on using CBH to handle its biomass wood pellets.

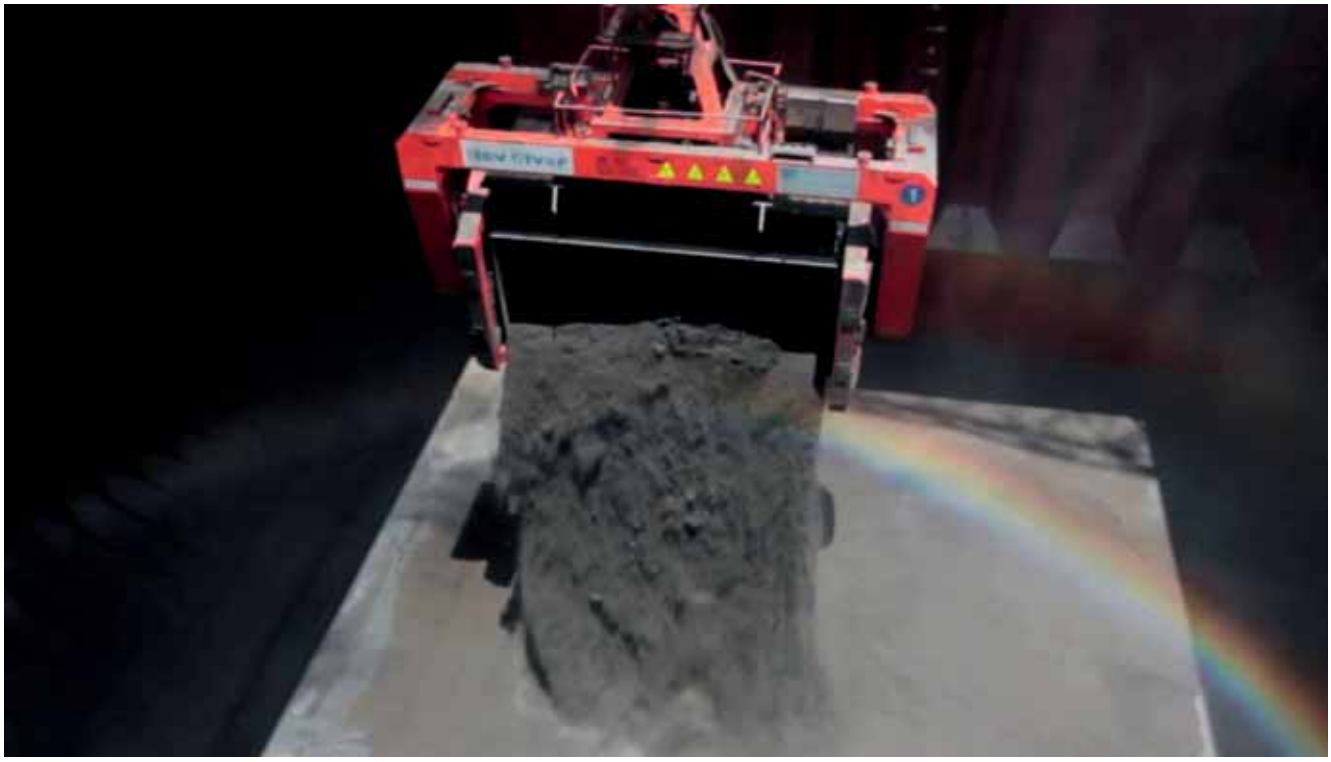
Biomass is filled in open top containers at source, or from a shed or stockpile in the port, and taken right to the dock. A rotating spreader hooked to an existing crane then picks up the container and takes it into the ship's hold, where the rotating spreader rotates the container through 360° tipping out the biomass. This operation significantly mitigates environmental issues, such as dust pollution and loss of material. This is a winning solution, right from exporter, the port and the environment.

Terminals which do not have a traditional bulk handling infrastructure can now use this simple but complete holistic approach to accommodate any type of dried bulk using existing equipment at the port. The open top container is used as a means of transport, storage and loading facility, in conjunction with the rotating spreader.

Through CBH, Portek's innovating management has taken the multi-purpose terminal to new heights of added-value services for its containers, breakbulk, timber and other types of bulk material operations.

The numbers

RUT had the option of considering the purchase of a conventional material handler worth €1.3 million, on top of other complimentary equipment, with significantly increased the total operational price. This conventional material handler option provided for a maximum biomass



loading rate of 200tph (tonnes per hour).

With the assistance of its Liebherr service and agent partners, RUT included the option of using a rotating spreader called 'RAM Revolver' for Containerized Bulk Handing, which rotates the 45-tonne-capacity container inside the bulk vessel's hold. With a small investment for the rotating spreader, RUT now has higher loading rates, higher annual tonnage and higher profits. This RAM Revolver option provided for a biomass loading rate of up to 600tph. Normal containerized bulk handling cycles per hour on a mobile harbour cranes are between 20 to 25 cycles.

The future

Although the CBH system, which handles all types of bulk material, is fully operational in many countries — from Australia all the way to Africa, the Americas and the Caribbean — RUT has deployed the very first CBH operation in Europe for the export of biomass. It has therefore set a new benchmark in the bulk handling industry, that is more efficient, environmentally safe and a fast deployment time; all with lower investment than most traditional systems.

Global, regional and also local port operators can now take advantage of the existing traffic of millions of tonnes of bulks that are available in their own hinterland, without having to invest in new expensive and complex traditional systems such as warehouses, conveyor belts and shiploaders. Everything they need, they already have; with the exception of a rotating spreader, which is usually procured by the port, and the right number of containers, which are usually bought or leased by the exporter or logistics provider.

Bulk exporters will no longer have to transport their product a long way to a port with warehouse facilities, whilst a local multipurpose terminal, with or without harbour cranes, can do the job more efficiently with a total lower cost for everyone.

Chile: Puerto Angamos

Puerto Angamos has achieved an operating record by transferring 2mt (million tonnes) of bulk mineral, mainly copper concentrate, with flip-up containers, with the help of the RAM Revolver.

The figure corresponds to the accumulated movement since implementing the rotating container technology. According to the company, this has made, according the transfer of mineral bulk more efficient, attracting new customers who have opted to use this terminal in Mejillones to send their cargoes abroad.

The general manager of Puerto Angamos, David Álvaro, stressed that "the new scenarios and challenges of the mining industry have required greater levels of flexibility and efficiency, in which we have been able to accommodate ourselves with the same quality of service that has identified us since our inception. Exceeding the 2mt of bulk transferred is a reflection of a job well done, planned, with demanding goals and fully meeting the great challenge of raising the operational standards in matters of work safety and care for the environment. This system, implemented in October 2014, has allowed the terminal to position itself as a benchmark in the national port sector".

Álvaro added that "the decision to invest in the implementation of innovative technology for the country, as were the flip-flop containers, was successful. We have been pioneers in Chile in offering this system, adjusting to the needs of our customers, offering solutions for the development of their activities and projecting the port towards sustainable growth over time, diversifying our burden towards new markets, such as the bulk market".

Before making the decision to use open top containers, the company analysed in detail the complete logistics chain associated with this technology, which included, among other things, a visit to Australia to port facilities that had already implemented the novel containerized bulk handling system.

The CBH process that is currently applied has the advantages of being simple, clean, safe from the operational and environmental point of view, as well as being highly efficient, since it implies zero material emission losses.

The logistic process begins when the container is loaded with bulk from the mine, where it is also weighed, sealed and washed. Before arriving at the port, two inspection elements are carried out at the exit of the mining operation and at the entrance of the terminal, where it is verified that the cargo is sealed during the entire transport process.

This is what our engineers say:

«Engineering such an integrated terminal handling system is extremely challenging as there are just so many factors one has to consider. Luckily we can rely on years and years of experience designing and building such systems around the world.»

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Then the containers are taken to a holding area, waiting to be taken by truck to the terminal's boarding area. Afterwards, they are positioned inside the hold of the ship (using the RAM Revolver), where a system is activated that raises its lid and (the RAM Revolver) rotates the container 360° to deposit the mineral inside the ship.

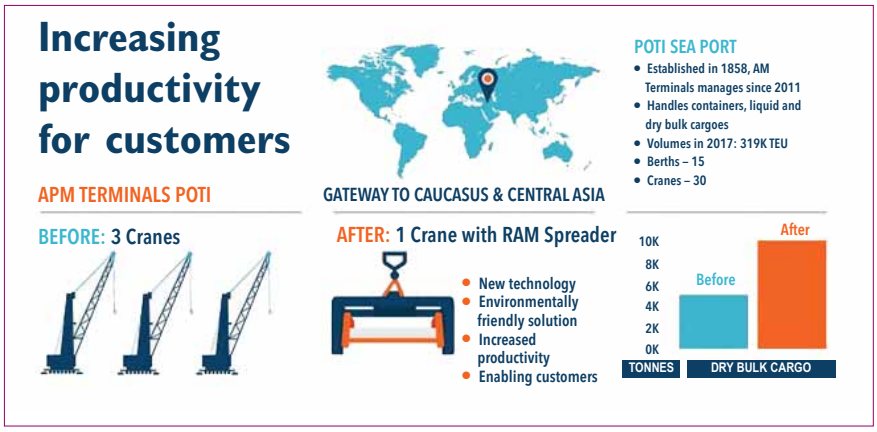
To capture possible particles in suspension, dust suppression equipment is installed on the mouth of the ships' hold to minimize any impact on the environment. Finally, the container is vacuumed and returned empty to the mine, thus completing the logistics cycle.

Port of Poti, Georgia

At the Port of Poti, to reduce spillage and wastage before being transported to the terminal, copper concentrate is loaded into reinforced open top containers covered by a tarpaulin in a closed warehouse. The use of the RAM Revolver has improved efficiency and improved the environmental impact of these operations.

The overall process is compliant with all environmental, IMO and REACH regulations as the concentrate never touches the ground, avoids spillage, dusting and water contamination, according to APM Terminals Poti. It also improves workers' Health & Safety and significantly speeds up terminal and port operations and daily vessel loading rate.

There is also a clear cost and time saving. "At the traditional bulk facility, we were happy if they would load 5,000 tonnes in a day using three cranes. Today we experience loading of 10,000 tonnes in a day on a single crane," explained Michael Mogilevsky, founder of Caucasian Metals Terminal, APM Terminals' business partner in this operation.



"We are seeing not only more product actually being loaded with less environmental impact, but we are also experiencing a cost advantage on the number of days we need to charter the vessel," added Mogilevsky.

APM Terminals Poti, Georgia has commissioned a new revolving spreader to load copper concentrate into bulk vessels, improve efficiency and minimize environmental impact during bulk cargo loading operations.

At the terminal, the revolving spreader attaches to a mobile harbour crane as a regular spreader does.

The suspended spreader turns the container upside down and deposits the contents at the bottom of the vessel's hold. As the product is loaded into the vessel, a hatch-mounted misting system prevents the copper dust from being blown away.

"With this solution, we have addressed the needs of our customer; enabling both sides to become more efficient and environmentally friendly," said Klaus Holm Laursen, managing director of APM Terminals Poti. "Furthermore, with the same equipment and infrastructure, we can now expand into a market with the potential for several million tonnes of bulk cargo."

The spreader means that the copper concentrate avoids spillage, dusting and water contamination.

In operation at the Port of Poti (and below).

Short-sea shipping made easier with equipment from MultiDocker

MultiDocker was founded as a part of the Österströms Logistics group. Österströms was founded in the early 1980s and developed into one of the major short-sea shipping companies in Northern Europe.

At its peak, the company had 30+ vessels in the 4,000 to 10,000dwt range. Österströms was an integrated logistics company as it also handled on-land transport on trucks and trains, and also operated its own ports and terminals.

MultiDocker was founded as means to increase the efficiency of the overall operations. Today MultiDocker offers hydraulic material handlers in the 45 to 130 metric tonne range. All machines are based on Caterpillar components, which means customers can access service and parts through the world's largest machinery dealership network.

The machines work in ports, cargo terminals and in pulp & paper mills, handling logs and every type of loose bulk cargo.

Over the last 18 months, MultiDocker has made strides into the North American market. Its products have been well received and the company is expanding its reach in the US and Canada by establishing relationships with more and more of the local CAT dealers.

NK Tehnologija's container handling technology goes full tilt at Ust-Luga

The Latvian company NK Tehnologija has been involved in a rather unique, and very successful project, for its client at the Port of Ust-Luga in Russia.

Ultramar Ltd is a logistics company, specializing in packing, stuffing, transportation and logistics of mineral fertilizers in containers from the terminals of ports of Saint Petersburg and Ust-Luga worldwide. To date, Ultramar is one of the largest Russian freight forwarders of mineral fertilizers in containers at the Russian Baltic ports.

In 2012, Ultramar came to NK Tehnologija, requesting its expertise and technological assistance with its dry bulk fertilizer handling terminal at the port of Ust Luga on the Baltic Sea. The incoming bulk commodities used to arrive at the terminal in the standard 20ft containers, to be then loaded into the vessels by the mobile harbour cranes equipped with the regular container spreading devices. The containers lowered down into a vessel's hull (picture 1) were manually opened and discharged by the terminal's stevedores, who simply cut the inner liners to release the cargo (picture 2).

NK Tehnologija's main goal was to improve the process, i.e. to automate and speed up the vessel-loading process, trying to combine both the containers and dry bulk cargo handling technologies. The local environmental conditions were rather challenging as well: in wintertime, the outside temperature at the terminal could fall

Picture 1.

Picture 2.

Picture 3.

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Picture 4.

rapidly from a positive down to a freezing negative and then return back up, all within 24 hours.

NK Tehnologija was able to present its first working prototype of the container-tilting spreader to the customer for field testing in 2013. At the same time, the first specialized 20ft bulk container, to fit NK Tehnologija's new spreader, was developed, manufactured and supplied by Nantong CIMC-Special Transportation Equipment Manufacture Co., Ltd. – CIMC (picture 3). Initially, the tilting spreader was meant to be operated with STS cranes. The field tests had confirmed such possibility, but the spreader's operation using mobile harbour cranes proved to offer much higher capacities, and to be more efficient, allowing the spreader to reach up to 20 working cycles per hour.

Following a number of successful field tests, four type SNP-20 tilting spreaders were ordered by and supplied to the customer by NK Tehnologija. CIMC supported the project with its specialized bulk containers provided in 2014/2015 and totalling 3,700 units.

Since 2015, the implementation of this container-tilting technology has enabled the terminal to transship a total of five million metric tonnes of dry bulk fertilizers. Through all these years, NK Tehnologija's developed technology has proved to be sufficiently efficient, increasing the quay berth loading capacity up to 15,000 tonnes per day (picture 4).

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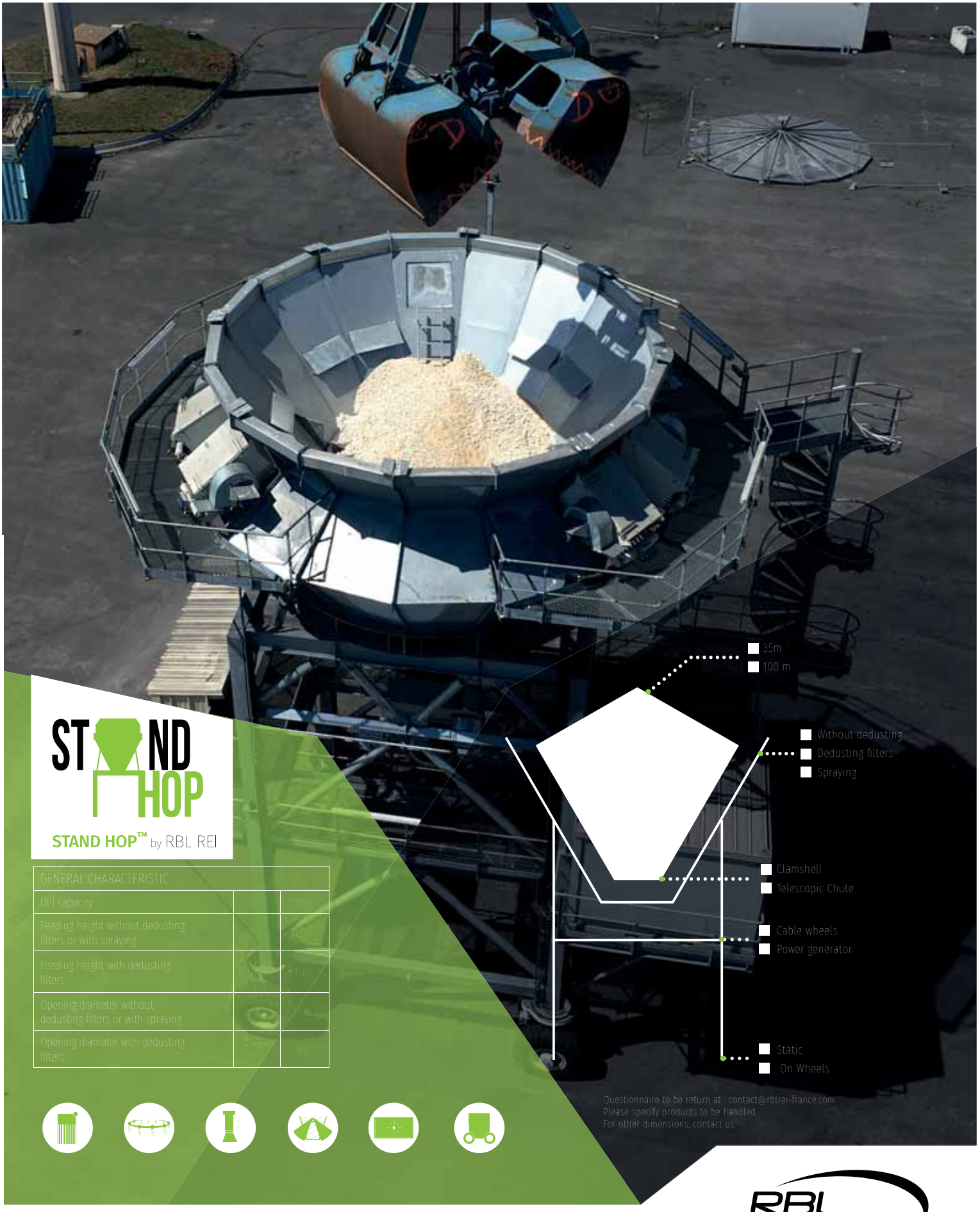
BULK UNDER CONTROL



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Opening diameter without dedusting filters or with spraying	2m	2,5m
Opening diameter with dedusting filters	2,5m	3m

- 35m
- 100 m
- Without dedusting
- Dedusting filters
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Turning to your advantage with Container Rotation Systems

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.

In 2009, when CRS designed the world's first 360° container rotation system, the company also undertook an FEA (finite element analysis) of a number of generic open top containers. The results revealed a range of failings when certain international safety standards were applied, especially when it came to the E-stop (emergency stop) requirement for large ship-to-shore and mobile harbour cranes.

Being the first manufacturer to rotate containers by only the top four twist lock

with gross weights of up to 38 tonnes, CRS reviewed container requirements which, ultimately, required a re-think of the conventional open top container design. CRS designed and patented the Rotorcon® container that is purpose-built for rotation without the need for side supports.

The Rotorcon® range of containers all have a standard gross capacity of 38,000kg and, due to their unique design, have one of the lowest tare weight-to-strength ratios.

CRS recently added new models to its range, including the 2,900mm High Cube portfolio. This includes the world's largest rotatable container which is 2,900mm high and 40ft long, making it perfect for biomass, woodchips and waste. CRS recently received an order from a European client for a 10ft variation of this model.

CRS's 2,900mm High Cube ranges from 10ft, 20ft,30ft and 40ft to cater for any application. CRS offers a Rotainer® to cater for each model of the range, with optional hard and soft lids. DC

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Engineering consultants under the spotlight

HPC's project in Chile.

full-service offering

Louise Dodds-Ely

HPC uses international experience to assist bulk operators in the implementation of new facilities

Field reports from around the globe

HPC Hamburg Port Consulting is active around the globe with projects in South and North America, Europe, Africa, Asia, and Australia. HPC's specialization on port facilities ranges from port masterplans over operational designs and automation to the commissioning of heavy port equipment.

Chile.

Chile: Recently, HPC has successfully completed professional engineering services for an unloading platform with two bulk handling grab-type ship-unloader gantry cranes. As part of a Chilean infrastructure project ensuring electrical power supply, the coal unloading platform constitutes a crucial element. "We state the requirements with absolute clarity in the specifications and make them part of the contract with the vendor," says HPC engineer Alexander Koschinsky: "In this way we make sure that our customers receive high-quality equipment with a long lifetime and minimum maintenance cost." HPC's engineers elaborated the unloading platform crane specifications, assisted in technical and commercial contract negotiations with the supplier until final contract signing, permanently supervised

Chile.

the construction, executed pre-shipment tests at the manufacturer's site, and finally supervised and executed final test trials until provisional acceptance of the cranes at the client's site.

HPC thoroughly specifies the equipment required in such facilities. In this setup it is, for example, very important to ensure the fatigue design is based on a conventional number of hoisting and trolley cycles of at least eight million cycles of operation, based on a design life of 40 years and utilization rate of 75%. The know-how needed for such assignments ranges from mechanical and electrical engineering to software integration expertise. The semi-automated control of the cranes contains highly specialized system features. Projects are successful when the involved team in addition to all specific engineering expertise also comprises a deep understanding of the customers' business goals. Koschinsky says: "At HPC we are especially proud to be able to offer our clients this holistic approach. We have very experienced operations experts in our team."

Uruguay: The mission of HPC in the realization of a bulk terminal in Uruguay was to monitor, verify and certify the project's physical and financial progress. The team continuously analysed the construction schedule and cost and checked compliance with applicable standards on regular site visits. Based on the findings of those inspections and documents received, HPC analysed the project and prepared quarterly progress reports, but also advised the operator directly as to defects and bottlenecks discovered in the course of the continuous monitoring. To issue independent engineer's certificates was of key importance to release disbursement requests and assistance in the final verification of the project to also release sponsors' guarantees.

Construction works had been split into seven individual construction contracts on design-build and design-bid-build basis of more than US$80 million. Construction works comprised as key elements a jetty of 290m length with three concrete loading towers of 46m height, automated shiploaders and conveyor belts on the jetty, dredging for the berths at the jetty, 12 main and several minor silos with a capacity of 10,000 tonnes, truck sampling and reception sheds, bucket elevator tower,


HPC's Uruguay project.

The new dry bulk jetty in Ghana.

wood chip stacker, buildings, conveyor belts and further terminal infrastructure at the landside, such as electrical network and automation system as well as reclamation of additional storage area and driving of a sheet pile wall for an additional feeder berth.

Several challenging tasks had been focused within the project period of four years. The first challenge was to harmonize and co-ordinate seven main contractors together with local site engineers and the operator. But also close to finalization, HPC experts guided the terminal operator when day-to-day work and operational adjustments of first regular operation stages ran parallel to the last construction works and taking-over procedures. HPC project manager Niels Kröger says: "With our deep operations know-how on one hand and high engineering expertise on the other, we interface between these two areas. This is of particular importance for the success of such projects and very often underestimated." The harmonization of the financial view of the lenders and the predominantly operational and economical perspective of the operator with the technical conditions and needs was not only in this project, but is regularly one of the biggest challenges.

Ghana: Within the course of upgrading Tema Port, a new dry bulk handling jetty has been constructed. The construction works have been executed by the Israeli enterprise AMANDI in the framework of a design-build contract. Project management and site supervision were realized by a joint venture formed by HPC and the civil engineering company Sellhorn. The new bulk handling jetty is designed with a length

of 450m and a width of 50m to enable berthing of four bulk carriers with up to 30,000dwt. In contrast to the existing berths that consist of precast concrete blocks, the new jetty is founded on steel-encased bored concrete piles with lengths between 20m and more than 30m. The upper jetty structure consists of a combination of precast concrete main beams and cross beams, precast concrete slabs and fillings casted in situ.

"Only in the beginning of construction works, some critical items were discovered," says HPC project manager Niels Kröger, "but then the works reached routine." Pile driving, drilling, precasting of concrete elements, positioning of reinforcement steel and precast elements, and casting in situ for pile heads, beam junctions and topping were the steps. Thus, throughout the entire project, no critical incidents occurred, which rarely happens in the context of construction works with important foundation works in the maritime environment. An important lesson learned: keep structures and related construction methods as simple as possible, which worked exemplarily well in this project with the major part of structural elements as precast structures.

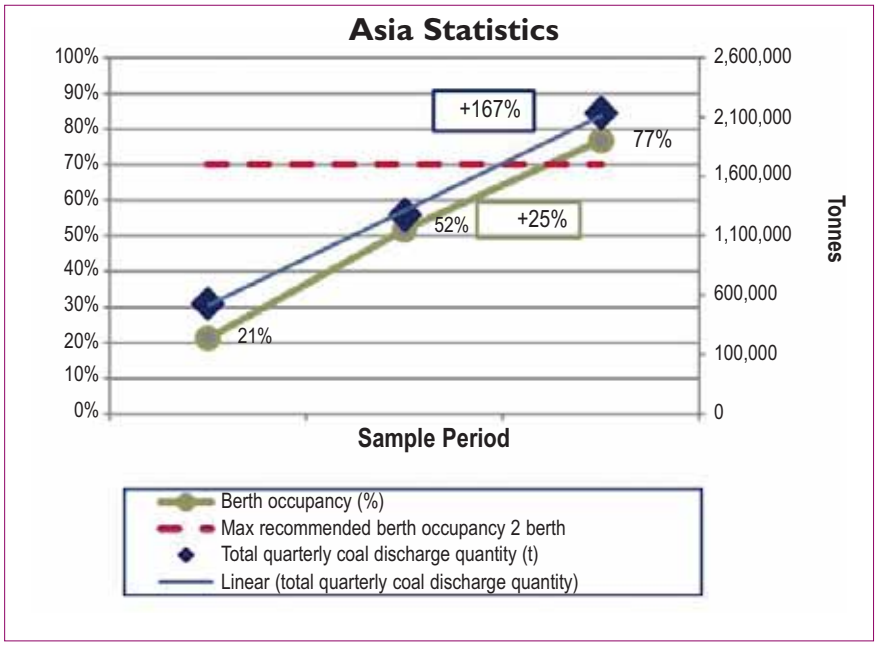
Asia bulk terminal.

Asia: During a current assignment for a rising bulk terminal operator in Asia, HPC is involved in the implementation and development of a bulk terminal. When it comes to the operational stage, plenty of single items have to be fitted to the big picture for making a facility run. Although detailed project plans are rolled out to make sure contributions are delivered in-time and in the right quality, every project has its surprises and urges for pragmatism down the stretch. When loading and unloading equipment is not fully available or handover devices are not interfaced properly, HPC experts try to identify simple workarounds connecting sub-processes to move the cargo through the facility. HPC's experience tells that most frequently affected areas are traffic flows and communication processes between terminal control and operations. HPC project manager Arman Lahouti says: "Communication is a key success factor. As a result of such a dynamic environment, the terminal staff has to be frequently informed on latest activities and engaged for measures ahead."

In the meantime continuous improvement activities are launched with the aim to elevate the terminal performance towards design levels. This process requires a performance measurement framework feeding terminal administration with accurate figures. Having identified valid data sources, the KPI set-up shall create understanding of terminal activities and dependencies, i.e. how consignment dwell times affect berthing schedules and housekeeping moves in the yard. Defining the proper quantity of KPIs is the main challenge thereby ensuring that key activities are monitored while the top view on the facility is maintained.

HPC's project team delivered operational performance reports enabling the management to identify utilization rates and facility bottlenecks, subsequently driving development measures towards capacity harmonization. The as-is figures were also converted to rolling forecast values feeding financial planning activities. HPC's KPI based improvement approach is eligible to be enhanced by simulation studies to validate dynamic terminal capacities taking into account commodity specific seasonality factors. HPC offers an extensive simulation toolbox, which — beyond the operational performance — also provides measurement of emission levels. Emission reduction becomes a relevant improvement area for bulk terminals as the carbon footprint is increasingly regulated by port authorities aiming for environmentally-friendly port operations.

In more than 40 years, HPC has delivered approximately 1,600 projects across 120 countries along the full project development cycle. HPC is convinced that this "makes us inimitably knowledgeable with regard to ports, dry cargo facilities and container terminals. Understanding ourselves as a full-service provider, our clients do not only benefit from our wide international experience but also value our multidisciplinary approach."



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PSI's 'one-stop-shop' approach enables swift and efficient disaster-recovery from highly destructive cyclone at Salalah in the Gulf of Oman

Portside International (PSI), an affiliate of Australian Portside Solutions, a successful service provider within the port logistics and shipping management industry, established itself in Singapore in 2017, seizing on engineering opportunities presented in Asia and the Middle East. The company focuses on providing ports with a one-stop solution for operations management, engineering services and equipment provision.

Managing Director Ray Lee told *Dry Cargo International* that "Often ports have to rely on a variety of external service providers to support port operations, which can complicate the scheduling of repairs and the prioritization of work. Our solution empowers ports to roll-out valued-adding upgrades to operations without causing a gap with income flow or frustrating port clients."

The first pressure test on PSI's capability came about one year into a service contract with the Port of Salalah (managed by APM Terminals) in May 2018, when disaster struck the Gulf of Oman in the form of cyclone Mekunu. The most destructive storm recorded in the region, Mekunu wreaked havoc in the port, destroying harbour access and causing major damage to all equipment.

PSI provided engineering and support services to restore operations at Salalah where on average 3,200 vessels are serviced per year. This response included technical and operational assistance, including the management of the engineering workshop for a nominated period to co-ordinate a rapid response for the terminal. Over the course of several months, PSI assisted with management, and repairs through partner Inver Port Services and re-mobilized or replaced 68 RTGs, 180 tractor tow motors, plus repairs to 26 ship-to-shore cranes. The Gottwald mobile harbour cranes at the bulk cargo handling section of the port suffered significant damage, which were repaired by PSI representatives within weeks of the disaster. The response by PSI enabled the restoration of operations within a much quicker timeframe than anticipated by port operators, APM Terminals.

Equipment damage.

The disaster enabled PSI to develop the responsive skills to address disaster repair alongside its standard services of crane repair and maintenance, crane relocation/removal and engineering support.

Although disasters force port owners and operators to consider the type of equipment used at a port and its ability to withstand natural disaster, not many operators take into account that early co-creation can ensure that the developed equipment solution (a combination of engineered equipment design, services and software) solves a real customer need. This type of 'Design Thinking' accelerates industry development by enabling innovative solutions that combine diverse perspectives.

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Ray Lee, Managing Director of Portside International (PSI).

PSI's design thinking approach to product advisory and process development is simply about working closely with the customer and the best equipment providers to develop a complete solution. The concepts of Design Thinking were forged out of significant societal changes driven by the industrial revolution and both World Wars. Cognitive scientist and Nobel Prize laureate Herbert A. Simon was the first to mention design thinking as a thought process in his 1969 book, *The Sciences of the Artificial*. He went on to contribute many ideas throughout the 1970s which are now regarded as principles of design thinking.

According to Peter McLean, who recently joined Portside International in Singapore, "the entire logistics industry is currently in the midst of a major shift that is set to transform almost every aspect of the business landscape over the coming years. Engineering, automation, digitalization and electrification, along with a vast range of new technical possibilities have brought genuinely disruptive change. This has created an incredible opportunity for the port industry to revolutionize its approach to problems. Over recent decades, it has become crucial to develop and refine skills which allow us to understand and act on rapid changes in our environment and behaviour. The world has become increasingly interconnected and complex, and design thinking offers a means to grapple with all this change in a more human-centric manner."

Design Thinking is a non-linear iterative process which enables designers to challenge assumptions, redefine problems, create prototypes and test products and services to uncover new ways to meet users' needs. The method consists of five phases — Empathize, Define, Ideate, Prototype and Test — and is most useful when problems are ill-defined or unknown.

The Design Thinking process was key to the success of the 21st century's most successful companies such as Google, Apple, Nike and Airbnb which have used it to notable effect. This outside-the-box thinking is now taught at leading universities across the world and is encouraged at every level of business.

Bulk loading operations.

Lee and McLean added "Port operations, whether general cargo, container terminals, or bulk handling operations are complex. These complexities are often determined by external and internal forces and are the result of outdated business decisions and operating systems that are redundant in the 21st century. Often the solution a port requires is simpler than expected; the key is to ask the right questions to enable the application of disruptive and transformative solutions".

Lee has more than 40 years of global industry experience. Portside boasts a robust team of industry specialists located throughout the company's focus regions. Integrated in-house capabilities range from conceptual analysis and feasibility studies, through to port management and specialized engineering services.

McLean brings more than 30 years of experience in senior leadership roles in industrial organizations in the mining, heavy construction, power systems and container handling industry sectors. Prior to joining Portside International's Singapore office, his most recent position was Senior Vice President of Asia Pacific for Kalmar and prior to that he served as the global President of Bromma, a container spreader company, also domiciled in Singapore.

Largest BayWa agricultural site in Upper Bavaria, Großmehring

Efficient grain reception, safe storage

By expanding the existing facilities, BayWa can now handle 60,000 tonnes of grain per year at the Großmehring site. In addition to the general increase in capacity, the focus of the expansion was on upgrading the systems to the latest food and feed safety standards and on centralizing regional maize processing.

Whoever wants to view the new BayWa steel silos in Großmehring from the top has to make quite an effort. A ladder runs 28 metres straight up the wall — of course with a safety basket behind and an intermediate platform every 8 metres. But the climb is worth it: the best way to get an idea of the size of the plant is from the ceiling bridge with the railings next to the conveyor system.

"We receive any and all types of grain that are regionally grown. From wheat to brewing grains to feed and rape seed for oil. The last crop in the year is maize," says Josef Bittl, Product Manager Grain.

Commissioned in 2016, 60,000 tonnes of grain are turned over here annually. BayWa has 17 operation sites in Upper Bavaria, but Großmehring is now the largest.

Raising efficiency and increasing quality

It was not only the storage capacity that was increased during the expansion of the site. The new conveyor system, the chain conveyors and the six elevators mean that grain can be handled much more efficiently.

In addition to the 120tph (tonnes per hour)

THE PROJECT AT A GLANCE

	EXISTING PLANT		EXTENSION	
	Type	**Capacity/ performance**	**Type**	**Capacity/ performance**
Storage	10 cells and 20 boxes	18,000 tonnes	6 steel silos and 2 concrete silos	22,000 tonnes
Receiving	Truck	120tph	Truck	150tph
Processing technology	TAS 204-4	120tph	ASU 200	150tph
Drying technology	STKX6D-12/2	24tph	STKX6-12/02, Eco Cool Wet corn from 35% to 15% moisture	30tph
Conveying technology	Chain conveyor LBCA 300 Elevator LBEA 400/280	120tph 120tph	Chain conveyor LBCB 400P-1 Elevator LBEB 500/315	150tph 150tph
Dedusting technology	Round filter RA 32-3,5	400m³/min	Round filter RA 28-3.5	165 m³/min
Loading	Truck Rail	120tph 120tph	Truck Rail	150tph 150tph

processed by the current plant, BayWa can now take a further 150 tonnes of grain arriving by tractor or truck, and the same amount again brought in by train. The product is pre-cleaned and dedusted immediately afterward where the installed machines can process up to 150 tonnes per hour. The plant is equipped with the latest standards for food and feed safety. This is an especially important aspect for BayWa.

"Responsible handling of raw food sources is very important for us at BayWa. It is absolutely necessary that the plant technology supports exactly this objective. That means that the lots can be kept healthy and we have as little waste as possible," says Peter Joneck, Senior Project Manager Digital Farming.

Using the possibilities of digitalization

Joneck is convinced that the topics of food safety and sustainability are inevitably linked to the new possibilities offered by digitization. Along the entire value chain, product data can now be recorded and checked using sensors.

In the area of grain handling, this means that it is possible to collect data about smaller and smaller processing lots so that any quality defects can be recognized in a very short time and eliminated. This development also doesn't stop for farmers, according to Joneck: "We live digitally. The farmer lives digitally. He combines digital elements with classic elements when handling commodities. And that doesn't stop with the grain storage, where we also collect much more accurate information about individual lots and can forward these to our buyers in the food and feed industry."

For Bittl, it was clear that after the installation of the first two construction phases in 1998 and 2008, Bühler would once again be the partner for the plant expansion: "We were used to very good collaboration from the past. And the link between the old and the new plant was particularly important for us. It was appropriate that we contracted Bühler for the work because they had built the old plant. In addition, it's a big advantage for us that the Bühler site in Beilngries is only a 25-minute drive from us. It goes very fast when we need a spare part quickly or an installer."

Centrally collecting and drying maize

In this third construction phase, Bühler increased the total storage capacity of the plant to 41,000 tonnes. In addition to the large steel silos, another maize collection

system was installed for 150 tonnes with air pre-cleaner and drum cleaner and an aspiration system. Bittl is particularly proud of the new maize dryer: We can kill several 'flies' at once with the dryer. We have more than doubled our capacity and at the same time save energy. And, very important in terms of quality assurance: The connected cooler cools the maize down after drying to below 20° thus making it completely ready for storage," says Bittl.

A total of 54 tonnes of wet maize can be dried per hour now at the BayWa site: "We want to centralize the entire maize drying for the Upper Bavaria North region here in Großmehring. That's also why we have invested in the new plant."

Since it was commissioned three years ago, business has been running smoothly. 150 tonnes of grain can be loaded onto trucks every hour and a further 150 tonnes into railway cars via the sidings. When it is harvest time, there is a lot of activity here: Every three minutes, a farmer drives onto the scales at the entrance gate of the site, ready for the first quality control, which is carried out before the actual unloading of the truck.

"It is extremely important for us to satisfy our suppliers. The efficient grain recording system ensures that the farmer has as little waiting time as possible and can quickly get out to the field where the combine harvesters are waiting during the harvest," says Bittl. Customer satisfaction for BayWa's customers is of course also central: "This investment gives us the opportunity to separate much better, to offer larger, more homogeneous lots to our buyers, and to achieve great marketing advantages."

Built on trust by Bühler: Moser Agrar & Baufachzentrum, Germany

Agriculture has a long, valued tradition in Bav aria. The region surrounding Ingolstadt especially is known for grain farming and trade thanks to its fertile soil. Moser Agrar & Baufachzentrum has been an integral part of this business for 60 years. Together with Bühler, the company set up a new collection point in Großmehring near Ingolstadt. When the harvest season is in full swing, tractors with trailers take turns with trucks every few minutes. Moser Agrar & Baufachzentrum can accept 350 tonnes of grains per hour at its collection point — by truck, but also by train thanks to the on-site rail connection.

"This is twice the capacity compared with our old system in town," says Thomas Goldbrunner, plant manager of the new location at Interpark industrial park in Großmehring. "For farmers, it's convenient since they never have to wait long. Plus, the new location is situated much better for them — they no longer have to worm their way through city traffic to deliver their grains," he adds.

GRAIN STORAGE PROJECT DATA

	Type	Capacity/performance
Storage	7 steel silos and 15 processing cells	16,200 t
Intake	Truck	200tph
	Train	150tph
Processing technology	TAS 206A-6	150tph
Drying technology	STKX6-10/02	10tph
	Wet corn from 35% to 15% moisture	
Conveyor technology	Chain conveyor LBCB 500P-1	200tph
	Chain conveyor LBCB 400P-1	150tph
	Elevator LBEB 500/315	150tph
	Elevator LBEB 630/400	200tph
	Conveyor belts LBBA 650	150tph
Dedusting technology	Round filter RA 69-3.5	650m³/min
Loading	Truck and train	200tph

Managing director Georg Moser is visibly proud of his new system:"In terms of food safety and occupational safety, we've made major progress," says the owner. In the old plant, dust emissions gave employees and neighbours alike trouble. The decision to put up a new building was in the pipeline for several years. For Georg Moser, it was particularly important for the new system to be located near the old one, since he felt obligated to his suppliers as a longstanding partner to the regional farming industry. "Local farmers have been bringing their grain to us for decades. Ninety per cent of our suppliers come from here, and we maintain very close contact with them. Trust forms the foundation of our business," states Georg Moser.

60 YEARS OF TRADITION

Established by his father in 1950 as a means for barter, the company was taken over by Georg Moser when he was 18 and has been gradually expanded ever since. Today, Moser Agrar & Baufachzentrum consists of three locations for grain intake as well as two locations for construction goods with a total of 70 employees.

The main focus is on grains, which are separated and cleaned at the collection points, dried when necessary, and then sold to international customers. The company also deals in plant protection, fertilizer and fodder, as well as seeds.

Georg Moser purchased a property at Interpark in Großmehring that is easily accessible to farmers, located near a highway and even featuring a rail connection. Plus, the location in

Riedenburg is also connected to the Rhine–Main–Danube Canal, enabling navigation both to the north and south.

"We don't know how logistics will change in the years to come. This is why it was important for us to offer access for both trucks and trains," says Georg Moser.

Longstanding partnerships

After realizing several successful projects together, Moser chose Bühler as its supplier and partner for constructing the new system. "We have known some of the employees for over 30 years. We know what they are capable of. One more plus was that as a full-range provider, Bühler offers us end-to-end services from planning, to machine delivery, silo delivery, hall filling down to assembly," says Georg Moser.

The handshake was followed by the go-ahead — and lots of pressure. After all, the system was supposed to go online in just 13 months. Developing the premises also turned out to be another challenge.

"The grounds had clear boundaries with an L shape. We had to find a place for everything Mr. Moser wanted from us. This meant maximum storage capacity, procuring a new machine building with processing cells, the railway connection that Mr. Moser really needs. All in all, not an easy task, but doable," says Hans-Peter Konrad, Area Sales Manager, Bühler.

Today, the seven steel silos with a total storage capacity of 16,200 tonnes can be

seen from miles away. The machine building shoots up right in the middle, offering space for 15 separate processing cells, a dedusting system, sieve cleaning system, a grader and a flow scale.

After pre-cleaning, the batches that are too wet go through the dryer, keeping pace with the fast throughput thanks to its capacity of ten tonnes per hour. All Moser processing equipment is now also state-of-the-art. And the company can offer its customers first-class quality goods. "The more you pre-clean the grain, the easier it is to process it later on. In the end, everyone wants the most clean food possible," states Goldbrunner.

The manager is convinced that working in the new plant is a major step forward for everyone. He is especially proud of the new drying system.

"Thanks to the modern control, we can enter the desired moisture content and the dryer does all the work for us, meaning we barely have to monitor the drying process anymore," says Goldbrunner.

Georg Moser is also confident that he made the right choice investing in a new building here at Interpark: "We have good machines with equally good performance and quality," says the managing director. "Besides, Bühler service can supply us with spare parts fast from its Beilngries location, which is another huge advantage for us."

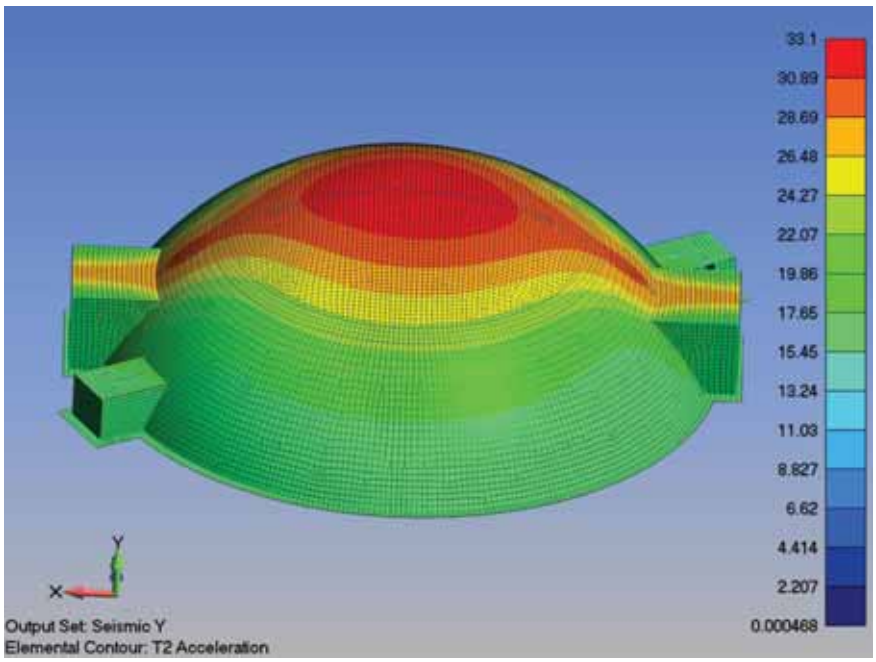
How finite element analysis helps produce reliable, durable dome storage

Building a durable dome for bulk storage requires a lot more than inflating a domed airform and placing concrete using the shotcrete method inside the dome, *writes Zane Wells for Dome Technology*. It also requires that the dome be designed for the stresses it will encounter over its lifetime.

To ensure a long-lasting structure, Dome Technology engineers utilize finite element analysis to determine how the dome will behave when loads are applied. These loads include self-weight, snow, wind and seismic, in addition to the pressure loads from the stored material. All of these loads impact the stresses in the dome in their own unique ways.

Imagine this: a dome is sized based on the required storage volume for the stored material, and an initial thickness is assumed based on previous experience. Engineers use a closed-form methodology based in classical engineering theory to identify the correct thickness and reinforcement for the structure. It's the starting point of the design, if you will. The closed form solution identifies the stresses in the shell due to the applied loads.

The geometry is then drawn up, and the required thickness and amount of reinforcement is specified on the plans. Local building codes spell out stress and deflection criteria for a structure, or how a structure should be designed to resist applied loads. The building codes are written around typical frame and bearing-wall structures. These structures behave in a very well understood manner. Concrete shells, including domes and silos, do not resist loads in the same manner as frame and bearing-wall structures, so further analysis is done to ensure code compliance and safety of the system.



A computer model of the dome is created in FEA software. The software then breaks the model into smaller pieces — the finite elements. Loads are applied to the dome model, and the software analyses the dome to determine the stresses and deflections due to the various loadings. These stresses are used to verify the specified reinforcement, and any areas of stress concentration are further investigated. The deflections of the system are used to identify the areas most likely to buckle under real-world loading situations. With those points identified, additional structure can be specified on the plans. This tool is invaluable for customers because high-stress areas are identified and actions are taken to design the concrete structure to resist the loads on the dome shell. Here are three ways customers benefit from FEA:

- **Longer life for the structure:** by identifying which portions of the dome will bear the brunt of pressure and loads inside and out, the dome is reinforced where needed, meaning the structure will have strength where it needs it for decades to come. For example, a customer might request a bigger opening to access the stored product; FEA will show what construction materials are required to make the dome strong enough to support the opening. FEA is also an important way to determine how a dome will behave when a headhouse or conveyor is supported on the dome apex.
- **Eliminate unnecessary spending:** this works in reverse too. Sometimes an engineer might assume a certain point in the dome could be compromised with additional loads and suggest more reinforcement be added there. But FEA software eliminates the guesswork (and manual maths) by identifying if that's actually the case. When that happens, unnecessary extra reinforcement is eliminated — and so is unnecessary spending.
- **Better preparation for weather events:** because FEA analyses how the pressures of tornado, earthquake, hurricane and heavy snow loads will interact with the dome shell, the dome itself can be designed to better withstand natural disaster. In high wind areas, like Tornado Alley in the United States, or high seismic areas, like Chile in South America, this is especially beneficial. DCi

Dome Technology grain storage dome.

Raising more than just standards

bulk handling cranes in focus

Four-rope bulker cranes with eccentric platform on a transshipper.

Jay Venter

Cranes for bulk handling applications on floating terminals: how to choose the right one?

Cranes are essential pieces of equipment in the world of dry bulk material handling, thanks to their flexibility in handling different types of cargo and the various possibility of installation.

One particular crane application that has become more and more important in the last years is the multimodal logistics of dry bulk materials. The cargo is transferred from smaller ships into oceangoing vessels and vice versa during ship-to-ship operations that are carried out by dedicated transshipment facilities. The market for bulk handling equipment has followed this trend and different types of cranes from several manufacturers are now available, each with specific characteristics to meet the demanding requirements for vessel loading and unloading both in sheltered waters and in open sea.

A list of the main types of cranes for bulk handling includes:

- **Four-rope bulker cranes:** the traditional heavy-duty type of crane designed for handling bulk material at high speeds and continuous operation in open sea. These cranes can be

Guglielmo Tersalvi, Operations Director at Shi.E.L.D. Services srl.

Lemniscate type crane during transshipment from OGV to barge.

installed directly on the pedestal or on an eccentric platform which extends the operating outreach.

- **Double girder cranes:** like the unique Liebherr MPGs with their large working range.
- **Lemniscate type cranes:** based on the double-boom principle, which delivers an optimal balance between weight and centre of gravity and that can handle even the largest bulk carriers.
- **Lattice boom cranes:** based on the well-proven mobile harbour crane design, which can serve ships of all types and sizes thanks to their high lifting capacities and working range.

The list of manufacturers is also well populated and includes well-known names such as Liebherr, Macgregor, TTS, NKM Noell Konecranes Gottwald, Kenz-Figee, iKnow, to name a few.

But given the variety of brands, types and models available, choosing the right type of crane for a specific application is not always as straightforward as it seems. Several factors have to be taken into considerations when selecting the crane and the installation on board the vessel:

- Characteristics of the material to be handled, such as the specific weight, which determine the size of the grab. For instance it might be difficult to unload a small barge with a big grab and it might be more convenient to select a crane with a lower SWL.
- Environmental conditions including sea state (wave height and period) and wind speed. Some cranes provide the highest performance in sheltered waters whereas their capacity is significantly reduced for operations in open sea.
- Size of vessel to be loaded/unloaded, including small vessels like barges up to the bigger Capesize.
- If the vessel to be loaded/unloaded has obstructions on deck.
- If the crane is the only cargo handling equipment installed onboard, think of floating cranes in this case, or if it is integrated in a more complex system where hoppers and conveyors are used, as it happens on the transshipment facilities.
- The handling rate requested by the customer.
- The initial investment, meaning the capital costs which include not only the purchase price of the crane but also the costs of the necessary auxiliary systems, such as power generation, and installation.
- The operating costs, which include the cost of maintenance, spare parts and consumables.
- Lead time.

In order to address all these issues and to select the best solution that would optimize the performance of the logistics project, which includes the cranes, the vessel and the conveyor system (if present), specific expertise and know-how are needed. The Italian company Shi.E.L.D. Services srl has acquired these skills with years of experience in this field.

Shi.E.L.D. Services srl: expertise in the logistics of dry bulk materials

Over the last years Shi.E.L.D. Services and its team have designed, built and operated

Lattice boom crane.

many transshipment facilities which are successfully used in complex logistics projects all over the world. The advantage of having operated the vessels has allowed Shi.E.L.D. Services to have direct feedback on the design choices and to understand what is really needed to accomplish these specific operations.

"Shi.E.L.D. Services Design and Operations Department's synergy, together with lessons learned on the field during the operations, are always translated into design improvements. Possible ways to optimize the performance of the vessel are analysed and discussed with our team members on site, who collect the issues and the experiences from the Terminal Manager and the vessel Captain. This applies to the vessel in general with a particular focus on the cargo handling equipment and the cranes." says Guglielmo Tersalvi, Operations Director at Shi.E.L.D. Services.

"The choice of the equipment and their arrangement on board, which take place at the design stage, have a great influence on the actual performance, in terms of both costs and cargo transferred per day." he explains further.

"In our experience the choice of the type of crane, its main characteristics and their arrangement on board shall be made considering the type of operation that will be carried out and the interactions with the other cargo handling equipment.

"This will result in better overall performance in terms of cargo transferred per day and lower costs per handled tons, with immediate benefits to the whole project."

About Shi.E.L.D. Services srl

Born as spin-off of Coeclerici Logistics, Shi.E.L.D. Services is now a consolidated reality in the off-shore logistics of dry bulk materials and vessel technical and crew 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.

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.

The company 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 provides a complete range of services for the logistics and transshipment sector including feasibility studies, definition and development of the most suitable logistic solution, vessel design, supervision of new-building construction and vessel conversion, technical, crew and operational management.

SIBRE introduces a new generation of USB thruster disc brakes

SIBRE's USB 5 V, one of 5 models in a new range of USB thruster brakes.

The world of industrial brakes

The SIBRE Siegerland Bremsen GmbH is a globally operating, medium-sized traditional company, with over 60 years of company history.

From the very first, the company has engaged in the development and production of brake systems for the industry. Right from the start, value was placed on technical innovation, the most modern manufacturing technology and high customer use. Production procedures are continuously supervised by a quality management system.

The aim during product development is the optimum combination of a top-quality product, the greatest ease of use and market-driven prices, both for plant engineers and plant operators. SIBRE has upgraded the well-proven design of its USB thruster disc brakes; the new generation is even more reliable and efficient, and comes with several new design features:

- Standardized functional principle, available in five different sizes. Designed for all applications in a crane (gantry, boom, slewing, hoist). Identical conditions in regards to installation, adjustment and maintenance.
- Improved brake linings. More stable friction coefficient and brake torque. Extended lifetime.
- Parallel opening of brake shoes. Simplified alignment of the brake system. Minimized risk of sliding between disc and linings.
- Optimized spring guiding unit. Reduced noise emission. Extended lifetime of brake spring.
- Upgraded manual release system. Increased operational safety for manual load lowering.
- Enhanced corrosion protection. By design features and improved coating. Additional options for status monitoring. Load cells for measuring the brake torque. PT100 temperature sensors for the brake linings. Linear position sensor for monitoring of thruster stroke. Linear position sensor for torque adjustment.

These brakes are designed considering the specific demands of crane-, lifting- and material handling applications and is the consequent result of the continuous research and development performed by SIBRE.

The new USB 5 series consists of the following models: USB 5 V, USB 5 III, USB 5 II, USB 5 I, USB 5 05.

About SIBRE

SIBRE's brakes are continuously developed by a team of highly qualified engineers, technicians and designers and are adapted to increasingly complex drives.

SIBRE not only has decades of experience in brake production, but also utilizes the most modern construction and manufacturing technologies. SIBRE works with modern, efficient construction 3D software for the design layout of its brakes and has its own high-class test and measuring lab.

SIBRE is present with representations around the globe and runs branches in Spain, Italy, the USA, China, Serbia, Sweden, Singapore and India.

ITALGRU

PORT & OFFSHORE CRANES

www.italgru.com

Our production includes a wide range of mobile harbour cranes with a lifting capacity from 25 t to 160 t.

ITALGRU S.r.l
Strada Statale Briantea
4 – 24030 AMBIVERE (BG) - ITALY
Tel. +39 035 4932411 - Fax. +39 035 4932409
email: info@italgru.com

ITALGRU: offering high-quality cranes since 1954

Two ITALGRU IMHC 2120 mobile harbour cranes — four-rope version — in operation at Kandla Port in India.

Italian crane manufacturer ITALGRU S.r.l. has proven experience in providing specific operational solutions in the cargo handling industry. These solutions cater to the most important logistic segments such as harbour, off-shore, shipyard, and steel mills businesses. Competence and innovation are the pillars behind the ITALGRU brand, designs and developments.

ITALGRU's crane designs, in compliance with F.E.M. 1.001 Design Rules, allow for classifications from A3 to A8 based on the client's requirements.

Port cranes

With over 60 years of experience in the cargo handling industry, ITALGRU's mobile harbour cranes are the result of careful studies of technological developments and the application of the necessary technologies to modern harbour equipment in order to handle every type of goods.

Efficient, mobile and versatile, ITALGRU's mobile harbour cranes can be used in any port for the handling of: bulk materials, steel or scrap metal, general cargo and heavy loads, containers.

Both diesel-hydraulic and electric drive system are available, controlled by ITALGRU's state-of-the-art electronic crane management system, ensuring the crane's performance is optimized.

Safe, smooth and precise crane handling is a result of innovative engineering and constant customer feedback and implementation of the latest technologies available.

Offshore cranes

ITALGRU consistently works towards improving its products and services while meeting the demands of developing markets. The company's products display the highest workmanship quality and full traceability is available for customer review, from the initial steel plate up to the final commissioning of the crane.

All offshore cranes are designed and manufactured according to the highest industry standards with strong adherence to customer requirements and third party certifications.

Reliable fibre-optic high speed data transmission retrofit for automation of

Conductix-Wampfler offers a full range of conductor rails, cable reels, motor driven reels, slip rings, cable festoons, cable chains, flexible cables and even systems to transfer energy and data contactlessly. The unique combination of product options and practical experience gives customers the right solution, every time. Getting the right power solution is a major focus for every crane manufacturer.

Increasing demand for automation and autonomous operation

The main reason companies are investing heavily in automation and autonomous operation is to increase the efficiency of processes such as improved performance and reduced downtime, enhanced safety of workers from hazardous work environment, and better cost effectiveness obtained by increased productivity and reduced operational costs. The increasing adoption of Industrial Internet of Things (IIoT), new sensor technologies, and smart devices are some other factors contributing to the growth of the demand for automation.

Autonomous operation: real-time, 100% reliable and high-speed data transfer

Autonomous operation will increasingly demand more reliable, redundant, real-time networks. In addition to being real-time, data sensing and transmission must be also 100% reliable, meaning that connectivity can't fail because of environment conditions, such as heavy rain or snow and is expected to last many thousands of hours of operation, with as minimal maintenance efforts as possible.

The demand for high-speed data will only increase as systems such as on-board video systems, environmental monitoring systems, sensing technologies and reliable autonomous driverless systems will generate vast amounts of data, which will require sophisticated high-speed point-to-point data links, which will be required to continuously increase bandwidths capable of transferring gigabytes of data to the cloud every hour.

Using fibre optic (FO) in place of wireless technology

The limitations in existing wireless communications technologies, such as Industrial WIFI and 4G-cellular LTE affect their suitability for mission-critical requirements for autonomous operation, because they are not able to provide gigabit/s data rates or ultra-reliable low latency over long distances. Until this moment, these wireless technologies have not been able to replace fibre optic data links, due their significantly lower capacity and higher latency (slower response times).

One example of the risks of using wireless technology in mission-critical autonomous operation, is the collision of two driverless hauling trucks in a mine in Australia, occurred after industrial WiFi coverage, which provides communications between the trucks and control centre, dropped out.

One additional advantage of fibre optics over wireless systems is its easier maintenance and troubleshooting. While wireless equipment normally relies in proprietary technology and a vendor service team for troubleshooting and to perform adjustments, fibre optic is a known and accessible technology, that allows the end customers to troubleshoot the fibre using a OTDR with their own personal and perform a quick fibre cable or fibre connector replacement if needed. Replacing the fibre normally requires significantly less time when compared to wireless data transfer troubleshooting.

Fibre optic retrofit options for existing equipment

Conductix-Wampfler is able to provide two retrofit solutions for machines already equipped with a motorized power cable reel. Both solutions will require a rotary data transmission element, in this case a transmitter of fibre optic (TFO).

The TFO ensures lossless transmission of optical signals between a rotating part (e.g. trailing cable being spooled on a cable reel) and a fixed part (e.g. connection to machine room). It is compact and slim: compared to all other solutions on the market, we offer minimum size constraint being the most compact and thinnest on the market; only 200 mm thick. Using Plastic Optical Fibres (POF) light is transmitted contactless over passive and independent channels. This means long life with no maintenance and without the potential problems that can affect slip rings such as vibration, humidity, and magnetism. Cost-effective for multi-channel systems with its simple and robust design which leads to a long lasting lifetime (500,000 cycles) with no data rate limit and no interference.

Both solutions will require a rotary data transmission element, in this case a transmitter of fibre optic (TFO).

Scenario 1

Adding a TFO to the existing motorized power cable reel and replacing the power cable with a new integrated fibre

TFO inside enclosure

Successful installation of TFO enclosure to a previous reel (box to the left with sticker)

Conductix-Wampfler HVR-FO medium voltage (MV) reeling power cable with integrated fibre optics.

Advantages:

- Minimal additional space required for TFO enclosure

Challenges:

- Requires the existing (MV) reeling power cable to be replaced by a new cable with integrated fibre optics.
- Retrofit made to a different manufacturer cable reel will need previous Conductix-Wampfler technical assessment.

Scenario 2

Monospiral reel for reeling length up to 370m

Small level wind reel with guiding device (TRV) for reeling length from 300m up to 800m.

Independent motorized cable reel for dedicated fibre cable advantages:

- Price of new reel with fibre cable is competitive to the price of TFO combined with new MV reeling power cable with integrated fibre optics.
- Can be installed to an existing machine equipped with different brands of power cable reel.
- Minimal maintenance required.
- In case fibre cable is damaged by external impact, its replacement is more cost effective and faster. Its smaller diameter and weight, makes it easier to transport by airfreight if needed.
- Design can be standardized among different machines located in the terminal or stockyard.
- These systems have been reportedly working over ten years without problems at the largest mining company in Brazil and other countries.

Challenges:

- The independent fibre cable reel requires more space when compared to the TFO enclosure solution.

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Smart Konecranes Gottwald mobile harbour cranes up to multi-cargo challenges

Business Unit Mobile Harbor Cranes (MHC) offers Konecranes Gottwald mobile harbour cranes to the marketplace.

The company has been in the MHC business since 1956, when it invented the mobile harbour crane. In 1998 it introduced rail-mounted portal harbour cranes based on mobile harbour crane technology. In 2004 it launched the first barge-mounted crane based on mobile harbour crane technology. The barge-mounted types are also operated in open-sea applications.

A Konecranes Gottwald Model 6 Mobile Harbor Crane handling bulk materials. A similar crane will be put into operation at the end of 2019 by HES Gdynia Bulk Terminal SP in Poland.

Robust, versatile and eco-efficient mobile harbor cranes

"We offer a range of dedicated four-rope grab mobile harbour cranes and derivatives on portal or barge as well," says Peter Klein, Senior Marketing Manager, Business Unit Mobile Harbor Cranes, Konecranes. "These machines can handle up to 2,000tph [tonnes per hour] depending on terminal and operation conditions." The machines can be equipped with smart crane features (refer to table below), which assist the crane drivers and also increase productivity and safety. The company is also working on additional features which are going to further automate crane operations.

MHCs handle virtually all types of cargo including containers, bulk materials, general cargo and heavy project cargo.

According to Klein "This machine can be ideally described as 'one serves all', for all kinds of terminals, all kinds of vessels and all types of cargo. We've been offering all of our cranes with the most modern electric drives since 1956. They are driven by electricity, the future energy." Since the cranes are electric cranes, they do offer an 'ideal match', which means that external power (electricity) can be fed into the crane without any need for energy conversion to operate the crane. "This is a great advantage," says Klein. "Also, energy recuperated during braking and lowering motions can be fed back into the grid."

SMART CRANE FEATURES: CARGO TYPE AND BENEFITS

	CARGO			BENEFITS		
SMART CRANE FEATURES	CONTAINER	BULK	GENERAL	EFFICENCY	SAFETY	ERGONOMICS
Load anti-sway	*	*	*	*	*	*
Semi-automatic point-to-point control	*	*	*	*	*	*
XY-path assistant	*		*	*	*	*
Hoisting-height assistant	*	*	*	*	*	*
Working-range assistants	*	*	*		*	*
Vertical-lift assistant			*	*	*	*
Tandem-lift assistant			*	*	*	*
Auto-adaptive grab control		*		*	*	
Cargo-hold totalizer		*		*	*	
Verifiable weighing system		*		*		
Web reporting	*	*	*	*	*	
Remote desktop	*	*	*	*	*	

For productive and safe cargo handling, Konecranes offers a variety of standard and optional smart crane features for its complete range of mobile harbour cranes.

Konecranes in the news

Konecranes wins mobile harbour crane order in Poland

In May this year, HES Gdynia Bulk Terminal SP (HES Gdynia), on the coast of northern Poland, ordered an eco-efficient Konecranes Gottwald Model 6 mobile harbour crane for continuous-duty bulk handling. The order was booked in the second quarter, and the crane will be pre-commissioned and handed over by the end of 2019.

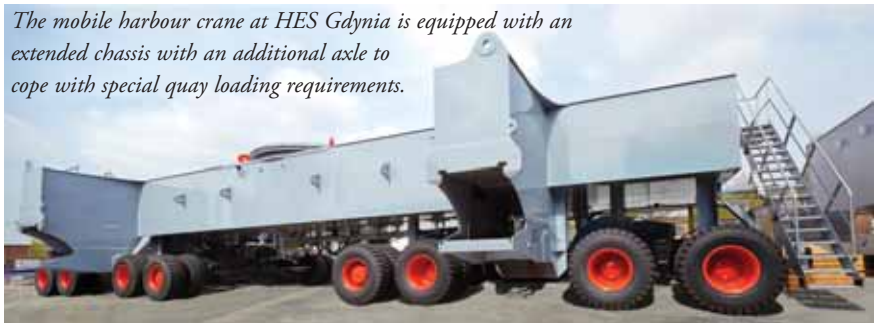
KONECRANES®
Lifting Businesses™

YOU NAME IT, WE CRANE IT

Heribert Barlage
Senior Vice President, Mobile Harbor Cranes

Bulk up your terminal

Outfitting a new bulk terminal or revamping an existing one? Looking to replace ageing equipment without hassle? Check out our ultra-efficient continuous-duty bulk-handling solutions with short delivery lead-times and smooth quay integration. You'll improve your operations in terms of productivity, safety and ergonomics with our cutting-edge automation features. You can have it all. Let us, the pioneer of portal harbor cranes based on mobile harbor crane technology, help you advance your terminal sustainably.



The mobile harbour crane at HES Gdynia is equipped with an extended chassis with an additional axle to cope with special quay loading requirements.

HES Gdynia Bulk Terminal is part of HES International, one of Europe's largest independent terminal operators in dry and liquid bulk products. HES terminals operate in Europe's most important ports at prime locations including a bulk cargo terminal in Gdynia, one of the biggest sea ports in Poland.

The Konecranes Gottwald Model 6 crane is a welcome addition to the terminal's existing stock of cranes. The crane is suitable to handle different kind of dry bulk materials and is furthermore able to travel between two quays. This results in more flexibility during the unloading process and enables HES Gdynia to offer even better service to customers.

"Another HES terminal in the Port of Rotterdam already operates a Konecranes Gottwald Model 6 mobile harbour crane, and it has consistently demonstrated high performance and reliability," says Sonia Florczuk, Commercial Director of HES Gdynia. "Its low cost of ownership and long service life convinced us to invest also in a Konecranes Gottwald mobile harbour crane in Poland. It was also customized for the challenging conditions on the quay at our Gdynia terminal."

The new crane will be a Konecranes Gottwald Model 6 mobile harbour crane in the four-rope variant G HMK 6508 B for continuous-duty bulk handling. It features a raised tower cabin for a better view on the vessel, and an extended chassis with an additional axle to cope with special quay loading requirements, a design already proven in other terminals. In addition to the eco-efficient diesel-electric drive, the crane is equipped with an external power supply, which boosts efficiency even more while also reducing local exhaust and noise emissions in the terminal.

"With this crane, we are continuing our success story of four-rope grab mobile harbour cranes for continuous-duty bulk handling," says Hans-Juergen Schneider, Regional Sales Manager for Konecranes' Business Unit Mobile Harbor Cranes. "The deal also reflects the good momentum we have seen lately with Baltic Sea customers, who really appreciate our continuous-duty bulk handling capabilities and ability to specially outfit machines as needed."

2,000th Konecranes Gottwald mobile harbour crane celebrated with Ership in Cartagena

On 8 May this year, the 2,000th Konecranes Gottwald mobile harbour crane was inaugurated in a formal ceremony at the Ership terminal in the Mediterranean port of Cartagena in southeastern Spain.

The crane is Ership's new eco-efficient Konecranes Gottwald Model 6 mobile harbor crane, in the G HMK 6407 B four-rope variant. They will use it mainly for continuous-duty bulk handling, and also for general and project cargo up to 100 tonnes.

Liebherr announces new LiUP® crane driver elevator for mobile harbour cranes

Liebherr presents new elevator for mobile harbour crane operators at TOC Europe 2019 in Rotterdam

Liebherr Maritime presented its new LiUP crane driver elevator for mobile harbour cranes at this year's terminal operator trade fair, TOC Europe. The in-house developed lift has an innovative drive technology and is powered by an electric motor with lithium-ion battery and energy recovery function, which is able to recover up to 40% of energy when the lift is lowered.

With multiple safety features, the Liebherr crane driver elevator LiUP is designed to transport the operator in a safe and efficient way to his workplace. The LiUP saves the drivers energy and time compared to climbing up several stairs. Service engineers also save themselves the trouble of climbing up stairs to the crane cab to carry out maintenance work. The lift is capable of transporting up to two people or a payload of 200kg.

The LiUP elevator has already been deployed successfully for a number of years with Liebherr tower cranes and has been awarded the golden innovation prize at the Intermat 2015 in the 'Equipment & Components' category.

DCi

The LiUP has innovative drive technology and is powered by an electric motor with lithium-ion battery.

Grain handling expertise

with Buttimer Engineering

Grain handling specialist

Grain handling has been the cornerstone of Buttimer Engineering since their inception in 1978, originally providing equipment exclusively for the handling of bulk dairy ad grain products. It can now boast four decades of experience in the design and supply of mechanical handling systems for grain and agri-industry applications. From the fabrication of bespoke pieces of equipment to the design and installation of complete turnkey materials handling systems, Buttimer's in house design team and on-site engineers have a wealth of knowledge and practical experience of providing tailored solutions to agri-industry sectors including malting, brewing, food processing, animal feed milling and energy crops. Delivering projects for clients such as Dairygold, Diageo and Bunge, the diversity and depth of Buttimer's grain handling expertise makes the company an ideal partner in the development and installation of grain handling systems.

Grain processing & storage

Buttimer design equipment and mechanical handling systems for a diverse range of grain products, including but not limited to: wheat, barley, maize (corn), rice, flaxseed, rapeseed and rapeseed meal, soya beans and soybean meal, coffee, food powders, wood fibres, pellets and other biomass.

Each system is designed to complement the characteristics of the handled dry bulk product, and the throughput and processing requirements of the client. Some processing applications installed include: drying, de-stoning, cleaning, milling, blending, pelleting (cubing) and treating as well as the required belt or chain conveying, bucket elevators, hoppers and loading and unloading equipment to rail, road, ship or other logistics systems.

Systems can be designed with full dust control, aspiration systems, ATEX and fire safety protocols to the specification of the grain's characteristics and client's process. Storage options include steel silos, concrete silos and flat-stores. Each dry bulk product, and client's processing requirements will require a unique handling system; Buttimer works with clients to deliver the grain processing, storage and out-loading system that meets those unique requirements.

Equipment supply

The range of equipment supplied by Buttimer is quite comprehensive and covers all aspects of the grain handling process. This includes equipment for;

- **mechanical conveying:** Buttimer supplies a range of belt, chain, bucket and screw conveyors for the handling of dry bulk product. With motors, gears, belts and components customized to

the client's process — Buttimer endeavours to provide the right unit based on requirements, prioritizing efficiency and ease of maintenance.

- **pneumatic conveying:** another form of conveying, Buttimer offers a selection of rotary valves, pneumatic conveying plant, two-way diverters and automatic filtering systems for handling powders and dry bulk products. Buttimer can provide the complete range of components including slide-gates, ducting and air blowers.

- **sorting & separating:** this includes specialist equipment for sorting or separating bulk product based on particle size, weight, colour or other commodity characteristics. Equipment provided includes gravity separators, magnetic separators and laser colour variance detectors.

- **mobile fume & dust extraction:** a range of mobile vacuum extractors with customizable, extendable and adjustable extraction tubes and arms. Perfect for localized removal of fumes, vapours, fine dust or odours, these units can be easily operated and then folded away for an effective and flexible extraction solution.

- **installed dust control:** industrial dust control systems including extraction filters, ducting and air pressure systems. Buttimer's range of filtration solutions includes bag and cartridge type dust capture. Fully customizable extraction units can be designed for aspiration in grain, biomass, pharmaceutical, recycling, metals and similar sectors

Sample projects

Over the past 40 years, Buttimer Engineering has completed provided equipment for many large projects in the grain handling sector for a number of high profile clients, such as;

Diageo

Buttimer Engineering provided design, procurement, fabrication and installation services in Dublin's famous St. James Gate brewery, where rice, malt barley and roasted malt barley are handled. The turnkey solution developed includes; bulk intakes, a bin block of 13 storage bins, five cleaning and de-stoning lines (including weighing, aspiration and process equipment), a rice grinding line and roller mill. Buttimer's service involved the full detailed design and supply of all equipment as well as on site installation which included equipment support structures, maintenance and project management.

Bunge Poland

Bunge is a global producer and trader of food oils and grains. The import/export facility in Swinousjcie, Poland, includes a

large flat storage facility for soybean meal and rapeseed meal, which also compromises a fully aspirated system for loading and unloading ships, rails and trucks, demonstrating very high throughput efficiency for a low-density bulk product. It includes a ship unloading capability of 800tph (tonnes per hour) of soybean meal, ship loading of 600tph of rapeseed meal, a handling and storage capacity of 50,000 tonnes. The fully aspirated turnkey project was designed and project managed by Buttimer.

Masnedo Bulk Terminal

Buttimer Engineering carried out a range of design, fabrication, delivery, installation and maintenance work at Masnedo Bulk Terminal, Denmark. This industrial part of the port is intended to handle grain cargo. Buttimer has completed, provided and installed equipment for the handling of bulk products. The project included: silos with a total capacity of 88,000m^3, a dryer with wheat capacity of 100tph, 500 tonnes of galvanized supporting structure and almost 60 different types of conveyors with capacities vary from 300 to 1000 tonnes of wheat per hour.

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Adding value to bulk raw materials

J.C. Steele & Sons re-purposes waste material

Steele classifies raw materials before developing their value-adding solutions.

Steele develops sustainable, scalable solutions to recover value from mill by-products previously marked for landfill.

Steele's work in solving customer challenges with raw materials dates back to 1889, when J.C. Steele, the company's founder, built machines to help customers produce high-quality brick consistently and reliably.

The ability to prepare, mix and shape clays and shales with varying moisture levels drove Steele's growth in brick-making machinery. A hundred years after opening its doors, Steele dominated the US market and had long-standing customer relationships with heavy clay producers in Asia, Australia and the Middle East.

Looking for new market opportunities, Steele made a strategic decision to move into industrial by-product management and resource recovery.

The company's engineers were confident that their signature stiff extrusion technology, which uses vacuum and high torque to agglomerate and shape various low-moisture raw materials, would be an ideal fit for iron & steel mills and ferro alloy plants ready to recover captive value from mountains of dust and fines.

As it turned out, they were right. Customers around the world were eager to work with a company that backed their machines with engineering and service, to deliver more uptime and increased productivity.

Recovering captive value in industrial by-products

Beginning in 1996, with a ferro alloy producer in Colombia, Steele has processed over 10mt (million tonnes) of nickel-rich lateritic ore dust, recovering an additional 10,000 tonnes of nickel annually for feedstock. This led to a second installation in Brazil, which used the same process with equal success.

In 2010, it began to work closely with iron & steel mills in Asia, Russia and South America to process DRI fines, blast furnace sludge, dust and fines, and mill scale. These are sustainable, scalable by-product recovery solutions, developed and refined by Steele's engineers and plant management, to convert waste streams to

engineered, high-quality feedstock for more metal recovery, improved sinter and lower carbon costs.

In 1993, Steele used one order for an even feeder, from a mining company looking for a paste backfill solution, to deliver material feeding solutions at 50+ installations worldwide. Steele even feeders provide consistent metering of wet, dry, sticky, abrasive and clump paste, filter cake and mine tailings.

Steele develops sustainable, scalable solutions to recover value from mill by-products previously marked for landfill. Inset, cross-section of extruded pellet produced from lateritic nickel ore fines, ready for 60–90 days of exposure before melting.

How Steele adds value to raw materials

Every raw material presents unique challenges, but Steele has the experience and global resources to classify materials and design the optimal combination of machinery and production processes. Its capabilities include a lab and test plant services, plant and application engineering, system installation and custom die manufacturing.

Steele even feeders handle mountains of mine tailings without the bridging and sticking of box or belt feeders.

The value Steele adds to these raw materials includes consistent output, increased durability and weather resistance, along with minimal dust generation. These extruded briquettes are shippable, handling 20+ transfers with attrition rates below specification.

Steele can build its production lines on-site or process bulk raw materials off-site and ship to its customers' operations.

Technology built on a knowledge base

The company manufactures a complete line of machines for feeding, sizing, mixing and shaping bulk raw materials. This technology forms the core of Steele solutions, which the company customizes for individual raw materials and production with ongoing engineering, operations support, and parts & service.

Steele has two subsidiary operations that give it single-source capabilities for plant engineering: Händle GmbH Maschinen und Anlagenbau, a German manufacturer providing application engineering and machinery for environmental engineering projects around the world, and Direxa Engineering, an engineering, procurement and construction company based in Lakewood, Colorado, that specializes in plant and application engineering.

A new strategic partnership with a mill services leader

In 2014, Steele began a proof-of-concept trial with TMS International, a major provider of global mill services. The trial converted iron- and carbon-rich fines, dust and wet sludge to high-quality feedstock and was successful.

As a result, TMS International launched Extruded Product Services (EPS), a mill by-product management solution using Steele stiff extrusion technology. EPS lets iron & steel mills engineer their extruded pellets to meet precise cost, performance and handling requirements.

In 2016, TMS opened a dedicated EPS plant to produce high-quality feedstock for full-scale trials. Customer interest in sustainable, scalable by-product management led to a dedicated EPS plant on-site for CAP Acero Steel in Chile in 2019.

Steele also supports other full-scale by-product management facilities in South Africa, India and Germany.

Higher production rates/lower cost per tonne

Steele's customers, whether they work in heavy clay, metals or mining, want scalable solutions. In response, the company will mark its 130th anniversary this year with the launch of its newest and largest extruder, ready to deliver higher production rates at a lower cost per tonne when commercially available in 2021.

As always, Steele will back its latest innovation with engineering, installation, operations and maintenance support, plus high quality parts and service. The company's ability to build service-based relationships that span decades powers its growth in markets that demand sustainability and scalability.

Shipping and transportation agents, material handling specialists and primary producers with raw materials problems should speak to Steele about possible solutions. DCi

The Steele 25 Series Extruder produces extruded briquettes at a rate of up to 20 metric tonnes per hour.

Pulp and paper industry a bright spot, amidst mostly stagnant Brazilian industry

Klabin is SET to build a second 900,000-tonne-capacity line at its new Puma mill

Patrick Knight

With Brazil's new government having difficulty in pushing controversial new legislation through congress, the country's economy is on course to grow very little, if at all this year, rather than the hoped for 2%. Output by industry, notably of vehicles, but also of steel and many other industries is down sharply, while unemployment is at record highs, cutting demand.

But there is one exception to the bad news, and that is the pulp and paper industry. World demand for short fibre pulp which is Brazil's speciality, continues to grow fast. Between 1.4–1.5mt (million tonnes) extra will be needed each year for the foreseeable future to meet strong demand, led by that from China. Most of Brazil's leading companies, notably Suzano, now greatly enlarged following its merger with Fibria, are planning new mills. The leading packaging company, Klabin, is to build a second 900,000-tonne-capacity line at its new Puma mill, while Eldorado is also planning a second mill in Mato Grosso state.

At least two companies completely new to Brazil, the Singapore based Royal Eagle, which plans to invest US$2 billion in a mill designed to make viscose in Sao Paulo state, and the Chinese owned Euca Energy which plans a brand new 2mt pulp mill in Mato Grosso state, are joining the existing industry. Eldorado claims that the pulp it produces at its Mato Grosso do Sul mill costs less that $150 a tonne to make. So although world pulp prices have dipped somewhat from their $800 a tonne average mark, following the slow down of the Chinese economy, because of the steady growth still to come, Brazil continues to be the best place to consider investment.

Suzano's merger with Fibria will bring major cost advantages, including a reduced tax bill, while the exchange of some plantations between mills, will reduce the

distance Suzano's wood has to travel from forest to mill from the present average of 240km, to 156km. In the short term, the company is to cease production at some of the elderly first generation of pulp mills in its portfolio, including a 200,000-tonne-capacity line at the Aracruz complex, built in the 1970s. This mill can make only 10% as much as the latest mills have capacity to produce. Brazil's ability to grow wood more cheaply as anywhere else in the world — pulp grown on the 60,000 hectares of plantation at the Lwarcell mill in Sao Paulo state, to be taken over by the Golden Eagle company, produces an average of 54m^3 of timber per year on each hectare — is also a major advantage.

With a worldwide shortage of wood, an export trade in timber, as well as chips for use in mills, notably those in China, has come into being and is now growing fast. This is forcing up the price Brazilian mills have to pay for wood not grown on forests they themselves own. To save the large pulp producers capital, an increasing amount of the wood the industry needs is now produced by independent growers, who in the absence of firm contracts can sell to who they want.

Until recently, several trade bodies have represented different aspects of Brazil's buoyant forestry industry, which is responsible for a massive 6.9% of the country's GDP, and which employs 3.7 million people in the country as a whole. The new body, the Brazilian Forestry Association, has taken over from the pulp and paper industry's Bracelpa, as well as various organizations representing different parts of the timber industry and forestry industries.

Bracelpa had been able to make a great virtue of the fact that all of the wood its members use to make pulp and paper derives from planted forests, and that none of came from the native forest, none at all from the Amazon region. There was one exception to this, the 200,000-tonne Jari Project, built in the 1960s in Amapa state, of which more later.

Brazil's new president Jair Bolsonaro, an ex-military man, is one of the few world leaders who believes that climate change is a myth. He has taken steps to liberate the cutting of trees in the Amazon region, many of which are exported. The area of the Amazon cleared of native trees each year fell steadily in the last years of the 20th century and the early years of this, following a tightening of restrictions, and equally importantly, an increase in policing. The introduction of a new 'forestry code', also helped. But the rate of clearance had risen again in recent years, during a period when public attention turned to the impeachment of a one Brazilian president, Dilma Rousseff, and the problem of widespread corruption which has ended in the imprisonment of two others.

American businessman Daniel Ludwig believed that the gmelina tree would be better suited to Brazil's conditions than the more commonly grown eucalpytus.

There are fears that the new right wing regime headed by Bolsonaro, will result in much more quality timber, whose origin is not certified, coming onto the market. It remains to be seen how the new forestry association, whose chief executive is Paulo Hartung, a previous governor of Espirito Santo state — where the Aracruz mills are located, as well as the main port for the export of pulp and other forest products, Portocel — will cope with the new situation.

For many decades, owners of all properties in the Amazon region, have been obliged to leave between 20–80% of their property uncleared, a measure designed to protect the whole forest from changing its nature. But Bolsonaro has decreed that this rule should be abolished, and a major revision of the forestry code and its various restrictions, which took years to agree, is also proposed. This is all expected to lead to a great increase in timber being cut. At the moment, many importers and traders insist that the timber from Brazil carries a label certifying that it has been sustainably produced, and many customers require this. The pulp and paper producers have always been able to point out that they produce nothing at all in the Amazon region, so the susceptibilities of customers in this regard, can be satisfied.

The important Orsa packaging company, which owned several mills in the south of Brazil, has recently been taken over by the US-owned International Paper company, which also processes much of the pulp produced at a mill previously owned by Fibria, now controlled by Suzano, in Mato Grosso, into printing and writing paper. But International Paper was not interested in buying the Jari mill, which has capacity to make 200,000 tonnes of pulp, all of it exported.

The Jari project was designed and built on a huge area of land bought in the 1960s by the American businessman, Daniel Ludwig, during the period when Brazil was ruled by a military-led regime. In exchange for the massive investment which was promised, Ludwig, whose main interest hitherto had been in shipping, was allowed to proceed as he felt fit. He arranged for a complete pulp mill to be built in Japan, then towed half way round the world to be set up on a dredged site in Amapa state, together with a similar sized power plant. Ludwig set about clearing a huge area of native forest, which was planted with seedlings of the Gmelina tree. This tree is native to Africa, and Ludwig was convinced it would be better suited to local conditions than the more commonly grown eucalyptus.

An infrastructure large enough to handle a far larger project than the 200,000-tonne initial Jari capacity, was installed, including a railway to carry wood from the forest to the plant. A township with shops, churches and schools was built at Jari. But it was found that the sandy soil at Jari made the use of normal wheeled vehicles impossible, so more costly tracked vehicles had to be acquired.

Only accessible by air, or needing a three-day river trip from the capital of Para state, Belem, supply and logistics have proved a serious and very costly problem from the start. Management personnel had to be paid well above average salaries to encourage them to re-locate to Jari, while obtaining reliable labour locally has proved a major headache.

Labourers in the Amazon region are accustomed to working for only short period, such as on riverboats or woodyards. They then leave their jobs, certain that they can get another when their savings run out. The idea of a full time job does not appeal. The turnover of staff is therefore extremely high, and no permanent solution to this has been found.

A sizeable town grew up on the opposite bank to the mill, where thousands of people now live. Expanding the capacity of the Jari mill might have been possible, had a hydroelectric plant been built on the Jari river. But after experiencing numerous setbacks, including having to accept a government presence at Jari, Ludwig was not prepared to invest more. None of his successors have been willing to build the new power station either. Another problem was that the gmelina tree did not perform as well as Ludwig had hoped, and all more recent plantations have been of eucalyptus.

When Ludwig finally quit the project, the government passed the administration of Jari to the Antunes family, which had manganese mine in the vicinity. Numerous leading Brazilian companies were more or less obliged to buy shares in Jari to allow the mill to continue. Jari now has debts of $300 million. South America and North America too, is littered with the remains of ambitious projects in isolated places which have been abandoned and are rotting. Not far away from Jari are the remains of Fordlandia, a project designed by Henry Ford to produce natural rubber from trees on plantations. The problem is that no such plantation in Amazonia has ever succeeded, as when rubber trees are planted in close proximity, they are susceptible to an incurable disease. Across in the Atamana desert in Chile, lie huge abandoned towns, located on nitrate mines which became uneconomic in the 1930s when nitrates began to be made from oil. Abandoned gold working tell a similar story in the United States, when much richer reserves were found in South Africa. Jari may soon join the list.

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The Jari mill.

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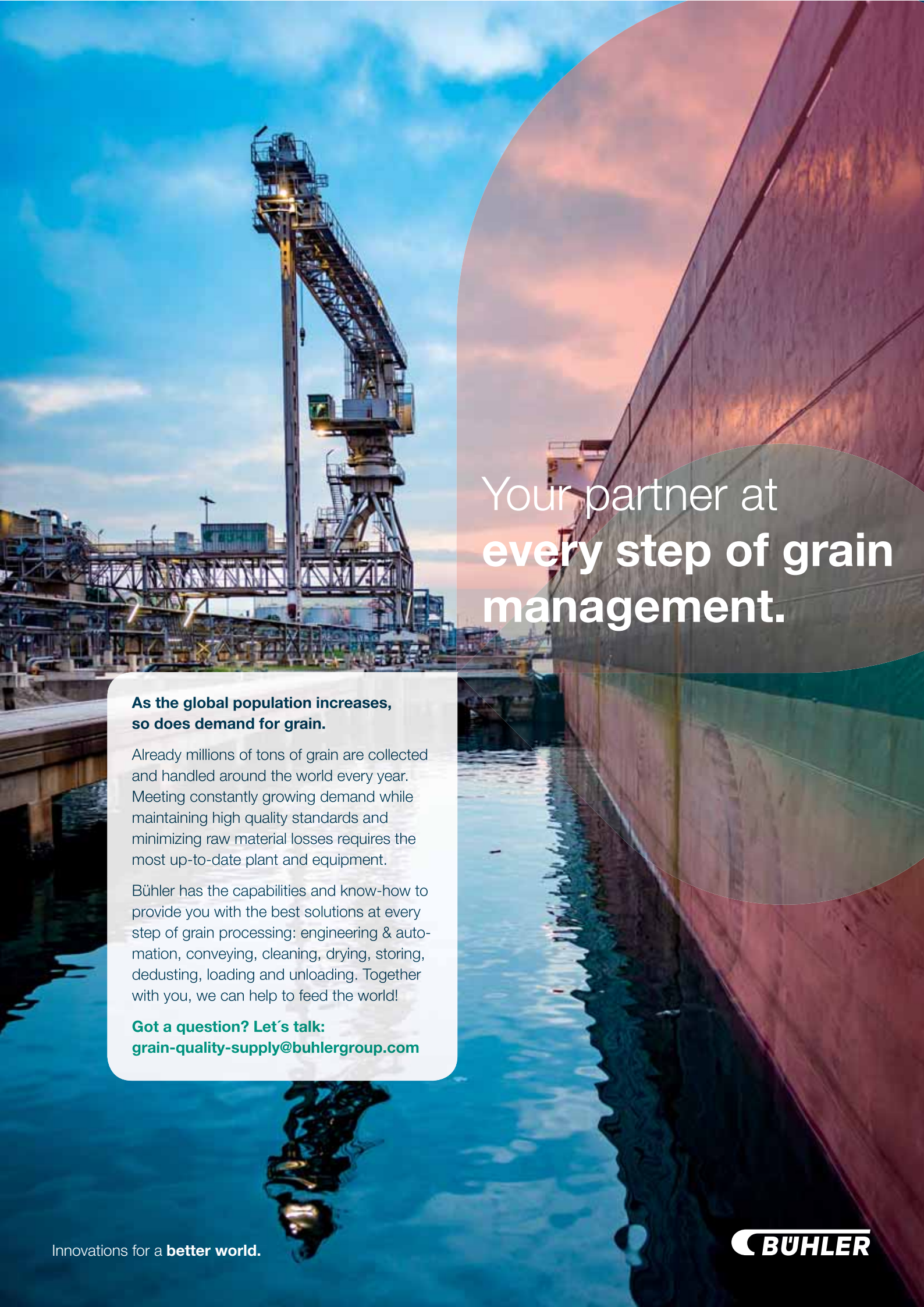

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Buckets/Grapples/Clamshells/ for Handling Scrap, Cement, Logs, Ore, Coal, Grain, Waste, Gravel, Rock, Stone, Demolition, Misc.
Supplying Customers Worldwide/Around the Clock/24-7!

Buhler AG, Grain Quality and Supply

Gupfenstrasse 5
Uzwil
Sankt Gallen
CH-9240
Switzerland
Contact: Mr Marcel Sherrer
T: + 41 71 955 3950
E: marcel.scherrer@buhlergroup.com
W: www.buhlergroup.com
Customized solutions for grain handling.
Bühler Grain Logistics Terminals is the ideal partner when it comes to reliable solutions in the area of grain handling and storage. The company's wide range of offerings includes ship loading and unloading solutions, conveying systems and silos as well as storage equipment.

Bühler GmbH

Grain Quality & Supply
Eichstaetter Strasse 49
Beilngries
DE-92339
Germany
Contact: Mrs Martina Eckerle
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T: + 49 8461 701 129
E: martina.eckerle@buhlergroup.com
W: www.buhlergroup.com/gq
Bühler Grain Quality & Supply offers package solutions, machinery and components throughout the entire food value-added chain - from the reception of agricultural products through to the final stages of processing. Whether it's a silo installation, a rice mill or individually tailored malting systems: Bühler is a competent global partner providing individualized on-site customer service from conception to startup. Safety, dependability and sustainability thereby form the basis of a trustful customer relationship.

Bulk Lift International

1013 Tamarac Drive
Carpentersville
IL
60110
USA
Contact: Mr Brian Kelly
Job Title: President/CEO
T: + 1 847 428 6059 x 215
F: + 1 847 428 7180
E: info@bulklift.com
W: www.bulklift.com
Manufactures a wide array of flexible intermediate bulk containers (FIBCs), or bulk bags. With manufacturing facilities worldwide and stocking available in the United States the company can offer just in time deliveries of all bulk bag requirements.

Buttimer Engineering

Cahir Business Park
Cahir
Co. Tipperary
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Ireland
Contact: Mr Fergal Buttimer
Job Title: Director
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F: + 353 52 744 1087
E: info@buttimer.ie
W: http://buttimer.com
Buttimer Engineering is a diversified mechanical engineering firm specialising in bulk materials handling solutions and high-quality steel fabrication. From once off design, fabrication or installation works to full turnkey projects, Buttimer Engineering can call upon skilled teams to deliver the service that our clients require.

C Spencer Ltd

One Humber Quays
Wellington Street West
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Job Title: Engineering Director
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E: marketing@thespencergroup.co.uk
W: https://thespencergroup.co.uk
Spencer Group is an industry leader in materials/mechanical handling, including the transportation of biofuel and biomass. We have vast experience in heavy-duty materials handling including loading/unloading, by road, ship or rail, and the automatic transportation of materials using bespoke conveyors.

C Transport Maritime S.A.M

7 Rue du Gabian
Gildo Pastor Centre
Monaco
MC 98000
Monaco
Contact: Captain Giorgio Vallega
Job Title: Operation/Commercial Manager
T: + 377 9798 5981
F: + 377 9798 2306
E: gvallega@ctmmc.com
W: www.ctmmc.com
Sums up the experience, know-how and networks of its parent companies in the dry bulk and logistics field, providing a full range of integrated services from the supplier to the end users, including specialised barge services, transshipment, river, coastal and ocean transportation by means of conventional bulkcarriers or self-unloading vessels and barge.

Cachapuz Bilanciai Group

Parque Industrial de Sobreposta
Apartado 2012
Braga
Braga
4701-952
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Job Title: Marketing Assistant
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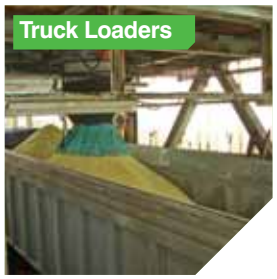
W: www.cachapuz.com
Cachapuz is a reference in the

Cleveland Cascades Ltd

Global leader in bespoke dry bulk loading chutes



Cleveland Cascades are Specialists in the design and manufacture of bespoke dry bulk loading chutes.

Our bespoke solutions are designed to meet each customer's specific requirements from a tool kit of proven components, utilising the expertise of a team of specialist in house design engineers.

We lead the loading chute industry & set the standard for dust emissions and environmental pollution control in dry bulk handling.

Our worldwide reputation is built on high quality, well-engineered, robust, high performance chutes, backed up by excellent customer service and global lifetime product support.

Contact Cleveland Cascades Ltd

Unit 22, Dukesway, Teesside Industrial Estate, Thornaby, Stockton-on-Tees, Cleveland, TS17 9LT, United Kingdom Tel: +44 1642 753260 | Fax: +44 1642 753270

E-mail: enquiries@clevelandcascades.co.uk | Website: **www.clevelandcascades.co.uk**

implementation of innovative solutions to automate the logistics, dispatching, reception and weighing processes in industrial plants. With a modular platform and extensive know-how, Cachapuz is able to meet the needs of several sectors worldwide.

Calim Grab Industry

Piri Reis Cad
Çinar San.
Sitesi No:46 Maltepe
Istanbul
81540
Turkey
Contact: Mr Murat Calim
T: + 90 533 226 4923
F: + 90 216 399 79 71
E: info@calimkepce.com
W: www.calimkepce.com
Calim Grabs is a manufacturer of mechanical, electro-hydraulic and remote controlled grabs.

Camar Mill Systems Ltd

P.O. Box 419
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Ontario
N0B 2N0
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Cambelt International Corp

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Suppliers of fully moulded sidewall belting, high incline conveyor systems, dome storage reclaim systems and conveyor components.

Caterpillar Inc

100 NE Adams Street
Peoria
IL 616-6335
USA
Contact: Mrs Sharon Holling
Job Title: PR
T: + 1 309 675 8995
F: + 1 309 675 4757
E: Holling_Sharon_L@Cat.com
W: www.cat.com
Wide range of front end loaders, bulldozers, wheel loaders etc, used for all types of bulk products and different industry applications.

Cavotec Deutschland GmbH

Ludwig-Erhard Strasse 1a
Eschborn
D-65760
Germany
Contact: Dipl.-Ing. Thomas Dreyer
T: + 49 6196 50950 20
F: + 49 6196 50950 22
E: thomas.dreyer@cavotec.com
W: www.cavotec.com
Cable management systems with electrical cable reels, hose reels, cables/hoses with up to 25kV. Spring reels; Plugs and sockets/connectors up to 660A up to 25kV medium voltage collectors, remote controls with Atex.

Cavotec SA

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Contact: Mr Dirk Fussel
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E: lorene.grandidier@cavotec.com
W: www.cavotec.com
Cavotec Group is a global leader in connecting mobile equipment. Products from the Cavotec Group manufacturing units include: Eex radio remote controls, electrical connectors up to 15kV, flexible cables, cable reels, and slipring units. Distribution is supported by 22 Cavotec sales and service companies around the world.

CDM Systems, Inc

19230 Evans Street NW
Suite 202
Elk River
MN 55330
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Contact: Mr Andrew Parker
Job Title: Vice President
T: + 1 763 428 9700
F: + 1 763 428 9701
E: sales@cdmsys.com
W: www.cdmsys.com
CDM Systems offers a comprehensive array of Bulk Conveying Systems, Components and Engineering/Design Services. With over 30 years of experience, we can provide you with conveying and bulk handling solutions for Materials from Ash through Zinc, including marine applications as well as those in hostile, severe or high-temperature environments.

Cesur Packaging Corporation

Cumhuriyet Mahallesi,
Yüzyil Caddesi, No:64,
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Kartal 34876
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Contact: Mr Cihan Cesur
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Cesur Packaging is a manufacturer of all types of FIBC 's (Type A, B, C, D for various industries - UN, Food Grade, Hygiene big bags), PP woven bags and international dunnage bags with 82 years of experience in the industry and international markets.

CHIA Espirales.es

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CHÍA focuses its efforts on providing tailor-made solutions for port, coal and olive oil industries. Specialized equipment for industry, hoppers, ship unloaders conveyor belts, lifts, port terminals, solid bulk storehouses, ecological load and unload systems are only some of the tasks most carried out by this enterprise.

Chief Industries UK Ltd.

Beckingham Business Park
Tolleshunt Major
Maldon
Essex CM9 8LZ
UK
Contact: Mr Geoff Freed
T: + 44 1621 868944
F: + 44 1621 868955
E: info@chief.co.uk
W: www.chief.co.uk
International supplier of galvanized grain storage silos and ancillary equipment. Undertake complete projects or component supply to main contractors. Manufacturing companies in USA, UK and France, providing flexibility for international design standards. Experienced in countries throughout the world.

Chief Industries, Inc.

Chief Agri
P.O. Box 848
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NE 68848
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Contact: Ms Christa Britton
Job Title: Marketing Coordinator
T: + 1 308 237 3186
F: + 1 308 389 6703
E: agri@chiefind.com
W: www.agri.chiefind.com
Chief Agri specializes in the design, manufacture and sale of grain storage systems around the world. Chief offers everything needed in a complete grain storage system, including steel grain bins, grain handling, conditioning equipment along with continuous flow grain dryers and square feed mill storage bins.

Christianson Systems Inc.

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Blomkest
Minnesota 56216
USA
Contact: Ms Barbara Gilberts
Job Title: Sales Manager
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F: + 1 320 995 6145
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W: www.christianson.com
Manufactures ship unloaders and conveyor systems under brand names of Handlair, VacBoss, Vac-U-Vator, SeedVac, ChemVac, Push-Pac, SuperTower and SuperPortable. Equipment for the transfer of dry flowable products including grain, feed, seed, rocks and sand.

Cimbria Unigrain A/S

Praestejorden 6
Thisted
DK- 7700
Denmark
Contact: Mr Lars Noergaard
Job Title: Managing Director
T: + 45 72 42 24 00 / +45 96179000
F: + 45 72 42 24 99
E: cbe@cimbria.com
W: www.cimbria.com
Markets a large line of products within dustfree loading systems. Loading solutions can be delivered for all types of material using ship loading, stock piling, road and rail. Close to 30 years experience. Product programme covers all branches where bulk products are handled from agriculture to industry.

Civettini Italo & c sas (CFS Handling)

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Job Title: Owner
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F: + 39 030 207 2026
E: civettini@cfshandling.it
W: www.cfshandling.it
Sede Operativa - working headquarters:
Via Sigalina a Mattina, 12/14
25018 - Montichiari - (BS) - Italy

Clariant Corporation

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Job Title: Head of Business Group CDP Americas
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W: www.desiccants.clariant.com
Clariant Cargo and Device Protection offers moisture solutions such as Container Dri® II container desiccants for a broad range of transport applications: from goods traveling in conventional cargo containers to shipment and storage of sensitive electronic and semiconductor devices.

Claudius Peters Projects GmbH

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Contact: Mr Frank Siebert
Job Title: Sales Director
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Cleveland Cascades Ltd

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Job Title: Managing Director
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F: + 44 1642 753270
E: enquiries@clevelandcascades.co.uk
W: www.clevelandcascades.co.uk
Designs, manufactures, markets and installs bulk loading chutes for ship loading, silo filling, truck loading, conveyor transfer point; minimising dust emissions and product degradation, as well as segregation.

COBRA Europe SAS

12 rue Henry Guy
BP 40081
Luxeuil les Bains Cedex
70300
France
Contact: Mr Jean Claude Mougeot
T: + 33 6747 87 012
E: mougeot@cobra-cs.com
W: www.cobra-cs.com
The COBRA group is specialized in the manufacturing and distribution of conveyor components for the material handling industry.
COBRA group combines four businesses: Conveyor belts (Depreux, Transco, Indi) and Components for conveyor (Go Smart)
Regional contacts:
Cobra Europe Sp. Z o.o; Tel: +48 501 269 218, Email: maria.namdakow@cobra-europe.eu
COBRA AMERICA; Tel: + 1 423 968 9700, Email: srrhoten@cobraamerica.com

Commodity Inspection Services

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Job Title: Co-Founder and Director
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E: info@cis-inspections.com
W: www.cis-inspections.com

Condepols S.A.

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Alcalá La Real
Jaén
23680
Spain
Contact: Mrs Laura Leyva
Job Title: Marketing
T: + 34 953 1021 00
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Manufactures and commercialises big bags made of polypropylene to store or transport merchandise ranging from 500 to 2000kg, with one or four lifting points. Also manufacture liners in polyethylene or polypropylene 'Dbulk' for maritime containers to store or transport merchandise in bulk. All the products manufactured are food approved.

Conductix-Wampfler

Rheinstrasse 27 + 33
Weil am Rhein
79576
Germany
T: + 49 7621 662 0
F: + 49 7621 662 144
E: info.de@conductix.com
W: www.conductix.com
Conductix-Wampfler's core competency is in the development, production, consulting, and installation of tailor made, engineered solutions like festoon systems, conductor rails, cable chains, slip ring assemblies or spring and motorized cable reels that provide energy supply and data transmission for moving machinery. Other equipment/services: Energy & Data Transmission Systems.

Conductix-Wampfler Americas

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Nebraska
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USA
Contact: Mr Mark Zuroske
Job Title: Market Development Manager, Americas
T: + 1 402 952 9325
F: + 1 402 339 9627
E: mark.zuroske@conductix.com
W: www.conductix.us
Mobile Electrification systems: Motorized reels, cable festoon systems, cable chains, slip ring assemblies (including hazardous duty), and pendant or radio remote controls. Conductix Wampfler is a global leader in the electrification of rail mounted equipment and bulk handling equipment involved in the storage and handling of all types agricultural products.

Conservatek Industries, Inc.

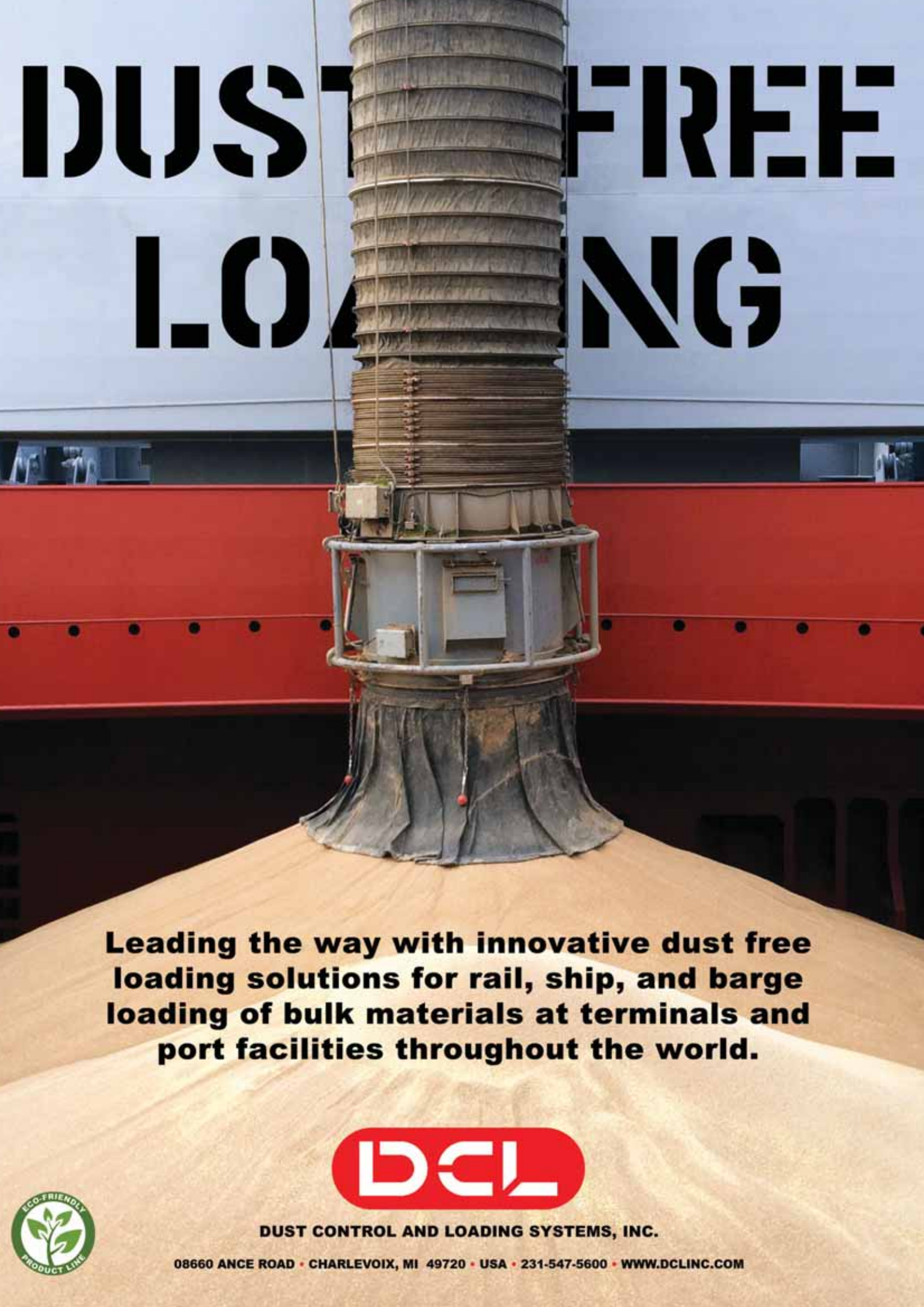
498 North Loop 336 East
Conroe
Texas
77301
USA
Contact: Ms Nita Bailey
Job Title: Marketing
T: + 1 936 539 1747
F: + 1 936 539 5355
E: nbailey@conservatek.com
W: www.conservatek.com
Designs, fabricates and installs aluminium domes and aluminium roof structures for use on tanks of various shapes and sizes. Typical applications include bulk storage enclosures.

Continental Construction (Memphis)

5646 Shelby Oaks Drive
Memphis
Tennessee
38134
USA
Contact: Mr Brian Morphis
Job Title: Marketing
T: + 1 901 382 4070
F: + 1 901 388 2534
E: mail@continentalconst.com
W: www.continentalconst.com
Heavy Industrial Contractor for Foundations, Silos, Conveying, and Unloading. Call (901)382-4070 or go to www.continentalconst.com for more information.

Continental Conveyor & Equipment Co Inc

PO Box 400
438 Industrial Drive
Winfield
Alabama
35594
USA
Contact: Lou Boltik



Leading the way with innovative dust free loading solutions for rail, ship, and barge loading of bulk materials at terminals and port facilities throughout the world.

DCL

DUST CONTROL AND LOADING SYSTEMS, INC.

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ECO-FRIENDLY PRODUCT LINE

Job Title: Director Marketing & Communications
T: + 1 205 487 6492
F: + 1 205 487 4233
E: info@continentalconveyor.com
W: www.continentalconveyor.com
The HAC® has proven itself to be a versatile and money saving alternative for elevating and lowering materials at any angle, up to and including 90° (vertical). The HAC® can be located on a ship or in a loading area.

ContiTech Antriebssysteme GmbH

Vahrenwalder Str. 9
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D-30165
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Job Title: Manager External Communications ContiTech
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ContiTech Transportband systeme GmbH

Breslauer Strasse 14
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Job Title: Managing Director
T: + 49 5551 702207
F: + 49 5551 702504
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W: www.contitech.de/conveyorbelts
With over 30 years experience in design, manufacturing and supply, MAXOFLEX has become one of the leading solution providers in the field of steep angle conveying. Quality, reliability and service is what our customers have come to expect. We pride ourselves on delivering and no challenge is too small.

Conveyor Dynamics, Inc.

3633 Alderwood Avenue
Bellingham
Washington
98225
USA
Contact: Mr Andrew Jennings
Job Title: President
T: + 1 360 671 2200
F: + 1 360 671 8450
E: cdi@conveyor-dynamics.com
W: http://conveyor-dynamics.com/
CDI designs the longest, strongest, and most advanced belt conveyor systems in the world. Last year we commissioned the world's longest belt conveyor: a 27km conveyor in South Africa. We specialize in detailed mechanical design, software development, and control system.

Cotecna Inspection SA

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CPS Projects (Pty) Ltd

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Affiliated with CPS Projects Pty and Salzgitter SA Pty in South Africa, Portquip Pty provides mechanical shiploaders, grabs and truck loaders and unloaders.

C-River Logistics

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CRS - Container Rotation Systems Pty Ltd

18 Sleigh Place
Wetherill Park
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NSW
2164
Australia
Contact: Mr Murray Bridle
Job Title: Managing Director
T: + 61 29 6096866
E: sales@containerrotationsystems.com
W: www.containerrotationsystems.com
CRS specialises in the design and manufacturing of containerised load and discharge system for any free flowing grain and related commodities.

CST Covers

498 N Loop 336 E
Conroe
Texas
77301
USA
Contact: Mrs Kimberly Mathis
Job Title: Global Marketing Director
T: + 1 713 351-3769
F: + 1 936 539 5355
E: kmathis@cstindustries.com
W: www.cstcovers.com
Designs, manufactures and installs large (30m to over 145m diameter) clear span aluminium domes for covering storage systems of all types. Conveyor penetrations and support can be all part of the roof design. Each dome is custom designed to the site and customer specific requirements worldwide. Cost competitive and virtually maintenance free as aluminium does not rust, rot or solar degrade.

CST Storage

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64131
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E: sales@cst-storage.com
W: www.cstindustries.com
Columbian TecTank is the leading manufacturer of bolted steel, and factory welded storage tanks for the dry bulk market. Columbian TecTank is proud to introduce a new coating -Trico-Bond EP™, a high-performance, factory-applied, thermally-cured, highly-engineered modified epoxy powder coating.

CWA Engineers Inc.

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Vancouver
BC
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CWA is a multidisciplinary engineering and planning consultancy that provides professional services including planning, engineering, procurement, construction management, and maintenance and operations management in the bulk materials handling and ports and marine terminals sectors to industry-leading clients around the world.

DCL, Incorporated

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49720
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T: + 1 231 547 5600 Ext 3124
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E: sales@dclinc.com
W: www.dclinc.com
DCL provides loading systems as well as components to the bulk material handling industry. Our product line includes Loading Spouts, Loading Spout Positioners, Aeration Equipment, Shut-Off Valves, Diverter Valves, Dust Collection Equipment, Bag and Drum Filling, System Design, and Plant Automation.

De Regt Conveyor Systems

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Contact: Mr Peter De Regt
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W: www.deregt.com
De Regt is a company specialized in developing, building and installing conveyor systems and structures needed to achieve a partial or total project.

DeMarco Industrial Vacuum Corporation

PO Box 1138
Crystal Lake
IL 60039-1138
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Contact: Mr Thomas DeMarco
Job Title: President
T: + 1 815 344 2222
F: + 1 815 344 2223
E: Sales@DeMarcoVacuums.com
W: www.DeMarcoVacuums.com
Manufacturer of Patented DEMARCO Industrial Vacuum Systems and vacuum loaders for portable, stationary and central manifold systems. 10 to 300 HP

Dinnissen BV

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Sevenum
NL-5975 NB
The Netherlands
Contact: Mr P Konings
T: + 31 77 467 35 55
F: + 31 77 467 37 85
E: powtech@dinnissen.nl
W: www.dinnissen.nl
Dinnissen Process Technology specialises in handling and processing bulk materials. Complete processes for the milling, sieving, weighing, mixing, dosing, drying, expanding, extruding, vacuum coating, packaging and transporting of powders, grains and granulates. Developed, tested and manufactured in-house. 70 years international experience in bulk materials technology, machine development, processing, engineering, control, automation and service.

DMN-WESTINGHOUSE

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Noordwijkerhout
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NL-2211 WC
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E: dmn@dmn-nwh.nl
W: www.dmnwestinghouse.com
Offering tailor-made solutions in the design and manufacture of rotary valves, diverter valves and other components for the bulk solids handling industry for more than 45 years. The company's products are distributed and supported worldwide.

Dome Corp of North America

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E: sales@dome-corp-na.com
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Dome Technology, LLC

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Contact: Mr Jason Miller
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E: jason.miller@dometechnology.com
W: www.dometechnology.com
Dome Technology Inc.,(Inventors of the thin shell concrete dome) - activities include the design and construction of modern, insulated reinforced concrete domes for both industrial and commercial applications. Dome Technology builds domes for all bulk storage products throughout the world. Products commonly stored include fertilizer, cement, clinker, gypsum, fly ash, coal, alumina, grains and mining ores. Established in 1976.

DOMTEC International LLC

4355 N Haroldsen Drive
Idaho Falls
Idaho
83401
USA
Contact: Mr Mike Hunter
Job Title: General Manager
T: + 1 208 522 5520
F: + 1 208 522 5344
E: domtec@domtec.com
W: www.domtec.com
Serving the bulk storage industry for many years, constructing concrete domes to store a multitude of products. The company designs and constructs high quality concrete domes, delivering projects on time and within budget. They have broad experience with a variety of reclaim systems, both mechanical and pneumatic, pending on clients' needs.

Donaldson Filtration Deutschland GmbH

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48249
Germany
Contact: Mrs Susanne Fulko
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T: + 49 2594 781 0
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E: IAF-de@donaldson.com
W: www.DonaldsonToritDCE.com
Donaldson offers innovative dust collection systems. The products are engineered to improve efficiency, save energy and extend filter lifetime. The R&D engineers invented new filtration technologies for customers and their specific applications.

Dos Santos International, LLC

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GA
30060
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Job Title: Marketing Manager
T: + 1 770 423 9895
F: Text: + 1 916 US SNAKE
E: info@dossantosintl.com
W: www.dossantosintl.com
Foremost authority on sandwich belt high angle conveyors with the inventor of the worldwide system at the helm of the company. DSI offers discipline-oriented engineering services in mechanical and structural engineering, along with their in-house conveyor analysis software, ExConTec.
Other Equipment: Sandwich Belt High Angle Conveyors.

Dry-Bag A/S

Dalagarde 1
Aarhus C DK 8000
Denmark
Contact: Mr Soren
Job Title: Marketing
T: + 45 86 19 0500
F: + 45 86 19 0577
E: production@dry-bag.dk
W: www.desiccant.com

DSH Systems Ltd.

PO Box 48052
Blockhouse Bay
Auckland
0644
New Zealand
Contact: Mr Ian Walton
Job Title: CEO
T: + 64 275 999 592
F: + 64 9828 8012
E: ian@dshsystems.com
W: www.dshsystems.com
DSH Systems award winning dust suppression loading spouts contain the dust from free-running, dry, granular products in a tight free-falling column. No electricity required, has no internal moving parts, mitigate dust explosion risk, achieve health, safety, environmental and business benefits.

Dust Solutions Inc

130 Bay Pines Road
Beaufort
South Carolina
29906
USA
Contact: Mr Richard Posner
Job Title: President
T: + 1 843 846 3700
F: + 1 843 846 3701
E: sales@nodust.com
W: www.nodust.com
Manufacturers of Dry Fog Dust Suppression Systems for conveyors, truck & rail dumps, hoppers, feeders, crushers, ship loaders/unloader. Modular systems produce fog droplets that attach to like size airborne dust particles. Functions in below freezing temperatures. DustTamer Windfences for hoppers & stockpiles.

E-Crane World Wide

Koekoeklaan 53
Adegem
B-9991
Belgium
Contact: Mr Bas Tolhuizen
Job Title: International Sales Manager
T: + 31 165 320100
F: + 31 165 320759
E: bas.tolhuizen@e-crane.com
W: www.e-crane.com
Provides engineering, sales management and technical product support for the E-Crane fleet. The 'E' stands for equilibrium. A revolutionary hydraulic bulk material handler, the E-Crane uses the balance principle and is perfectly suited for loading and unloading ships and inland river barges, all while consuming up to 50% less energy.

E-Crane World Wide / E-Crane International USA

1332 Freese Works Place
Galion
Ohio
44833
USA
Contact: Mr Mark W Osborne
Job Title: President
T: + 1 419 468 0090
F: + 1 419 468 0074
E: mark.osborne@e-crane.com
W: https://www.e-crane.com/
Equilibrium Cranes from 6 to 40 tons capacity, reach from 64 to 147 feet with project specific lowers such as fixed, gantry, rail or crawler for bulk material handling.

ECS Eurocargo Services AS

Tongavej 19
Århus C
DK-8000
Denmark
Contact: Mr Peterson
T: + 45 86 20 82 20
E: ecs@eurocargoservices.dk
W: www.eurocargoservices.dk
Custom clearance
Evaluation of damages

EDGE INNOVATE. (NI) LTD

30 Farlough Road
Newmills
Dungannon
County Tyrone
BT71 4DT
Northern Ireland
Contact: Mr Lee Williamson
Job Title: Sales Manager
T: + 44 2887 740525
F: + 44 2887 747244
E: info@edgeinnovate.com
W: https://edgeinnovate.com/
Edge Innovate are a blue sky thinking, imaginative and creative equipment manufacturing company. With our ethos of "Innovation at Work" EDGE persist in pushing the boundaries of design and manufacturing to produce hard working, quality machinery to fit any materials handling requirement from recycling, material handling to quarrying.

Elgin Engineering and Construction

2001 Butterfield Road
Downers Grove
Chicago
Illinois
60515
USA
Contact: Mr Bob Williams
Job Title: Marketing Director
T: + 1 630 434 7200
F: + 1 630 434 7272
E: soros@elginindustries.com
W: www.elginindustries.com
An international consulting and engineering firm specialised in conceptual development, planning, feasibility studies, design engineering, project management, construction supervision, etc.

EMS-Tech Inc

699 Dundas Street West
Belleville
Ontario
K8N 4Z2
Canada
Contact: Mr Kyle Sorensen
Job Title: Assistant Manager, Global Sales & Market Research
T: + 1 613 966 6611
F: + 1 613 966 6710
E: sales@ems-tech.net
W: www.ems-tech.net
A multi-task, multi-discipline company specialising in design and supply of dry bulk material handling equipment, including custom designed conveyors, shiploaders, stackers and reclaimers, self-unloading ships, transhippers, belt elevators, receiving hoppers, storage/loadout systems, environmental controls.

Endress + Hauser Inc

2350 Endress Place
Greenwood
IN
46143
USA
Contact: Mr Victor Wolowec
T: + 1 317 535 1410
F: + 1 317 353 1481
E: info@us.endress.com
W: www.us.endress.com
Processes control devices and measurement systems, which include level flow, pressure tank guaging, temperature and liquid analysis systems.

Engicon nv

Broelstraat 20
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Belgium
Contact: Mr Pieter Van Acker
Job Title: Sales & Marketing Director
T: + 32 56 73 21 21
F: + 32 56 73 40 40
E: sales@geldof.be
W: www.geldof.be
Specialised in the engineering, construction and erection of storage and handling installations for bulk goods. Fully equipped mechanical shiploaders; Silos; Tanks; Dust reducing hoppers and stackers; Belt, chain and bucket elevators, conveyors and screws. Large turnkey installations combining storage and handling; Environmental projects - flue gas cleaning, waste incineration plants, recycling plants.

EQUIPO LLC

P.O.Box : 64624
DEIRA
Dubai
64624
UAE
Contact: Mr Dharmaraju Sundaram
Job Title: Marketing Manager
T: + 971 55 473 6204
F: + 971 4 268 2217
E: sales@equipo.ae
W: http://www.equipollc.com/

Esch Group bv

Veerweg 14
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5145 NS
The Netherlands
Contact: Mr E van Esch
Job Title: Marketing Director
T: +31 (0) 416 315656
E: info@eschgroup.nl
W:
http://www.eschgroup.nl/nl/home
A manufacturer (production) of transport rollers, drive and tension drums and import bearings and bearing blocks.

ESI Eurosilo BV

Newtonstraat 26-28
Purmerend
1446 VR
The Netherlands
Contact: Mr Richard Spaargaren
Job Title: Commercial Director
T: + 31 299 630 730
F: + 31 299 630 737
E: esi@eurosilo.com
W: www.eurosilo.com
Large scale flat bottom storage silos with a Eurosilo stacking and reclaim system inside. Max.storage volume 100,000 m3 per unit.

Euromec Srl

Via Visano 78/80
Isorella
25010
Italy
Contact: Mr Ricardo Segala
Job Title: Owner
T: + 39 030 9958 151
F: + 39 030 995 2223
E: sales@euromecsrl.info
W: www.euromecsrl.com
EUROMEC, born from the merger of companies Eurohydromec and Isomec, has years of experience in the material handling field and the production of products such as lifting equipment, electrohydraulic and mechanical grabs and buckets.

Euro-Tech Corporation

N48 W14170 Hampton Avenue
Menomonee Falls
Wisconsin
WI 53051
USA
Contact: Ms Patricia Albers
Job Title: Marketing Coordinator
T: + 1 262 781 6777
F: + 1 262 781 2822
E: sales@eurotechcorporation.com
W: www.eurotechcorp.com
Eurotech Corporation is a distributor of crane & excavator attachments. We service North and Central America. Our product range includes attachments of all types and in all size ranges including hydraulic, electro hydraulic, diesel hydraulic and mechanical grabs for bulk material handling.

Euro-Tramco BV

Spacelab 47 D
Amersfoort
3824MR
The Netherlands
Contact: Mr Hans Plekkenpol
T: + 31 33 4567033
F: + 31 33 4558149
E: hans@tramco-europe.com
W: www.tramcoinc.com
Manufactures chain, screw and bucket conveyors and 'Aerobelt' air-supported belt conveyor systems.

FAM Magdeburger Förderanlagen und Baumaschinen GmbH

Sudenburger Wuhne 47
Magdeburg
D-39112
Germany
Contact: Mr Michael Kutza
Job Title: Director, Sales & Marketing
T: + 49 391 6380 10 1 03
F: + 49 391 6380 10 1 99
E: sales@fam.de
W: www.fam.de
FAM successfully plans, designs, manufactures and delivers turnkey equipment for extracting, producing, loading and storing bulk materials. FAM combines know-how of series and customized production processes and offers a complete range of manufacturing services including after-sales services along with engineering services.

FAMUR S.A.

ul. Armii Krajowej 51
Katowice
40-698
Poland
Contact: Ms Iwona Sobczak
T: + 48 22 244 57 00
E: famur@famur.com
W: www.famur.com

FELD Maschinen- und Industriebau GmbH

Winkelfeld 3
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Germany
Contact: Mr Andreas Renner
Job Title: Executive Director
T: + 49 2368 98 8930
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FFE Ltd

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Hitchin
Hertfordshire SG4 0TJ
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Contact: Mr Mark Wood
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F: + 44 1462 444 789
E: sales@ffeuk.com
W: http://www.ffeuk.com/

Figee Crane Services BV

PO Box 235
Zaandam
1500 EE
The Netherlands
Contact: Mr Robert de Rijcke
Job Title: Commercial Director Kenz Figee Group
T: + 31 75 6810 410
E: r.derijcke@kenz-figee.com
W: www.kenz-figee.com
Engineering, manufacturing, commissioning and service of a wide range of harbour cranes and lifting systems such as grab cranes, including floating Lemniscate cranes, single and double boom cranes and gantry grab cranes.

Flexco

2525 Wisconsin Avenue
Downers Grove
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60515-4200
USA
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Founded in 1907, this US-based company services the world's belt conveyors through subsidiaries in Mexico, England, Germany, Australia and South Africa. Perhaps best known for heavy-duty Flexco® bolt-or rivet-attached belt fasteners, the company has expanded into providing a wide range of accessory products to enhance belt conveyor performance.

Flexco Europe GmbH

Leidringer Strasse 40-42
Rosenfeld
D-72348
Germany
Contact: Mr Joerg Schairer
Job Title: Managing Director
T: + 49 7428 94060
F: + 49 7428 9406260
E: europe@flexco.com
W: www.flexco.com
Manufacturer and distributor of mechanical belt fastening systems, installation tools, ceramic lagging, cleats and cleaners.

Flexicon Corporation

2400 Emrick Blvd
Bethlehem
PA
18020-8006
USA
T: + 1 610 814 2400
F: + 1 610 814 0600
E: sales@flexicon.com
W: http://www.flexicon.co.uk/

Flexoveyor Conveyor

3795 Paris St., Unit D
Denver
Colorado
80239
USA
Contact: Mr Bill Priday
T: + 1 303 375 0200
F: + 1 303 373 5149
E: www.flexoveyor.com
W: www.flexoveyor.com
A leading manufacturer of material handling equipment for bagged material to include belt conveyors, bag palletizers, empty pallet dispenser and full pallet conveyors. Systems are complete with all required electrical controls, wiring and programming. All equipment is shipped as fully assembled as possible and is tested 100% prior to shipment.

Franz Wölfer Elektromaschinenfabrik Osnabrück GmbH

Industriestraße 14
Osnabrück
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Contact: Mr Ulrich T. Beholz
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Ganz Danubius Trading Co Ltd

Váci út 184
Budapest
H1138
Hungary
Contact: Mr Károly Bajusz
Job Title: Managing Director
T: + 36 1 350 5570
F: + 36 1 329 8041
E: gdtco@hu.inter.net
W: www.ganztrading.hu
Suppliers of mechanical shiploaders and unlaoders, level luffing harbour grab cranes, floating grab cranes and other bulk handling equipment.

General Kinematics

5050 Rickert Rd
Crystal Lake
IL
60014
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Contact: Mr Gordon Frank
Job Title: VP Sales & Marketing
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Geo - Chem Laboratories Pvt. Ltd

Geo - Chem House
294 Shahid Bhagat Singh Road, Fort
Mumbai
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Contact: Mr Subhashis Chakraborty
Job Title: Head of Marketing
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Geometrica Inc

12300 Dundee Court
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Cypress
Texas
77429
USA
Contact: Mr Cecilio Zalba
Job Title: Sales Manager
T: + 1 832 220 1200
F: + 1 832 220 1201
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W: www.geometrica.com
Specializes in design, fabrication and erection of bulk storage enclosures requiring large, column-free interiors. Geometrica structures may span over 300m and may be galvanized steel or aluminium. Geometrica domes are used over circular, square, rectangular, and irregular piles.

Geroldinger GmbH & Co KG

Au-Strasse 9
Sigharting
A-4771
Austria
Contact: Mr Walter Geroldinger
Job Title: CEO
T: + 43 7766 24370
F: + 43 7766 243724
E: office@geroldinger.com
W: www.geroldinger.com
Product range includes grain silos and bins, railcar loaders and unloaders, truck loaders and unloaders and hopper systems.

Getriebebau NORD GmbH & Co. KG

Getriebebau-Nord-Str. 1
Bargteheide
22941
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Contact: Mr Joerg Niermann
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Golfetto Sangati s.r.l. (GEA Group)

Via Monte Grappa, 8
Galliera Veneta (PD)
35015
Italy
Contact: Mr Pietro Barbujani
Job Title: Sales Area Manager
T: + 39 0422 476 700
E: pietro.barbujani@gea.com
W: www.golfettosangati.com

Construction of grain terminals and plants for bulk handling, including shiploaders, pneumatic and mechanical shipunaloders and conveyors. Engineering and construction of fully automated systems for grain handling.

Goodtech AS

Bjoernslettveien 2
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N-3917
Norway
Contact: Mr Knut Halvorsen
Job Title: Senior Sales Manager
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E: knut.halvorsen@goodtech.no
W: www.portabulk.com or www.goodtech.no
Part of the Norwegian Goodtech Group, Goodtech Solutions' business network provides superior materials handling technology, services and systems, under the PORTABULK® brand, to a wide variety of user segments throughout the world.

Grapplers India Pvt Ltd (Essar Ind)ustries

XIV/261- A, Chembaracky
South Vazhakulam Post
Aluva Perumbavoor Road
Ernakulam
Bengaluru
Kerala
683105
India
Contact: Mr A.M Sherif
Job Title: CEO
T: +91-8048764863
W: www.essarmaterialhandling.com

Greystones Cargo Systems (Pty) Ltd

PO Box 41314
Rossburgh
Durban
4072
South Africa
Contact: Ms Linda Smit
T: + 27 31 274 2600
E: lindas@greystonescargo.co.za
W: www.greystones.co.za
Manufactures pneumatic and mechanical shiploading and unloading systems, belt conveyor systems and other bulk handling equipment.

Gulsan A.p.

Organize Sanayi Bolgesi 2 Cad. No: 18
Gaziantep
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E: info@gulsan-group.com
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Guttridge Limited

Wardentree Park
Pinchbeck
Spalding
Lincolnshire
PE11 3UU
UK
Contact: Mr Doug Anderson
Job Title: Sales and Marketing Manager
T: + 44 1775 765300
F: + 44 1775 765304
E: sales@guttridge.co.uk
W: www.guttridge.co.uk
Manufacture a range of bespoke bulk conveying and elevating equipment, as well as storage facilities.

Guven Grab Machine Industry and Trade Inc.

Akse Mahallesi 535. Sk. No: 3/1
Çayırova
Kocaeli
41420
Turkey
Contact: Mr Engin Demir
Job Title: Foreign Trade Group Manager
T: + 90 262 743 8858
F: + 90 262 743 1141
E: info@guvengrab.com
W: www.guvengrab.com
Established in 1984, Guven Grab & Machine (Guven Kepce Makine) has its own manufacturing facilities. Its product range includes radio remote control grabs, electro hydraulic clamshell/orange peel grabs, mechanical clamshell orange peel touch down grabs and mechanical double wired grabs. It has supplied its units to countries all over the world.

Hanson Silo Company

11587 County Rd
8 SE
Lake Lillian
MN
56253
USA
Contact: Mr Mike Hanson
Job Title: Director of Business Development
T: + 1 800 843 7456
E: hscinfo@hansonsilo.com
W: www.hansonsilo.com
Hanson Silo is the leader in Modular Precast Concrete Storage Systems.

Hapman

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MI
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Contact: Mr Greg Patterson
Job Title: Vice President
T: + 1 269 343 1675
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W: www.hapman.com

Haskoning India Pvt Ltd

13th Floor, Maithili's Signet
Plot - 39/4, Sector 30A
Vashi
Navi Mumbai
400 705
India
Contact: Mr Hareld van den Brink
Job Title: Director of Business - India
T: + 91 22 4161 5004
E: hareld.van.den.brink@rhdvhv.com
W: www.royalhaskoningdhv.com

HASLER GROUP SAS

Z.I. De l'Abbaye
496 rue Louis Bréguet
Pont-Evêque
38780
France
Contact: Mr Michel Jamey
Job Title: CAO
T: + 33 474 161151
F: + 33 474 161155
E: sales.fr@hasler-gp.com
W: www.hasler-gp.com
We are specialized in the study and the realization of industrial installations grouping an important and coherent set of equipments. Our Strategic Business units are: dosing, mixing, filtration and processing.

Henry International Diplomatic Marine

27502 Vilna Avenue
Santa Clarita
CA
91351
USA
Contact: Mr Jim Hill
Job Title: International Sales Manager
T: + 1 713 676 2400
F: + 1 713 673 5805
E: jhill@henry.com
W: www.henry.com
Products include:
RAM-NEK - Premium heavy duty hatch cover tape.
GULF-SEAL - Heavy duty hatch cover tape
MARITAPE-60 - Hatch cover tape
MARITAPE-40 - Hatch cover tape
KOAMING-AIDE - Coaming joint sealant
RAM-WRAP - Pipe repair system

Heyl & Patterson Equipment Division of The HALL Group

701 Technology Drive
Suite 100
Canonsburg
PA
15317
USA
Contact: Mr Len Walnoha
Job Title: Vice President
T: + 1 412 481 1100
F: + 1 724 758 1558
E: heylpatterson@hallindustries.com
W: http://www.heylpatterson.com
Heyl & Patterson Equipment specializes in custom engineered capital equipment for bulk material handling. We engineer railcar movers, dumpers, stacker reclaimers and barge unloaders, as well as provide replacement parts, upgrades and retrofits for the life of our equipment, which is measured in decades.

HKD Blue

15 Mercer Road
Natick
MA
1760
USA
Contact: Mr Gordon Santry
Job Title: Business Development Manager
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E: gsantry@hkdblue.com
W: www.hkdblue.com/
HKD Blue engineers and manufactures water-atomizing dust control equipment and technology. The company offers powerful misting cannons for sensitive material handling, as well as turnkey engineering and design services for automated dust suppression infrastructure.

Horizon Conveyor Equipment

Unit 1, Hayseech Road
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West Midlands
B63 3PD
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Contact: Mr Alan Bowler
Job Title: Managing Director
T: + 44 121 550 2218
F: + 44 121 550 2243
E: info@horizonconveyors.co.uk
W: www.horizonconveyors.co.uk
Manufacturers of steel, plastic idler rollers and Idler Sets, conveyor belt scrapers, pulleys/drums and conveyor components.

Huadian Heavy Industries Co., Ltd.

No. 6 Auto Museum
East Road
Fengtai
Beijing
10070
China
Contact: Ms Chen Qiao
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Hycontrol Limited

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W: www.hycontrol.com
Hycontrol has been providing precision level measurement solutions to industry for over thirty-five years, measuring most liquid and solid materials including slurries, pastes, powders, grains, pellets and flakes at ranges up to 100m. Hycontrol is also the world's leading silo pressure safety system expert.

IMASA

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F: + 34 985 22 25 98
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IMGS

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Jumeirah Lakes Towers
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E: info@imgs.ca
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Império Inteligência

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Contact: Mrs Angela Prates
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W: imperio.com.br

Inspectorate (Suisse) SA - Bureau Veritas Commodities Division

Route de Cossonay 28b
Prilly
CH-1008
Switzerland
Contact: Mr Ivan Ivanov
T: + 41 21 623 62 30
F: + 41 21 623 67 00
E: Agri@inspectorate.ch
W: www.inspectorate.com
Inspections and testing of various commodities worldwide.

Inspectorate America Corporation

12000 Aerospace Avenue
Suite 200
Houston
Texas
77034
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Contact: Mr Marlon Guillory
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Interjute BV

PO Box 154
Hulst
4560 AD
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Contact: Mr Robin van Hal
Job Title: Business Development Exec
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F: + 31 114 311512
E: rvhal@interjute.nl
W: www.interjute.com
INTERJUTE is a global supplier of woven polypropylene bags and big bags with offices in the Netherlands, Spain, Romania and Brazil. Based on its 50 years' experience supplying flexible packaging materials, the company has achieved a leading position in the international bulk packaging sector offering quality, efficiency and competitive prices. We deliver from stock throughout Europe including Black Sea and Baltic ports but also to Africa.

Intermodal Solutions Pty Ltd

The Zhen Building
210/33 Lexington Drive
Bella Vista
NSW
2153
Australia
Contact: Mr Matthew Chalmers
Job Title: General Manager
T: + 61 448 855 650
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W: www.pittoship.com/
Suppliers of a dust free logistics , storage and ship loading system using bulk containers and tipplers. Visit our website to see how the system works www.pittoship.com

Intersystems

9575 N 109th Ave
Omaha
NE
68142
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Contact: Mr Hugo Wenshau
Job Title: VP Sales, Industrial Sampling
T: + 1 214 495 9713
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E: sampling@intersystems.net
W: www.intersystems.net
Intersystems manufacturers a complete line of enclosed belt and en-masse conveyors, bulk weighers, bucket elevators, samplers, probes, screeners, distributors, micro ingredient systems and bolted bin systems.

Istop Spamat Srl

Corso Antonio de Tullio 3
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Contact: Mr Vito Totorizzo
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W: www.spamat-group.com

Italgru S.r.l

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(BG)
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Contact: Mr Fabrizio Bonfanti
Job Title: C.E.O.
T: + 39 035 4932 411
F: + 39 035 4932 409
E: info@italgru.com
W: www.italgru.com
Since 1954 a total number of 1500 cranes have been delivered world wide and ITALGRU is an established market leader in crane technology.

J & B Grabs b.v.

Rijksstraatweg 32
Utrecht
Utrecht
3545 NA
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Contact: Mr Edgar Joustra
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T: + 31 3066 21616
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E: info@jb-grijpers.nl
W: www.jb-grabs.com
Designs, engineers and manufactures mechanical and hydraulic grabs for all kinds of bulk material.

Jansen & Heuning

Bulk Handling Systems
Duinkerkenstraat 11
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9723 BN
The Netherlands
Contact: Mr Bart Klimp
Job Title: Marketing & Sales
T: + 31 50 312 64 48
F: + 31 50 313 80 18
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W: www.jh.nl

JEM International

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Kansas
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USA
Contact: Mr Brett Mattson
Job Title: VP - Marketing
T: + 1 913 441 4788
F: + 1 913 441 1711
E: info@JemScales.com
W: www.JemBaggingScales.com
Manufactures complete range of open-mouth bag filling equipment and bag closing conveyors. Also makes self-contained bag plants comprising bag filling scales, bag closing conveyors, air compressor surge hoppers, control panels - all container installed and mounted.

Jenike & Johanson Inc.

400 Business Park Drive
Tyngsboro
MA 01879

USA
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Job Title: Marketing Manager
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W: www.jenike.com
Bulk solids handling engineers with nearly 50 years of field experience. Based on the scientific approach, the company will assist with handling needs, improving the reliability of clients' existing equipment and helping to choose new equipment. The quick response engineering team provide on-site consulting services in; Testing, Modelling, Functional design, Structural design, Equipment supply and Courses/seminars.

Jim Way Enterprise Co., Ltd

No.17 Chang Tai Street
Hsiao Kang Dist.
Kaohsiung
81266
Taiwan
Contact: Mr Guillermo Su
Job Title: Int'l Sales Section Manager
T: + 888 7 8718126
F: + 886 7 8718128
E: jw@roller.com.tw
W: www.roller.com.tw
Established in 1982 and obtained ISO certification in 1998, Jim Way is an expert belt conveyor components manufacturer. We focus our expertise to produce idlers, pulley laggings, belt cleaners, skirt rubber, ceramic liners, etc. for conveyor solutions

Kalenborn Kalprotect GmbH & Co. KG

Asbacher Str 50
Vettelschoss
D-53560
Germany
Contact: Mr Stefan Kurtenbach
Job Title: Sales Manager
T: + 49 26 45 18 217
F: + 49 26 45 18 0
E: stefan.kurtenbach@kalenborn.com
W: www.kalenborn.com

Kinergy Corporation

7310 Grade Lane
Louisville
Kentucky
40219
USA
Contact: Mr Bill Ware
Job Title: Project Manager
T: + 1 502 366 5685
F: + 1 502 366 3701
E: bware@kinergy.com
W: www.kinergy.com
Manufacturer of vibratory machines for bulk solid material handling. Induced Vertical Flow units either discharge or densify materials placed in storage. Induced Conveying units use vibration to transport or process bulk solid materials.

King Bag & Manufacturing Co

1500 Spring Lawn Avenue
Cincinnati
OH
45223
USA
Contact: Mr Mike Jennings
Job Title: Sales Manager
T: + 1 513 541 5440 ext 306
F: + 1 513 541 6555
E: mike@kingbag.com
W: www.kingbag.com
Manufactures FIBCs with 100 years of experience in the speciality bag business producing custom sewn products for customers around the world.

KINSHOFER GmbH

Hauptstrasse 76
Waakirchen
Bavaria
D-83666
Germany
Contact: Mr Marcus Auer
Job Title: Marketing
T: + 49 8021 8899 2510
F: + 49 8021 8899 37
E: m.locher@kinshofer.com
W: www.kinshofer.com
KINSHOFER GmbH produces Premium Quality Attachments such as Clamshell Grabs (up to 7 cubic metres) for excavators & re-handling machines up to 100 t operating weight, HD Orange Peel, Selector and Timber Grabs. Big Bag Handlers too. Custom solutions. Catalog available.

KOCKS ARDELT KRANBAU GmbH

Heegermühler Straße 64
Eberswalde
16225
Germany
Contact: Ms Ulrike Manke-Krausemann
Job Title: Marketing Manager
T: + 49 341 4953 221
F: + 49 341 4953 108
E: ulrike.manke-krausemann@kocksardelt.de
W: www.kocksardelt.de
Crane manufacturer (designing, fabrication, assembling, commissioning, training, after sales service in one hand for harbour cranes, shipyard cranes, balancer cranes - refurbishment, inspection, repair service for own and third party cranes)

Komatsu Mining Corp.

West Quay Road
Sunderland Enterprise Park
Sunderland
Tyne & Wear
SR5 2TD
UK
Contact: Mr Paul Bancroft
Job Title: Global Product Director - Conveyors
T: + 44 370 252 1000
E: rebecca.crossley@mining.komatsu
W: https://mining.komatsu/
Previously known as Joy Global and Continental Conveyor Ltd.

Konecranes Port Solutions - Konecranes GmbH

Forststrasse 16
Düsseldorf
D-40597
Germany
Contact: Mr Giuseppe Di Lisa
Job Title: Sales & Marketing Director
T: + 49 211 7102 3771
F: + 49 211 7102 3651
E: ps.info@konecranes.com
W: www.konecranes.com
FOR GREATER BULK HANDLING PRODUCTIVITY
Reach out and grab it with eco-efficient Konecranes Gottwald Mobile Harbor Crane technology. Depending on site and operating conditions, our four-rope grab cranes, also available as rail-mounted portal and floating cranes, achieve handling capacities of up to 2,000 tph in continuous-duty bulk handling. Our broad range of products with their smart crane features is supported by dedicated planning and consultancy services and backed by a global service network.

Kröger Greifertechnik GmbH & Co. KG

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Lachenmeier Monsun A/S

Grundtvigs Allé 176
Sønderborg
6400
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Contact: Mr Chrisitan Petersen
Job Title: Sales Director
T: + 45 74 42 24 64
F: + 45 74 43 04 04
E: mail@lachenmeier-monsun.com
W: www.lachenmeier-monsun.com

Laidig Systems Inc

14535 Dragoon Trail
Mishawaka
Indiana
IN 46544
USA
Contact: Mr Mike Schuster
Job Title: VP of Sales
T: + 1 574 256 0204 x 236
E: sales@laidig.com
W: www.laidig.com
Laidig Systems Inc, manufactures custom engineered storage and reclaim systems for tough, hard to handle materials and whole grains. Such materials include soybean meal, other grain meals, whole grains, wood chips, sawdust, and recycled materials.

Langston Companies Inc.

PO Box 60
Memphis
Tennessee
38101-0060
USA
Contact: Mr Bob Langston
Job Title: President
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F: + 1 901 942 5402
E: blangston@langstonbag.com
W: www.langstonbag.com

Lawrence Industries, Inc.

10403 Arbor Trail
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46725
USA
Contact: Mr Kerry McAtee
Job Title: Sales Engineer
T: + 1 260 432 9693
E: kmcatee@lawrenceindustriesnow.com
W: www.lawrenceindustriesnow.com
Lawrence Industries, Inc. is a supplier of industrial lining materials that improve bulk material flow in silos, bins, and bunkers. TIVAR 88 is a primary material that is used to eliminate bridging, arching and ratholing. Lawrence Industries designs and fabricates.

Legacy Building Solutions, Inc.

19500 County Road 142
South Haven
Minnesota
55382-9240
USA
Contact: Ms Sarah Cords
Job Title: Director of Marketing
T: + 1 320 258 0500
F: + 1 320 259 0087
E: marketing@legacybuildingsolutions.com
W: www.legacybuildingsolutions.com
Legacy structures harness the power of corrosion resistance, natural light, and a faster installation process for an increase in ROI. Custom engineered to spec, worldwide installation, built in half the time, warrantied in corrosive environments. Legacy Building Solutions, customized for your needs.

Librawerk Maschinenfabrik GmbH

Vossenkamp 1
Braunschweig
Lower Saxony
D-38104
Germany
Contact: Mr Rolf Klein
Job Title: Owner
T: + 49 531 370980
F: + 49 531 3709888
E: info@librawerk.de
W: www.librawerk.de/en/home.html
Fully automatic and semi-automatic bagging units for almost all kinds of bulk goods. Big bag filling machines with a weighing range of up to 2,000kg, with capacities from 5 to 60 bags/hour.

Liebherr-MCCtec Rostock GmbH

Liebherrstr. 1
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18147
Germany
Contact: Ms Monika Schedler
Job Title: Head of Marketing
T: + 43 50809 41725
F: + 43 50809 41447
E: maritime.cranes@liebherr.com
W: www.liebherr.com
With over 1,600 machines delivered in more than 100 countries Liebherr mobile harbour crane offers today a range of 7 models (42 - 308 tonnes capacity), providing ideal solutions for the efficient handling of containers, bulk, general cargo and heavy lifts.

Lion Bulk Handling b.v.

Global Headquarters
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Capelle aan den Ijssel
Zuid-Holland
2908 LT
The Netherlands
Contact: Mr Marcel van Rangelrooij
Job Title: CEO
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E: news@lionbulkhandling.com
W: www.lionbulkhandling.com

Listenow GmbH & Co.

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71277
Germany
Contact: Mr Carsten Lohr
T: + 49 7152 50900
F: + 49 7152 509050
E: c.lohr@listenow.com
W: www.listenow.com
Loading equipment from 200-2000mm and length up to 24m, loading tubes - patented - PU flex, loading tubes of many materials, filter for loading equipment, electric rope winches, bellow expansion joints, collars, hoses, folding stairways, transport racks.

Loeffler Engineering Group

4 S Pintail St
La Marque
TX
77568
USA
Contact: Mr Frank Loeffler
Job Title: President
T: + 1 512 267 8700
E: frank@loefflerengineering.com
W: www.loefflerengineering.com
Specializing in Conveyors and bulk materials handling.

Macawber Engineering, Inc

1829 Clydesdale Street
Maryville
TN
37801-3796
USA
Contact: Mr Dean Wicks
Job Title: VP Business Development
T: + 1 800 433 2213
F: + 1 865 984 5286
E: webinquiry@macawber.com
W: www.macawber.com
Designing and manufacturing low-velocity pneumatic conveying systems to solve your conveying needs, especially when your material is difficult to handle. With thousands of materials conveyed in virtually every industry, Macawber has remained X to its core business for 40 years with proven capability and expertise to create systems that are not only reliable and efficient but also cost-effective to operate and maintain.

Mack Manufacturing Inc

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7205 Bellingrath Road
Theodore
Alabama
36582
USA
Contact: Mr Matthew A. Davidson
Job Title: Vice President - Marketing
T: + 1 251 653 9999
F: + 1 251 653 1365
E: sales@MackMfg.com
W: www.mackmfg.com
A leader in designing and building heavy-duty high performance grapples and clamshell buckets since 1942. We are dedicated to supplying our customers with the right attachment for their application. Quality and reliability are trademarks of Mack grapples and buckets.

Mantsinen Group Ltd Oy

Valikankaantie 3
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Finland
Contact: Ms Mari Riissanen
Job Title: Marketing Coordinator
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E: mari.riissanen@mantsinen.com
W: www.mantsinen.com
Mantsinen Group manufactures highly efficient and precise hydraulic harbour cranes for bulk and general cargo operations. Mantsinen cranes can be tailored to best suit each application. Mantsinen HybriLift® energy saving system and wide range of attachments makes the cranes economical, efficient and universal tools for stevedoring companies and harbour operators.
Other equipment/expertise: Wood handling Log stackers, subcontracting.

Maquinas Condor SA

Av Dos Estados 1383
Porto Alegre
RS
90200-001
Brazil
Contact: Mr André Meyer da Silva
Job Title: Director
T: + 55 51 2104 3388
F: + 55 51 2104 3345
E: andre@maquinascondor.com.br
W: www.maquinascondor.com.br
Founded 1959. Engineers and manufactures complete systems for solid bulk materials handling ports and terminals. Equipment range includes pneumatic grain unloading, continuous shiploading, bulk stacking, reclaiming, belt coveyor, bucket elevator and mechanical conveyor. Operating from barges up to capesize ships, to 3000 tph. Shipunloaders and shiploaders operating successfully in ports around the world.

Martin Engineering

One Martin Place
Neponset
Illinois
IL 61345
USA
Contact: Mr Greg Milroy
Job Title: Customer Service Manager
T: + 1 309 852 2384 ext 214
F: + 1 800 814 1553
E: rickf@martin-eng.com
W: www.martin-eng.com
Supplier of conveyor components, flow aids, safety products and training to make bulk material handling cleaner, safer and more productive.

Martin Engineering GmbH

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Walluf
Hessen
D-65396
Germany
Contact: Mr Joachim Preiß

Job Title: Marketing Manager Europe
T: + 49 61 23 978 221
F: + 49 61 23 75 5 33
E: info@martin-eng.de
W: www.martin-eng.de
Conveyor Inspection (WTB) Safety training seminars, Conveyor equipment, belt cleaners, belt tracking systems, impact cradles, sealing systems , dust suppression systems, air cannons and vibrators, silo cleaning services , air supported conveying systems, inertial flow transfer chutes.

Martin Engineering South Africa

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South Africa
Contact: Mr Hannes Kotze
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Installation & Maintenance of belt cleaners, sealing systems, impact support, belt tracking, air-cannons, screen vibrators, silo cleaning, service contracts, Martin Engineering Service Group - MESG S Class air supported conveyors, Inertial Flow chutes.

Maschinen und Mühlenbau Erhard Muhr GmbH

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Job Title: Managing Director
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F: + 49 8034 9072 526
E: info@muhr.com
W: www.muhr.com
MUHR offers a wide range of high quality Bulk Loading Systems (for open and closed, dust-free loading), Loading Spout Positioners, Pneumatical Docking Devices and even Railcar Dumping Systems for economical unloading of trains with open railcars.

Matrix PDM Engineering

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Job Title: Marketing Manager
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Matrix PDM Engineering delivers complete design-build services to the grain industry for 35 years. From greenfield facilities, retrofits, and expansions our services include Owner's Engineer, multidiscipline engineering, fabrication, construction, marine and dock expertise, silo design and inspection and control systems integration.

MegaDome® Buildings by Harnois

1044 Prinicipale
St-Thomas
Saint-Thomas
Quebec
J0K 3L0
Canada
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T: + 1 450 756 1042
F: + 1 450 756 8389
W: www.megadomebuildings.com

MegaRoller

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W: www.megaroller.com.au

Merrick Industries

10 Arthur Drive
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FL
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Contact: Mr Erik Nolte
Job Title: Sales Manager
T: + 1 850 265 3611
F: + 1 850 265 9768
E: info@merrick-inc.com
W: www.merrick-inc.com
Invented dynamic weighing in 1908 and has been operating continuously ever since. Offer carbon and stainless steel belt scales, weigh belt feeders, loss-in-weight feeders, volumetric feeders, flow meters and microprocessor controls. The company is focused on the dynamic weighing of powders, granules, pellets and liquids while in motion. Products are supplied worldwide and can be used in batching, continuous weighing and continuous feedrate control applications.

Metso Brasil Industria e Comercio Ltda.

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18087-050
Brazil
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T: + 55 15 2102 1762

Metso Minerals Industries, Inc.

Bulk Materials Handling
2715 Pleasant Valley Road
York
PA
17402
USA
Contact: Mr Tom Lippencott
Job Title: VP, Mineral Process Solutions Sales, USA
T: + 1 412 999 8552
F: + 1 717 849 7148
E: Tom.Lippencott@metso.com
W: www.metso.com
Products: Railcar and Barge Pullers, Railcar Dumpers and Positioners, Grab & Equilibrium Unloaders, En-Masse Conveyors, Ship Trimmers, Throwers, Railcar Indexers, Barge Haul Systems, Breasting Winches, Apron Feeders
Brand Names: Stephens-Adamson, McNally Wellman, PECO, Nolan HCM, MKT, Mead Morrison, McDowell Wellman, NICO

Mideco

22/137-145 Rooks Road
Nunawading
Victoria
3131
Australia
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Job Title: Chief Marketing Officer
T: + 61 3 8873 0200
F: + 61 438 859 178
E: sales@mideco.com.au
W: www.mideco.com.au
Mideco is an Australian founded and 100% owned designer and manufacturer of dust and air pollution control systems with headquarters in Melbourne, Victoria. Mideco have developed industry leading equipment for dust control including innovations - Burnley® Baffles and Bat Booth®.

Midwest International Standard Products, Inc.

105 Stover Road/ PO Box 438
Charlevoix
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49720-0438
USA
Contact: Mr Walter Pair
Job Title: President and CEO
T: + 1 231 547 4000
F: + 1 231 547 9453
E: sales@midwestinternational.com
W: www.midwestmagic.com
Midwest International's specialized Vacupac™ Bustle Filters, velocity reduction modules, and vented low velocity trimming spoons make loading of grains into barges and ocean going vessels simple and dust free. Available in multiple configurations and sized to handle up to 100,000 bushels per hour, these devices can be adapted to an existing telescoping spout, or supplied as a complete telescoping solution.c

Mitsubishi Chemical Advanced Materials Inc.

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F: +1 724 468 4044
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W: https://www.mcam.com/na-en/
With more than 40 years experience, MCAM's SystemTIVAR® Engineering designs, fabricates and installs lining systems worldwide for use in hoppers, chutes, bins, dump bodies, railcars, ships, etc., featuring industry-leading low coefficient of friction, abrasion-resistant TIVAR® 88 family of products.

Mole•Master Services Corporation™

27815 State Route 7
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Ohio
45750
USA
Contact: Mr David Laing
Job Title: General Manager
T: + 1 740 374 6726
F: + 1 740 374 5908
E: contactus@molemaster.com
W: www.molemaster.com
Silo, bin, bunker, transport and process vessel cleanout & unclogging services and equipment. Pipe cleaning, Vacuum services, Dry ice Blasting, Media Blasting, Silo structural inspection services and facility cleaning.

Monolithic Dome Institute

177 Dome Park Place
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76651
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Motherwell Automation

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Contact: Mr Lawrence Sule
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W: www.motherwell.net.au

MRS Greifer GmbH

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Contact: Mr Peter Koerting
T: + 49 7263 9129 20
F: + 49 7263 9129 12
E: export@mrs-greifer.de
W: www.mrs-greifer.de
Approaching 50 years experience in producing all types of grabs. The company's product range extends from mechanical grabs, also radio-controlled, to hydraulic and electro-hydraulic grabs with motor drive. Besides excellent after-sales service, MRS provide spare parts from stock.

Mühlen Sohn GmbH & Co. KG

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W: www.muehlen-sohn.de
Mühlen Sohn GmbH & Co. KG is one of the leading suppliers of fluidising fabrics and looks back to a success story since 1880 which means over 130 years of weaving experience.
Fluitex® air slide fabrics for pneumatic loading and unloading systems, airslides for pneumatic conveying, storage and homogenising silos, discharging cones, fly ash handling systems.

Muller Beltex BV

Ambachtsweg 28A
Pijnacker
2641 KS
The Netherlands
Contact: Mr Lars Muller
T: + 31 15369 5444
F: + 31 15369 7864
E: info@mullerbeltex.com
W: www.mullerbeltex.com
Other Equipment: Elevators. Specialists in elevator components, buckets belts ATEX conform safety monitoring equipment. Design engineering and problem solving.
Elevator belt bolt hole punching up to 2000 mm width
Specialist in abrasion resistant polyurethane liners.

MWI Silo Systems Inc.

5001 Rd. 104 N. Easthope Perth East
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E: joel@mwisilo.com
W: http://mwisilo.com

Nantong Rainbow Heavy Machineries Co.,Ltd.

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China
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E: karen.huang@rainbowco.com.cn
W: rhm.rainbowco.com.cn

Natural Grabs

Toros Caddesi Fethi bey sokak no 11
Natural Business Center
Maltepe
Istanbul
Turkey
Contact: Cpt Hayrettin Yakut
T: + 90 216 380 60 03
F: + 90 216 380 65 59
E: sales@naturalgrab.com
W: www.naturalgrab.com/

NAVCO (National Air Vibrator Co)

PO Box 40563
Houston
TX 77240-0563
USA
Contact: Mr Trey Gros
Job Title: Technical Sales Manager
T: + 1 832 467 3636
F: + 1 832 467 3800
E: trey@navco.us
W: www.navco.us
Manufacturer of high quality, industrial grade air vibrators and vibratory equipment. NAVCO is the leading expert in material flow solution using industrial vibrators and vibratory equipment.

Nectar Group Ltd

No 1 Ashton Gate
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Job Title: Commercial Director
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E: commercialteam@nectar.co.uk
W: www.nectargroup.co.uk
Nectar is involved in handling bulk commodities such as cereals and fertilizers in ports and/or inland locations. Involvement ranges from positioning of mobile bagging machines for spot cargoes to long term projects including terminal management and storage and logistics solutions.

NEGRINI
since 1967
S.R.L.

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

VIA TORRICELLI 4 · CASTELFRANCO E. (MO) ITALY
www.negrini.org

NEDCRANES BV

Duikerweg 30-32
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Waalwijk
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Contact: Mr Arno Koolen
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T: +31 6 120 80 446
E: ako@nedcranes.com
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Negrini Srl

via E. Torricelli n.4
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Modena
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Italy
Contact: Mr Massimo Negrini
Job Title: Managing Director
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E: info@negrini.org
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Negrini srl considers the attainment of client satisfaction our primary objective, through a continuous and effective process of study and collaboration with both clients and suppliers. Professionalism and versatility towards different customer demands: this is the business philosophy of Negrini srl.

Nemag BV

Deltastraat 15
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Contact: Mr Riny Stoutjesdijk
Job Title: Sales Manager
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F: + 31 111 416 154
E: sales@nemag.com
W: www.nemag.com
NEMAG specializes in sales and manufacture of tailormade mechanical grabs. Also rope end fittings like the NEMAG Rope Pear Socket and NEMAG Quick Release Link. NEMAG is one of the leading grab manufacturers world wide.

NERAK GmbH Fördertechnik

Brigitta 5
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Contact: Mr Edgar Bleeker
Job Title: Marketing
T: + 49 50 84 944 0
F: + 49 50 84 944 222
E: info@nerak.de
W: www.nerak.com
Conveying on combined horizontal/vertical paths is our strength. The NERAK rubber block chain is the basis for the world wide success of NERAK conveyors: reliable, nearly maintenance free, without any lubrication and very silent, operating in various industries.

Neuero Industrietechnik GmbH

Neuerostrasse 1
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D-49324
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Contact: Eng. Andreas Haeuser
Job Title: Sales & Project Manager
T: + 49 5422 9503 26
F: + 49 5422 9503 50
E: a.haeuser@neuero.de
W: www.neuero.com
NEUERO offers a wide range of pneumatic ship unloaders up to 800 t/h and ship loaders with Neuero KIKO system and loading capacities up to 3.000 t/h.
Bulk handling products varies from grain to alumina and biomass. Special unloading systems with rotating feeder for non-free flowing materials are also available.

Nilfisk SpA

Via Porrettana 1991
Zocca
Modena
41059
Italy
Contact: Dr Leonardo Bianco
Job Title: Director of Marketing
T: + 39 059 973 00 00
F: + 39 059 973 00 99
E: industrial-vacuum@nilfisk.com
W: Nilfisk SpA
Nilfisk SpA is the world leader in the production of industrial vacuums, pneumatic conveyors, centralized vacuum systems and high power vacuums.

NK Tehnologija SIA

120Z Dzelzavas Street
Riga
LV-1021
Latvia
Contact: Mr Andrey Oleynik
Job Title: Marketing & Publications
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F: + 371 67271038
E: nkteh@nkteh.lv
W: www.nkteh.lv
Industrial design, engineering and assembly company specializing in dry bulk material handling projects and lifting equipment since 2001. In addition to shiploaders, weigh hoppers and container tilting spreaders we supply solutions for integrated bulk handling systems and equipment allocation.

NKM Noell Special Cranes GmbH

Kruisweg 643
Hoofddorp
2132 NC
The Netherlands
Contact: Mr Frank Heen
Job Title: Manager Offshore Cranes
T: + 31 20 655 0030
F: + 31 20 655 0040
E: sales@nkmnoell.com
W: www.nkmnoell.com/
Leading manufacturer of lemniscates cranes and special equipment for the bulk industry. Turn key project capability; design, manufacturing and erection in-house. Our maintenance division provides added value service for refit, modernisation and redesign for increased performance.

NMH s.r.o

Priemyselná 4608/10
Sered'
926 01
Slovakia
Contact: Ms Veronika Kreml
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W: www.nmh-sro.com

Nordströms Konstruktionsbyrä

Storgatan 58
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SE-903 30
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Contact: Mr Peter Vedin
Job Title: Marketing
T: + 46 90 1136 4500
F: + 46 90 1330 69
E: arletun@nordstroems.se
W: www.nordstroems.se
The company, established 1981, is a supplier of turnkey plants and custom-made equipment for general dry bulk solids and aggregate material handling. The product portfolio includes belt and worm conveyors; telescopic loading chutes; weighing scales; silos, bins and hoppers; feeders and valves. Machines are parametrically adjusted to meet individual client's needs on terms of specifications and capacities.

O B Wiik AS

Industriveien 13
Skedsmokorset
2020
Norway
Contact: Mr Ole Gregersen
Job Title: Export & Marketing Director
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E: obw@obwiik.no
W: www.obwiik.com
WiikHall Storage Tents are used for storage of food and non-food items within the construction segment, industry in general, Storage and logistics, Oil and gas. WiikHalls are installed in more than 100 countries. Size: in widths from 4 to 100 meter. Unlimited length in 5 meter sections.

OPTION srl

Via Domenico Scolari, 8
Codroipo
UD
33033
Italy
Contact: Mr Roberto Baradello
T: + 39 0432909727
F: + 39 0432909728
E: option@qnet.it
W: www.insacchettatrice.com

Orthos Projects Ltd.

Fernie Road
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Leicestershire
LE16 7PH
UK
Contact: Mr Nick Hall
Job Title: Director
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F: + 44 1858 464403
E: Nick.Hall@orthosprojects.com
W: www.orthosprojects.com
Orthos Projects, specialists in bulk materials handling, have taken over the operation of E&F services. Their Dockside Mobile Loaders have gained a technological lead in eliminating spillage and controlling dusty products from Ports operations. Their range of Filters eliminate pollution.

ORTS GmbH Maschinenfabrik

Schwartauer Strasse 99
Serez
D-23611
Germany
Contact: Herr Sigvard Orts
T: + 49 451 3988515
F: + 49 451 392374
E: info@orts-gmbh.de
W: www.orts-grabs.de
Grabs "Made in Germany". Whole range of grabs for all kind of bulk materials, dredging and scrap handling: Radio controlled independent working motor grabs, electro- hydraulic grabs, mechanical rope grabs, load-beams. For nearly all kind of dry bulk materials and scrap handling.

PAGE MACRAE ENGINEERING

61 Aerodrome Road
Mount Maunganui
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3116
New Zealand
Contact: Mr Bruce Ennis
Job Title: Cargo Handling Equipment Manager
T: + 64 7 575 5079 Ext 810
F: + 64 7 574 8594
E: brucee@page-macrae.co.nz
W: www.page-macrae.co.nz
With over 50 years of engineering experience behind it, Page Macrae Engineering is regarded as Australasia's leading manufacturer of ship cargo handling equipment. They have commanded a reputation for delivering high quality equipment that is robust, low maintenance and highly productive, regardless of conditions and loads.

Pakiet

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Gdansk
Poland
Contact: Mr Piotr Rzeszutek
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Paul Hedfeld GmbH

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58285
Germany
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F: + 49 2332 61167
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W: www.hedfeld.com
The company has produced complete installations for over 60 years for the transport of bulk goods such as bucket elevators, screw- and chain conveyors. The delivery of spare parts used in these conveyors was and is the basis of the current business.

PEBCO®

PO Box 7506
225 North 4th Street (42001)
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KY
42002-7506
USA
Contact: Mr David Finke
Job Title: VP, Sales and Marketing
T: + 1 270 442 1996
F: + 1 270 442 5214
E: sales@pebco.com
W: www.pebco.com
PEBCO® is recognized world-wide as the leading manufacturer of powder and dry bulk solids handling equipment. Products range from truck, train, and ship loading equipment to gates, valves, diverters, mass flow feeders, Cascade® and dustless loading chutes.

Peinemann Cranes

Nieuwe Langeweg 40
Hoogvliet
DB 3194
The Netherlands
T: + 31 10 295 50 00
F: + 31 10 295 50 49
E: kranen@peinemann.nl
W: www.peinemann.nl

PEINER SMAG Lifting Technologies GmbH

Windmühlenbergstraße 20-22
Salzgitter
D-38259
Germany
Contact: Mr Arnulf Köhnemann
Job Title: Area Sales Manager
T: + 49 5341 302 613
F: + 49 5341 302 424 or 606
E: arnulf.koehnemann@peiner-smag.com
W: www.peiner-smag.com
Manufacturer and supplier of a complete range of grabs, ie (electro-hydraulic) motor grabs, single-rope grabs, two- and four-rope grabs, hydraulic grabs as well as rotators (slewing units) and special grabs for all kinds of bulk materials for various applications and purposes.

Peterson Agricare & Bulk Logistics BV

Boompjes 270
Rotterdam
3011 XZ
The Netherlands
Contact: Mr Arno Maehlmann
T: + 31 10 282 3333
F: + 31 10 282 3282
E: info@peterson.nl
W: www.peterson.nl
Offers a wide range of logistic, inspection, laboratory and certification services in agribulk commodities, mineral bulk commodities, chemicals, biomass and biofuels. Complete supply chain covered from origin to destination.

Pfister Waagen Bilanciai GmbH

Linker Kreuthweg 9
Affing-Mühlhausen
D-86444
Germany
Contact: Ms Susanne Geller-Dürr
Job Title: Marketing and Sales Manager
T: + 49 82 07 9 58 99 28
F: + 49 82 07 9 58 99 29
E: marketing@pfisterwaagen.de
W: www.pfisterwaagen.de
Truck weighbridges, railway scales, platform scales, crane scales, weighing data management software, load cells, load cell units, weighing indicators.

PHB Weserhütte, S.A.

Parque Científico y Tecnológico de Gijón
C/Ada Byron, 220
Gijón
Asturias
33203
Spain
Contact: Dr Jose Ramón Prado
Job Title: Technical & Commercial Director
T: + 34 984 495 640 / + 34 984 49 55 00
F: + 34 985 134 222
E: joseramon.prado@pwh.es
W: http://www.grupotsk.com/
PHB Weserhütte, has over 60 years' experience and its own "know how" in the area of materials handling. The company has vast experience in the development of Turnkey Projects in the sectors of energy, cement, ports, iron and steel, fertilisers, mining and industrial plants.

PHOENIX Conveyor Belt Systems GmbH

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Hamburg 21079
Germany
T: + 49 40 7667 03
F: + 49 40 7667 2413
E: info@phoenix-cbs.com
W: www.phoenix-conveyorbelts.com

Pirs SAS

ZI St Hermentaire
309, Avenue de l'Europe
Draguignan
Var
83300
France
Contact: Mr Fikri El Mourabet
Job Title: International Sales Manager
T: + 33 4 98 10 6767
F: + 33 4 98 10 6768
E: info@domepirs.com
W: www.domepirs.com
Specialists in the construction of reinforced concrete dome storage for bulk products. Storage capacity can reach up to 100,000 tons depending on the product. The company has built more than 100 domes worldwide and provide engineering, materials, supervision construction and turnkey projects.

PLM Cranes B.V.

Sluisweg 21-25
Heijningen
4794 SW
The Netherlands
Contact: Mr Pieter Pulleman
Job Title: Managing Director
T: + 31 167 528 510
F: + 31 167 524444
E: info@plmcranes.com
W: www.plmcranes.com
We build hydraulic and electric cranes from 50 to 2000 tm with a transhipment capacity up to approx. 2000 ton/hour. We are specialized in shipboard cranes, mobile cranes and harbour cranes for dredging, transhipping, hoisting and pile-driving.

Pneumat Systems Inc

110 Mohr Dr
Mankato
MN
56001
USA
Contact: Mr Sam Cebula
Job Title: Sales and Marketing Manager
T: + 1 507 345 4553
F: + 1 507 345 3639
E: info@pneumat.com
W: http://pneumat.com/

Polymer Industries - Ultrapoly Division

2404 Center Street
Tacoma
WA
98409-7638
USA
Contact: Mr Bryan Olin
T: + 1 253 272 1217
F: + 1 253 272 1457
E: bryan.olin@polymerindustries.com
W: www.polymerindustries.com
Other equipment: wear and liner components. UHMWPE and other olefins for impact, wear and flow applications.

Portpack UK Limited

Unit A2/G11 Enterprise Business Park
Wigwam Lane
Hucknall
Nottinghamshire
NG15 7SZ
UK
Contact: Ms Sharon Henson
Job Title: General Manager
T: + 44 1159 680130
F: + 44 1159 641926
E: portpack@portpack.biz
W: www.portpack.biz
Portpack design and manufacture containerised Mobile Bagging Systems for the direct discharge of bulk carriers in the port of arrival, with materials weighed and bagged at dockside, filled sealed bags are loaded directly onto trucks for onward distribution or delivery.

Port-Trade AS

Karetmagervej 9
Fredericia
DK 7000
Denmark
Contact: Mr Peter J Muller
Job Title: Managing Director
T: + 45 7628 0102
F: + 45 7628 0103
E: peter.muller@port-trade.com
W: www.port-trade.com
Sales and service in all Nordic countries of mobile harbour cranes, grabs, containerspreaders, shiploaders, reclaimers, material handling equipment etc.

Powertex Inc

1 Lincoln Boulevard
Rouses Point
New York
New York 12979
USA
Contact: Mr Stephen Podd
Job Title: President and CEO
T: + 1 518 297 4000 ext 102
F: + 1 518 297 2634
E: stephenpodd@powertex.com
W: www.powertex.com
Powertex is a market leader in the dry bulk container liner market, with its Sea Bulk container liner system for 20' and 40' ocean containers. Powertex assist clients through Project Management, with Logistics and with Loading and Discharge Equipment - supplying equipment specifically designed for the use of bulk container liners.

PRADO SILOS

Ribera de Axpe 6
Erandio
48950
Spain
Contact: Mr Javier Resano
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Precia-Molen Nederland BV

Franse Akker 1
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4824 AL
The Netherlands
Contact: Mr Frédéric Felten
Job Title: Export Manager
T: + 31 76 524 2510
F: + 31 76 522 8039
E: export@preciamolen.nl
W: www.preciamolen.nl
For almost 150 years Precia Molen is specialized in industrial weighing equipment such as weighbridges, hopperscales, baggingscales, platformscales, truckdumpers etc.

Premier Tech Chronos

1, avenue Premier
Premier Tech Campus
Rivière-du-Loup
Québec
G5R 6C1
Canada
Contact: Ms Marie-Pier Vallée
Job Title: Communications Coordinator
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F: + 1 418 862 6642
E: valm2@premiertech.com
W: http://www.ptchronos.com/
With offices around the world, Premier Tech Chronos is among the largest packaging equipment manufacturers in the world and well-known in the bulk industry for its state-of-the-art packaging machines and complete lines for small and large-scale production.

Premier Tech Chronos b.v.

Meerheide 40
Eersel
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5521 DZ
The Netherlands
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PREMIER TECH CHRONOS (PTC) is recognized worldwide for its innovative and customized packaging, material handling and bulk processing solutions. We are driven by innovation: we developed several state-of-the-art technologies which are still in the lead today. Our prime objective is to meet your packaging needs in the most creative and efficient way.

Premier Tech Chronos GmbH

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53773
Germany
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Job Title: Geschäftsführer
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F: + 49 2242 9335 186
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PREMIER TECH CHRONOS (PTC) is recognized worldwide for its innovative and customized packaging, material handling and bulk processing solutions. We are driven by innovation: we developed several state-of-the-art technologies which are still in the lead today. Our prime objective is to meet your packaging needs in the most creative and efficient way.

Premier Tech Chronos Ltd

Unit 1, Centurion Business Centre
Blenheim Industrial Estate
Nottingham
Notts
NG6 8WN
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Contact: Mr Peter Orm
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PREMIER TECH CHRONOS (PTC) is recognized worldwide for its innovative and customized packaging, material handling and bulk processing solutions. We are driven by innovation: we developed several state-of-the-art technologies which are still in the lead today. Our prime objective is to meet your packaging needs in the most creative and efficient way.

Procon Engineering Limited

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Otford Road
Sevenoaks
Kent
TN14 5EL
UK
Contact: Mr Brian Sangster
Job Title: Sales Manager - Beltweighers
T: + 44 1732 781 300
F: + 44 1732 781 311
E: joe.naylor@proconeng.com
W: www.proconeng.com
Manufactures belt weighers for process control and trade use in the grain industries. Weighing systems for grain have been produced with capacities as low as 2t/h and as high as 2,000t/h. (In other materials the company has machines as high as 12,000t/h. Many single sites trade over GBP£100 million per annum over their Procon Inflo trade approved belt weighing systems.

Protan International

PO Box 420
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Drammen
NO-3002
Norway
Contact: Mr Erik Øyno
Job Title: Direktor Protan International Roofing
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E: erik.oyno@protan.no
W: www.protan.no

PT Armada Rock Karunia Transshipment

AIA Central Building 33rd Floor
Jl. Jend. Sudirman Kav. 48 A
Jakarta
South Jakarta
12930
Indonesia
Contact: Ms Lisa Witono
Job Title: Manager - Marketing

ORTS independent

diesel-hydraulic grab

fully radio controlled!

just hook on and

GRAB

ORTS Grabs

Phone: +49 451 - 398850
E-Mail: info@orts-gmbh.de

www.orts-grabs.com

ORTS GmbH Maschinenfabrik
Schwartauer Strasse 99
D-23611 Sereetz
Germany

made in Germany
since 1972

T: + 62 817 609 8883
F: + 62 21 2525 928
E: enquiry@ark-transshipment.com
W: www.ark-transshipment.com

PT. Bando Indonesia

Wisma Hayam Wuruk, 6th floor, Suite 600
Jln. Hayam Wuruk No. 8
Jakarta
10120
Indonesia
Contact: Mr Wahyono Wardiman
Job Title: Conveyor Belt Division
T: + 62 21 3517590
F: + 62 21 3517591
E: conveyor.div@bandoindonesia.com
W: www.bandoindonesia.com
PT. Bando, established in 1987, is one of the leading automotive and industrial power transmission belt manufacturers in Indonesia. It has one main plant located in Tangerang and its marketing office located in Central Jakarta.

QML Services

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Speers Point
NSW
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R & S Srl / Roncuzzi - WAM Group

Via del Cmapo Sportiuo 40
Mezzana
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Contact: Mr Michael Grass
Job Title: Marketing Communications Manager
T: + 39 0535 61 81 11
F: + 39 0544 41 10 99
E: Michael.Grass@wamgroup.com
W: www.roncuzzi.com
Design and build wide range of equipment for bulk handling material. Pneumatic ship unloaders, mechanical ship loaders (bulk and bags), grab loading hoppers (dust free) conveyor belt, bucket elevators and chain conveyors. Rotary valves, Screw conveyors, diverters, telescopic bellows.

RAM SMAG Lifting Technologies

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Stanley
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Lancashire
WN8 8EF
UK
Contact: Mr Patrick Draper
Job Title: PR & Communication
T: + 44 1695 556355
F: + 44 1695 556356
E: p.draper@ramspreaders.com
W: www.ramspreaders.com/
Part of the SMAG Group, we are the world's leading lifting accessories suppliers in the bulk cargo industry; providing bulk handling solutions to ports, ships, crane manufacturers, waste-to-energy plants, recycling/scrap handling industries, as well as providing container lifting spreaders.

Rapat Asia

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Angeles
Pamapaga
061
Philippines
Contact: Mr Craig Stall
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T: + 1 2182514261
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E: cstall@rapat.com
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Rapat Corporation

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E: jkoenig@rapat.com
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Rapidpack Corporation

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Jameirah Lakes Towers
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UAE
Contact: Mr Peter Ascot
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Rapidpack designs, engineers and manufactures state of the art bulk cargo handling machinery for ports, trading houses and shipping companies around the world.

RBL-REI France

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Paris
Cedex 14
75682
France
Contact: Mr David Nirefois
Job Title: Project Manager
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F: + 33 1 53 90 22 24
E: d.nirefois@rblrei-france.com
W: www.rblrei-france.com
Designs, builds and supplies continuous bulk handling belt conveyor systems and associated equipment, stackers up to 10,000 tph, reclaimers up to 15,000 tph and shiploaders up to 3,000 tph.

REEL Alesa Ltd

150 Rockland Rd
Town of Mount Royal
Quebec
H3P 2V9
Canada
Contact: Mr Jean-Pierre Desmoulins
Job Title: General Manager
T: + 1 514 937 9105 ext. 2231
F: + 1 514 937 0473
E: jean-pierre.desmoulins@reel-alesa.com
W: www.rta-alesa.com
Alesa Engineering Ltd is specialised in tailor made solutions for the pneumatic handling of bulk materials. Travelling ship unloaders are typically designed for capacities above 600 t/h. Dense Phase conveyors is another speciality of which various capacities and conveying distances have been contracted.

REEL Alesa Ltd

Max Hogger-Strasse 6
Zurich
CH - 8048
Switzerland
Contact: Mr Marcel Polidori
Job Title: Manager Sales & Marketing
T: + 41 44 435 3357
F: + 41 432 0666
E: marcel.polidori@reel-alesa.com
W: http://www.reel-alesa.com/
Specialised in dry bulk materials handling system for port terminals and plant, travelling pneumatic ship unloaders >600 t/h, storage systems, truck/railcar loading unloading systems, all kind of pneumatic conveying system (incl. dense phase, dilute phase, airlifts, airslides, suction systems), belt and tube conveyors, bath plant & carbon recycling plant, which includes for crushers, electrolysis pot control system, engineering services for all project activities above including civil and structural.

REMA TIP TOP AG

Gruber Straße 65
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Bavaria
D-85586
Germany
Contact: Mr Jonas Kothy
T: + 49 8121 707 77141
E: info@rema-tiptop.com
W: www.rema-tiptop.com
World leader in high-quality conveyor maintenance, wear protection and corrosion prevention. Provides products, accessories, technical consultancy and customized problem solving solutions in over 150 countries. Equipment range - rubber linings for wear protection; rubber repair material for conveyor belts; pulley laggings; corrosion protection linings; coating and bonding systems.

Representaciones Alfredo Brand y Cia. Ltda.

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RHC Deutschland GmbH

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E: info@rhc-deutschland.de
W: http://rhcheavymachinery.com/
RHC is a German company with engineering and manufacturing facilities in Europe and Asia.

RIKON A/S

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AS – Joint Stock Company
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LV-1034
Latvia
Contact: Mr Aleksandrs Nikolajevs
Job Title: Commercial Director
T: + 371 67393156 / + 371 29103410
F: + 371 67393828
E: rikon@rikon.lv or sales@rikon.lv
W: www.rikon.lv
A/S RIKON manufactures portal slewing and gantry cranes, parts of cranes, grabs, spreaders. A/S RIKON makes handling devices, overhead cranes and other steel structures, provides services for installation, commissioning and handling portal cranes, gantry cranes and various other port equipment.

River Consulting

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LA
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USA
Contact: Mr Kevin Fry
Job Title: Vice President
T: + 1 504 293 3900
E: kfry@riverconsulting.com
W: www.riverconsulting.com
River Consulting delivers EPCM material handling experience, including project management, design/supply of conveying systems and engineering. With 30 years of experience, we provide proven solutions including blending, conveying, silo and stacking tubes, automation and controls, and marine structures.

Robson Handling Technology Ltd

Coleford Road
Darnall
Sheffield
S9 5PA
UK
Contact: Mr Tris Young
Job Title: Marketing Manager
T: + 44 114 244 4221
F: + 44 114 243 3066
E: youngt@robson.co.uk
W: www.robson.co.uk
Design and Manufacture and Install Bulk Handling Systems including Belt, Screw and Chain Conveyors, Elevators, Hoppers, Vibros and Feeders. Steelwork and Supports. Individual units or Turn Key Projects.

Ronin GMS

No 1 Nobel Avenue
Modderfontein
Johannesburg
Gauteng
1645
South Africa
Contact: Mr Ferdinand Meyer
Job Title: Sales and Marketing Executive, Ronin Group
T: + 27 11 608 3666
F: + 27 11 608 4679
E: ferdi@roningms.com
W: www.roningms.com
Ronin GMS supplies Bulk Inventory management solutions, analytical grading equipment and services to the Southern African Grain Handling Industry. We provide Cargo Monitoring, Bulk Audits, Portside and Marine services on hard Commodities. We promote our laser Inventory Systems Worldwide.

Royal Haskoning DHV

PO Box 8520
Rotterdam
3009 AM
The Netherlands
Contact: Ms Berte Simons
Job Title: Director Advisory Group
T: + 31 10 2865 398
F: + 31 10 443 3688
E: info@rotterdam.royalhaskoning.com
W: www.royalhaskoningdhv.com/
With knowledge and experience in the development of modern ports and (un)loading, transport and storage systems, high quality advice and comprehensive project management is provided in the field of grain and other dry bulk handling. Clients' objectives vary from increasing capacity, operational efficiency and handling speed to shifting from road to rail or inland water transport. From pre-investment studies and conceptual design to construction management, practical, sustainable and cost-effective engineering solutions are offered.

Rubb Buildings Ltd

Dukesway
Team Valley Trading Estate
Gateshead
Tyne & Wear
NE11 0QE
UK
Contact: Ms Clare Wilson
Job Title: Marketing Director
T: + 44 191 482 2211
F: + 44 191 482 2516
E: info@rubb.co.uk
W: www.rubb.co.uk
Designs, manufactures and installs bulk storage and general storage buildings from 3m span to 100m span. Supply structures for storage of all types of cargo, from coal and grain to salt. The structures are totally prefabricated and relocatable, are maintenance free and the fabric has a life expectancy of up to 25 years depending on usage.

RULMECA HOLDING S.P.A.

Via A Toscanini 1
Almé
Bergamo
24011
Italy
Contact: Mr Carsten Spanggaard
Job Title: Group Sales Director
T: + 39 035 430 0111
F: + 39 035 545 700
E: rulmeca@rulmeca.it
W: www.rulmeca.com
The RULMECA Group specializes in the production of rollers, motorized pulleys and other components (such as stations, suspended garland sets and covers) for bulk material handling applications. It is composed of 10 manufacturing units, 7 sales companies and 2 representative offices and employs more than 1100 people + temporary workers.

SAMSON Materials Handling Ltd

Gemini House
Cambridgeshire Business Park
1 Bartholomew's Walk
Ely
Cambridgeshire
CB7 4EA
UK
Contact: Mr Dale Lockley
Job Title: Managing Director
T: + 44 1353 665001
E: sales@samson-mh.com
W: www.samson-mh.com
Experts in mobile bulk materials handling equipment for surface installation: from truck unloaders, to ship loaders, rail and barge loaders, ecological import hoppers and mobile stockpiling equipment. Hard-working equipment designed for rapid set-up and continuous high performance.

Saxlund International Ltd

11 Freemantle Business Centre
Millbrook Road East
Southampton
Hampshire
UK
Contact: Mr Matt Drew
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F: + 44 2380 636343
E: mattdrew@saxlund.co.uk
W: www.saxlund.co.uk

Schenck Process UK Limited

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Doncaster
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DN8 5TZ
UK
Contact: Mr Richard Sims
Job Title: MD - Construction, Minerals & Metals
T: + 44 1302 321 313
F: + 44 1302 554 400
E: enquiries@schenckprocess.co.uk
W: www.schenckprocess.co.uk
Schenck Process Group provides innovative solutions for the handling and storage of bulk materials using pneumatic and mechanical conveying technologies together with weighing, feeding and air filtration equipment to give a comprehensive package of products and services.

Scorpio Engineering Pvt. Ltd

Scorpio House
132 Wheeler Road
Cox Town
Bangalore
560 005
India
Contact: Mr Jacob P.
Job Title: VP - Marketing & Application
T: + 91 99801 625 39/+ 91 77026 3779
F: + 91 80 2548119
E: jacob@scorpioengg.com, jacobsebmh@gmail.com
W: www.scorpioengg.com
The company engineers and manufactures a complete range of grain & flour handling equipment with turnkey engineering capability. Capacities of equipment range from a few tonnes per hour to about 500mt per hour. Key strengths are the ability to engineer, manufacture, install and commission complete grain terminals for ports and grain storage & flour handling systems for large grain processors & food processing industry.

Screw Conveyor Corporation

700 Hoffman Street
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46327-1894

USA
Contact: Mr Jim Calhoun
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E: jcalhoun@screwconveyor.com
W: https://screwconveyor.com

Seabulk Inc

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V6X 2W8
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Contact: Mr Sidney Sridhar
Job Title: President
T: + 1 604 273 1378 Ext 103
F: + 1 604 273 1358
E: sbs@seabulk.com
W: www.seabulk.com
Design and build contractors involved with ports, self-unloaders and transshippers for bulk cargo. The firm provides turn-key logistics solutions for the transportation, storage and handling of bulk materials, prototype new developments including material handling systems for ship and open-sea transshipment.

S-E-G Instrument AB

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Sweden
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T: + 46 8 764 74 00
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E: inform@s-e-g.com
W: www.s-e-g.com
S-E-G is one of few companies in the world specializing in industrial weighing. For over 50 years we have acquired a unique knowledge in our special fields such as Belt Scales, Mass Flow Meters, Batching Systems, and Level Measuring.

Sempertrans

Modecenterstrasse 22
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E: sempertrans@semperitgroup.com
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SEMPERTRANS has been developing, manufacturing and installing conveyor belts for more than 50 years. Its knowhow, its experience and the quality of its products make SEMPERTRANS one of the world´s leading companies in its field.

SENNEBOGEN Maschinenfabrik GmbH

Hebbelstrasse 30
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W: www.sennebogen.com
SENNEBOGEN offers a wide range of all kinds of materials handling machines, HD rope excavators/cranes, crawler cranes, telescopic cranes and base carriers. SENNEBOGEN has a specific strength in realizing solutions based on individual customer specifications.

Servo Berkel Prior

Jan Evertsenlaan 4
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Servo Berkel Prior B.V. is the biggest manufacturer and supplier of weighing equipment in the Netherlands.

SESCOTRANS For Developed Logistics (SAE)

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T: +2 057 229 00 95
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E: kareem.abdelatif@sescotrans.net
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Other Equipment: Mobile Harbour Cranes - CMA, SMA. SESCOTRANS has 50 years experience of integrated logistics solutions for your business, serving main Egyptian ports including transportation, customs clearance, warehousing, loading and discharging of different cargo and vessel sizes, supported with full setup of facilities and fully-employed resources.

SEW-EURODRIVE GmbH & Co KG

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W: www.sew-eurodrive.com
Complete drive packages: Helical gear units, Bevel-helical gear units, motors, couplings, swing bases, brakes, geared motors. Planetary gear units, frequency inverters Torque range: 100 ... 1 Mio Nm

SGH Equipment Limited

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King Street Trading Estate
Middlewich
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SGH Equipment provide process & materials handling engineering solutions, specialising in bulk powder & granular materials
Equipment: Storage Silos & Vessels, Conveying, Weighing, Mixing & Blending, FIBC Fill+Discharge, Dust Collection, Filtration, & Suppression, Bagging, Weighing & Packing Machines
Services: Design, Manufacturing, Fabrication, Electrical - Control & Instrumentation, Installation (Mechanical & Electrical), Commissioning

SGS (Nederland) BV

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SGS Australia Pty Ltd

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SGS is the world's leading inspection, verification, testing and certification company. SGS also designs and supplies mechanical sampling systems for a wide range of bulk materials. SGS has more than 30 years experience in this field with equipment in operation throughout the world.

Shanghai Global Machinery Co Ltd

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We are a Chinese grab manufacturer, specializing in the shore and ship crane grabs for handling bulk cargo, such as radio remote control grabs and motor-hydraulic grabs. www.sgmcgrab.com

Shanghai Guanbo Machinery Equipment Co.,Ltd

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Shanghai Qifan Co., Ltd.

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Develops high-tech grabs, such as motor hydraulic bulk grab, motor hydraulic orange peel grab, wireless remote control bulk grab and contractible single rope bulk grab. Also manufactures a variety of handing tools, loading and unloading equipment, steel structure frame and other mechanical products.

Shanthi International

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Manufacturer & Exporter of Radio Remote Control Grabs, capacity from 6 CBM to 55 CBM, with the unique features of Grabs operation counting, with Weight calculation, online Grab monitoring systems etc.

Shi.E.L.D. Services srl

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Siwertell dry bulk handling systems are based on a unique screw technology and provide the most environment-friendly, efficient and versatile operation on the market today. All systems can be tailor-made to fit each port or terminal.

Sly Incorporated

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SMB International GmbH

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Smiley Monroe Ltd

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Solimar Pneumatics

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Discharge aids for storage silos.

Sotecma inc

245, boul. Yvon - L'Heureux Nord
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Canada
Contact: Mr Denis C Boulais
Job Title: President
T: + 1 450 464 4426
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E: cgermain@sotecma.com
W: www.sotecma.com
Canadian company offering turnkey engineering and construction services in bulk handling and flat storage solutions at low cost. The type of structure used is a highly versatile alternative to conventional constructions. The storage shed can be dismantled and be relocated. For more details visit www.sotecma.com.

STAG AG

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With extensive experience in the bulk handling sector, STEMM manufactures a wide range of grabs for harbour and industrial cranes, especially electrohydraulic clamshell and orange peel grabs and single rope radio-controlled clamshell grabs with state-of-the-art construction and service concepts.
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Strudes Inc

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Strudes Inc. is an Engineering Consulting Company, specializing in design for heavy industry in general and Cement Industry in particular. For markets and more information: www.strudes.com.

Suomen Viljava Oy

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Suomen Viljava is the leading Finnish company in grain logistics specializing in storage and handling. We serve, in addition to domestic market, companies operating in export, import and transit trade in and around northeastern Europe. Suomen Viljava operates in 19 different storage locations in Finland. The silo plants of Rauma, Naantali, Helsinki, Loviisa and Kotka are situated at

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Superior Industries

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Superior Industries, Inc.

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Job Title: Communications Manager
T: + 1 320 589 2406
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TAIM WESER, S.A.

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TAIM WESER is a worldwide company with 120 years of experience and projects in more than 65 countries, specialized in the development and supply of tailor made solutions in the fields of lifting of loads and bulk materials handling.

TBA Doncaster

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TBA Group

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The TBA Group is an international consultancy, simulation and software company for ports, terminals and warehouses. TBA provides the market-leading Terminal Operating System software for bulk material handling and terminal operations, which has been running at bulk terminals for over 20 years.

TBMA Europe BV

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Job Title: Marketing Manager
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F: + 31 252 37 54 36
E: marketing@tbma.com
W: www.tbma.com/engels/
Systems and Components for dry Solids Handling. Pneumatic and mechanical conveying, rotary valves, diverter valves, sampling equipment, bellow feeders, Big-Bag filling and discharging equipment, dosing feeders, silo discharge equipment etc.

TD Micronic

201-14770 64 Avenue
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T: + 1 604 594 9191
F: + 1 604 594 9193
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Blaabaervej 3
Haslev
DK-4690
Denmark
Contact: Mr Anders Larsen
Job Title: CEO
T: + 45 56314925
F: + 45 56314555
E: sales@techNaero.dk
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Other Expertise: Pneumatic transport systems.
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BT79 0NZ
Northern Ireland
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E: sales@telestack.com
W: www.telestack.com
Telestack Limited specialize in the design, manufacture, installation and commissioning of MOBILE bulk material handling solutions for the Ports & Inland Terminals, including a range of ship-loaders / Ship Un-loaders, mobile truck un-loaders, link conveyors and hopper feeders.

Teta Mühendislik A.Ş.

Çankırı Yolu 7.km Aselsan Karşısı
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Provides engineering, representation, manufacturing and erection of industrial equipment and plants for storage, handling and weighing, as well as bagging and loading of wide ranging bulk products.

Teufelberger Seil Ges.m.b.H

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The Grab Specialist b.v.

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E: info@tgs-grabs.nl
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W: www.thermofisher.com/bulkweighing
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thyssenkrupp Industrial Solutions AG

Mining Technologies -OU Materials Handling Germany
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E: info-mh@thyssenkrupp.com
W: www.thyssenkrupp-industrial-solutions.com
Besides individual items of machinery as listed above, thyssenkrupp Industrial Solutions design and supply complete material handling plants turn-key.to the fertilizer industry (for handling of urea and phosphates etc.), the cement and mining industry, coal handling systems for power stations as well as complete port handling solutions.

TMSA Tecnologia em Movimentação S/A

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The TMSA group, headquartered in Brazil with offices in LATAM and the USA, is one of the largest suppliers for bulk material handling equipment for Port Terminals, Agro Industries and Oilseed Processing Plants under turn-key, EPCM and Partnership Contract Agreements.

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RDS specialises in the design and manufacture of electronic instrumentation including on-board weighing systems for loaders operating in grain and animal feed applications enhancing operational efficiency. The range includes the Weighlog 10 , Weighlog 200 and Loadmaster series.

Tramco Europe Limited

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E: sales@tramcoeurope.co.uk
W: www.tramceurope.com
A global leader in bulk material handling, TRAMCO EUROPE LTD produce a complete line of high quality, robust, fully ATEX certified enclosed conveyors including TramrollTM, JetBeltTM, Bulk-FloTM, the Model G, Model RB, and Bucket Elevators.

Tramco, Inc

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TRAMCO has been involved in the design, application, engineering and manufacture of the worlds most complete line of chain conveyors, enclosed belt conveyors, specially designed conveyors and conveyor conversions since 1967. TRAMCO's philosophy is to produce high quality, reliable equipment that meets specific customer needs.

Translift Port Equipment Services Inc

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Transship LTD

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Tsubakimoto Bulk Systems Corporation

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Produces bulk handling systems equipment, bucket, flow and pan conveyors.

TTS HuaHai Ships Equipment

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TVH Equipment

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V D D B (Pty) Ltd

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Veenstra Machinefabriek B.V.

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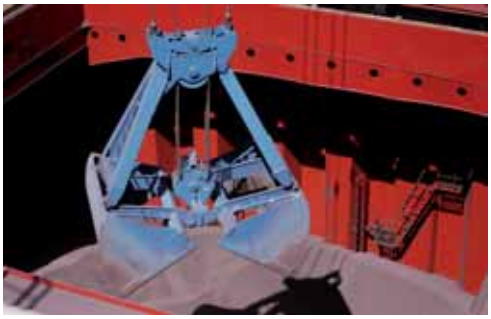

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Vendig AB

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Vendig develops and markets conveyor components for bulk material handling industry in Sweden and rest of Europe and distributors.
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Verachtert Nederland B.V.

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Verstegen Grijpers BV

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Manufactures and supplies wide range of grabs for all bulk commodities.

Vibco Inc

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Vibrafloor

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Vigan

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VIGAN equipment are suited for most of materials in bulk such as cereals, oilseeds, alumina, chemicals and wood pellets. As a solution provider, VIGAN can manage your bulk handling projects from initial design up to full erection under "turnkey" conditions.

VIVO consult s.r.o.

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110 00
Czech Republic
Contact: Mr Josef Vanousek
Job Title: Product Manager
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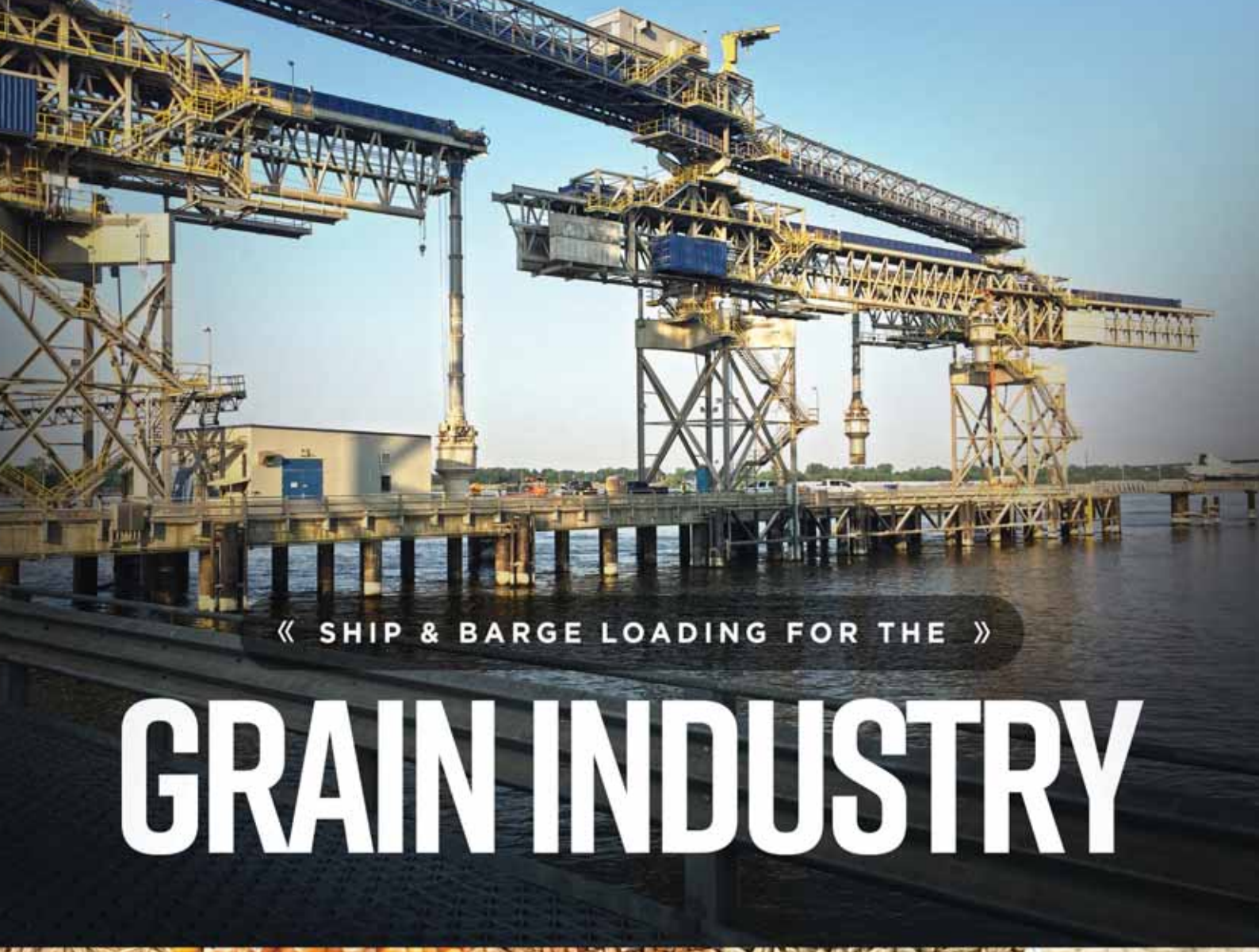

« SHIP & BARGE LOADING FOR THE »

GRAIN INDUSTRY

"The most critical features of ship loading equipment are reliability and environmental safety. Nowadays, ports worldwide consider pollution prevention a primary objective – paying special mind to reducing dust emissions and preventing cargo overflow or spillage. To address these concerns, it is critical to incorporate sophisticated engineering controls and dust control measures capable of fulfilling the highest environmental standards."

– **Mark Schaberg P.E.**, Chief Engineer, Vortex

FAST & EFFICIENT LOADING.

When loading dry materials into bulk carriers, travel distance, product dispersion and loadout speed are of primary concern. The Vortex Ship Loading Spout is specifically designed for loading efficiency. Capable of load rates over 113,510 bushels | 141,260 ft^3 | 4,000 m^3 of grain per hour, which averages 1 ton per second, the Vortex Ship Loading Spout is among the world's fastest loading solutions. It is also designed to capture fugitive dusts and reintroduce them back into the load, to reduce product loss and waste. This improves profitability.

Learn more about Vortex Loading Solutions at

www.**vortexglobal**.com

VORTEX

Vortex Global

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Vortex manufactures loading spouts, slide gates & diverters for fast and steady loading flow of dry/bulk materials. Vortex spouts are designed to capture fugitive dust, prevent material waste, and ensure plant and environmental safety, with low maintenance and service expenses.

WeatherSolve Structures

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WeatherSolve Structures dust control professionals that build customized suspended fabric systems for many situations from dust / wind fencing, hopper, truck dumps, conveyor and many more situations requiring dust control. Give a call today and we will come up with a solution for you. 1.604.607.7781 or www.weathersolve.com

Webster Griffin Ltd

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Manufactures all types of bag and sack filling systems (including mobile systems), big bag/bulk bag filling systems, robot palletising systems for all types of grain, granular or powdered products.

Windmöller & Hölscher KG

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Windmöller & Hölscher - one of the leading machine manufacturers in the world for the flexible packaging industry and the global leader in bag making and bagging equipment.

Wolf Point Engineers & Contractors

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W: www.westmar.com
Provides consulting engineering services to clients worldwide. The diverse experience gained over thousands of projects, combined with a commitment to research results in maximum value for clients. The team of project management and design specialists work with clients to develop projects from concept to completion, providing services ranging from initial planning and economic evaluation studies through to detailed design, procurement, construction and commissioning.

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ZPMC - Shanghai Zhenhua Heavy Industries Company Limited

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A world-famous manufacturer of bulk materials handling equipment. Its main products include ship loaders and unloaders, bucket wheel stackers and reclaimers. With proven design, manufacturing and fully-erect shipment capabilities to ensure on time delivery.

GRAIN HANDLING EQUIPMENT SUPPLIED

KEY

S&BL	=	ship and barge loaders
PS&BL	=	pneumatic ship and barge loaders
MS&BU	=	mechanical ship and barge unloaders
C	=	conveyors
FB	=	FIBCs, bags & bag handling
H	=	hoppers
G	=	grabs
DS	=	dust suppression
S&I	=	sampling & inspection
W&M	=	weighing & measuring
G&S	=	grading & sifting
TL&U	=	truck loaders & unloaders
RL&U	=	railcar loaders & unloaders
SS	=	storage systems
EC	=	engineering consultants
O	=	other

A chute from Cleveland Cascades loading grains at 2,000tph.

	S&BL	PS&BL	MS&BU	C	FB	H	G	DS	S&I	W&M	G&S	TL&U	RL&U	SS	EC	O
2000 Engineering																
4B BRAIME Components			✔	✔											✔	✔
A/S Cimbria	✔			✔		✔		✔			✔	✔	✔	✔	✔	
AAF International																
Advanced Conveyor Technologies Inc (AC Tek)																
AGI				✔		✔	✔	✔						✔		
Agrico Sales, Inc.	✔			✔										✔		
Agromatic AG									✔	✔					✔	
Airoflex Equipment																
Alex Stewart Agriculture Ltd									✔	✔						
Alex Stewart International Corporation Ltd									✔							
AMECO SAS	✔													✔		✔
Andrew S. McCreath & Son, Inc.																
Anvil Attachments	✔					✔	✔									
Applied Conveyor Technology, Inc. DBA The ACT Group				✔		✔		✔		✔			✔		✔	✔
Arlona Engineering			✔	✔	✔	✔	✔								✔	
Arodo BVBA																✔
Ashton Bulk Ltd				✔		✔							✔			✔
Atlas Manufacturing Co. Inc							✔									
August Penkert GmbH	✔			✔				✔	✔	✔		✔	✔		✔	
Aurecon	✔															
Ausenco Engineering Canada Inc.	✔		✔	✔		✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Australian Superintendence Co																
B.V. BECO							✔									
Babcock & Wilcox Loibl Gmbh																
Bayards Aluminium Constructions														✔		✔
Bedeschi America Inc.	✔		✔	✔		✔		✔				✔	✔	✔	✔	✔
Bedeschi Mid-West Conveyor	✔		✔	✔		✔		✔				✔	✔	✔	✔	✔
Bedeschi SpA	✔		✔	✔		✔		✔				✔	✔	✔	✔	✔

	S&BL	PS&BL	MS&BU	C	FB	H	G	DS	S&I	W&M	G&S	TL&U	RL&U	SS	EC	O
BEHN + BATES Maschinenfabrik GmbH & Co. KG					✔											
Belt Conveyor Guarding																
Bendezu Port Equipment GmbH	✔		✔	✔		✔	✔	✔							✔	✔
Bergu International AB				✔										✔		
Best Service Group (B.S.G.) bvba	✔					✔	✔					✔	✔	✔		
BGS Holland	✔				✔			✔				✔	✔	✔		
Bilfinger Tebodin															✔	
Birrus International Pty Ltd				✔												
Blue Water Misting								✔								
BLUG Credeblug S.L.							✔									
Bobcat EMEA s.r.o	✔		✔									✔	✔			
Bosch Rexroth B.V.	✔	✔	✔	✔		✔										
BossTek				✔		✔		✔								✔
Boyne Area Manufacturing (BAM)	✔	✔	✔	✔	✔	✔	✔	✔				✔	✔	✔	✔	✔
BRUKS AB	✔		✔	✔								✔		✔		
BRUKS Klöckner GmbH																
BRUKS Rockwood Incorporation																
BSP ENGINEERING S.R.L																
Bucket Mart Inc.	✔	✔	✔	✔		✔	✔			✔		✔	✔		✔	✔
Buhler AG, Grain Quality and Supply	✔	✔	✔	✔		✔		✔	✔	✔	✔	✔	✔	✔	✔	
Bühler GmbH	✔		✔	✔	✔			✔	✔	✔	✔	✔	✔	✔	✔	✔
Bulk Lift International	✔				✔									✔		
Buttimer Engineering	✔		✔	✔		✔		✔		✔		✔		✔	✔	
C Spencer Ltd	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
C Transport Maritime S.A.M.																✔
Cachapuz Bilanciai Group										✔		✔			✔	✔
Calim Grab Industry	✔					✔	✔					✔	✔			
Camar Mill Systems Ltd															✔	
Cambelt International Corp				✔								✔	✔	✔		
Caterpillar Inc												✔				
Cavotec Deutschland GmbH	✔			✔											✔	
Cavotec SA																✔
CDM Systems, Inc			✔	✔												
Cesur Packaging Corporation					✔											
CHIA Espirales.es	✔		✔	✔		✔		✔			✔	✔	✔	✔	✔	
Chief Industries UK Ltd.				✔										✔		
Chief Industries, Inc.														✔		
Christianson Systems Inc.		✔		✔								✔	✔			
Cimbria Unigrain A/S	✔			✔				✔				✔	✔			
Civettini Italo & c sas (CFS Handling)							✔									
Clariant Corporation																✔
Claudius Peters Projects GmbH																
Cleveland Cascades Ltd	✔							✔				✔	✔	✔		
COBRA Europe SAS				✔												
Commodity Inspection Services																
Condepols S.A.					✔											
Conductix-Wampfler	✔	✔	✔	✔								✔				✔
Conductix-Wampfler Americas	✔	✔	✔	✔		✔							✔	✔		✔
Conservatek Industries, Inc.														✔		
Continental Construction (Memphis)	✔	✔	✔	✔		✔		✔				✔	✔	✔		
Continental Conveyor & Equipment Co Inc				✔												
ContiTech Antriebssysteme GmbH																
ContiTech Transportbandsysteme GmbH				✔												
Conveyor Dynamics, Inc.				✔									✔		✔	
Cotecna Inspection SA									✔							
CPS Projects (Pty) Ltd	✔						✔					✔				

	S&BL	PS&BL	MS&BU	C	FB	H	G	DS	S&I	W&M	G&S	TL&U	RL&U	SS	EC	O
C-River Logistics																
CRS - Container Rotation Systems Pty Ltd																✔
CST Covers														✔		
CST Storage						✔								✔		
CWA Engineers Inc.	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
DCL, Incorporated	✔			✔	✔			✔				✔	✔	✔		
De Regt Conveyor Systems				✔												
DeMarco Industrial Vacuum Corporation	✔	✔			✔							✔	✔			
Dinnissen BV				✔	✔	✔					✔					
DMN-WESTINGHOUSE					✔					✔						
Dome Corp of North America								✔						✔		
Dome Technology, LLC														✔	✔	
DOMTEC International LLC														✔		
Donaldson Filtration Deutschland GmbH								✔								
Dos Santos International, LLC	✔		✔	✔											✔	✔
Dry-Bag A/S																✔
DSH Systems Ltd.	✔							✔				✔	✔	✔		
Dust Solutions Inc								✔								
E-Crane World Wide	✔		✔				✔									
E-Crane World Wide / E-Crane International USA	✔		✔			✔	✔								✔	
ECS Eurocargo Services AS									✔	✔						
EDGE INNOVATE. (NI) LTD	✔			✔								✔	✔			
Elgin Engineering and Construction															✔	
EMS-Tech Inc	✔		✔	✔		✔		✔					✔	✔	✔	✔
Endress + Hauser Inc										✔						
Engicon nv	✔			✔		✔						✔	✔	✔		
EQUIPO LLC							✔									
Esch Group bv																✔
ESI Eurosilo BV														✔	✔	
Euromec Srl							✔									
Euro-Tech Corporation							✔									
Euro-Tramco BV			✔	✔												
FAM Magdeburger Förderanlagen und Baumaschinen GmbH	✔		✔	✔	✔	✔			✔			✔	✔	✔	✔	
FAMUR S.A.																
FELD Maschinen-und Industriebau GmbH																
FFE Ltd																
Figee Crane Services BV	✔		✔			✔		✔							✔	
Flexco				✔												
Flexco Europe GmbH				✔												
Flexicon Corporation																
Flexoveyor Conveyor				✔								✔	✔			
Franz Wölfer Elektromaschinenfabrik Osnabrück GmbH																
Ganz Danubius Trading Co Ltd	✔		✔				✔									
General Kinematics				✔							✔					✔
Geo - Chem Laboratories Pvt. Ltd									✔	✔						
Geometrica Inc								✔						✔		
Geroldinger GmbH & Co KG				✔	✔	✔						✔	✔	✔		
Getriebebau NORD GmbH & Co. KG																
Golfetto Sangati s.r.l. (GEA Group)	✔	✔	✔	✔				✔		✔	✔			✔		
Goodtech AS				✔	✔	✔	✔	✔		✔		✔	✔	✔	✔	
Grapplers India Pvt Ltd (Essar Ind)ustries																
Greystones Cargo Systems (Pty) Ltd	✔	✔		✔												
Gulsan A.p.					✔											
Guttridge Limited			✔	✔	✔	✔		✔						✔		
Guven Grab Machine							✔									

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Industry and Trade Inc.							✔									
Hanson Silo Company														✔		
Hapman																
Haskoning India Pvt Ltd																
HASLER GROUP SAS										✔						
Henry International Diplomatic Marine																✔
Heyl & Patterson Equipment Division of The HALL Group	✔		✔				✔	✔					✔		✔	
HKD Blue																
Horizon Conveyor Equipment				✔												
Huadian Heavy Industries Co., Ltd.																
Hycontrol Limited										✔					✔	
IMASA																
IMGS																
Império Inteligência																
Inspectorate (Suisse) SA - Bureau Veritas Commodities Division									✔	✔						
Inspectorate America Corporation									✔							
Interjute BV					✔											
Intermodal Solutions Pty Ltd	✔													✔	✔	
Intersystems				✔					✔	✔				✔		✔
Istop Spamat Srl																
Italgru S.r.l																✔
J & B Grabs b.v.							✔									
Jansen & Heuning																
JEM International				✔	✔	✔				✔						
Jenike & Johanson Inc.						✔		✔						✔	✔	
Jim Way Enterprise Co., Ltd				✔												
Kalenborn Kalprotect GmbH & Co. KG																
Kinergy Corporation				✔		✔					✔		✔			
King Bag & Manufacturing Co					✔									✔		
KINSHOFER GmbH					✔		✔									
KOCKS ARDELT KRANBAU GmbH	✔		✔													
Komatsu Mining Corp.				✔												
Konecranes Port Solutions - Konecranes GmbH	✔		✔													
Kröger Greifertechnik GmbH & Co. KG																
Lachenmeier Monsun A/S				✔				✔				✔		✔		
Laidig Systems Inc						✔						✔		✔		✔
Langston Companies Inc.					✔											
Lawrence Industries, Inc.						✔								✔	✔	✔
Legacy Building Solutions, Inc.	✔			✔		✔								✔	✔	✔
Librawerk Maschinenfabrik GmbH					✔					✔						
Liebherr-MCCtec Rostock GmbH	✔		✔													
Lion Bulk Handling b.v.																
Listenow GmbH & Co.	✔				✔							✔	✔			
Loeffler Engineering Group	✔		✔	✔		✔	✔					✔	✔	✔	✔	
Macawber Engineering, Inc				✔												
Mack Manufacturing Inc							✔									
Mantsinen Group Ltd Oy	✔		✔				✔					✔	✔			✔
Maquinas Condor SA	✔	✔	✔	✔			✔	✔								
Martin Engineering				✔				✔							✔	
Martin Engineering GmbH	✔			✔				✔	✔						✔	
Martin Engineering South Africa				✔												
Maschinen und Mühlenbau Erhard Muhr GmbH	✔											✔	✔			
Matrix PDM Engineering															✔	

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MegaDome® Buildings by Harnois														✔		
MegaRoller																
Merrick Industries										✔						
Metso Brasil Industria e Comercio Ltda.																
Metso Minerals Industries, Inc.	✔		✔	✔			✔						✔	✔	✔	
Mideco								✔								
Midwest International Standard Products, Inc.	✔							✔				✔	✔			
Mitsubishi Chemical Advanced Materials Inc.	✔					✔						✔	✔	✔		
Mole•Master Services Corporation™						✔								✔	✔	
Monolithic Dome Institute														✔		
Motherwell Automation																
MRS Greifer GmbH							✔									
Mühlen Sohn GmbH & Co. KG		✔										✔	✔	✔		
Muller Beltex BV				✔											✔	✔
MWI Silo Systems Inc.																
Nantong Rainbow Heavy Machineries Co.,Ltd.																
Natural Grabs																
NAVCO (National Air Vibrator Co)																✔
Nectar Group Ltd		✔	✔	✔	✔	✔	✔			✔		✔	✔	✔	✔	
NEDCRANES BV																✔
Negrini Srl							✔									
Nemag BV			✔				✔	✔								
NERAK GmbH Fördertechnik				✔												
Neuero Industrietechnik GmbH	✔	✔	✔	✔												
Nilfisk SpA		✔		✔		✔										
NK Tehnologija SIA	✔			✔		✔		✔				✔	✔	✔	✔	
NKM Noell Special Cranes GmbH	✔		✔												✔	✔
NMH s.r.o																
Nordströms Konstruktionsbyrä	✔			✔		✔			✔			✔	✔	✔		
O B Wiik AS														✔		
OPTION srl																
Orthos Projects Ltd.			✔	✔		✔		✔		✔				✔		
ORTS GmbH Maschinenfabrik							✔									
PAGE MACRAE ENGINEERING						✔	✔	✔				✔				
Pakiet																✔
Paul Hedfeld GmbH				✔												
PEBCO®	✔							✔		✔		✔	✔			
Peinemann Cranes																
PEINER SMAG Lifting Technologies GmbH							✔									
Peterson Agricare & Bulk Logistics BV									✔							
Pfister Waagen Bilanciai GmbH										✔						
PHB Weserhütte, S.A.	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
PHOENI Conveyor Belt Systems GmbH				✔												
Pirs SAS														✔		
PLM Cranes B.V.							✔									
Pneumat Systems Inc																
Polymer Industries - Ultrapoly Division																✔
Portpack UK Limited					✔											
Port-Trade AS	✔		✔				✔						✔	✔		
Powertex Inc					✔											✔
PRADO SILOS																
Precia-Molen Nederland BV					✔	✔				✔						
Premier Tech Chronos				✔	✔					✔						✔
Premier Tech Chronos b.v.				✔	✔	✔				✔						

	S&BL	PS&BL	MS&BU	C	FB	H	G	DS	S&I	W&M	G&S	TL&U	RL&U	SS	EC	O
Premier Tech Chronos GmbH				✔	✔	✔				✔						
Premier Tech Chronos Ltd				✔	✔	✔				✔						
Procon Engineering Limited										✔						
Protan International																
PT Armada Rock Karunia Transshipment																
PT. Bando Indonesia				✔												
QML Services																✔
R & S Srl / Roncuzzi - WAM Group	✔	✔		✔	✔	✔		✔		✔		✔	✔	✔	✔	✔
RAM SMAG Lifting Technologies							✔	✔								
Rapat Asia																
Rapat Corporation																
Rapidpack Corporation	✔	✔	✔	✔	✔	✔	✔	✔		✔	✔	✔	✔	✔	✔	
RBL-REI France	✔		✔	✔	✔	✔						✔	✔	✔		
REEL Alesa Ltd	✔	✔		✔		✔						✔	✔	✔		
REEL Alesa Ltd	✔	✔		✔								✔	✔	✔		
REMA TIP TOP AG				✔					✔					✔	✔	✔
Representaciones Alfredo Brand y Cia. Ltda.																
RHC Deutschland GmbH	✔	✔	✔	✔		✔		✔	✔				✔	✔	✔	
RIKON A/S							✔									✔
River Consulting															✔	
Robson Handling Technology Ltd				✔		✔				✔		✔		✔	✔	
Ronin GMS									✔	✔	✔			✔		✔
Royal Haskoning DHV															✔	
Rubb Buildings Ltd														✔		
RULMECA HOLDING S.P.A.				✔												
SAMSON Materials Handling Ltd	✔		✔	✔		✔		✔				✔	✔			
Saxlund International Ltd																
Schenck Process UK Limited																
Scorpio Engineering Pvt. Ltd	✔	✔		✔	✔	✔		✔		✔		✔	✔	✔	✔	
Screw Conveyor Corporation																
Seabulk Inc	✔			✔											✔	
S-E-G Instrument AB										✔						
Sempertrans				✔												
SENNEBOGEN Maschinenfabrik GmbH	✔		✔		✔		✔					✔	✔			
Servo Berkel Prior										✔						
SESCOTRANS For Developed Logistics (SAE)	✔	✔	✔	✔	✔	✔	✔			✔	✔	✔		✔	✔	✔
SEW-EURODRIVE GmbH & Co KG																✔
SGH Equipment Limited				✔	✔	✔		✔		✔	✔	✔		✔	✔	
SGS (Nederland) BV									✔							
SGS Australia Pty Ltd									✔							
Shanghai Global Machinery Co Ltd							✔									
Shanghai Guanbo Machinery Equipment Co.,Ltd																
Shanghai Janus Grab Co., Ltd.						✔	✔									
Shanghai Qifan Co., Ltd.	✔						✔									
Shanthi International		✔	✔	✔		✔	✔							✔		
Shi.E.L.D. Services srl																
Siwertell AB	✔		✔	✔								✔	✔	✔	✔	✔
Sly Incorporated																
SMB International GmbH	✔		✔	✔	✔										✔	
Smiley Monroe Ltd				✔												
Solimar Pneumatics														✔		
Sotecma inc	✔	✔	✔	✔		✔		✔		✔		✔	✔	✔	✔	
STAG AG				✔												
Stemm Equipos Industriales, S.L.							✔									
Strudes Inc	✔	✔	✔	✔	✔	✔		✔	✔	✔		✔	✔	✔	✔	

	S&BL	PS&BL	MS&BU	C	FB	H	G	DS	S&I	W&M	G&S	TL&U	RL&U	SS	EC	O
Suomen Viljava Oy	✔	✔		✔	✔	✔		✔	✔	✔	✔	✔	✔	✔		
Supercargo, Lda									✔	✔				✔		
Superior Industries																
Superior Industries, Inc.	✔			✔		✔						✔	✔	✔	✔	✔
Svendborg Brakes USA, LLC																
TAIM WESER, S.A.	✔		✔	✔		✔	✔					✔	✔	✔	✔	
TBA Doncaster										✔				✔	✔	
TBA Group															✔	✔
TBMA Europe BV	✔				✔				✔	✔		✔	✔	✔	✔	
TD Micronic				✔		✔				✔						
techNaero aps								✔								
Telestack Limited	✔		✔	✔		✔		✔		✔		✔	✔			
Teta Mühendislik A.Ş.		✔	✔	✔	✔					✔				✔		
Teufelberger Seil Ges.m.b.H																
The Grab Specialist b.v.							✔									
Thermo Fisher Scientific									✔	✔						
thyssenkrupp Industrial Solutions AG	✔		✔	✔		✔		✔	✔	✔		✔	✔	✔		
TMSA Tecnologia em Movimentação S/A	✔	✔	✔	✔		✔	✔	✔	✔			✔	✔	✔		✔
Topcon Technology Ltd										✔						
Tramco Europe Limited	✔		✔	✔									✔			
Tramco, Inc				✔												
Translift Port Equipment Services Inc		✔		✔		✔										
Transship LTD																
Tsubakimoto Bulk Systems Corporation				✔												
TTS HuaHai Ships Equipment																✔
TVH Equipment																✔
V D D B (Pty) Ltd																✔
Veenstra Machinefabriek B.V.	✔							✔								
Vendig AB																✔
Verachtert Nederland B.V.							✔									
Verstegen Grijpers BV							✔									
Vibco Inc				✔		✔					✔	✔	✔			
Vibrafloor																
Vigan	✔	✔	✔	✔								✔	✔	✔	✔	
VIVO consult s.r.o.																
Vortex Global	✔							✔				✔	✔			✔
WeatherSolve Structures	✔	✔	✔	✔		✔		✔				✔	✔	✔		
Webster Griffin Ltd					✔											
Windmöller & Hölscher KG					✔											
Wolf Point Engineers & Contractors																
Worley Parsons Canada (Westmar)	✔	✔	✔	✔		✔		✔				✔	✔	✔	✔	
ZAO SMM (CJSC SMM)																
ZPMC - Shanghai Zhenhua Heavy Industries Company Limited	✔		✔												✔	

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Alumina Shipunloader, Malaysia, 2018

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