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featuring...

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Ongoing support from coal trade

Various components of commodity import demand in a range of countries are holding up or strengthening and may continue to evolve positively. But following prospective solid growth in global seaborne dry bulk trade in 2024, restraints may tighten.

Underlying support for dry bulk trade from global economic activity is still not gaining much momentum. The latest (mid-July) International Monetary Fund update points to world growth in gross domestic product remaining close to last year's lower 3.3% in 2024, at 3.2%, including slightly lower growth in China. IMF analysts suggest that the world economy is "in a sticky spot", with the disinflation trend's progress slowing, resulting in interest rates staying elevated.

Coal

A supportive trend in coal trade has been unfolding this year, benefiting in particular form the sustained strength of China's imports after last year's large increase. The International Energy Agency's mid-year coal market update predicts that world trade in 2024 "will set another record if Chinese demand continues," forecasting a small annual increase of 1%.

Among major Asian importing countries reviewed in the IEA analysis, not all are evolving firmly. Japan, South Korea and Taiwan saw reduced volumes last year and are expected to see further reductions during the current twelve months. By contrast a strong pattern in India's imports seems to be evolving in 2024, while in Vietnam — becoming a much more significant buyer — a vigorous upwards trend is being boosted by rising power station coal usage.

Iron ore

Some forecasters point to potential for another rise in world seaborne iron ore trade during 2024, after last year's upturn. But the growth foreseen is largely dependent on continued expansion in dominant importer China's volumes, prospects for which are uncertain in the second half of this year.

A revised assessment by analysts at the Australian Government's Department of Industry, published in early July, is not so optimistic. World iron ore trade (including land movements but mostly seaborne) is predicted to grow only marginally by 0.5% in 2024 as a whole, to 1,628mt (million tonnes). In this forecast China's imports are estimated at 1,118mt, a 5% decline from last year. Higher imports into Japan, South Korea, Europe and other countries could be partly offsetting.

Grain & soya

The outlook for world grain and soya trade in the period ahead is showing some potential for a downturn. In the 2024/25 trade year starting October 2024 (beginning July for wheat) grain import demand may diminish, although a positive trend in the soyabeans and meal segment could continue. Within the current 2023/24 year, a 6% increase is estimated.

Based on a Bulk Shipping Analysis compilation of separate US Department of Agriculture calculations, world trade in wheat, corn and other coarse grains, plus soyabeans and meal, is likely to be about 12mt or 2% lower in 2024/25, compared with the previous twelve months. The total could decline from 707mt, to 694mt, mainly as a result of lower imports into several Asian and European countries.

Minor bulks

Following robust growth of about 6% in world seaborne trade in aluminium raw materials — bauxite, and the processed alumina — during 2023, another increase is expected this year. The total could reach about 210mt, mostly as a consequence of China's sustained upwards imports trend.

Bulk carrier fleet

Expansion of cargo-carrying capacity in the world fleet of bulk carriers looks set to be assisted by a similar volume of newbuilding deliveries to that seen last year. The newbuildings total in 2024 may be about 35 million deadweight tonnes, although the breakdown among vessel size groups may differ, compared with last year, as shown in table 2. Higher Handysize, Handymax and Panamax completions could accompany sharply lower Capesize deliveries.

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

	2019	2020	2021	2022	2023	2024*
Japan	54.6	49.7	52.1	51.3	49.8	49.0
South Korea	22.6	21.2	21.5	22.3	22.2	24.0
China	42.0	44.5	39.5	36.0	46.0	47.0
India	63.2	59.2	67.8	72.2	68.0	72.0
Total of above	**127.8**	**174.6**	**180.9**	**130.5**	**186.0**	**192.0**

source: various & BSA 2024 estimates * *estimate*

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

	2019	2020	2021	2022	2023	2024*
Handysize (10–39,999dwt)	3.1	2.8	3.7	4.0	4.3	5.5
Handymax (40–69,999dwt)	8.2	9.2	7.0	7.3	9.4	11.0
Panamax (69–99,999dwt)	11.4	12.1	8.6	9.8	10.9	11.5
Capesize (100,000dwt and over)	19.0	25.1	19.0	10.3	10.7	7.5
Total	**41.7**	**49.2**	**38.3**	**31.4**	**35.3**	**35.5**
% change from previous year	45.8	18.0	–22.2	–18.0	12.4	0.6

source: Clarksons Research & BSA 2024 estimates * *estimate*

by Richard Scott, Bulk Shipping Analysis, Tel: +44 (0)12 7722 5784; Fax: +44 (0)12 7722 5784; e-mail: bulkshipan@aol.com

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Iron ore trades

supply will be the principal price determinant

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Kunal Bose

The supply will be the most important decider of iron ore prices in future as Chinese steel production is to stay at the present level. The pursuit of a carbon-neutral goal will lead steelmakers to use increasingly big volumes of high quality ore.

China, which is by far the world's largest importer of iron ore required to run the BF-BOF segment of its giant steelmaking industry, presents analysts with the riddle surrounding continuing arrivals of the raw material at Chinese ports in high volumes in the face of steel production fall. The country's imports of iron ore in the first seven months up to July were 6.7% up year-on-year to 713.77mt (million tonnes). But in the first half of this year, production of crude steel was down 1.1% to 530.6mt. No wonder then inventories of the steelmaking ingredient at Chinese ports are sitting at elevated levels *vis-à-vis* established seasonal norms. The riddle becomes even tricker by high summer ore imports, when mills routinely apply the brakes in capacity use in response to a fall in demand for steel from the construction and housebuilding sector.

Port iron ore stockpiles

Beijing-based consultants SteelHome says in a report that port stockpiles of ore have been rising steadily since reaching a seven-year low of 104.9mt in the final week of October. Underlining the continuing strength in imports, monthly port stockpiles are showing an average gain of 6.06mt. SteelHome informs Chinese ore inventories across ports as of 26 July rose 1.47% week-on-week. Even then, inventories will have to climb further before they hit the May 2018 record high of 160.6mt. With China being an importer of such big volumes of iron ore, there inevitably is a strong correlation between ore prices globally and going beyond what it buys to actual end use. What automatically follows is that if iron ore keeps accumulating at ports and also with steel mills beyond certain volumes, prices of the raw material will come under pressure.

Take Singapore Exchange where ore with 62% contained iron hit an 18-month high of $143.60 a tonne on 3 January and since then the market has been facing headwinds. Expectedly, the causes of iron ore bearishness are mostly on account of the woes of the Chinese economy and that includes insufficient domestic demand for steel and falling prices eroding margins of steelmakers. For instance, China's gross domestic product decelerated to 4.7% on the year in the second quarter in 2024 from 5.3% in the January–March quarter. Moreover, the country's factory activity contracted for a third straight month in July, leaving the economy in a weak trajectory.

Demand triggering moves

The official manufacturing purchasing managers' index for July was 49.4, according to China's National Bureau of Statistics. The number was slightly worse than the June reading. A Singapore-based iron ore merchant trader visiting India told *DCi*: "We hope that, following the recent Chinese Communist Party politburo meeting, President Xi Jinping would turn the focus on boosting consumption to combat 'insufficient domestic demand.' The major challenge is to revive the real estate sector and fund infrastructure development through appropriate stimulus.

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Simandou holds over 2bn tonnes of ore with iron content 65%.

All this will generate domestic demand for the steel industry and in turn for iron ore."

Every time there is a dip in ore prices, buying for delivery to China sees a spurt and that explains the relentless accretion in port stocks all this while. Chinese steel industry's working experience says profits become elusive once iron ore costs more than $100 a tonne. Now production and demand are down, steel prices are agonizingly low and mills — in order to avoid growth in factory stockpiles of steel products — have turned into aggressive exporters, allegedly often at below production cost. In the given circumstances, high ore imports by China could be either in anticipation of the government announcing at some point stimulus measures for the real estate sector or this could be yet another instance of part of national strategy to support build up of inventories of a number of commodities, specially the ones with high import dependence.

The ground reality for the steelmaking ingredient is that China, which last year had a share of 53% of global steel production and also features in about 75% of all seaborne iron ore trade has decided to restrict annual metal output at around 1bn tonnes for two considerations. First, China's crude steel demand is unlikely to see any major improvement from 911mt in 2023 in view of tepid performance of the economy. Second, climate change being a major concern for Beijing with the campaign for clean air being assiduously led by President Xi Jinping himself, a principal target for housecleaning is naturally the big polluter steel industry. Incidentally, steel mills account for nearly 16% of China's total emissions. This is double the global emission average for steelmaking.

High grade ore in demand

As Beijing is targeting peak carbon emissions by 2030 and carbon net zero by 2060, mills have come to realize that the journey to green steel will be facilitated by the use of better grades of iron ore. Experts describe ore with high iron content, whose use limits energy-intensive sintering, is the low-hanging fruit for the industry told to reduce emissions at an accelerated pace. Blast furnace (BF) efficiency improves when ore bearing high iron and low impurities such as alumina and silica is used. At the same time, steelmakers armed with BF and basic oxygen furnace (BOF) could be a lot less environment fouling in its

operation by switching to higher grade agglomerates such as pellets and direct reduced iron (DRI), using iron ore fines and low grades of ore. This will explain why Chinese steelmakers have stepped up buying of better grades of iron ore in recent years.

Supply of very high iron contained ore to Chinese mills in particular and also to others will get a boost once operationalization of mines at Simandou in West Africa's Guinea begins by December 2025. Simandou, which holds by far the largest deposit of iron ore of a quality not easily available, should have been in production years ago but for interminable delays caused by political uncertainty, ownership disputes and widespread corruption. That the mining giant Rio Tinto secured its first exploration licence in 1997 serves as proof of the uncertainty that surrounded project implementation and funding issues all these agonizing years. Simandou holds over 2bn tonnes of ore with an iron content of 65% mostly, a rare global phenomenon. In fact, once ore starts flowing in volumes from this Guinean deposit, it will have the potential to challenge the dominance of Pilbara region of Western Australia, the world's largest producer and exporter of the ingredient.

Exports from Pilbara (pictured here) may be threatened by the higher-quality ore at Simandou, once it comes online.

Simandou versus Pilbara

Even while Western Australia has the biggest share of global crude iron ore reserves at 24%, the average iron content there is 62% in line with the world average. High grades of ore are preferred by mills for these contain fewer impurities and for the miners these have a significant impact on operating margins, helped by the premium such ore commands in the market. The interesting thing about Simandou is the involvement of a number of Chinese companies through Chalco Iron Ore Holding (Baowu group owns 20% of it) and Singapore-based Winning International. Chinese investors have been drawn to Simandou for the size and quality of ore found here. There is also the consideration of China diversifying sources of iron ore imports, particularly Australia with which Beijing had quite a few rather serious run-ins. By far the major part of Australian iron production in 2023 of 960mt was shipped to China, which yielded a record 85% of $136bn revenue for Australia from iron ore exports.

No doubt the major part of Simandou production will find its way to China, whose steel production is more than that of the rest of the world. Canberra has every reason to be concerned about iron ore of very high quality starting to flow from

Simandou hopefully in a year-and-a-half, posing some threat to Pilbara ore exports. This is despite the freight advantage that shippers from Australia will always have over despatches from competition to emerge from West Africa. Guinea is roughly 7,700 nautical miles or 14,260km farther from Australia and iron is a bulky commodity making it expensive to transport. But as steel mills in China in particular and elsewhere too will have the compulsion to use the relatively new capital equipment for a good number of years till their renewal becomes due and still will be required to cut carbon intensity they likely will be ready to pay extra freight for Simandou ore. Simandou reserves have been assigned to separate consortia for development. Blocks three and four are with Rio Tinto and China's CIOH owned by Aluminium Corporation of China (75%), Baowu Steel (20%), China Harbour Engineering (2.5%) and China Railway Construction Corp (2.5%) while blocks one and two are to be commissioned by Winning Consortium Simandou (WCS) of which the partners are Singapore headquartered Winning International Group, Weiqiao Aluminium and United Mining Suppliers. The total investment across the four blocks will be around $25bn, making it the single largest investment in African continent.

Simandou to boost GDP

A Rio Tinto official said that the Simandou project at its full capacity use could raise the country's GDP by 50%. At over 2bn tonnes, Simandou is among the largest single location iron ore reserves in the world. Citing the example of Australia and a few other ore bearing countries where new deposits keep on being discovered in the course of intensive exploration and mining, the director general of Federation of Indian Mineral Industries (FIMI) RK Sharma says, "same will be the case with Simandou." However, what needs to be factored in is the Guinean proneness to political instability, policy uncertainty and rampant corruption.

Notwithstanding its potential, it will be some years before Guinea emerges as a significant supplier of iron ore. In the meantime, according to a study, global ore production estimated at 2.4bn tonnes in 2023 is likely to register a CAGR (compound annual growth rate) of 1.9% till 2030 when output should be 3.004bn tonnes. Expectedly, the world's two industry leaders, Australia and Brazil, will be contributing the maximum to the growth by way of commissioning new mines and capacity expansion at operating sites. This, however, has to be seen against the warning by the Reserve Bank of Australia that Chinese demand for iron ore may have peaked, setting the scene for a potential multi-decade hit to government revenue and profits of mining groups.

EAFs to curb ore demand

Hasn't Beijing wanted the steel industry to restrict production around current level? Moreover, the industry is encouraged to realize the country's potential to make steel through the low carbon route of electric arc furnaces (EAFs) where the feedstock is steel scrap and not iron ore. Global Energy Monitor informs that by January 2024, China had installed 151mt of EAF exceeding the 2025 target capacity of 143mt needed to have a 15% share of total crude steel production. The International Energy Agency's net zero by 2050 target demands in that year the global steel industry will be required to use EAF technology for 43% of total primary steelmaking with hydrogen-based DRI. All these factors combined will make the demand outlook for ore somewhat complicated. What, however, looks certain is that Chinese demand unlikely to show any significant changes, supply will remain the principal price decider for iron ore. Furthermore, in view of the mounting pressure on steelmakers to become carbon neutral, miners will be obliged to focus on improving ore quality in alignment with changing demand profile. DCi

Petcoke market

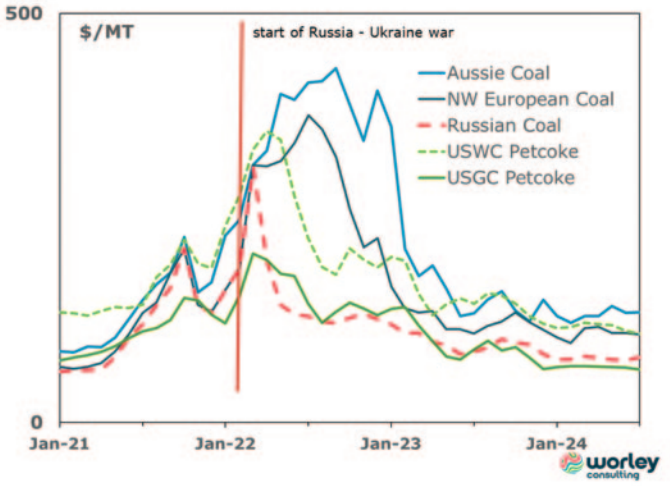
prices stabilizing, but trade flows changing

Ben Ziesmer, Pedro Mackay & Rituraj Jha, Worley Consulting

The petroleum coke (petcoke) market pricing has stabilized after four years of remarkable volatility (see Figure 1 — Thermal Coal and Fuel-grade Petcoke Prices), but this relative pricing stability masks significant underlying changes in trade flows that have occurred and are likely to continue into 2025. The historically high price volatility was driven by a multitude of factors including volatile coal prices, trade policies, and major geopolitical events such as the Covid-19 pandemic followed by Russia's invasion of Ukraine. Almost simultaneously, with the implementation of Covid-19 lockdowns, there was a historic crash of oil prices in March 2020 followed by unprecedented oil production cuts by OPEC+ (12 OPEC countries + 9 non-OPEC countries led by Russia). So far in 2024 petroleum coke prices, especially US Gulf Coast (USGC) petcoke prices, have been very stable. Part of the stability can be attributed to more stable thermal (steam) coal prices because thermal coal pricing establishes the solid fuel pricing environment within which fuel-grade petroleum coke trades. However, in 2024 USGC fuel-grade petroleum coke prices have been more stable than Russian or especially Northwest European thermal coal prices, and USWC fuel-grade petcoke prices have been more stable than Australian thermal coal prices.

We focus on United States fuel-grade petroleum coke export prices because US fuel-grade petcoke provides approximately 75% of seaborne petcoke trade. Fuel-grade petroleum coke has lower pricing and is

Figure 1 – Thermal Coal and Fuel-grade Petcoke Prices



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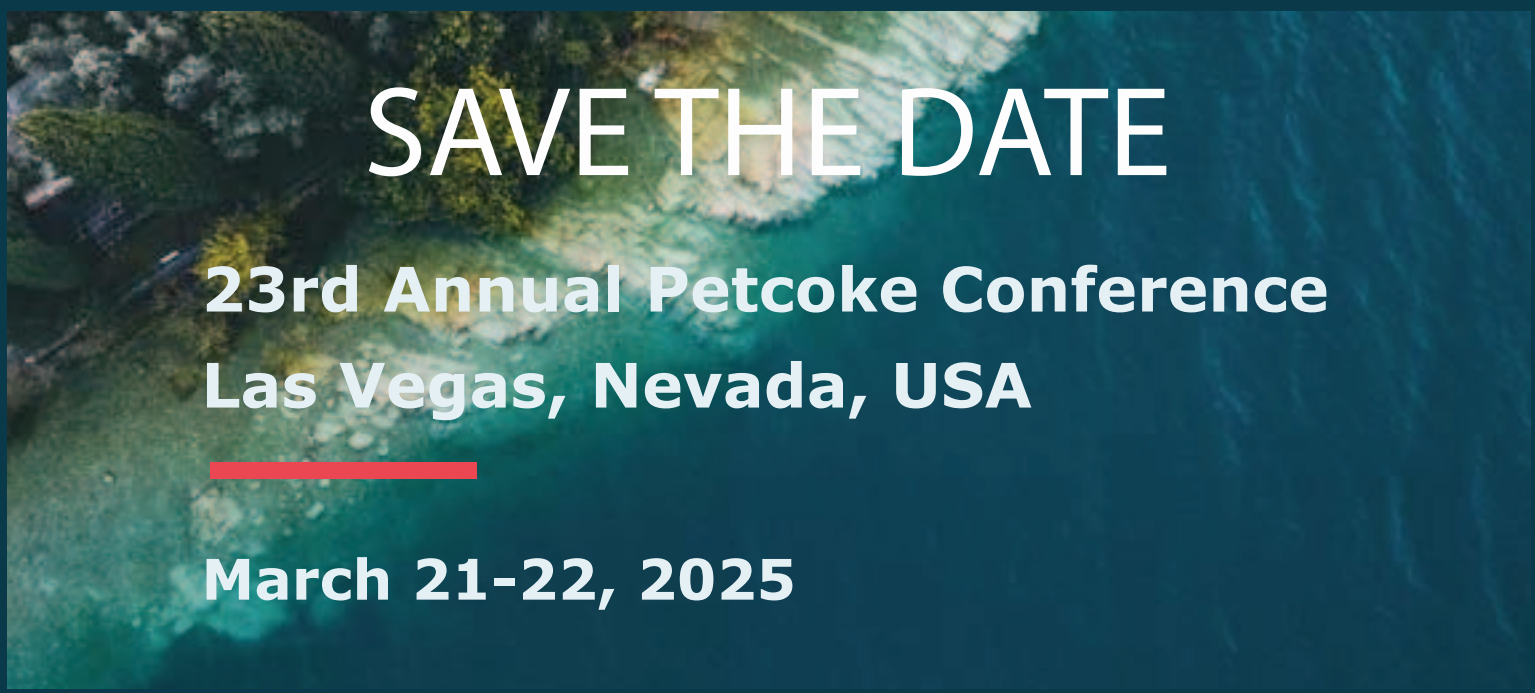


generally lower quality than petcoke used for carbon applications (see Petroleum Coke Markets below for more information). Figure 1 illustrates that US West Coast (USWC) petroleum coke prices (unless specified otherwise, all references to petroleum coke prices refer to fuel-grade petcoke prices) are higher, sometimes substantially higher, than US Gulf Coast (USGC) petcoke prices. USWC petroleum coke prices are higher because USWC petcoke typically has much lower sulphur content than USGC petcoke (there are exceptions) which allows it to go into higher value markets like the steel and glass industries, and export volumes are much lower (<6 vs. 24+mt [million tonnes]), which makes it easier to limit sales to higher value markets. USWC exports are dominated by China and Japan which typically each receive about 40% of USWC exports. USGC export destinations are varied with shipments typically going to 40+ different countries in a year.

Before discussing changing trade flows, let us review a brief background on petroleum coke.

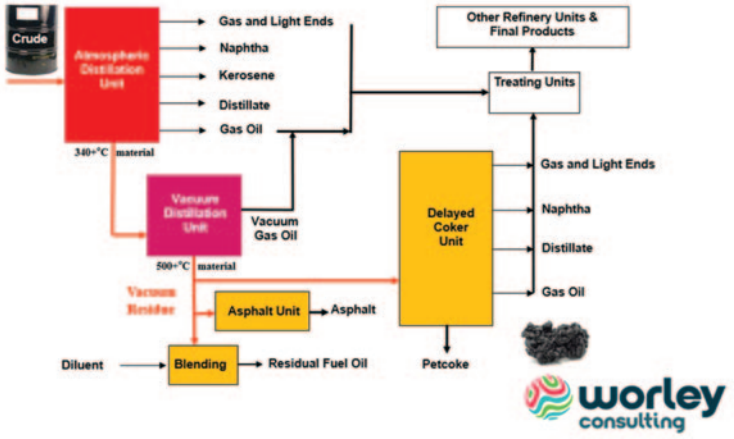
Coking Background

Petroleum coke is produced as a by-product in many oil refineries. Crude oil is first processed in an atmospheric distillation unit, followed by a vacuum distillation unit. The heavy residuum exiting the bottom of the vacuum tower (i.e., vacuum tower bottoms, or VTB) can be used to make asphalt, residual fuel oil (RFO)[1], or used as feedstock for a coker (see Figure 2 — Simplified Coking Refinery Flow Diagram) or other bottoms upgrading technology.

For decades, the refining industry has faced the problem that demand growth for transportation fuels (i.e., gasoline, diesel, jet fuel) has been, and continues to be, much greater than demand growth for RFO. To put it another way, people are buying cars and trucks and flying in airplanes, but no one is building RFO-fuelled power plants or industrial facilities. In response to this problem, the refining industry developed various technologies to upgrade VTBs to produce more valuable light products and eliminate the need to produce RFO.

Coking is the dominant bottoms upgrading technology. It allows refiners to reduce production of RFO per barrel of crude oil processed and bridge the gap between growth in demand for light products and RFO demand growth. To summarize, the primary purpose of a coker is to reduce the production of residual fuel oil by converting heavy VTBs into high value transportation fuels (gasoline, diesel, jet fuel, etc.) with petroleum coke produced as a by-product of the coking process.

Figure 2 - Simplified Coking Refinery Flow Diagram



It is also important to recognize that the percentage of VTBs produced as a result of refining crude oil increases dramatically as the crude oil processed in the refinery gets heavier (i.e., lower specific gravity). For example, about 10% (by weight) of light Arabian crude oil becomes vacuum tower bottoms, whereas almost 40% of very heavy Mexican Maya or Alberta crude oils become vacuum tower bottoms. Consequently, the percentage of crude oil that converts into petroleum coke increases dramatically, as crude oil gets heavier, and refineries that are designed to process heavy crude oils are much more likely to have coking capacity (or other VTB upgrading technology) than refineries designed to refine lighter crude oil.

Petroleum Coke Production

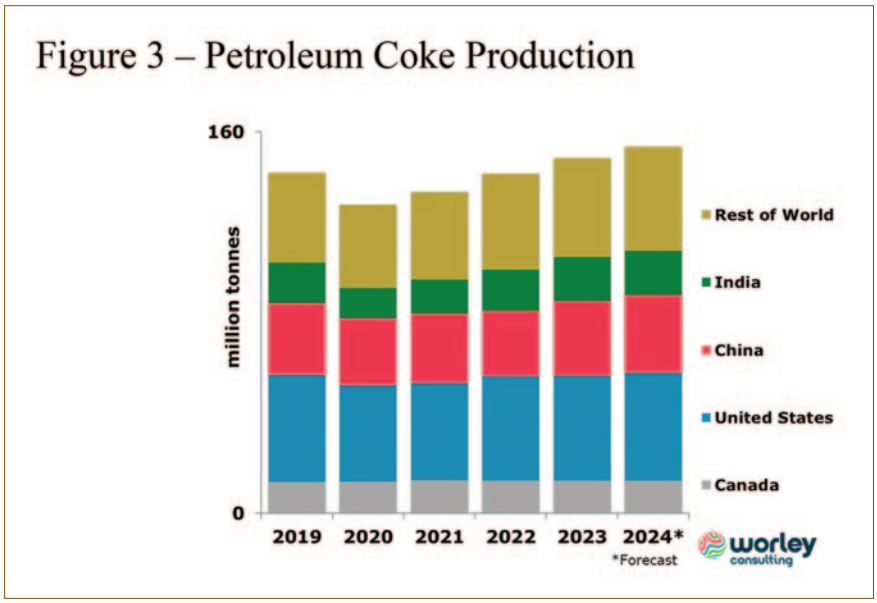
Traditionally, cokers are installed in oil refineries to convert VTB and other heavy residual oils into higher-value light transportation products (e.g., gasoline, jet fuel, diesel fuel). Until recently, a coker almost invariably increased refinery profitability because the yield of high-value transportation fuels is maximized and the production of low-value RFO is minimized[2]. While the coking process has been in use since the 1930s, petroleum coke production saw its largest growth between 1995 and 2018 (production: 1995= ~30mt, 2018 =~140mt) principally because light transportation petroleum product demand grew faster than RFO demand worldwide and the overall global crude slate got heavier. Consequently, petroleum coke production grew much faster than crude oil demand (1995–2018 CAGR = 6.6% for petcoke vs. 1.6% for crude oil).

However, recently petroleum coke production growth has slowed markedly because crude oil, on average, is getting lighter and the recent move for refineries to be configured for oil to chemicals production. Two factors have been driving crude oil, globally, to be lighter. The first is due to increased production of tight light oil (TLO), particularly in the United States, as a result of the fracking revolution. The second reason is crude oil production cuts by OPEC+.

US crude oil production has increased significantly, mostly because of the rise in tight light oil (TLO) share. US crude oil production increased from 5.5 million barrels per day (mbpd) in 2010 to 13mbpd in 2023 and is further projected to grow to ~14mbpd by 2025 and remain almost the same through 2030. This dramatic increase of US crude oil production has been driven by TLO production, which increased from ~0.5mbpd in 2010 to ~8.9mbpd in 2023 and is expected to increase another 20% to ~10.6mbpd by 2030, primarily from the Permian Basin in Texas. The share of TLO is seen rising from ~9% in 2010 to ~69% in 2023, and to over 75% by 2030. Offshore

1. Typically, about 30% high value diluent such as light cycle oil needs to be added to meet RFO viscosity and density specifications.

2. Since the early 1990s cokers have also been used in upgraders that produce various grades of synthetic crude oil (SCO) from bitumen or ultra-heavy crude oils. This type of upgrader exists in Venezuela where ultra-heavy Orinoco Belt crude oil is upgraded and is exported as lighter crude oils, and in Canada where upgraders are used to produce SCO from the bitumen derived from Alberta oil sands. Upgrading economics are driven by crude oil economics, not refining and coking economics.



production from the US Gulf of Mexico is expected to peak at 2.1mbpd in 2026 and will then retreat to 1.8mbpd in 2030.

Refineries run a blend of different crude oils (known as the crude slate), and choices of crude oils which are in the crude slate significantly impacts the quantity and quality of petroleum coke that is produced. The selection of crude slate is driven by a complex series of factors including the capacities and capabilities of the various processing units within the refinery, the expected operating state of various processing units, crude oil pricing and availability of different qualities of crude oil, and demand for various refined products.

Increasing TLO share of crude oil production makes the crude slate lighter — hence lower petroleum coke production. In parallel, with the shortage of heavy crude oil, because of the OPEC+ cuts, US exports of lighter crude oil, mostly to the European refiners, have turned the crude slate lighter elsewhere.

Global petroleum coke production dropped by almost 10% in 2020 due to governments' policies implemented in response to the Covid-19 pandemic and the indirect impact of sharp OPEC+ production cuts. Production partially rebounded in 2021. Production growth accelerated in 2022, and production slightly exceeded pre-pandemic levels (see Figure 3 — Petroleum Coke Production). Production grew almost 5% in 2023 and is expected grow about 3% in 2024.

After the price war between Saudi Arabia and Russia, which led to the oil price crash in March 2020, OPEC+ members decided to impose a historic production cut, equivalent to 10% of global oil demand, which, after succeeding extensions, came to end in August 2022. However, subsequent to the meetings, OPEC+ members decided to implement 3.66mbpd of oil production cuts and additional voluntary cuts of 2.2mbpd over and above 3.66 mbpd cuts[3]. Most recently, the OPEC+ members decided to extend the 3.66mbpd cuts until the end of 2025, while the voluntary additional cuts amounting to 2.2mbpd will phase out from October 2024 onwards, though the group maintains that the phase out will depend upon the market conditions and could be paused or even reversed. Total cuts, which as we write, amounts to ~5.8mbpd or equivalent to 6% of the global oil demand.

OPEC producers tend to preferentially cut heavy oil production when they make production cuts in order to maximize revenue as heavy crude oil sells at discounts to light crude oil. This preferential cutting of heavy crude oil causes a relative shortage of heavy crude oil, and the discount for heavy crude oil tends to shrink. The shrinking discount for heavy crude oil hurts the profitability of coking and tends to induce coking refineries to migrate to lighter crude slates. Petroleum coke production reduces with lighter crude slates. Generally, but not always, lighter crude oils have lower sulphur content, which reduces petroleum coke sulphur content.

Petroleum coke markets

Petroleum coke is unusual because it is used not only as a heat source (i.e., fuel) but also as a carbon source in metal production and chemical processes. Petroleum coke that is used as a carbon source requires better quality (e.g., low sulphur and metals content) and commands a higher value, driven by different factors than fuel-grade petcoke prices.

Green[4] petroleum coke is usually upgraded by calcination when it is used as a carbon source. Calcination is a process that uses heat [1,150-1,350°C (2,102–2,462°F)] to remove moisture and volatile matter from petcoke, improves critical physical properties, and converts green petcoke into an electrically conductive form of carbon. Green petcoke that has been calcined is referred to as calcined petroleum coke (CPC). The largest market for CPC is in the production of carbon anodes for aluminium smelting. Other uses for CPC are in the production of carbon electrodes for electric arc

3. Global oil production increased from 100.2 mbpd in 2022 to 102.2 mbpd in 2023 and is projected to touch 103 mbpd this year.

4. Technically, all petcoke that has not been calcined is green petcoke (GPC). However, within the petcoke industry, the term GPC is usually only used for petcoke that is used as calciner feedstock. Unless otherwise noted, discussion of petcoke or petroleum coke will be referring to green (i.e. not calcined) petroleum coke.

furnaces, titanium dioxide (TiO_2) production, as a recarburizer (i.e., carbon raiser) in the iron and steel industry, and, very recently, as a source of synthetic graphite in lithium-ion (Li-ion) battery production. A little over 30% of petroleum coke that is produced is sold into these higher value-added markets for higher quality petcoke; the remaining production is used as a fuel source. The carbon source market share has been growing recently as demand in these markets has been growing faster than overall petroleum coke production.

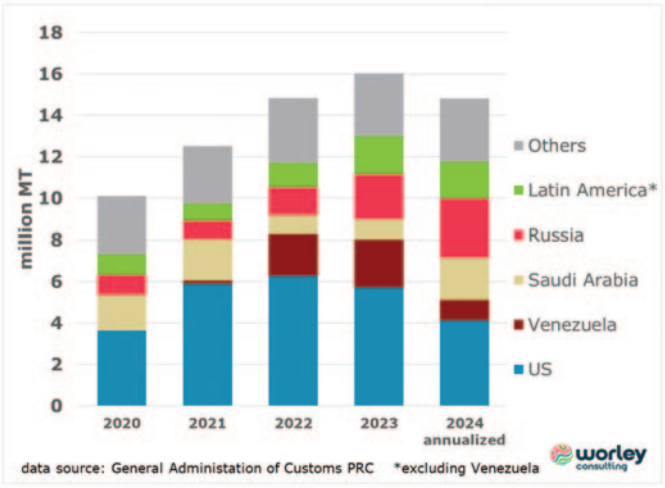
Fuel-grade petroleum coke is used in a variety of industries — primarily as a substitute for coal, but sometimes as a substitute for fuel oil. Petroleum coke has higher calorific value (i.e., kcal/kg) and much lower ash content than coal. However, it is more difficult to burn, generally has higher sulphur content, and is often more difficult to pulverize[5] than coal because most fuel-grade petroleum cokes are harder than coal, so it typically sells at a discount to coal. The cement industry is the largest consumer of fuel-grade petroleum coke because cement kilns are particularly well suited to burn petcoke, and cement kilns inherently capture approximately 90% of the sulphur oxides (SOx) emissions resulting from burning petcoke. The next largest demand segment for fuel-grade petroleum coke is the 'other industry' category, which includes lime[6], brick, calcium carbide, and glass production, plus gasification of petcoke to produce chemicals (e.g., ammonia, urea ammonium nitrate, etc.). The remaining categories in declining market size are power generation, long-term storage, and iron & steel production. The 'long-term storage' category refers to petroleum coke produced as a by-product of upgrading bitumen (primarily Western Canadian oil sands) where petcoke is placed underground as part of the reclamation process associated with open cast (open pit) mining of bitumen or was placed in long-term storage in Venezuela because dependability problems at petcoke terminals located at the Port of Jose prevented exports of petroleum coke from keeping up with petcoke production.

Shifting petroleum coke trade flows

Venezuela re-emerged in 2021 as an exporter of petroleum coke as petcoke from the huge (estimated at 18mt+) inventory located near the Port of Jose began to be loaded onto vessels. Less than 0.3mt were exported in 2021, but export volume shot up to almost 3.2mt in 2022. Exports during the first seven months of 2023 were running at the equivalent annual rate of about 4.7mt/year. Then contract disputes between Maroil, the primary exporter, and Petróleos de Venezuela, SA (PdVSA) caused exports to only average about 80,000 tonnes/month from August through November. In October, the US Department of State issued sanctions relief on Venezuela's oil industry in return for the Maduro government lifting bans on opposition political candidates, other political reforms, and release of detained US citizens. Shortly thereafter, exports of Venezuela petroleum coke rebounded as globally Venezuela import volumes averaged just under 0.5mt/month from January 2024 through April. US sanctions relief expired April 18 because the US said the Maduro government had failed to abide by the terms of the agreement. Subsequently, vessel loadings have slowed with an average of 0.25mt/month being loaded in June and July.

Historically, three key export markets for US petroleum coke have been China, India, and Turkey, but trade flows changed in the last year and are likely to change shortly due to probable changes in China's regulations regarding the use of petroleum coke.

Figure 4 – China Green Petroleum Coke Imports



China's petroleum coke imports surged during the first four months of 2023, 73% more than the first four months of 2022, even though China imported a record 14.mt of green (non-calcined) petcoke in 2022. During this same period, China's domestic petroleum coke production was also up (+10%) versus 2022. The combination of surging import volumes, increased domestic production, and somewhat lacklustre demand caused petroleum coke inventories to surge to 6.5mt+.

Import volumes reduced in May and June, and monthly imports reduced further during the second half of 2023 to ~20% less than in the second half of 2022. Inventory levels decreased as 2023 proceeded, but inventory levels at the end of 2023 remained at very high levels by historical standards. For the year, China imported 16mt of petroleum coke, continuing the recent trend of setting new record high import volumes each year.

The sources of China's petroleum coke imports have changed markedly since 2021 (see Figure 4 – China Green Petroleum Coke Imports). Imports from the United States trended down some in 2023 and the

5. Coal (and petcoke) is typically pulverized to approximately the consistency of talcum powder to facilitate the pulverized (suspension) fuel combustion process used in the power, cement, lime, and many other industries.

6. Lime kilns are very similar to cement kilns and have the same inherent capabilities to successfully burn petcoke as cement kilns.

downward trend accelerated during the first six months of 2024. Simultaneously, imports from the Kingdom of Saudi Arabia (KSA) were up in the second half 2023 and during the first half of 2024. These trends can at least be partially attributed to vessel transit restrictions put in place by the Panama Canal Authority during the later part of 2023 and the first half of 2024 to conserve water as a result of severe drought conditions in Panama. The vessel transit restrictions significantly increased the cost for vessels transiting the Panama Canal. Vessels carrying USGC petroleum coke typically transit through the Panama Canal when going to China but transit the Suez Canal when going to India. Thus, the Panama Canal vessel restrictions put USGC petroleum coke to China at a freight disadvantage compared to USGC petcoke to India moves.

Typically 90% of KSA's petroleum coke production is exported to China and India. The higher shipping costs from the USGC to China provided a comparative freight advantage to Saudi Arabia. Consequently, a higher percentage of KSA petroleum coke was shipped to China while USGC to India shipment volumes increased.

Imports of Russian petroleum coke in 2023 were 2.5 times larger than they were in 2021 and they are on track to increase another 30% in 2024. Russian petroleum coke exports to China surged after the EU sanctioned Russian energy products (including petcoke) as Russia redirected its petroleum coke exports from the EU to China. The bulk of these shipments are made by rail, not ocean transport.

Imports of petroleum coke from Latin America (excluding Venezuela) increased 50% in 2023, primarily driven by a sharp rise in exports from Brazil to China. The three primary Latin American exporting countries are Argentina, Brazil, and Colombia. These are low sulphur petroleum cokes; petcokes from Argentina and Brazil are very high quality and are in demand as calciner feedstock. Imports from Latin America are on track to be about the same in 2024 as 2023, as decreased imports from Brazil are being offset by increasing imports from Argentina and Colombia.

Year to date through June, China imported 0.5mt of Venezuelan petroleum coke, 75% less than the 2mt imported during the first six months of 2023. Some of this decrease could be attributed to the Panama Canal freight impact that impacted USGC petroleum coke exports to China, but other factors discussed previously also influenced the sharp drop in imports of Venezuelan petcoke.

It is likely that imports of high sulphur petroleum coke into China will be lower in the second half of 2024 than they were in during the first half of 2024 because on 30 May, China's government published a plan stating that "….high-sulphur petroleum coke shall not be used as fuel..." Presumably this plan will not impact use of high sulphur petroleum coke for process use (e.g., calcining to produce calcined petroleum coke for the aluminium industry or silicon carbide production). It should be noted that while the notice is titled ..."2024–2025… Plan", it is clear many elements of the plan such as "Accelerate the construction of large-scale wind power and photovoltaic bases with a focus on desert, Gobi and wasteland" will take years

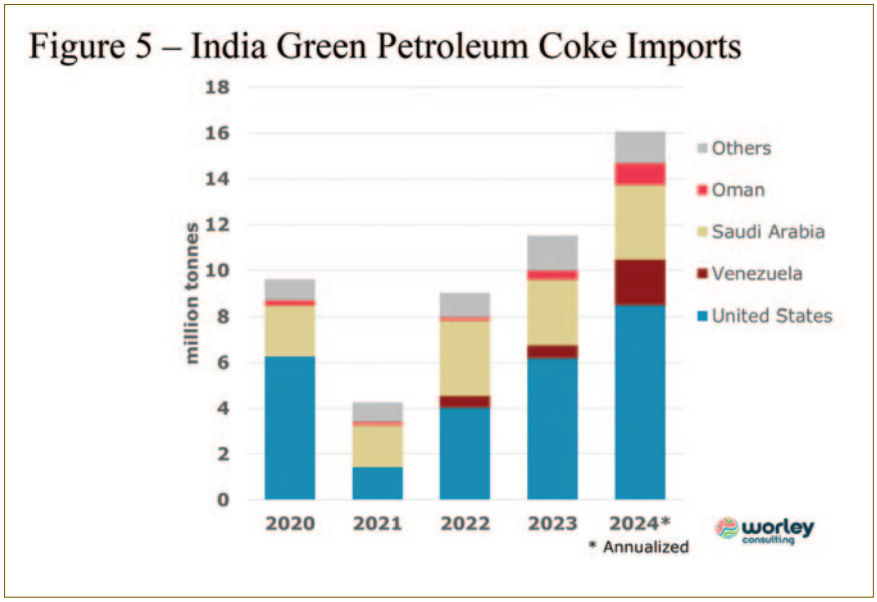
to implement. There are many uncertainties regarding the ban on using high sulphur petcoke as fuel including:

- What is the definition of high sulphur petroleum coke?
- Will enforcement be via a large tax or an outright ban?
- What will be the implementation timeline?
- How will high sulphur petroleum coke for process use be differentiated from high sulphur petcoke for fuel use?

So far China's announcement has had little impact on the USGC petroleum coke market as very little high sulphur USGC petroleum coke was being exported to China. One concern is that exports of petroleum coke produced in the KSA, which is very high sulphur, to China will be greatly restricted and will end up competing with USGC petroleum coke in the Asian market, especially India. Another concern is that Venezuela petroleum coke that would have been sold to China will also end up competing in the Asian market (especially India) with USGC petcoke.

India's petroleum coke imports year to date through May 2024 totalled ~6.7mt, which is a record high for the same period as compared with previous years. Annualizing the YTD through May 2024 numbers, India's petroleum coke imports may reach a record high ~16mt in 2024, breaching the previous high of ~13.2mt in 2016 and up from ~11.5mt in 2023. See Figure 5 – India Green Petroleum Coke Imports

Figure 5 – India Green Petroleum Coke Imports



Petroleum coke imports into India are regulated and regularly monitored. This year, the anode-grade GPC imports quota for Indian calciners has been increased from 1.4mt/year to 1.9mt/year. Calcined petroleum coke (CPC) imports will be increased from 0.5mt/year to 0.8mt/year for Indian Fiscal Year 2025-2026 (i.e., April 2025 to March 2026) onwards. Earlier, in April 2023 integrated steel plants were allowed to import low sulphur petroleum coke for blending with coking coal, and in June 2023 importation of needle petroleum coke for the production of synthetic graphite for Li-ion battery anodes was allowed.

Turkey's petroleum coke imports during the first half of 2024 are ~130% higher (~2.3 times higher), at ~2.2mt than the

Bedeschi stacker/reclaimer handling petcoke.

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same period in 2023, and petcoke imports are on track for record high ~4.4mt. Because of the earthquake that hit southern and central Turkey in February 2023 coupled with a significant rise in thermal coal imports, petroleum coke imports in 2023 fell 20% versus 2022, to ~2.5mt.

Summary

The petroleum coke market has returned to close to historical pricing levels, which is a strong indication that the petcoke market is moving beyond the disruptions of the last several years. Production will grow in 2024 to record high levels but at a slower rate than in 2023. Trade flows have changed due to various factors. The biggest uncertainty in the near term is China's policy regarding the use of high sulphur petroleum coke.

Longer term outlook – petroleum coke megatrends

Developments in specific industries as well as the evolution of the energy transition are expected to significantly shape the petroleum coke industry going forward. We refer to these developments as petcoke megatrends and are summarized as follows:

- Pace of the energy transition from oil-based transportation fuels to renewable fuels and electric vehicles;
- Repurposing of petroleum refining assets to renewable fuel production;
- Permanent shut down of marginal refineries;
- Refineries pursuing oil to chemicals strategy, which typically does not involve the installation of a coker;
- Increased demand for synthetic graphite produced from petroleum coke for battery production to support increased use of electric vehicles and renewable power generation;
- Growth in aluminium production (primary and recycled);
- Inert anode (also known as 'carbon free') aluminium smelting technology (eliminates current need for calcined petroleum coke in consumable anodes).

Each of these trends will have a different impact on petcoke production or consumption and the net effect will determine the future course of petroleum coke.

These megatrends will be discussed in more detail at our upcoming Fall Petcoke Forum and our 23rd Annual Petcoke Conference in March 2025. DCi

About the authors

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Ben is a widely recognized authority in global petroleum coke consulting. He successfully led Worley Consulting's Fuel Grade Petcoke practice for many years and now acts as a senior advisor to the team. Ben continues to be a key contributor to Worley Consulting's *Pace Petroleum Coke Quarterly*, as well as providing support to single client consulting projects, the annual Worley Consulting Petcoke Conference, Worley Consulting Fall Petcoke Forum, and other Worley Consulting petcoke related publications.

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Pedro has over 25 years of experience working in various energy-related fields such as oil exploration, solid fuel purchasing and trading including petroleum coke and coal, ocean freight chartering, consulting in the petroleum coke industry, and raw materials purchasing in the coke calcining industry. Through his career, Pedro has held responsibilities focused on purchasing and supply chain aspects related to solid fuels for cement plants and raw materials for calciners, solid fuel trading, ocean shipping, and consulting. He holds a bachelor's degree in Mechanical Engineering from the University of Texas at Austin and a Master's in International Management from Thunderbird.

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Worley Consulting (formerly Jacobs Consultancy, Inc. and previously The Pace Consultants, Inc) has published the *Pace Petroleum Coke Quarterly*© since 1983. The report has been published monthly since January 1985 and is considered the global authoritative source of petcoke market information.

World's first installation of rotor sail on a Capesize bulk carrier for VALE

Mitsui O.S.K. Lines, Ltd. has announced that a 200,000-tonne class bulk carrier, currently employed under a mid-term contract for the transportation of iron ore for Vale, has been successfully retrofitted with two 35m x 5m Norsepower Rotor Sails™ and marked its first call at Ponta da Madeira, Brazil.

This is the world's first case of rotor sails on a Capesize bulk carrier*. The vessel is expected to achieve about 6–10% fuel and GHG emissions reductions on the Brazil to Far East routes, combined with voyage optimization technology.

MOL has established the 'MOL Group Environmental Vision 2.2' and has set the target of achieving net zero greenhouse gas (GHG) emissions by 2050. One of the key actions to achieve this target is the "introduction of clean energy, further energy-saving technologies," which includes installing wind propulsion systems**.

MOL Group will contribute not only to the reduction of GHG emissions from its own group, but also to the reduction and decarbonization of society as a whole through the safe management and efficient operation of its environmentally friendly fleet that combines wind propulsion technology.

Vale is committed to supporting the maritime industry in achieving the International Maritime Organization's (IMO) decarbonization targets. Aligned with the ambition of the Paris Agreement, Vale also has a target of a 15% reduction in scope 3*** emissions by 2035, related to the value chain, of which shipping emissions are a part, since the ships are not owned by the company.

Focused on adopting and leveraging technologies and fleet modernization to reduce GHG emissions, Vale created the Ecoshipping programme, an R&D initiative based on strong partnerships with shipowners. Since 2018, the company has been operating second-generation Valemaxes (capacity of 400,000 tonnes) and, since 2019, Guaibamaxes (capacity of 325,000 tonnes) — these vessels are among the most efficient in the world. As part of the Ecoshipping programme, Vale developed innovative energy-efficient projects, such as the rotor sails project, and a pioneering project to incorporate multi-fuel tanks on iron ore carriers.

Two Norsepower Rotor Sails™ equipped onboard bulk carrier Camellia Dream *in operation.*

MOL and VALE will continue to work towards both the stable transportation of iron ore and the reduction of GHG emissions with the help of Norsepower, to contribute to the realization of a low-carbon society.

About Mitsui O.S.K. Lines, Ltd. (MOL)

MOL is a renowned shipping company operating over 800 ships across the world. MOL's fleet includes bulk carriers, liquefied natural gas carriers, Ro-Ro car carrier ships, oil tankers, etc. In addition to the traditional shipping businesses, MOL offers social infrastructure businesses such as real estate, terminal and logistics, offshore wind power, and associated businesses. With one of the largest merchant fleets and 140 years of history, experience, and technology, MOL group aims to be a strong and resilient corporate group that provides new value to all stakeholders.

About Vale International SA

Vale is a global mining company that exists to improve lives and transform the future together. One of the world's largest producers of iron ore and nickel and a major copper producer, Vale is headquartered in Brazil and operates around the world.

The company's operations comprise integrated logistics systems, including approximately 2,000km of railways, marine terminals and ten ports around the globe.

Vale has the ambition to be recognized by society as a benchmark in safety, the best-in-class reliable operator, a talent-driven organization, a leader in sustainable mining, and a benchmark in creating and sharing value.

About Norsepower

Norsepower Oy Ltd is a Finnish clean technology and engineering company pioneering modern auxiliary wind propulsion to help reduce the environmental impact of shipping.

The Norsepower Rotor Sail™ has been used by customers for ten years and has been installed on various ship types such as tankers, LCO_2 (liquefied CO_2) carriers, bulk carriers, and RoRo and RoPax vessels, and the number of installations will be more than doubled within the next 15 months.

Norsepower's CEO, Heikki Pöntynen, adds: "We are very proud of our partnership with MOL and VALE. The successful installation of Norsepower Rotor Sails™ on a Capesize bulk carrier marks a significant milestone not just for Norsepower, but for the entire maritime industry. The integration of our wind propulsion technology on such a large vessel highlights our partners' growing commitment to reducing greenhouse gas emissions and embracing innovative solutions for a sustainable future. We are delighted to be a part of this pioneering project that aligns perfectly with our efforts to decarbonize the shipping industry."

The performance of the Norsepower Rotor Sails™ has been confirmed by multiple independent third-party verifiers and is seen as one of the most prominent existing solutions for significantly reducing the carbon emissions of shipping.

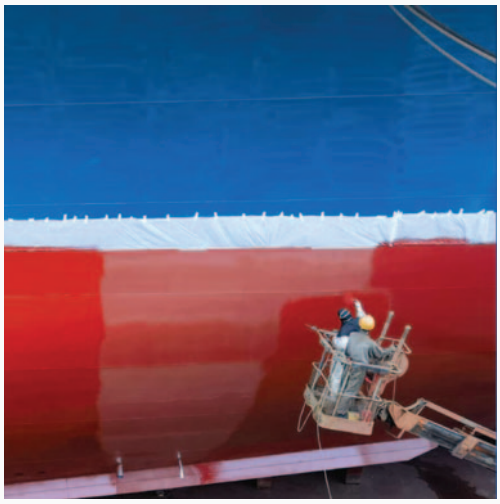
*Capesize bulk carriers: 100,000 to 200,000 Deadweight Tonnage class.

**In May, TOKYO-Mitsui O.S.K. Lines, Ltd. and its group company MOL Drybulk Ltd. announced their intent to install wind propulsion systems on a total of seven newbuilding bulk carriers and multi-purpose vessels, which will be operated by MOL Drybulk.

***A category of GHG emissions that covers not only direct GHG emissions within the company, but also indirect emissions associated with the company's business.

Nippon Paint Marine successfully applies FASTAR solution to over 1,000 vessels in just three years since launch

Nippon Paint Marine's FASTAR product line, offering ultra-low friction with patented hydrogel water-trapping technology, has been applied to more than 1,000 vessels to date, supporting the maritime industry's drive for decarbonization and increased sustainability.



On 8 July, marine coatings expert, Nippon Paint Marine, announced the successful application of its award-winning FASTAR product line to over 1,000 vessels since its release in 2021.

With the shipping industry adapting to tighter global and regional emissions regulations to meet decarbonization targets, ship owners and operators are under significant pressure to act rapidly to reduce the greenhouse gas emissions of their vessels. Nippon Paint Marine's fourth generation antifouling system, FASTAR, incorporates a new resin technology, which promotes better hull performance and more sustainable and efficient operations through a reduction in fuel consumption, as well as associated costs and emissions. The innovative FASTAR coating helps to address the trend for slow steaming to achieve EEXI targets, by lowering energy usage during voyages. The coating also reduces fouling build up for vessels operating in higher sea water temperatures with lower voyage activity levels.

Since incorporating FASTAR into their product portfolio in 2021, Nippon Paint Marine has seen uptake of the coating increase rapidly and has received positive and encouraging feedback from customers who have used the product. Fuel consumption and emissions reductions of up to 8% have been proven, as well as a significant reduction in drydocking time due to the reduced thickness in application required, which means that FASTAR is able to dry much quicker than alternative solutions.

Continued innovation by Nippon Paint Marine's R&D department has led to the improvement of the FASTAR product line, which now provides an ultra-low friction coating and patented hydrogel water-trapping technology. By incorporating hydrogel in antifouling products, such as FASTAR, Nippon Paint Marine has significantly reduced hull-to-water friction.

Kazuaki Masuda, Corporate Officer, Technology Division Director at Nippon Paint Marine, said: "At Nippon Paint Marine, innovation represents a core brand pillar that drives our product development to ensure we can deliver great value to our customers, with our advanced product technology. The positive results that FASTAR is achieving, even at this early stage, are very encouraging and are important for both Nippon Paint Marine, and our customers. It is technology and solutions like FASTAR that will play a vital role in supporting the shipping industry's continued efforts to achieving net zero emissions, that will benefit our oceans and the planet for decades to come."

In May, FASTAR was recognized by the Japan Chemical Industry Association at its annual technology awards, becoming the first marine coating to win the JCIA's prestigious Environmental Technology award.

Enabling maritime decarbonization means no shipping companies left behind

"Ships that support developing economies are struggling to make the transition," *writes Thomas Zaidman, Managing Director, Sagitta Marine SA.*

We live in an asymmetric world and nowhere can this be seen more clearly than in national responses to climate change and the energy transition. The shipping industry displays a similarly uneven attitude to the nature of the problem and potential solutions.

The industry's leading edge are setting an admirable example, with projects embracing new fuels, energy efficiency and even new operating models. It is these leaders that we hear from most often, exhorting the need for change, innovation and collaboration.

Spare a thought though, for the owners and operators that still carry the majority of the world's cargoes, the raw materials and semi-finished products that construct and sustain the world economy. Broker data puts sub-Panamax vessels at 63% of the global dry bulk fleet.

The energy transition that the world so desperately needs is happening only slowly in this sector. Many developing countries do not have the luxury of choice; they rely on small ships and limited port infrastructure to keep the lights on.

Ask the average small vessel owner or operator — and let's not forget they are by far the majority — about climate change and the majority will express concern and a desire to do better. But this intent will be tempered by a list of realities that are much less likely to apply to the larger, international trading conglomerates.

Initiatives on green finance and insurance are welcome but for small and medium sized operators they raise costs without delivering a benefit that can be realized on the balance sheet. The exposure that these companies experience in daily business is already high, making the means to finance new, cleaner vessels potentially more expensive does not encourage innovation.

Investors in dry bulk in particular tended to come close to the end of the queue when it comes to shipyard slots for understandable reasons. Higher value vessels, increasingly featuring dual fuel engines and energy saving devices, will always be preferred by yards over commodity carriers.

However, if the levers that effect positive change are not provided, it cannot be surprising when the change doesn't happen. The same squeeze on demand is happening at repair yards where conversions and retrofits are booming but operators of small ships may have limited options.

Over 45% of Capesize bulkers are fitted with an EET.

Data from Clarksons shows that the number of ships featuring an energy efficiency technology (EET) device is just 8,700 out of the global fleet. That might be 33% in gross tonnage terms but it masks the skew towards larger ships where fuel consumption savings are potentially greater.

In tankers, more than 50% of VLCCs are said to have an EET fitted, while just 20% of medium range tankers — the workhorses of the tanker fleet — do so. The picture is repeated in the dry bulk sector, where over 45% of Capesize bulkers are fitted with an EET, but little more than 11% of the Handysize fleet feature one.

Even in the container sector, where the demand for fuel efficiency is greatest, while over 80% of 12,000+ TEU vessels have an EET, for ships under 3,000-TEU capacity the level is just over 16%.

Clarksons says that around 70% of ships fitted with some form of EET had the technology installed at the newbuilding stage, a trend that has increased over time. Around 60% of tonnage delivered over the last three years has been EET fitted, up from 25% ten years ago, it said.

Small ship operators are struggling to make similar investments, not least because the commodity cargoes they carry rarely attract the kind of premiums that enable higher costs to be passed on.

As Vasileios Gkikas of class society ABS pointed out on Splash 24/7, from a practical point of view, the design of bulk carriers, particularly smaller ones with deck cranes, presents technical hurdles to conversions for new fuels or large scale EETs.

However, because of the predicted trajectory of the energy transition, with carbon intensive cargoes declining as we pass 2030 and approach 2050, retrofitting will need to overtake fleet renewal if ships are to comply with tightening regulations.

Despite carbon reduction goals and net zero targets, the speed and extent of the decarbonization process will depend on factors that are to some extent outside of shipping's control.

The fact that it is coming is not in doubt but we need to accept that not all sectors of the industry are created equal. Their contributions are different and so are their challenges.

The IMO has stated that it wants to achieve a just and equitable transition, designed to be environmentally effective, procedurally fair, socially just, globally equitable and technologically inclusive. This principle should apply equally to all sectors of the shipping industry too.

About Thomas Zaidman

After earning his bachelor's degree from the University of Toronto in Economics and Political Science, Zaidman began his career as an operations assistant in the dry bulk cargo industry and later as a ship broker for Selinger Brokers and Agency in Venezuela. After completing his MBA at Babson College, he went on to work for Cargill Ocean Transportation, where he served as a trader for the Handysize and Supramax table. Zaidman joined Luzar Trading as Chartering Director and co-founded Sagitta Marine SA in 2015.

Launch of Dry Bulk Management Standard Platform

The Dry Bulk Centre of Excellence (DBCE) has announced the launch of the Dry Bulk Management Standard (DryBMS) platform, marking a significant achievement for the maritime industry. It has taken four years of development through dedicated collaboration with leading shipowners and managers, together with risk management experts and supply chain stakeholders.

It's a user-friendly online self-assessment tool for subscribing shipowners and stakeholders, which is designed to assess safety management processes and practices. There are 30 subject areas within the sections: Performance, People, Plant and Process.

All the data entered is confidential, only the subscriber can share it. The DryBMS self-assessment tool provides a score of a subscriber's standing against industry expectations, at four levels; basic, intermediate, advanced and excellence; which provides a pathway for maintaining good current practice or management improvements.

By adopting the DryBMS framework a subscriber can show their dedication to safety improvement and can demonstrate their operations exceed fundamental requirements.

The welfare of crew, protection of the environment, and sustainable operation of assets form the bedrock of this initiative, all of which encourage companies towards better operational practices. This benefits not just ship owners, but all in the industry. The DBCE urges ship owners, managers, and other stakeholders across the dry bulk sector, to use this tool and to come on this transformative journey to make dry bulk shipping stronger, safer, and more sustainable.

About DBCE

An independent, not-for-profit industry organization dedicated to raising standards and best practices in dry shipping through the implementation of the DryBMS framework.

Gearbulk orders two additional Pulpmax vessels

Gearbulk has signed contracts for delivery of two additional ammonia/ methanol conversion ready 82,300dwt Open Hatch newbuildings.

These units will be sister vessels to Pulpmax no. 1-4 ordered earlier this year, and will be built in the same shipyard, CSSC Huangpu Wenchong Longxue in Guangzhou, China. The vessels will be delivered to Gearbulk in October 2028 and January 2029.

The technical specifications and capacity, including enhanced cargo crane capacity of 2×75 metric tonnes and 2x 120 and tween decks, will be the same as no. 1-4.

"This order marks yet another milestone in Gearbulk's drive to renew its fleet with efficient, high-capacity vessels servicing G2 Ocean customers," says Kristian Jebsen.

Pulpmax specifications

- eight holds/hatches;
- four electro-hydraulic jib cranes with safe working load (SWL) lifting capacity of 2x 75 metric tonnes and 2x 120 metric tonnes
- dedicated deck space on either side of the accommodation for the future installation of fuel tanks for alternative fuels; and
- LOA of 225 metres and beam of 36 metres.

About Gearbulk

Gearbulk is a world-leading player in the open hatch bulk shipping segment, controlling a combined fleet of about 65 open hatch and other specialized vessels. The fleet is commercially operated by G2 Ocean, where Gearbulk is the majority owner.

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ORTS Grabs – 'The best link between ship and shore' – made in Germany

For 50 years now, ORTS GmbH Maschinenfabrik has been delivering grabs to customers all around the world. In 2024, these customers came from Southeast Africa, the near and middle East, eastern Mediterranean, North America as well as Sweden and of course Germany.

The main customers are shipping companies with their bulk carriers, which know that they can rely on the performance, speed and reliability of ORTS grabs for many, many years — even in the rough conditions experienced by sea-going vessels. Terminal operators, stevedore companies and heavy industry companies (for example steel works) also value the quality of ORTS grabs.

The complete range of grabs is offered, from electro-hydraulic grabs and radio controlled diesel-hydraulic grabs to mechanical rope grabs. Each grab is the constructed by ORTS Maschinenfabrik in its own facilities. This is visible at first sight, because of the unique construction design. It is not enough to just replace the block and tackle construction in the middle of a mechanical rope grab with a hydraulic cylinder, e-motor or hydraulic pump to get an electro-hydraulic grab. If you install a six-cylinder engine in a tractor, you don't get a racing car.

Therefore ORTS electro-hydraulic grabs and the radio controlled diesel-hydraulic grabs look different. And they do not only look different, they are different: The have a lower dead weight and higher closing force, while being fast and reliable. The construction surrounding the drive unit (hydraulic parts, e-motor, control block etc.) is easy and safe to reach for the service engineer/seaman. The escutcheons can be opened from two sides of the grab and used as a working platform right in front of all important parts of the grab.

Unique and innovative grabs, like those that have radio controlled diesel-hydraulic technology, came from ORTS. The idea of this grab was born over 30 years ago in the technical offices of ORTS GmbH.

Since then, the radio controlled diesel-hydraulic grabs from ORTS (type DHS-B, DHM and DHZ) have been manufactured in the workshop near Lübeck in Northern Germany.

No other grab maker has this kind of long-term experience with this specific grab type. Over the years, since 1995, the ORTS diesel-hydraulic grabs have become flexible, reliable and high-performance 'workhorses', thanks to continuous improvements in co-operation with the company's customers. ORTS' DHS-B (two- clamshell design) and DHM (orange-peel clamshells) are in operation on all continents, in all climate zones.

ORTS was also one of the very first grab makers to construct and build environmentally friendly grabs with enclosed clamshells in the 1980s, specifically to address environmental concerns.

All of the grabs by ORTS (diesel-hydraulic, electro-hydraulic and mechanical ones) are well-known for their effectiveness (high discharge-rates), reliability and long lifetimes, handling millions and millions of tonnes.

The purchase price for a grab becomes

less and less important, the longer the grab is working for the owner/operator. Quality, reliability and performance are more important and are the characteristics that really pay off over the years.

A cheap grab can become a very expensive grab very quickly: when the grab needs the first spare parts after only a short time of being in operation, has breakdowns during operation or takes more time for loading/discharge operations because the clamshells do not work at full capacity.

ORTS still supplies customers with spare parts for grabs, even when those are 25–30 years old. One of the first radio controlled diesel-hydraulic grabs is still functional now, after 25 years.

ORTS doesn't only produce smaller grabs, bigger grabs with 50t (orange-peel dredger grab), 60t, 80t (two-clamshell dredger grabs) and 115t (salvage grab for ship wrecks) dead weight were also constructed and built by ORTS in the past.

In addition to grabs, special constructions like a self-floating oil-salvage grab, which is able to skim off oil from the water-surface after ship-accidents, and load-beams for up to 100t were constructed and built by ORTS.

Elevating transshipment efficiency: keys to effective loading and unloading cargo ships

Transshipment plays a big role in the seamless operation of the global supply chain, enabling bulk goods to reach their final destinations through strategic intermediate stops. However, the process is filled with operational, technical, and financial challenges, from avoiding port congestion and demurrage costs to maintaining operations under harsh sea conditions and navigating market pressures.

In this article Nemag dives into these challenges and discusses optimization strategies that are essential for enhancing the efficiency and cost-effectiveness of transshipment operations. Nemag illustrates how strategic practices and the right equipment choices — specifically in crane and grab technology — can significantly improve productivity even in geographically challenging conditions.

A good example of a transshipment situation is in Sierra Leone, West Africa, where SMT Shipping has achieved significant transshipment advancements. (see page 21 of the June 2024 issue of *DCi*) This region presents a unique challenge due to its shallow shores, extending 10 to 20 metres in depth for up to 10 miles. To be profitable, you will have to ship your cargo with colossal ore carriers.

THE DEFINITION OF TRANSSHIPMENT

Transshipment refers to the process where goods or dry bulk cargo are transported to an intermediate destination before reaching their final destination. This logistical strategy serves various purposes, including the consolidation of multiple smaller shipments into a single larger one, enhancing efficiency and reducing transportation costs. Conversely, large consolidated shipments can also be divided into smaller packages (deconsolidation).

THE BEST CRANE AND GRAB FOR LOADING AND UNLOADING CARGO SHIPS

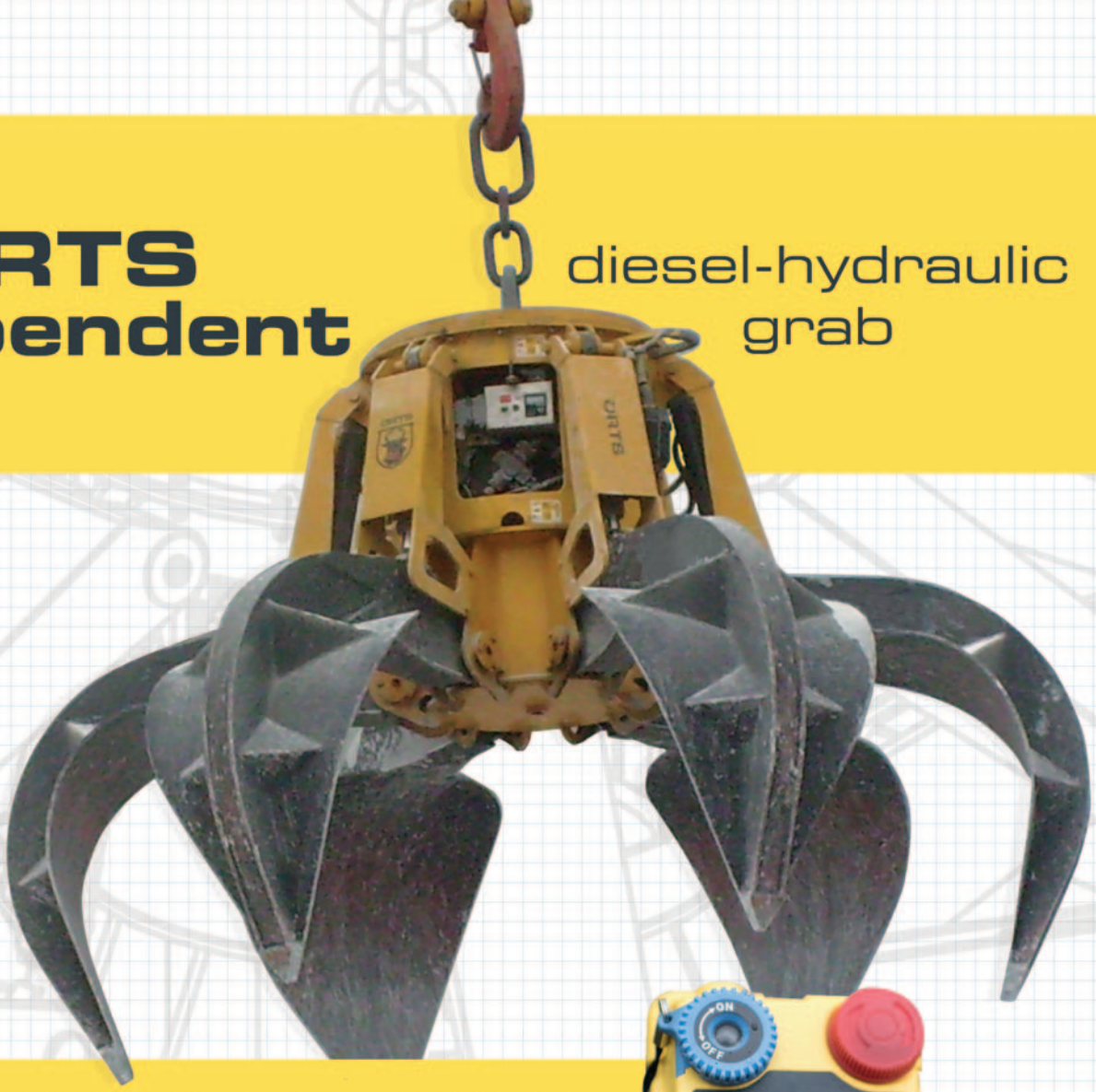
Many high-performance marine transshipment hubs are equipped with four-rope (grab) slewing cranes. The reason for choosing four rope cranes is the significantly higher efficiency offered, compared to, for instance, slow-moving, single line derrick cranes equipped with slow-operating remote-controlled or electro/hydraulic grabs.

In most cases, these four-rope cranes are standardized to a high degree with specific speeds and accelerations, depending on the make and type. Within these constraints, the productivity of any transshipment crane depends entirely on the productivity of the grab.

Any grab, regardless of type or brand, will have a given deadweight and payload. The general idea is that the lower the grab's deadweight, the higher the payload

ORTS independent

diesel-hydraulic grab



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and the higher the productivity.

When selecting the best grab, operational speed and the weight of the material are generally the most important aspects. When it comes to transshipment, maintenance is a key factor that affects the choice of grab. Generally, both the clamshell grab and the NemaX are suitable, but the choice is as follows:

Clamshell grab:

A clamshell grab is highly versatile. It can handle almost every material and is an excellent all-rounder. It can handle soybeans, grain, fertilizers, iron ore, bauxite and more. A single clamshell grab can manage different materials, which is advantageous given the limited number of grabs (usually two or three) a pontoon can carry. Additionally, its ability to close completely is beneficial for environmental containment.

NemaX:

However, if the material is compatible, the NemaX grab emerges as a better option. Its revolutionary design translates to lower dead weight, faster opening and closing, and its also simplifies maintenance — an essential consideration in remote transshipment locations. With fewer moving parts, the NemaX's maintenance needs are reduced compared to a clamshell. In addition, this grab can be accessed from the ground when open, which also facilitates easier maintenance. However, the NemaX is not universal across all materials yet. The major streams of material in transshipment are coal, bauxite and iron ore, for which the NemaX is suitable.

How to improve transshipment

Improving transshipment efficiency depends significantly on the optimization of crane and grab operations. Productivity, defined as the product of payload capacity and the number of cycles per hour (productivity = payload x cycles per hour), underscores the importance of matching the optimal grab with the crane and material being handled. Since different materials require specific grabs for efficient handling, having a selection of grabs tailored to the various materials being transshipped is crucial. In fact, less productivity can also lead to demurrage costs.

The cycle time, which significantly influences productivity, is determined by the sum of the crane's hoisting and slewing times, along with the grab's opening and closing times. The speed at which the crane's winches operate affects the grab's closing time, which in turn depends on the length of the grab's closing cable withdrawal. It is essential to note that a crane can only begin slewing once the grab is fully closed and lifted out of the cargo, making the grab's opening and closing speed a critical component of overall productivity. This is particularly true for operations requiring small slewing angles, where operators aim to minimize cycle time for maximum efficiency. Therefore, investing in grabs that can open and close rapidly, without compromising on payload capacity, can significantly enhance transshipment productivity by reducing cycle times. This not only boosts throughput but also reduces the risk of demurrage costs by ensuring an efficient transfer of cargo, emphasizing the need for precise equipment selection and operation in optimizing transshipment processes.

Navigating the future of transshipment with strategic insights

Transshipment is an integral component of the global supply chain, enabling the strategic movement of bulk goods through intermediate stops to their final destinations. Yet, it is a process filled with operational, technical, and financial challenges — from mitigating port congestion and demurrage costs to ensuring seamless operations under challenging sea conditions and overcoming market pressures.

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Introducing GENMA Marine Crane: flexible lifting solutions for ships

The GENMA brand is based on the strong financial strength of Nantong Rainbow Heavy Machinery Co., Ltd. (referred to as 'RHM', the parent company is Jiangsu Rainbow Heavy Industry Co., Ltd..). It is a resource sharing platform, a material handling brand integrating independent research and development, design, manufacturing, sales and service.

GENMA Marine Crane provides flexible and reliable lifting solutions for various types of ships, including container ships, bulk carriers, multi-purpose refrigerated cargo ships, tankers, and custom barges and transfer ships. It is mainly used for cargo loading and unloading at ports and wharfs, food supply, hose hoisting and other operations in sheltered waters.

The design and manufacture of the Marine Crane fully comply with ILO and specifications of relevant classification society, and can obtain product certificates from multiple classification societies such as ABS, DNV, BV, LR, CCS etc.

Deck van crane.

Deck Crane

The GENMA Deck Crane is designed with high efficiency, long lifespan and high reliability. It adopts electro-hydraulic drive, A-type boom, wire rope luffing, and 360° slewing. Its maximum lifting capacity is up to 350t, maximum working radius up to 36m, and can be customized according to user requirements.

The Deck Crane can be installed on the ship's deck and is mainly used for handling operations in ports, wharfs and other work areas. The design and supporting parts of the deck crane can meet the requirements of high efficiency, smoothness and long-term reliability for cargo loading and unloading operations at wharfs. Optional features: double-body model, can be designed according to variable frequency motor drive and offshore crane standards.

Outstanding product features:

- short design cycle;
- high work efficiency and fast speed
- stepless speed regulation, smooth movement;
- equipment and components are installed inside the crane tower to effectively prevent corrosion in the humid marine environment;
- single-layer winch drum design to extend the lifespan of wire rope;
- integrated hydraulic pump station; and
- automatic anti-fault brake device, standard ergonomic cab for comfortable operation environment.

Deck Van Crane

The Deck Van Crane is designed with simplicity in mind, using motor-hydraulic drive, welded box-type boom, hydraulic cylinder luffing, 360° slewing. Its maximum lifting capacity reaches up to 200t, with

Deck crane.

Deck knuckle crane.

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Professional companies in more than 110 countries worldwide work with Verstegen grabs, because our grabs offer them the highest reliability and best productivity. Combining our extensive knowledge and experience with the feedback from our loyal customers results in optimized grabs for all bulk materials and unloading situations. We call this 'Grab Intelligence'.

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Gantry slewing crane.

maximum working radius up to 36m, and can be customized according to user requirements. The crane has a built-in independent hydraulic pump station powered by the ship's power supply; hydraulic power can also be supplied by the ship's central hydraulic system.

Optional features: Deck Knuckle Crane, Deck Telescopic Crane, travelling gantry. Can be designed according to offshore crane standards.

Outstanding product features:

- welded box-type boom, low maintenance requirements, high stability and rigidity, accurate operation positioning;
- light weight and low centre of gravity;
- simple structure, easy and convenient maintenance;
- integrated hydraulic pump station;
- stepless speed regulation, smooth movement; and
- reliable operation.

Deck Knuckle Crane

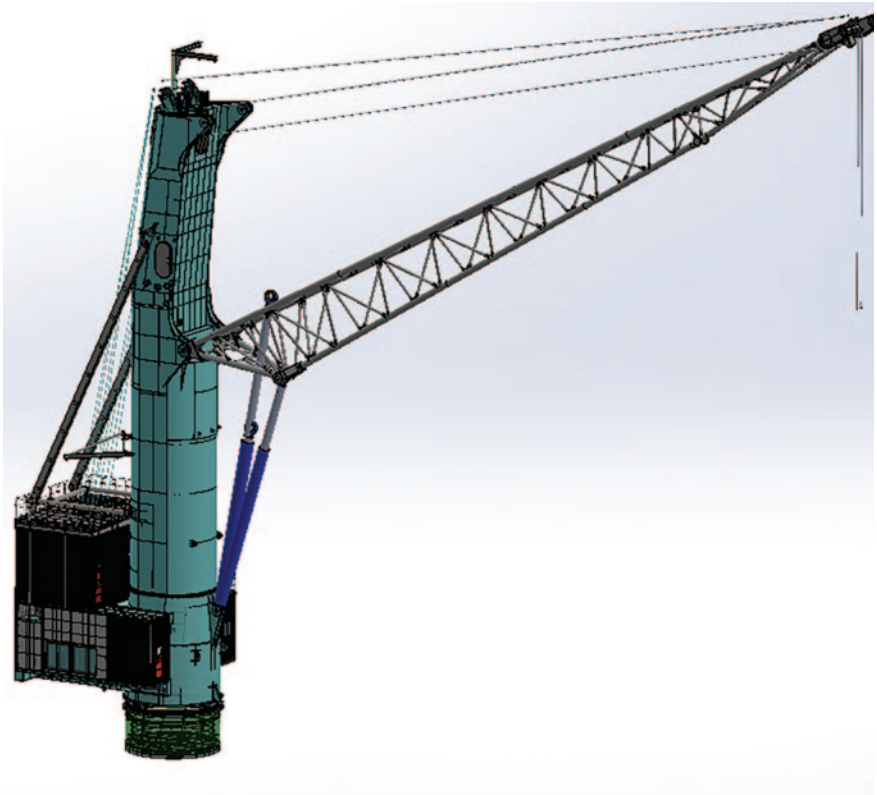
The Deck Knuckle Crane adopts a welding box boom, hydraulic oil tank luffing and folding arms. It has low requirements for maintenance, high stability and rigidity precise operational positioning and space efficiency,etc. This model has four working mechanisms. which are elevation, luffing, rotation and arm bending. It can operate independently or collaboratively. All mechanisms have stepless speed control. It moves smoothly. It is safe and reliable. The integrated hydraulic pump station, can provide electric motor-hydraulic drive or diesel engine-hydraulic drive solution.

Outstanding product features:

- welded box-type boom, low maintenance requirements, high stability and rigidity, accurate operation positioning;
- high space efficiency, light weight and low centre of gravity;
- simple structure, easy and convenient maintenance;
- integrated hydraulic pump station;
- stepless speed regulation, smooth movement; and
- reliable operation.

Gantry Slewing Crane

The Gantry Slewing Crane is designed with the aim of a large working area and high efficiency, using motor-hydraulic drive,



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

truss (or A-frame) boom, wire rope luffing, 360° slewing, gantry travel. Its maximum lifting capacity reaches up to 100t, maximum working radius up to 65m, and can be customized according to user requirements.

The Gantry Slewing Crane is mainly installed on floating docks and dredgers, mainly used for shipbuilding and maintenance, cargo handling and other operations at ports and wharfs, sheltered waters and other places.

Gantry Slewing Crane features:

- able to travel on rails, with large working area;
- optimal weight ratio lifting capacity;
- modular design, flexible installation;
- compact structure, centralized installation, easy to inspect and maintain;
- strong resistance to wind;
- advanced hydraulic and control system; and
- stepless speed regulation, smooth movement.

Transshipment Crane

GENMA Second-generation Transhipment Crane – Model GHC100FE2

The GENMA barge crane can be used for loading and unloading operations between ships on shore or between ships.

The turntable of this machine has a low center of gravity, good stability, and flexible operation, making it an ideal loading and unloading equipment for coastal areas, along the Yangtze River, and in inland lakes.

- GHC: Representing GENMA Mobile Harbor Cranes
- 100: Representing the maximum lifting capacity
- F: Representing fixed type
- E: Representing electric motor drive
- 2: Representing second-generation products

Advantages and highlights:

Convenience of maintenance:

- The independent layout of the power room, electrical room, and winch room takes into account both compact and simple internal layout as well as customer maintenance convenience;
- The parts of the entire machine that require maintenance are designed with repair channels to access. Each organization is equipped with maintenance lifting lugs at its designated location for disassembly and maintenance purposes

Durability:

- The design of the structure meets the high-intensity and frequent loading and unloading operations of the crane: the turntable adopts a composite beam structure design to achieve perfect stress distribution, the cylindrical tower has sufficient anti torsion performance, and the boom is welded with high-strength welded pipes, which is lightweight, has a small windward area, and has strong anti torsion ability;
- Strong applicability of the mechanism: the lifting and slewing mechanism adopts a variable frequency speed regulation system with high control accuracy, which can meet the high-precision requirements for parameters such as speed and torque. At the same time, it also has the characteristics of fast response and good stability. The luffing mechanism is implemented through cylinders, and the hydraulic system controls smooth operation with low impact force.

Operation stability:

- Wide range of power regulation: Variable frequency speed regulation technology can achieve precise power regulation by adjusting output voltage, frequency and other parameters, enabling equipment to adapt to different loads, working conditions and other changes.
- High control accuracy: the control accuracy of the variable frequency speed regulation system is high, which can meet the high-precision requirements for parameters such as speed and torque, and also has the characteristics of fast response and good stability.
- Low energy consumption: compared to traditional constant speed regulation, variable frequency speed regulation technology can reduce the operating energy consumption of equipment by adjusting parameters such as load voltage and frequency, thereby achieving energy-saving goals.
- High operational control accuracy: the S+B master controller is adopted, which has advanced fault detection and self diagnosis technology. The control cycle is short and the delay is low, ensuring timely and effective execution of instructions.

Dust elimination:

- The whole machine is equipped with a dust collector, which blows positive pressure air into the indoor space of the machine room through the air duct, effectively reducing the entry of external dust into the room and creating possibilities for construction in locations with poor working conditions.

Exploring transshipping with Aspec Engineering

Transhipping involves the loading of larger ocean-going vessels from smaller vessels or barges. This typically occurs in areas that are too shallow to accommodate large vessels at berth, enabling the transfer of raw materials such as grains, iron ore, and coal. By using smaller vessels to transport cargo to deeper waters where larger ships can anchor, transhipping optimizes shipping routes and ensures the efficient delivery of bulk materials.

This method enhances the reach of maritime logistics, allowing access to ports and regions that cannot directly accommodate large bulk carriers, thus

Figure 1: Transhipment example – Dumb Barge & Self-Loading Geared Vessel (courtesy of TSA).

Figure 2: Dedicated transshipper example – "CSL Whyalla" (courtesy of CSL).

J&B Grabs

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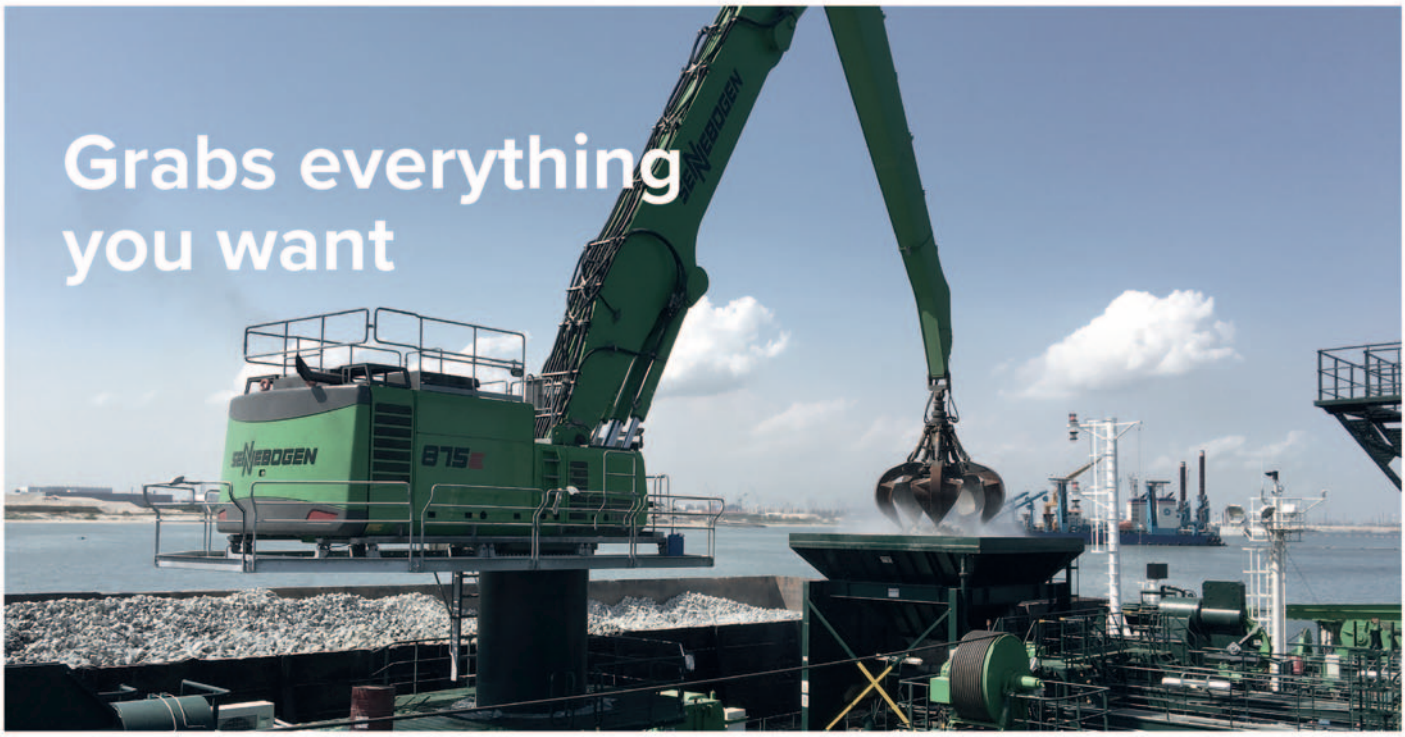

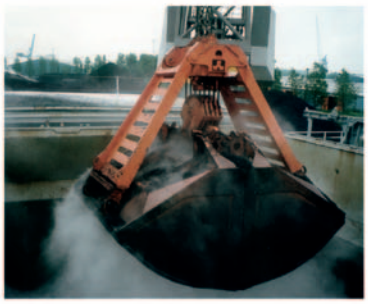

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facilitating global trade and supply chain flexibility.

There are two main means of transhipping: dedicated transhipping vessels and geared vessels with tug assisted dumb barges. Dedicated transhipping vessels, such as the *CSL Whyalla* shown in Figure 2, are specialized ships designed to facilitate the transfer of bulk cargo onto larger ocean-going ships without the need for external equipment or port infrastructure. These vessels are equipped with unloading systems, including conveyor belts, cranes and sometimes shiploaders, enabling them to efficiently handle and transfer large quantities of bulk materials. There are a number of these vessels operating around Australia, Asia and Africa. These vessels typically have high unload rates (5,000–10,000tph [tonnes per hour]) making them efficient solutions.

The alternative option involves the use of dumb barges and geared vessels as shown in Figure 1. Typically, Handysize or Handymax vessels (30,000dwt to 50,000dwt) are 'geared' in that they are equipped with ships' cranes. This feature is conducive to transshipment whereby the ships cranes can be used with a purpose designed grab system to carry out barge unloading/transhipment. Barges are loaded at a loading facility and manoeuvred, either self-propelled or with the assistance of tugs, to the geared vessel located in deeper water for unloading by the geared vessel. This is a less capital intensive option but comes with reduced loading rates (300–500dwt).

Factors influencing capacity

There are many factors influencing the overall throughput capacity of a transhipping system including the following.

- **Gross Loading Rate (GLR):** defined as the average loading rate achieved from the time to load a ship from start to finish including the berthing and unberthing time (i.e. from when a ship arrives at the berth to when it departs).
- **Berth Occupancy Rate:** defined as the time that a berth is utilized, divided by the total available time. For a port, it is an indicator of congestion, which can reduce throughput. Typically, berth occupancy is between 50–75% (depending on cargo and number of berths), with higher berth occupancy rates indicating a more congested berth. PIANC WG 184 Design Principles for Dry Bulk Marine Terminal recommends a maximum berth commitment threshold of 75–85%. This corresponds to a berth occupancy of 60–70% once channel transit times and scheduled maintenance is accounted for. Figure 4 depicts the breakdown of calendar time for system.
- **Gross Loading Time:** total time spent by a ship between entry and departure.
- **Barge queuing effects:** the ability of the geared vessels to unload barges (i.e. two simultaneously vs in series) has a large impact overall capacity. High barge load rates are redundant if the unloading rates cannot keep up which can lead to high queuing times and a low load rate. These effects are illustrated in Figure 4 — both scenarios require three cycles of the first barge to complete the loading but the longer wait times of the single barge case results in a longer overall loading time.
- **Weather:** barges are more influenced by weather delays compared to larger OGVs.
- Calendar utilization of the shiploader/barge loader.

Advantages and disadvantages of transhipping

Table 1 details some of the advantages and disadvantages of transhipping.

By eliminating the need for extensive port infrastructure and reducing loading and unloading times, self-loading vessels enhance the efficiency and flexibility of bulk material transportation.

This capability is particularly beneficial in remote or underdeveloped regions, where traditional port facilities may be lacking or in high-demand ports, where reducing berth time is crucial for maintaining throughput and reducing congestion.

Aspec Engineering Pty Ltd (ASPEC) is a multi-disciplinary engineering company in Australia that provides services to mining companies, ports, heavy industries and government organizations. The company's focus is on extending asset life, reducing risk, increasing throughput and complex brownfield upgrades. The range of services provided by ASPEC is extensive, covering civil, marine, hydraulic, mechanical and structural engineering. This multi-disciplinary approach allows the firm to offer comprehensive solutions tailored to the specific needs of its clients. ASPEC's experience extends to emerging fields such as transshipping with projects in Cape York, Northern Territory, Pilbara and Indonesia.

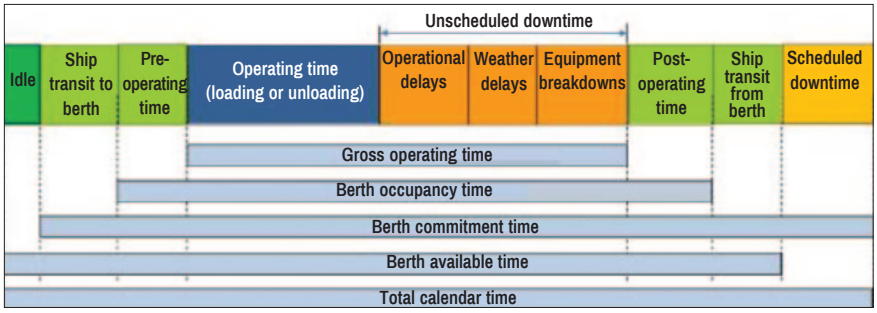

Figure 3: System commitment for ship handling (courtesy PIANC WG184).

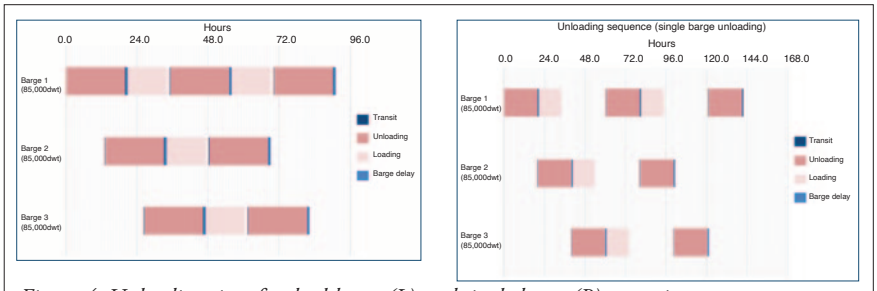

Figure 4: Unloading time for dual barge (L) and single barge (R) operations.

TABLE 1: ADVANTAGES AND DISADVANTAGES OF TRANSSHIPPING.

Advantages	Disadvantages
Reduced environmental footprint: less/no dredging required	Higher operational cost/ double handling of material
Lower capital expenditure (reduced port infrastructure to reach deeper water)	Throughput is potentially subject to barge queuing delays
Flexibility and scalability	Barges are more susceptible to weather delays
Access to larger OGVs for shipping	Potential for spillage when unloading barges

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‘Humber Sprinter’ services the Humber

The Port of Hull in the UK recently welcomed the *Humber Sprinter* to King George Dock, under charter to TTS (Shipping) Ltd, providing more capacity for businesses trading to and from the Baltic and taking advantage of the multi-port flexibility that ABP’s network of Humber ports provides.

This is the latest vessel acquired by the Navalis Group and chartered long term to TTS Shipping. The vessel’s maiden voyage for TTS was a cargo of timber from Finland. The vessel will then load static caravans to the Baltic.

TTS operate long-established timber lines from the Baltic Sea into the ports of Goole, Hull & Immingham. The *Humber Sprinter*, the sister ship to *Humber Runner*, will call at the Humber ports a minimum of twice per month with timber from The Baltic and Scandinavia.

Simon Bird, Regional Director of the Humber ports said:“We are delighted to welcome Humber Sprinter to our port of Hull. It is great that the Navalis Group are expanding their offerings to the Humber.

“We see them continuing to grow their operations and are committed, as the port operator, to playing our part in enabling customers and operators to meet their ambitions.”

Juliet Keep, Managing Director of TTS Shipping, said: “We now have another vessel within our own fleet which can all call in the three ABP Humber ports where we are tenants. This gives us much more flexibility and reliability for the services we offer our customers.”

Peter Waud, Managing Director of Global Shipping Services Ltd, added: “This is fantastic news, and gives great flexibility in continuing to service the needs of clients into The Ports of Hull, Goole and Immingham where we operate as licenced stevedores.”

The *Humber Runner* was acquired three years ago to assist TTS in maintaining the schedule of their many services to the Humber Ports.

Global Shipping Services will act as stevedores in the Ports of Hull, Goole and Immingham.

The Navalis Group and TTS Shipping have traded together successfully for more than 20 years before the acquisition in December 2021. Both companies specialize in the forest product trade in the North and Baltic Sea.

The Humber Sprinter *will visit the Humber ports twice a month (photo submitted by Global Shipping).*

About ABP Humber

ABP Humber Ports complex form the UK’s busiest trading gateway. The four ports of Immingham, Grimsby, Goole, and Hull handle more than 58mt (million tonnes) of cargo between them each year worth approximately £75 billion. Across the Humber, the ports support 34,900 jobs and contribute £2.5 billion to the UK economy.

ABP Humber’s major investment programme ensures the ports offer state-of the-art cargo handling infrastructure and equipment, alongside a highly skilled team who can handle a vast array of cargo safely, efficiently, and sustainably.

ABP Humber works collaboratively to build long-term partnerships and deliver the right supply chain solutions for customers, including value-added services and new facilities tailored to suit their business needs.

Its Port Operations are complemented by the Pilotage Service and Vessel Traffic Service which ensure vessels are safely navigated through the Humber Estuary.

ABP Humber offers 364 hectares of development land across its port locations capable of attracting investment and delivering transformational benefits for the economy both locally and nationally.

The ports are all part of the new Humber Freeport, which offers three tax sites with an exceptionally business-friendly tax and regulatory environment for potential manufacturing investors.

ABP Humber supports its local communities. The ABP Humber Coastal Half Marathon and 10k is now in its eighth year and complements ABP’s race sponsorship across the country.

About ABP

Associated British Ports (ABP) is the UK’s leading ports group, with 21 ports and other transport-related businesses, creating a unique national network capable of handling a vast array of cargo. It is driving growth, contributing £15 billion to the UK economy every year and supporting over 200,000 jobs.

ABP is redefining what Keeping Britain Trading means in the greener, cleaner economy. Its sustainability strategy, ABP Ready for Tomorrow, sets out the plan to reach net zero greenhouse gas emissions from ABP’s own operations by 2040.

ABP in numbers

- ~ 90mt of cargo handled each year.
- 4,000 hectares of port estate owned.
- 38% reduction in GHG emissions from 2014–2021.
- 18 out of 21 ports have renewable energy generation projects.
- > £55 million investment made in low emission and renewable energy generation technologies.

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Port of Liverpool bulk warehouse space sells out before completion due to demand

New bulk storage in Liverpool sold out before its construction was complete, due to high demand likely resulting from challenging growth conditions in the UK.

Half of the brand new 237,000ft^2 multipurpose warehouse at the Port of Liverpool was assigned for grain, and this space was fully booked up by importers while construction was still ongoing.

The first of two vessels successfully offloaded the Alexandra Dock facility's first shipment of grain on 12 July, with a second shipment arriving later in the month. When full, the shed will accommodate approximately 90,000 tonnes of cargo.

Operator Peel Ports invested £25 million in the development of the warehouse, which was designed by industry experts for the efficient storage of dry bulks.

Phil Hall, Mersey Port Director at Peel Ports Group said: "We're seeing very strong demand for storage at ports rather than further inland — in this case, it is due to the wet weather earlier in the year impacting the harvest, making the job much harder for UK farmers, and so as a nation we're having to import more grain and animal feed to keep up with demand.

"But owners of all cargo types say they're looking for efficiencies at every point in the supply chain, and we need to be responsive to that. Investing in and creating infrastructure that's essential for the future has always been at the heart of our strategy, and this is a perfect example of us doing that — and good news for our customers as they look to reduce costs and improve reliability."

Customers utilizing Alexandra Dock Warehouse will also gain access to Peel Ports' port-centric solutions to enhance their efficiency, with services including customs clearance, inventory management and transportation services.

In addition to its operational efficiency, the warehouse is set to play a significant role in Peel Ports' sustainability efforts. The installation of over 6,000 solar panels on the warehouse's roof has begun, forming part of a larger project across the Port of Liverpool to install up to 63,000 panels — set to become the UK's largest roof-mounted solar energy system.

Farming industry body the Agriculture and Horticulture Development Board (AHDB) produces regular insights on the sector which highlight continued issues with the weather impacting on harvests, in terms of quality and quantity compared to the average. Forecasts for winter and spring wheat are considerably behind where they were this time last year, which could increase import requirements.

More information on recent trends and projections on the UK's cereal crop production and trade can be seen in AHDB's annual market outlook and its latest quarterly report.

About Peel Ports Group

Peel Ports Group is the UK's second largest port operator, owning and operating six of the UK's most important ports (Liverpool, Heysham, Manchester Ship Canal, Medway (Sheerness/Chatham), Clydeport and Great Yarmouth). It also operates a container terminal in Dublin and owns BG Freight Line, which provides short sea container services between the UK, Ireland and mainland Europe and Peel Ports Logistics, one of the UK's leading shipping and freight forwarders.

Peel Ports handles approximately 70 million tonnes of cargo every year. 14% of the total UK major ports traffic flows through ports operated by the Group. Headquartered in Liverpool, it employs around 2,000 staff.

Noatum to purchase Algeposa

Spanish port terminal operator Noatum is being linked to a buy out of the operating arm of fellow Spanish port company Algeposa, which provides a variety of logistics solutions throughout the Iberian Peninsula. According to local press speculation, the Pasajes-based company could be worth in the region of €200 million.

Significantly, in 2018, Noatum and Algeposa signed a collaboration agreement, allowing each company access to the other's port facilities. Both companies now have active collaborations in the Spanish ports of Castellón, Sagunto, Huelva, Avilés and Gijón.

In Pasajes, Algeposa functions as a stevedore concentrating mainly on the handling of steel goods and dry bulk. There,

in 2021, it expanded its warehousing facilities, effectively doubling capacity at a cost of €2.5 million. This allows Algeposa to store 2,000 coils in pavilion 4 compared to 1,200 previously. In the process, this has allowed the company to boost overall capacity from 24,000 tonnes to 40,000 tonnes.

In October 2023, it revealed it would add 3,895m² to its main Lezo dock area. It needed this to allow it to handle larger vessels. In November of the same year, it opened a brand new multipurpose terminal on Buenavista quay of 35,000m².

One of its largest clients remains Arcelor Mittal, along with various automotive interests in the region.

In addition to ports, Algeposa also has a presence in rail freight, with facilities in Irun, Madrid, Girona, Barcelona, Valencia Community, and at four sites in France.

Noatum, a logistics operator in its own right, is based in the Port of Barcelona, although was bought by Abu Dhabi's AD Ports two years ago. It also operates in Pasajes, where it handles finished vehicles and also steel products. *Barry Cross*

Solar power extends concession at Tarragona

The Catalan Port of Tarragona has extended the concession that Ership has at its base on the Moll d'Aragó for a further ten years, until 25 November 2038. This has been linked to a major project to install photovoltaic panels across the terminal. The project has a budget of €2,635,000. The solar panels will be installed on warehouses A11, A13 and A15, which are currently used to store dry bulk commodities and breakbulk goods.

The existing concession is for a 50,000 m² terminal, which will henceforth contribute substantially in the generation of green energy, thereby reducing the overall environmental impact of port operations.

Tarragona already produces electricity using photovoltaic panels on seven port buildings. However, the new Ership initiative is linked to the port's Sustainability Plan-Agenda 2030, which features a number of sustainable and environmentally friendly actions. *Barry Cross*

Commodity Ag finds niche in Western Australian export grain market

The Port of Albany is making news in Western Australia. A 23,000-tonne grain consignment en route to Surabaya, in Indonesia, was loaded by Commodity Ag, a family-owned business that leased a mobile ship loader to undertake the operation.

The company first sought an export licence from the Australian Competition and Consumer Commission in March 2023. It claimed it would be handling around 50,000 tonnes of export grain per month at a common-user berth in the Port of Albany.

Commodity Ag managing director Alan Richardson noted in a statement that, "This facility not only enhances our capacity to handle traditional crops like wheat, barley and canola but also supports the expansion of new and emerging crops such as faba beans, lentils, and chickpeas that desperately need a bulk export pathway to continue expanding in Western Australia,"

This initiative by Commodity Ag is the first new grain-exporting facility to open in Western Australia since Bunge's Bunbury terminal commenced operations some ten years previously. Other than Commodity Ag, the Port of Albany's other main grain exporter is the CBH Group's terminal.

Commodity Ag additionally undertakes road transport, cattle backgrounding, and fabrication of Duraquip grain trailers. The company annually grows around 59,000 tonnes of wheat, barley, canola, oats, oaten hay and lupins at 13 sites, amounting to some 21,300ha, which are absorbed by both domestic and international customers.

Significantly, Commodity Ag wants to export additional grain produced by other suppliers, stressing this would enhance a traceable and reliable supply chain, and increase market access for growers in the region and beyond.

The company acquired a 20,000-tonne capacity grain cleaning and storage facility in late 2022, which is located some 8km north of Albany. This will function as a staging post for inbound grain consignment that will be sent by road to the export berth at the port.

Previously, grain export outlets in Western Australia mainly comprised CBH Group's terminals in Albany, Esperance, Geraldton and Kwinana. The largest cooperative in Australia, CBH Group has 90% of the state's grain-exporting capacity.

Bunge's Bunbury terminal provided the remaining 10%.

Nevertheless, what was lacking was a niche provider, since CBH's Albany berth mainly handled Panamax bulk carriers of up to 60,000dwt, while the berth used by Commodity Ag is better suited for operation with Handymax bulkers.

Commodity Ag, in particular, is expected to start handling faba beans in Western Australia's 2024/25 harvest season.

Valencia salt exports up 73%

In the first half of 2024, the United States has received a total of 8,384 tonnes of common salt, making it the leading destination for this product.

Saudi Arabia breaks into the top spot and is 1,100 tonnes higher than last year's figures, while Finland has already received more than 800 tonnes of the product.

The United Kingdom and Ghana are other main recipients of salt from the Port of Valencia.

In the first six months of 2024, salt exports from Valencia have increased by 73.6% compared to the same period in 2023.

The tables of the United States, Saudi Arabia and Finland are the main recipients of the common salt exported from the Port of Valencia. In total, Valencia has exported 18,729 tonnes of this product in the first half of the year, with the United States being the country that has received the most goods, with 8,384 tonnes between January and June.

In just the first six months of the year, the American country has already received more common salt traffic from Valencia than during the whole of the 2023 financial year, which closed with the export of 7,087 tonnes.

For its part, and as a novelty, Saudi Arabia bursts onto the podium with the arrival of 1,152 tonnes of common salt in the first half of 2024, a figure that contrasts significantly with the figure for 2023, as it only received 22 tonnes of this product during the entire financial year.

Other countries also benefiting from common salt exports from the Port of Valencia in 2024 are Finland, the United Kingdom and Ghana, with 897, 571 and 497 tonnes respectively. As in the case of Saudi Arabia, Ghana stands out, which in the whole of 2023 only received 42 tonnes of salt from the Port of Valencia.

The export of common salt also rises significantly with Jordan, which in the first half of 2024 has received 299 tonnes of this product when in 2023 it had no commercial relations with Valencia in this category. This situation is similar to that of France, which in 2024 received 100 tonnes of salt after 2023 with no exports.

For its part, Canada exceeds the 2023 total with 289 tonnes exported in the first six months of 2024, while Taiwan, Morocco and Israel remain at the top of the export table with 324, 322 and 80 tonnes of common salt received so far in 2024.

73% INCREASE COMPARED TO 2023

In the first six months of 2024, the Port of Valencia has exported a total of 18,729 tonnes of common salt to the five continents. This is 73% more than in the first half of 2023, when the figure from January to June reached 10,787 tonnes. In the whole of 2023, 21,638 tonnes of common salt left the Port of Valencia, so the figures for the first half of 2024 suggest that this year will exceed the previous one.

The proof is in the sampling

Inspection, analysis & sampling of dry bulk material

Jay Venter

Exploring pulses with SGS

With over 325+ combined years of experience, SGS' teams across Australia, the Baltics, Canada, India, Pakistan and Singapore provide vital services to the pulses industry

For millennia, humans have been cultivating and consuming pulses. These dried legume seeds, which include varieties such as beans, chickpeas, lentils and peas, have played a significant role in many cultures and continue to nourish societies globally.

In this excerpt from SGS' 2024 'Focus on Pulses' newsletter, SGS examines key trends in the global market and various challenges faced by exporting countries, highlighting how their trusted experts support the industry — whether on the ground or in the laboratory.

Pulses are a staple in many global diets, offering a low-fat protein source packed with vital nutrients like iron, potassium, and folate. The various health advantages of consuming pulses have led to the sale of plant-based foods outpace non-plant-based food sales by threefold in 2021 alone, spurred by consumers' growing preference for plant-based diets and use as a meat alternative.

Commitment to Excellence

The global agricultural commodities supply chain presents opportunities and challenges. While you can easily access a huge range of markets and commodities, you must ensure that your goods meet the necessary quality and quantity parameters, fulfill contractual obligations, and meet local and international standards and regulations.

For over 145+ years, SGS has been renowned for their independence, accuracy, and technical excellence, offering a unique, industry-leading depth and breadth of solutions. As global grains and oilseeds tester, they provide agricultural expertise and innovative solutions tailored to cover the entire supply chain. With SGS' vast network of offices and state-of-the-art laboratories by your side, SGS can ensure that customers' testing, inspection, risk management, and fumigation needs are met.

Focus on: Australia

Wide-spread agri-capabilities

Since being founded in 1950, SGS' agricultural services in Australia have seen consistent growth and expansion, solidifying their position as a key contributor to the nation's agriculture industry.

SGS' operations include two key laboratories specializing in agricultural commodity testing, and three offices that oversee their trade and inspection services for their agri-business. These are located across Perth, Western Australia; Adelaide, South Australia; and Melbourne, Victoria.

Spearheaded by its status as Grains and Feed Trade Association (Gafta) and Federation of Oils, Seeds, and Fats Associations (FOSFA) approved Superintendents and accredited for ISO 17020, SGS Australia provides a comprehensive and seamless range of solutions for pulses. These solutions include sampling, testing, and on-site inspection at inland packing facilities, and bulk export terminals for pulse commodities. Furthermore, on behalf of the Australian Government, SGS' team is authorized to inspect vessels and cargo at port to ensure they meet phytosanitary requirements for the destination country.

Focus on: The Baltics

Multi-country operations

SGS' agricultural operations in the Baltics began in 1992. In the 30+ years since; their footprint has expanded to include a network of 13 laboratories across the region.

Stretching across multiple countries, their reach includes six laboratories in Latvia's cities of Riga, Ventspils, and Liepāja; and two each in Lithuania's Klaipeda, Estonia's Muuga and Sillamäe. The most recent addition is an express laboratory in Sillamäe, inaugurated within the last year.

Supporting these laboratories, SGS has five Agri-trade offices located in Riga, Ventspils, Liepaja, Klaipeda, and Tallinn. Across the Baltics, their team comprises 117 full-time professionals, all dedicated to serving the agricultural industry.

Accredited for Excellence

Ensuring the best in services, SGS' laboratories boast multiple accreditations and certifications. For example, their laboratory in Klaipeda, Lithuania is a FOSFA-certified Approved Analyst for oilseed testing. Furthermore, their operations in Latvia and Lithuania have achieved Gafta-approved Superintendents, Analysts, and Fumigators status.

SGS offers a wide range of services across the Baltics, including intake control,

Experienced
Agri Inspections

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Alex Stewart Agriculture

Your global network of inspection and analytical services

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UKAS TESTING
4352

FOSFA INTERNATIONAL

Gafta APPROVED REGISTER

loading inspection for containers or shipments, laboratory services in line with ISO 605 standards for testing pulses for human or animal consumption, and proficiency testing in cereals and agri-food certified by BIPEA.

Furthermore, SGS provides fumigation services. Each year, SGS' team inspects over 350 kilo metric tonnes (KMT) of pulses, providing more than 150 different analytical services, demonstrating their extensive capabilities and commitment to the agricultural sector.

Focus on: Canada

Operational Offerings

Across Canada, SGS' operations are spread across six states with eight offices and three laboratories in Prince Rupert, Vancouver, Calgary, Saskatoon, Winnipeg, Hamilton, Thunder Bay, Burnaby, and Montreal. Initially founded in 2000, its agricultural team comprises over 250 full-time employees who support these various facilities.

In Burnaby and Vancouver, both in British Columbia, SGS' laboratories are FOSFA-certified and specialize in analysing oils, fats, and oilseeds. They are also Gafta-approved Fumigators, Analysts, and Superintendents which verifies the company for excellence in their testing and inspection solutions, including supervision of loading and discharge operations.

SGS is also accredited with ISO 17025 and ISO 17020, which reflects their competence, impartiality, and consistency in operations. Additionally, it is verified by the Non-GMO Project to conduct GMO testing on agri-commodities.

SGS is also authorized by the Canada Food Inspection Agency (CFIA) to provide grain testing services as part of the REGAL programme, which includes testing for live insects.

Wide-range of solutions

With its various accreditations and certifications, SGS in Canada offers remote inspections of containers/railcars during a comprehensive range of solutions for the agriculture industry. This includes on-site and loading, quality analysis to Canadian, US, or ISO standards, Glyphosate testing, and GMO testing.

In the future, SGS intends to broaden their analytical services to encompass testing for fats, fibers, starch, ash, and proteins in pulses.

As part of their commitment to sustainable practices, SGS expanded their capabilities in January 2023 to include Sustainable Carbon Tracing. This allows it to include total carbon footprint reduction on certificates for each client using SGS' remote inspection services.

Focus on: Pakistan

Comprising two laboratories and seven trade offices, SGS' operations in Pakistan have greatly expanded since they first launched in the country in 1952.

Centred around pulse-related services, they operate from the vibrant cities of Karachi, Lahore, Islamabad, and Multan. To ensure excellence throughout, a dedicated team of over 315 inspectors, analysts, technicians, and commercial team members oversees their proceedings.

Certified Capabilities

SGS' comprehensive suite of solutions is tailored to cater to every requirement across the pulses supply chain. The company provides a plethora of services, including sampling, chemical and microbiological testing, supervision of loading and discharge, draught survey, warehouse inspections, verification of packaging and bag marking, as well as dispatch supervision from the port to the end buyer.

In addition, SGS' disinfection and fumigation services include pre-shipment treatment of wooden packaging materials, non-toxic pest management, and Integrated Pest Management (IPM) for grain warehouses. All these services are designed to ensure the highest quality and safety standards.

It is also authorized to conduct joint surveys and consultancy services for Pakistan's Government Department of Plant Protection.

As of 2022, SGS Pakistan stands as the only Gafta-approved fumigator in the country. In the past year alone, it has completed over 550 types of analyses and conducted inspections on more than 130,000 tonnes of pulses commodities, including beans, chickpeas, lentils, and matpe.

Focus on: Singapore

Since establishing its presence in Singapore in 1971, SGS has been eager to assist with customers' business operations.

Its Singapore team serves as a vital link between clients and the company's wealth of local and international experts, catering specifically to customers engaged in the South East Asia Pacific (SEAP) pulses markets.

Operating from Singapore, their team ensures smooth and uninterrupted delivery of services across the region.

SGS' regional team

SGS' agriculture commodities expertise stretches globally. Combining local in-depth knowledge and the latest worldwide industry best practices, SGS works for its customers to protect their interests and reduce their risk, ensuring that all commodities meet global standards for quality and excellence.

Fly ash and bottom ash: Alfred H Knight explains the importance of testing

Typical fuels do not contain ash but instead contain mineral matter which forms ash on combustion. The formation and chemistry of ash from biomass fuel however is dependent upon the combustion process, particularly to the combustion conditions. This, as well as the nature of the fuel burned, can have a massive effect on the quality and composition of your ash which can impact the efficiency and uptime of your boiler, waste disposal or re-use.

Generally, two types of ash are of interest — fly ash and bottom ash.

What is fly ash?

Fly ash is a fine material prevented from escaping to the atmosphere by a suitable abatement system such as bag filtration or electrostatic precipitation. These are typically contaminated with volatile trace materials, Dioxins and Furans.

What is bottom ash?

Bottom ash is the residue left under the grate at the bottom of the boiler and may contain physical contaminants mixed with the fuel such as metal, stones, glass, ceramics and other materials. It is coarser than fly ash and is typically contaminated with heavy metals.

How can fly ash and bottom ash impact my boiler?

Issues may arise when ash chemistry is present, including the promotion of corrosion or low ash melting., which leads to adverse impacts on boiler/plant efficiency, uptime and long-term material sustainability. This has a greater significance with some fuels than others and is particularly important when considering agricultural material or other biomass recyclates.

How can Alfred H Knight help?

As an industry-leading testing and inspection company, Alfred H Knight helps organizations around the world build an accurate and reliable profile of their materials. Alfred H Knight supports the biomass sector through a range of inspection and analytical services, including ash testing.

By independently verifying the quantity and quality of material, the company can help clients to minimize the risk involved in their investment and certify the quality of their commodities.

Inspection

Alfred H Knight provides trust and certainty to the global supply chain through quality and quantity assessment of bulk, bagged and containerized cargo. Its inspectors operate at many locations on behalf of its clients, including mine sites and at crucial points in logistic chains such as loading and discharge ports, warehouses and receiving works including refineries, smelters and recycling plants.

Analysis

Accredited laboratories

Alfred H Knight operates a global network of accredited laboratories, specializing in the commercial analysis of metals, minerals, solid fuels and agricultural commodities. The company also specializes in production analysis, physical testing and sample preparation. Its high standard of technical expertise, years of experience in classical analysis and investment in the most sophisticated instrumental techniques enable its laboratories to provide fast and efficient service.

Consultancy services

Alfred H Knight has over 140 years of experience in the provision of independent analysis and inspection services to the metals & minerals industry and has since utilized that experience to expand into the solid fuels and agricultural sectors. Its services can be provided both on-site at any location, or remotely through its network of global expertise.

Markets served

Metals & minerals

Alfred H Knight helps organizations to determine the chemical composition, commercial quality and regulatory compliance of metals and minerals through independent inspection and analytical services.

The company maintains rigorous quality standards to ensure that all our operations provide the highest level of services to our clients. This is achieved through compliance with industry standards and regulations, accreditations from external agencies including ISO/IEC 17025:2017 and ISO 9001:2015, and in-house quality standards.

Solid fuels

Quality determination

Through independent testing and inspection services from Alfred H Knight. companies can determine the chemical composition, commercial quality, and regulatory compliance of their commodities.

The company has extensive experience within the power generation industry, working with major clients in the coal, waste management, wood pellet, biomass agricultural and forestry sectors.

Agriculture at Alfred H Knight

Alfred H Knight offers a wide range of quality and quantity inspections, rapid analytical assessments and precision agriculture services to support the entire agricultural supply chain. From grains to fertilizers, fibres and seeds, its experts can help.

The company provides clients around the globe with clear risk management solutions to monitor intrinsic values, compliance and brand protection. Its in-depth knowledge and approach allows it to tailor its services to suit the client's individual needs.

IMA Fast Conveyor Analyzer, a solution for copper mining risks

IMA technology allows mines to know where the valuable ore is. This information is key to avoiding processing waste, which involves a huge quantity of water.

The recently published PricewaterhouseCoopers LLP report warns about the risk of having more than 50% of the copper mines in drought areas by 2050.

So, reducing water and power use is essential during all mining stages. This is because the quantity of necessary copper for the clean-energy transition is increasing drastically.

Technology is the key

IMA Engineering's technology works in this direction, from drill cuttings, blast hole sampling, and analysis on-site, to online elemental composition analysis on the conveyor belt.

"We started working on this technology about 25 years ago, and that's how we developed the Fast Conveyor Analyzer. This is very useful, as it helps mines separate ore from waste before the material reaches the intensive water and electricity-consuming process, in the concentrator. So, as a result, fewer chemicals are used, fewer tailings result – which saves water – and the CO_2 emissions significantly drop," Jukka Raatikainen, CEO of IMA Engineering, mentioned.

IMA technology — proven efficiency

Moreover, we are already involved in dry processing technology, which helps mines save precious water amounts.

The Fast Conveyor Analyzer and the Bulk Ore Sorting system are already used in copper mines. Chilean mines appreciate the value of the FCA, while Brazilian mines take advantage of IMA Engineering's Bulk Ore Sorting System. Using the technology, the mines can reduce the amount of water and energy involved in the process by up to 20%.

In Chile, "water shortages have restrained copper production in recent years as the industry invests in the use of seawater," according to Mining.com. So, the mining companies felt the need to do something about it.

Now, according to the same source, Zambian "copper mines are facing a power supply squeeze as drought roils hydroelectric installations." So, IMA Engineering's solutions could also help them significantly.

All of the company's solutions are available now when more than 70% of key minerals for the net zero energy transition are at risk from climate disruption.

About IMA Engineering

IMA Engineering has used on-line sensors for analysing ore and waste rock in mining for over 25 years. Today IMA on-line sensors are used in various stages of the mining process including on-line analysis of drill cores, drill chips, ore, and waste in loader buckets, ROM ore analysis on conveyor belts and in bulk ore sorting, as well as in slurry analysis in concentrators.

Navonus – Agency service and cargo surveyor 2-in-1

13 years ago Navonus co-owners Josie Peiffer and Joris Clappaert decided to combine their previous maritime proficiency by launching their own company. The two branches of expertise combine beautifully, agency service and cargo survey all rolled into one.

The Head-office of Navonus is located in Ghent with branch offices in Antwerp, Zeebrugge, Rotterdam/Zwijndrecht, Hamburg and Aarhus/Denmark. The actual head count for the group is 28 employees, for Netherlands, Denmark, Germany and Belgium.

"We also operate in Hungary, Poland, Romania, Austria, France, Sweden, Finland, Norway, the Baltic States, Ukraine, Russia and Spain." says Josie Peiffer, Manager Supervision, Navonus.

The group maintains a network of representatives throughout the world.

"The Navonus Cargo Survey department, being your eyes, ears and nose can guarantee the quality of your product, whether you are buying, selling or merely transporting.

"Our tightly-knit team of surveyors has nearly a century of experience and our competence is deeply rooted in the GAFTA, FOSFA and ISO 17020 accreditations and recommendations."

The service include supervision during loading and unloading of dry agribulk and liquid products, draft survey, hold condition survey, pre-shipment survey and weight control.

Cargo sampling

Accurate lab results require samples of the highest quality. By taking samples at quick intervals, Navonus ensures that bulk samples represent the cargo as well as possible. The company ensures that its clients' samples are with the lab of their choice as quickly as possible.

The Navonus Group's skilled surveyors work around the clock to ensure cargo is safe and secure at every step of the transport operation.

They are equipped with portable equipment (moisture tester, equipment for measurement of temperature, sieves etc.), which enables the client to quickly get the first results on quality of the cargo at loading or discharge on the basis of its findings.

In order to perform further contractual analyses, Navonus forwards samples to the recognized and independent laboratories.

Dry bulk covered by Navonus' operations in all areas of quality, condition and weight control include:

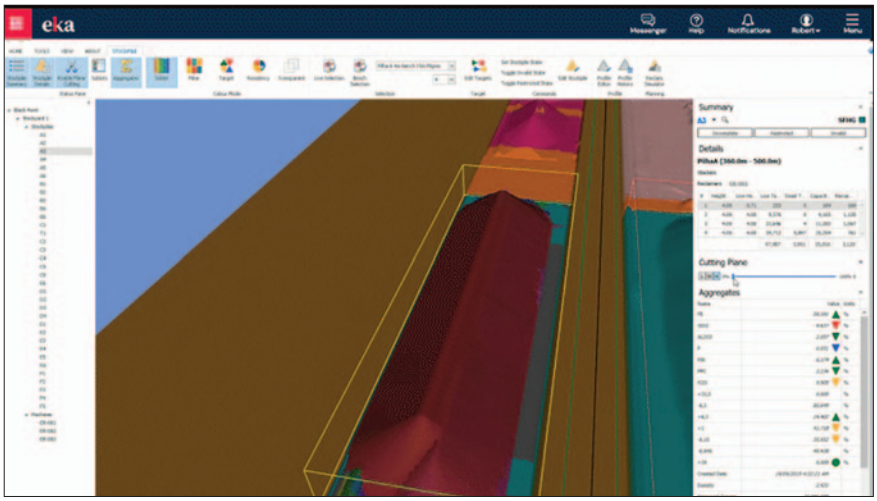
- grains (wheat, barley, rye, oats, rice, maize, DGDS, etc.);
- oilseeds (sunflower seeds, rape seeds, soyabeans);
- pulses (peas, beans, lentils etc.);
- sugar (raw sugar / white sugar);
- organic and bio products;
- coffee and cocoa;
- wheat flour and milk powder;
- feed stuff (soyabean meal, sunflower seed meal, rape seed meal); and
- fertilizers (dry bulk and liquid).

Improving the efficiency of mining operations with Quor Group's QMS

One major challenge faced by the mining sector today is improving the efficiency of mining operations by harnessing the potential of technology, *writes Ben Koch, Vice President of Bulk Handling Solutions at Quor Group*. Organizations need extensive support in site automation control, quality management, and real-time integration to strengthen the robustness of their supply chain networks.

Effective quality management is of crucial importance in bulk mining operations due to multiple compelling factors. Bulk mining involves the large-scale extraction and processing of dry bulk commodities often under challenging and variable conditions. The implementation of a Quality Management System (QMS) in these operations can yield substantial benefits.

The QMS is a critical feature of Quor Group's stockyard management solution for mining operations and our warehouse management solution for agriculture. From small single pit mines to leading global mining groups with mines in Australia, Africa, Asia, and Central America, our customers use QMS extensively in their day-to-day mining operations.



The implementation of a QMS in bulk mining operations can yield substantial benefits.

QMS in mining and agriculture

The QMS is designed to support companies in the mining and agriculture sectors by ensuring that the grades of materials they ship meet contract specifications. This is crucial during operational planning to prevent penalties and optimize the blending process. The QMS provides accurate predictions of shipped grades, which is essential for fulfilling contracts and maintaining profitability.

Advanced digital twins of stockyards and terminals

The QMS leverages advanced digital twins, which are highly detailed, virtual replicas of physical stockyards and terminals. These digital twins are continuously updated in real time, reflecting the exact 3D placement of all bulk materials as they are stacked and reclaimed. This ongoing update ensures that the virtual model remains an accurate representation of the physical environment.

Real-time 3D placement and material tracking

In these digital twins, every material lot is tracked with precision. The QMS integrates with Laboratory Information Management Systems (LIMS) to associate these material lots with their most recent laboratory results. This integration allows for accurate tracking of the quality and composition of the materials as they move through the supply chain, ensuring that companies can maintain quality standards and meet contractual obligations.

Precise simulation of reclaiming operations

One of the standout features of the Quor Group's QMS is its ability to simulate reclaiming operations with high precision. These simulations use the 3D location data of materials within the stockyard to forecast the grades of the materials that will be shipped. Unlike basic weighted average forecasting methods, which might oversimplify the process, this simulation accounts for the real-world mechanics of stacker, reclaiming, and siloing operations. This allows companies to predict the quality of the shipped materials more accurately.

Superior to basic weighted average forecasting

Traditional methods of forecasting often rely on weighted averages, which can be less accurate because they do not account for the complex dynamics of material movement within stockyards. The QMS's approach, which simulates the actual reclaiming process, provides a much more accurate forecast by considering factors like the exact 3D positioning of materials, the sequence in which they are reclaimed, and how these factors influence the final shipped grade.

Continually updated predictive performance

The system continually updates its predictive performance statistics. This means that the QMS not only predicts outcomes but also tracks how accurate those predictions are over time. By understanding how close the predictions are to actual results, scheduling and logistics teams can make more informed decisions. They can confidently push the limits of contract specifications, maximizing value without risking breaches that could lead to penalties.

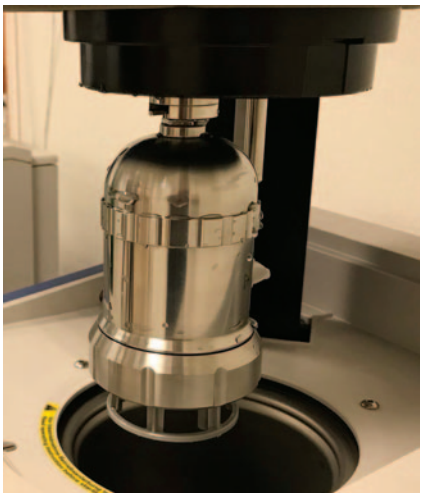
Optimizing operations

Overall, this technology enables companies to fine-tune their operations to get as close as possible to contract limits without exceeding them, ensuring that they are not leaving potential revenue on the table. By optimizing blending and material handling, companies can enhance profitability while maintaining compliance with contractual obligations.

Quor Group's QMS is a highly advanced system that far exceeds basic weighted average forecasting. It continuously updates its predictive data on performance using complex analytics. QMS helps users track and extract the desired quality in stockpiles with a true volumetric physical 3D stockpile model of material quality. The system equips operators to better match inventory quality specifications to sales quality specifications and increase throughput and site efficiency.

Quality management is not only crucial but also indispensable in bulk mining due to the scope and complexity of operations. An advanced quality management system (QMS) is essential for the success and sustainability of mining operations, as it provides the structure and discipline necessary to manage risks, enhance efficiency, ensure safety, and deliver consistent product quality.

Highly qualified and skilled team: PSB Inspection



PSB Inspection was founded by Peter Bagchus as a 100% private enterprise in 2016 and has been operational since 1 February 2017. Headquartered in Rotterdam Port Area, the Netherlands, the company's team of 18 employees follows the slogan: "Giving up is not an option, we are always available for both our customers and any future customers!"

PSB Inspection serves as a distinguished player in the field of inspection, sampling, sample preparation, analytical services, and weight ascertainment. Situated in Vlaardingen within the Rotterdam port area, the company boasts a cadre of highly qualified and experienced senior surveyors, a proficient sampling preparation team, and a state-of-the-art laboratory staffed by skilled technicians. This well-co-ordinated team is overseen by both the operational and management teams, each with decades of experience in the industry.

PSB Inspection employees have a broad spectrum of experience in the field of; weight determination of inland vessels, draft surveys of seagoing vessels, gauging, stockpile inspections of coal, gas/toxid measurements, transhipment supervision, temperature controls of stockpiles and coal, (torrefied) biomass, Solid Recovered Fuels (SRFs) metal and mineral loads and wide inspections of sea going vessels and inland vessels.

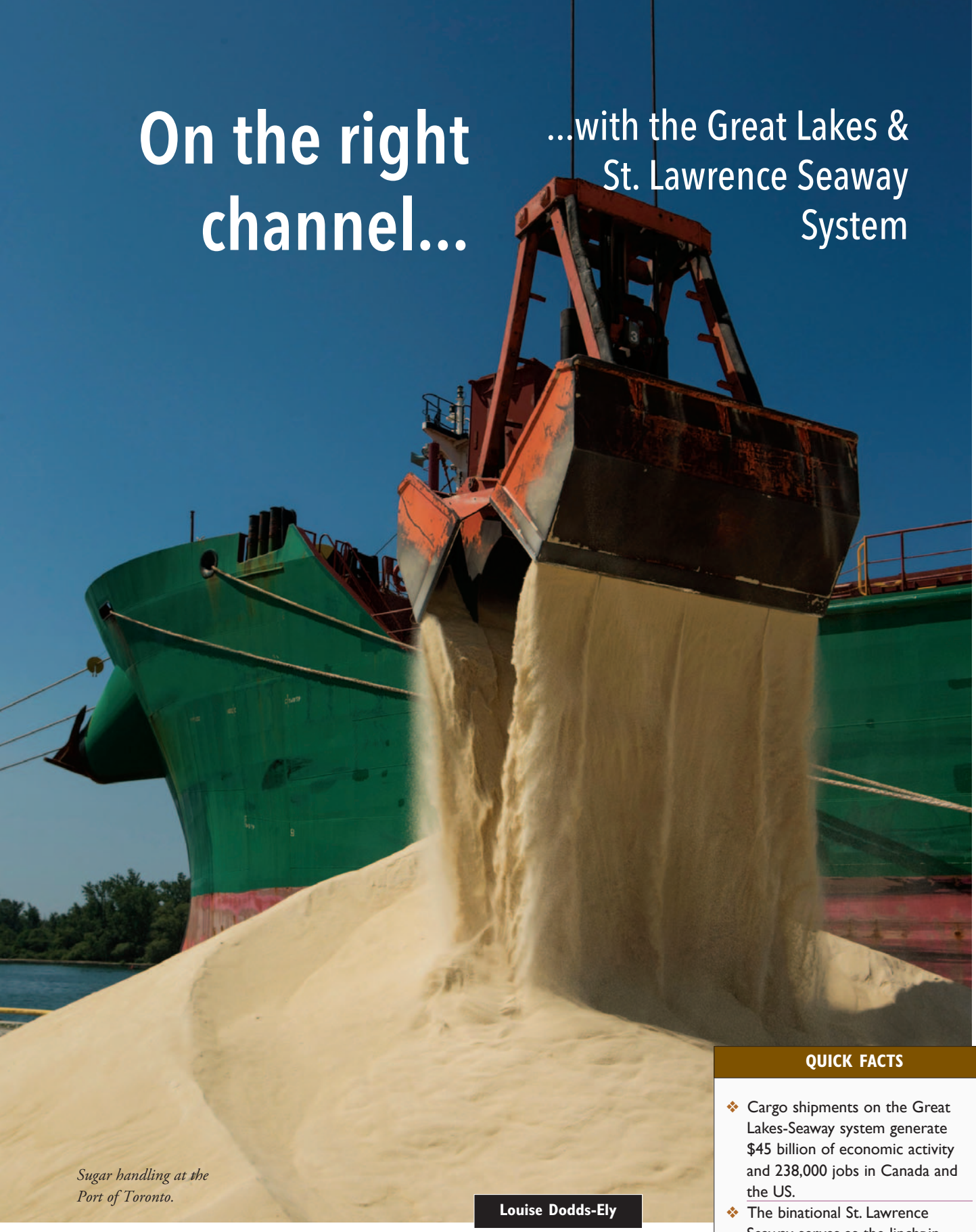
PSB Inspection is well-known and accepted by international producers/consumers, International trading companies and industrial users of solid fuels. All activities are performed in accordance with the most recent International Standards ISO and/or ASTM standard and internal quality procedures.

Currently, the company is operating in the following countries/continents: Europe, South-Africa, USA, LATAM, Turkey, Egypt, Morocco, India, Australia, China, Indonesia and more (on request, we can send you the total overview).

PSB Inspection recognizes that it is imperative that it continues to follow the market. From that perspective the company, next to its current global network, is expanding: for example, the latest development is a partnership in Vietnam/Malaysia. This should not be the last step of its expansion ambitions. As mentioned previously, the company is also diversifying its product portfolio, for which it is not only investing in qualified people if and where needed, but certainly also in equipment. Last but not least, the company is also continuously screening its service portfolio based on if and how it makes sense to comply with potential market requirements.

On the right channel...

...with the Great Lakes & St. Lawrence Seaway System



Sugar handling at the Port of Toronto.

Louise Dodds-Ely

The Europe-North America trade route is a vital transportation link and is a long standing and vital link for continental trade. Vessel traffic between the European continent and North America via the St. Lawrence River and Seaway System serves as one of the world's foremost two-way trade.

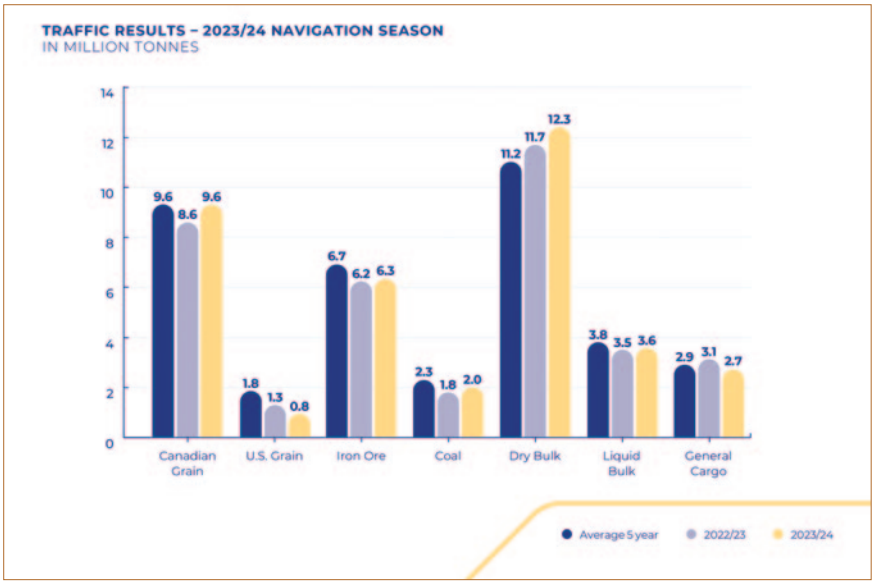
The Great Lakes–St. Lawrence Seaway System is a deep draught waterway extending 3,700km (2,340 miles) from the Atlantic Ocean to the head of the Great Lakes, in the heart of North America. The St. Lawrence Seaway portion of the System extends from Montreal to mid-Lake Erie. Ranked as one of the outstanding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

QUICK FACTS

- Cargo shipments on the Great Lakes-Seaway system generate $45 billion of economic activity and 238,000 jobs in Canada and the US.
- The binational St. Lawrence Seaway serves as the linchpin within the broader waterway, connecting the lower St. Lawrence River to the Great Lakes. Beginning in Montreal and extending to points west, the Seaway's 15 locks (13 Canadian and two US) enable ships to climb a total of 168 metres from sea level up to Lake Erie.

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

With economic output estimated at $6 trillion, the provinces and states bordering the Great Lakes–St. Lawrence Seaway System account for 30% of combined Canadian and US economic activity and employment. The region would rank as the third largest economy in the world if it were a country. Positioned at the core of this economic powerhouse, the Great Lakes–St. Lawrence Seaway System serves as a vital supply chain.



The Great Lakes/St. Lawrence Seaway was built as a binational partnership between the US and Canada, and continues to operate as such. Administration of the system is shared by two entities, the Great Lakes St. Lawrence Seaway Development Corporation (GLS) in the US, a federal agency within the US Department of Transportation, and the St. Lawrence Seaway Management Corporation in Canada, a not-for-profit corporation (ownership of the Canadian portion of the Seaway remains with the Canadian federal government).

About the SLSMC

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

About the GLS

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

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

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

SLSMC Annual Summary

In his message prefacing the SLSMC's Annual Summary, outgoing President and CEO Terence Bowles stressed the year's theme of a Seaway that is resilient, predictable, and sustainable, noting that the System has the capacity to not only endure great challenges, but to get stronger in the midst of them.

The Seaway's resiliency was witnessed through its negotiations of a renewed and modernized 20-year management, operation and maintenance agreement

Wood pellets at the Port of Belledune.

with the Federal Government.

Economic uncertainty prevailed in 2023/24, with stubbornly high inflation. Despite this, tonnage increased 3.4% to 37.6mt (million tonnes), even with a brief shutdown in October due to a labour disruption — the first in 55 years. Clearing the impacted vessels took place in record time and allowed the Seaway and its stakeholders to return to normal operations in short order.

In terms of traffic results:

- overall, grain movements increased 5.0% vs. 2022 results;
- Canadian grain movements have rebounded from the drought-reduced results of 2022 posting an increase of 11.6%;
- US grain exports remained subdued throughout the navigation season due to continued competitive pressures. The year ended 44.1% below 2022's results;
- a record amount of other grain moved through the System this year, up 462.9% vs. 2022;
- iron ore movements were slightly ahead of last year by 1.9;
- coal movements returned to normal levels ahead of 2022 by 14%;
- dry bulk movements showed an increase again this year, up 5.4% vs. 2022. These results are attributable to record setting movements of both potash and cement, up 41.8% and 10.9% respectively. Movements of gypsum (up 13.4%) and stone (up 44.3%) also contributed to the improvement over 2022 results; and
- general cargo posted an 11.9% decline with lower iron & steel shipments (down 16.4%) and fewer other general cargo movements (down 59.1%). This decline was partially offset by improvements in steel slab shipments (up 44.9%).

Infrastructure and maintenance

As ever, the SLSMC has remained focused on infrastructure maintenance and improvements. It takes pride in maintaining and operating movable bridges that are integral to the daily functioning of adjacent communities.

The engineering team adopted a modern approach to eliminate the need to replace festoon cables on lift bridges (cable between the movable span and towers). This was achieved by installing remote input-output at ground level with fibre optic communication and upgrading the control panels to simplify the design, reduce complexity, and improve reliability. This innovative initiative reduced failures, thus reducing the maintenance team's intervention time.

The maintenance teams worked in close collaboration to manufacture a template for the permanent installation of guard rails on the last stop log. The guard rail system underwent several modifications in recent years to improve both safety and technical aspects, aiming for quicker installation. However, complexities in the existing design, coupled with the new regulation on working at heights, led to a switch from a removable to a fixed guard rail system. Team collaboration played a crucial role in this innovation, as various employees involved in the stop log installation process, such as mechanical maintenance engineers, mechanical technical officers, welders, machinists, crane operators, and civil maintainers, contributed their insights and expertise. This collaborative approach facilitated the realization of an innovative idea in a short time frame. The new system not only saved time during lock emptying and filling but also ensured safe passage from the north to the south side of a lock. Additionally, it significantly reduced the time required for installing the guard rails.

SLSMC announces appointment of a new President and CEO

On 10 June, the St. Lawrence Seaway Management Corporation's (SLSMC) Board of Directors announced the appointment of Demetrios (Jim) Athanasiou as the Corporation's next President and Chief Executive Officer, effective 12 July 2024.

Athanasiou replaces Terence F. Bowles, who is retiring as the longest serving Seaway President, having taken over this role in November 2010. Prior to joining the SLSMC, Bowles was President and CEO of the Iron Ore Company of Canada and worked for many years with QIT Fer et Titane du Quebec.

Paul Gourdeau, Chair of the Board of Directors commented on behalf of the Board: "We have been very fortunate to have Terry Bowles as our President and CEO for the last 14 years. Under his leadership, SLSMC has delivered excellent operational results, implemented impressive modernization and innovation initiatives and developed a strong Seaway team, which is well placed to continue serving its stakeholders and contributing to the Canadian and US economies. Of note, the SLSMC received the OECD International Transport Forum Promising Transport Innovation Award for the development of its hands free-mooring and remote operations. This was the most significant change to the operation of the Seaway since its opening in 1959, and has resulted in improved safety and efficiency for SLSMC employees, as well as for vessels transiting the system. We wish to thank him for these achievements."


Jim Athanasiou.

Athanasiou, joined the SLSMC in 2008 as Corporate Mechanical Engineering Manager. He followed this with ever-increasing responsibility, including as Vice-President Engineering and Technology and the recent renewal of a 20-year Management, Operation and Maintenance Agreement between the SLSMC and the Federal Government.

Gourdeau further commented: "We are pleased to name Jim Athanasiou as the next President and CEO. Jim brings with him extensive Seaway knowledge, and his broad SLSMC portfolio has allowed him to touch on every aspect of the organization.

"We are also convinced that Jim's strong leadership skills and vision will benefit him as he takes on the challenges of his new role."

Great Lakes Seaway announces port winners of 2023 Season 'Pacesetter Award'

Earlier this month (August), the U.S. Great Lakes St. Lawrence Seaway Development Corporation (GLS) announced that two US ports in the Great Lakes St. Lawrence Seaway System received the Robert J. Lewis Pacesetter Award for increases in international cargo tonnage shipped through its ports during the 2023 navigation season.

"Great Lakes ports play a key role in moving goods through our nation's supply chains and lowering costs for consumers, as I recently saw firsthand with visits to ports in Menominee, Manitowoc, and Milwaukee," said U.S. Transportation Secretary Pete Buttigieg. "This year's winners reflect the vital importance of these ports and are a credit to the skill and dedication of workers who do so much for our freight systems."

More than 241,000 jobs and $35 billion in economic activity are supported annually by movement of various cargoes on the Great Lakes St. Lawrence Seaway System. The two ports earning the Robert J. Lewis Pacesetter Award for 2023 are the Illinois International Port District (Chicago, Ill.) and the Port of Green Bay (Wis.).

"Congratulations to the two Great Lakes ports being recognized as GLS Pacesetter Award recipients for their achievements during the 2023 Seaway navigation season," said GLS Administrator Adam Tindall-Schlicht. "Their sustained high performance is a testament to the hard work and resilience of countless, dedicated Great Lakes port professionals. Their leadership and commitment have kept the North American maritime economy thriving, reflecting the dedication and vision across the Great Lakes region."

The Robert J. Lewis Pacesetter Award was established in 1992 to recognize the achievements of US ports whose activities result in increasing international tonnage shipped through the St. Lawrence Seaway, in comparison with the previous year. The Pacesetter Award name was officially changed in 2001 to posthumously honour the noteworthy career of GLS Logistics Director Robert J. Lewis, who was instrumental in developing and implementing the GLS's trade development programme.

GLS celebrates 70th anniversary with grand opening of New Seaway Visitor Center in Massena, N.Y.

On 14 May, top U.S. Department of Transportation officials were on hand as the Great Lakes St. Lawrence Seaway Development Corporation (GLS) celebrated the grand opening of its new visitor centre at the US Eisenhower Lock in Massena, N.Y. The centre will welcome visitors to the Seaway and provide a world-class tourist attraction for the region. The new visitor centre represents a best-in-class example of a Federal net-zero emissions building: it is all-electric, meets the Biden-Harris Administration's Federal Building Performance Standard by eliminating the on-site use of fossil fuels, and uses 100% carbon-free electricity, as the centre takes advantage of hydropower generated from the Seaway.

"I am proud to announce the opening of the new Visitor Center at the Great Lakes St. Lawrence Seaway in Massena, New York," said Deputy Secretary of Transportation Polly Trottenberg.

"The Great Lakes St. Lawrence Seaway System is a driver of economic development and job creation in the region. The new visitor centre will not only serve as a cornerstone for tourism in the North Country region, but it will also allow tens of thousands of people from around the world to watch ships transit the lock and to learn about this vital part of the U.S. Marine Highway system."

"The grand opening of the new Seaway Visitor Center at Eisenhower Lock, which I worked hard to deliver funding to support, is a big day for our St. Lawrence River communities, and the culmination of a years-long effort to bring much-needed upgrades to an essential transportation link and tourist destination," said Senator Chuck Schumer.

"Each year, tens of thousands of tourists visit Massena to witness ships passing through the iconic Eisenhower Lock and now they will have the modern facility needed to make their visit one to remember. These upgrades will provide a major boon to tourism and give families a proper welcome with top-notch amenities. I fought to ensure this new Visitor's Center would open, and now it's ready to further revitalize the entire North Country, bringing economic energy to our downtown and scenic communities. I am proud to have fought for and delivered the $6 million in federal funding that made this possible and will always work to boost our tourism economy in the North Country."

Cutting the ribbon on the new centre (L-R): Ross Levi, Vice President/Executive Director of Tourism, Empire State Development; David McMillan, Chairman, GLS Advisory Board; Ben Dixon, Executive Director, St. Lawrence County Chamber of Commerce; Town Supervisor Susan Bellor, Village of Massena, N.Y; Deputy Secretary of Transportation Polly Trottenberg; William Mielke, Member, GLS Advisory Board; Administrator Adam Tindall-Schlicht, GLS; and Amy Stark, Visitor Center and Community Relations Manager, Great Lakes St. Lawrence Seaway Development Corporation.

During the grand opening ceremony, Deputy Secretary Trottenberg and GLS Administrator Adam Tindall-Schlicht were joined by US and Canadian dignitaries, along with a gathering of Great Lakes Seaway System stakeholders.

This modern facility not only showcases the Seaway's rich history, but is a major North Country destination, and is expected to draw over 100,000 visitors annually. As the new centre opens its doors, the GLS invites the public to explore the past, present, and future of this vital waterway.

"As we celebrate the 70th anniversary of the Wiley-Dondero Act, which created the St. Lawrence Seaway, we reflect on the Great Lakes St. Lawrence Seaway System's performance and how it continues to highlight its resiliency and importance as a global maritime supply chain," said Adam Tindall-Schlicht, Administrator of the Great Lakes St. Lawrence Seaway Development Corporation. "Watching ships coming through the Lock is not only important to the economy of the area, but it holds cherished memories for many who have grown up or spent their summers here."

The Biden-Harris Administration is leading by example to tackle the climate crisis through President Biden's Federal Sustainability Plan, which establishes an ambitious path to achieve net-zero emissions from federal buildings by 2045.

"President Biden set bold goals for Federal sustainability, and this project helps us achieve those goals," said Andrew Mayock, Federal Chief Sustainability Officer of the White House Council on Environmental Quality. "Upgrading our federal buildings to be more efficient and sustainable also means healthier communities."

The Great Lakes St. Lawrence Seaway System provides maritime commerce with reliable, efficient, and environmentally friendly cargo movement that supports high-quality jobs in the US and Canada and helps us address our joint climate goals. More than 241,000 jobs and $36 billion in economic activity in the US and Canada are supported annually by the movement of various cargoes on the Seaway System – more than 135mt (million metric tonnes) of cargo each year. Hundreds of ships from all over the world make multiple trips through the St. Lawrence Seaway annually, moving grain, iron ore, coal, steel, stone, and large cargoes such as windmill components.

Port Milwaukee boasts flexibility and excellent hinterland connections

Port Milwaukee offers a commercial operational flexibility unique to the western Great Lakes, the St. Lawrence Seaway and the inland river system. The port is located on the western shore of Lake Michigan, about 75 miles north of the city of Chicago. It is 1,021 nautical miles from Montreal, Quebec with a transit time by water from Montreal of about four-and-a-half days.

Port Milwaukee serves as a regional transportation and distribution centre with a primary market including the State of Wisconsin, northern and western Illinois (including the City of Chicago) and eastern Minnesota including Minneapolis and St. Paul. Port Milwaukee is also capable of cost effectively reaching Iowa, North Dakota, South Dakota, Nebraska, Missouri and Indiana, and the western Canadian Provinces of Alberta, Saskatchewan and Manitoba.

The port maintains a robust network of transportation partners within the region, including vessel and barge owners, rail operators, truckers, freight forwarders, and other beneficial owners of cargo, working together to design high quality, cost effective transportation and distribution programmes for both domestic and international supply chains.

Port Milwaukee personnel and tenants are thoroughly trained and experienced transportation and logistics professionals, to develop complete handling and transportation solutions for regional businesses.

Port Milwaukee is the northern most approved point on the Great Lakes with access to the Inland River System, providing direct access to Gulf Coast Ports including Houston and New Orleans via the Mississippi River.

Port Milwaukee is very well equipped to handle bulk, breakbulk, heavylift and liquid cargoes. It has 16 Seaway Max docks, including a heavy cargo dock. It can host a wide variety of vessels, including barges, Lakers, and Seaway Max vessels. The largest-sized vessels calling on Port Milwaukee would be Lakers at a length of 1,000ft. and width of 105ft.

Port Milwaukee handles a variety of dry bulk cargoes including salt, cement, bottom ash, fly ash, limestone, agricultural commodities and decorative stones. It also handles liquid bulk including butane, propane, ethanol and gasoline additives.

Cargo volumes fluctuate based on seasonality and customer demand.

Bulk cargoes are predominantly imported or domestic, however, exports are continuing to increase since the opening of a new agriculture maritime export facility

Port Milwaukee and its dry bulk stevedore Kinder Morgan offer a variety of equipment including cranes, conveying systems, front-end loaders and ship loader/unloaders

Liquid cargo at Port Milwaukee is handled via water, rail and truck. The port has a liquid cargo pier where commodities handled by water are loaded/unloaded via pipe to storage tanks at the Liquid Cargo Terminal.

In terms of storage, Port Milwaukee offers both covered and open storage facilities for its dry bulk commodities. These facilities include two 10,000-tonne domes, two 15,000-tonne domes, and 311,000ft^2 of indoor storage, with a lifting capacity of 300 tonnes.

Port Milwaukee's Liquid Cargo tenant has seven liquid bulk tanks and four compressed gas tanks with approximately 300,000 barrel storage capacity

Over the past five years, Port Milwaukee has averaged 1.8mt (million tonnes) of cargo throughput. This figure

remains relatively stable, with some year-on-year fluctuation depending on weather and customer demand.

One of the great advantages of Port Milwaukee is its excellent hinterland connections, which are available via water, rail and road. Positioned on the western shores of Lake Michigan and the northern most point on the Great Lakes with access to the Inland River System, water connections can be made via vessel and barge.

The port has access to:

- two Class I railroads, Canadian Pacific Kansas City and Union Pacific, service Port Milwaukee; and
- Federal Highway System I-94/ 794, which leads directly into Port Milwaukee

Environmental issues are becoming more pressing in ports worldwide, and Port Milwaukee is no exception. In 2022, the port introduced its StewardSHIP programme offering discounts on dockage fees for ship owners that have implemented emission reduction practices and environmental improvements to their vessels.

The port maintains its Green Marine certification, and continually strives to meet more stringent and higher-level criteria.

Port Milwaukee is compliant with DNR, EPA and all local and state environmental standards.

The port works constantly to ensure that it remains competitive, and a good choice for its customers. It works closely with local and regional manufacturers, importers/ exporters, growers and producers.

Port Milwaukee staff and tenants are highly experienced and skilled in handling a wide-range of commodities including complex and specialty cargoes, which makes it competitive and attractive to customers. The port's position on the Great Lakes and access to the inland river system provides a direct link to the North American Industrial heartland via multiple modes of transportation, including two Class I railroads, offering cost effective and efficient supply chains.

Port Milwaukee is open year-round and is operationally available 24/7.

Summer sailings bring breadth of cargo to Duluth-Superior

Duluth-Superior is now a hub for high, wide and heavy project cargoes.

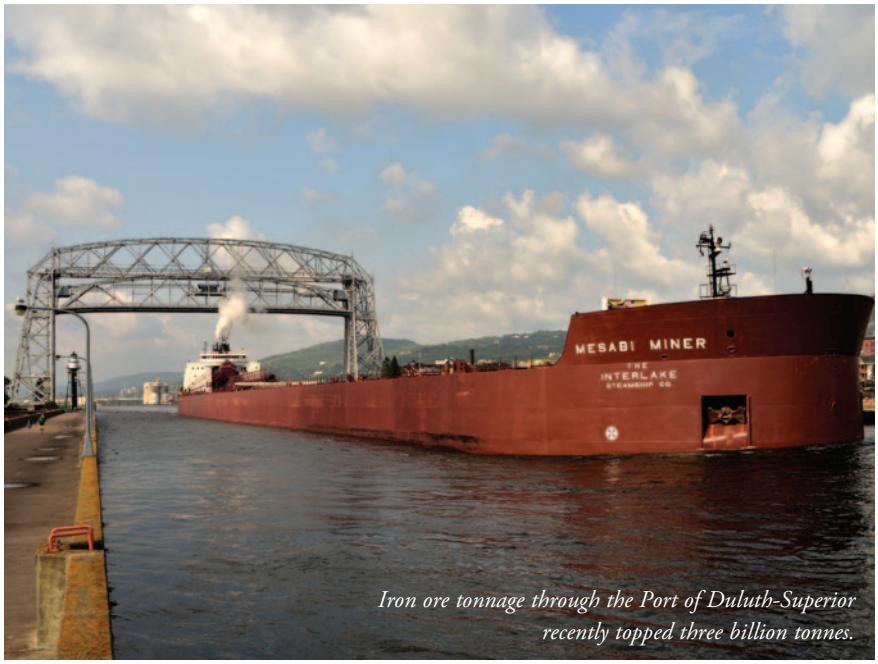
Boosted by 19.6mt (million metric tonnes) last year, the Port of Duluth-Superior's all-time iron ore tonnage total recently topped three billion tonnes since the first shipment sailed in October 1892.

No United States port ships more iron ore, a fact that helped establish Duluth-Superior's early reputation as a bulk natural resources port. Of course, since the Great Lakes-St. Lawrence Seaway System opened in 1959, Duluth-Superior's cargo portfolio has expanded greatly with its emergence as North America's furthest-inland seaport. Now a hub for high, wide and heavy project cargoes and containers moving through the continent's midsection, Duluth-Superior is far more than just a bulk port, but bulk still drives its Great Lakes-leading tonnage totals.

Through midsummer, that tonnage topped 11mt in 2024, paced by more than 8mt of iron ore . The port also tallied nearly 700,000 metric tonnes of coal sailing from its docks, an increase of 49% compared to the 2023 pace. Limestone, grain, salt and cement shipments rounded out the port's dry bulk leaderboard.

Despite ascending bulk tonnage totals, general cargo shipments lassoed more of the spotlight this summer with Duluth Cargo Connect welcoming multiple shipments of 80-metre wind turbine blades, the lengthiest ever shipped through the port, and several industrial heavy-lift pieces destined for locations throughout the American and Canadian northwest.

"It was an excellent first half of the season for general cargo moving across our docks," said Deb DeLuca, executive director of the Duluth Seaway Port Authority. "All of those oversize cargoes have been an impressive sight and a good addition to the cargo activity in Duluth-Superior. Seeing it move efficiently to and from our port underscores the importance of robust terminal facilities and transportation infrastructure. We're fortunate to have both here at the Head of the Lakes, and it's been on full display this summer, especially with those very long wind blades moving smoothly from ship to shore to rail."



Iron ore tonnage through the Port of Duluth-Superior recently topped three billion tonnes.

NORTH AMERICA'S LARGEST IRON ORE HANDLING PORT

PORT SEPT-ÎLES

SEPT-ÎLES . **QUEBEC** . CANADA

Picton Terminals reports on vessel calls and recycling projects

In April, Picton Terminals by Doornekamp used its 1950s-era shiploader to load sugar onto the Whitefish Bay.

Picton Terminals by Doornekamp provides logistics solutions and diverse port services which provide better, more efficient shipping throughout the St. Lawrence Seaway & Great Lakes region. Picton Terminals offers stevedoring and unique storage options, innovative solutions and proximity to large markets.

History

The Picton port was brought back to life when it was purchased by Doornekamp in 2015. The port can trace its roots back to 1948, when Bethlehem Steel Mills of New York discovered a magnetite ore body in Marmora, Ontario, in 1948 via a government aeromagnetic survey.

The mine site was developed between 1951 and 1953 which included the stripping of 120 feet of limestone overburden. The first shipment of iron ore pellets commenced in 1955.

The iron ore containing magnetite was crushed and ground, and magnetically separated to produce 65% iron concentrate and roasted at 2,400F. Each day, one ore train of 30–35 cars delivered iron ore pellets to the Picton port for loading into 25,000dwt ore ships destined for the Bethlehem Steel Company plant in Lackawanna NY via the Welland Canal. Annual plant production was 520,000 metric tonnes.

The Marmora mine was expected to operate for over 50 years. However, in the late 1970s, iron production significantly decreased due to a sluggish economy, runaway inflation and a decrease in world demand for steel. In March 1978, the Marmora Mine closure was finalized resulting in the loss of over 300 jobs in the mine and at the Picton loading dock.

Keeping busy

Picton Terminals by Doornekamp's tug crews have been busy with some special projects, and the terminal anticipates further bulk shipments in autumn.

Furthermore, H. R. Doornekamp

Sunlight in the shiploader tunnel (photo: Paul Wash).

The Algoma Bear *(photo: Brian Way).*

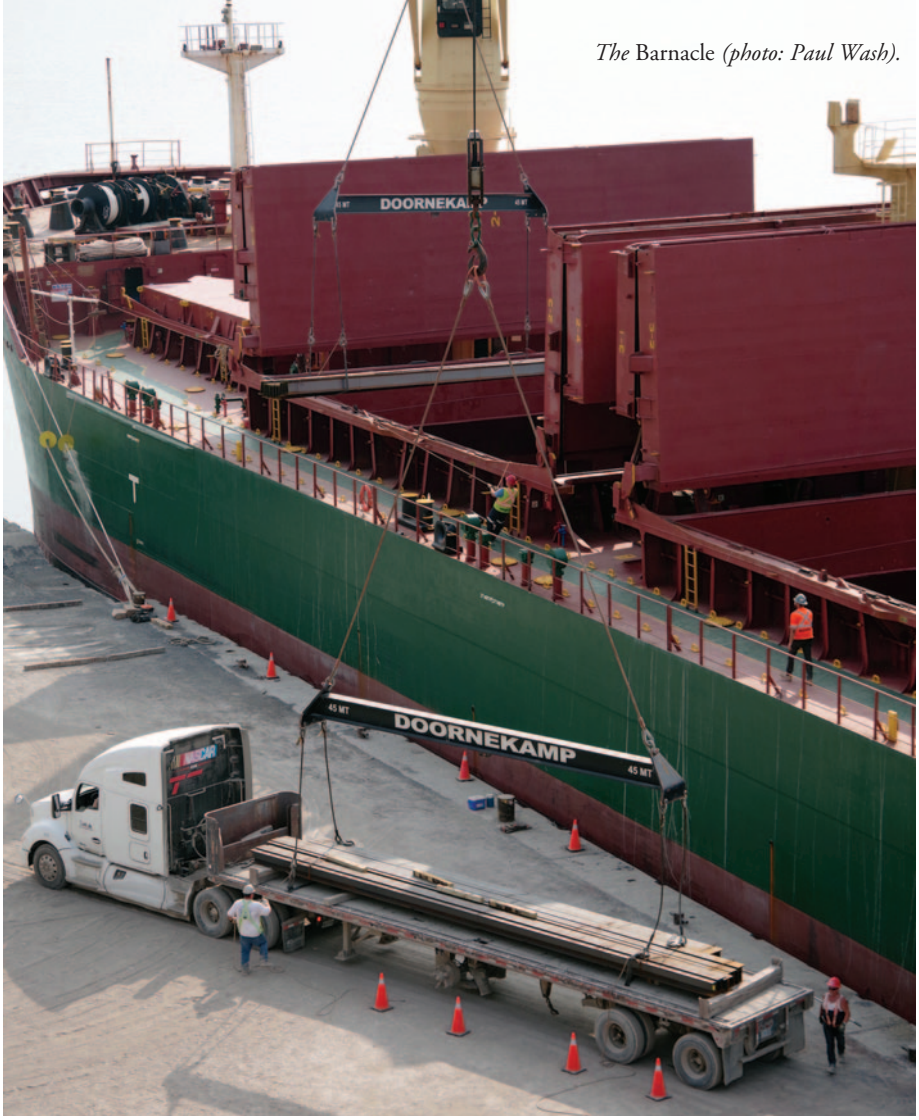
Construction Ltd. is celebrating its 45th year anniversary in 2024.

Picton Terminals itself is in its tenth year of marine shipping operations, so 2024 is filled with milestones for the whole team.

In terms of vessel calls, the terminal has been busy:

- In April this year, Picton Terminals loaded the vessel *Whitefish Bay* with sugar via its modernized 1950s-era shiploader.
- Later, in May, it welcomed the new *Polsteam Dabie* on her maiden voyage into the Great Lakes in May 2024 (steel). Officials at Picton Terminals greatly appreciated that the Captain provided a tour of his vessel.
- Picton Terminals assisted the new *Algoma Bear* (May) and Baie Comeau (June) with equipment.
- Picton Terminals welcomed the *Barnacle*, on Captain Oleksandr Myedvyedyev's maiden voyage into the Great Lakes, in July 2024 (steel), where again it was greatly appreciated that the Captain provided a tour of his vessel.
- The *Amy Lynn D* tugboat crew successfully completed their first voyage pushing the Heidelberg

The Barnacle, *docked at Picton Terminals (photo: Paul Wash).*



The Barnacle *(photo: Paul Wash).*

Materials barge Metis, loaded with cement across Lake Ontario and arriving in Oswego, NY USA.

As part of its dedication to environmentally friendly operations, Picton Terminals' crew recycled train trestle steel (on its site) to build bin walls on its barge — a great example of its dedication to recycling rather than replacing. Over winter, the Doornekamp Construction Team designed and built a pin wall on the *Dowden Spirit* barge. Vertical posts are fixed to the barge deck, and these posts hold the wall sections in place. This pin wall design allows wall sections to be removable, thus affording multiple barge access points, and bin wall layouts. The bin walls serve two main purposes including :

- better containment of aggregates (more aggregate per trip means a more efficient trip); and
- cleaner/safer access to hatches and bits for the tug crews.

The pin wall barge project was constructed using 50 metric tonnes of recycled steel beams from the old Bethlehem Steel train trestle bridge that remains on the Picton Terminals' site.

Bin walls on barge.


YOUR PRODUCTS
OUR PEOPLE
Working hand in hand with our customers, providing the most efficient and reliable marine cargo handling supply chain solutions.
LOGISTEC

Picton Terminals and Parrish & Heimbecker announce new bulk agricultural marine terminal in Prince Edward County

Picton Terminals by Doornekamp and Parrish & Heimbecker, Limited (P&H) are proud to announce the construction of a new bulk agricultural marine terminal at Picton Terminals in Prince Edward County. This state-of-the-art facility will provide crucial support to farmers in eastern Ontario by offering a closer, more efficient delivery option for their corn, wheat, and soybean crops.

The new terminal will significantly reduce travel time for local farmers, alleviate truck traffic on Highway 401 and enhance the overall efficiency of the agricultural supply chain. With high throughput and rapid turnover capabilities, this facility is designed to meet the needs of the region's farmers while expanding P&H's export capacity, which currently serves customers in 24 countries.

The construction of storage silos and receiving buildings is set to commence this autumn (fall), with the terminal expected to be operational by 2026. This development represents a major investment in the future of regional agriculture and the local economy, creating skilled jobs and fostering economic growth in Prince Edward County.

"Our team is excited to partner with the Doornekamp Group, another family-owned business, as we build this new facility at Picton Terminals. P&H is committed to serving Canadian agricultural producers, and the addition of Picton Terminals to our supply chain strategy will make it more economical for local farmers to bring their crops to global markets," said John Heimbecker, CEO, Parrish & Heimbecker, Limited.

"The Doornekamp Group is honoured to collaborate with the visionary team at Parrish & Heimbecker. As we celebrate our first decade of port operations at Picton Terminals, we are thrilled to work with P&H to bring our shared vision of supporting regional agriculture to life. This project is an investment in the next generation of farmers, and we're eager to get started," said Ben Doornekamp, CEO, H. R. Doornekamp Construction Ltd.

About Parrish & Heimbecker, Limited

Parrish & Heimbecker, Limited (P&H) is a Canadian, family owned agri-business, with roots in the agriculture industry dating back to 1909. P&H is growth-oriented, diversified and vertically integrated with operations including grain handling and merchandising, flour milling, as well as crop inputs and feed mills. With over 70 locations from coast to coast, and trade links around the globe, P&H leverages its well-established network of assets, strong business relationships with customers and suppliers and ongoing infrastructure development to support Canadian agricultural producers.

About Picton Terminals

Picton Terminals by Doornekamp provides logistics solutions and diverse port services which provide better, more efficient shipping throughout the St. Lawrence Seaway & Great Lakes region. It offers stevedoring and unique storage options, innovative solutions and proximity to large markets. Doornekamp is known for its dedication to its core values: commitment to customers, team and family; quality of products and services; resourcefulness in achieving its mission. H. R. Doornekamp Construction Ltd. celebrates 45 years of engineering excellence in 2024.

Picton Terminals' existing facility is celebrating its first decade in operation.

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Government of Canada invests in digital infrastructure projects across Canada – with HOPA Ports set to benefit

An efficient and reliable transportation system is essential for the economy. With the National Trade Corridors Fund (NTCF), the Government of Canada invests in making supply chains more efficient, reducing trade barriers, and directly contributes to the growth of businesses to create the economic opportunities of the future.

On 31 May, the Canadian Minister of Transport, Pablo Rodriguez, announced up to $51.2 million for 19 digital infrastructure projects under the National Trade Corridors Fund. By supporting the use of innovative technologies for stronger supply chains, the Government of Canada is ensuring that goods move faster and more cheaply, making life more affordable for Canadians.

This commitment represents strong collaboration with stakeholders across the country on important digital projects to better address transportation bottlenecks, vulnerabilities, and congestion along Canada's ports. By strategically investing in supply chains, the Government of Canada is paving the way for sustained growth, creating opportunities for businesses to thrive domestically and compete on the global stage.

"Strong supply chains help make the cost of living more affordable for Canadians. This technological innovation will help make supply chains faster and more resilient. With these investments, we're making sure crucial knowledge and information can be shared and acted on for the benefit of Canadian consumers,

workers and businesses," said Minister Rodriguez.

Investment in New Intelligent Vehicle Management System at HOPA Ports

As part of this cross-Canada announcement, Minister Rodriguez announced funding for a new Intelligent Vehicle Management System at HOPA's port facilities.

The project will use AI-enabled technology to monitor the number and type of trucks, how they are entering and exiting the port, and how long they are queuing. "This will give us the information we need to make operational improvements like creating staging areas and improving scheduling," said HOPA Ports President & CEO, Ian Hamilton. "Data is a powerful resource that can help us improve supply chains and the environmental performance of our transportation system. We are grateful for the collaboration of Transport Canada in helping us launch this future-minded initiative."

The implementation of the $512,354 project is expected to kick off in 2024, funded on a 50/50 basis by HOPA Ports and the NTCF programme.

Charting the future with new vessels and expanding horizons

Grain handling operations at Sarnia.

As Algoma Central Corporation celebrates its 125th anniversary on 11 August 2024, the company not only reflects on its rich history but is looking eagerly towards the future. This rare milestone marks the beginning of a new chapter, defined by growth, innovation, and fleet renewal. With 18 vessels currently on order or under construction, the next five years will bring significant advancements for Algoma, reinforcing its commitment to sustainability and operational efficiency.

Fleet renewal has enabled Algoma to continue to provide reliable and efficient service to its customers and since 2010, Algoma has invested nearly $600 million in 11 new Equinox-class vessels. These vessels achieve a 40% improvement in carbon intensity, on average, when compared to the ships they have replaced. These ships have brought technological advancements in fuel efficiency and cargo capacity, and have enabled further investments to improve efficiency such as real-time vessel monitoring

The *Algoma Bear* stands out among the newly acquired Equinox Class vessels. Arriving in Canada on 29 April 2024, this 740-foot Seawaymax self-unloader is fitted with several notable enhancements, some of which are expected to improve deadweight capacity by over 1,000 tonnes compared to earlier designs.

Additionally, as a testament to Algoma's dedication to modernizing its fleet, the company has placed a newbuild order for three methanol-ready Kamsarmax-based ocean belt self-unloaders. These ships, which are expected to exceed EEDI Level III requirements and include Tier 3 engines, will replace the oldest vessels in Algoma's ocean self-unloader fleet and are expected to be 40% more efficient than their predecessors, owing to a combination of fuel efficiency and optimized cargo lift.

Algoma Bear at HOPA Ports (photo: Kelly Knoseworthy).

Photo of the Algoma Bear *taken from the* Algoma Niagara *while they transit down Lake St. Clair.*

Further solidifying its future growth in expanding markets and partnering with Canadian customers, Algoma is also investing $127 million to build two new 37,000dwt ice-class climate-friendly product tankers. These vessels will serve the Irving Oil refinery in Saint John, New Brunswick, delivering to ports in Atlantic Canada and the US East Coast. The vessels are currently under construction and expected to arrive in early 2025.

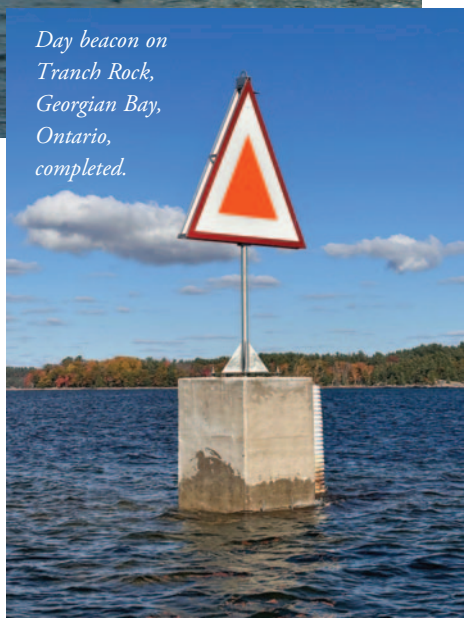
The marine sector, including marine carriers like Algoma, plays a pivotal role in providing the most sustainable mode of transporting goods and is a key part of our critical supply chain network. The cargo Algoma transports around the Great Lakes – St. Lawrence Seaway is moved on behalf of key customers around the region that support major industries like construction, agriculture, and transportation. Iron ore, mined in Quebec, is transported to Hamilton, Ontario to manufacture steel, which is fundamental for producing things like cars, appliances, and construction materials. Grain, sourced from farms in Saskatchewan and Manitoba, is not only transported to mills in Ontario, but is also exported to international ports in Europe, the Middle East, and Africa from the Port of Thunder Bay, Ontario. This grain is crucial for producing bread, pasta, cereal, and various other food products. Road salt sourced from Goderich, Ontario, the largest salt mine in the world, is essential for de-icing roads during winter, ensuring safe transportation. Petroleum products from refineries in Eastern Canada are transported to distribution terminals for road transportation (gasoline), heating homes, and for the aviation industry (jet fuel).

Algoluna *at the Port of Green Bay (photo: Master Sergeant Media LLC).*

As Algoma celebrates its 125th anniversary and steps into this next era, the company remains committed to its values and core competencies. Algoma's investments and commitment to innovation are not only driving the company forward but also playing a crucial role in shaping a sustainable future for the marine industry and the world at large.

Safety first on the Lakes and beyond thanks to the Canadian Coast Guard

Crew of CCGS (Canadian Coast Guard Ship) Cove Isle *and MCI (Maritime and Civil Infrastructure)* Parry Sound *working together on a day beacon, on Tranch Rock, Georgian Bay, Ontario.*



Day beacon on Tranch Rock, Georgian Bay, Ontario, completed.

The Canadian Coast Guard's (CCG) Aids to Navigation programme is an essential part of maintaining maritime safety and commerce, and helps ensure the safe and efficient transit of people and goods across the Great Lakes. CCG maintains a network of over 17,000 aids to navigation across Canada, including lighthouses, beacons, range lights, and several types of floating buoys.

The Aids to Navigation programme in CCG's Central Region is responsible for more than 6,300 floating and fixed aids to navigation throughout the Great Lakes and St. Lawrence River in Ontario and Quebec. These aids help identify hazards and preferred routes, and help mariners confirm their position, for both recreational and commercial boaters alike.

As commercial shipping picks up in the spring, CCG is busy with the commissioning of buoys across the Great Lakes. Depending on the type and location of these aids, this can include:

- placing buoys in the correct location;
- installing lanterns and new reflective markings on buoys; and
- cleaning and maintaining buoys, markers, and lighthouses.

In the fall (autumn), the CCG decommissions these same aids.

To support its Aids to Navigation programme, the CCG relies on several multi-purpose assets. It has small,

1.3 metre, Canadian Coast Guard (CCG)-designed buoy to be placed by CCGS Samuel Risley *on Lake Superior, being loaded at CCG base in Parry Sound, Ontario.*

CCGS Griffon *loaded with buoys in her home port of Prescott, Ontario.*

specialized, buoy tending vessels, as well as larger vessels with powerful cranes to lift and place heavier buoys. These same large vessels are also equipped with smaller work barges, to access shallow water areas. CCG helicopters often transport crews to isolated sites across the Great Lakes, where they maintain and repair fixed aids, including lighthouses and range lights.

The Aids to Navigation programme works very closely with CCG Marine Communications and Traffic Services during the spring and fall decommissioning periods to monitor completed operations and ensure the most up-to-date data is available for all users and clients. This collaboration is crucial for monitoring and reporting active navigational issues to the commercial mariner and the general public through Navigational Warnings (NAVWARN).

Crew of CCGS Cove Isle *and MCI* Parry Sound *with contractor barge working together on a day beacon, on Wall Island, Georgian Bay, Ontario.*

CCGS Samuel Risley *in Thessalon, Ontario, on Lake Huron.*

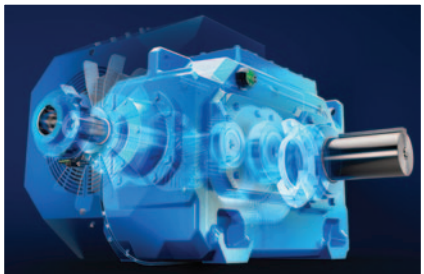
The CCG also carries out aids to navigation work on smaller inland waters across Canada, to support the busy summer recreational boating season.

About the CCG

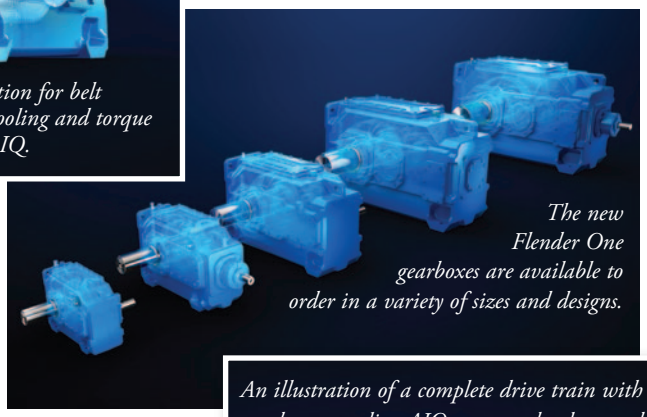
The Canadian Coast Guard is a special operating agency within Fisheries and Oceans Canada. It works to ensure the safety of mariners in Canadian waters and protect Canada's marine environment.

The CCG supports Canada's economic growth through the safe and efficient movement of maritime trade. It helps to ensure the country's sovereignty and security through its presence in Canadian waters. DCi

Launch of gearbox platform extension – **Flender One**: the next chapter



A Flender One configuration for belt conveyors with external cooling and torque measurement thanks to AIQ.



The new Flender One gearboxes are available to order in a variety of sizes and designs.

An illustration of a complete drive train with new Flender One gearbox, revealing AIQ sensor technology underneath.

"We are reinventing the standard." Those were the words of CEO Andreas Evertz when Flender introduced the Flender One single stage version to the market last year.

Now, this reinvention enters the next chapter. Flender announces the global launch of the next extension of Flender One gearboxes. After the models for pumps and paper applications, Flender One expands its reach, offering versatile solutions for over one hundred different applications.

The new gear units are designed to meet a wide range of application needs, including bucket elevators, belt conveyors, and hoisting applications. With a broad spectrum of power classes, sizes, and designs, these gear units ensure optimal coverage of various industrial requirements.

Perfect fit with each gearbox

Flender One stands out with its tailored solutions. Customers only purchase what they need, eliminating unnecessary components and maximizing efficiency. This customization reduces operating expenses and enhances performance, providing a perfect fit for each specific application. Additionally, the gearboxes offer a wide range of add-on parts and customizable output shafts.

The Flender One design saves both time and money in planning and plant operations. The new configuration process can be completed in minutes with just three parameters. Combined with instantly accessible 3-D data, prompt quotations, and shorter delivery times due to automated manufacturing processes, project timelines are accelerated from the planning phase. Overall, plant operators can achieve up to 25% time savings in planning through simplified processes.

In operation, the Flender One platform reduces operating expenses. All gearboxes are equipped with performance-optimized Metaperform® gearing, reducing power dissipation by up to 20% compared to previous models and a 30% higher thermal capacity. Also, the bearing lifetime increases by 80%. This results in faster cost amortization for industrial gearboxes from Flender than ever before.

Smart gearboxes with AIQ technology

Flender One offers built-in gear unit intelligence straight from the factory. Each unit comes with an integrated AIQ Core sensor, providing digital monitoring and intelligent onboard analytical functions. This allows for increased plant availability and process optimization, reducing unplanned downtime by up to 70%. Data- and need-based maintenance intervals can decrease service costs by up to 40% and service-related downtime by up to 50%. The optional torque measurement function allows for process and operating point optimization. The AIQ Core torque can be easily selected via the configurator.

Rouven Daniel, President Industrial Gear Units at Flender, also once again stresses the fact that with the help of collected data and AI models, Flender is now able to size the gearboxes only as large as needed for the respective application. "Most industrial gearboxes from all manufacturers in the field, including Flender, are oversized by up to 50%. With Flender One and AIQ, we have the right tools to continuously eliminate this oversizing together with our customers. As a result, we will realize massive savings in raw materials, energy consumption, delivery times and installation space. Any waste is eliminated in terms of the environment and costs."

On the way to the customized gearbox

In the future, further expansions of the Flender One platform will make it possible to configure gearboxes tailored to the respective application and the associated requirements. Despite maximum individuality, customers will benefit from the advantages of series production: Process efficiency in production and thus fast delivery times and low costs.

This is made possible by a real milestone in transmission manufacturing: the complete digitization of the engineering process. It triggers the design exactly according to customer requirements and translates it into a fully automated manufacturing and delivery process.

Flender CEO Andreas Evertz states, "Flender One represents a significant shift in how we think about gearboxes. It is not just a mechanical iteration of its predecessor FSG but an entirely new solution from the first customer inquiry to operation in the plant."

Rouven Daniel adds, "Flender One stands for being more individual, efficient, and smarter. With an easy-to-understand configuration process, automated manufacturing, and comprehensive 3-D data and documentation in the cloud, it saves our customers valuable time. In operation, Flender One excels with improved power dissipation and AIQ optimization, making it the most efficient Flender gearbox solution we have ever introduced."

A proven successor

Flender One succeeds the renowned standard industrial gearbox range, FSG, with over 500,000 units in the field. As the most successful standard industrial gearbox range to date, FSG sets a high bar, but Flender One is ready to surpass it with its innovative features and superior performance.

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100,000th machine: Liebherr sets milestone on its 75th anniversary

It is another milestone in the history of Liebherr-Hydraulikbagger GmbH: the production of the 100,000th machine at the Liebherr Group's founding site. The anniversary machine is absolutely unique, as all employees were able to place their names on the machine. The white LH 22 M Industry therefore bears a very special signature.

On the anniversary machine of Liebherr-Hydraulikbagger GmbH, the founding plant of the Liebherr Group, the 100,000 is emblazoned in large black numbers on white background. The machine was presented to employees for the first time as part of the celebrations to mark the Liebherr Group's 75th anniversary. As a special highlight, all employees were able to sign the LH 22 M Industry personally.

Like all Liebherr mobile material handling machines, the anniversary machine is characterized by high flexibility and exceptional mobility. The LH 22 M Industry impresses with its sturdy and compact design, which makes it particularly suitable for deployment in the area of recycling. With the latest engine and hydraulics technology, developed in-house by Liebherr, the main focus is on fuel efficiency while at the same time enhancing material handling performance. The attachment of the machine is available in a variety of versions and is thus always optimally matched to your respective application. The 100,000 machine is equipped with a sorting grapple, making it ideal for demolition or recycling applications.

Liebherr was founded 75 years ago in Kirchdorf an der Iller

In 1949, the pioneer Hans Liebherr invented the world's first mobile tower crane, laying the foundations for the future group of companies. Back in 1954 Hans Liebherr laid the foundation for a new type of machine with his first L 300 wheeled excavator which to this day is still among the best in the world. In the following years, the product range was constantly expanded to meet the growing demands of the construction industry. The A 650 wheeled excavator was the first fully hydraulic wheeled excavator from Liebherr in 1960. Based on this success, Liebherr expanded its product portfolio in the 1980s to include material handling machines in order to meet the growing requirements in the field of material handling. The specialized machines are designed to move large quantities of bulk materials, scrap, timber and other materials efficiently and safely.

In 1989 the Litronic followed as another innovation highlight from Liebherr. The Litronic is a complete system of intelligent electronics and functional hydraulics for monitoring, controlling and coordinating all key systems of the excavator. The perfect interaction of machine and tool attachment plays a decisive role for successful deployment on site. This is why Liebherr also invested in this area and in 2001 was able to present its fully automatic quick coupler system LIKUFIX. With LIKUFIX the machine operator can change all mechanical and hydraulic tool attachments at the touch of a button from the cab as well as adjust the hydraulic pressures and volumes. With the introduction of the new generation of articulated trucks in 2020, Liebherr developed into a full-liner in the earthmoving sector. Further developments are continually being added in all areas in line with the motto 'Standing still is a step backwards'.

About the Liebherr Group – 75 years of moving forward

The Liebherr Group is a family-run technology company with a widely diversified product programme. The company is one of the largest construction equipment manufacturers in the world. It also provides high-quality, user-oriented products and services in a wide range of other areas. The Liebherr Group includes over 150 companies across all continents. In 2023, it employed more than 50,000 staff and achieved combined revenues of over €14 billion. Liebherr was founded by Hans Liebherr in 1949 in the southern German town of Kirchdorf an der Iller. Since then, employees have been pursuing the goal of achieving continuous technological innovation, and bringing industry-leading solutions to its customers. Under the slogan '75 years of moving forward', the Group celebrates its 75th anniversary in 2024.

The 100,000 machine at the founding site in Kirchdorf an der Iller bears a special signature: all employees have signed it.

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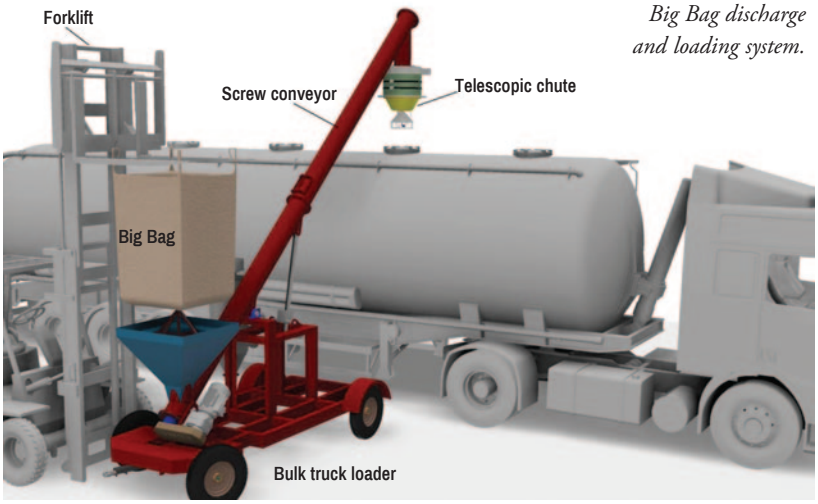
Mobile big bag discharging and bulk truck loading system from Polimak

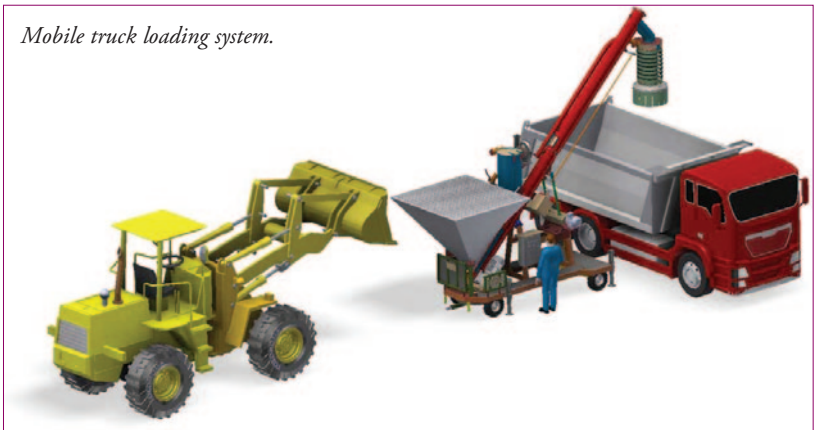
Bulk solids in the shape of powders and pellets are stored and moved around in many industrial applications. They are stored in bags, bulk bins, and warehouses and have to be moved around by using trucks or other bulk carriers. Loading and discharging these solids is a major logistic issue and has to be managed. Polimak's systems give a strong capability to move around such materials efficiently, safely, and economically due to their excellent design and robust construction.

A range of systems are available, including:

- **Big Bag system:** mobile Big Bag discharge silo truck loading system sack discharge jumbo bag handling;
- **large hopper system:** mobile truck loading with front-end wheel loader large hopper loading system
- **vacuum system:** mobile silo truck loading system with vacuum sucking hose.



Big Bag discharge and loading system.



Mobile truck loading system.

Mobile truck loading system with vacuum system.

Fast, robust and economical

Polimak's mobile bulk truck loading processes, using the company's unique technology, guarantees quick emptying of bags and robust, automatic and dust-free loading in the truck. For this reason, Polimak's mobile truck loading systems are in use all over the world with very high client satisfaction.

They are not only efficient, easy to maintain and above all economical. Customers that require Big Bag discharging and loading should look at Polimak's models to find one that exactly suits their needs.

Polimak's system consists of a mobile platform, Big Bag discharger, loading screw, telescopic loading chute and dust collector. The system can be towed by a forklift and a screw conveyor can be brought to horizontal position for easier and safe transport.

Advantages of Polimak's bulk loading systems

- **Mobility:** wheeled mobile chassis that allows easy transportation of the system to the desired location.
- **Functionality:** compact form can be moved easily from one place to another.
- **Efficiency:** the system can transfer large quantities of material in a short time.
- **Ease of operation:** very few operators are necessary to handle both discharging and loading trucks/tankers at the same time.
- **Availability of remote control:** the operator can control the whole operation with a remote controller.
- **Reliability:** it can work a long time without any need for maintenance, which saves money.
- **Suitability for uneven ground:** the screw jack levelling legs can be adjusted to any place to place the system.
- **Flexibility:** the loading bellows can be extended and retracted according to the height of the bulk truck.
- **Environmental friendliness:** built-in dust collection system captures dust and prevents material loss.
- **Robust design:** the system will work for continuous long hours without failure.

Handled materials by Polimak's bulk truck loading system

Materials suitable for handling by Polimak's bulk truck loading system include those in powder and granule form like: cement, fly ash, mining minerals, calcium carbonate, PVC, plastic pellets, plastic powders, polyethylene, ceramic powders,alumina, bentonite, bauxite, coal, cement clinker, gypsum, perlite, kaolin, limestone, marble powder, soda ash, quartz, urea, sodium sulphate, wheat, flour, animal feed, seed, corn, rice, sugar, salt and similar powdered or granular dry bulk solids.

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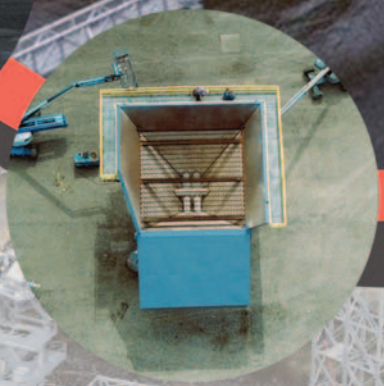

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Service contractors

results come down to training

Some contractors only address the effects of conveyor inefficiency, while others offer solutions to remedy the root causes of inefficiency (all photos: copyright © 2024 Martin Engineering).

High-volume belt conveyor systems are among the most hazardous pieces of equipment in any bulk handling operation. Maintaining the delicate balance between production demands and efficiency can be a challenge for any internal maintenance team. To control labour costs and improve safety, operators often enter servicing agreements with outside contractors to perform routine maintenance or to retrofit new equipment during a shutdown.

Although outside contractors may be experienced, they often lack the proper training and specific knowledge needed to offer adequate servicing and installation of modern equipment designs. Moreover, this gap in expertise might limit what recommendations to common problems they offer, causing them to default to antiquated equipment or debunked solutions. This is why it is so crucial for contractors to have ongoing training that ensures they use modern techniques, install the latest equipment and operate to workplace safety best practices.

MSTs gather near a heavy-duty conveyor specifically set up for training purposes, ready to properly install new equipment.

Modern equipment & techniques training

As the global leader in belt conveyor accessories and material flow technology, Martin Engineering technicians are often invited to offer solutions to serious conveyor issues. For example, a common complaint from customers is that the belt cleaners currently installed on the belts are ineffective. The perception of the operator is that the product is defective or just plain "garbage". Upon inspection, the technicians often find the equipment was simply, (1) not installed properly, (2) not adequately maintained (improper intervals, over-tensioned, etc.) and/or, (3) inappropriately specified to match the application requirements. All these issues can be addressed through proper training.

That's why Martin Engineering ensures its team of Martin Service Technicians (MSTs) are up to date on the latest techniques and bulk handling technologies by conducting regular, intensive week-long 28-hour training sessions like the most recent one in the spring of 2024. MSTs

Confined space entry requires specific training since it is one of the most dangerous activities in bulk handling.

who have been with the company for a few months to a few decades regularly receive refreshers on their existing knowledge and to learn about new products and practices.

From deep mines to large cement plants, the goal of the training is to ensure Martin's customers experience maximum efficiency and productivity in their bulk handling systems and are provided with the highest standard of service that complies with safe workplace best practices at every step.

"As factory-trained MSTs, it's not just our experience but also our knowledge that allows us to provide a solution for our customers," said Blayne Anderton, Martin Service Technician. "For an expert contractor to come in and do the job professionally and safely is one less stress the customer needs to worry about."

Considerations when entering a service contract

A service contract can reduce labour costs and ensure conveyor systems run efficiently. This has proven to reduce unscheduled downtime, improve system safety and lower the cost of operation. To improve project outcomes for every visit, service technicians should:

- Walk the Belt™ to identify safety issues and obstacles to system efficiency.
- Carry the correct certifications to provide the service safely.
- Have the training required to properly complete maintenance and installation tasks.
- Observe workplace safety best practices for every project including lockout/tagout/tryout and assistance-required procedures.
- Possess the knowledge and experience to identify/offer economical solutions.
- Provide a Walk the Belt™ report with photos tracking the project and any recommendations.

Martin Engineering's MST training hours are not just in the classroom but also hands on, working with operational life-sized equipment specifically designed to simulate real world environments. The most recent training week featured product training (install and maintenance), safety training (confined space entry, energy isolation, manlift, first aid and CPR), and skills training (welding).

With a focus on the details, MSTs were taught the most efficient methods of installing Martin's newest products from the innovative CleanScrape® Primary Cleaner to the labour-saving Modular Transfer Point Kit.

"Martin is uniquely positioned because while we're on the site we're walking the belts and creating detailed reports with pictures," Jesse Beasley, Martin Service Technician, pointed out. "We offer ongoing knowledgeable support, not just installing our equipment and leaving."

Training resources

Martin Engineering has long been recognized as having one of the most comprehensive onsite and on-line conveyor training programmes in the world. The training textbooks, *Foundations*, *The Practical Resource for Cleaner, Safer, More Productive Dust & Material Control* and *Foundations for Conveyor Safety*, written by established industry experts, have become standard in several vocational programmes with 22,000 copies currently in circulation worldwide.

The company also has the largest free

Innovative equipment like the CleanScrape have redefined what belt cleaner installation and tensioning looks like.

online archive of training resources in the Foundations Learning Center presented by knowledgeable and engaging trainers. The Learning Center uses a mix of text, graphics, videos, webinars, online events, and live experts available to answer questions. These free resources have democratized conveyor safety training globally, allowing for refreshers amongst both internal staff and contractors if questions about conveyor maintenance arise.

Managing risk for better production

Operation managers and safety managers alike are encouraged to go over reports created by MSTs and consider their recommendations. The internal Martin Engineering training programme has ensured that suggestions offered in Walk the Belt reports are informed observations that can help improve production and safety, as well as forecast any issues that might result in unscheduled downtime or equipment damage. This allows operators to plan future improvements and better control costs.

"Our service technicians are basically the face of Martin; they're the front line," concluded Mike Moody, Business Development Manager for Martin Engineering. "Our MSTs are factory-trained service professionals who are fully aware of everything that needs to be looked at to make sure systems are safe and working best for our customers."

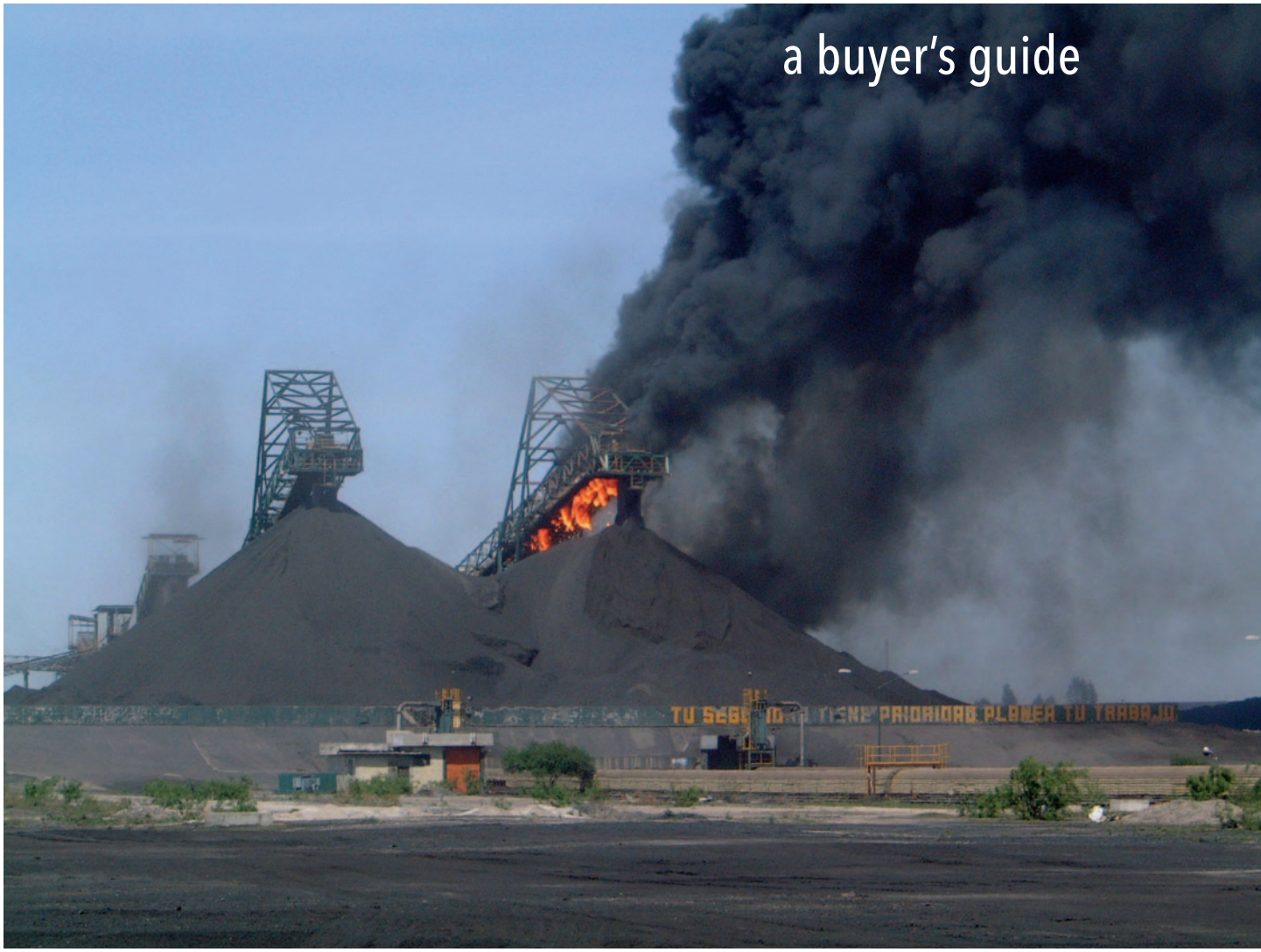
Retrofitted installation by a professional who is familiar with the new equipment has the fastest and best result.

About Martin Engineering

Martin Engineering has been a global innovator in the bulk material handling industry for more than 80 years, developing new solutions to common problems and participating in industry organizations to improve safety and productivity. The company's series of *Foundations* books is an internationally recognized resource for safety, maintenance and operations training — with more than 22,000 print copies in circulation around the world. The 500+-page reference books are available in several languages and have been downloaded thousands of times as free PDFs from the Martin website. Martin Engineering products, sales, service and training are available from 17 factory-owned facilities worldwide, with wholly owned business units in Australia, Brazil, China, Colombia, France, Germany, India, Indonesia, Italy, Malaysia, Mexico, Peru, Spain, South Africa, Turkey, the USA and UK. The firm employs more than 1,000 people, approximately 400 of whom hold advanced degrees.

Fire-resistant conveyor belts

a buyer's guide



Fire is one of the most destructive and unforgiving forces known to man, destroying everything in its path. Insurance companies are becoming increasingly alarmed about conveyor fires. Anecdotal, as well as factual evidence gained from numerous laboratory tests, certainly indicates that even some of Europe's biggest terminal and ports, are using conveyor belts that are not nearly as resistant to fire as they are claimed to be by the supplier. Here, one of Europe's top application engineers, provides an essential guide to choosing fire resistant conveyor belts.

Establishing the correct grade

Never assume that the fire resistance specification (grade) of your current belts is in line with the current level of risk. The best way to check is to carry out an internal risk assessment, with the type of materials being conveyed and the operating environment at the top of the checklist. Fortunately, establishing the correct level or standard of fire resistance needed for conveyors operating above ground is relatively straightforward. EN 12882 is the standard for safety requirements for conveyor belts for general-purpose use.

The minimum grade

In environments where coal dust, fertilizer, grain or other potentially combustible materials such as biomass are present, it is essential that the conveyor belt cannot create static electricity that could ignite the atmosphere. Belts need to be able to allow static electricity to pass through the metal frame of the conveyor structure down to earth rather than allow static to build up. The safest approach is for all belts to meet EN 12882 Category 1, which simply demands that the belt is anti-static and conforms to EN ISO 284 international standards. This means that they can all be used in ATEX 95 (94/9/EC Directive) classified zones if necessary.

Bulk handling — typical grades

The basis of most tests for belting fire resistance is EN ISO 340* and is included within the classifications of EN 12882 on electrical and flammability safety

*EN/ISO 340 testing

*EN/ISO 340 tests involve exposing six individual samples of belt to a naked flame causing them to burn. The source of the flame is then removed and the combustion time (duration of flame) of the test piece is recorded. A current of air is then applied to the test piece for a specified time after the removal of the flame. The flame should not re-ignite.

The time it takes for the belt sample to self-extinguish after the flame has been removed is then measured. The duration of continued burning (visible flame) should be less than 15 seconds for each sample with a maximum cumulative duration of 45 seconds for each group of six tests. This means that the average allowable time per sample is 7.5 seconds. This factor is of paramount importance because it determines the distance that the fire can be effectively carried by a moving belt.

ISO 340 testing.

Even if a manufacturer states that its belt has passed the ISO 340 test, caution should still be exercised. A typical conveyor belt can easily travel more than 40 metres within the 15 seconds that is allowable for a belt sample to pass the test, which is a potentially very dangerous distance. For this reason, Fenner Dunlop in the Netherlands applies an average maximum time limit of only one second, which is more than six times faster than the required standard and decidedly safer as a consequence.

All belts should at least be EN 12882 Category 1 (anti-static conforming to EN ISO 284 international standards)

requirements for general purpose conveyors used above ground. These standards make the distinction between fire resistance with covers, which is Class 2A (or K grade) and fire resistance with and without covers, which is Class 2B (or S grade). The relevance of "with and without covers" is primarily because the rubber skim layers between the synthetic plies protect what is essentially the most flammable part in the construction and which can actually be the path for flames to propagate. The rubber skim material therefore needs to be as equally fire resistant as the outer covers. Worryingly, manufacturers who want to minimize costs to achieve a more competitive price often use rubber skims that have insufficient resistance to fire.

For the majority of bulk material handling 'open air' applications, EN 12882 Class 2A (K grade) or Class 2B (S grade) levels of fire resistance would be perfectly adequate. The best way to decide between Class 2A and Class 2B is to consider the material being carried. For moderately abrasive materials such as grain, then Class 2A is usually suitable. However, if the material is more abrasive and tends to wear the top cover more rapidly then the safest option is to choose Class 2B.

Handling biomass

A higher level of fire resistance for conveyors handling biomass is necessary. One of the biggest dangers is dust emission. In the production process of biomass wood pellets, wood chip and similar renewable resources, the materials

Class 2A is usually perfectly adequate for moderately abrasive materials such as grain.

EN 12882 Class 4A is usually the best choice for conveyors operating in closed or covered conditions.

are continually broken down. This results in high levels of combustible dust that can be easily ignited by static electricity. Biomass dust can also be highly prone to self-ignition, especially if it becomes damp. A chemical reaction can take place that causes self-heating and what is referred to as "off-gassing" (carbon dioxide, carbon monoxide and methane emissions).

Because of the increased risk of self-ignition, the use of covered conveyors is becoming increasingly commonplace. In enclosed environments the risk of human life is heightened because burning rubber and other synthetic materials such as polyester and nylon release thick toxic smoke that contains cyanide, carbon monoxide, sulphur dioxide, and products of butadiene and styrene. For this reason, EN 12882 Class 4A is usually the best choice for conveyors operating in closed or covered conditions because it involves a more severe fire test according to EN12881-1 method A, C or D in addition to EN/ISO 340 testing.

Rubber compounds that have a combined resistance to both fire and oil are available for materials that contain oil. This is an important consideration when deciding on the correct type of fire-resistant belt so it is important to be very specific when requesting quotations from manufacturers and suppliers. If you are still unsure of what grade of belting you need then do not hesitate to seek expert advice.

The chemical ingredients used to create fire-resistant rubber generally have an adverse effect on its wear resistant properties. Consequently, fire resistant belts tend to wear faster and as the thickness of the rubber reduces so does the level of protection given to the inflammable carcass. To provide an adequate wear life I would expect an abrasion figure no higher than 160 mm^3.

Choosing the right supplier

Deciding on the correct grade of fire-resistant belt is much easier than deciding who should supply that belt. Always select a supplier that will readily provide a high standard of professional technical support and who has a good reputation for quality. Most importantly of all, always select belts based on their safety and longevity (whole life cost) rather than for short-term 'economic' or budgetary motives. Experience shows, without doubt, that the price of the belt will invariably be reflected in its overall quality and its ability to self-extinguish fire in good time.

If you intend to buy from a service provider then beware of those who appear to offer very competitively priced components because they are not necessarily providing the best value for your money or the best safety. Supplying low-price components such as rollers and conveyor belts presents them with a win-win situation because they enjoy much

Do not hesitate to seek expert advice.

bigger profit margins with the added benefit of more frequent repairs and replacements.

The biggest source of low-price, low-grade belting is the Far East, primarily China. Their low prices may be very tempting, but it is important to understand how those prices are achieved. It has very little to do with labour costs because they account for as little as 5% of the production cost. The true reason for the difference in price is that raw materials, including the expensive chemicals needed to create rubber that has a good standard of resistance to fire, ozone & ultraviolet, oil and wear, represent up to 70% of the cost of producing a conveyor belt. Consequently, the only way to manufacture a low-price belt is to use low-price (low grade), raw materials. There simply is no other way. This is why laboratory testing shows that some belts that are claimed to be fire-resistant burn like paper and up to 90% of all belts sold in Europe are not resistant to the damaging effects of ground-level ozone and ultraviolet light.

Of equal concern is that manufacturers located outside of the Europe are not subject to REACH (Registration, Evaluation and Authorization of Chemical substances) and POPs (Persistent Organic Pollutants) regulations. This provides them with an open door because they are free to use unregulated chemicals, which cost much less compared to their regulated counterparts, even though they may be entirely prohibited or at least have strict usage limitations within Europe.

Manufacturers located outside Europe are not subject to same high standards of environmental and human safety regulation.

Provenance and accountability

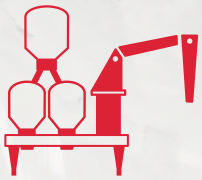
For the very good reasons just mentioned, ensure that you are totally confident of provenance (manufacturer's origin) by asking for certified confirmation of the actual place of manufacture. This is important because, with the exception of Fenner Dunlop in The Netherlands and North America, nearly all manufacturers supplement their production with imported belting. Finally, always choose a supplier that can be held accountable and who would be easy to communicate with in the event of a problem.

About the author

Rob van Oijen has specialized in conveyors for over 17 years, supporting businesses throughout Europe, Africa, the Middle East and South America and is widely regarded as being one of the most respected application engineers in the conveyor belt industry. DCi

The answer to your bulk handling questions

Ship unloaders



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BULK HANDLING

An empty vessel?

ship-unloading technology

Louise Dodds-Ely

Autonomous ship-unloaders for bulk materials by iSAM

The task

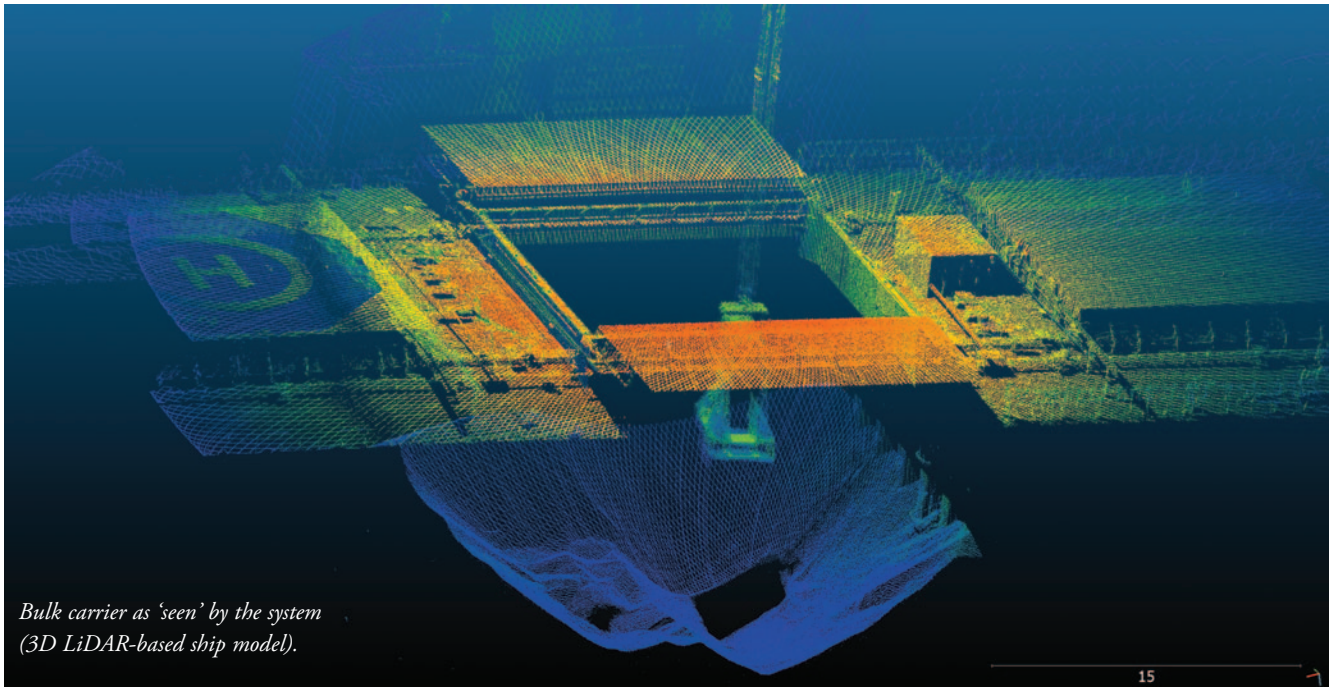
In an increasingly competitive environment, all manufacturers and operators of large gantry cranes have been tasked with providing a higher level of automation to provide additional value and reduce the cost of operation.

With the exception of fewer than 20 ship unloaders globally — which have been already automated by iSAM — all ship-unloaders still need to be manned by an operator, and only basic teach-in procedures are available to support manual operation. Major parts of the unloading process have to be performed entirely manually and the collision protection is sometimes difficult, because the operator can see neither the unloading area nor the complete machine in all positions.

iSAM has developed and implemented two main technologies to improve production, safety and economy on grab ship unloaders. This technology allows for the first time autonomous operation of equipment in ship-to-shore operations and is also available for continuous or pneumatic unloaders.

The solution

The task of operating a grab ship-unloader autonomously was a great challenge, if not a mission impossible. With a combination of the latest 3D LiDAR technology originating in self-driving cars, highly accurate RTK GPS systems for machine positioning and internally developed



Bulk carrier as 'seen' by the system (3D LiDAR-based ship model).

leading-edge control technology, iSAM succeeded in solving the problem.

One of the key components of the systems is the intelligent grab tracking system based on the 3D real time laser scanner. The new high-tech scanner with 128 individual scan lines is fast enough to track the hold/close ropes and the grab itself in real time to measure sway, attitude and rotation of the grab. In most installations — with the exception of the largest cranes and special crane geometries — the same sensor can be used to track the grab, measure the hatch positions and generate the material profile inside the hatch.

Grab ship-unloader in autonomous operation

In contrast to a human operator, the control system is not only able to calculate the current position but also the kinetic energy of the grab at any point on the moving path. This guarantees that the grab does not collide with the hatch or the unloader structure during the whole cycle — not even in case of 'hard' stops, for instance when an emergency stop is pushed. It also allows for a precise 'landing' of the grab at any given point in the cargo hold with a precision of about 0.5m — regardless of the environmental conditions.

Whereas the 3D scanner is the 'eyes' of the automation system, iSAM's leading-edge control technology connected with the PLC is the 'brain'. Finally, the best unloading strategy is automatically determined on the basis of the known material properties and the current sensor data of the machine environment. For example, a 'performance-oriented' strategy with a reduced cycle time is automatically chosen for materials that flow well, for instance pellets. For coal and ores which have poor flowing properties, the system selects a strategy to unload right from the start "out of the corners".

Highlights

- Real autonomous operation, not a remote control.
- Autonomous control, including anti-sway and active use of sway underneath hatch coaming.
- Permanent update of data for the energy and position model for the grab's moving path.
- Safer operation due to control within machine limitations by enforcing e.g. limits for diagonal pull.
- Emergency Stop safe operation by limiting the kinetic energy of the grab ensuring that it can't hit vessel structures.
- Very uniform and steady unloading performance minimizing equipment idle times.
- Driverless operation even under the hatch coaming, under virtually any weather conditions.
- Operation of all equipment from a central control station, i.e. minimum stress for the supervisory operator thanks to a maximum degree of automation (easily up to six cranes by one operator).
- Possibility of manual intervention from the central control station by remote control.
- Lower wear and tear because mechanical performance limits are respected in automated mode

References

iSAM has already delivered autonomous solutions for ship-unloaders for import and transshipment terminals, including:

- four autonomous grab ship unloaders up to Capesize class vessels (Hansaport, Port of Hamburg, Germany);
- four autonomous grab ship unloaders up to Valemax class vessels (EMO, Port of Rotterdam, Netherlands);
- three autonomous grab ship-unloaders up to Valemax class vessels (Vale Malaysia Minerals, Teluk Rubiah Maritime Terminal, Malaysia);
- five further system currently in delivery to Bahrain, Canada and Japan; and
- numerous 3D modelling systems for machine envelope protection for shiploaders.

About iSAM

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

iSAM's team includes specialists from the engineering, computer science and physics sectors as well as business economics, focusing on increasing customer value. The company's customers can be found all over the world and in almost every industry, such as mining, coal handling, transport and logistics, steel and metal manufacturing and processing, tube welding and pipeline construction, mechanical engineering and plant building, electronics and aerospace.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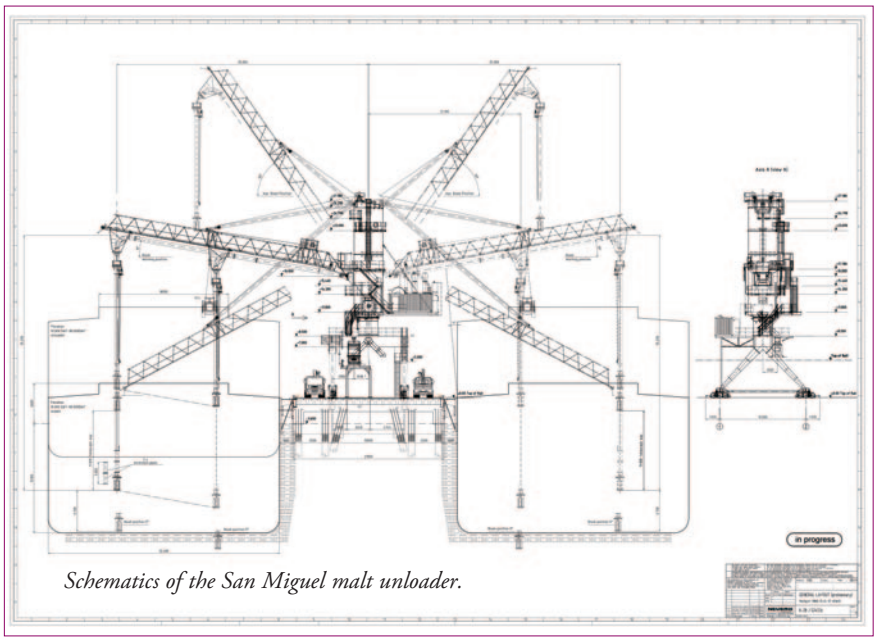
NEUERO continues to develop its unloading systems and expertise

Bulk handling equipment manufacturer NEUERO has particular expertise in pneumatic and mechanical unloading systems. Below, the company details some of its notable unloading projects and expertise.



Schematics of the San Miguel malt unloader.

Recent contracts

San Miguel Malt unloader

The general design is a NEUERO Multiport - 35 newest generation (for more details, see 'current installations' below) for Capesize ships or, as in this case, the ship-unloader is designed to unload on both sides of the jetty.

This unloader is equipped with a 35-metre boom, 19m horizontal telescopic range and a payload winch with a lifting capacity of 10 tonnes (12, 15 or 16 tonnes are also available as an option). The ability to lower the boom to the ground facilitates inspection and maintenance and provides additional protection in extreme weather conditions such as typhoons with wind speeds of up to 300km/h and earthquakes.

The Multiport M800 is specially designed for gentle malt handling, ensuring high capacity and efficiency. To further improve malt handling, the unloader is equipped with the latest generation of Belt-Airlock*, which minimizes leakage and wear while eliminating the common problem of blockage of conventional airlocks by foreign objects. This advanced airlock system also includes automatic belt tracking for improved reliability.

For even greater efficiency and capacity, NEUERO offers the ADS (Auto-Dipping System*) along with a remote control to adjust the airflow of the suction nozzle* to optimize the unloading process.

* *See details at technological developments.*

Mariveles Grain Terminal

Mariveles Grain Terminal is one of multiple companies that have recently placed orders for the NEUERO Flexiport design unloader. The Flexiport, with a capacity of 800tph (tonnes per hour), combines the best of pneumatic and mechanical technologies, and is designed with a special rotating feeding/digging nozzle to efficiently unload non free flowing material such as soyameal, fishmeal, etc., etc.. Clients see the benefit of the NEUERO design compared to

Mariveles Grain Terminal has placed a recent order for a NEUERO Flexiport unloader, which combines the best of pneumatic and mechanical technologies.

mechanical-only unloaders that require bulldozers in the ship's hold to break up the material and push the material to the feeder. The Flexiport design can efficiently unload non-free-flowing material without the use of bulldozers — saving manpower and additional equipment costs.

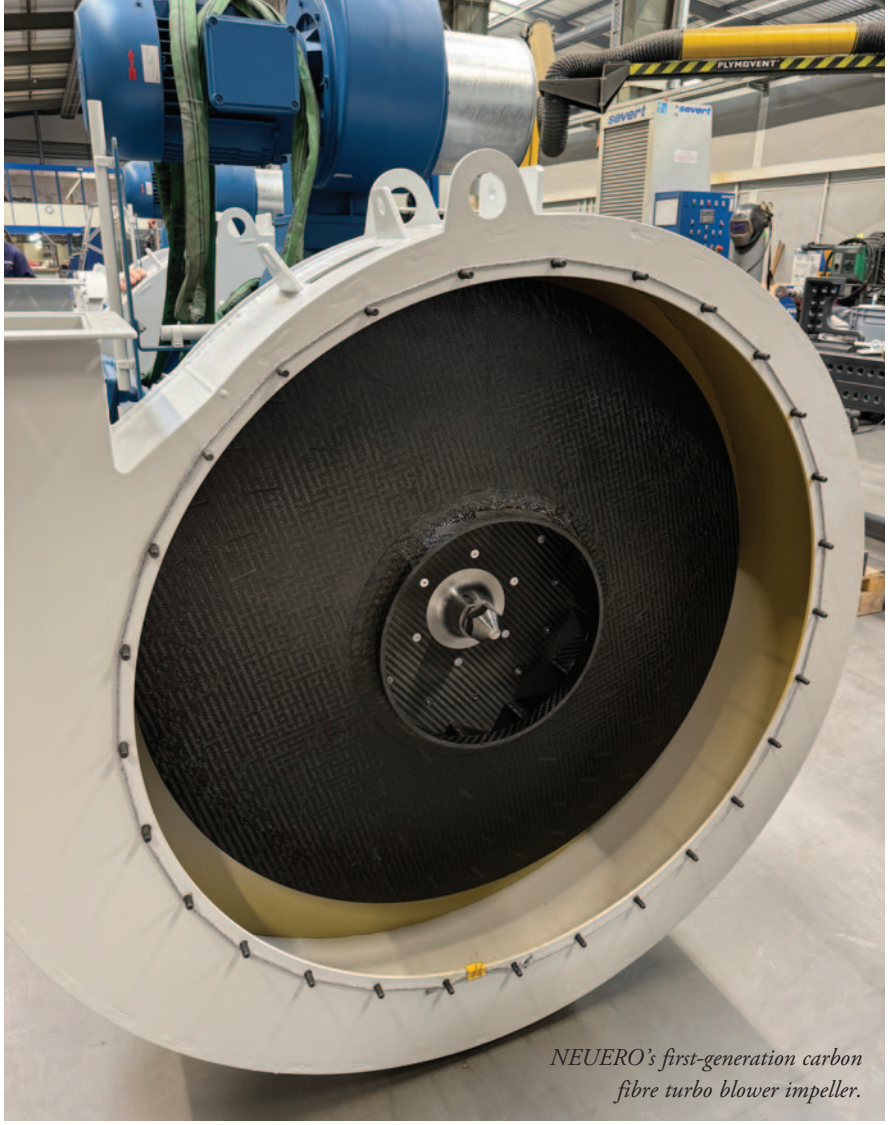
Current installations

NEUERO Multiport new Generation

Several units of this model, designed to unload Cape size vessels, have been ordered by customers in the Middle East.

The main characteristics of these ship-unloaders include:

- M600, 600tph (tonnes per hour)** — 2 x 250kW direct drive turbo blowers with steel impellers;
- M800, 800tph** — 2 x 330kW direct drive turbo blowers with carbon fibre impellers*;
- 35m working boom length — measured from centre vertical pipes to centre slewing boom;
- auxiliary winch of 10 – 12 – 15 – 16 tonnes;
- all are equipped with the NEUERO scavenging filter (no need for compressed air);
- all have the ability to lower the boom to the ground;
- New joint sealing between the horizontal pipe and the main receiver filter means no wear, and no leakage;
- airlock standard, or advanced Belt Airlock;
- Auto Dipping System; and
- Suction Nozzle Airflow Regulation.



NEUERO's first-generation carbon fibre turbo blower impeller.

Technological developments

One major development is the **belt airlock new generation** with improved automatic self-alignment belts. The biggest advantage of belt airlock is the ability to avoid blockages caused by foreign material and grain chopping caused by sharp edges between the rotor tip and airlock body.

The **turbo blower impeller** is a new development. The first generation of carbon fibre impellers is for NEUERO's largest 330kW turbo blowers. The impellers have a much lower weight and are more resistant, resulting in higher speeds with possible higher vacuum.

The **Auto Dipping System Automation** positions the suction nozzle at optimal material penetration. The optimal suction nozzle penetration is helps to maintain best capacity. The operator is given the ability to set the machine to capacity — energy-efficient operating point.

The **Suction Nozzle Airflow Regulation Automation** positions the air entrance at the suction nozzle. This is an excellent alternative to manual mode, where the operator needs to go inside the ship. The goal is to find the optimal Material X Air relation. This optimal relation varies according to the specific product characteristic. The operator is able to set the air opening remotely, to find best capacity — energy-efficient operating point

*** Based on wheat 750kg/m³ standard capacities.*

and does not need to enter the ship. The air opening is done by an electric actuator and opening and closing a slide grid. The best setting is given at the machine operating manual.

Case studies

Retrofitting old pneumatic unloaders

What can you do if an old rotary piston blower has a failure? To replace the system with a similar like-for-like unit often involves long delivery times, and generally complex designs with motor-clutch — gearbox — blower. Additionally, the gearbox and blower need a hydraulic unit for lubricating and cooling.

At ADM in Hamburg Germany NEUERO was able to replace the old system with new turbo blowers, offering the same capacity as the previous system. These blowers have advance protection to identify vibrations or temperature increases and adjustable speed with frequency inverters. The blower and the motor have a common shaft that has no mechanical loss that is common in belt or gearbox designs.

An ageing pneumatic ship-unloader: NEUERO replaced the failed roots blower (bottom, right) with its new high-tech turbo blower (bottom, left).

NEUERO's replacement turbo blower.

An additional benefit, besides energy savings, was the noise reduction of the unloader; the characteristic low frequency of a rotary or piston blower is difficult to insulate. This was solved with the high frequency of a turbo blower.

"Amazingly quiet, I feel like I'm in my living room," was the first testimonial from Michael Siebels, Silo Manager.

The old unloader's failed roots blower.

ENERGY SAVING BY RETROFITTING FROM ROOTS BLOWER TO NEUERO TURBO BLOWERS

Line 1	Before kW	After kW savings/hr	Saving	Estimate	Usage hour/year	Saving tonne CO_2 annual
Energy	315	250	65	20%	5,000	160
Line 2	**Before kW**	**After kW savings/hr**	**Saving**	**Estimate**	**Usage hour/year**	**Saving tonne CO_2 annual**
Energy	450	330	120	27%	5,000	300

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Telestack were commissioned by their customer to design, build and install a TB 42 All Wheel Travel (AWT) high rise shiploader and x2 Titan dual-feed AWT 800-6 Bulk Reception feeder to load a range of commodities. The introduction of the AWT direct "truck to ship" shiploading system has transformed the flexibility and rapidity given to operators, not only in terms of speed (achieved by faster loading rates) but also the agility achieved through the ability to operate and move large scale shiploaders within the limited space on current jetty/docks.

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Smelting plant in Norway installs Loibl feed hopper as part of major upgrade to ship-unloading system

Loibl, known for custom conveying solutions and custom bulk handling machines, has delivered a feed hopper for a smelting plant in Norway.

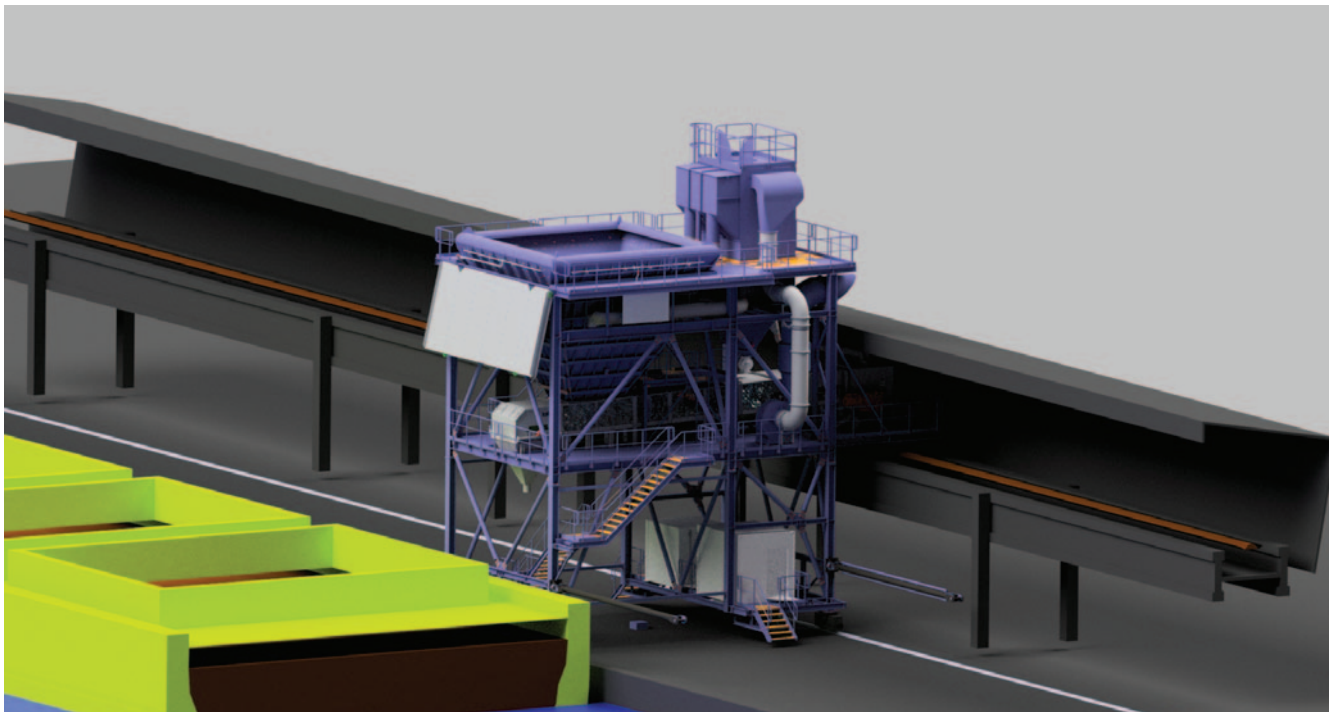
The materials handled by the hopper include sulphates, oxides (clinker), aluminium hydrates and calcium fluorides.

Special features of the hopper include grain sizes in µ range, and high bulk density. To protect the environment, special emphasis is placed on reducing the formation of dust.

Retrofit project in Norway

Enclosed between mountains and fjords lies the zinc smelting plant for which Loibl Förderanlagen GmbH supplied a customized feed hopper system. The factory is being fundamentally modernized and extensively expanded.

In the process, the decades-old ship-unloading system was replaced by a new one. The Loibl hopper car is an important part of the ship-unloading process. It is the



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link between the handling dredger and the conveyor system. The feed hopper leads right up to the factory and is equipped with modern and innovative solutions, including a dust retention system to enable dust-free ship unloading.

Overview

The hopper car runs on rails in the harbour and can be moved together with a transshipment dredger as needed. The dredger feeds the hopper with bulk materials that are needed for the zinc smelting plant and are delivered by ship.

The integrated extraction with filter system and special dust retention system in the bin prevents dust from developing in the surrounding area. Underneath the bin is a bin discharge conveyor, transporting material onto a stationary conveyor.

Wear-resistant construction

A special plastic lining was selected for all surfaces in contact with material in order to improve wear resistance and gliding properties.

The dust retention system is likewise used in a reinforced version adapted to the customer's needs. An integrated sprinkler system takes care of cleaning the bin.

Dust reduction & water protection

The sophisticated extraction system of the feed hopper continuously extracts dust-laden air. A rotary valve discharges the filtered dust onto a discharge belt and conveys it into the main material flow.

An additional special construction, the spillage board from Loibl, is used to collect spilled material during the transfer from ship to bin in order to guide it back into the ship. This protects the surrounding sea, so nature remains unaffected.

The scope of supply and services includes: basic and detail engineering; static design of the steel structure; manufacture in Straubing, Bavaria; steel construction EXC3; feed hopper and bin; weighing system; spillage board; dust suppression system; extraction with filter system; LASHBELTCON® — belt conveyor; electrical and control system; assembly; and commissioning.

Environmental responsibility and sustainable business

Zinc is an essential raw material for numerous industries, which is usually delivered by ship. Investments in innovative conveyor and filter systems are crucial to protect people and nature and to maintain the economic viability of plants in the long term.


The worldwide grain trade is increasing year-by-year, necessitating an advanced supply chain for these vital commodities.
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Siwertell road-mobile unloader ordered for US flyash operations

Bruks Siwertell has secured an order for a next-generation Siwertell 5 000 S road-mobile ship-unloader to support the environment-friendly handling of flyash for an American operator. It is destined for service in the port of Houston, Texas, promising to deliver highly efficient, reliable flyash ship unloading with minimal dust emissions and zero spillage.

"This operator is looking to capitalize on the distinct advantages that our Siwertell road-mobile technology can deliver to very dusty dry bulk handling sectors, such as flyash," notes Jörgen Ojeda, Sales Director Mobile Unloaders, Bruks Siwertell. "Houston is a key port for the region's construction industry, and this new unloader will be in good company.

"We have a number of similar units and large-scale Siwertell ship-unloaders already serving the port for many years, as well as more widely across the country, and numerous global installations in the cement and fly ash industry," Ojeda continues.

"Siwertell road-mobile unloaders are unchallenged in terms of flexibility, capacity, and efficiency, both in terms of unloading capacity and operational costs," he adds. "We have secured many US references in recent years. This, and our operational track records, probably influenced the customer's decision in choosing Siwertell road-mobile technology, with the contract won in direct competition with other available systems."

The next-generation road-mobile ship unloader is scheduled for delivery to the operator in mid-2024, fully assembled and tested from Bruks Siwertell's premises in Bjuv, Sweden. It will discharge flyash from smaller barges, up to 5,000dwt, at a rated capacity of between 200tph (tonnes per hour) and 225tph, ensuring an efficient, totally enclosed conveying line to minimize dust emissions and eliminate spillage.

Next-generation units meet the highest environmental regulations, in terms of exhaust and sound emissions. They have advanced electrical systems that employ fieldbus-based technology; a user interface with touchscreen technology; and a four-colour graphic operating display panel. They also feature innovative digital solutions, enabling remote monitoring and service support.

Transforming ship-unloading technology: the first 50 years

Since 1974, Siwertell ship-unloaders have repositioned the standards in dry bulk handling, setting them so high that its through-ship efficiencies, capacities and technological capabilities remain unmatched today.

Behind the success of Siwertell screw conveyor ship-unloading technology is the unique inlet feeder, designed and developed by two Swedish inventors, Olle Siwersson and Gunnar Tell, who combined their surnames to give the brand its famous name, Siwertell.

It has now been 50 years since the counter-rotating inlet feeder was patented. Competitors have tried to copy the technology, but so far without substantial success, strengthening Bruks Siwertell's position as a world-leading manufacturer of continuous screw-type conveyor ship unloaders.

A story of trust

Many units that were delivered in the 1970s, are still operational today, still delivering highly competitive performances. When operators needed a new approach to dry bulk handling, which offered safe, enclosed, efficient ship-to-shore material transfers, rejecting the issues of the open handling of dry bulk materials, like spillage and dust emissions, Siwertell's technology was there to help.

Siwertell's story is one of trust. Its ship-unloading technology was, and still is, revolutionary. It takes bravery to step away from convention, to question whether or not something is as good as it can be.

Together, with its customers, Siwertell is transforming the dry bulk handling industry. The company knows that, to be sustainable, it needs to keep listening, keep innovating, and remain open to all the new possibilities that digitalization and automation will bring.

These technological advances will be underpinned by the company's most important resource — its people. Their integrity, commitment and teamwork will remain at the heart of the company, and it recognizes the contributions of its personnel.

Giving voice to values

The voices of Bruks Siwertell AB's directors not only echo the ethos and values of the company, but also, understanding their individual contributions, over decades, identifies the spirit that is intrinsic within Bruks Siwertell. As board members they make decisions that drive the company forward, including Bruks Siwertell Group's ambitions to set dry bulk industry's sustainability standards, just like the technology set performance standards 50 years ago.

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Your challenge might be finding a grain-handling solution that ensures the profitable, sustainable growth of your business.
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BULK HANDLING & WOOD PROCESSING

Peak performance: how Bühler's Performance Assessment Workshops can help clients in the ship loader/unloader sector to optimize their processes

Bühler Portalink 600/100 mechanical ship-unloader in Trincomalee (all pictures)

The Performance Assessment Workshop (PAW) has long been a valued tradition within the Bühler Group, and has now been extended to shiploaders and ship-unloaders after highly successful implementation in other parts of the business.

This new consulting service for this sector is designed to specifically address its key challenges. The workshops do this by enabling businesses to analyse their current operational processes, identify opportunities for improvement, and develop solutions that are tailor-made for their unique requirements. They allow organizations to maximize the efficiency of their existing installations, combining Bühler's customized solutions with a structured and holistic methodology to optimize specific production goals.

Multi-phase approach

So what happens in a Performance Assessment Workshop? Experienced professionals evaluate the state of a company's processes and systems through a multi-phase approach. First is the analysis phase, during which the current state of performance is thoroughly examined, with process data collected and analysed to identify bottlenecks and inefficiencies according to the 4M concept ('Machine' — condition, safety devices, parts availability, 'Method' — process, maintenance, recipe, quality control; 'Man' — knowledge, responsiveness, training, and 'Material' — quality, consistency, handling). The assessment evaluates the current situation according to various performance criteria such as performance, product quality, machine lifetime & safety and availability.

Based on the analysis results, a tailored action plan is developed to address the identified weaknesses. This planning phase is then followed by the final implementation phase, during which the measures are executed and continuously monitored to ensure the goals are achieved. This structured methodology means that all relevant aspects are fully considered for sustainable improvements and optimal performance.

Customer benefits

PAWs have a wide range of benefits for customers, including efficiency improvements, cost reductions, and enhanced competitiveness. Identifying and eliminating bottlenecks and inefficiencies means that companies can accelerate their workflows, put their resources to more efficient use and, ultimately, reduce their operational costs. Continuous process improvements also help them to stay competitive and prepare for future challenges.

But PAWs are not about a top-down approach. The workshops operate through mutual engagement, with Bühler's experts carrying out interdisciplinary analysis in full partnership with the customer. All relevant production factors — whether technical, technological or operational — are analysed to clearly demonstrate any potential for improvement.

Unlike a standard inspection, which would traditionally only cover areas like machine uptime and lifetime, the PAWs also encompass areas like capacity, product quality, technology, energy efficiency and

workplace safety. They allow the customer to make targeted investments for its new processes, machines or workforce based on a transparent, objective assessment.

All PAW clients are provided with a full detailed report and customized action plan. This includes an executive summary and overview followed by full specifics about the methods used, a detailed breakdown of every finding — clearly spelling out its impact on performance factors — and a set of recommendations for improvement.

Boosting efficiency at Prima Ceylon (Private) Limited

One Bühler customer to experience PAW's benefits is Prima Ceylon (Private) Limited, located in Trincomalee. Built in 1980, the flour mill is the Group's flagship Sri Lankan enterprise. Today, Prima Group operates one of the largest food conglomerates in Sri Lanka, encompassing flour milling, food production, and agro-food. Prima Ceylon (Private) Limited faced the challenge of modernizing its flour milling facilities while also boosting efficiency, and the workshop enabled a number of critical improvement areas to be identified.

Bühler's recommended measures were seamlessly integrated into Prima's production process, resulting in significantly reduced downtime and operational costs. What's more, overall efficiency increased by approximately 20%, while maintenance and operational issues saw a reduction of up to 30%. These enhancements led to notable savings in power consumption and daily operational costs.

"The PAW conducted by Bühler has been instrumental in modernizing our older facilities while enhancing efficiency," the company stated. "This type of long-term relationship is what makes our collaboration with Bühler unique."

Increasing sustainability

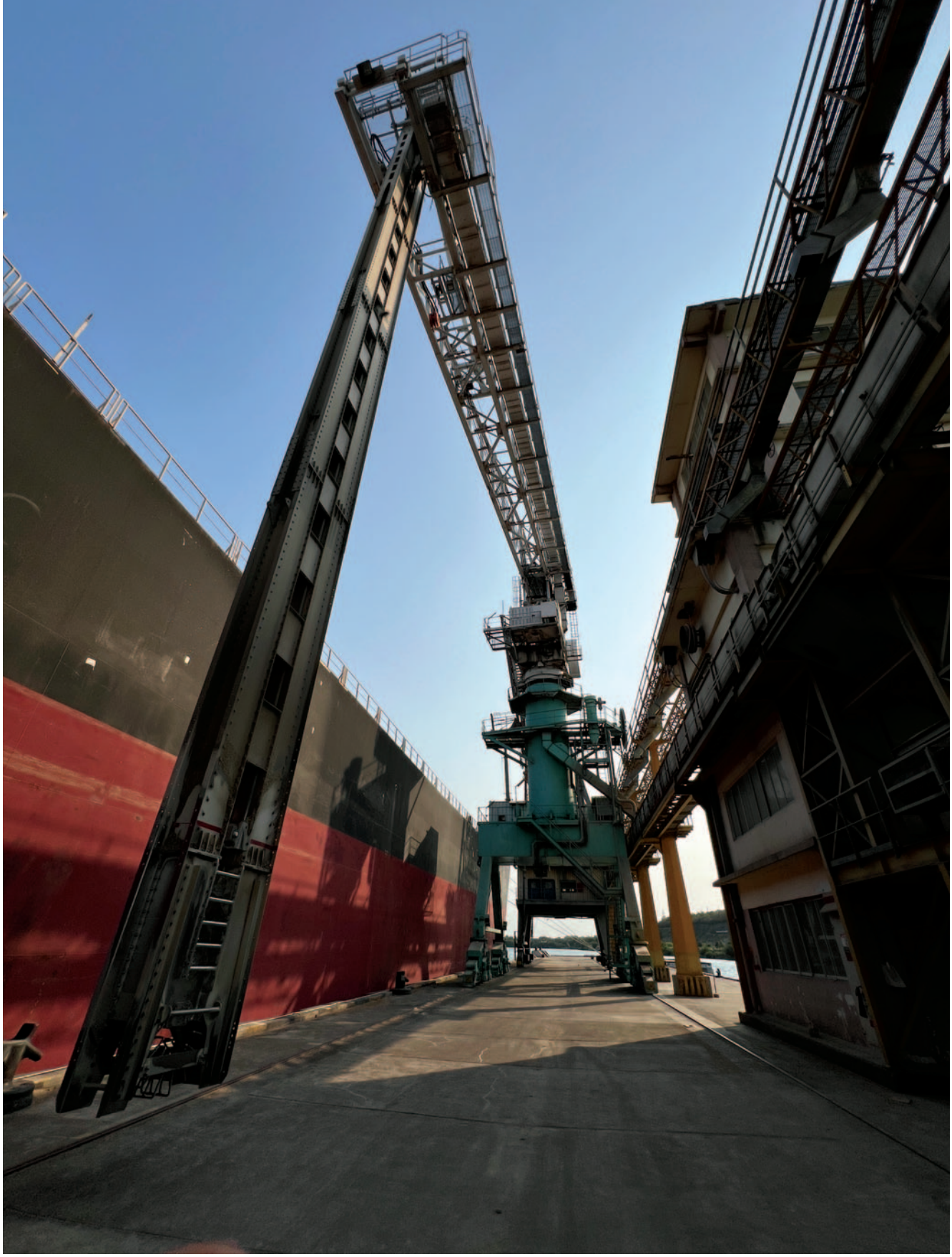
Efficiency is a key production target for quality losses such as waste and rejects, or energy consumption and losses in terms of (heat) waste. A Performance Assessment Workshop can be an essential tool for companies looking to optimize their processes and ensure long-term sustainability. By leveraging Bühler's structured and holistic approach, businesses can significantly improve their efficiency, reduce costs, and stay competitive in a rapidly evolving market.

About Prima Ceylon (Private) Limited

PCL is Prima Group's flagship Sri Lankan enterprise. When completed in 1980, the flour milling complex in Trincomalee was the world's largest flour mill under one roof with a daily milling capacity of 2,200 metric tonnes of wheat. Located in the strategic Trincomalee harbour, the self-contained complex has now expanded to 3,650 metric tonnes of wheat per day and a total silo space of 350,000 metric tonnes, with facilities for the movement of products directly onto and from the ships docking at the jetty. The fully integrated and automated milling process is connected by a modern transport network, with road, rail and sea access. On-site R&D facilities and residential living amenities exist within the complex for employees.

About Bühler

Bühler is driven by its purpose of creating innovations for a better world, balancing the needs of economy, humanity, and nature in all its decision-making processes. Billions of people come into contact with Bühler technologies as they cover their basic needs for food and mobility every day. Two billion people each day enjoy foods produced on Bühler equipment; and one billion people travel in vehicles manufactured using parts produced with Bühler solutions. Countless people wear



eyeglasses, use smartphones, and read newspapers and magazines — all of which depend on Bühler process technologies and solutions. Having this global relevance, Bühler is in a unique position to turn today's global challenges into sustainable business.

As a technology partner for the food, feed, and mobility industries, Bühler has committed to having solutions ready to multiply by 2025 that reduce energy, waste, and water by 50% in the value chains of its customers. It also proactively collaborates with suppliers to reduce climate impacts throughout the value chain. In its own operations, Bühler has developed a pathway to achieve a 60% reduction of greenhouse gas emissions by 2030 (Greenhouse Gas Protocol Scopes 1 & 2, against a 2019 baseline).

Bühler spends up to 5% of turnover on research and development annually to improve both the commercial and sustainability performance of its solutions, products, and services. In 2023, some 12,500 employees generated a turnover of CHF3.0 billion. As a Swiss family-owned company with a history spanning 164 years, Bühler is active in 140 countries around the world and operates a global network of 105 service stations, 30 manufacturing sites, and Application & Training Centers in 25 locations.

Taichung Port's fleet of seven SENNEBOGEN 870s are key to loading and unloading operations

The Port of Taichung, situated in central Taiwan, is a key maritime gateway along the East Asian shipping routes. As Taiwan's second largest port, it serves as a crucial regional centre for the shipping and storage of large-scale bulk cargo and operates as an important near-sea container shipping port. Established in the early 1970s, the port has grown exponentially, becoming a linchpin in Taiwan's maritime infrastructure.

The handover ceremony at Taichung Port that was held on 3 July 2024.

A LASTING RELATIONSHIP SINCE 2007

Since October 2006, Chien Shing Harbour Service has been operating its ship stevedoring business at Taichung Port. The listed Taiwan-based company is mainly engaged in the provision of integrated logistics solutions, including customs declaration, warehousing, transportation and ship stevedoring. Remarkably, in its second month of operation, Chien Shing achieved first place in stevedoring performance at Taichung Port in 2006.

Scrap metal and soil are the two main materials unloaded by Chien Shing's stevedores. Chien Shing received its first two SENNEBOGEN 870 material handlers in 2007, working successfully with SENNEBOGEN dealer and service partner, Capital Machinery Limited. As the years went by, an additional four 870 machines

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SENNEBOGEN 870 E unloading scrap metal easily from ship to truck.

have been delivered to Chien Shing between 2019 and 2022. The oldest 870 has been in operation for 17 years!

Maximum uptime and exceptional reliability

When the time came to replace one of their machines, Chien Shing did not hesitate to go with the 870 again.

"We need to work quickly and productively," says John Ko, General Manager of Chien Shing Harbour Service. We love the SENNEBOGEN 870 because it ensures maximum uptime with its exceptional reliability. We also appreciate the ease of maintenance, as having the same machine makes things more efficient. The 870 is especially suited to our needs and the job site."

A handover ceremony to celebrate Chien Shing taking possession of their seventh SENNEBOGEN 870 E was held on 3 July 2024 at Taichung Port.

This specific machine was outfitted with a 14.7m 'banana boom' and a 13.3m stick to facilitate its primary task of unloading and loading scrap metal and soil from ships. To meet these requirements, two types of orange peel attachments — half-open and closed variants—were selected.

Excellent visibility for high tide at Taichung Port

In order to accommodate the approximate six-metre tidal difference at Taichung Port, Chien Shing needed a machine that would provide clear visibility at all times. The Mastercab with Skylift 900 and additional 3m tubular pylon were chosen to give the machine and operator the height needed to get the job done safely.

As the largest cabin in its class, the Mastercab's all-round-view and large glass floor window provides the operator with the clearest view at all times when unloading ships. Operators have praised the cab for its spaciousness and ergonomic design, which significantly reduce fatigue and enhance their productivity.

'We have chosen the 870 for its high efficiency and continuous stability'

Ultimately, the 870 E's operational efficiency was a decisive factor for Chien Shing. "Over the years, we have consistently chosen the 870 for its high efficiency and continuous stability. Additionally, we are extremely satisfied with the service provided by the Capital Machinery team. Their logistical support is unparalleled," says John Ko, General Manager.

From left to right: Richard Kuok (Head of Machinery Division, Capital Machinery Ltd), John Ko (General Manager, Chien Shing Harbour Service) and Marco Burgmer (SENNEBOGEN Asia Pacific).

VIGAN boasts wide expertise in pneumatic bulk unloading

Pneumatic unloaders are in a niche market, with only a few companies that play a significant role. One of the most important of these is Vigan, which started building modern pneumatic unloaders in 1968. Compared to the period before 1968 major differences could be observed when the Vigan unloaders entering the market:

- one elbow principle;
- one large capacity pipe per machine;
- multiple step turbines on the same shaft (2-3-4 rotors per shaft);
- pulse regenerated filters using the Venturi principle;
- luffing booms by hydraulic jacks; and
- use of state-of-the-art wear-resistant materials.

The result of these developments was an major improvement in energy efficiency, as well as a large capacity increase.

Further integrations of electronic components related to safety, steering, control and power brought the machines to the leading edge of technology.

Together with Vigan's philosophy — to build every single machine under the same roof at its premises in Belgium — the company has a very important USP: it maintains full control and has a detailed overview of all specifications and features of every single machine. This approach has resulted in a very important cost consequence: to produce every single machine under the same roof one needs a lot of space.

When building its latest assembly hall some five years ago, most of Vigan's workers

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VIGAN

Vigan NIV800.

thought that the company would host part of the next Olympic games. As we speak seven 800tph (tonnes per hour) pneumatic unloaders are on order for four customers — and one of these is a repeat order.

As can be seen from the pictures, Vigan will no longer even host the Badminton part of the games. Premounting its machines in the factory takes more time. But upon mounting at the customer's site, Vigan earns this time back many times over. Often, customers have congested quays and want no activities to interfere with their operations — or at least wants these activities to be minimized. Or they want to play safe, an all-in cost until the final operation. Vigan is prepared. Every single machine has been pretested, every single electrical motor, camera, etc., has been put into operation.

So Vigan has taken this philosophy to a very large scale — next level. Very soon, seven more 800tph machines from Vigan will be operating somewhere in the world. Between them, they can easily unload an annual capacity of 30 million tonnes of cereals, soybean or wood pellets. Vigan is proud to say it follows the ever-increasing need for bulk to be loaded and unloaded throughout the world.

Turbo blower in machine room.

Conclusion

Vigan Engineering has established itself as a cornerstone in the niche market of bulk handling equipment in sea ports. Since its inception in 1968, Vigan has been a pioneering force in the development of modern pneumatic unloaders. With a commitment to innovation and excellence, the company has consistently introduced cutting-edge technologies and engineering advancements that have set new standards in the industry. As one of the leading players in this specialized field, Vigan prides itself on producing high-efficiency, large-capacity unloaders, meticulously crafted under one roof at its state-of-the-art facilities in Belgium. This holistic approach ensures unparalleled quality control and precision, reinforcing Vigan's reputation as a leader in bulk handling solutions.

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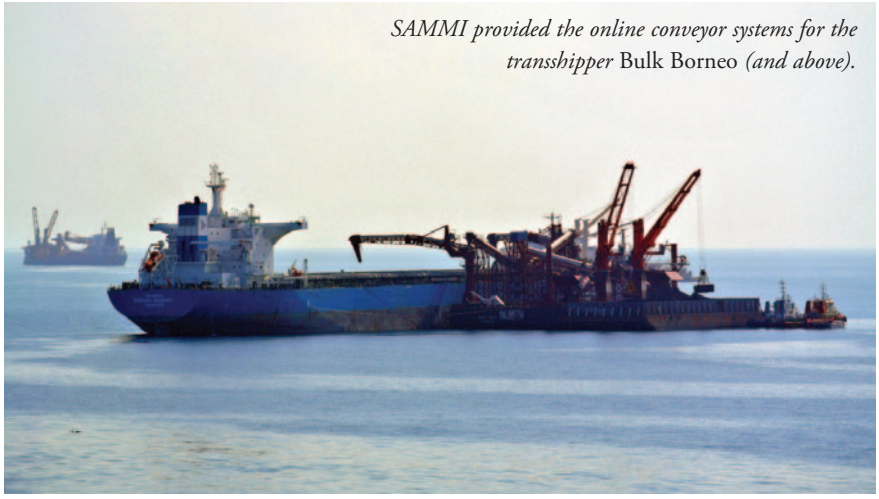
Flagship ship-unloading and transshipment projects from SAMMI

Bulk handling equipment specialist SAMMI is involved in many aspects of the bulk industry. It has strong expertise in ship-unloading systems and ancillary equipment, and has shared some of its most unloading projects with *Dry Cargo International*.



SAMMI provided the online conveyor systems for the transshipper Bulk Borneo *(and above).*

Self-unloading system for transshipper 'Bulk Borneo'

Offshore belt conveyor systems for transshipper 'Bulk Borneo', with a rated capacity of 2,000tph (coal)

Solution for bulk material, belt feeders, hoppers, shiploaders, belt conveyors

This 2011–2012 project was a transshipment system in Nantong, China, installed on the

Self-unloading system on the Bulk Sumatra *transshipper.*

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Coal transshipment on the Bulk Sumatra.

geared pontoon *Bulk Borneo* (the transshipper) for coal transport. The capacity is 2,000tph, capable of loading vessels from Capesize 180,000dwt to nine holds and Panamax from 80,000dwt to seven holds, through the two grab cranes which feeds the receiving hoppers TR1/TR2. From each hopper, the handled material is extracted by means of two belt conveyors BC1/BC2 and conveyed into a single belt conveyor BC3 placed transversely extractors. The customer was the Coeclerici Group.

Self-unloading system for transshipper 'Bulk Sumatra'

Solution for bulk material, extractors, hoppers, shiploaders, belt conveyors

Design, full supply (MEC-ELE-AUT-OLE) and commissioning of belt conveyor system for the transshipper *Bulk Sumatra* in Indonesia for coal transport, in 2011–2012. The capacity is 2,500tph (coal), capable of loading vessels ranging from Capesize 180,000dwt to nine holds and Panamax from 80,000dwt to seven holds, through the two grab cranes which feed the receiving hoppers TR1/TR2. From each hopper, the handled material is extracted by means of two belt conveyors BC1/BC2 and conveyed into a single belt conveyor BC3 transversely placed belt feeders. The customer was the Coeclerici Group.

Big-bag unloading system and material transfer

Big-bag unloading system and material transfer to turbine dissolvers for table ware raw material (micronized alumina)

This project, in Le Palais-sur-Vienne, France, took place in 2018. It involved FIBC (flexible intermediate bulk container) dischargers with a design that guarantees safe and handy loading, unloading and bulk bag opening operations. The innovative petal-shaped flow aid system allows total or partial discharge of the material ensuring superb efficiency and cost-saving operation even with difficult-to-empty materials.

The interface is the core of a system designed for easy and safe access when connecting the FIBC outlet valve. This interface enables dust-proof sealing thus avoiding product leaks and contamination. The FIBC discharger with loading interface is essential for a healthy, clean and safe indoor work environment.

The system features modular design, which is easily adaptable to different bulk solids, FIBC sizes and weights. An electric motovibrator acts as an additional material discharge aid. The innovative discharge system (ATEX version) is tailored for different material characteristics.

Benefits include:

- internal footprint (no protruding parts) allowing optimized battery configuration;
- no labour required for complete FIBC emptying;
- full pre-equipment for subsequent retrofitting of any accessories;
- easy adaptability to a wide range of materials, different FIBC sizes, types and weights;
- large-scale industrial production ensures an attractively priced high-quality product;
- problem-free, complete emptying of bag corners even with compressed bulk materials.

The customer was Imerys Ceramics.

Big-bag unloading system, material transfer to turbine dissolvers for sanitary ware raw material (kaolin, feldspar)

Big-bag unloading system, material transfer to turbine dissolvers for sanitary ware raw material (kaolin, feldspar) and belt conveyors system revamping, in Civita Castellana, Italy

Complete system, in 2018, for discharging bulk materials from FIBCs. It consists of a frame, a discharge hopper, and a movable upper gantry for lifting the bags using a forklift and introducing them into the system.

Key features included:

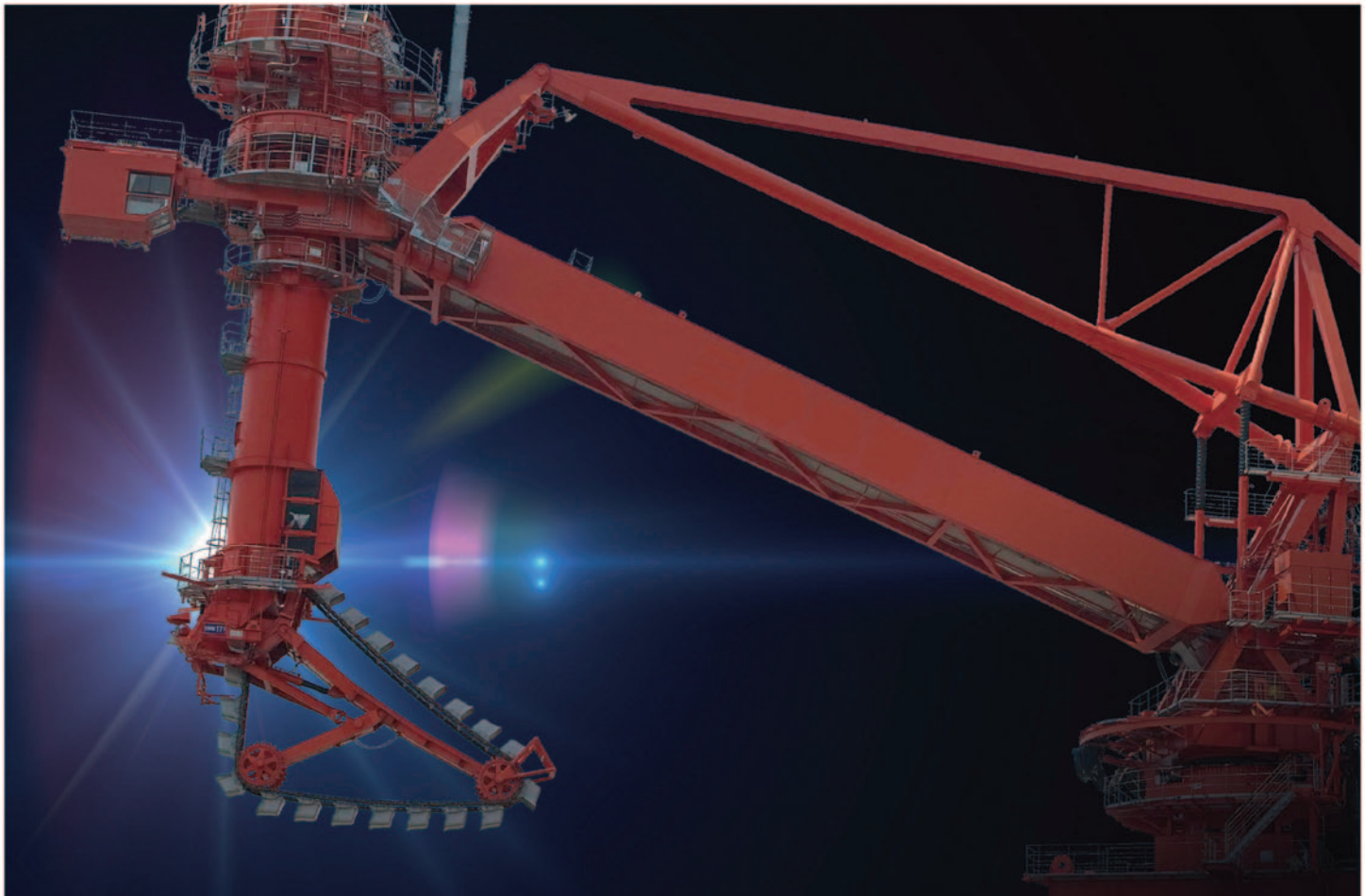
- safe and efficient discharge of bulk materials from Big Bags;
- sturdy frame construction for stability;
- discharge hopper for collecting discharged material;
- movable upper gantry for easy lifting and positioning of Big Bags; and
- hopper port for opening the Big Bag.

Benefits include:

- reduced manual labour & risk of injury;
- minimized dust and product spillage;
- a clean and efficient discharge process; and
- suitability for a wide range of bulk materials.

Applications include:

- food and beverage industry;
- pharmaceutical industry;
- chemical industry;
- construction industry; and
- recycling industry.



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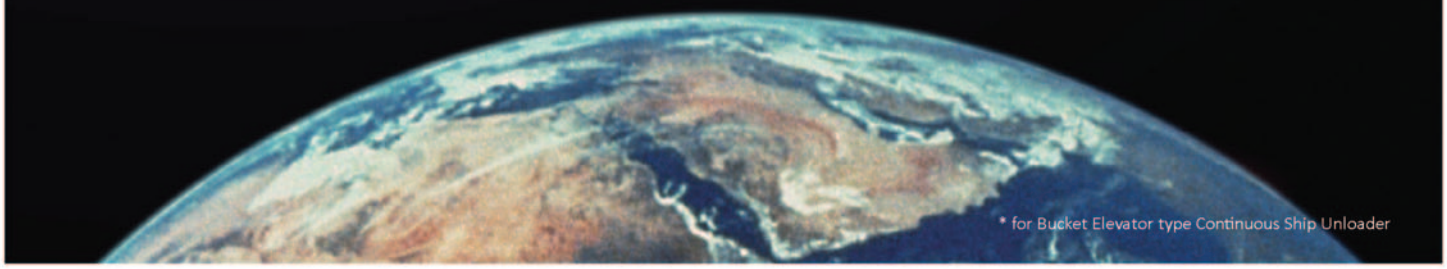


* for Bucket Elevator type Continuous Ship Unloader

Transforming port efficiency: the case for converting to SAMSON Eco Hoppers

The evolution of port sustainability in the era of green ports

While the fundamental principle of ship unloading — transferring bulk materials from vessel to shore efficiently — has remained constant for over a century, the technology behind this process has evolved dramatically, *writes Emily Bone, SAMSON Materials Handling*. Modern unloading systems can handle capacities many times greater than their predecessors, while simultaneously addressing environmental concerns.

As ports worldwide adopt green initiatives to reduce their environmental footprint, the role of efficient and environmentally friendly ship unloading systems has become increasingly crucial. These systems are key to helping ports meet emission reduction targets while maintaining or improving operational efficiency.

One area of significant improvement lies in the conversion of traditional import hoppers to more advanced, eco-friendly systems. SAMSON Materials Handling Ltd, an expert in bulk material handling solutions, offers a compelling upgrade path with its Eco Hopper conversion programme.

Four key reasons to convert import hoppers

Enhanced dust control

One of the primary advantages of converting to a SAMSON Eco Hopper is the substantial improvement in dust control. The conversion includes the following Modules:

- **Integrated shroud:** minimizes the impact of crosswinds, reducing dust spread during grab discharge.

- **Flex-Flap system:** this feature effectively contains dust beneath the inlet grill.
- **Cartridge filters with exhaust fans:** these high-efficiency filters trap dust particles, not only containing dust inside the hopper but also ensuring sufficient air downflow above flex-flap to suck in the dust within the shroud.
- **Dust-controlled telescopic truck loading chute:** this addition provides advanced dust containment during the discharge process.

These enhancements significantly reduce airborne dust, creating a cleaner, safer working environment and minimizing environmental impact.

Environmental protection

Converting to an Eco Hopper demonstrates a commitment to environmental stewardship. Key features include:

- **High-performance filtration:** the implementation of reverse pulse jet dust filtration offers high efficiency with low air consumption, reducing operational expenses and environmental impact.
- **Compliance with international standards:** these upgrades ensure port operations meet stringent environmental regulations with ease.
- **Dust emissions guarantee:** like with a new system, SAMSON is able to offer guarantees on dust emissions with full conversions, providing demonstrable complications.

Modular design for durability and efficiency

The SAMSON Eco Hopper conversion utilizes a modular design that enhances durability and operational efficiency:

- **Dust controlling modules:** each of the dust controlling modules mentioned above can be offered separately or in combination with other modules.
- **Module sizes:** SAMSON Materials Handling offers various sizes of each dust controlling modules in order to provide best fit to an existing equipment
- **Additional, performance enhancing features** can be offered, such as:
  - Wear-resisting liners for enhanced durability.
  - Reinforced tubular shroud rim that protects against grab impact damage and snagging.
  - Inlet grille with reinforced mounts that protects the hopper and on-going equipment from ingress of oversized material lumps.
  - Grab position detection with traffic light warning system

This modular approach allows for customization to fit specific port requirements, making the transition seamless and efficient.

Operational benefits

Converting to a SAMSON Eco Hopper brings several operational advantages:

- **Reduced dust emissions:** the proven design modifications significantly cut down on dust emissions, promoting a healthier environment and potentially reducing cleaning and maintenance costs.
- **Improved efficiency:** the enhanced design features can lead to faster unloading times and reduced material loss.
- **Versatility:** the Eco Hopper's ability to handle a wide range of materials makes it a versatile solution for ports dealing with various bulk cargoes.

Example of an import hopper with no dust control.

While the conversion to Eco Hoppers addresses immediate environmental and efficiency concerns, it also paves the way for future advancements. The modular nature of these systems allows for easier integration of emerging technologies, such as remote monitoring and predictive maintenance capabilities.

Conclusion

As the maritime industry continues to evolve, the conversion of traditional import hoppers to advanced systems like the SAMSON Eco Hopper represents a significant step towards more sustainable and efficient port operations.

By addressing key areas such as dust control, environmental protection, durability, and operational efficiency, these conversions offer a compelling solution for ports looking to upgrade their facilities.

Port operators and logistics professionals should consider the long-term benefits of such conversions, not only in terms of meeting current regulatory requirements but also in preparing for future challenges and opportunities in the maritime industry.

About SAMSON Materials Handling Ltd

SAMSON Materials Handling Ltd, part of the AUMUND Group, is a leading manufacturer of mobile materials handling equipment for the shipping, mining, quarrying, and cement industries. With over 50 years of experience, SAMSON is recognized for its innovative bulk material handling solutions. SAMSON's equipment offers mobile, flexible solutions that reduce dust emissions and increase operational efficiency, supporting sustainable port operations and green logistics.

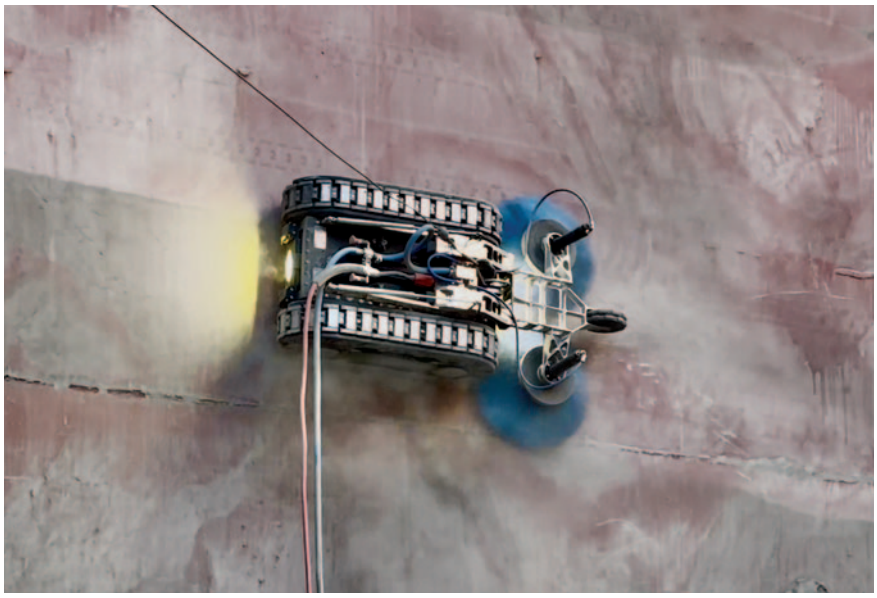
SAMSON's Aftersales, Service, and Conversions department ensures comprehensive support through regular maintenance and prompt repairs, quick access to genuine spare parts, performance-enhancing upgrades and conversions, expert technical support, and comprehensive training programmes for safe and efficient equipment operation. SAMSON's commitment to exceptional service helps customers achieve optimal performance and sustainability in bulk material handling operations.

CLIIN Robotics' system comes into play once unloading is complete

CLIIN Robotics Cargo Hold Robot (CHR)

CLIIN Robotics specializes in engineering compact yet highly effective ROVs (remotely operated vehicles) capable of climbing all ferromagnetic surfaces using magnetic tracks. The company's flagship product, the Cargo Hold Robot (CHR), is specifically designed for comprehensive cleaning of cargo holds, including frames and topsides. Even after the most successful unloading operations, it is inevitable that some product remains in the hold, so this must be cleaned away to avoid cross-contamination.

CLIIN Robotics' versatile ROV excels not only in cargo hold cleaning but also in tank cleaning and inspections in challenging,



NS United Kaiun Kaisha relies on CLIIN Robotics for cargo hold cleaning

In an innovative step towards safer and more efficient cargo operations, NS United Kaiun Kaisha, Ltd. has partnered with CLIIN Robotics to streamline the cleaning process of their cargo holds. The Japanese shipping giant recently integrated four of CLIIN Robotics' Cargo Hold Robots (CHR) into their fleet, marking a significant advancement in maritime maintenance practices.

Cargo hold cleaning is a critical aspect of bulk carrier operations, essential for ensuring the safe transportation of various types of cargo. Failure to maintain clean holds can result in damage claims, additional cleaning requests from shippers, and even suspension of hire payments. Moreover, traditional cleaning methods pose risks to crew members, particularly when working at heights.

Recognizing the imperative for a safer and more efficient solution, NS United Kaiun Kaisha sought assistance from CLIIN Robotics. The CHR presents a revolutionary approach to hold cleaning. CLIIN Robotics' robots can scale the walls and even the topsides of cargo holds, efficiently removing residue with high-pressure water while being remotely controlled by the crew.

In a statement regarding its adoption of CLIIN Robotics' technology, NS United Kaiun Kaisha emphasized the significance of ensuring crew safety and optimizing work efficiency. It affirmed that the deployment of CHR exceeded its expectations, enabling it to carry out hold cleaning tasks with unparalleled safety and precision.

"We have integrated four CLIIN Robotics' hold cleaning robots into our management vessels. These robots, easily operated remotely by the crew, excel in safety and efficiency. They effortlessly scale cargo hold walls, utilizing high-pressure water to achieve superior cleanliness. Their performance aligns perfectly with our expectations," states Hideharu Eguchi, General Manager/Philippine Standard Shipmanagement Inc. (Manila Branch of NS United Kaiun).

CLIIN Robotics expressed its enthusiasm for the collaboration, emphasizing its commitment to pioneering solutions that revolutionize maritime maintenance practices. The successful integration of CHR into NS United Kaiun Kaisha's fleet stands as a testament to the transformative potential of robotics in the shipping industry.

hard-to-reach areas. Recently, CLIIN Robotics introduced a new addition to its product lineup: a hull cleaning robot launched in May, expanding its range of innovative robotic solutions.

CLIIN Robotics' equipment, particularly the CHR, is designed to clean a wide range of dry bulk commodities using only fresh water, without the need for chemicals. The CHR can effectively clean cargoes such as petcoke, coal, concentrates, bauxite, cement, and clinker. It utilizes a combination of dry and wet cleaning methods to ensure thorough cleanliness, even reaching up to 90% of the cargo hold surface area depending on its structure. The robot's magnetic setup enables access to challenging areas including the upper hopper, while its adjustable high-pressure tools allow functionality on pipes, inner corrugations, and surfaces with angles up to 75°.

CLIIN Robotics' innovative spray pattern further enhances its capability to clean both between and behind frames. Moreover, the CHR's robust design enables cleaning operations even during rough weather conditions, achieving cleaning rates of up to 800m²/hour, albeit varying based on the cargo hold's structure. For instance, on a SUPRAMAX vessel, the CHR typically requires six to eight hours per cargo hold with a water consumption of 10–12 tonnes per hold, demonstrating its efficiency and environmental sustainability benefits.

CLIIN Robotics has many clients, including major companies such as Oldendorff Carriers and NS United Kaiun Kaisha. The company stays competitive by leveraging its extensive industry experience and focusing on sustainability through alignment with the UN Sustainable Development Goals. It fosters close client collaborations to create tailored, value-maximized solutions, and prioritizes simple, user-friendly technology for easy integration. CLIIN Robotics' innovative culture, driven by diversity and empowerment, ensures continuous technological advancements. Additionally, its strategic global presence allows it to effectively respond to market demands and expand its influence across the shipping industry.

In terms of recent contracts, NS United Kaiun Kaisha, Ltd. has partnered with CLIIN Robotics to streamline the cleaning process of its cargo holds (see box).

In terms of technological developments,

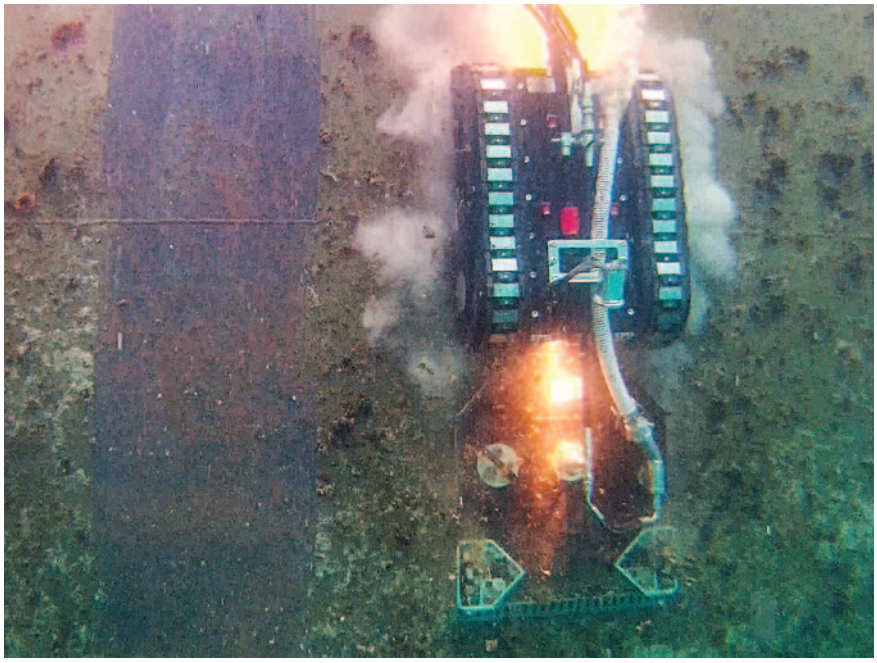
CLIIN Robotics has made significant advancements in its robotic technologies. In November last year, it launched the latest version of its robot, the RAW11, which offers enhanced robustness and improved performance across its entire operational width. Additionally, in May 2024, CLIIN Robotics introduced its newest innovation, the Hull Cleaning Robot, designed specifically for cleaning and grooming ship hulls. This robot represents a major step forward in maintaining vessel efficiency and reducing environmental impact. Furthermore, by September 2024, the Hull Cleaning Robot is set to achieve ATEX certification, ensuring it meets rigorous safety standards for operation in explosive atmospheres. These developments underscore CLIIN Robotics' commitment to providing cutting-edge, reliable, and safe robotic solutions for the maritime industry.

About CLIIN Robotics

CLIIN Robotics tackles diverse industry challenges with simple, safe, and sustainable robotic solutions. Specializing in cutting-edge magnetic robots, CLIIN makes the unreachable reachable. Its mission is to provide versatile robotic solutions that redefine possibilities across various environments and industries. While its robots have wide-ranging applications, CLIIN excels in the shipping and oil & gas industries. In shipping, the robots excel in cargo hold cleaning and robotic antifouling, which includes grooming and cleaning hulls. Additionally, CLIIN's robots are adept at cleaning the external and internal walls of storage tanks.

These robots are remotely operable, enhancing safety by allowing operators to remain securely on the ground while accessing challenging areas. This efficiency is achieved using only water, eliminating the need for harmful chemicals and setting new standards for safety and sustainability. CLIIN Robotics envisions transforming heavy industries like shipping and oil & gas into more sustainable contributors to global infrastructure, benefiting present and future generations worldwide.

CLIIN Robotics' solutions not only streamline operations and reduce environmental impact but also contribute significantly to the safety of workers by minimizing the need for them to work at heights during cleaning operations. Its user-friendly robotic systems are designed to optimize vessel turnaround times and increase cargo intake, offering substantial value to industry stakeholders worldwide.



Ardelt Kranbau re-enters the manufacturing market after state guarantee

In August 2023, the company Ardelt Kranbau GmbH (Ardelt) was newly founded by its managing director and shareholder, Uwe Grünhagen.

The company has considerable expertise in harbour slewing cranes and feeder server container cranes, which was gained from its former company Kocks Ardelt Kranbau GmbH (KAK) — an expertise shared by the remaining staff of the Ardelt branch in Eberswalde.

When Ardelt initially started up, it concentrated mainly on the service and spare parts business, but was then able to re-enter the market as a manufacturer and supplier of new cranes following the positive approval of a state guarantee from the state of Brandenburg in June of this year.

With the state guarantee as security, Ardelt has found a financial partner that is prepared to provide the necessary and essential guarantee framework to accommodate new crane orders.

Weserport — which was closely involved in the application procedure for the necessary state guarantee — was continuously informed on the latest status and had full confidence in the continued existence of Ardelt Kranbau GmbH.

As a result, Weserport GmbH (Weserport), an existing customer of KAK, signed the first contract with Ardelt in July for the delivery of a double jib level-luffing crane with integrated hopper system of the Tukan-K model.

The crane in question is destined for Terminal 3 of the Weserport site in Bremen and is scheduled to be handed over by December 2025.

The TUKAN-K is an electrically operated, rail-mounted crane with integrated hopper system specially developed for the fast and efficient handling of various types of materials.

The general design of the crane is based on the long-time experience in building custom-made double jib slewing cranes by Ardelt personnel.

The crane is especially designed to handle iron ore pellets and fine ore, which can be unloaded directly onto an existing conveyor belt system on the quay side via the integrated hopper system.

If required, the handled material can also be unloaded onto stockpiles or deep bunkers, which are located in the backyard of the crane, thanks to the unrestricted slewing capability of the slewing part.

In addition, the crane is also capable of unloading various other handling goods/aggregates (such as limestone, dolomite, gravel, bauxite, etc. with a varying bulk density) onto the stockpiles.

The tailor-made design of the Ardelt crane enables an optimum integration of the crane in the existing Weserport facilities, with maximum operating efficiency.

The crane has a maximum radius of 55m and has two grab stages with a maximum lifting capacity of 50 tonnes and 63 tonnes.

These parameters enable the crane to unload Panamax-size vessels with a designed free-digging handling capacity of approximately 2,300tph (tonnes per hour) when unloading iron ore pellets.

As mentioned above, Ardelt Kranbau GmbH emerged from the former well-known company Kocks Ardelt Kranbau GmbH. The branch in Eberswalde was already specialized in the rail-bound all-electric driven slewing crane sector during KAK times.

With the takeover of the know-how, slewing cranes in any design, double jib as well as single jib cranes, for the most diverse applications (for general cargo, bulk and container handling as well as for shipyard or floating dock operations) will form the core business for the new company Ardelt Kranbau GmbH.

All cranes supplied by Ardelt Kranbau GmbH are customized and tailor-made so that the crane system works efficiently and is optimally integrated into existing customer process technology.

The design of new crane systems is based on proven constructions from a large variety of executed crane systems from the past, with integration of innovative in-house-developed special solutions to meet specific customer requirements.

The electrics installed in the crane are standard, based on the latest Siemens technology, which is kept up to date by constant further development in the Ardelt company.

This applies both to the electrical design and to the in-house software development of the crane's own control and visualization system.

This means that Ardelt is always able to respond to customer requests at short notice, such as the integration of a semi-automatic control system, electronic sway damping, grab filling optimization, and so forth.

The so-called kangaroo cranes are slewing cranes (normally double jib cranes – TUKAN-K) with integrated hopper and hopper discharge system and have a special position in the Ardelt product portfolio.

With the integrated hopper and discharge system, the kangaroo cranes are the most efficient way of unloading bulk material directly onto the customer's existing conveyor system for further distribution of the required material to the customer's plant

The TUKAN K combines the advantages of the standard TUKAN double jib crane (e.g. short rope pendulum lengths, horizontal hook path when luffing in and out, exact positioning of the grab, multifunctionality) with those of the integrated hopper (e.g. short working distances, elimination of the slewing movement, controlled material flow, high handling capacity, minimized spillage, optimized footprint).

To ensure an optimum material flow with the customer's intended handled materials, the integrated hopper can be equipped with a variety of conveyor systems (vibrating-chute, conveyor belt, apron-feeder, etc.) as well as dust-reducing measures (spill-plate, hopper-walls, flex-flap system, fogging system, pneumatic filter systems, etc.) to adapt perfectly to the customer's requirements.

Other special solutions, such as the installation of two separate bunker systems where separation of the existing bulk material flows is required, have also been put to use.

In the last few decades, Ardelt has experienced a great interest and demand for the kangaroo typed slewing cranes for installations in the energy and metal industry (handling of coal and ores), as well as for the multi-purpose sector (handling of all kinds of animal feed, fertilizers, minerals, sand, gravel, lime, etc.).

Especially in the medium and high handling range, a 'kangaroo' crane is an efficient and cost-effective alternative for continuous ship-unloaders as well as for standard grab-type ship-unloaders.

With executed hoisting capacities for grab mode ranging from 16 up to 63 tonnes and a maximum outreach ranging from 27 up to 55m, the Tukan-K can be adapted for handling capacities ranging from 600 up to 2,500tph and handling ship sizes from barges up to Capesize/VLBC (Very Large Bulk Carrier).

However, it important to note that the possible crane systems are not limited to these figures and Ardelt always strives to find the most suitable combination to fit the clients' specifications and demands.

The power of a 50kg fertilizer bag in the unloading process

Have you ever considered the incredible impact a single 50kg bag of fertilizer can have? For a farmer in Africa, this bag is much more than just an agricultural input; it's a lifeline. It can enhance crop yields by up to 60%, potentially feeding a family for an entire season. Imagine the ripple effects on the broader economy and community.

The backbone of fertilizer distribution

Given that a significant portion of the region's fertilizers is imported via Kenyan ports, Kenya's logistics infrastructure, including its extensive road and railway network, plays a vital role. These networks distribute vital inputs to landlocked neighbours such as Uganda, Rwanda and Ethiopia.

In a recent operation through Kenya's northern corridor, IMGS Group provided full bulk logistics, storage, and mobile bagging facilities. IMGS' team expertly managed the entire process, from discharging and on-site bagging to distribution. By working closely with local importers and producers, IMGS Group ensured efficient and reliable delivery, reinforcing its commitment to the region's agricultural supply chain.

Navigating bumpy roads

Fertilizer is critically important in East Africa, where agriculture is a major economic activity. However, the region faces logistical and infrastructural challenges that impact fertilizer availability and affordability. Ongoing efforts to improve trade and logistics — such as reducing trade barriers, harmonizing regulations, and improving transportation infrastructure — aim to enhance regional trade, reduce transportation costs, and ultimately improve fertilizer accessibility.

In this operation, IMGS' high-speed mobile bagging solutions and well-co-ordinated distribution management expedited the process, ensuring that fertilizers reached farmers in a timely and cost-effective manner.

Building a sustainable future

A single 50kg bag of fertilizer has far-reaching impacts, from boosting a farmer's productivity to enhancing regional food security and driving economic growth. Kenya's strategic role in fertilizer logistics, combined with government initiatives and IMGS Group's customized solutions, ensures that these vital inputs are distributed efficiently across East Africa. By supporting sustainable agricultural practices and fostering economic development, IMGS is building a resilient future for farmers, the economy, and ultimately the region.

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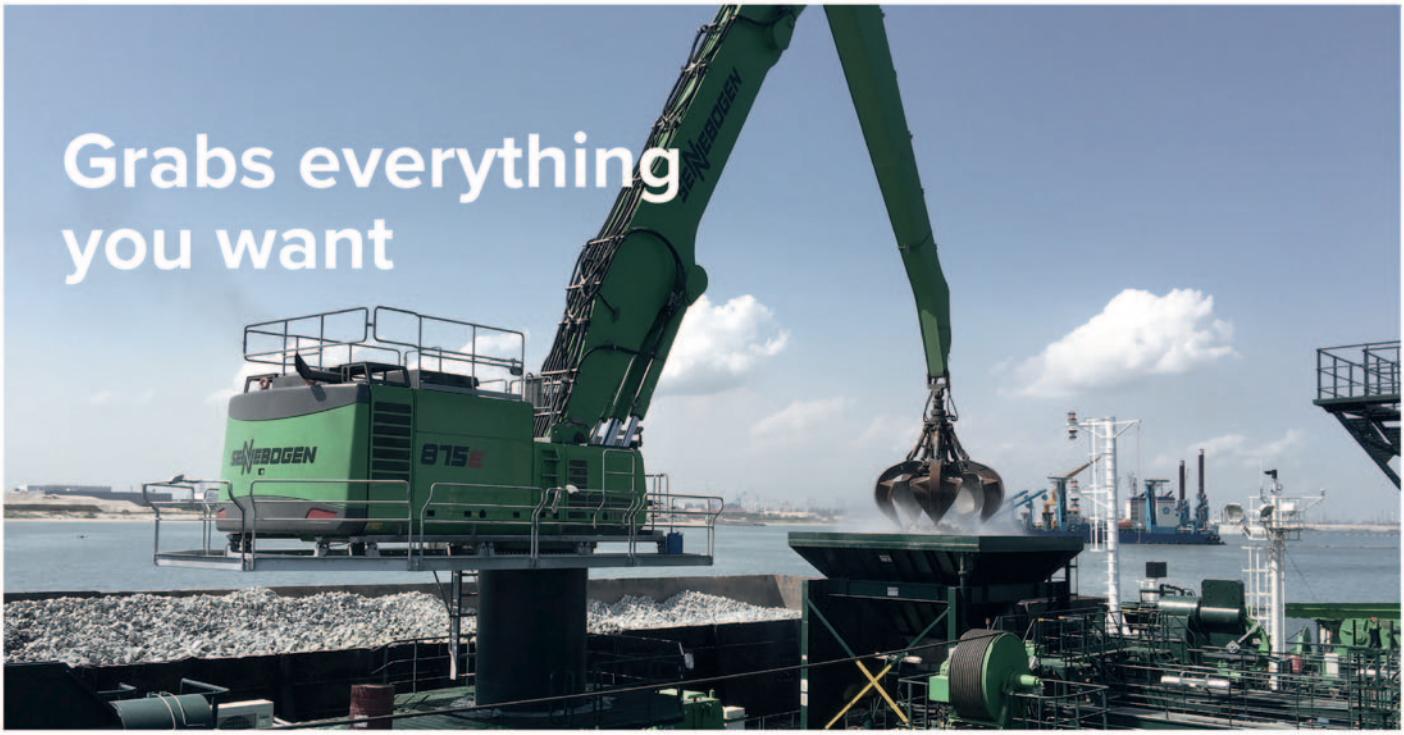

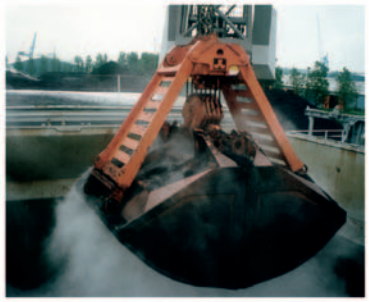

Our products

For all kinds of bulk handling

- Cactus Rope Grabs
- Clamshell Rope Grabs
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