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FEATURES

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Dry bulk trade optimism recedes

It has become more difficult to justify a positive view of global seaborne dry bulk trade. There are still signs suggesting rising import demand for commodities in many countries. But elsewhere, including some of the biggest individual trade movements, reductions or absent growth seem more likely during 2016.

Further downgrading of forecasts for key economies provides a sombre backdrop. Updated estimates, published last month by the OECD organization, showed 3% world GDP growth in 2016, no higher than seen last year and the joint slowest pace in the past five years. Despite a vast amount of monetary stimulus, achieving a more robust pace of economic activity remains elusive in numerous countries.

Iron ore

During the year ahead growth in world seaborne iron ore trade looks likely to be very modest, and some forecasts point to the possibility of a decline. Calculations shown in table 1 indicate a one percent rise, to 1,372mt (million tonnes), assuming that China's imports, comprising more than two-thirds of the total, increase marginally. Potential for larger volumes among other key importers seems quite limited.

In the European Union, Japan and South Korea additional iron ore import demand in 2016 is expected to be small, and there is considerable uncertainty about whether this slightly positive outcome is attainable. Among many other relatively minor importers around the world, there are no obvious signs of any sizeable boost for trade. China's dominant market position, with 953mt received last year, ensures that even a low percentage change will heavily affect overall global evolution.

Coal

Global seaborne coal trade's large estimated reduction last year, following a slight decline in the previous twelve months, seems to have ended a long period of strong growth. However, despite all the clear signs of restraining influences, another decrease in 2016 does not necessarily appear inevitable.

Again, much depends upon China's import demand. A continuation of the plummeting purchases by Chinese buyers seen in the past twelve months, falling by a huge 30% to 204m, would almost certainly lead to reduced global coal movements. But some countries in Asia and elsewhere are still increasing their coal usage and imports. Table 1 shows a 2% global rise this year, to 1,133mt, although India's faltering uptrend, coupled with possible negative influences in Europe are uncertainties.

Grain

Estimates of grain trade, including soya movements in the twelve months ahead are always characterized by a high degree of speculation. Weather patterns affecting domestic harvests in importing countries, as well as harvests in exporting countries, are largely unpredictable, complicating forecasts of import demand.

Based on very tentative assumptions, global grain and soya trade in 2016 may grow marginally to just over 400mt. Lower imports into China and the Middle East area during the period up to mid-2016 could be partly offset by higher volumes into Europe. In the second half, trade will be greatly affected by summer grain harvests in northern hemisphere importing countries, prospects for which are not yet entirely clear.

Minor bulks

The varied and extensive minor bulks group comprises over a third of all seaborne dry bulk trade. Last year's total of commodities related to industrial and agricultural activities appears to have exceeded 1,600mt. This category includes large individual elements such as forest products and steel products, as well as many smaller volume commodity movements. Further growth at a moderate rate could be seen in 2016.

Bulk carrier fleet

A continued slowdown in the world bulk carrier fleet's capacity growth to 2% was seen last year, as shown by table 2. The deceleration is expected to persist in 2016 despite the possibility of a slightly higher volume of new ships entering the fleet, because scrapping of old or uneconomic vessels probably will be greater.

TABLE 1: WORLD SEABORNE DRY BULK TRADE IN 3 MAJOR COMMODITIES (MILLION TONNES)

	2011	2012	2013	2014	2015*	2016*
Iron ore	1,048	1,105	1,183	1,330	1,360	1,372
Coal	1,014	1,111	1,191	1,172	1,115	1,133
Grain (including soyabeans)	313	329	355	390	399	401
Total 3 major bulks	**2,375**	**2,545**	**2,729**	**2,892**	**2,874**	**2,906**
% growth from previous year		7.2	7.2	6.0	-0.6	1.1

source: Bulk Shipping Analysis estimates and forecasts **forecast*

TABLE 2: WORLD BULK CARRIER FLEET (MILLION DEADWEIGHT TONNES)

	2011	2012	2013	2014	2015*	2016*
Newbuilding deliveries	100.0	100.3	62.9	48.1	49.5	51.0
Scrapping	23.3	33.4	23.1	16.3	30.4	36.0
Losses	0.5	0.1	0.4	0.1	0.1	0.2
Other adjustments/conversions	4.3	-1.1	0.0	0.1	-0.8	0.0
Net change in fleet	80.5	65.7	39.4	31.8	18.2	14.8
Fleet at end of year	**621.0**	**686.7**	**726.1**	**757.9**	**776.1**	**790.9**
% growth from previous year		10.6	5.7	4.4	2.4	1.9

source: Clarkson Research (historical data) & BSA 2065 forecast **forecast*

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China's dry bulk imports losing momentum

A dramatic change in China's dry bulk commodity imports trend has unfolded over the past two years. After more than a decade of very strong expansion, mostly double-digit annual percentage increases, 2014 saw much slower 2% overall growth. This sharp deceleration was followed, in 2015, by an actual reduction estimated at 2%. Currently, there are few signs of a rebound in the next twelve months.

Weakness in China's imports is having a huge impact on global seaborne dry bulk trade. Although there are some bright spots among other commodity importers around the world, these positive changes are offsetting only a limited part of the faltering China trend.

Slowing growth in economic activity is one general explanation for the softening import demand. Reflecting Chinese government policy choices, an accompanying extended process of placing greater emphasis on consumer spending and services, and less on investment spending and manufacturing, is also instrumental. Several more specific factors affecting individual commodities are having an impact as well.

Among forecasters, economic growth is widely expected to slacken further over the years ahead. The latest (mid February) forecast by the OECD organization suggests that GDP increases in China will continue decelerating from 6.9% last year, to 6.5% in 2016 and 6.2% next year. According to some alternative calculations, the real pace may be rather less healthy than these figures suggest.

Slowing iron ore imports

The consistent pattern of huge annual rises in iron ore imports, seen in most years over a long period, abruptly faltered in 2015 when only a limited increase occurred. The significance is large, because iron ore comprises about three-fifths of China's entire dry bulk commodity imports, and also because iron ore imports into China comprise over two-thirds of global iron ore trade.

During last year as a whole China imported 953mt (million tonnes) of iron ore, a 20mt or 2% increase compared with the previous twelve months. This positive outcome contrasted with a 2% decline in crude steel production to 804mt, accompanied by a decline closer to 4% in pig iron output from blast furnace mills. Despite success in raising steel exports, lower domestic demand for steel weakened production.

It seems clear that high-priced domestic iron ore, produced at mines in China, is still being progressively displaced by lower-priced, better quality foreign supplies. But this trend has become less prominent than seen earlier, and prospects for a continuation have become less predictable. Moreover, the outlook for steel production remains negative, with estimates pointing to another sizeable decline during 2016.

Falling coal imports

Following a large reduction in 2014, Chinese coal importers dramatically cut their purchases last year, when the total fell by 87mt or 30%, from 292mt in the previous twelve months to 204mt (including low-grade lignite), based on China Customs figures. Both steam and coking coal imports were much lower.

The downturn in steel production was one influence, while changes in the power generation sector contributed greatly. Amid a slowdown in electricity demand and output growth, a decline in coal-fired power generation occurred. Increasing emphasis on other energy sources — hydro-electricity, gas, nuclear and renewables, especially wind turbine power — reflects government policy designed to cut pollution.

Steps to control and reduce coal-burning in industry and in power generation have become a priority because of the severe air pollution experienced in many cities and urban areas. Domestic production of coal as well as imports are affected. Measures have been introduced which prohibit or diminish coal usage and imports, particularly the lower grades which cause most environmental damage. These developments are likely to continue having an adverse impact on foreign coal purchases.

Strong grain and soya imports

Imports of agricultural bulk commodities into China maintained a strong upwards trend last year. Much larger volumes of cereals and oilseeds were required. The dominant element is soyabeans, which continued rising, while grain (mainly wheat, corn, sorghum and barley) was sharply higher.

Official figures show soyabeans imports in 2015 rising by 10mt or 14%, reaching 82mt. Chinese domestic consumption of soyameal in livestock feed, and soyaoil used in food manufacturing and home cooking, is still increasing, while domestic production of soyabeans supplies only a limited part of the market. Growth in usage and imports is expected to continue.

Imports of grain, a smaller category, surged last year, despite another good domestic harvest which is the main market supply source. As a result inventories rose rapidly, especially corn, and the government is now attempting to reduce these. Consequently the import trend recently has begun to weaken, and it seems possible that 2016 will see a reduction.

Mixed pattern of other imports

Almost one-fifth of dry bulk commodity imports into China is comprised of a variety of other cargoes, comprising minerals, agribulks and fertilizers, steel products, forest products and semi-manufactures. A mixed pattern of changes was seen last year, with some sizeable increases accompanied by decreases elsewhere.

The aluminium industry raw material bauxite, and semi-processed form alumina, saw a recovery in 2015 after plummeting in the previous year. This category increased by 19mt (45%), reaching 61mt. By contrast nickel ore, which also had fallen steeply in 2014, continued downwards last year, declining by 13mt (26%), to 35mt.

Richard Scott

CHINA'S DRY BULK IMPORTS (MILLION TONNES)

Main bulk commodities	2011	2012	2013	2014	2015	% change**
Coal*	222.3	288.9	327.2	291.6	204.2	–30.0
Iron ore	687.0	745.5	820.3	933.1	953.4	+2.2
Soyabeans	52.6	58.4	63.4	71.4	81.7	+14.5
Bauxite/alumina	47.1	45.1	75.4	41.8	60.8	+45.3
Nickel ore	48.3	65.0	71.2	47.7	35.2	–26.3

source: China Customs, USDA, BSA **coal includes lignite* *** 2015 compared with previous year*

Global grain trades

A Telestack cambered boom shiploader loading grain onto a coaster vessel direct from truck.

Maria Cappuccio

HIGH OUTPUT PROJECTED FOR 2016 CROPS, MARRED BY BURDENSOME SUPPLIES AND WEAK GROWTH

The global economy is projected to grow by 3% this year and 3.3% in 2017 well below average, and unlikely to expand any faster in 2016 than last year, its slowest pace in five years, according to the latest assessment from The Organisation for Economic Co-operation and Development (OECD), with the downgrade spread across both advanced and major emerging economies, the largest impacts expected in the US, the euro area and economies reliant on commodity exports, like Brazil

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and Canada. Financial instability risks are substantial, as demonstrated by recent falls in equity and bond prices worldwide, and increasing vulnerability of some emerging economies to volatile capital flows and the effects of high domestic debt. Global growth prospects have practically flat-lined, recent data have disappointed and indicators point to slower growth in major economies, despite the boost from low oil prices and low interest rates. Given the significant downside risks posed by the financial sector the OECD urged, policy makers to strengthen growth and reduce financial risks.

Crop prices remain under pressure in 2016/17

The agricultural sector has been hit by low economic growth-the downturn in China as it transits from an industrial to service based economy, low commodity prices and volatile currency movements. Record grain and oilseed production has outpaced consumption for the last three marketing years, despite an intensification of the *El Niño* weather phenomenon. While, high output projections for 2016 crops are expected to sustain stocks, already at record levels, keeping prices under pressure in 2016/17.

Global wheat crop marginally lower in 2016

In the Northern Hemisphere, planting of the 2016 winter wheat crop, which accounts for the bulk of the wheat cultivated globally, is complete; conditions have not been entirely ideal in some regions, due to the influence of the prevailing *El Niño* — have made it through winter without any unusually high winter damage, encouraging prospects for the 2016 harvest. With a small drop in the global wheat area, the UN's Food and Agricultural Organization (FAO), forecast global wheat production at 723mt (million tonnes) in 2016, below last year's record, mostly due to dry weather conditions reducing winter plantings, in Russia and Ukraine, with smaller crops the EU and India.

Downturn in prices cut North American plantings

US wheat sowings expected to fall by 3m/acres to 51m/acres in 2016/17, the smallest all-wheat area since 1970 reflecting the downturn in commodity prices-winter wheat plantings to fall to 36.6m/acres Hard Red Winter (HRW) 26.5m/acres, Soft Red Winter (SRW) 6.7m/acres, small increase for White wheat to 3.4m/acres). Early indicators suggest the US wheat crop will be just below 2015, higher yields expected to make up for reduced winter plantings, and unusually, weak autumn sowings unlikely to be followed by some gain in spring plantings. Canada is also expected to cut acreage to 9.3m/acres, with a recovery to average yields, output is expected to reach over 28mt, some 700,000mt up on last year. With plantings complete, the focus shifted to the progress of *El Niño*, and whether its effect will diminish in the spring and fade or, give way to a developing *La Niña*. Meteorologists, suggest that in the past, the US has been subject to greater risk of unfavourable weather in the summer months, after the winter wheat crop harvest.

Smaller wheat crop forecast for the EU and Ukraine

Favourable planting conditions and mild winter weather across much of the EU, with most crops well-established, benefiting from plentiful soil moisture, lifts prospects for this year's harvest. Copa/Cogeca estimate the EU soft wheat crop at 148mt below last year's 150mt crop, due to an increase in the sown area of 560,000/ha to 24.5m/ha, above both 2014 and 2015. Strategie Grains confirmed the EU's winter cereals are mostly in good condition but cut their forecast for soft wheat to 143mt, based on smaller sowings in some parts of the EU's eastern countries. Dry weather forced Ukraine to sharply cut the area under wheat and in Russia also, expected to reduce crop output below last year. Mars, the EU's crop monitoring body, flagged concerns in February, that winter crops across western and southern Europe, as well as Germany, Romania, southern Poland and western Ukraine, remain vulnerable to frost, after a warm winter prevented the development of cold resistance.

GLOBAL WHEAT PRODUCTION (MT)

	2012	2013	2014	2015	2016
Europe	138	148	160	162	160
EU	134	144	156	158	156
E.Europe	4	4	4	4	4
CIS Baltic's	78	104	113	118	112
Russia	38	52	59	61	60
Ukraine	16	22	25	27	20
N &C America	92	99	88	87	88
US	61	58	55	56	55
Canada	27	38	29	28	28
S America	18	20	24	20	22
Argentina	9	11	13	11	12
N East Asia	37	42	35	41	41
Turkey	16	19	15	20	20
F East Asia	249	249	258	249	249
China	121	122	126	126	126
Africa	24	27	25	27	25
North Africa	17	20	19	18	18
Australia	23	26	24	24	25
Total	658	715	726	736	723

Source IGC, USDA, UN trade-totals may not add due to rounding

Lack of moisture hampers India's wheat plantings

India's wheat production in 2016 is forecast lower reflecting a 4% decline in planted acreage, and poor planting conditions. due to low water supplies in the main reservoirs, early withdrawal of 2015 monsoon and scanty rainfall across the key growing areas of northwest and central India. Trade sources estimate the crop to be c. 75-84mt, down from last year's crop of 89mt. In Pakistan, wheat output is expected to increase by 3% in 2016, assuming good water supply and adequate inputs. Wheat cultivation in China is anticipated to remain unchanged from last year, reflecting continued government support for wheat and beneficial weather in key producing areas.

Good conditions for a large Australia wheat crop

In the Southern Hemisphere, early-season dryness in Brazil and Argentina could result in reduced plantings. By comparison, Australia's wheat season is shaping up for near ideal conditions. Abares expects Australian farmers to plant a near-record wheat crop in the next few months, above last year, despite benchmark prices falling to over five year lows. Improvements in seasonal conditions could see output go even higher than the 24.5mt forecast, if the recent *El Niño* is followed by a *La Niña* weather event (which has a 50% chance of materializing) bringing rainfall to the country's east coast and boosting yields.

Forecasts point to sharp falls in wheat prices in 2016

While USDA forecast US wheat prices to fall to $4.20/bu ($154.45/t) a decline of 16% from the current year. Preliminary data for US wheat plantings suggests growers have switched

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winter wheat acreage to corn this year-a strong dollar, increased competition from other origins, and sharply reduced prospects for future US wheat exports. Rabobank forecast Chicago wheat futures at $4.75/bu ($174.67/t), and trimmed its forecast for Paris futures by E15/t to E170/t ($185.84/t) by the end of 2016, citing strong harvests and fierce rivalry on export markets, leading to massive stock-building in the EU and US.

Ergot tolerance sparks controversy for wheat sales to Egypt

Egypt, the world's largest wheat buyer sparked controversy when plant health officials rejected a series of wheat cargoes on the grounds they contained traces of the ergot fungus, even though the country's grain authority allows levels of up to 0.05%. The rejected cargoes, highlighted an internal clash between Egypt's agricultural and trade authorities, which stymied trade, until being resolved, but not before international sellers, wary of bidding for further business, boycotted Egyptian tenders, increased the risk premium for shipments to Egypt, and a leading shipper, Bunge, filed a legal challenge. Both ministries subsequently, confirmed the ergot tolerance at 0.05% and shortly after, Egypt's General Authority for Supply Commodities (GASC) purchased 240,000/t of wheat with prices reflecting a $9-$10/t risk premium. At a subsequent tender on 25 February, the GASC bought a further 300,000/t at more competitive prices-Soufflet amongst few others, offered 60,000/t French wheat for $183.98/t (includes freight $8.98/t), this and other offers reflected a much lower risk premium. The GASC also bought 30,000/t of US Hard Red Spring (HRS) for delivery in 15–25 March taking advantage of record-low freight costs, which typically rules out supplies from the US.

Removal of tax boosts Argentine wheat exports

The removal of the export tax on Argentine wheat exports and the devaluation of the peso by the new government raised the profile of Argentine wheat in global markets. Argentine ports loaded almost 1.8mt of wheat (December – 5 February) with exports expected to reach 6.5mt in 2015/16, up over 50% on the previous year. While growers look set to benefit under the new farmer-friendly regime, millers are less than happy having to compete with exporters for supplies. But despite a larger 11.3mt wheat harvest, crop quality is weak with a significant proportion being feed quality, adding to the squeeze on milling quality supplies; and exacerbated by Argentine growers holding grain, in anticipation of higher prices, when Brazil (forecast to import over 6mt-harvest rains reduced protein levels) enters the market, typically in May/June. Milling premium offered by exporters at southern Buenos Aires ports for wheat include: $180/t – 10.5% protein, $160/t – 10% protein and $145/t – 9.5% protein.

COARSE GRAIN SUPPLY & DEMAND

2012-2015/16 (mt)

	2012/13	2013/14	2014/15	2015/16
Production	1,136	1,281	1,298	1,264
Consumption	1,135	1,233	1,267	1,261
Trade	132	165	173	170
Stocks	163	211	242	245
China	68	81	101	112
Major exporters*	59	82	90	89

*Source: USDA — *major exporters Argentine, Australia, Brazil, Canada, EU, Russia, Ukraine, US*

GLOBAL WHEAT SUPPLY & DEMAND

2012–2016/17 (mt)

	2012/13	2013/14	2014/15	2015/16	2016/17
Production	659	715	726	736	723
Consumption	679	698	705	711	718
Trade	147	162	161	163	160
Stocks	177	194	215	239	244
China	54	65	76	94	-
Major Exporters	51	54	63	72	-

Source: USDA/FAO/IGC

Global wheat stocks at record level of 239mt in 2015/16

US wheat exports are 13% down year-on-year unlikely to exceed 22mt with US values uncompetitive compared with other origins, like Russia and Argentina, whose currencies have been devalued, and also expected to incentivize farmers to boost production. Argentina's exports are forecast up by 2.3mt to 6.5mt. With the Russian rouble at a record low, wheat exports combined with other CIS countries are forecast to rise to over 46mt (Russia 23.5/t, Ukraine 15.5mt, Kazakhstan 6.5mt), 6mt more than the previous season. USDA forecast global wheat stocks to close at a record high of 239mt by the end of 2015/16, reflecting mainly an upgrade in Chinese inventories, less wheat used in China and India, and an increase in supplies in the US 26mt and EU 19mt. Wheat futures have declined as favourable weather improved crop conditions, and as US stockpiles rise due to cheaper prices in other producing nations.

CBOT Futures for May delivery fell to $4.4525/bu ($163.60/t – 2 Mar '16). In Paris, milling wheat for the same month dropped as much as 1% to a three-week low of €151.75 ($164/t). US HRW FOB (free on board) Gulf $201/t and EU France Grade 1 Rouen $164/t – 25 Feb '16.

Corn acreage to rise in major producing countries in 2016

Global corn acreage is forecast to expand in 2016/17 by 1% including gains in the US, the CIS, South America and Africa, according to Informa economics-they expect the small increase in production to be absorbed by higher use, with global ending stocks to fall only slightly, but to remain above 200mt.

US growers expected to switch wheat and soy acreage to corn

With low returns for wheat, soyabeans and sorghum, USDA expects US growers to switch acreage to corn and increase corn plantings by 2m/acres to 90m/acres (harvested area 82.3m/ha) in 2016, the first time in four years. Lower fuel and fertilizer costs make corn more attractive relative to other crops; with yields estimated at 168bu/acre — implies a crop of c.351mt, 5mt more than last year, with US stocks at a record level of 50mt by close of 2016/17, pushing prices lower-USDA forecast corn to average near $3.45/bu during 2016/17.

More than ample supplies boosted by large 2015 coarse grain crop

With better crops in several countries, the global coarse grain harvest is forecast at 1.26Bn/t in 2015/16, the third-largest crop on record. Lower crops of corn and barley partially offset by an increase in sorghum. Overall demand for coarse grains to fall by

6mt to 1.26Bn/t, as sharp fall in oil prices, volatile currency movements and low growth affect purchasing power in several countries. Coarse grains used in food/industry fell by 18mt to 513mt, only partially offset by the increase in feed use up by 13mt to 748mt.

Sharp contraction forecast in corn for food/industry use

Global corn production at 970mt is lower than last year, but still a significant output, boosted by large crops in the US 346mt South America 111mt (Brazil 84mt Argentina 27mt) and better crops in Canada 14mt, China 225mt and Russia 13mt. Resilient feed demand in Brazil, Russia and especially China account for most of the 14mt anticipated rise in corn use up to 597mt for animal feed partially offsetting a sharp contraction of 24mt in corn used for food/industrial use, down to 371mt in 2015/16.

Weak energy prices dent ethanol margins

Challenging conditions beset the ethanol industry through 2015, sharply low oil prices coupled with regulatory indecision regarding future volume requirements under the Renewable Fuel Standard (RFS), dented profit margins. Late last year, the Environmental Protection Agency (EPA) finally set the volume requirements for the RFS for 2014–2016 at 14.5 Bn gallons, well below industry expectations (800 m/gallons less than production capability), and below those mandated by Congress, which the industry continues to challenge. The first three months of 2016, saw energy prices plummet, with front-month ethanol futures trading at $1.350-$1.406 a gallon in New York, less than half their 2014 highs. The Andersons Ethanol Group recently released its fourth-quarter and full-year reports that showed overall ethanol production in 2015 up by 12m/gallons to 384m/gallons, but pre-tax income for 2015 at $28.5m compared with the previous year's $92.3m.

Ethanol industry upbeat on projected rise in US gasoline use

Despite lower oil prices-US ethanol exports rose to 850m/gallons, helping to limit the build-up of ethanol stocks, as supply continues to outpace demand. Even with record stocks and a lull in demand, the industry remains upbeat for 2016/17, hopeful that international demand for ethanol will grow, and, domestic demand, based on the US Department of Energy's forecast that gasoline use in the US is expected to rise to near record levels this year, will pick-up. Geoff Cooper senior vice president of the Renewable Fuels Association said "I think we'll set a new record this year for US ethanol blending despite the fact that we have $30 oil and low gasoline prices."

USDA project corn use for ethanol in 2016/17 at 5,225m/bu (133mt), the same level as last year, producing a record output of ethanol of 14.7Bn gallons and 40mt of livestock feed (36mt Distillers Dried Grains and Solubles (DDGS) 4mt Corn Glutenfeed/meal, with almost 13mt of DDGS exported to several countries, including 6mt to China.

Lower government support expected to cut China's corn acreage and output

Due to higher prices set for corn, above those of the world market, China became a leading market for cheaper feed ingredients like DDGS, sorghum and barley to support growing feed demand. The planned reduction in the government's support price for corn, is to be introduced over the next few months; with the Chinese government keen to reduce the huge stockpiles of corn, forecast at 112mt by the end of this season, are also expected to slow imports of cheaper feed ingredients like DDGS, sorghum and barley to prevent further growth in corn stocks. The IGC expect the change in support arrangements will see a decline in the planted acreage for corn in marginal areas, with China's corn production to fall to 212mt in 2016, 12–13mt below last year's record crop.

US corn faces fierce competition from South America

Global corn trade in 2015/16 is forecast at 131mt, but could be revised up, according to Jannie de Villiers chief executive of Grain SA, if the official estimate for South Africa's 7mt drought-affected corn crop is further downgraded, increasing corn imports from 2mt to 5mt. US corn exports are forecast lower this season, down from 47mt to 42mt, due to fierce competition from Brazil, Argentina and Ukraine. By the end of February, Brazil's harvest was ahead of schedule with planting of the second crop ahead of last year and exported from July–December, a period that coincides with the US harvest, and means Brazil's corn exports will hit the market sooner, inflicting further pressure on US prices. Combined corn exports for Brazil (36.5mt) and Argentina (19.5mt) are forecast to rise from 40mt to a record 56mt in 2015/16, both countries benefiting from depreciated currencies, making their exports more competitive relative to other suppliers, especially the US.

Increased corn acreage and record stocks

Global corn stocks are expected to rise by 3mt to 209mt in 2015/16, aside from the large build-up of Chinese stocks, US stocks are forecast to rise to a record 47mt. Average export prices for Corn (YC3), dropped to $161/t FOB (24 Feb '16), and Argentine (up river) $164/t (24 Feb '16). Futures markets gains limited by record global grain supplies and expectations US farmers will boost seedings in the planting season already underway in the southern part of the country — CBOT Futures Corn contract May '16 dropped to $3.562 at close on (2 Mar '16).

Global barley output forecast 3% lower in 2016

World barley area is expected to be broadly unchanged from last year with increases predicted in Europe, the CIS, North America, but with drought containing the area in North Africa. World average barley yields are projected to fall, leading to a 3% drop in production implying a crop of c.141mt. Conditions for winter crops remain favourable across the EU. With the contraction of beer and distilling markets across the EU, malt demand for 2016/17 remains unclear with buyers waiting until firm demand materializes, similar to the situation in the US and Canada. USDA forecast that combined exports of barley and sorghum to China will decline to 9.6mt in 2016/17 from14.5mt in the current marketing year, as China reduces the support for domestic corn.

Large harvests in Turkey, Morocco, Argentina, Australia, Canada and the EU lifted global barley output up by 5mt to 146mt in 2015/16, offsetting smaller crops in the Ukraine and Russia. Barley use is expected to increase by 6mt to 147mt (feed use up by 2mt to 98mt, food/industry use up by 4mt to 48mt). With better domestic crops in several countries trade is forecast slightly lower at 23.6mt mainly due to reduced imports into China, Iran and Saudi Arabia, with stocks by the end of season, similar at 25mt. UK Feed Barley Ex-Farm £95–100 ($132.7–139.6 25 Feb '16); EU Feed Barley (France) FOB Rouen $168/t (Feb 24'16) some $30/t lower than last year. Paris

GLOBAL MAJOR OILSEED PRODUCTION

2011–2015/16 (mt)

Oilseeds	2011/12	2012/13	2013/14	2014/15	2015/16
Production	446	475	504	536	527
Soybean	240	269	283	319	321
Trade	111	118	134	147	148
Crush	394	396	418	440	446
Meal use	258	259	272	289	300
Oil use	152	158	166	171	177
Stocks	67	68	78	91	91
Soybean	54	56	62	77	80
US	5	4	3	5	12
S.America	29	36	42	51	49

Source: USDA/Meal use excl. fishmeal c.5mt

SOYABEANS MAJOR PRODUCERS

2011–2015/16 (mt)

Countries	2011/12	2012/13	2013/14	2014/15	2015/16
US	84	83	91	107	107
Brazil	67	82	87	96	100
Argentina	40	49	54	61	59
China	15	13	12	12	12
India	12	12	10	9	8
Paraguay	4	8	8	8	9
Canada	5	5	5	6	6
Others	15	16	16	19	20
Total	240	269	283	319	321

Source: USDA

Futures Malting Barley May contract closed at E214/t ($235.9/t Feb 25'16).

Reduced sorghum demand to cut acreage in 2016

The planted area for US sorghum is expected to fall by 14% in 2016 in response to reduced demand from China, with combined imports of sorghum and barley to fall to 9.6mt in 2016. By contrast to last year, when production of sorghum increased by 4mt to 68mt helped by a bumper 15mt US harvest and better crops in Sudan, Mexico, Australia and India. Global sorghum demand for animal feed rose by 3mt to 67mt mainly due to feed use in China. While trade in 2015/16 is forecast at 10mt, below the previous year, when China imported a combined total of 20mt of sorghum and barley and 6mt of DDGs. Sorghum prices (April) FOB — Nola $177.06/t (25 Feb '16).

Soyabean output and prices forecast lower in 2016

Abares expects global soyabean output to fall by 2% to 311mt in 2016/17 down 10mt on this year, with declining output in Argentina and the US where farmers are expected to switch extra area to grains; while soyabean prices are forecast at a ten-year low of $349/t (based on US Gulf), due to abundant supplies, including record high carryover stocks of 80mt from 2015/16 and an anticipated increase in global soymeal stocks-expected to weigh on the price of soyabeans, due to the high meal content of the oilseed.

US soyabean acreage is expected to fall for a second successive year, this time by 200,000 acres to 82.5m/acres in 2016 according to the latest assessment from USDA, with lower soyabean prices to average $8.50/bu ($312.32/t) in 2016.

Record soyabean crop and large stockpiles pressure prices

Global oilseed output is expected to reach 527mt in 2015/16, slightly below last season, boosted by record soyabean output in major exporting countries, either harvested, or being harvested in early 2016, lifting production to 321mt; with small increases for other crops including, groundnut 40mt palm kernel 16mt and copra 6mt and lower crops for cottonseed 38mt, sunflower seed 39mt and rapeseed 68mt-poor prospects for the rapeseed harvest this year, suggest prices, unlike soyabeans are likely to rise. Large stocks and ample supplies have pressured soyabean prices, to record lows. Global crushings, are expected to rise by 6mt to 446mt especially in China and Argentina-the lower prices improving crush-margins in those countries and in Brazil, with oil meal use up by 11mt to 300mt. While trade in the major oilseeds is marginally up on last year at 148mt, stocks by end of 2015/16 of 91mt are at a similar level to the previous year.

South American production is forecast at 174mt (Brazil 100mt, Argentina 59mt Paraguay 9mt others 6mt). The Brazilian real has plummeted against the dollar R$3.95 to US$1.00 (26 Feb '16) exerting stronger competitive pressure on US exports.

Soyabean imports into China are expected to remain strong, unlike other grain crops.

Global soyabean trade is raised by 4mt to 130mt in 2015/16, due to rising Asian imports forecast at 95mt, with China expected to import 81mt-83mt this season. Increased imports are also expected for Malaysia, Philippines, Taiwan, Thailand, Indonesia, Vietnam and South Korea, due to strong demand for protein. US soyabean exports are expected to fall to 46mt while Brazil's exports are expected to increase to 57mt.

Argentina's crushing set to rise

With the recent change of government in Argentina, tariffs on

OILSEEDS AND MEAL SUPPLY/DEMAND 2015/16 (MT)

	Oilseeds				Meal		
	Prod	Trade	Crush	Stocks	Prod	Trade	Use
Soybeans	321	130	276	80	217	66	216
Sunseed	39	1	36	2	16	7	16
Rapeseed	68	14	66	7	39	6	39
Copra	6	*	6	*	2	1	2
Palmkernal	16	*	16	*	9	7	8
Peanuts	40	3	17	3	7	*	7
Cottonseed	38	1	30	1	14	*	14
Total	527	148	446	91	303	86	300

*USDA: *less than 200,000/t. Meal totals excl. fishmeal*

SOYABEAN & SOYABEAN MEAL MAJOR PRODUCERS 2013/14–2015/16 (MT)

	Soybeans			Soybeanmeal		
Importers	**2013/14**	**2014/15**	**2015/16**	**2013/14**	**2014/15**	**2015/16**
EU	13	13	14	18	19	20
Asia	83	92	95	18	18	20
China	70	78	81	—	—	—
L. America	2	2	2	5	5	5
N. America	6	5	5	3	3	3
Mexico	4	4	4	1	2	2
MidEast/Africa	4	6	6	9	7	8
Others	3	4	5	4	5	5
Total	**112**	**122**	**127**	**58**	**60**	**64**

Source: USDA

meal and oil have been removed increasing incentives for domestic crushing. Volumes for the first three months of 2016 are expected to be at record levels, and likely to pressure crushing margins elsewhere, especially in the US. Although Bunge's CEO Soren Shroder said the effect would be short-lived noting that even before the reforms, Argentine crushing was running at 'near capacity' limiting the potential growth in volume to the first half of the season.

Brazil to benefit from large crops and strong demand

While Brazil is expected to benefit from large crops, strong domestic meal demand for animal feed, and a competitive global cost structure, following the decline in the value of the real, US export volumes with a strong dollar are facing intense pressure. Bunge expects the new US harvest to bring improvement in the fourth quarter as demand switches back to the US.

Falling prices anticipating sizeable crop and rising stocks

Soyabean prices have plummeted reflecting large crops over the past three years, large stocks and the prospect of another sizeable crop in 2016. Futures markets registered a sharp downturn when acreage and prices for soyabeans were released. CBOT Futures Contract soyabeans May '16 fell before recovering on the back of a bullish assessment for Chinese soyabean demand to close at $8.61/bu (Mar 2 '16).

Average export price for soyabeans 2Y FOB Gulf $334/t (Feb 29 '16) some $177/t below last year; while Soyabean prices out of Brazil (Paranagua) $326/t and Argentina (Up River) are quoted at $317/t respectively (29 Feb '16).

Asian feed demand supports rising meal imports

While China is expected to crush almost 81–83mt of soyabeans in 2015/16, margins are expected to be weaker, despite strong demand due to excess crushing capacity. Projected soyabean meal exports are raised by 4mt to 64mt mainly due to Argentine sales, up by almost 4mt to 32mt to countries, other than China, in South East Asia in 2015/16 reflecting strong feed demand. With a significant fall in prices year-on-year, the average export price for Argentine soyabean meal pellets (Up River) $307/t (Jan '16); CBOT Futures contract soyabean meal-May'16 closed at $262.8/t (1 Mar '16).

Grains buck the trend in Brazil

With its economy shrinking, at a time when the price of iron ore, as well as steel and many other 'hard' commodities remain weak, and with state-owned oil company Petrobras in deep crisis, most of the news coming out of Brazil at the moment, is extremely bad, *writes Patrick Knight.*

But there is one important exception, and that is agriculture, with special emphasis for the all important grains industry. The current exceptionally severe *El Niño* phenomena has forced estimates for the 2015/16 soya and maize crop to be revised down slightly, and last year's all time record crop of just over 200mt (million tonnes), may not be exceeded, as had been hoped. But because about a million additional hectares have been planted to soya for 2015/16 as was in the previous season, most of that in Mato Grosso state, this year's total output will be the same as last year's. While conditions in the north and north east have been drier than usual this year, although excess rain which has fallen in the south of the country, something which invariably happens when a strong *El Niño* is active, this has only prejudiced the rice crop there. The soya and maize crops have been very similar to those of last year in the south of the country.

World grains prices have weakened only slightly following the news that Brazil's crop will be

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high again, coupled with the news that the new government in Argentina, will be treating agriculture fairly from now on. Farmers were persecuted during the ten years when governments were headed by the Kirchner couple, and larger crops and exports can be expected from the southern cone producer from now on. The fact that the US dollar has gained strength against other currencies, notably Brazil's real, has meant US grains are less competitive in many export markets. Being unable to export at a profit, many farmers in the US seem likely to switch to planting more maize, which finds a ready market on the domestic market, in preference to soya this year.

Many analysts worry about the prospects for China's economy, and the negative impact this is having on the prices of most hard commodities, notably iron ore, steel and other metals. But the Chinese government is having some success in switching priority away from investments in housing and infrastructure, to consumers. Higher wages mean that demand for food and feed ingredients continues strong, although imports of grains are not growing as fast as they did before 2013. Even so, the destination for 77% of Brazil's soya beans last year, is likely to need an extra 2mt this year. This is not as much as the 10–15mt extra of earlier years, but still pretty good. Some analysts worry that the country's complex financial situation, which includes large debts run up by regional governments and by individuals, could mean a hard landing lies ahead, and the Brazilians are praying this does not happen.

Although soya remains Brazil's most important farm product, and continues to be Brazil's leading export earner, more remarkable has been the surge in production and export of maize in the past few years. Until quite recently, Brazil was frequently a net importer of maize, huge quantities of which are used by the meat producers there. A massive 27mt of maize were exported from Brazil last year, an all-time record, and this year could see a repeat of that. The increase has been almost entirely due to the fact that in the past few years, maize has been planted as a second, 'winter' crop, in the north of the country, where the grain is sown immediately the early varieties of the soya which form about a third of the crop, are harvested. Until a few years ago, the only maize planted in Brazil's mild, but dry 'winter', was sown in the southern state of Parana, but this has changed in recent years. The area planted to summer maize, not planted in the north, has remained static. So while 5.7 million hectares was planted to 'summer' maize, (still referred to as the 'main' crop) last year, the area planted in the 'winter' totalled 9.6 million hectares. About a third of the soya planted in Mato Grosso and elsewhere in the north, is of 'early' varieties, harvested in time for 'winter' maize to be planted early enough to take advantage of the moisture left in the soil after the wet summer months.

Leading markets for Brazilian maize, which has been aided by the 50% devaluation of the 'real' in the past 12 months, can now be sold more cheaply than that from the US, include Vietnam, Iran and South Korea. So far, China has not figured strongly in the list of buyers for Brazilian maize, but is expected to take some this year. Some analysts suggest that China will in future prefer to import more meat, rather than the grains needed to

feed locally raised stock. There is little space for more animals to be accomodated there apparently.

With the widening of the Panama canal to be completed in the next few months, the news that about 20mt of the 100mt of the grains exported from Brazil during 2015, left from ports in the North and North East of the country, compared with the 13mt which left from ports in this region in 2014, is extremely significant for the maritime industry and for grain traders.

Although Santos, Paranagua and Rio Grande in the south east and south each still handle larger volumes than any one port in the north, between them, the river ports of Itacoatiara and Santarem on the Amazon river, together with Vila do Conde, at the mouth of the giant river, the fast-growing port of Itaqui in Maranhao state, and Salvador in Bahia are benefiting from the major investments which have been made in recent years in facilitating river transport. Taking grains to deep water ports by barge, rather than road can cut $40 per tonne from the cost of getting beans and maize from farms in the states of the north and nort east, where about 50% of all Brazil's soya and maize is now planted, to the ports of this region. These ports are all three or four days' less sailing time to ports in Asia and Europe, than those in the south and in Argentina. The fact that larger ships will be able to navigate the Panama canal in future, will give a new spur to the building of new loading facilities in the north, and require numerous new large shiploaders, as well as encourage new plantings there.

Although the deep financial crisis now affecting Brazil means that the construction of new roads, and improvement of existing ones by official bodies has slowed, a group of leading trading companies, which have already been responsible for building dozens of new terminals in the northern part of Brazil, now plan to build new railway lines. A 930km line which will run parallel to what is now a major road route for the movement of soya to the north, the BR 163, which has not been duplicated as promised, should mean that the growth in the share shipped from the north will continue to increase. The north is the only area remaining in Brazil where large tracts of land, most of it previously used to graze cattle at very low densities, but which can be converted to growing grains at relatively low cost, still exist.

The present weakness of the Brazilian currency, has largely compensated for the recent falls in the world price of soya and maize. As a result, Brazilian farmers have not seen their incomes fall much, even though the price of maize and soya has fallen. But the price of imported goods, notably fertilizer has risen, and because farms and producing regions in Brazil are much further from ports and markets than those of its competitors, the country continues to be extremely vulnerable to the weaknesses of its infrastructure, whose capacity and quality has not kept pace with the growth in the amount of grains produced and exported.

DC

No wear for RiverTough after over 20,000 hours in abrasive Alaskan waters

After nine years of operation in the harsh, abrasive waters of Alaska's Yukon River, aboard Inland Barge Service's push boat *Ramona*, Thordon Bearings' RiverTough water-lubricated tail-shaft bearing system has emerged completely free of wear and tear.

The exceptional performance of the RiverTough bearings in waters renowned for their high content of gritty glacial silt came to light when the 16m (52.5ft) workboat's cracked struts underwent repair in dry-dock.

Charles Hnilicka, the owner of Inland Barge Service Inc, said: "In the spring of 2011 we were doing some hot work on one of the struts and decided to change the bearing since everything was apart. We didn't have to and could have reinstalled the original bearing after the hot work, but we had a spare set.

Inland Barge Services' push boat Ramona *serves the communities along Alaska's Yukon River (courtesy of Inland Barge Service Inc).*

"When we took it out, the RiverTough bearing and sleeves had no appreciable wear and tear, which was amazing considering the environment in which the *Ramona* operates."

The 1971-built push boat provides an invaluable service delivering freight and consumer goods to communities along the Yukon River and its tributaries.

These shallow waters, usually only navigable between May and October, are fed by rain and glacial melt containing highly abrasive silt and ground rocks, called glacial till, that can severely damage other propeller shaft systems.

Since 2003, when Inland Barges Services replaced the single-screw Ramona's rubber bearings, Thordon's polymer system has undertaken over 2000 hours of operation per year in some very abrasive environments.

"I haven't seen anything like it," said Hnilicka. "When we used rubber bearings we were lucky to get a full operational season out of them before they needed replacing."

Scott Groves, Thordon Bearings' Business Development Manager, said: "We have data from workboats operating on the Mississippi showing typical RiverTough wear rates of 0.075mm to 0.100mm (0.003" to 0.004") in 6,000 to 7,000 hours of annual use, but this is the first time we have received data from a vessel operating in the high north. The feedback from Inland Barge Services provides clear evidence of RiverTough's superior wear life in very abrasive water conditions. They routinely outlast rubber bearings by a factor of two or more."

Todd Terry, President of Pacific Marine Equipment (PME), Thordon Bearings' Seattle-based distributor, said Inland Barge Service, Inc is among a growing number of workboat and small craft operators to covert from rubber tail-shaft bearings to the RiverTough solution.

Thordon Bearings' RiverTough routinely outperforms rubber bearings, even in highly abrasive waters.

"In 2001, we supplied the water-lubricated bearing system to HamiltonJet's Yukon Queen. The vessel ran from 2001 to around 2010 when it was sold and left the river. HamiltonJet reported that the RiverTough bearing worked exceedingly well in this application. Since then, we have supplied Interlake Steamships, Riverway Transport, American Commercial Lines, Ingram Barge Line, Blessey Marine Services and Eckstein Marine."

McAsphalt Marine Transportation is the latest owner to opt for the RiverTough solution and Thordon Bearings will supply water-lubricated bearings and Nickel Chrome Boron-coated stainless steel liners for a twin-screw articulated push barge operating in the Great Lakes waterway system. The bearings will be designed for 365mm (14.4") shaft diameters.

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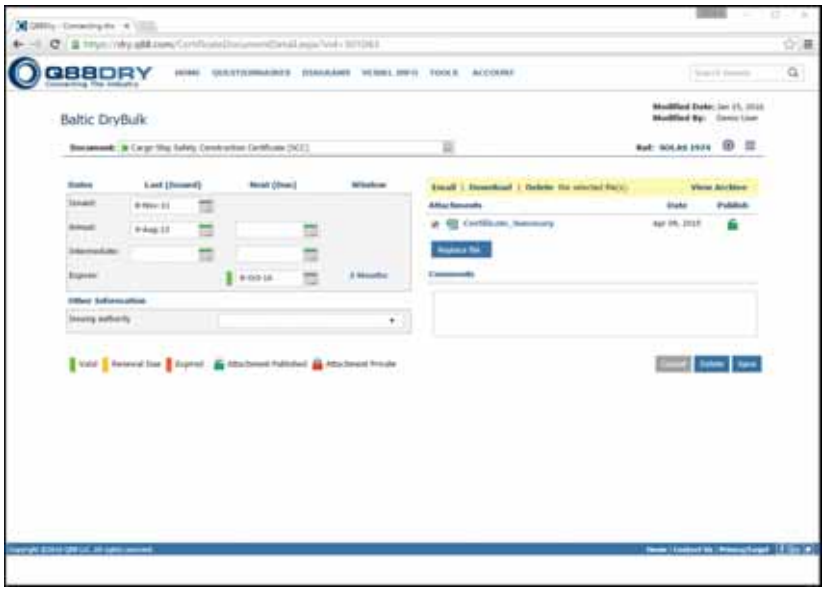
Cloud-based, Q88Dry allows companies the ability to manage all of their fleets' certificates, documents and questionnaires in one central database. The data directly links to an automated notification system which prompts vessel owners when safety certificates are coming due. In turn, assisting the industry leaders in maintaining the most up to date certifications onboard at all times to ensure safe waters.

Q88Dry, a Q88 LLC company, boasts a client list of over 90 companies operating over 1,500 bulkers. Notable clients include commodities trading giants Cargill and Glencore, as well as some of the world's leading owners and operators including Pacific Basin, Western Bulk, Clipper Bulk and Scorpio Bulkers. Q88 LLC was founded in 2008, and is considered to be at the forefront of information technology for the maritime industry. It has over 1,000 clients on six continents, and has 160 years of combined shipping experience.



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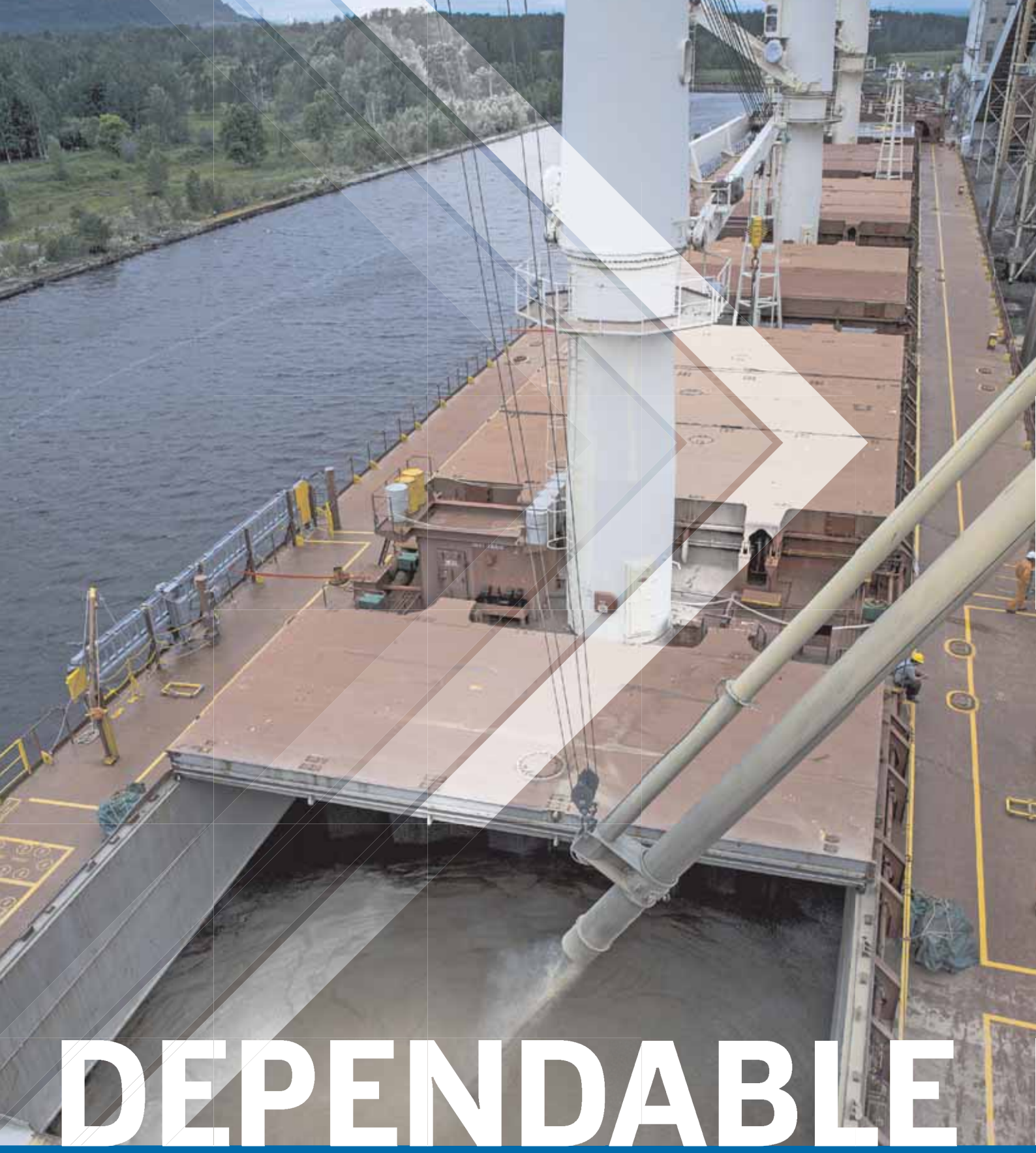

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Archer Daniels Midland (ADM) is one of the world's leading agricultural processors. As the world's population grows, so does demand for quality foods, feed ingredients for livestock, alternative fuels, and environmentally friendly alternatives to traditional chemicals. ADM plays a pivotal role in meeting all of these needs.

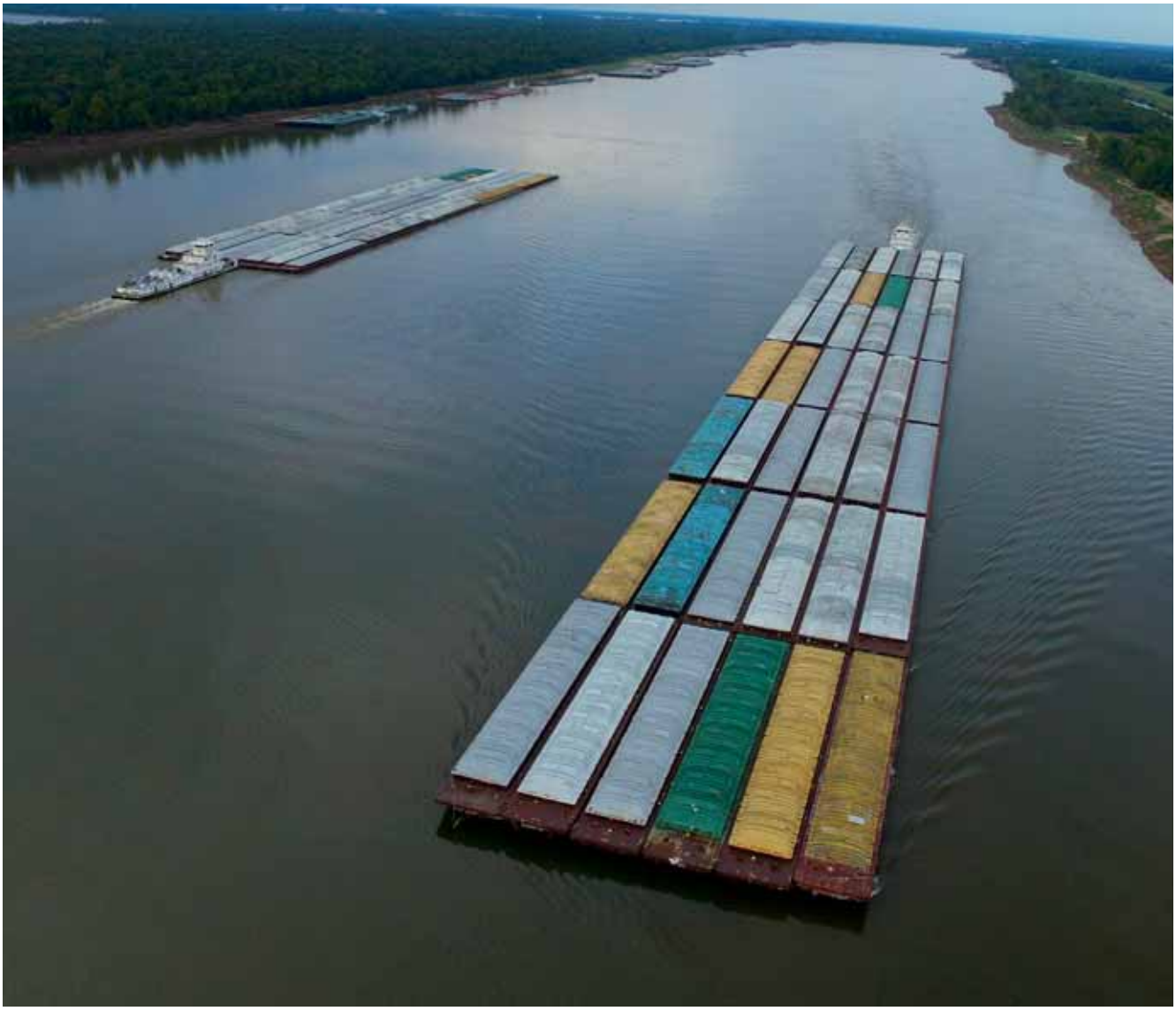
For more than a century, the people of ADM have transformed crops into products that serve the vital needs of a growing world. Today, it is one of the world's largest agricultural processors and food ingredient providers, with more than 32,300 employees serving customers in more than 160 countries. With a global value chain that includes 428 crop procurement locations, 280 ingredient manufacturing facilities, 39 innovation centres and an outstanding crop transportation network, ADM connects the harvest to the home, making products for food, animal feed, industrial and energy uses.

Because of its pre-eminent position, ADM is able to serve thousands of customers efficiently and profitably. Its customers benefit from ADM's wide global reach, strong relationships with farmers, and extraordinary range of logistical, analytical and technological services.

ADM in the US Gulf

One of the regions in which ADM is particularly active is the US Gulf. Archer Daniels Midland Company's (ADM) Ag Services business unit has two major groups operating in the Gulf. ADM Grain Company, the export grain division of ADM, has four grain elevators and two floating rigs that can either load at a buoy system or alongside a vessel at an elevator. These floating rigs have scales for actual weighed cargo. American River Transportation Company, LLC (ARTCO), the river transportation division of ADM, also has six midstream floating rigs currently in operation.

To support both of these operations in the Gulf region, ADM,



through its ARTCO division, currently operates 20 fleeting boats, a full-service shipyard with five drydocks, and a full-service barge wash and repair facility.

The US Gulf is a very important region for ADM. The company buys a variety of products from local farmers, including wheat, soybeans, corn, milo and other crops. In terms of customers based in the US Gulf, ADM has some local farmers on the export side, and many of its northbound customers have a significant presence in the US Gulf.

As ADM has customers in more than 140 different countries, it relies heavily on the US Gulf region as one of its most important hubs for exports and imports. The US Gulf helps provide access to ADM's vast transportation network throughout the world.

The US Gulf is an important region for ADM, so it is always looking for opportunities to potentially grow its business. For example, it completed the missing link in its self-contained supply chain in 2015, with the launch of ARTCO Stevedoring.

ADM has solid partnerships with all of the ports in which it operates, namely Port of South Louisiana and Port of New Orleans.

In terms of tonnages handled, in 2014, ADM exported 988 million bushels of grain/product from the US Gulf. ADM Logistics offers full turn-key service to its customers including ocean-going vessels, containers, ship agency, stevedoring, barges, linehaul vessels, rail car, terminals and trucking. It's truly a one-stop shop for transportation customers.

ADM uses a Heyl Patterson Marine Leg at its elevators. ARTCO Stevedoring has a fleet of six Gottwald-Terex cranes, with capacities up to 100 tonnes/lift and production up to 10k to 15k tonnes/day/crane.

ADM has its own storage at each of the four elevator locations. In total, it has in excess of 16 million bushels of storage in both silos and shipping bins. To protect the environment and operators, ADM also has dust systems in place on everything that it unloads and loads out.

Safety is the top priority at ADM. In addition to a best-in-class safety programme and culture instilled in each and every employee, ADM practises excellent housekeeping and focuses on training for its employees. Its fire-prevention measure include: smoke and carbon monoxide detectors, sprinkler systems, fire pumps, fire hydrants, explosion suppression systems, hazard monitoring systems, among others.

ADM owns and charters vessels ranging from small Handymax vessels to Post-Panamax vessels. It currently owns ten ocean-going vessels and charters many others.

ADM currently operates one of the largest covered hopper fleet in North America, operating primarily in the Upper and Lower Mississippi River, Ohio, Arkansas, Missouri, Tennessee and Illinois River regions, as well as throughout secondary river transportation corridors like the Red River and related waterways.

In the US Gulf, ADM's primary source of unloading grain is via barges. It also uses rail and at times, unloads trucks at its St.

Launch of ARTCO Stevedoring to serve customers on Lower Mississippi

In August 2015, American River Transportation Co., LLC (ARTCO), a wholly owned subsidiary of Archer Daniels Midland Company, announced the launch of ARTCO Stevedoring.

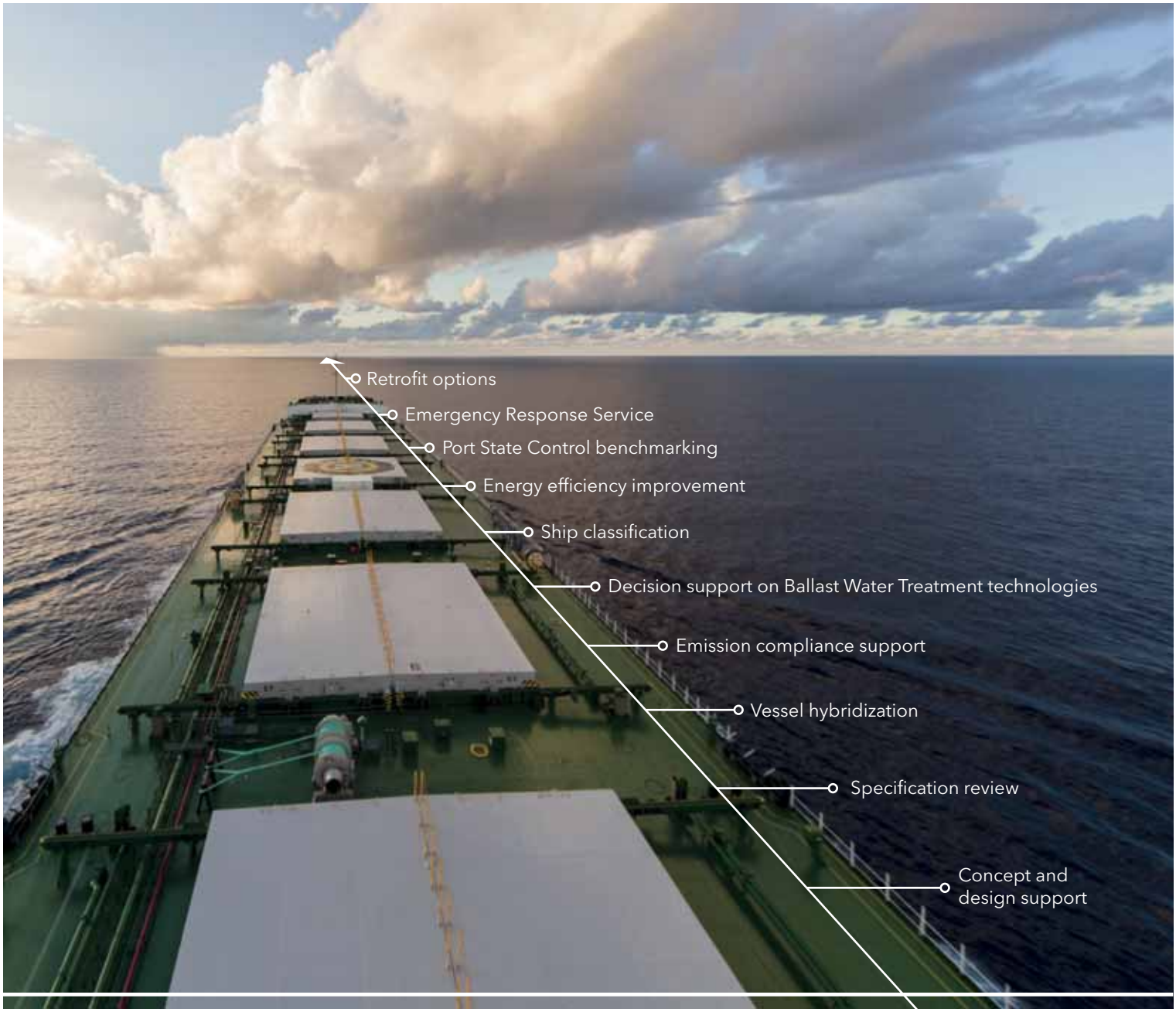
ARTCO Stevedoring operates five mid-stream berths between mile markers 110 and 121 on the Mississippi River, and offers customers a complete range of river services, including bulk transfer stevedoring and crane service; fleeting, switching, boat and related harbour services; and linehandling and crewboat services. Those capabilities are delivered by an expert team, most of whom come to ARTCO Stevedoring from its joint venture with St. James Stevedoring Partners, and bring with them years of experience on the Mississippi. In addition, ARTCO Stevedoring is the only company on the lower Mississippi that can offer customers the benefits of full integration with ADM's global transportation network and the company's world-class logistics expertise.

"ARTCO Stevedoring provides a range of services that no one else on the lower Mississippi can offer," said Jason Porter, vice president of operations for ARTCO. "Our experienced operators can efficiently meet transload requirements with our high-tech Gottwald/Terex cranes; in fact, we'll be adding two more cranes this summer to meet growing customer demand. And our services extend far beyond the lower Mississippi. Unlike anyone else, we offer fully integrated global capabilities, including blue water vessels, ship agency services, mid-stream stevedoring, fleeting, switch boat and harbour services, barging, inland terminal warehousing, container yard service, and rail and trucking operations. No one else in the Gulf offers that kind of one-stop shopping for transportation and logistical needs."

Elmo facility. ADM has one of the largest transportation networks in the world, so it has a range of options to offer its transportation customers and also to move its products and supplies.

ADM has been operating elevators in the area since 1963, handling more than 30 different commodities. ADM also has a total unload capacity of 5 million bushels and a load capacity 6 million bushels in a 24-hour period. ADM also has its own in-house stevedoring crew at all of its facilities. In addition to its fleet of lineboats, fleet boats, and barges, it operates 17 fleets throughout the inland river system, a fuelling terminal, line handling and crewboat services, barge washing and repair facilities, and full-service shipyards.

ADM is one of the only companies that can offer full vertical integration of the entire supply chain without the use of a single third-party, which is a tremendous competitive advantage for ADM and helps it provide efficient, seamless service to its customers. DCi



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For those in peril on the sea

Michael King

Maritime crime, piracy & liquefaction remain major threats to bulk carrier safety

The bulk carrier industry is making progress on ship safety, at least in terms of ship losses. Allianz Global Corporate & Specialty report, *Safety and Shipping Review 2015*, found that total losses of all vessels had fallen from a high of 170 in 2007 to 75 in 2014 — figures for 2015 were not available as *DCI* went to press. Bulk carriers made up 94 losses out of 1,271 recorded over 2005/2014, with the annual figure over that period peaking in 2013 at 15 before falling to three in 2014.

General cargo ships by contrast accounted for 523 losses over the period, although the bulk sector continues to underperform containerships (36 over the period and an annual high of five ships recorded in 2012) and tankers, the latter recording just 15 losses over 2005–2014. By region, Asia continues to dominate the losses column, headed by 'South China, Indo China, Indonesia & Philippines' with 253 losses across all vessels counted over 2005-2014.

"2014 was only the second year over the past decade when annual losses have dropped below 100," said the report. "Together cargo (523) and fishing vessels (229) have accounted for almost 60% of the 1,271 losses since 2005. On average more than 50 cargo ships a year have been lost over the past decade, although this record has improved in recent years."

As reported by *DCI* consistently over the last decade, cargo liquefaction has been a major cause both of losses and fatalities

'Industrial-level' piracy unlikely to return

Bulk carrier safety: Middle East political instability and piracy in South East Asia remain huge risks, but piracy in the Indian Ocean is on the decline

Piracy in the Indian Ocean has now almost been stamped out but it is on the rise in South East Asia, while political instability in North Africa and the Middle East was turning the region into a major danger area to maritime operations, ships and seafarers. That was the conclusion of Dryad Maritime, a shipping intelligence company which recently released its 2015 crime statistics.

Dryad's sources identified 236 maritime 'incidents' in South East Asia last year. This compared to only 18 in the Indian Ocean, the source of much angst over the last decade due to Somali pirates. Some 50 incidents were recorded in the 'Rest of the World' and 49 in the Gulf of Guinea where kidnappings of crew is a major issue.

A total of nine seafarers were killed globally in 2015, 96 were kidnapped and an estimated 47 are currently in captivity. "The media focus of maritime security shifted again in 2015 from West Africa towards Southeast Asia and the Mediterranean," concluded Dryad. "Continued increases in reported incidents of maritime crime, and considerable geopolitical unrest, have had a large effect upon maritime trade and operations. The picture is not one of complete gloom, however, with international recognition of a reduction in piracy in the Indian Ocean and a marked increase in the quality of incident reporting throughout the rest of the world."

Southeast Asia saw a 10% rise in maritime crime from 2014, continuing year on year trends, but Dryad said this could have been larger were it not for the success of the various maritime authorities in arresting maritime criminals. "The final quarter of the year saw a more proactive and effective approach to law enforcement, in particular from the Indonesian and Malaysian authorities, resulting in a welcome drop in crime levels," sad Dryad.

However, South East Asia remains a problem area, not least for bulk carriers. One of the most serious incidents recorded last year was in the Sulu archipelago, where a number of vessels have been approached by armed men in small fast craft which, after the ships' Masters took anti-piracy measures, would retreat.

Dryad said that on 18 December, approximately 7nm northwest of Doc Can Island Philippines, armed personnel in a speedboat fired upon bulk carrier *Aqua Venture* after they failed in a boarding attempt. "Whilst the initial report describes the personnel in the speedboat as robbers, it is unlikely that those seeking to carry out a simple theft would open fire on the vessel," said the report. "These actions appear to be more indicative of Islamist rebels, such as the Abu Sayyaf Group, intending to kidnap crewmembers for ransom.

"Dryad anticipates that further similar incidents in this area are possible in the coming months, but they will probably be opportunistic in nature and are unlikely to be frequent."

Geopolitical tensions in the Mediterranean have made it the region of "most concern", according to Dryad which cited continued civil war in Libya and the expansion of the Islamic State terrorist organization both there and in the Sinai as worrying developments. Ships being diverted to help migrants on distressed vessels in the Mediterranean were a continuing problem and one likely to worsen when the weather improved in the summer months.

"Thankfully, attacks ashore, like those seen in Tunisia, have not been mirrored with incidents at sea," reported Dryad. "Despite this, the unprecedented flow of desperate people, fleeing across the sea to Europe, has meant that the ongoing crises and instability across North Africa and the Middle East have had a significant impact upon maritime activities.

"The war in Yemen has so far had minimal effect on the transit of shipping through the area, although the Saudi led coalition's closure of the country's ports has contributed to a humanitarian crisis ashore. The recent increase in hostilities between Saudi Arabia and Iran has the potential to add to the volatile geopolitical situation in the Gulf region.

"[But] Dryad's view is that while further attacks on foreign fishing vessels operating in or near the claimed Somalis EEZ are possible, a return to the industrial level of piracy seen at the start of this decade is unlikely."

at sea for bulk carriers. Allianz was quick to raise the danger, warning that the threat of rapid liquefaction of cargo with catastrophic results has continued to plague the sector. The analyst noted two recent dry bulk carrier losses were suspected to have been caused by liquefaction — a phenomenon in which a dry cargo liquefies due to excess moisture and movement/vibration at sea. This can quickly cause a vessel to lose stability as the cargo sloshes around in the hold.

"At the start of 2015, the 2006-built 56,009dwt *Bulk Jupiter* sank off the coast of Vung Tau, Vietnam, just a day before the 1984-built, 2,327dwt *Cemfjord* foundered off the coast of Scotland," said the report.

The *Bulk Jupiter* was carrying bauxite, while the *Cemfjord* was transporting cement. A subsequent report by the Bahamas Maritime Authority, the flag state of the *Bulk Jupiter*, confirmed that liquefaction of its bauxite cargo was the most likely cause of

the loss of the vessel and the deaths of 18 Filipino seafarers. The report was later presented to the IMO's subcommittee on Carriage of Cargoes and Containers' (CCC) 2nd session last September, with BHA advocating "precautionary amendments to the Individual Schedule for bauxite" under the IMSBC Code to improve the safety of seafarers and shipping. The IMO responded by issuing a circular calling for increased scrutiny for the potential dangers of bauxite cargoes prior to shipping.

A third incident in 2015 was not included in the Allianz report but, again, liquefaction was the suspected cause. Last July the Singapore-flagged bulk carrier *Alam Manis*, a 55,652dwt bulk carrier owned by Malaysian Bulk Carriers ran aground in the Philippines after loading a cargo of nickel ore from Surigao City. After setting sail for China it encountered heavy swells which caused the vessel to lose stability. Twenty-one crew members were rescued, but the ship's chief mate died due to a heart attack during the rescue.

"As a result of heavy weather conditions and adverse swell, the cargo in holds No 1 & 2 shifted, resulting in the vessel listing by 14 degrees starboard," said a statement from Malaysian Bulk Carriers.

David H Tongue, Secretary General of Intercargo and the subject of an exclusive interview in *DCI* next month, said the number of bulk carriers lost due to structural failure over the last ten years had been falling. However, he said he remained concerned about losses linked to liquefaction and welcomed recent research into the liquefaction of bauxite by Australia, Brazil and China, as well as work by an IMO Sub-Committee to evaluate the properties of bauxite and coal types that may liquefy. "The Bahamas report into the loss of the Bulk Jupiter was excellent," he told *DCI*. "It was in depth, it was quickly made public and it identified the shipper as unco-operative.

"Flag State casualty reports are an essential contribution to safety, but for bulk carrier losses over the last ten years, only 24 reports have been submitted to IMO for 69 losses and the average time for submission of those actually received is 20 months. This is far too long. We need timely and accurate reporting."

"We need more accurate shipper definitions and cargo information to protect shippers and seafarers. We'd also like more quality assurance requirements for charterers."

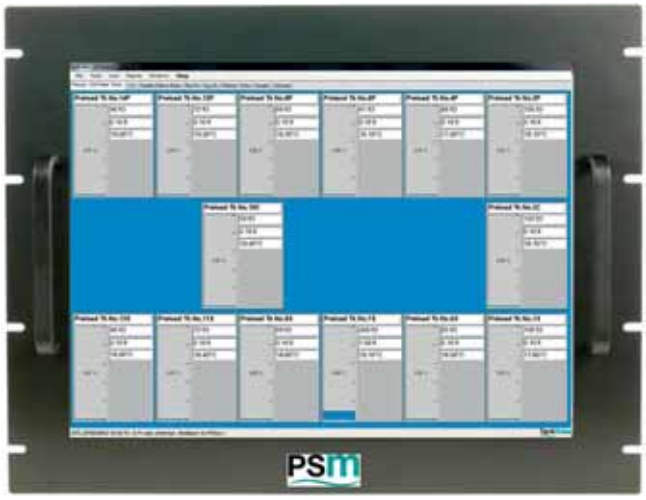
Going digital with PSM

Faced with rising operating costs and a plethora of emerging safety regulations, improving efficiency and safety has never been so important for ship owners. Mark Jones of PSM looks at how modern digital tank gauging systems can help with these challenges.

Recent years have seen a quantum leap in marine technology with a move away from historical methods towards modern digital systems which use the latest instrumentation, software and communications technologies to deliver the high degree of reliability and accuracy required. New regulations under IMO and SOLAS call for the improved safety that such systems can supply. In addition, ATEX and IECex certified and marine approved digital tank gauging systems are now also increasingly a requirement for shipping organizations, providing a key driver in refit programmes.

Flexibility and adaptability

Modern tank gauging systems are designed to be flexible, providing continuous monitoring and measurement in real-time for a range of fluid types from fuel oil and lubricants to hydraulic



fluid and bilge or ballast water with applications in all types and size of vessel and applications.

The complexity of the system required will depend on the specific functionality required. Solutions range from discrete transmitters and switches to more complex radar-based measurement systems.

Centralized control

A Windows software-based package, such as TankView from PSM uses a Modbus data communications network to acquire data on level, pressures and inclines from tanks, void spaces and bilges which is then displayed on touch screen panel-mounted PCs. The rugged design of the monitors ensures the displays will operate in the often harsh environments prevailing at sea, while the Modbus architecture allows multiple PCs to be used on the same databus, thus providing several points around the ship for the display and control of tank levels. Additional instrumentation, such as radar level or inclinometers (for trim & heel measurement) are easy to integrate into the same bus system for more complex installations. The RFM modules which partner the ICT1000 to provide safe networking and power cabling are housed in aluminium for below deck mounting or painted steel construction for above deck mounting to ensure protection for the system and operating reliability in all conditions.

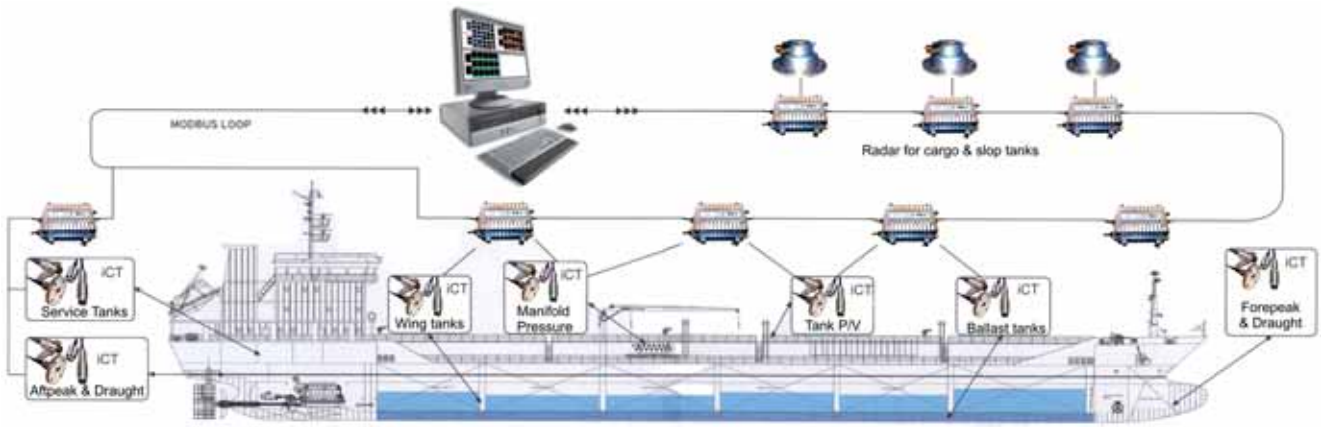
Delivering added functionality

The whole life benefits of digital gauging systems in terms of repair and maintenance extend beyond commissioning to in service use.

Pre-configured with display layouts to suit each application the latest systems like PSM's TankView allow modification through a simple interface to suit individual voyages, which ensures more accurate data measurement and reduces the

Applications

- The measurement and display of ship's trim and list, and the vessel draught. These measurements are also used to correct the indicated tank contents.
- Local gauges provide a visual indication of tank content.
- Low-level conditions in lubricating oil, freshwater feed and fuel tanks are monitored by dedicated alarm switches.
- High level conditions to prevent overfill are also monitored.
- Bilge switches, deployed as part of a pump control or flood detection safety system are used to detect rising levels of oily waste or water in bilges and void spaces, with water ingress a serious risk which can quickly escalate to threaten a ship's safety.



potential for errors.

Being able to programme the system to reassign duties to substitute transmitters simplifies repairs and replacement as well as providing additional protection against system failure without the need to hold spares in transit.

In addition to improved reliability, interoperability and ease of expansion are also key attributes of tank gauging systems. The digital route enables a more proactive approach to maintenance based on automatic fault-finding, via transmitters like PSM's ICT1000, which have built-in diagnostics. In addition, modern digital tank gauging systems also enable other instrumentation to be integrated into the measurement loop which can then be used for simple routine calibration.

Fast and cost-effective

A key driver in the switchover to digital systems is their cost-effectiveness and simplicity of installation. The type-approved and quality-certified range of transmitters, gauges and switches available from suppliers like PSM offer substantial cost savings during a ship's construction or repair and enable a rapid fit-out even in the case of bespoke solutions and systems.

Unlike traditional analogue systems which require a signal cable and barrier to be fitted for each sensor with multiple converters, digital systems require only a single power and communications cable, eliminating the need for multiple barriers and A/D converters, reducing installation time and materials costs by up to 50%.

Paving the way

The availability of a simplified solution with software offering powerful functionality, should see a significant increase in the number of shipbuilders and operators opting to move up from more basic systems of measurement to a more technologically-driven approach, driving up the benchmark for systems performance, delivering improved efficiency and safety and helping to ensure industry compliance.

Grease-free bearings for a safer working environment

Even the most seemingly safe deck machinery maintenance can be hazardous to bulk carrier crews, but Thordon Bearings' ThorPlas-Blue provides for a safer working environment.

In March last year, MARS, the Mariners' Alerting and Reporting Scheme run by The Nautical Institute, reported that an ordinary seaman nearly lost his hand whilst carrying out routine maintenance on deck machinery. The seafarer was holding a grease gun in one hand while resting the other on the groove where the winch gear is engaged when another seaman began slowly turning the gear unaware his shipmate's hand was in the mechanism.

"It is incidents like this, which underscore the dangers seafarers face when undertaking even the most mundane and seemingly innocuous of tasks, that is a primary factor in the wider take-up of our self-lubricating bearings in deck machinery," says Craig Carter, the head of marketing and customer service at Canada-based Thordon Bearings.

Carter is referring to ThorPlas-Blue, the grease and maintenance-free polymer bearing introduced in 2007 as an alternative to the greased bronze bearings commonly found in everything from fairleads and lifeboat davits to winches, hoists and steering gear.

Due to the corrosive nature of the marine environment in which above the waterline machinery operates, conventional bearings require frequent maintenance and grease lubrication to ensure machinery is operationally safe and reliable. But when routine maintenance is delayed or regular greasing is overlooked, machinery failure can occur, sometimes with catastrophic results.

"It is an unfortunate truth that the human factor still accounts for a significant proportion of machinery failures and injuries at sea, so any system that can reduce or negate completely the human-machinery interface in order to provide seafarers with a safer working environment is today an important consideration for shipowners. ThorPlas-Blue improves crew safety considerably as deckhands no longer have to grease bushings in hard to reach places," says Carter.

"ThorPlas-Blue improves crew safety considerably as deckhands no longer have to grease bushings in hard to reach places," says Carter, head of marketing and customer service at Canada-based Thordon Bearings.

Tommy Holmgren, Sales Director with the Duwel Group, Thordon Bearings' distributor in Sweden, which supplied ThorPlas-Blue to deck machinery aboard JT Cement's recently delivered 58,000dwt cement carrier *Greenland*, the world's first ever LNG-fuelled dry cargo vessel, says that another benefit is the amount of time it saves ships' staff: "Since crews no longer

ThorPlas-Blue for a safer working deck.

capstans, water-tight doors and hatches.

ThorPlas-Blue can also be supplied as a split spherical bearing (SSB) for use in rudder and steering gear systems to counter the alignment problems typical of hydraulic steering systems.

As most bearings in the steering system are greased sleeve type bushings, there is no allowance for vertical movement of the tiller pins. However, the ThorPlas-Blue SSB allows the bearing to tolerate small angular misalignment resulting from deflection or improper mounting. Misalignment is not the only stress input on this type of product: vibration, corrosion, and pollution are also very damaging factors to the steering system. The ThorPlas-Blue SSB can prevent these potential failures from happening.

Montreal-based shipowner CSL Group, which owns and operates a fleet of sophisticated self unloading vessels and bulk carriers, is the most recent ThorPlas-Blue proponent, having specified the bearing for fairleads in four vessels undergoing refit work at Méridien Maritime Shipyard in Quebec.

Thordon Bearings will supply the yard with bearings for 51mm (2") shaft diameters for installation to the self-unloading bulkers Baie St.Paul, Baie Comeau, Thunder Bay and Whitefish Bay.

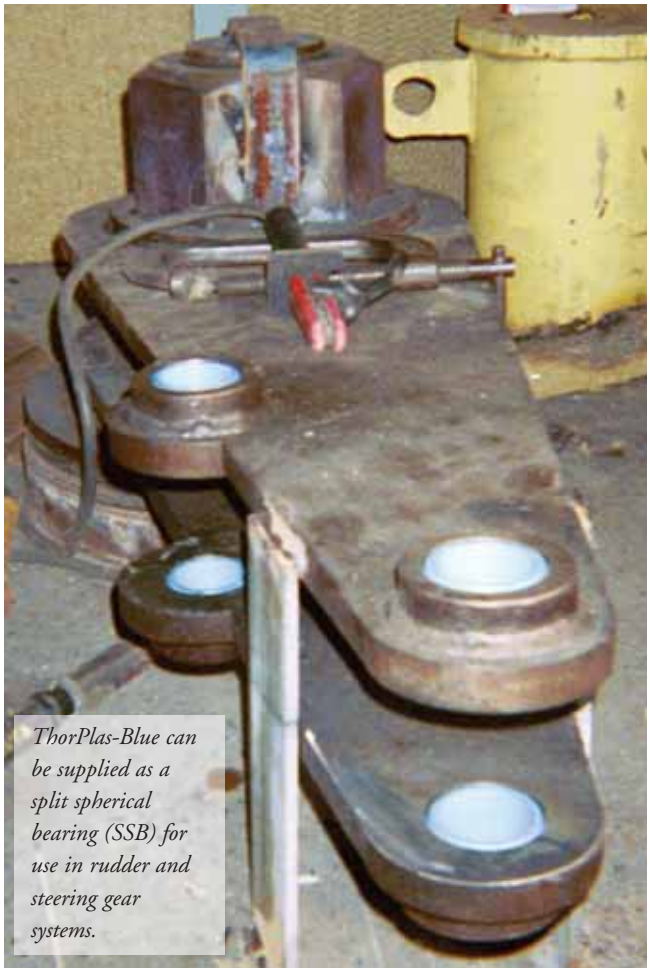
Installation was due for completion at the time of writing, in mid-February.

ThorPlas-Blue bearings used in fairleads can prevent rollers from seizing or freezing in low temperatures.

need to grease the bearings — because they just don't wear out — maintenance is negligible, leaving the crew to get on with other jobs."

Aside from the obvious safety and environmental benefits, use of the polymer bearing facilitates a smoother more reliable operation of deck machinery since seized bearings from inadequate greasing is no longer an issue. This also reduces operational costs given that a seized bearing would often result in the need to replace expensive rope or cables, while piston and cylinder damage and subsequent mechanical failure arising from increased levels of vibration is avoided. "Shipowners also save on the costs associated with the purchase, storage and disposal of greases," says Holmgren.

These grease-free, maintenance-reducing attributes are due in part to the thermoplastic properties and its' ability to withstand pressures exceeding 45MPa (6,527psi). In essence, the bearing is self-lubricating. The built-in lubricants throughout the homogenous polymer matrix ensure a low, stable coefficient of friction, even as the bearing wears. It also provides for much lower density to weight ratio in comparison to conventional metal bearings. ThorPlas-Blue bearings can be easily machined and installed quickly into a variety of applications where greased bronze bearings are traditionally installed. Applications include lifeboat and tender davit systems; fairleads, which can have a huge impact on mooring ropes that wear quickly; tiller arms and jockey bars; cranes and hoists; pivot point bushings; winches,



ThorPlas-Blue can be supplied as a split spherical bearing (SSB) for use in rudder and steering gear systems.

New lifeboat from Norsafe for bulk use

Norsafe, renowned globally as a provider of in marine life-saving equipment, has designed a lifeboat specifically for the dry bulk vessel sector following requests from ship owners and ship managers for a compact high specification quality life-craft. It is also suitable for all ships that use free-fall lifeboats including LNG, and chemical tankers.

The GES 21 is a totally enclosed free fall lifeboat taking up to 26 people. It is designed and manufactured according to latest SOLAS Classification Society and National Authority requirements and its construction fits in with client requirements for a reliable, low maintenance vessel.

It can be launched from a hydraulic ramp which ensures the boat enters the water at a safe distance from the mothership with significant forward motion.

Boarding is through an aft door with easy access to the seats on either side of the central aisle.

TECHNICAL DATA

Length overall:	6.55m
Beam:	2.6m
Height:	3.15m
Capacity:	26 persons
Weight boat with equipment:	3,655kg
Max. Drop Height:	20m
Material:	GRP

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Falck and VIKING Saatsea launch 'blended learning' STCW refresher training

Falck Safety Services and VIKING Saatsea have signed a preferred partnership agreement to offer unique blended learning STCW refresher training that combines onboard-online theoretical and practical exercises with practical onshore training. The unique training gives the maritime industry three benefits: lower costs, better learning and global consistency in how mariners are trained.

The new offering, launched on 1 January 2016, forms an innovative answer to the maritime industry's need to achieve full compliance with the STCW Convention and Code by 1 January 2017 in regards to training, certification and competency management.

While such time- and cost-efficiencies are welcomed in the industry, VIKING Saatsea's CEO, Kim Baarsøe, explains that there is a broader perspective to the alliance:

"In the past, learning was squeezed into a rather short period of time," he says. "Research tells us, however, that this is anything but optimal for learning retention, which is why our new, joint training package with Falck Safety Services covers a five-year certification period that combines on shore practical exercises with onboard training in the participant's real environment.

This also means, for example, that the theory component can be repeated as often as needed without incurring further costs."

VIKING Saatsea, with its unique digital platform, will offer onboard refresher theory training as part of the deal. The company's solution enables crew to reduce their training time on shore, lets crew train at their own pace while at sea, and tracks competency status for easier administration. Company-specific training requirements and equipment can be added to the solution.

Falck Safety Services is renowned worldwide as a provider of safety training and brings practical, land-based STCW refresher training to the table, using its onshore facilities in 19 countries and at 38 training centres. In 2014 Falck Safety Services trained more than 370,000 people worldwide and thus brings deep expertise to the table.

Working together, the two companies initially plan to offer seven courses, ranging from Sea Survival to Advanced Fire Fighting. The new training concept has been approved by the Danish Maritime Authority.

By combining Falck's safety training experience with VIKING Saatsea's innovative technology we are creating a cost effective and high quality safety training solution for the industry", says Torben Korsgaard, Senior Director of Global Business Development at Falck Safety Services. "VIKING and Falck have worked together for 30 years, so we know we can deliver high quality to the customers together".

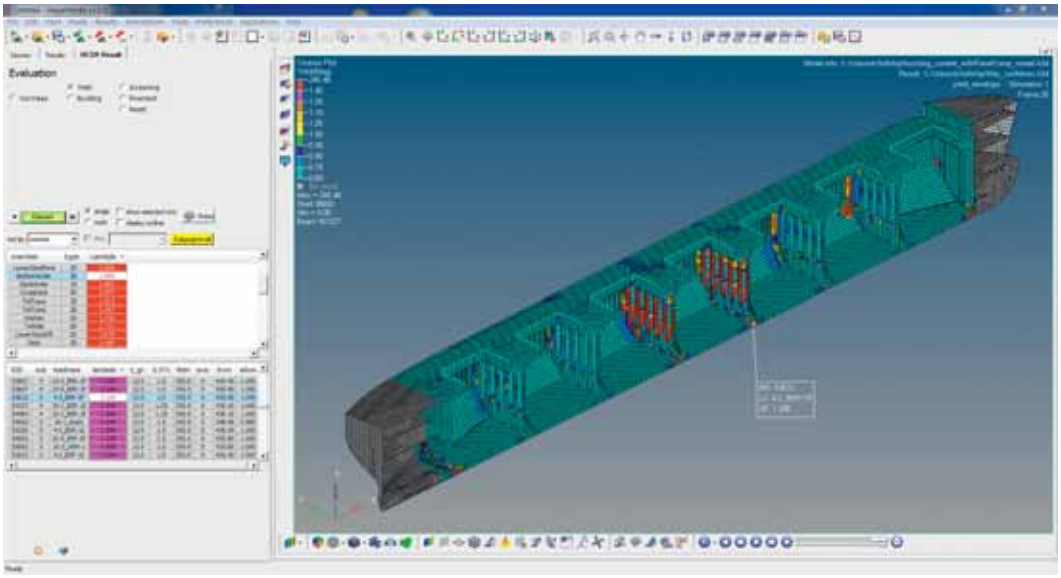
About VIKING Saatsea

VIKING Saatsea is a joint venture with leading marine and fire safety equipment and service provider VIKING Life-Saving Equipment. It provides a unique onboard training and administration platform to help ship and rig owners or operators improve their training capability. The advanced platform helps the company's customers to avoid the delays, exposures to liability and financial losses that can result from inefficient, out-dated solutions to the onboard competency management and training problem.

About Falck Safety Services

Falck Safety Systems is a global company operating 38 training centres in main oil hubs on six continents. With 372,000 course participants trained in 2014, Falck Safety Services is the world's largest supplier of safety training for the oil and gas and maritime industries. The company also offers the broadest product range within safety services including bespoke courses, and has the most accreditations of any safety services provider, including OPITO, STCW, Norwegian Oil and Gas, and more. Falck Safety Services is a division in the Falck Group.

Designed to be safe: ClassNK commits to improving ship design



ClassNK is a leading, non-profit classification society that provides the entire spectrum of class services for dry bulk vessels, supporting all parties in creating safe and compliant shipping operations.

New ship designs are constantly evolving and being tested on the world's oceans. As these designs emerge, so do new design-related issues and it is only hands-on experience which allows a classification society to tackle these issues as they arise. Whilst many classification societies develop and update their design rules in line with IACS and IMO, ClassNK takes its commitment to ship design safety one step further by also carrying out damage analysis to improve the safety of all NK-registered vessels.

ClassNK's survey records have been collected over many years and serve as a fount of knowledge. When necessary, it uses these survey records when conducting damage analysis to identify the root causes. The results are then used to improve its existing rules. Using this system ClassNK can quickly advise on countermeasures to prevent the same kind of damage occurring in similar new vessel designs and make all NK-registered vessels safer in general.

Five years ago, liquefaction of nickel ore cargoes on four vessels resulted in the loss of stability, subsequently capsizing the vessels, and costing the lives of 66 seafarers. While cargo-related matters had traditionally fallen outside the realm of ship classification, these tragedies spurred ClassNK to find solutions to prevent such losses in the future and so it developed the *Guidelines for the Safe Carriage of Nickel Ore* in 2011.

These *Guidelines* compiled requirements from the IMSBC Code with precautionary measures and recommendations for safely loading and transporting nickel ore. ClassNK then conducted extensive testing and numerical simulations on cargo properties and the behaviour of nickel ore. Based on this research, it established the world's first standards for stability, hull strength and other requirements necessary for vessels to safely carry nickel ore cargoes and published these in the Second Edition of the *Guidelines for the Safe Carriage of Nickel Ore* in 2012. These *Guidelines* have become the *de-facto* standard for transporting nickel ore and were widely praised by the industry, winning awards at the Lloyd's List Awards and Seatrade Awards.

As well as creating guidelines for the industry, ClassNK also supports the industry's compliance with international safety regulations. Adopted in 2013, the IACS Common Structural Rules for Bulk Carriers and Oil Tankers (CSR BC & OT) were designed to enhance safety and reliability. Although they represent a major step forward for ship safety, they also present a number of new challenges due largely to the increase in overall vessel design time.

To alleviate the burden of these new rules on ship designers, ClassNK developed PrimeShip-HULL (HCSR), a multi-functional vessel design support tool that makes it quick and easy for designers to carry out rule calculations and optimize their designs.

Initially released in July 2012, ClassNK's PrimeShip-HULL (HCSR) has quickly become the go-to design support system for ship designers worldwide with over 800 licences provided to more than 90 shipyards to date. ClassNK recently released PrimeShip-HULL (HCSR) Ver. 3.0.0. The new version is up to speed on all the latest rules and is fully compliant with the February 2016 corrections (Corrigenda 1) made to CSR BC & OT.

Supporting safety compliance after vessel delivery is another key area of focus for ClassNK. To encourage design transparency throughout the life of vessels, the new SOLAS regulation II-1/3-10 made goal-based standards (GBS) applicable to bulk carriers and oil tankers of 150m in length or above for which the building contract is placed on or after 1 July 2016 or the keel laying data is on or after 1 July 2017.

The regulation requires that a Ship Construction File (SCF) complying with GBS be provided upon delivery of a new ship. The SCF provides vital design and construction information to ensure the ship's safety throughout its operational life. Some safety-related information must be stored on board whereas other information, such as the yard plan, lines plan and detailed structural calculations, is highly confidential and can be stored ashore.

To protect intellectual property (IP) rights whilst remaining compliant, the industry needed a secure onshore digital archive centre. As the infrastructure of the industry, ClassNK responded by joining forces with software giant IBM Japan and The Shipbuilder's Association of Japan (SAJ) to develop the world's first GBS-SCF ashore archive centre.

The neutral and independent platform, known as ClassNK Archive Center, provides secure storage for SCF information. Its customized IP-level access lets the shipbuilder set the desired IP security levels for each drawing and IBM's cutting-edge Intrusion Prevention System further prevents any unauthorized access to the cloud database.

The service will be online from July 2016, when the GBS will start to apply. As the only platform of its kind in the world that meets one of the essential requirements of the GBS, ClassNK anticipates its widespread use for all applicable vessels. DCi

Owners seek service in difficult market

As bulk freight rates tumbled to new record lows, bulk carrier owners have cut back on ordering new vessels and sought improved support and service from their classification societies. Konstantinos Chatzitolios, Manager, Bulk Carriers, Bureau Veritas, says, "In this environment bulk carrier owners are under severe cost pressure. As class it is our job to help them to stay safe. Non-compliance is not an option. We have to help them develop resilience to maintain quality of operations while drastically reducing costs and agility to change course and move into areas which offer better prospects. Throughout the turbulence Bureau Veritas is a steadfast partner, helping companies under stress to maintain quality while smoothing the way for those who can move into new markets."

Konstantinos Chatzitolios.

The most essential role of class is to keep its clients safe and in business. Despite intensified PSC scrutiny, increased regulatory burdens and more stringent environmental demands such as reduced air emissions and ballast water management there is no option for non-compliance. "Owners and operators have to comply to operate," says Chatzitolios, "And Bureau Veritas worked hard in 2015 to provide specific and tailored assistance to ensure that standards are maintained. That meant providing fleet managers with a six-month review and root cause analysis which drills down to identify problems."

Fleet growth

In the difficult conditions for bulk owners Bureau Veritas' classed fleet of bulkers grew by 7% in 2015 to 1,052 vessels totalling 73.5m dwt. That total was boosted by 60 bulkers in service being moved to BV class and 54 ships totalling 3.3m dwt being delivered from shipyards. Owners sought more efficient ships and reduced operating costs in a fight against fleet overcapacity and no sign of freight rates lifting.

Key deliveries

The 54 new bulkers built and delivered to owners with BV class included the first 20 Ultramax vessels. Eco-designs were in favour including three new generation *Dolphin 64 SDARI* 64,000dwt bulkers built at Jaingsu Yangzijiang for Greece's Starbulk, the first of a series of eight sister ships. Safety Management Overseas benefited from Panamax efficiency gains when it took two newly-designed Panamax vessels built to BV class at Sasebo Heavy Industries, Japan. The vessels offer 3,000dwt extra capacity and reduced fuel consumption of 10%. France's Louis Dreyfus Armateurs took four efficient Handysize vessels built to BV class at China's Tianjin Xingang yard, part of a series of ten sister ships. Japan Marine United delivered to BV-class 60,000dwt bulkers to Italy's Augustea Technoservices. The *Future 60* vessels deliver increased capacity. Taiwan's U-Ming took delivery of the only two Capesize vessels in the year,

183,000dwt vessels built at China's Shanghai Waigaoqiao yard.

China's Sinopacific built three 63,500 ultramax vessels to BV class, two for Allseas Marine and one for Norbulk while Chengxi built three similar size vessels for Wah Kwong. In the smaller sizes Nisshin Shipping took four 39,000 Handysizes from Jiangmen Nanyang while Laskaridis Shipping chose BV class for two slightly bigger 39,300 dwt units that were built at Penglai Zhongbai Jinglu.

New tonnage

Despite the difficult market owners in USA, China, Japan and Taiwan were able to order new tonnage against long-term contracts. The largest order was for six 84,000dwt Kamsarmax vessels for Foremost Maritime, to be built to BV class at Japan's Oshima yard. In total only 16 new bulkers were ordered, down dramatically on the previous years. The orders included an 81,600dwt bulker for Taiwan Navigation and a sister vessel for Singapore's Gina Shipping ordered at Oshima and two 63,500dwt vessels ordered by OAL Shipping, Ukraine, to be built at Yangzhou Dayang, China.

CSR-H orders

The first orders for bulkers to be built to the new Harmonised Common Structural Rules were placed during 2015. Bureau Veritas invested heavily in working with shipyards and designers to ensure that its tools and rules were fully up to date and that yards were able to work quickly and efficiently with VeriSTAR and its powerful suite of software.

Urabá port project under way

In Colombia, the Conconcreto company is to invest $2 billion in a new port complex, the construction of which is due to start this year at Necolí, in Urabá. The multipurpose port, which is being backed by the American company Moffat and Nichol, is being built in an area focused heavily on overseas trade and hopes to provide an alternative to other outlets in the region.

In addition to dry bulk, it will also accommodate liquid bulk and containers.

Alongside the port, which will be known as Darién International Port, an industrial park covering 230ha will also be developed. Once operational, it will cut distances to and from the country's two main cities of Medellín (380km distant) and Bogotá (820km), and will also act as an alternative for the coffee industry, which is concentrated in an area around 574km from the port.

By 2020, Darien should be handling in the region of 680,000 tonnes, rising to 13 million tonnes in 2040. *Barry Cross*

New £7m bulk at Port of Liverpool

Newport Industries is set to invest £7m in the creation of a new bulk handling facility at the Port of Liverpool, to service increased demand from its North West customer base.

The facility at Canada Branch Dock will allow the global firm — which specializes in importing dry bulk chemicals to the glass, adhesive, detergents, chemicals and feed industries to meet increasing demand.

Newport Industries has been a customer at Peel Ports' Runcorn Docks site since 2009.

Its partnership with Peel Ports has seen the company grow bulk volumes handled through Runcorn by 200% in five years.

Investing in a new Liverpool-based facility, will allow Newport Industries to take advantage of a purpose built facility with direct deep water access. By continuing operating from its existing site at Runcorn Docks, it will create an all water 'highway' into the manufacturing heartland of the UK, via the Manchester Ship Canal — reducing costs and CO_2 emissions.

When Peel Ports' £300m deep water container terminal Liverpool2 is completed later this year, it will open future opportunities for Newport Industries to tap into far eastern markets, potentially facilitating direct calls for large container ships to and from China.

Liverpool2 will enable the port to handle the largest container ships in the global fleet, while at the same time doubling its container capacity to one million TEU.

Construction of the new bulk handling facility will be completed in several phases. The first phase, which includes the construction of a pneumatic ship discharger and two silos, is expected to be delivered by autumn 2016. The further construction of an additional four silos and a pallet warehouse will be completed by 2018.

Raj Patel, Managing Director of Newport Industries, said: "We are delighted to announce the development of Canada Dock, a state-of-the-art facility which will combine our technical expertise of the products we supply, with a 24-hour supply chain for all our consumers in the North of England. The facility will have an initial capacity to supply over 500,000 tonnes by 2017, with an additional 300,000 metric tonnes by 2020."

Newport Industries has also signed up to Peel Ports' major carbon emission initiative, Cargo200, which aims to reduce UK freight mileage by 200 million miles over the next five years.

Peel Ports aims to recruit up to 200 cargo owners, importers and exporters to support the campaign, by switching current delivery of ocean freight from south east ports to the centrally-located Port of Liverpool, if their goods start or end their journey in the north of the UK.

Andrew Martin, Group Land and Property Director at Peel Ports, said: "We have a long-standing partnership with Newport Industries, which has seen the volume of bulk products it handles grow by more than 200% in just under five years.

"The new bulk handling facility at the Port of Liverpool will allow these volumes to grow further. The project emphasizes both the strength of our regional logistics market and the opportunity that our £300m Liverpool2 development will offer to customers.

"Looking at the geographical demands of the UK, 50% of the demand for cargo comes from the northern half of the country — which makes the Port of Liverpool strategically important as the most centrally located port in the UK.

"In reality though, only 8% of goods arrive in the UK through this route. That means the majority of cargo destined for the north currently has to be transported via road or rail, incurring hundreds of additional miles, burning fuel, creating road congestion and adding to carbon emissions and costs.

"Peel Ports' network of terminals in the North West, including Liverpool2, opens up a viable and cost effective alternative which we are urging cargo owners and logistics operators such as Newport Industries to consider."

Work on the first phase of construction began in February 2016.

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Dry bulk terminal opens in Montevideo

The Uruguayan Port of Montevideo finally put its dedicated dry bulk terminal TGM into operation in December. The facility, which specializes in grain, absorbed investment of $100 million. It has a capacity to handle vessels of up to 85,000dwt and expects to attract cargo from the coastal and midwestern regions of the country.

The project was implemented by Obrinel SA, whose investors include the Christophersen group and Hidrovias do Brasil. The concession is for 20 years.

Construction originally began in January 2014 in the extreme northern region of the port, close to the Colombia access gate.

The complex encompasses 12 silos, each of which can handle up to 10,000 tonnes. The terminal's single berth has alongside draught of 12.5 metres and will allow vessels coming from Nueva Palmira to call there. Both Panamax (65,000 tonnes) and post-Panamax (85,000 tonnes) vessels are expected to use the facilities.

This is only the second private terminal to be built in the port of Montevideo, the previous one having been a container terminal opened in October 2019.

According to the National Ports Authority, TGM is expected to handle soya and other grains as well is wood chip. *BC*

First Capesize vessel calls at Mormugao

The Indian port of Mormugao has successfully handled its first Capesize vessel, which arrived at berth 6, carrying 82,499 tonnes of coal. It was inbound from Jaigarh port, in the neighbouring district of Maharashtra.

The port wants to attract more such vessels and has announced a dredging programme that will allow the main approach channel to be dredged to depths of 19.8 metres. *BC*

All four shiploaders now operational in Paranaguá

The Brazilian port of Paranaguá has put into operation its fourth new shiploader to handle grain exports.

All four were acquired in 2005. The first two commenced operations in March 2015 followed by a third in October and the fourth in December.

In total, $15 million was invested in the four shiploaders, paid for out of the resources generated by the port authority APPA.

Each machine can work to an hourly capacity of 2,000tph (tonnes per hour), compared with the previous shiploaders, which were limited to 1,500tph. Overall productivity is expected to rise by 33%. *BC*

Vostochny has 20 million tonnes of coal

In Russia, Vostochny port handled more than 20 million tonnes of export coal in 2015, which was dispatched to countries in the Asia-Pacific region, including South Korea, China and Japan. The port is now implementing a third phase expansion plan to boost exports. Equipment is being renovated at both the handling and production facilities in the port with this in mind.

Most of the coal handled comes by rail from the Kuzbass region. Currently, it accounts for 98% of turnover, with 1.5% down to the coastal coal trade and 0.01% from other cargoes. *BC*

Port of Antwerp's trade mission to India

True to its annual tradition the port of Antwerp organized a trade mission to India in February this year. Port Authority chairman Marc Van Peel was accompanied on his visit to Delhi and Mumbai by Pieter De Crem, the Belgian secretary of state for Foreign Trade. The agenda included, among other things, the annual Port of Antwerp reception, the presentation of an award to the Indian forwarders' association and the opening of a new course offered by JNPT APEC Port Training Centre that was set up in Mumbai last year in close collaboration with APEC, the Antwerp training centre for maritime professionals.

Presence in India

The Port of Antwerp has been investing for several years now in strengthening collaboration with the Indian business world and local authorities. As well as the annual visit, Antwerp has its own permanent, full-time representative in the port city of Mumbai, as part of a series of measures to raise its profile in India. These efforts have been successful, as trade between India and Antwerp has grown over the past years to just over five million tonnes annually.

In 2012 the port of Antwerp went a step further in establishing its presence in India when Port of Antwerp International, the international consulting and investment subsidiary of Antwerp Port Authority, signed a strategic alliance with Essar Ports Limited, one of the largest private port operators in India. The alliance was wound up in the middle of last year. Thanks to this operation the Port Authority not only made a substantial capital gain but was also able to gain a great deal of commercial know-how concerning the Indian port world. It also led to further agreements for both PAI and APEC.

Further development of these agreements, in particular with JNPT APEC Port Training Centre, was one of the main points on the agenda of the trade mission this year.

Antwerp's training expertise

On 16 February Marc Van Peel and Pieter De Crem together with JNPT chairman Anil Diggikar attended the official opening of the course entitled Strategy, Policy and Business Development in Mumbai. This five-day course focused on, among other things, the role played by the port in relation to the surrounding region and the importance of good relations between port authorities and terminal operators.

Later that day the annual Port of Antwerp reception was held, at which Van Peel presented an award to the chairman of FFFAI, the Federation of Freight Forwarders' Associations in India. "The success of the Port of Antwerp in India is the result of interaction with a large number of players, in particular the local ones. We therefore wish to thank the partners who have supported us from the very early days, for their devotion to Antwerp. FFFAI has played this role for us in a large number of Indian cities, from Chennai to Ludhiana," declared Van Peel.

Duqm to start bulk exports

In Oman, the port of Duqm is to commence the export of minerals as of February from its breakbulk terminal. The initial commodity will be dolomite, for which capacity exists to handle consignments of up to 50,000 tonnes. According to CEO Reggy Vermeulan, the terminal potentially could generate volumes of 5mt (million tonnes) as part of its first phase development, although this could be scaled up substantially in the future. He said that there is huge potential for mineral exports from Oman, which wishes to reduce its dependency on oil revenue.

The CEO explained that the port is working with Oman Railway ramping up the amount of mineral exports that could be brought into the port area or stored nearby. The two organizations have recently signed a memorandum of understanding, which will see a better connection and also the development of our support cluster on industrial land near the port.

"We will build a conveyor belt system and pre-staging areas to dramatically increase the capacity," said Vermeulan. "Although the initial plan is to build capacity for 5mt, it can be quickly enhanced to 20mt or 30mt."

Oman has various minerals that it can export, including limestone, for which India is a very important market, gypsum and silica sand. *BC*

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Record year for Santos

In 2015, the Brazilian port of Santos posted a 7.1% rise in traffic to 119mt (million tonnes), beating by 4.3% the previous record of 114mt posted in 2013. Santos accounts for around 25% of all Brazilian export traffic.

The result was unexpected; Codesp, the port authority, had predicted at the end of 2014 that the following year's traffic would reach 117mt.

Exports rose by 13.1% to 86.6mt, due mainly to increased sugar, soya and wheat consignments. In contrast, imports were down by 6.4% to 32.3mt. The number of vessel movements dropped by 0.8% to 5,100.

According to Codesp's director of engineering, maintaining a stable draft in the port had helped with overall productivity. Three dredging contracts have resulted in an average of 13.2 metres of draught being available throughout almost all of the 24.5km fairway.

Codesp president, Alex Oliva, has said that for 2016 it's important to establish the right conditions to attract private investment for port terminals. Three tenders issued at the end of last year did not generate levels of investment that the earlier been predicted.

BC

Marseille Fos speeds ship call procedures

The Marseille Fos port authority has introduced a new fully automated information system, Neptune Port, to simplify and harmonize administrative procedures for vessels calling at the leading French port. Developed at a cost of €3 million, the new system replaces Escale V2 Nautique — in use since 1992 — which in contrast was only partially automated and not entirely paper-free.

Neptune Port is linked to the private systems of some 600 users in the port community, allowing them to synchronize declarations. It also provides real time nautical, administrative and logistical data relevant to all calls across the port's activity range — including container, bulk, cruise, ferry and inland waterways operations — which last year totalled more than 10,400 calls and 78 million tonnes of cargo.

As a fully integrated management tool, the system is designed to optimize call durations and enhance coordination throughout the logistics chain. It is linked to other systems such as the port's vessel traffic service, the AP+ cargo community system and Maritime Affairs. The solution also meets a European Union directive enabling electronic declarations under the so-called Guichet Unique Portuaire.

Neptune Port was developed over three years and more than 8,000 man/days in conjunction with French multinational technology specialist Capgemini. The system's Service Oriented Architecture (SOA) ensures that it is robust, highly available, intuitive and fast while allowing new functionalities and total compatibility among users.

The port authority organized a training support programme to assist rapid take-up and has now implemented a telephone helpline. A users club will be launched in early 2016 to exchange ideas on future enhancements.

Marseille stevedore wins top terminal award

The operator of the South Ro-Ro Terminal in Marseille has won the Port Terminal 2015 prize in the annual awards scheme run by France's Bureau de Promotion du Shortsea Shipping.

Marseille Manutention received the trophy in Paris following a unanimous decision by a panel of judges representing shipping and intermodal leaders. The citation recognized performance levels under a strategic plan launched in July 2014 and the key addition of a recently introduced Terminal Operating System (TOS).

The competitiveness plan prompted initiatives covering internal restructuring, stevedore recruitment, equipment renewal, commercial policy and marketing. In 2015 this was underlined by investment in the TOS, which was fully activated in November after a ten-month test phase.

Linked to the port's AP+ cargo system, the new information platform connects the terminal, shipping lines, shippers, forwarders, logistics operators, customs and harbour masters to support real time automated data exchange ranging from port procedures to loading/unloading status reports and the location and condition of cargo.

Port de Tarragona

Puertos del Estado

GOBIERNO DE ESPAÑA MINISTERIO DE FOMENTO

Spain's Port of Tarragona organizes 'International Food Congress'

The Port of Tarragona and the State Ports have organized the International Agrifood Congress, which will take place over two days from 14–15 April this year. This event will be the most important in Europe dedicated to this sector.

The programme has been developed to include the most relevant aspects that currently affect — or will have a future impact on — the agro industrial sector. Topics under discussion will include food and agricultural policy in the EU with regard to health and safety. In attendance will be experts from the FAO (Food and Agriculture Organization of the United Nations) and the WHO (World Health Organization), who will discuss the impact of climate change on agricultural production and food security. The market and prices are other aspects that will be examined with a representative of the CME. Production and logistics will be discussed by representatives of European ports along with fodder manufacturers in the industry.

This programme will be complemented with visits to the premises of the Corporación Alimentaria de Guissona and the port facilities of Tarragona, while an extensive period of time will also be devoted to information exchange and networking among all participants within this sector.

This will be a great opportunity for attendees to learn answers to questions that are emerging in food and agricultural markets and a good chance to share ideas and proposals, strengthening personal relationships that will improve business in the future.

The Port of Tarragona is looking forward to the International Agrifood Congress, and will strive to make it as beneficial as possible to everyone involved.

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Dry bulk traffic static in the Baltic

Barry Cross

It is difficult to make generalizations about such a large area as the Baltic Sea, but many of the ports contacted by *DCI* reported either static dry bulk traffic, or even decreases. While local issues impacted on performance, the continuing downturn in the Russian economy is clearly influencing events in the region, as export Russian raw materials benefit from a weak rouble, while imports become unaffordable.

In 2015, cargo handled at the ports of Szczecin and Świnoujście was similar in volume to the previous year. Both handled a combined 23.2mt (million tonnes). In terms of dry bulk, traffic amounted to 9.3mt compared with the 10.7mt reported for 2014, equivalent to a decrease of 13%. This was due to a drop in coal traffic (–32%), grain (–4%) and iron ore (–1.5%).

In respect of coal, part of the existing traffic moved to other ports. However, general market trends were also to blame, notably a drop in the Baltic Dry Index (BDI), which reflects a slowdown of growth in China.

Not all commodities decreased. Fodder and oilseeds, for example, rose 16%, while fertilizer went up by 4%, in line with greater demand from the agricultural sector.

Improvements to the ports have been undertaken by the Szczecin and Świnoujście Seaports Authority, which has been a direct beneficiary of EU funding. In 2007–2020, it has either spent, or plans to spend, nearly $513 million. The emphasis has been primarily on improving the accessibility of both ports, since this has a major impact on their competitiveness in the transport market. Therefore new quays have been built and the transport infrastructure modernized.

"In recent times, we have also modernized road and rail infrastructure, rebuilding, for example, nine kilometres of roads. In addition, new waiting areas have been provided for trucks, amounting to 600 new places in five areas across the two ports", says Karolina Bierdzinska, the port authority's Communication and PR specialist.

The railway infrastructure project has focused on rebuilding and modernizing nearly 36km of track and 134 sets of points. The track was adjusted to handle rolling stock used on the international E-59 and CE-59 trunk routes, which has significantly helped to improve the dry bulk handling service provided.

In 2015, the port authority also finished rebuilding quays in the grain handling area in Szczecin. The Zbożowe Quay was modernized, while a brand new facility, the Niemieckie Quay, was built.

"The investment is expected to enable the port to service larger vessels of up to 230 metres in length, or simultaneously

unload two smaller ones," said Bierdzinska, pointing out that plans exist to dredge the fairway to 12.5 metres to enable larger vessels to call there; 40,000dwt ships are eventually expected to use the terminal.

In addition to the port authority, private operators are also investing in the improvement of services. A new company, Szczecin Bulk Terminal Ltd, is to begin operating at the modernized Zbożowe Quay, making use of the existing concrete silo complex, which is the biggest one in the port. The terminal will be upgraded in 2016 to operate fully automated silos with a total capacity of 55,000 tonnes, this will make it possible to handle various bulks for both import and export.

The terminal is also equipped with a comprehensive pre-cleaning technology.

Loading of vessels is performed at a maximum rate of 1,000tph (tonnes per hour) using a mechanical system, while pneumatic unloading can be achieved at a rate of 300tph.

Another operator in Szczecin — Bulk Cargo Port Szczecin Ltd — specializes in a variety of commodities, including coal, coke and agribulk and has recently widened its range of services, opening a new warehouse for soyabean meal in 2014/2015, boosting turnover by a further 100,000 tonnes per year.

The various silos in the Szczecin–Świnoujście port complex allow it to store up to 230,000 tonnes of agricultural products.

"The biggest future challenge for the port complex is the new outer port area in Świnoujście, where a new LNG terminal is located on the eastern part of the outer port. The western side, however, is dedicated to a variety of port activities, including dry bulk. Since various new berths are there, the outer port will decisively increase transshipment capacity for both ports, as well as being able to handle larger vessels," notes Bierdzinska.

Asked whether there are any new commodities that the port authority would like to attract, she points out that, at present, the port is able to cover all various market requirements and currently has enough capacity flexibility to cope with all demands. But in the future, the port authority is planning to enhance capacity by creating new terminals, in both the outer port in Świnoujście, as well as at Ostrow Grabowski, in Szczecin, which is its main development area.

In terms of overall size of vessels deployed on dry bulk trades, she notes that Szczecin, 68km inland, is some distance away from Świnoujście. Therefore, it can only handle vessels drawing up to 9.15m of water, which translates into vessels of around 30,000dwt. In contrast, Świnoujście is on the coast, so has no such restrictions. It offers a maximum draught of 13.2 metres, allowing ships of up to 100,000dwt to call.

"The intention to dredge the 68km fairway from Świnoujście to Szczecin to the depth of 12.5 metres should be seen as being as important as the dredging to 14.5 metres of the access channel to Świnoujście and between the entry to the outer port basin and the Portowców Quay," adds Bierdzinska.

Both ports also add value to the basic raw materials, including offering such services as weighing, packing and sorting.

In respect of land side movements of dry bulk consignments, this is done almost exclusively by rail, with some shipments making use of inland waterway. Figures are not yet available for 2015, but those for 2014 show that rail handled 45.7% of all cargo, barge 4.2% and road 50.1%.

For non-road haulage to increase, the navigability of the Oder River is very important. Although it is a natural waterway, due to many years of negligence, its potential still remains underutilized. However, examples of other ports such as Hamburg and Antwerp show that inland shipping is an excellent complement to services provided by ports. Similar solutions, it is hoped, can also be applied in the Szczecin–Świnoujście port complex.

"The Oder Waterway does have the potential to attract cargo to the ports. However, to make it happen, we need to determine specific actions in the area leading to that goal. It is

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really worth doing, since the development of navigation on the Oder will provide Szczecin and Świnoujście ports with access to three affordable modes of transport: sea, inland waterway and rail," says Bierdzinska.

Further to the east, the Port of Gdynia handled just over 6mt of dry bulk in 2015 as compared to 5.004mt in 2014. This performance was all the more remarkable given a decrease in the amount of coal handled from 2.1mt to 1.4mt, which Harris Mawusi, the port's specialist in Development Projects, notes was a direct result of the low rate of the Russian Rouble, which made buying Russian coal eminently more affordable, at least, in the short term.

However, this loss was compensated for by the increase in the handling of cereals, which grew from 2.9mt to 3.7mt.

"The main reason why this slight increment took place can be traced back to investments made in developing port infrastructure," says Mawusi, who points to the reconstruction of the Swedish Quay, which enables the port to handle Panamax vessels with draught up to 13.0 metres.

In addition to the Swedish Quay development, an ultra-modern fodder/grain warehouse with a capacity of 60,000 tonnes was also built on the premises of Maritime Bulk Terminal Gdynia (MTMG). Moreover, the dredging and deepening of the port's access channels to a depth of 16 metres is planned to be implemented in 2018–2020. This will enable Gdynia to receive bigger vessels, especially larger bulk carriers.

As for possible new commodities, Mawusi points out that market conditions and demand will determine whether these are introduced or not. However, he adds, being a universal port, Gdynia can handle any type of cargo at its highly-specialized terminals.

In terms of size, Gdynia receives calls mostly from Panamax vessels in the dry bulk market, but does occasionally also handle partly-loaded 180,000dwt Capesize vessels.

"We are not just a raw material handling port, though. Value-added services are available on request, and these include sorting, mixing, big bagging, sifting, screening, classifying, grading, and matching," he says.

Rail has a significant role to play in landside movement of both coal and fertilizer for both import and export. All other dry bulk cargo is mainly transported by road.

In 2015, Riga Freeport, in Latvia, handled 23.3mt of dry bulk, down 2.7% on the previous year, although this market segment is by far the largest in the port, with coal exports alone accounting for 36% of total traffic. The downturn is attributed to growth in dry bulk volumes at the competing Russian ports of Ust-Luga and Primorsk.

Last year, Latvia experienced its largest ever grain harvest, with grain shipments topping the one million tonne mark for the first time, which represents a 36.6% increase.

"Due to the intensive operation of the new fertilizer terminal, there was an increase in the turnover of chemical cargoes, too," notes Edgars Suna, Deputy CEO, Director of Department of Marketing at the Freeport of Riga Authority.

Positive dynamics were also observed in the shipment of woodchip (+24%), peat (+16%) and in other bulk cargoes. In contrast, the amount of sugar shipped was down by 100%, while there were also falls in the amount of construction materials (–45.7%), ore (–44.5%), various metals (–33.7%), sawn timber (–11.3%) and coal.

"Although the volume of dry bulk declined in 2015, in general, it was the second most successful year in the history of the port," says Suna. "However, the Port of Riga continue to feel the effects of geopolitical events. The drop in ore, various metals and coal turnover was caused by the transfer of cargo to Russian ports where dry bulk cargo volumes rose in 2015. The major cause of the decline in sawn timber was down to lower demand in key European export markets and competition

becoming tougher due to increased supply."

Last year was significant in that the Freeport of Riga completed an infrastructure objective that formed part of the framework 'Development of Infrastructure on Krievu Island for the Transfer of Port Activities from the City Centre' document. This project is one of the largest ever infrastructure projects in Latvia, with €133.65 million invested. Of this, the EU Cohesion Fund stumped up €77.19 million, with the port authority providing €56.46 million.

Work consisted of building four dry bulk berths totalling 1,180 metres, allowing ships drawing up to 15.5m of water to be accommodated. In addition, necessary road and rail links were provided, along with utilities and communications facilities.

"The total capacity of the Krievu Island project is 20mt of bulk cargo per year. Approximately 35% of cargo at Riga Freeport will now be transferred away from the city centre," says Suna.

Because of these new arrangements, cargo distributed along the banks of the River Daugava will henceforth be balanced, providing much needed relief for the city centre, including diverting much road and rail traffic away from congested areas, as well as reducing noise and coal dust pollution.

Asked whether there are any new commodities that the port authority would like to attract to Riga, Suna explains that the philosophy is to maintain overall multi-functionality.

"The dynamic nature of the market plus an increase in competition from ports in the Eastern part of the Baltic Sea is forcing us to look into attracting new types of cargo, while at the same time maintaining existing commodities," he says.

As an example, he points to one of the newest dry bulk terminals in Port of Riga: the Riga Bulk Terminal. Officially launched in February 2014, it is one of the most modern agribulk terminals in the Baltic Sea region. Based in Kundzinsala, the facility can handle a diverse range of bulk commodities, including grain, aluminous ore and sugar, with bulk handling sales anticipated to reach one million tonnes annually.

Indeed, despite existing terminal capacity, which allows up to 70 different dry bulk cargoes to be handled, Riga port remains interested in attracting various new types of dry bulk cargo, with Suna citing alumina as an example, along with new types of grain and agricultural products.

The recession in Russia as well as restrictions in trade between Russia and the EU, USA and other countries, has had a big impact on many Baltic ports as they handle a large portion of the consumer goods bound for the Russian market. Despite this, he believes that the dry bulk cargo segment will maintain positive growth and that coal will continue to be the most important dry bulk commodity.

"However, being aware of the potential impact on the relationship between the EU and Russia, as well as on the political decisions in Russia to boost dry bulk cargo volumes handled in Russian ports, Riga port forecasts a slow, long-term decline in coal volumes handled," he says.

Riga sees mostly calls from Panamax bulk carriers. The largest ever vessel to call there was the UBC ONSAN, which could carry 112,000 tonnes of coal, having an overall length of 260m.

In addition to its role as a pure handler of raw materials, Riga Freeport does provide some value-added services, such as bulk packaging, rubber processing, cargo weighing, road and rail scales, forage cereal packaging, grain and oilseed disinfection, as well as coal sorting, crushing and magnetic separation.

In terms of landside movement, sea, road and rail are all used, although 80% of dry bulk is transported to/from the port by rail, the other 20% going by road.

In Sweden, the Port of Hargshamn saw its dry bulk traffic drop to just 622,000 tonnes in 2015, compared to the 1.5mt reported for 2014. Port managing director Curt Nilsson explains that this was due to the biggest client, Dannemora Mineral (DMAB) — an iron ore mining company operating some 40km distant — being declared bankrupt in March 2015. The previous year, this customer had generated traffic of 1.2mt of iron ore.

"Nevertheless, throughout 2015, we continued to invest in a variety of small infrastructure projects," he says.

At present, the focus is on trying to increase the handling and storage capacity of grains, whilst also continuing to handle project cargo along with building equipment and materials, for which in port storage facilities exist.

As for commodities in long-term decline, Nilsson identifies peat briquettes, pointing out that this is a controversial fuel, and will almost certainly be phased out most within the next five years.

Coal handling at Riga.

In terms of vessel size, Hargshamn normally handles 'Baltic size' cargo ships, ranging in size from 1,000dwt up to 23,000dwt (Wagenborg's 'R' ships). In addition, there is also some small barge traffic.

"Some of the vessels that call here are geared, but loading and unloading usually involves the use of portal cranes or conveyor belts," says Nilsson. "The general thinking in the sector is that ships are getting ever larger. Many clients want to benefit from the effects of economies of scale for their handling of bulk goods, which is seeing a move away

from coasters towards more Handysize vessels."

As for adding value to the basic commodity, Hargshamn does pack peat briquettes into containers, and also packs some commodities in big bags for some clients. So-called 'firewood' is also processed into woodchips.

Finally, onward movement of goods takes place in a number of ways. Some inbound cargo is rotated out by other vessels, rail also transports some consignments, while others move by road.

The Port of Hargshamn.

"This year, we are forecasting that more cargo will move by rail to and from the port," said Nilsson.

In neighbouring Denmark, the Port of Kalundborg reported dry bulk traffic amounting to 1.2mt in 2015, compared with 980,000 tonnes for 2014. Spokesperson Liselotte Rørup explains the 22% increase on the fact that the port has deep water facilities and also because the price of grain has been higher when shipped out on larger bulk carriers. Export wheat has, in particular, grown noticeably in volume for exactly this reason.

"At the moment, we aren't making any significant new investment in dry bulk infrastructure, although we are targeting more fertilizer traffic," she says, pointing out that this has so far appeared to be in long term decline.

Kalundborg can currently accommodate up to Panamax-size vessels, which are sufficient for the size of consignments currently being shipped.

"In terms of adding value to the dry bulk commodities that we handle, there is a privately owned packaging factory for salt and pellets within the port area," she reports.

As for landside movements of dry bulk, these are unchanging. Most dry bulk goes by road, however there is also some vessel-to-vessel transfer within the port, which sees some commodities moved from larger bulk carriers to smaller vessels for onward delivery of cargo.

Also in Denmark, the port of Rønne is one of the smallest in terms of dry bulk operators in the Baltic Sea region. In 2015, for example, it handled just 813 million tonnes, compared to 810 million tonnes the previous year.

According to Ulla Kiersgaard, Manager Maritime Services/Business Development, although some traffic segments within the port did vary from one year to the next, this was not the case with dry bulk. As a result, no short term investment is needed in developing additional dry bulk facilities.

"The traffic that we can attract is limited to the size of the island where the port is located," she notes, although stresses that none of the commodities handled should be considered to be in long term decline.

"The largest vessels we see here are about 10,000dwt; some of them are geared, whilst others use the port's handling equipment. Although it is true that vessel sizes are increasing, this, in our case, is limited by the draught."

As for landside movements, these are undertaken uniquely by trucks and tractors.

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Another successful co-operation for Bedeschi and Yara

On 15 December last year, after the successful completion of commissioning and performance tests, Bedeschi handed-over to Yara Germany a newly installed shiploader for urea. The supply consisted of an EPC (engineering, procurement, construction) turnkey project, to replace the existing loading facilities.

This project strengthens Bedeschi's reputation in the fertilizer sector, as well as its relationship with Yara, one of the major world players in this sector.

Enel: the biggest coal-fired power plants in Italy

Bedeschi is celebrating the completion of a major contract in Italy. The project, for Enel, is a turnkey solution; it includes the engineering, construction, complete supply of materials, commissioning and start-up of the equipment to develop the 2,640MW coal storage facility at the power plant.

South Brindisi is one of the biggest coal-fired power plants in the country. It is operated by ENEL Produzione S.p.a. The power plant will utilize coal sourcing from Indonesia and South Africa. The project has taken into account environmental concerns and is intended to replace the current outdoor longitudinal coal storage at the power plant. This involved the implementation of two new domes with a wooden covering structure and an environmental impact almost equal to zero.

In December 2013 Bedeschi started the erection phase of the first dome, while the second one started in April of that year. By the end of 2015, both installations had been positively tested and accepted by end user.

This represents another great success for the Bedeschi team.

Equilibrium handler: backbone of wood logistics at Borg Manufacturing

What can we do to increase our productivity while also saving on operating costs? This is the question many companies ask themselves. For John Borg, owner of Australia's Borg Manufacturing, the SENNEBOGEN was able to deliver a persuasive solution for wood handling with the 8130 equilibrium handler.

Borg Manufacturing operates a large MDF factory in Oberon, a small town in New South Wales, Australia, that is about 2.5 hours West of Sydney. Since its founding in 1991, the family-owned business has become Australia's leading manufacturer of kitchen cabinet doors and decorative MDF panels distributed through the brand Polytec. The wide range of MDF panels are manufactured primarily at the Oberon site. This is where the new SENNEBOGEN handling machine comes into play.

Optimized logistics processes — SENNEBOGEN crane at the core

The SENNEBOGEN 8130 is the heart of the reorganized lumberyard. Whereas previously the conveyor belts of the loading system would be laboriously served by multiple vehicles using a ramp, these logistics are now covered by one stationary crane. The raw material, which can be between four and five metres in length, is unloaded and sorted all around the stationary balance crane. With its reach of 23 metres, the 8130 can easily cover an operating area of around 1,600m^2. The reorganization added logistical value and also enhanced occupational health and safety, since only one central machine now does all of the loading. The loading line can now be safely filled from above, and vehicle traffic has been reduced.

Saving costs — working effectively with a stationary electric machine

Operating and maintenance costs have also been reduced, reported Borg. "Where numerous vehicles were consuming a lot of expensive diesel before, the electric equilibrium handler now only accounts for a fraction of the costs." The excessive ground wear from the vehicles is also a thing of the past. These vehicles would not only damage the surface when retrieving wood at ground level and result in yearly repairs, they would also introduce foreign material to the loading lines. This is now completely avoided thanks to the elevated machine position and grabbing from above.

Australian sales and service partner Pacific Materials Handling delivered the 8130 in the middle of 2014. The machine is equipped with a 132kW electric motor, a 23m, and the Maxcab Industry cab. The crane is mounted above the loading line on a 5.5m-tall pylon. The equilibrium principle keeps the machine balanced thanks to a coupled counterweight. Only two hydraulic cylinders are needed to move the entire equipment. The electric drive proves itself with its strong performance and low noise level. In total, the longer maintenance intervals, small number of moving parts and the electric drive save up to 75% on operating costs — an argument that has persuaded not only Borg.

Centrally located, the SENNEBOGEN 8130 serves the loading line, unloading and sorting the raw material that has been delivered. The machine operates quietly and inexpensively thanks to the electric motor and equilibrium concept.

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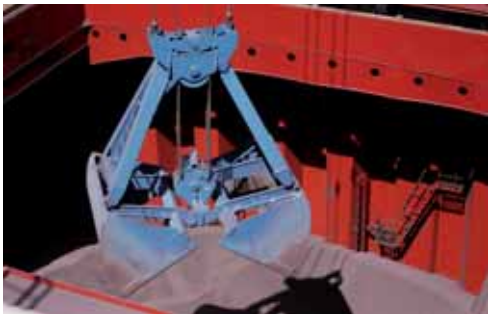

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Cimbria Director in Egypt receives Prince Henrik's Medal of Honour

During a private trip to Egypt, His Royal Highness Prince Henrik of Denmark extended the HRH Prince Henrik Medal of Honour and the Danish Export Association's Diploma to Sami Salaheldin, Regional Director of Cimbria Unigrain in Egypt at a ceremony at the Helnan Dreamland hotel on 6 October. The ceremony took place in the presence of the Ambassador of Denmark, Pernille Dahler Kardel.

Cimbria delivers seed and grain storage complexes to Egypt, which is the world's largest importer of grain. In the past, 30% of imported grain would go to waste, but thanks to modern storage facilities, this has been reduced. Salaheldin has had an important role in this.

"Sami Salaheldin has advised the Egyptian ministries, consultants and clients on how Danish technology can reduce the enormous losses of grain after the harvest," says Søren Overgaard, CEO of A/S Cimbria, who has nominated him for the Medal of Honour.

Danish technology recognized in Egypt

Cimbria's projects in Egypt has made the way for more orders from Egypt.

"Sami Salaheldin's effort has contributed to the general acknowledgment of Danish technology in Egypt. Ministers and decision makers show great satisfaction with Cimbria's solutions, and this strengthens the general perception of Denmark in the country," says Pernille Dahler Kardel.

Stepping stone to new projects

In August 2014 Cimbria received an order in Egypt financed with help from UAE, to deliver the market with 23 new silo complexes in 2015 and 2016. Although this means the need for grain storage in Egypt will be covered, Cimbria continues its work. The success in Egypt will be used as a stepping stone to new client segments and markets.

"We want to focus on the private sector for seed plants, cleaning facilities for the food industry, machines for treatment of herbs and spices as well as cleaning devices for the treatment of oil and wheat. At the same time, Cimbria Egypt will focus on the other markets in the Middle East and North Africa — we have silo projects in Sudan in the pipeline," says Søren Overgaard, CEO of A/S Cimbria.

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SENNEBOGEN

Product launch: SENNEBOGEN 870 E-Series

At the bauma 2016 exhibition, which will take place in Münich, Germany, in April, SENNEBOGEN will introduce the new 870 material handler for demanding material handling at ports, scrapyards, or for industrial use. The newly developed product boasts a convenient safe working load of 8 tonnes at a maximum reach of up to 25m, as well as the innovative Green Hybrid energy recovery system.

The SENNEBOGEN material handlers of the Green Line have proven themselves in demanding tasks across the globe with reliable technology, minimal operating costs and innovative, custom solutions for any challenge.

As the latest model in the current E-Series, the SENNEBOGEN 870 comes with a powerful 261kW diesel engine complying with Tier 4f emission standards, including automatic idle stop and EcoMode. A 250kW electric motor is also available. With equipment lengths up to 25m at a maximum safe working load of 8 t, the latest model in the current E-Series supersedes its predecessors with vastly increased performance.

Green Hybrid system saves up to 30% in energy through energy recovery

The innovative Green Hybrid energy recovery system is the latest development and is fitted to both the SENNEBOGEN 875 and the new 870. This system has been proven through initial customer use across the globe. An energy recovery cylinder mounted on the boom in between the two hoist cylinders offsets the weight of the boom, reducing energy costs up to 30%. This additional hydraulic cylinder stores the energy produced by lowering the boom in compressed gas cylinders placed in the rear of the machine. This accumulated energy is then provided during the next stroke. The principle is similar to a spring being compressed and then releasing its energy when it is allowed to expand.

Maximum comfort and ideal overview for port handling applications

The new SENNEBOGEN 870 offers operators a comfortable work space with an ideal overview from the Maxcab cab which can be elevated as standard. The largest Maxcab Industry cab with glass bottom or the spacious Mastercab with training seat are available as options, especially for use at ports. All cabs offer the operator a pleasant workplace with automatic air-conditioning and high-precision joystick control. The new material handler is available with a new option: the newly developed Skylift cab extensions allow access from the ground and views up to 15m with ease. This allows, e.g., the monitoring of loading operations into ship hulls, a valuable safety feature in port handling.

The proven SENNEBOGEN modular concept offers an extensive range of superstructure variants to meet customer requirements. From a mobile undercarriage with 4-point claw support to crawler and rail undercarriages, to gantry and pylon solutions for special port applications, all can be provided as custom solutions. With gantry and pylon superstructures in particular, the SENNEBOGEN 870 achieves an outstanding viewing height for use in material handling. The custom modular system consisting of several undercarriage variants, various equipment lengths, cabs and cab extensions allows for more than 1,000 flexible combinations – the right solution for any challenge.

Easy to maintain and easy to use

In daily operations the SENNEBOGEN 870 distinguishes itself by its ease of maintenance and servicing. The walk-on uppercarriage with continuous gallery ensures uncomplicated access to maintenance and service points. A service/maintenance box in the uppercarriage makes it easy to check and conveniently service the entire machine with just a few actions. Typical for SENNEBOGEN in this regard is the clear arrangement of all components, with the proven longitudinal installation of the

with Green Hybrid energy recovery

engine offering service advantages. The SENNEBOGEN Control System, or SENCON in short, offers easy menu navigation. Machine parameters can be read out centrally on a generously proportioned, intuitively operated display, and the operator can conveniently make individual fine adjustments himself.

The SENNEBOGEN 870 E-Series: overview

The new E-Series of the SENNEBOGEN 870 supplements the extensive range of Green Line material handlers for port handling and scrapyard applications. Versatile configurations are available for such operations, allowing the machine to be tailored to customer-specific requirements.

- **top-level performance:** Cummins Tier 4f 261kW diesel engine, alternative: 250kW 400V 50/60Hz electric motor;
- **superior safe working loads:** up to 8 tonnes at 25m reach;
- **versatile equipment:** lengths from 18m to 25m;
- **flexible modular system:** mobile undercarriage, crawler undercarriage, pylon variants, gantry solutions, rail undercarriages;
- **modern Maxcab comfort cab** for continuously relaxed work, optional vertical and horizontal adjustment, other special variants available;
- **highest safety standards:** easily accessible maintenance points via walk-on uppercarriage, railing and gallery on the cab and uppercarriage, LED headlights, peripheral cameras right and rear; and
- **energy-saving drives:** all machines are optionally available with electro-hydraulic drive solutions, with the Green Hybrid energy recovery system for savings up to 30% being fitted as standard.

Martin Engineering names new COO

Robert Nogaj has been named Chief Operating Officer (COO) of Martin Engineering, a global leader in bulk material handling solutions. Nogaj will be responsible for all facets of the company's business, including R&D, manufacturing, sales, marketing and finance. With 22 years of experience in bulk materials handling, he has previously served Martin Engineering as Vice President of Operations from 2001–2015.

"Our mission for the coming years will be to keep streamlining our business for continued growth, building on the international expansion that has led us to become a truly global company able to supply and service customers virtually anywhere in the world," he said. "We are developing a wide range of new products and strategies to address the industry's most difficult issues and compete in the challenging markets that are forecast for 2016 and beyond." Nogaj added that Martin Engineering continues to expand its focus into new regions and target industries to assure the company's profitable growth and long-term stability.

A key component of the company's strategy will be to continue its role as an industry resource and innovator of products and services to improve the efficiency, safety and productivity of bulk materials handling operations. The firm's emphasis will include further development of safety training programmes and active participation in key industry organizations such as the Conveyor Equipment Manufacturers Association (CEMA).

Nogaj is a hands-on executive with broad expertise in all aspects of business. Fluent in Polish, with linguistic skills in German, Russian and other Slavic languages, he has extensive overseas experience. Nogaj holds a B.S. in Construction and an M.B.A. from Bradley University in Peoria.

Founded in 1944, Martin Engineering supplies conveyor products and material flow aids around the world for a wide variety of bulk material applications, including coal, cement/clinker, rock/aggregate, biomass, grain, pharmaceuticals, food and other materials. The firm is headquartered in Neponset, IL, offering manufacturing, sales and service from factory-owned business units in Brazil, China, France, Germany, India, Indonesia, Mexico, Peru, Russia, South Africa, Turkey and the UK, and under exclusive licence with ESS Australia.

Robert Nogaj has been named COO of Martin Engineering.

Improving filling accuracy with National Bulk Equipment

Dry bulk material processing and packaging operation uses single-station, container filling system to improve fill and weigh accuracy of drums, cartons, totes, gaylord containers, and bulk bags

National Bulk Equipment, Inc. (NBE). NBE introduces a single-station, variable container filling system for bulk filling of drums, cartons, totes, gaylords, bulk bags and other bulk container types. The NBE variable container filling system advances beyond conventional rotating fillhead designs to provide dry bulk material processing operations container-specific filling, densification, and NTEP-certified weighing.

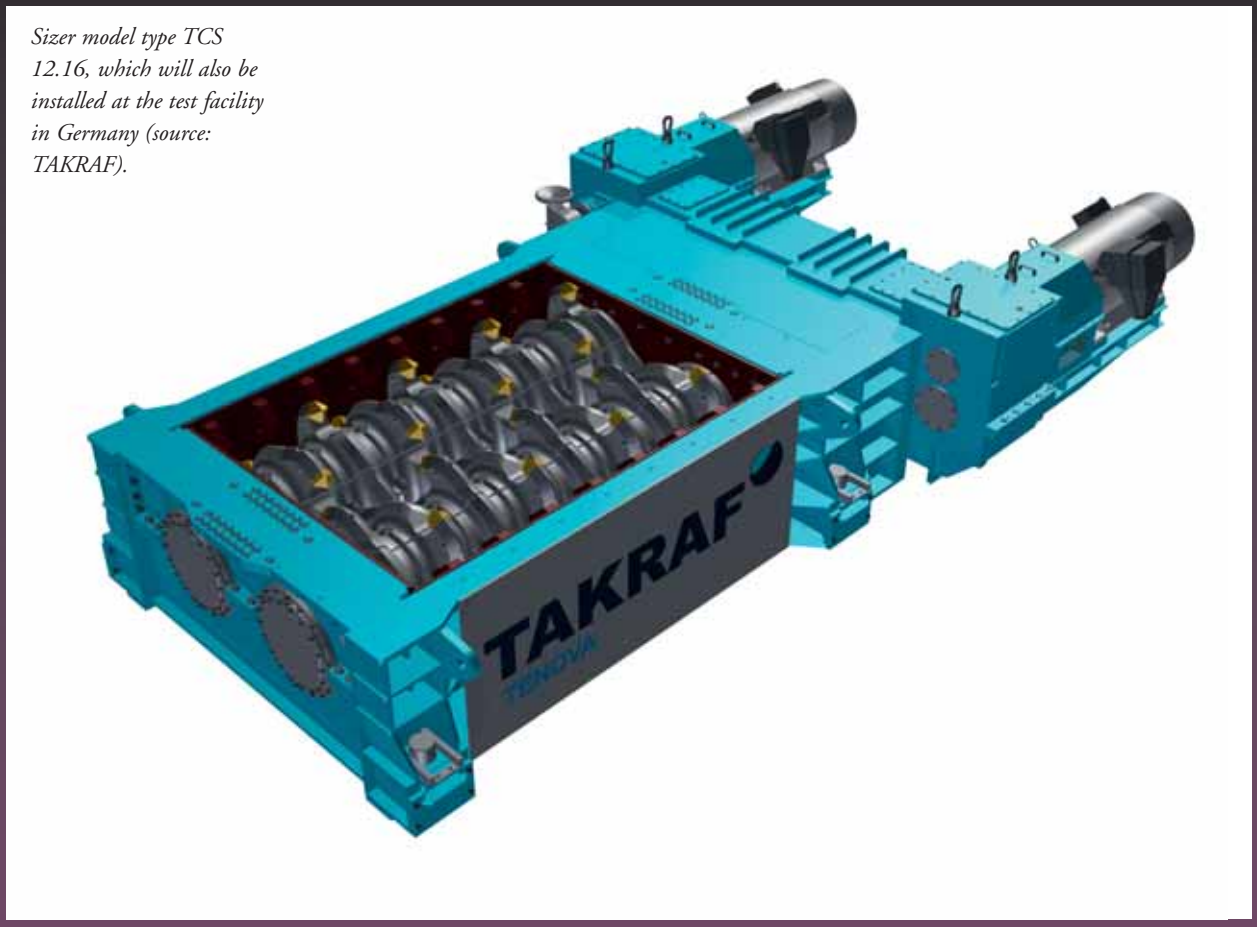
The NBE variable container filling system has a proprietary densification design integrating two densifying methods. This NBE design enables varied container types to be processed through the same fill station. The NBE design ensures precise fill volume and weigh accuracy, optimal line speed, reduced material waste, and eliminates material contamination resulting from operator hand leveling of material.

When in the multiple container mode, the NBE variable container filling system uses an automated, vibratory densifier pad to individually densify each drum on a pallet. The densifier arm and pad automatically extend from the unit to densify one drum at a time. When a drum fill/densification cycle is complete the pallet deck rotates to repeat the cycle with each drum on the pallet. This one-by-one densification eliminates the problems common with rotating fillhead designs that vibrate the entire base of the unit; these problems include drums bouncing out of the unit, and operators reaching into equipment during densification to stabilize drums.

When in the single container mode, the NBE variable container filling system uses a deck-only vibratory densifier for large, single containers such as gaylords, totes, and bulk bags. The NBE design isolates 3 Gs of vibration force to the deck of the system rather than vibrating the entire base of the unit. This isolated vibration concentrates the vibratory effect to the container enabling precise material fill volume and weigh accuracy. The isolated vibration also eliminates the damaging and annoying transfer of vibration to surrounding equipment and work areas common with conventional densifiers.

The NBE variable container filling system is designed with a completely integrated, NTEP-certified weigh system. A single, UL-listed, menu-driven controller, designed and built by NBE, meters material feed rates based on container type, material type, densification cycles, and finished package weight. The NBE variable container filling system can weigh containers with capacities from 113 to 1,814kg to an accuracy of plus/minus .01%. The NBE NTEP-certified weigh system eliminates material waste common with manual designs. Operator interaction is limited to controller operation and container loading and unloading.

TAKRAF unveils series of primary & secondary sizers



Sizer model type TCS 12.16, which will also be installed at the test facility in Germany (source: TAKRAF).

Easy to use and to maintain:

With hundreds of complete systems, as well as individual machines, having been supplied to clients all over the world, Tenova TAKRAF is a key supplier of equipment and systems for open pit mining and bulk handling. The international company offers innovative technological solutions as well as process and commodity knowledge along various industry value chains. Recently, TAKRAF's product portfolio has been enhanced with the addition of sizer equipment, which now enables the company to integrate its own crushing machines into complete mining solutions for its clients.

TAKRAF offers standardized primary and secondary sizers for various crushing applications. The primary sizer product range covers inlet sizes from 2.5m to 4m with a throughput of up to 10,000tph (tonnes per hour); whereas the secondary sizer range covers inlet sizes from 2m to 4m with a throughput of up to 3,500tph. Both sizer product ranges are suitable for the comminution of all material types, from standard to most challenging.

A key differentiating factor of TAKRAF's sizers is the fact that special focus and attention was directed towards attributes such as ease of maintenance, reduced downtime and long equipment service life already during the sizer's initial development.

As a result, this sizers offer unparalleled levels of maintenance efficiency and service life. Some of the innovative solutions adopted include the quick and easy changing of crushing segments, as well as the use of advanced wear-resistant materials such as hard-faced segments and tungsten picks. Other innovative solutions include an inching drive for roll maintenance, which increases safety significantly, a heavy duty drivetrain system; as well as adopting an efficient oil lubrication system with a view to greater environmental sustainability.

Mineral laboratory supports sizer selection

Rock fragmentation and abrasion are critical elements with regards to material characterization. As a result, TAKRAF boasts in-house test facilities in Germany where it is able to conduct material tests across a wide variety of conditions. Determination of material crushability and wear behaviour can thus be analysed by specialized test machines, the results of which can then be employed to assist in sizer selection. Furthermore customized wear predictions of the crushing tools can also be determined.

TAKRAF GmbH

TAKRAF GmbH is a renowned supplier of equipment and systems for open cast mining, bulk material handling and the minerals industries. Headquartered in Leipzig, an additional engineering and production site is located in Lauchhammer. TAKRAF's product range includes planning, development, design and delivery of equipment and systems, including the manufacture of key components for open cast mining equipment and bulk handling systems in TAKRAF's own workshop.

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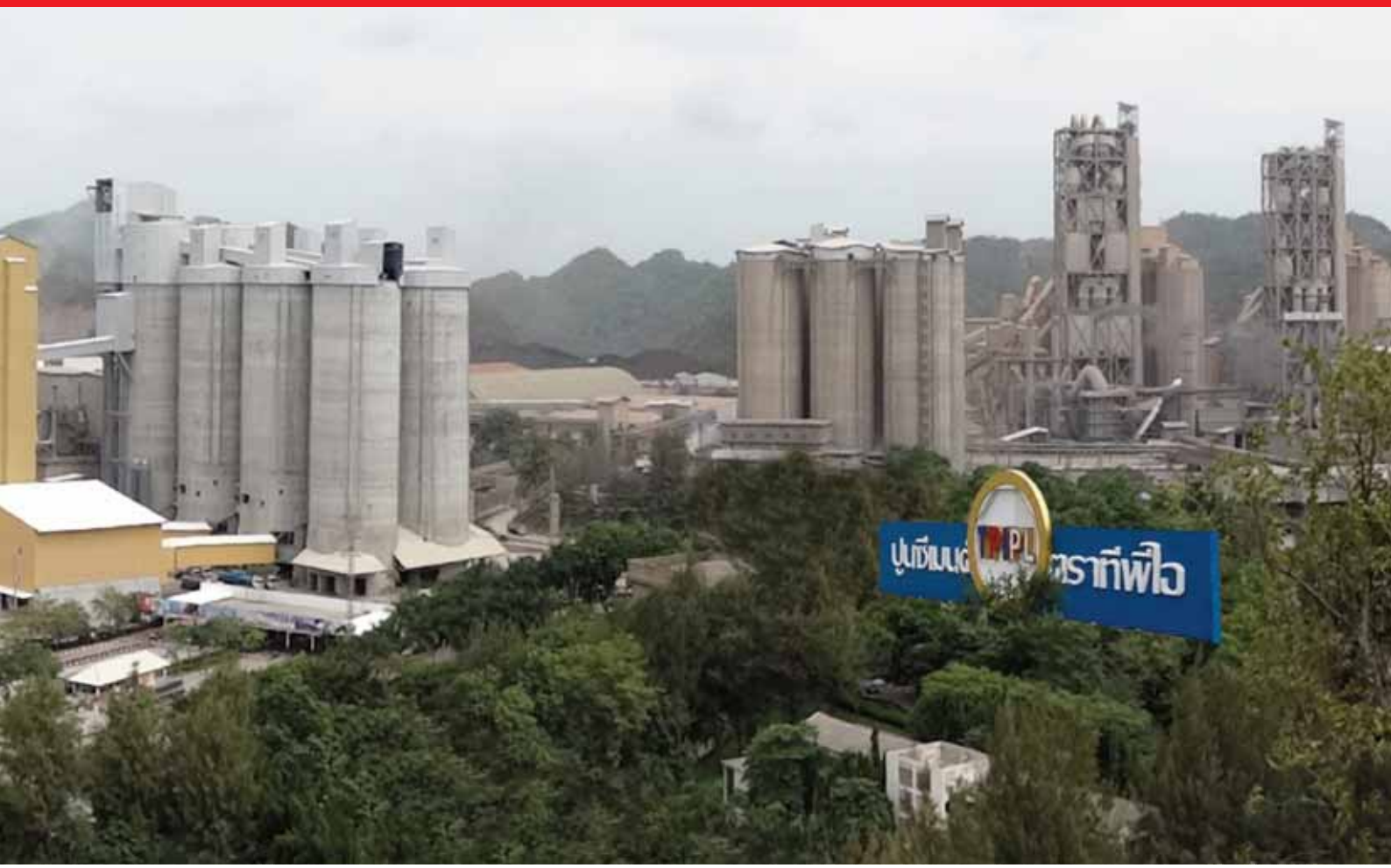

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Maquinas Condor: busy in bulk

The company Maquinas Condor is based in the south of Brazil, in Porto Alegre. It has been in business for 56 years, and serves the grain and agribusiness market — it handles commodities including soy, corn, bran, sugar and fertilizers. It is also active in the metals and mining industries through its partner company ISOMONTE, which is based in Contagem/MG, in central Brazil.

The Maquinas Condor factory in Porto Alegre.

The main equipment manufactured by Maquinas Condor includes: shiploaders, ship-unloaders, belt conveyors, conveyor elevators, bucket elevators, as well as stackers and reclaimers for stockyards.

Maquinas Condor does business with huge companies such as Bunge, Cargill, ADM, Dreyfus, Noble, and so on, in ports. It also works with smaller clients that carry out overflow operations for these major players.

In the mining market, Maquinas Condor works through ISOMONTE, and its main clients in this sector include Vale, MBR, etc. providing stackers, reclaimers and belt conveyors.

Currently, the company is about to complete work on two terminal integration projects for VLI in the mid-north of Brazil; here, grains are collected from trucks and transported to ports using railcars. Maquinas Condor is also close to completing work on a special conveyor that receives product from barges and loads ships at Nueva Palmira, Uruguay; this conveyor is for the Noble Group.

Maquinas Condor is always striving to be competitive in the market, and to provide high-quality equipment at low investment and maintenance costs.

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RDS exhibits the LOADEX 100 at SCOTPlant 2016

Making its debut at the SCOTPlant exhibition, which is due to take place in Scotland, UK, at the end of April, LOADEX 100 is a retrofittable scale. It is suitable for installation on both tracked and wheeled 360 degree excavators to weigh the amount of material in the bucket, grab or clamshell.

The LOADEX system is easy-to-use and allows drivers to load correctly first time, eradicating trips to the stockpile and reducing vehicle and tyre wear and maximizing tonnes per hour performance.

Also on display at SCOTPlant will be the LOADMASTER a100 on-board weighing scale for wheel loaders. Now approved for commercial transactions, LOADMASTER a100 is a CAN-based system combining cutting-edge sensor technology and signal processing techniques. The LOADMASTER a100 provides precise and consistent bucket weight information and emphasizes the gains in productivity and profitability.

Another product to be shown for the first time in the SCOTPlant arena, is the recently launched iSOSYNC PC software, designed to enable control of load-out operations, inventory, productivity and traceability management. iSOSYNC can be used with either LOADMASTER a100 or LOADEX 100 and allows the rapid transfer of job information from a central computer to the loader or excavator. The resultant load information is sent back to the PC upon completion.

The system can be one or two-way and is designed to operate fully automatically and without changing the loading routine for the mobile operator.

iSOSYNC can also be remotely accessed utilizing standard query language (SQL), acting as a bridge module between the on-board weighing system and a customer's existing load management software package.

For smaller loaders and skid-steers, RDS offers the WEIGHLOG a10. This instrument is a user friendly on-board weighing system which provides accurate and consistent bucket and total load results, meaning stock management and check-weighing operations can be controlled more effectively.

Another new product on show at SCOTPlant will be the LIFTLOG 1000, designed specifically for forklift trucks operating in the fastest loading environments.

With the ever-increasing focus on productivity and safe-loading, the new LIFTLOG 1000 is a cost-effective weighing instrument that reduces loading cycle times and maximizes tonnes per hour performance.

All of these systems will also be exhibited at the Bauma 2016, which will take place in Munich, Germany, in mid-April.

Indexator presents its test winner at Bauma 2016

Kent-Erik Mattsson & Camilla Waara at Indexator paying attention to the final details for Bauma 2016.

Indexator Rotator Systems, with more than 40 years' experience under its belt, has created an additional rotator range, XR. The recently developed test winner, which very quickly attracted great interest — especially from the construction industry — will be presented at the world's biggest construction exhibition, Bauma 2016 in Munich, Germany.

"Taking part in Bauma — the world's biggest exhibition for construction equipment — is a step in the right direction toward meeting more customers within the construction industry," says Erik Svensson, Sales and Marketing Manager. "We already have XR customers in market segments that are new to Indexator, which is a very exciting development. Bauma provides us with an opportunity to continue growing sales of XR rotators, especially to the construction industry," continues Svensson.

In addition to the XR rotators, Indexator also launched an entirely new range of hose swivels in 2015 designated K100. The K100 is a cost-effective hose swivel offered for installation in any interface on the market.

"Our rigorous tests and extensive field trials provided incredibly positive results for both the XR rotators and K100 swivels. In many cases, both products came first in comparison tests with competitors and competing solutions," Svensson tells us. "In fact, our designers are more than a little proud of a couple of unique solutions that made it possible to meet and in many cases even exceed customer expectations."

Interest in the new product ranges has grown constantly over the past year and continued positive trends for both the K100 swivels and XR rotators are anticipated during 2016.

XR rotator mounted on a crane.

Product news from Indexator

During Bauma, Indexator will be presenting its broad swivel K100 programme, but the major focus will be on the XR programme where visitors will be able to enjoy a preview of the latest model, the XR 300.

"To promote the company and show our news and broad product range at such a well-known and major exhibition in Europe demands careful planning," explains Camilla Waara, Marketing Coordinator at Indexator. Colleagues throughout the entire company have contributed expertise in different ways and thus ensured that we will be able to present an attractive stand at Bauma," concludes Waara.

K100 Swivel.

Indexator
Rotator Systems

XR

Extreme performance, extreme reliability

"I'm impressed by the XR"

"The XR rotator has a rigid design that exceeds all of our expectations. It works extremely well in whatever way we put it to use. XR has extremely high torque and still very smooth to operate."

Bernard Grantner, Pabst Holzindustrire, Obdach, Austria

"Performs beyond expectations"

"The XR has worked like clockwork for a very long time. Not only does the rotator cope with powerful side forces, I also find the low, compact design incredibly flexible as we don't need to build the rotator into the grapple."

Jan Lindbäck, CEO, Marine Cranes, Sweden

Bauma 2016, Stand FM 807/5 indexator.com

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Chief Industries offers new grain bin for the European market

Chief Industries UK Ltd is now offering a new grain bin for the European market.

The silo is manufactured at the Chief facility in France and is produced to the latest EUROCODE criteria.

The silo is available as standard in capacities from 80m³ to 15,000m³ from the European facility, and up to 27,000m³ on special order.

The 1,077mm wall sheet height requires significantly fewer rings, seams and stiffeners. Combined with Chief's exclusive 'W' stiffener, the bins offer unsurpassed strength, whilst reducing costly assembly time.

The 'W' stiffener is nearly twice as strong as the closest competing competitor. Designed to support the vertical load, the unique 'W' staggered stiffener system provides supplemental strength and fully supports overhead catwalks and conveyors.

The 120 × 11mm profile of the shallow form corrugated sheets minimizes the build up of residual grain on the silo wall during unloading.

The wall sheets are manufactured from high quality steel to EN 10326 and are Sendzimir galvanized to Z450 as standard and Z600 on request.

Roof panels are of Aluzinc AZ 185, which is superior to galvanized steel, and feature an interlocking 'J' rib design for outstanding strength and reduced assembly time.

All roofs have a 30° pitch with high peak load capacities and are designed to support additional loads imposed by conveyors, temperature cables, or heavier snow loads. The design meets anti-explosion criteria.

New UK Sales Manager for Chief Industries UK Ltd

Mark Buttle, new Sales Manager, UK Region, for Chief UK.

Chief UK has announced that Mark Buttle joined the company in January 2016 as Sales Manager for the UK sales region.

Buttle has a broad technical and sales background and has taken on his new role with characteristic energy.

The MD of Chief UK, Rod Watson, said that the appointment had come about due to the high degree of interest generated by regularly exhibiting full scale silos, dryers and cleaners at Lamma, Cereals & Highlands. So much so, that Chief's existing sales team cannot dedicate the time that each individual UK customer deserves. Chief aims to emulate the successes and long-term customer relationships that it has enjoyed overseas for the previous decades.

It is intended that Buttle will offer more face-to-face assistance, quickly developing relationships with customers, agents and dealers and provide them with a dedicated service, with the full support of its existing sales force.

About Chief Industries

Chief Industries has been a manufacturer of grain storage silos, grain dryers and grain handling equipment for over 60 years, with manufacturing facilities in the United Kingdom, France and the USA. Project design is a speciality.

The agency for Marot cleaners, for the United Kingdom and Northern Ireland, is held by Chief UK.

In addition, full spares backup and service advice can be supplied for all Denis and Law Denis equipment, including the Law Denis dryer.

Siwertell to deliver high-capacity ship unloader to grain terminal

Siwertell grain unloader installations can be found on all continents. This one has an unloading rate of 1,500tph and is installed at Cargill's floating terminal in Brazil.

Siwertell, part of Cargotec, has received an order from a port development company for a high-capacity ship unloader destined to serve a busy grain terminal. The ST640-M screw-type unloader has been ordered as part of an ongoing development programme and will replace an old mechanical unloader.

The customer chose the Siwertell unloader after a two-year tendering process, which gathered information on global innovations in the field, with a particular focus on minimizing air and water pollution.

"A wide range of factors influenced the customer's decision. Siwertell offered the best technical solution with the best environmental performance and we are able to deliver the necessary high capacity, efficiency and reliability. We offered all this at a very competitive price," says Juha Huovilainen, sales director at Siwertell.

Siwertell unloaders are ideal for virtually all dry agribulk cargoes. Their screw technology transports the cargo very gently, resulting in minimal degradation. The new unloader will have a rated capacity of 1,200tph (tonnes per hour) and will be able to handle ships up to Panamax size. It will be constructed in Europe and China and delivered in sections for final completion on site during the third quarter of 2017.

"This order identified Siwertell as a reliable supplier with a convincing list of references and testimonials. Our totally enclosed technology eliminates spillage and keeps dust emissions to an absolute minimum, making it a perfect fit for the customer's purposes," Huovilainen continues.

As extensive support during the first year of operation to maximize the unloader's performance and long-term reliability is included in the contract.

Siwertell ship unloaders and loaders are based on unique screw conveyor technology, in combination with belt conveyors and aeroslides, and can handle virtually any dry bulk cargo, such as alumina, biomass, cement, coal, fertilizers, grain and sulphur. Siwertell's product portfolio includes ship unloaders, mobile ship unloaders, ship loaders, conveying systems and complete bulk terminal solutions, all of which are designed to ensure environmentally-friendly and efficient cargo operations.

Telestack announces new managing director

UK-based Telestack, specialists in the design, manufacture and installation of mobile bulk material handling systems, has appointed Martin Dummigan as its new Managing Director with immediate effect.

Dummigan will be responsible for setting and achieving Telestack's goals and objectives and will report to the Group Vice President Aggregates & Mining, Jeff Elliott.

Joining Telestack from Terex, Dummigan has had various roles in his ten-year tenure. His last role saw him serve as Vice President, China Operations and Business Initiatives for Terex and was based in Xiamen in China. Prior to this, he served in various positions of increasing responsibility within Terex, including Terex Environmental Equipment, Terex Materials Processing, Terex Cranes and Terex Port Solutions, all with an emphasis on Operations.

Commenting on the new appointment, Jeff Elliot said: "Martin brings valuable operational know-how to Telestack and will be an tremendous asset to the company. His knowledge of manufacturing and international experience will be invaluable as we look to define more innovative solutions for our clients and grow our presence globally."

Dummigan commented: "I look forward to expanding Telestack's business globally and building on the strong growth that it has experienced over the last number of years. The Telestack brand has an excellent reputation in the industry and I am confident of a positive and strong future for the company."

Dummigan studied at Queens University in Belfast and received a Master (MSc) in Electrical and Electronic Engineering.

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Products

The company's equipment range includes: pan conveyors, apron and surface feeders with possible weighing systems, bucket elevators, drag chain conveyors, screw conveyors and all types of connection valves.

Gambarotta's equipment is able to satisfy customer requests, in full compliance with international regulations and proven quality, reliability and long-life. Gambarotta Gschwendt guarantees efficient after-sales service, timely supply of spare parts and sends qualified technicians to any part of the world, to existing plants for upgrading and improving capacity and reliability.

Plant revamping — enhancing potential of existing machines

Through its design engineers, Gambarotta Gschwendt can offer the implementation of its know-how and experience to revamp, upgrade and enhance machines already installed on plants, whether supplied by Gambarotta Gschwendt or other manufacturers.

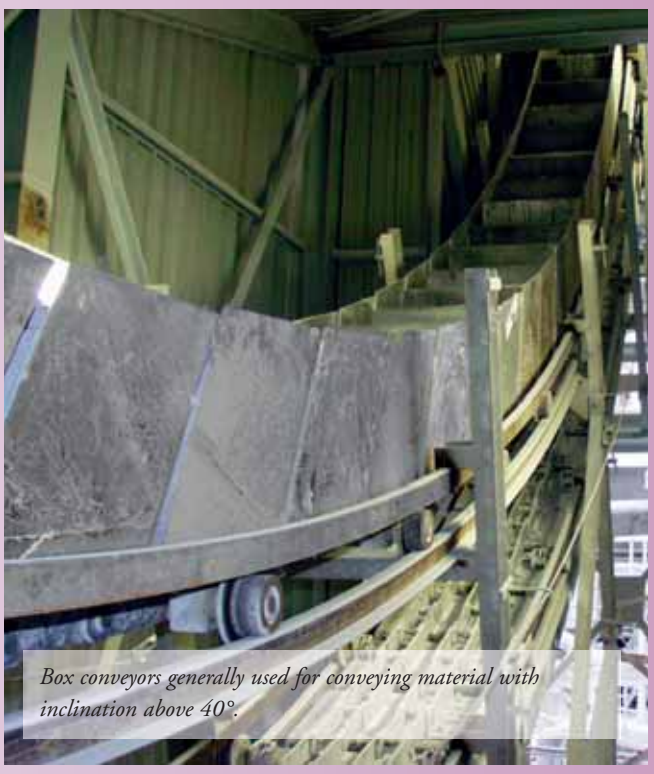
Revamping involves collecting geometric and process data by our specialised technicians through on-site surveys and interviews with the customer to define the project targets.

Possible targets involve:

- capacity increase;
- partial or total revamping;
- conversion;
- efficiency enhancement;
- maintenance; and
- reduction of maintenance costs.

The offered revamping phases may include the following:

- initial assessment: assessment of customer requests and, if the machines are manufactured by Gambarotta Gschwendt, retrieval and analysis of any possible technical documentation in the company's possession;
- inspection at the plant: measurement of overall dimensions, assessment of wear conditions, operational check, operating conditions check;
- data analysis: parameters check using Gambarotta Gschwendt's calculation programmes, analysis of collected data, identification of possible solutions; and
- drafting of an intervention project and proposal to the customer.



Box conveyors generally used for conveying material with inclination above 40°.

Cargotec completes acquisition of INTERSCHALT

Cargotec has completed the acquisition of INTERSCHALT maritime systems AG, after receiving regulatory approvals. The transaction was announced on 20 January 2016. The acquisition strengthens Cargotec's and its business areas' Kalmar's and MacGregor's software strategy and complements Cargotec's strategic aim to be the leader in intelligent cargo handling.

Cargotec will consolidate the results of INTERSCHALT software business into Kalmar business area results and the results of INTERSCHALT services business into MacGregor business area results as of March 2016.

Cargotec is a major provider of cargo and load handling solutions with the goal of becoming the leader in intelligent cargo handling. Cargotec's business areas Kalmar, Hiab and MacGregor offer products and services that ensure its customers a continuous, reliable and sustainable performance.

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DELACHAUX GROUP

Bühler enjoys pole position in rice processing

Bühler has become the number one supplier in industrialized rice processing. Its position in the industry as a trusted technology partner to processing businesses is further underlined by its raft of innovative solutions to suit the needs of processors large and small.

Rice is grown on every continent, apart from Antarctica, and is a staple food for more than half of the world's population. In fact, one billion people globally are directly or indirectly reliant on rice — either for food or income, or both. With the world's population predicted to reach 8.27 billion by 2030, demand for rice is expected to increase by approximately 100mt (million tonnes) to 550mt in the same period.

Bühler is well prepared to play a key role in processing these fast growing rice volumes: thanks to significant contract wins over the past 12 months, the company has taken the pole position in global industrialized rice processing, exceeding its closest competitor in terms of combined turnover in rice milling and logistics. Today, around 30% of the global rice harvest will be processed on systems from Bühler.

This accomplishment is owed to Bühler's commitment and success in delivering global expertise with local customer service, innovations, and its ability to understand every step along the value chain.

Understanding of local needs and state-of-the-art technology

"Paramount to Bühler's success are the 90 service stations around the world," explains Detlef Blass, Head of Rice Processing Europe and Americas at Bühler. "They have a deep-rooted understanding of the issues affecting the markets they operate in and cement Bühler's ability to adapt its technology and business model to the needs of processors in each area."

Furthermore, Centres of Competence located in major rice producing markets, including India and China, house the world's best rice technology and nutrition experts, who are well placed to develop regional rice processing and added-value technology solutions that meet distinct local requirements in paddy handling, storage, and milling.

The success achieved in South East Asia is a perfect example of this formula and highlights Bühler's widening technology and engineering footprint in the key rice processing markets. Rustom Mistry, Head of Rice Processing for China and South East Asia explains: "In the past two years we have secured in excess of US$100 million worth of business, including the company's largest-ever contract for rice processing, a landmark agreement with Merry Rice in Thailand." The contract, for more than 50 Bühler SORTEX S UltraVision™ optical sorters, and 50

high-capacity UltraPoly™ rice polishers, will result in the world's largest rice mill, capable of processing more than 10,000 tonnes of rice per day.

Bühler is also trading strongly in Europe, where it has completed a combination of new installations and plant upgrades. In Spain, the company installed a 100% Bühler rice grinding plant — the largest in the world — producing high value premium rice flour for use in baby foods, instant beverages and gluten free products.

Meanwhile in the Americas, market development and penetration for Bühler rice processing solutions remains buoyant. In Columbia, Bühler has supplied engineering and accessories for a paddy project, processing more than nine tonnes per hour.

Among the innovations in rice processing solutions launched in recent years is the high capacity rice processing installations UltraLine™. It comprises the optical sorter UltraVision™, the rice polishing machine Ultrapoly™, and the rice whitener Ultrawhite™. By way of example, built-in intelligence enables UltraVision™ to make intelligent decisions about which grain is acceptable and which grain should be rejected.

Bühler will continue to expand local sales and service channels, plus build expertise to further strengthen its provision of energy efficient, processing technologies for emerging and mature rice markets worldwide. Bühler's commitment to understanding and serving its customers, underpinned by a solid strategy of forging and investing in long-lasting business partnerships with rice processors, large and small, around the world, will ensure that Bühler remains in pole position for 2016, where several significant rice projects are further expected.

About Bühler:

Every day, billions of people come into contact with Bühler technologies, to cover their basic needs for food and mobility. With its industrial process technologies and solutions, Bühler contributes significantly to feeding the world's population, setting a focus on food security and safety as well as reducing carbon emissions of cars and buildings. In 2015, its roughly 10,800 employees in more than 140 countries generated a turnover of CHF 2.4 billion. The global Swiss family-owned company Bühler is particularly committed to sustainability. DCi

Strong partner in Grain Management.

One of the big challenges of our age is to supply all the people worldwide with food. Every year, millions of tons of grain are collected, stored, and handled around the globe – and the upward trend is unbroken. Only the most up-to-date plant and equipment can guarantee rapidity and quality while minimizing raw material losses. In order to meet the increasingly stringent challenges, Bühler Grain Logistics provides with its capabilities the best possible solution – for conveying, cleaning, drying, storing, dedusting or loading and unloading the most important commodity on earth. www.buhlergroup.com

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Safety is the be all and end all for humans and machines: bucketwheel excavator in open-cast mining.

Modernization expertise for open-cast mining

Technically outdated mechanical components, lack of replacement devices, more stringent safety requirements specified by changed standards: there are a variety of reasons for modernization projects in open-cast mining. Quite naturally, it is the safety aspects that are at the forefront. Large machinery in open-cast mining such as excavators and conveyor bridges are permitted to perform their tasks only within approved design and technologically assured operating ranges. To ensure they adhere to these operating ranges it is imperative to reliably monitor their position in conjunction with a reliable solution to safely limit the end position of moving system components. The dangers posed by large machines such as bucket wheel excavators are immense for personnel and the machine itself: If the boom leaves the allowable range, it is possible that the whole excavator can become unbalanced and topple over because the centre of gravity has moved. To avoid scenarios of that nature operating companies invest in safety solutions such as the U-ONE-SAFETY-Compact offered by Johannes Hubner Giessen; this reliably monitors the defined limit values of speeds and positions.

At Johannes Hubner Giessen modernization projects are more than just delivering an encoder system. Here we demonstrate the modernization expertise of the encoder specialist based on an application example (of the bucket wheel excavator mentioned above) — beginning with documenting the present situation on-site to putting forward individual design suggestions through to fabricating and installing the customized encoders and their attachments.

Outdated mechanical components

The project begins with Hubner specialists documenting and measuring the installation situation on-site. To date, absolute encoders and mechanical limit switches (spindle limit switches) have been used to determine the position and limit the end position of the moving system parts in relation to one another (e.g. crawler unit to the upper, rotary part of the excavator). In

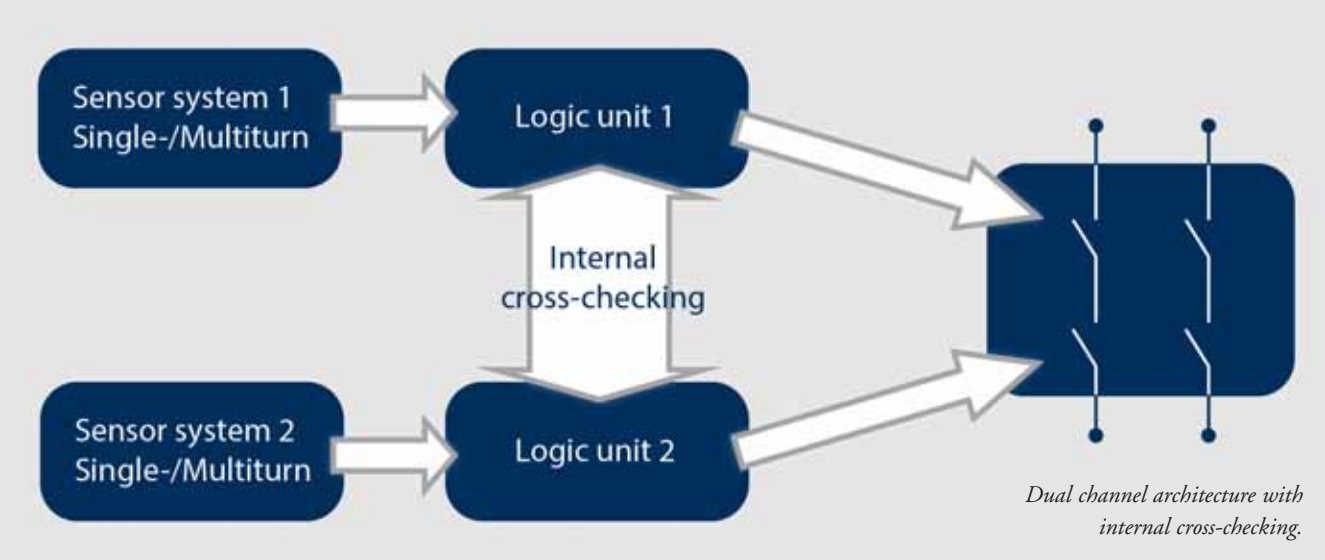
this case the operator had installed two devices: one as a control or rather intermediate switch and the other as a limit switch, which must afford the highest level of safety. Thomas Brandenburger head of the Project Management department at Johannes Hubner Giessen, explains the disadvantages of the legacy solution: "Calibrating the purely mechanical installation of the spindle limit switch is a time-consuming process. Delays resulted when re-starting the system after replacing the rope or the end limits were exceeded, which in turn led to a loss of valuable production time. In addition, the construction including a chain drive required to fit two spindle limit switches to the drive shaft was susceptible to faults."

Legacy installation: Two spindle limit switches driven by a gear wheel.

The requirements demanded of a modernization solution were: more safety, not least by means of a two-channel system, as well as upgrading from a mechanical solution to a simplified electronic solution. Based on the measurement data, design drawings and discussions with the engineers on-site Hubner Giessen produced sketches and put forward solution proposals for the new encoder system including interfaces and attachments. This led to the contract-specific design and fabrication of the specific components. "As far as we are concerned the contract does not end with selecting the right encoder," Brandenburger emphasizes, "it all depends on the overall installation situation. We examine very closely how the operator actually uses our devices, and which interfaces and component attachments are also necessary."

U-ONE-SAFETY-Compact replaces several individual devices

For the modernization project of the system, which monitors the bucket wheel excavator, the U-ONE-SAFETY-Compact encoder system was selected to replace the outdated mechanical system.



Dual channel architecture with internal cross-checking.

It was installed directly onto the rotary shaft, replacing several individual devices with a single, compact device. The system consists of six position switches, which it is possible to programme according to the desired angular positions. In other words, it is possible to implement the control points as well as the limit switching point with a single device. The compact version of the encoder system U-ONE-SAFETY-Compact consists of a basic unit and directly attached switch or bus modules. All functions are integrated in a robust housing, which is able to defy the harsh conditions in open-cast mining operations. The advantage: it was possible to install the device on-site using the existing cabling. There was no need to install component parts in the electrical cabinet, so there was no need to create additional space. Highly precise safety switching signals are issued according to position and speed based on a 13/15 bit resolution (max. 32,768 rotations). The system-wide two channel architecture facilitates the implementation of safety functions up to Category 3 and Performance Level (PL) d as well as SIL 2.

The U-ONE-SAFETY-Compact offers the operator simple configuration options for safe switching points without an additional safety PLC — and, as a consequence, there is no need to intervene in the control software.

Contract-specific attachment solutions

The on-site situation meant an individual solution was required to install the encoder system; above all, the gear construction was to be circumvented. Brandenburger explains: "The new U-ONE-SAFETY is installed using a coupling that is simply slid onto the shaft. In contrast to the chain solution the coupling does not vibrate and there is no play. Moreover, precision adjustment as well as the encoder aligning perfectly with the drive shaft are important factors ensuring both the quality of the signals and a long service life. The solution required a specially adapted support structure, which we also designed and installed on-site." Throughout the entire planning and execution stages the customer is provided with extensive documentation including sketches, design drawings and an installation report.

In addition, a second U-ONE-SAFETY-Compact system was also installed for a further rotary axis to reliably monitor the positions and speeds of the boom as it performs lifting motions. The situation is the same in this case: it is possible to control a variety of limit values with a single device.

Thanks to professional preparatory planning and uncompromising support throughout the entire project the operators benefited from a brief period of standstill and a high-level of plant availability. The actual conversion work went smoothly and paid for itself within a short period of time. By installing the U-ONE-SAFETY-Compact the client is now able to fulfil the higher levels of reliability demanded by the machinery directive and the resulting regulations pertaining to monitoring the speed and position as well as limiting the end position of bucket wheel excavators in open-cast mining. DCi

The new solution today: the encoder system U-ONE-SAFETY with a new coupling and individually fabricated support structure.

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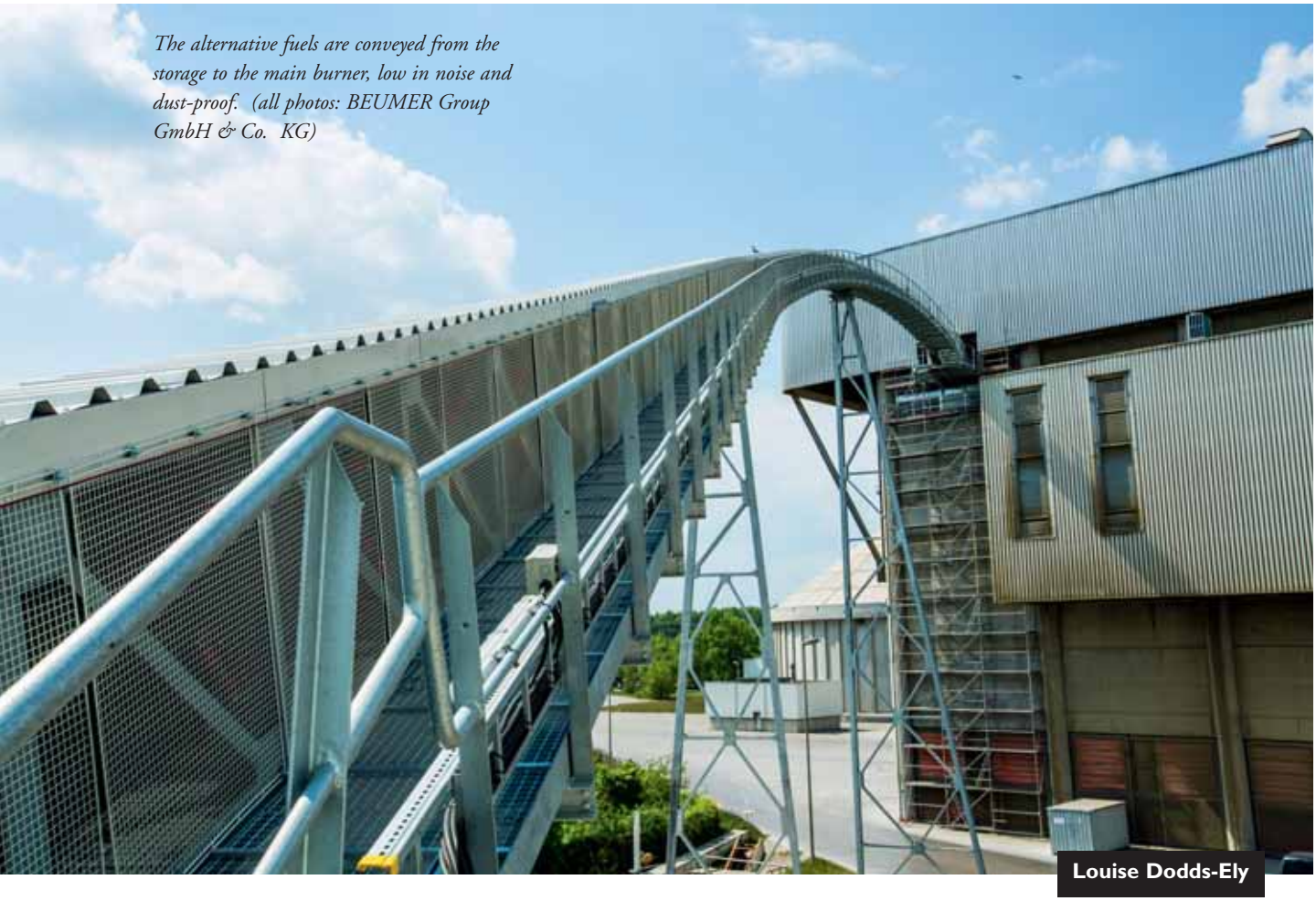

The alternative fuels are conveyed from the storage to the main burner, low in noise and dust-proof. (all photos: BEUMER Group GmbH & Co. KG)

Louise Dodds-Ely

BEUMER pipe conveyors central to alternative fuel handling system

The new business segment AFR systems at BEUMER Group makes it possible for cement and lime plants to use alternative fuels. Central to this concept is a BEUMER pipe conveyor system that efficiently moves alternative fuels in an eco-friendly and low-maintenance fashion.

Reliable energy supplier

Cement manufacturing is particularly energy-intensive. In order to reduce the use of expensive primary fuels like coal and oil, cement plant operators focus increasingly on alternative fuels and raw materials (AFR). The use is generally focused on the fuels. Neither the manufacturing process, the end product, nor the emissions may be affected. Therefore, high-caloric wastes that cannot be further recycled, e.g. from plastic and packaging residues, paper, composite material or textiles, have to be treated beforehand to be ready for co-processing.

In order to help customers efficiently convey, store and dose the treated fuels, BEUMER Group has established the new business segment AFR systems. Germany, October 1973. For political reasons, Arab countries reduced their oil production, which caused oil prices to skyrocket. This was a very precarious situation, because crude oil was an important energy source, also for the cement industry to operate their rotary kilns. With this first oil crisis, plant operators started to shift towards using cost-effective fuels and raw materials.

Besides mineral waste that can be used as alternative raw material, the market primarily employs the use of fuel alternatives, because approximately 30% of production costs are spent on energy. In addition to fluid alternative fuels, such as used oil or solvents, the majority of solid fuels consist of complete or shredded scrap tyres, scrap wood, or mixtures of plastic, paper, composite materials or textiles.

After they have been treated and quality-controlled, they show calorific values similar to brown coal. The calorific value of scrap tyres is even comparable to that of stone coal. When producing cement, it is also necessary to ensure that the quality of the ash residues matches the quality of the end product. As all material components are completely incorporated into the

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clinker and mineralized, their use makes for an economic production process. In addition, primary raw and fuel supplies are conserved and landfill volume is reduced.

Pre-treated alternative fuels are mostly supplied from external vendors, ready for incineration. BEUMER Group now offers tailor-made AFR systems to lime and cement plants for the safe transport and storage of solid materials. Based on wide-ranging experiences and the customer's requirements, the systems comprise the entire chain, from receiving and unloading the delivery vehicle, up to storing, sampling, conveying and dosing solid alternative fuels. BEUMER Group, provider of intralogistics, supplies its customers worldwide now with three systems, from one single source.

Tailored to every application

BEUMER Group's programme includes the starter system that is used at the main burner. In the cement and limestone industry, primary fuels are usually ground to grain sizes of less than 100 micrometres and fed via the burner. At the end of the rotary kiln, the burner heats up to 2,000°C, the temperature that is needed for limestone, sand, clay and ore to react and become clinker as an intermediate product. In order to use solid alternative fuels in the clinkering zone burner, they should deliver a calorific value that is at least similar to brown coal (ca. 22 ± 2MJ/kg), have grain sizes of less than 30 millimetres and burn out while being fed. The oven-ready material is usually delivered in moving-floor trailers.

Technology to feed a growing world

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BEUMER Group provides a docking station that also serves as storage on site. Once the trailer is emptied, it is completely replaced or refilled in the large tent using a wheel loader. The material is metered volumetrically and conveyed to the clinkering zone burner. This solution is deliberately designed as a test system. This way, the operator can test their suppliers, the quality of the fuels and their furnace behaviour.

By using alternative fuels, the production process becomes more economical. Primary raw materials and fuels are conserved and landfill volume reduced.

Solution for the calciner

With the second system, the calciner can be fed with more coarse alternative fuels, such as tyre derived fuel or the fuels described above, but in a more coarse state. They are generally less processed, contain three-dimensional particles and therefore require more time to burn out than for example the more intensively processed, exclusively two-dimensional secondary fuels for the main burner.

The coarse calciner fuel is delivered in moving-floor trailers or tippers. The secondary fuels are quickly unloaded and stored temporarily in a dust-proof way. Another storage serves as a flow buffer, which can hold the overall capacity of 900 cubic metres of the preceding bunker. From here, the pipe conveyor transports the material to the calciner in the preheater tower. Here, the secondary fuel is weighed and dosed. During the feed towards the hearth in the calciner, there is often the risk that the material or the conveying system can catch fire due to thermal radiation or pulsations. For this reason, the valveless special feed was developed, so the material can be safely fed to the calciner.

In order to ensure safe and automatic fuel supply after successful testing, BEUMER Group provides systems for permanent operation with high thermal substitution rates. The systems consist of the receiving area and a storage system, where the crane system can store material of different quality into different storage zones and boxes. Experiences so far have shown that you always have to calculate with disruptives or quality deficits in the fuel. This is why the entire storage and conveying technology in the hall can be provided with equipment that is able to separate metal, wet and three-dimensional disruptives from the fuel for the main burner and keep disrupting oversized grains from the calciner fuel.

Equipped with the necessary sensor technology, the operation runs automatically. The crane can be used independently for homogenization, in order to minimize quality variations or feed the lines towards the main burner and the calciner.

Pipe conveyor stands the test

Schwenk Zement AG's product diversity and production capacity make their plant in Bernburg one of the largest and most efficient cement plants in Germany. In order to reduce energy costs, the cement plant is increasingly using secondary fuels that are engineered in external processing plants into high-quality fuels with defined product parameters.

Until now, the manufacturer had been using drag chain conveyors. After almost a decade of use and numerous modifications however, more and more maintenance was required. The fuel quality also improved over time, so that, due to its density of 0.2t/m^3, the existing technology was no longer sufficient to convey the required quantities towards the main burner. This created the need for a reliable, eco-friendly and low-maintenance solution. In addition, the new conveyor needed to be optimally adapted to the curved routing in the plant.

If suppliers encounter problems in regards to the quality of their processing, BEUMER AFR systems can be upgraded and are suitable for high substitution rates.

Schwenk Zement KG opted for the BEUMER AFR system with its pipe conveyor to feed the main burner with alternative fuels. The system works almost completely automatically, from receiving to the feeding system of the rotary kiln. Cranes pick up the engineered secondary fuels in the storehouse and fill them into the discharge bunkers with their discharge equipment. From there, a chain belt conveyor transports the fuel continuously towards the pipe conveyor, which conveys it to the weigh feeders before the main burner.

The curved pipe conveyor at the core of the system requires little maintenance and its enclosed design and quiet operation protect against emissions and the wind-blown dispersal of the fuel. It is able to connect long distances without interruption and navigate tight curve radii that adapt to the individual conditions of the plant.

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Conveyor upgrade tackles dust and spillage at Coeur Rochester mine

Dust and spillage created a maintenance burden and potential safety hazard.

Coeur Mining, Inc. is the largest primary silver producer in the nation and a significant gold producer, with three wholly-owned operations in North America and two in Latin America, *write Robert Stepper, General Manager, Coeur Rochester and Richard Shields, Western Regional Manager, Martin Engineering*. Incorporated in 1928, the firm currently employs around 2,000 people. The company's Rochester mine and associated heap leach facilities are located in Pershing County, Nevada. Coeur Rochester produced 4.2 million ounces of silver in 2014, along with 44,888 ounces of gold, and has proven and probable reserves of more than 80 million ounces of silver and over 500,000 ounces of gold.

The company operates with a deep commitment to its code of corporate responsibility to employees, contractors, communities and the environment. "Our primary commitment to employees and contractors is to protect their health and safety," said Coeur President and CEO Mitchell Krebs. "Safety programming and management systems are continuously reviewed and improved to provide the training and tools necessary to prevent accidents, injuries and occupational illnesses." That code is evident in the facility's safety record: more than six years and counting without a single lost-time injury (LTI).

As part of that commitment, Coeur Rochester recently undertook a comprehensive review of its bulk material handling processes. The massive Rochester site is spread over 10,800 acres (43.7km^2), and includes a network of 20 conveyors, originally designed and installed in 1986. Given the system's age and the amount of usage over nearly 30 years in service, company officials began considering ways to update the conveyors with leading-edge technology to raise efficiency, reduce dust and spillage, and contribute further to safety.

Coeur managers initiated discussions with HARDROK Equipment, a trusted supplier with a history of more than 40 years of combined experience in maintaining and optimizing crushing, conveying and screening operations. The teams met and did a thorough review of the entire conveyor network, followed by a series of five training sessions to review the issues and the technologies available to resolve them. HARDROK is a licensed dealer of Martin Engineering conveyor products, and much of the discussion revolved around the company's EVO® Conveyor Architecture, a literal reinventing of the conventional design approach for conveyors.

"We've always operated under the belief that high-quality products and services cost less per tonne over the life of the product," observed HARDROK President Ted Zebroski. "With proper design, premium components should improve productivity and safety, and that greater efficiency delivers a lower total cost of ownership."

During plant construction most conveyor systems have been specified by determining the capacity and meeting the minimum codes and safety requirements, with a focus on the lowest construction cost," Zebroski said. "Instead, the Martin EVO approach examines every detail for opportunities to make conveyors safer, more productive and better able to contain fugitive material. And the concept can be applied to new systems or retrofitted to existing designs."

Conveyor B was chosen as the starting point with the most potential for improvement, a 48in (122cm)-wide belt running at 386 FPM, with a 40ft (12.2m) chute wall. With a troughing angle of 35°, Conveyor B handles nearly 1,500tph of rock that has been sized to 4in (10.2cm) minus, carrying it from the secondary cone crusher to the surge pile stacker. It's loaded directly by a vibrating grizzly feeder under the chute and the secondary crusher.

"There's a long fall going to the secondary crusher, and that creates a huge disturbance in the material flow," explained Crusher Operations/Fixed Plant Maintenance Superintendent Wayne Maita. "We were seeing a lot of dust and spillage in that area. It not only affected the air quality and presented a potential safety risk from accumulated material on floors and structures, but it also meant putting operational personnel in close proximity to the moving conveyor for cleanup."

Double apron seal.

Coeur also noticed belt damage occurring as a result of fugitive material. "As material escapes, it accumulates on idlers and other components, often creating friction points that contribute to excessive wear and premature failure," commented Martin Engineering Product Engineer Daniel Marshall. "That can have immediate costs such as belt replacement and seized bearings. And once an idler freezes, the constant belt movement can wear through the shell with surprising speed."

The integrated air cleaner is an independent unit positioned directly at a dust generation point.

Maita estimated that dealing with the spillage required 5-10 man-hours per day, seven days a week. So in addition to the safety aspect of the fugitive material, there was a significant cost in wasted labour. "We pay our guys to be operators, not to sweep and shovel spilled material," he said. "That time is better spent on core business activities."

The proposal for Conveyor B included a number of upgrades to eliminate belt sag, provide effective edge sealing and remove dust from the material stream, while withstanding the heavy loads and near-constant usage. Specific components were recommended for durability under the heavy load and impact at the transfer point.

A team of eight technicians from HARDROK and two Martin supervisors began work during a scheduled outage, starting by leveling out the conveyor structure and adding 4×4" (10.2 × 10.2cm) angle iron reinforcement as needed to straighten out the belt path. They removed existing clamps, skirt seal, skirt boards, belt support components and belt cleaner assemblies, and modified the inlet chute to accommodate a new containment system and provide a clean, flat surface at a CEMA standard width.

Five Martin EVO Combination Cradles were then installed to absorb the impact of the falling load, while minimizing friction and belt wear. The design features steel-reinforced impact bars and adjustable wing supports to match standard trough angles of 20°, 35° or 45°. Instead of the full layer of support bars that appear on a true impact cradle, the Combination Cradle replaces the center bars with an impact idler roll, a design that delivers a flat surface for an effective edge seal, but minimizes the friction of having sliding bars all the way across. Eccentrics built into the supports also deliver five degrees of wear adjustment, so the alignment between wings and idlers can be optimized for effective transfer point sealing.

The cradles employ Martin Engineering's Trac-Mount™ technology, allowing the units to slide in and out easily for maintenance or replacement. The modular components are light enough to be removed by one person, without using heavy lifting equipment. "Conveyor downtime is extremely expensive, especially for high-speed operations," Marshall added. "The longer components last and the easier they are to replace, the lower the cost of ownership."

Technicians also installed five EVO Slider Cradles with low-friction bars to support the belt edges and stabilize the belt line, eliminating belt sag and bounce. The Slider Cradles are also track mounted for ease of installation and maintenance. Located in the chute box after the impact cradles, the units feature "double-life" slider bars, which offer a superior seal with low friction. The proprietary box design allows each bar to be flipped over at the end of its useful life to provide a second wear surface. The result is a flat and stable belt surface throughout the settling zone, reducing fugitive material and extending belt health.

Forty feet (12.2 m) of modular chute wall was used to replace the old structure, with a tail box and integrated dust curtains. A chromium carbide overlay on the inside protects the new containment system from intermittent high-burden depths on the conveyor.

The chute was then fitted with an abrasion-resistant external wear liner, another design upgrade. Previous wear liner designs were welded to the inside of the chute, with only the skirt seal located on the outside. The logic behind this conventional design is for the wear liner to protect the skirtboard, which is typically ¼ inch (0.64 cm) sheet metal and not strong enough to withstand the sustained force and abrasion from bulk material.

Unfortunately, the wear liner is essentially a sacrificial layer, and the eventual removal/replacement of this design requires confined space entry, multiple workers and days of downtime. Instead, Martin Engineering designers came up with the idea of raising the chute work about 4" (10.2 cm) above the belt, then putting the wear liner on the outside. Using this approach, the material still hits the liner and doesn't damage the chute. The result is significantly reduced installation and service time, with reduced risk during service.

At the bottom of the wear liner is mounted 84 linear feet (25.6m) of Martin ApronSeal™ Double Skirting, which delivers two wear surfaces on a single elastomer sealing strip. When the bottom side of the strip against the belt is worn, the sealing strip is inverted, providing a second service life. The design was the first dual-sealing system for belt conveyors, incorporating a primary seal clamped to the steel skirtboard to keep lumps on the belt and a secondary or "outrigger" strip to capture any fines or dust particles that pass beneath the primary seal. The secondary seal lies gently on the belt and self-adjusts to maintain consistent strip-to-belt pressure, despite high-speed material movement and fluctuations in the belt's line of travel.

To maintain a straight and consistent belt path, technicians then installed a Martin Heavy-Duty Tracker™ Belt Tracking System, both upper and lower units. Utilizing innovative multiple-pivot, torque-multiplying technology, the tracker detects slight misalignments initiated by unbalanced loads and fouled rollers, using the force of the belt to immediately adjust its position and realign the path.

Rollers attached to the end of a sensing arm assembly ride both sides of the belt edge, detecting even slight variations in the belt path. Employing the force of the wandering belt, the arms automatically position a steering idler in the opposite direction of the misalignment. Transferring the motion to the steering idler through a unique parallel linkage requires less force to initiate the correction, so fine-tuning of the path can be continuous, active and precise.

To address belt carryback and further reduce the chance of fugitive material, a dual belt cleaner system was mounted on the face of the head pulley. The primary unit is a Martin QC1™ Cleaner XHD, which is engineered to deliver durable belt scraper

performance in challenging applications. Designed for high belt speeds and multiple splices, the unit's patented "CARP" Constant Angle Radial Pressure design maintains cleaning performance through all stages of blade life. The rugged 3/8in (95mm) steel tubing main frame has a steel bar backbone, and an aluminium extrusion in the base holds the cleaner snugly in place.

Directly after the primary cleaner is a Martin DT2™ Inline Cleaner XHD, a secondary conveyor belt scraper featuring rugged blades installed on a track that slides into position on a rigid steel mandrel, which allows quick blade replacement to increase the conveyor's availability. The design's individual belt cleaner blade segments slip into a sturdy track-forming cartridge, which slides over the stainless steel mainframe for simple installation.

A final belt protection mechanism was installed at the tail pulley. To fight the potentially damaging effects of fugitive material on the return side of the belt, the Martin Torsion V-Plow is engineered with a unique spring-loaded suspension system that allows the plow to rise and fall with fluctuations in belt tension and travel. Attached with dual steel crossbars bolted to the conveyor frame a few feet from the tail pulley, the unit is secured by two heavy-duty safety cords. Three torsion arms adjust independently, maintaining consistent pressure for effective cleaning in all stages of blade wear.

"Bulk material bounces when it comes in contact with a fast moving conveyor and often shifts as it travels over carrying idlers," explained Marshall. "These disturbances can eject small amounts of material from the belt. Occasionally along its return run, the belt will collect lumps of spilled material on the non-carrying side. If these objects are not removed, they can become trapped between the tail pulley and the belt and do significant damage to both."

To complete the containment system, technicians also installed an integrated air cleaner, which contains a suction blower, filtering elements and a filter cleaning system. Instead of a centrally located unit connected to dust generation points via ductwork, the Martin Air Cleaner is incorporated into the dust generation point itself. The particles are not extracted, but are instead collected within the enclosure and periodically discharged back into the material stream. Unlike central systems, the integrated approach employs a smaller, independently operating unit directly at the dust generation point.

The integrated air cleaner contains an apparatus to clean the filters using a pulse of compressed air. As material is captured by the filters, it agglomerates against the filter media. When the filter media is pulsed, the material will fall. If it is agglomerated and large enough, it will fall back into the material stream. The pulse system is designed to alternate pulses to each filter element. When one filter is being pulsed, the adjacent filter is still drawing air. If a pulsed particle is too small to drop out of the air stream, it is immediately pulled into an active filter.

Like the central system, integrated units use negative pressure, with airflow created by a blower sized to provide the airflow needed for the pickup point. As there is no ducting, there are no pressure losses other than the filters that must be accounted for. Because of this, the power requirements of an integrated air cleaning system are far lower than for central collection systems.

The entire upgrade was completed within the seven-day shutdown, and the results were immediately apparent. "We've gone from an everyday battle with this conveyor to almost no clean-up at all," said Maita. "We have a guy go down there with a broom every few days. That's it."

The upgraded conveyor now requires only minimal clean-up, instead of as many as 70 man-hours per week.

Coeur Rochester is currently evaluating five additional conveyor areas for its next upgrade, with a plan currently under development to address those locations in 2016. "We're extremely happy with the system," Maita concluded. "The installation was well done, and the guys were very professional and safety-conscious. It's changed a nightmare into an extremely functional system that operates at a high level."

thyssenkrupp supplies handling system for YASREF Refinery in Saudi Arabia

The Industrial Solutions business area of thyssenkrupp, a highly respected expert in the planning, construction and service in the field of industrial plants and systems, has successfully supplied a complete transport and storage system for pelletized sulphur and petroleum coke for the YASREF Refinery Project in Yanbu, Saudi Arabia. The project includes the construction of a new full-conversion refinery complex to process 400,000 barrels of oil per day. It will be realized in Yanbu Industrial City located on the

west coast of Saudi Arabia along the Red Sea. Central to this project is a major conveyor system.

thyssenkrupp was commissioned with the delivery by the general contractor Techint Engineering & Construction, through its regional Italian headquarters, at the end of 2011. The general scope of supply includes the following:

- transportation of petroleum coke from the delayed coker unit to the storage,
- sulphur stocking to the storage, and
- loading of petroleum coke and pelletized sulphur into ships at the port.

The detailed scope of supply comprises a conveyor system consisting of 12 conveyors and seven transfer towers (with a total conveying length of more than 7km), two travelling stackers, two portal reclaimers, one circular storage system and two shiploaders. Three of the 12 conveyors are designed as curved conveyors, with conveyor lengths between 710m and 1,740m and a curve radius of only 500m. Its long-standing experience in the design of curved conveyors and its ability to realize this challenging radius were decisive reasons for the contract award to thyssenkrupp Industrial Solutions.

The handling capacity of the conveyors and stockyard machines varies between 800tph (tonnes per hour) and 2,000tph; the two shiploaders have a capacity of 2,000tph. As parts of the handling system are designed to transport sulphur as well as petcoke, special attention was paid to the varying material properties. Consequently, the shiploaders are equipped with three automatic belt cleaning devices to avoid pollution, spillage and mixing of both materials. Furthermore, all hazardous areas are equipped with explosion-proof components to prevent combustion.

The design engineering scope has been executed in close

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cooperation with the USA division of thyssenkrupp Industrial Solutions in Denver, which has been responsible for the complete electrical and instrumentation portion based on NEMA standards (NEMA, National Electrical Manufacturers Association). The project required that 3D models of virtually every part of the plant be developed during the engineering phase. These 3D models made it possible to demonstrate to the client the various functions and special features of the single system units already in the design phase.

Manufacturing of the structural steel components for the belt conveyors and the machines took place in Saudi Arabia as well as in the neighbouring countries of Qatar and Dubai under the supervision of thyssenkrupp's personnel. In total, more than 7,500 tonnes of steel have been fabricated in the Arab region. Mechanical components were predominantly supplied from Germany, while electrical components including motors, switchgear or control units were supplied from the USA.

This prestigious and challenging contract represents another cornerstone in thyssenkrupp's already extensive track record in the supply of complete materials handling systems. Moreover, it demonstrates the companies' continued technological excellence. Following the successful realization of numerous projects in the Arab region during the past years, the Yanbu contract additionally underscores the growing presence of thyssenkrupp Industrial Solutions in one of the Middle East s most dynamic economies with enormous market potential.

New approach to steep-angle conveying in quarries and smaller open-pit mines

An energy-balanced steep-angle conveying concept to optimize operating costs and energy efficiency in hard rock mines

Quarries and open-pit mines for ores, building materials, minerals and coal are often characterized by steep terraced slopes formed over many decades by blasting and material removal, *writes Dr. Franz Wolpers, Head of thyssenkrupp Industrial Solutions AG – Materials Handling*. Depending on the stability of the ground a slope angle is chosen that will prevent slippage, particularly in loose rock and in regions at risk of earthquakes.

Fig. 1: Alternative ore/mineral and overburden haulage in open-pit mines and quarries.

The terraced slopes with inclines from 25° to in some cases 75° are intersected by slowly rising roads that carry heavy truck traffic and also secure access to the mine. The serpentine roads generally have two lanes or feature lay-bys to allow two-way traffic. Maintaining these roads is complicated and costly. Larger open-pit mines use heavy load trucks with deadweights from 106 to 260t and payloads of 136 to 400t and more.

In quarries and smaller ore, mineral and coal mines, all-terrain trucks are also used for haulage, usually with payloads of 40 to 100t. The trucks transport uncrushed material from the bottom of the mine or distant mining areas. They travel on unpaved, often muddy, gently rising haul roads with gradients of roughly 4.6° to a tipping area outside the mine or a crushing and processing station near the edge of the mine. The distances the trucks have to cover are therefore long. Based on an average speed of 15–20km/h a truck cycle can take almost an hour.

Fig. 2: thyssenkrupp cable cranes for dam construction.

thyssenkrupp — known among other things as a global supplier of mining, mineral processing and materials handling systems — has now developed a new steep-angle conveying system that makes it possible to transport hard rock, ore or overburden from a mine more efficiently by the shortest direct route while at the same time significantly improving the CO_2 footprint of the mine (Fig. 1). The system and process, for which patents have been filed, are based on well-known and proven cable crane technology from thyssenkrupp and reduce the use and number of heavy load trucks in an open-pit mine. With the thyssenkrupp system, the trucks travel only relatively short distances — and without major gradients — between the truck shovel loading station and the unloading point at the steep conveying system. For a given handling capacity the number of trucks in a mine can be reduced, with an associated reduction in capital, operating and manpower costs.

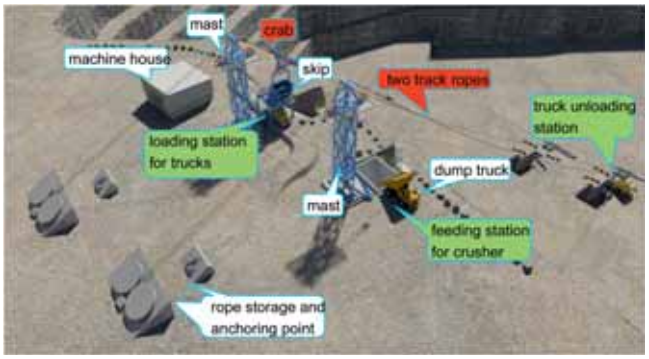

Fig. 3: Overview: tandem Skip Way System with options 'Truck – 2 – Truck' and 'Truck – 2 – Crusher'.

Even if diesel costs are relatively low at present, it has to be assumed in light of rising energy requirements and increasing fuel scarcity that world market prices will rise again soon. In addition, standards on environmental protection and resource conservation are being raised worldwide. Both aspects will also impact on the sustainability and profitability of existing open-pit mines.

The tk Skip Way System is based on the technology of cable crane systems (Fig. 2), which are used in the construction of large dams and are also part of the wide product range offered by thyssenkrupp. At two truck unloading stations at the bottom of the mine (Fig. 3 and Fig. 4) skips running in opposite directions are charged with uncrushed material by dump trucks. The skips are fitted with wear plates and slide rails and are suspended in a vibration-damping support frame and carriage assemblies from two parallel track ropes in each direction (Fig. 5 and Fig. 6). The full locked ropes are anchored in the ground near the bottom

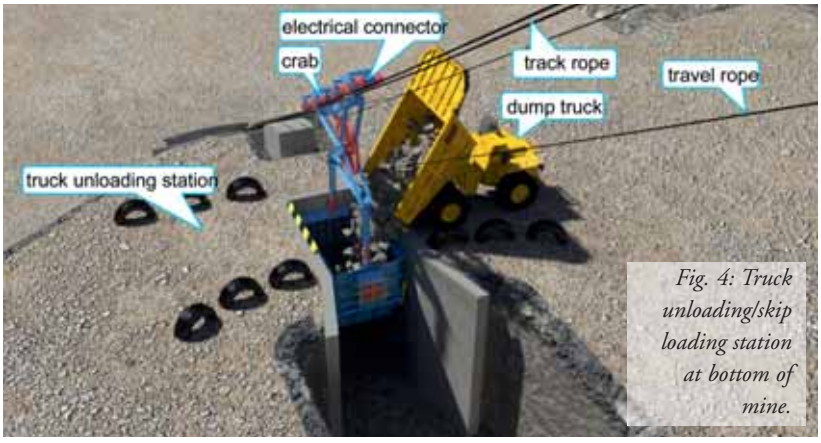

Fig. 4: Truck unloading/skip loading station at bottom of mine.

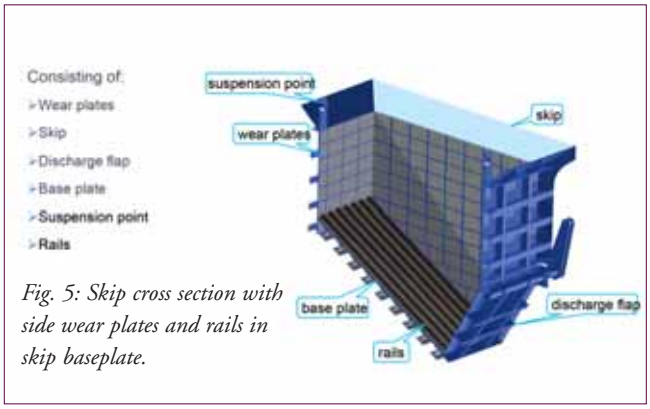

Fig. 5: Skip cross section with side wear plates and rails in skip baseplate.

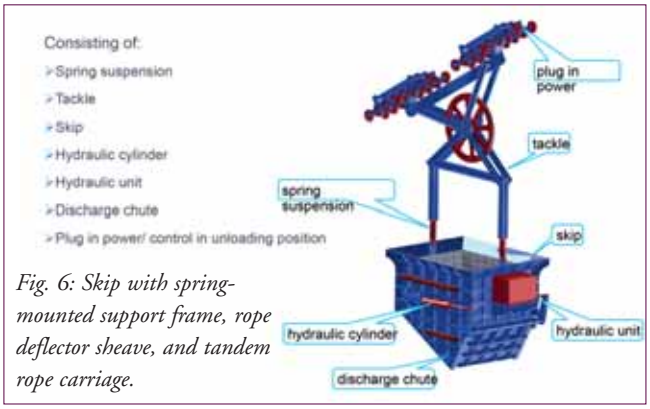

Fig. 6: Skip with spring-mounted support frame, rope deflector sheave, and tandem rope carriage.

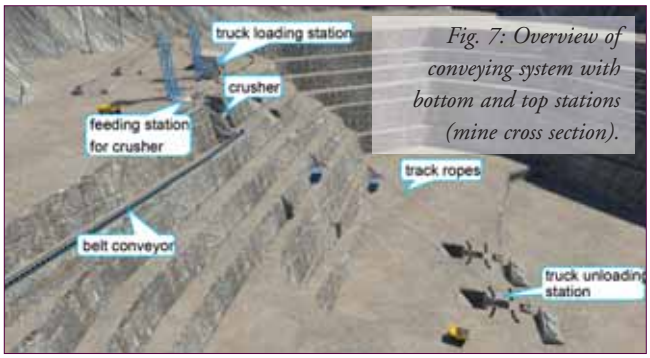

Fig. 7: Overview of conveying system with bottom and top stations (mine cross section).

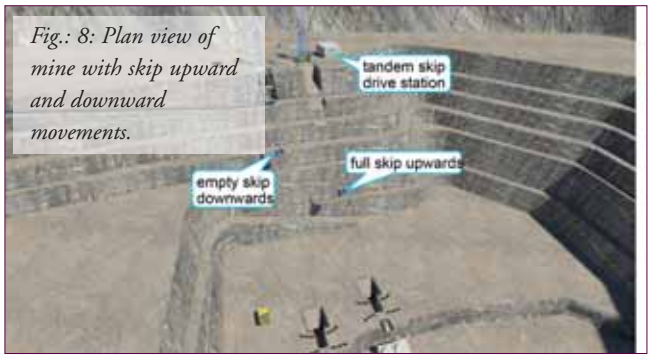

Fig.: 8: Plan view of mine with skip upward and downward movements.

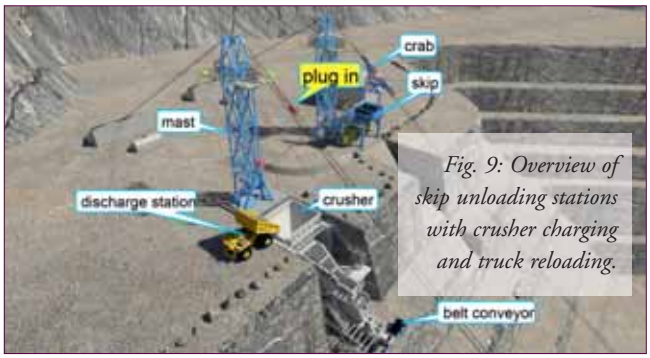

Fig. 9: Overview of skip unloading stations with crusher charging and truck reloading.

Fig. 10: Truck reloading station at the mine rim.

station and span the entire slope of the mine up to the skip unloading station at the top without any intermediate supports. At the top of the mine the ropes are led over a mast and anchored either in the ground or in a counterslope. The run of the ropes from the bottom station to the top station is determined by the position of the unloading station near the edge of the mine, the deadweights of the ropes, the rope tension and resultant sag, and additionally by the upward or downward running skips (Fig. 7 and Fig. 8). Rope tension is set so that both laden and empty skips maintain a safe distance from the mine slope and any roads leading into or out of the mine.

The two parallel rope anchor stations at the rear of the skip unloading stations serve as tensioning and storage systems for additional rope lengths should the bottom station be relocated as mining progresses.

The use of two parallel track ropes in each direction allows the use of standardized — still common — full locked ropes. Two track ropes result in a shorter skip carriage as the number of running wheels needed to distribute loads is divided over two ropes. Polyamide running wheels, already proven in cable cranes, are used to reduce wheel-rope contact pressure and maximize rope life.

The Skip Way System offers several options for skip unloading at the top station. As shown in Fig. 9, valuable ore or minerals can be transported on one rope system so that automated skip discharge takes place in this part of the conveying system above a crusher. Once the locking mechanism opens, the entire skip load of uncrushed ore or mineral slides into the crusher bin. After crushing and possibly screening the raw material is transported out of the mine area via a conventional belt system for further processing or for example to a cement plant.

The second rope track of the Skip Way System can be used for example to transport uncrushed overburden, which is loaded

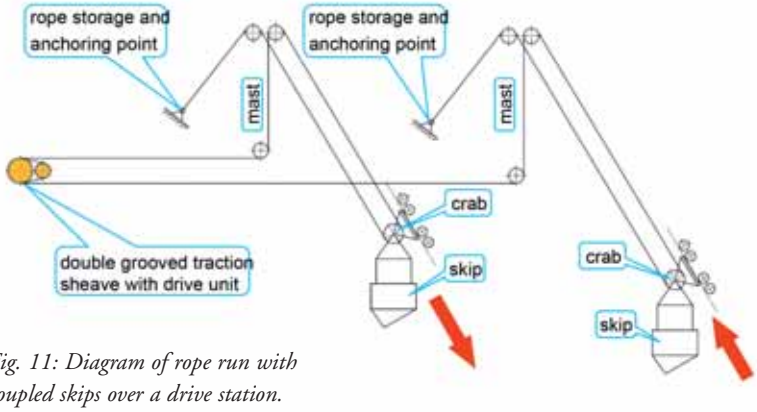

Fig. 11: Diagram of rope run with coupled skips over a drive station.

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from the skip back onto mine trucks at the top station (Figs 9 and 10). The trucks can then transport their load to the overburden dump on virtually flat roads. As most mines and quarries already have nearby screening and crushing stations, both skip unloading stations at the top of the mine could also be used for truck loading and onward transportation.

The skips are connected by a common travel rope and transport valuable raw material or overburden out of the mine within preselected travel cycles. As one skip is being loaded by a dump truck at the bottom station, the second skip is located at the top station above the crusher or the truck loading point. Fig. 11 illustrates the run of the travel rope of the upward travelling skip and the run of the rope over a deflector sheave in the first support mast of the first unloading station up to the separate drive station at the side. Inside the drive station (Fig. 12) the travel rope is passed over a double grooved traction sheave with countersheave and is driven by friction through a wrap angle of 2 × 180°. The travel rope drive unit is a conventional wrap drive of the type used in rope or cable cranes.

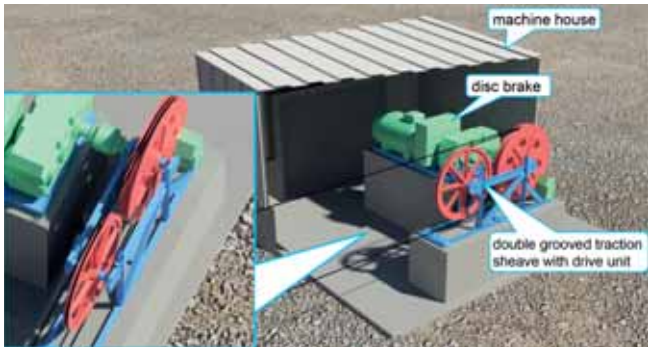

Fig. 12: Travel rope drive station with double grooved traction sheave and deflector sheave for rope return to the traction sheave.

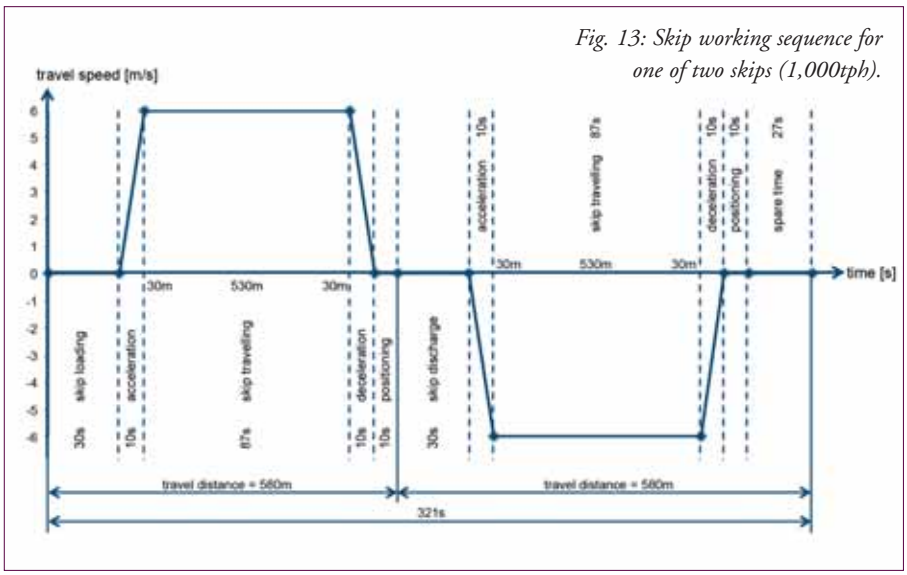

Fig. 13: Skip working sequence for one of two skips (1,000tph).

Its main components are a variable-frequency induction motor with spur gear unit and service brake, and a double grooved traction sheave with emergency brake. The entire drive station sits on a concrete foundation close to the ground and is easily accessible for inspection and maintenance. The switchgear and controls for the Skip Way System are located in the machine house.

From the drive station the travel rope passes over a deflector sheave in the second mast station to the downward travelling counter skip. Both ends of the travel ropes, like the track ropes, are anchored in the ground or the mine slope at the rear of the unloading stations. If the truck unloading station at the bottom of the mine is moved, the necessary additional rope length can be drawn from this rope storage point.

A typical travel cycle for this steep conveying system with 1,000tph (tonnes per hour) handling capacity, a vertical lift of 410m and a roughly 45° slope is shown in Fig. 13. Thirty seconds are allowed for skip loading at the bottom of the mine, 10s for skip acceleration and roughly 87s for the actual travel distance of 530m. Forty seconds are planned for simultaneous skip deceleration and positioning in the loading and unloading stations. With a calculated cycle time of 321s the system would still have a time reserve per cycle of 27s. This spare time is available as additional skip waiting time for truck positioning in the dumping station.

As an example Fig. 14 shows the torque curve of the drive motor for a skip upward trip, taking into account deadweight compensation by the second, empty skip travelling downwards at the same time. The motor's rated torque is reached/exceeded only very briefly when the laden skip is positioned slowly in the top station. Due to the different angles of the track ropes in the stopping stations, torque equalization by the dead loads of the skips is no longer fully possible.

The bottoms of the skips are protected against wear and impact deformation by clamped-on railway rails (Fig. 5). The honeycomb-shaped skip sidewalls are lined with replaceable wear plates, so the robust basic structure of the skip can be maintained over many years of operation through replacement of worn plates and rails. Impacts from individual boulders measuring up to 1m diagonally and weighing up to around one tonne are absorbed by the steel structure without permanent deformation. This has been demonstrated by FEM analyses and is to be verified in practical tests on a 3 × 4.2m skip baseplate subjected to a load of one ton dropped from a height

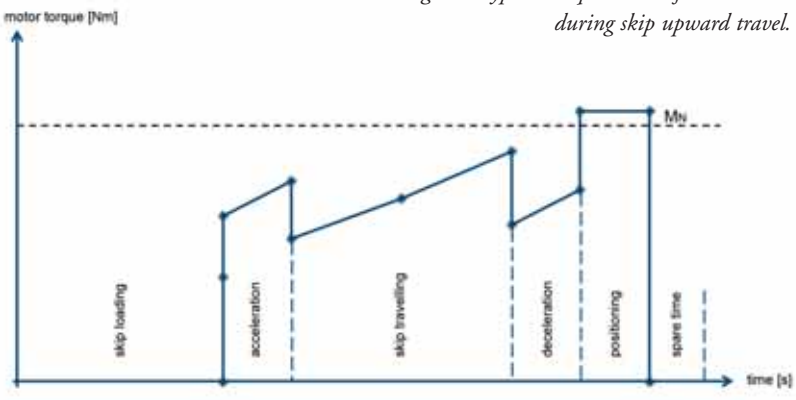

Fig. 14: Typical torque curve of drive motor during skip upward travel.

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of 4.5m. In addition, the initial impact of an ore or stone boulder on the baseplate is cushioned by the formation of a bed of fines between the wear rails, supported by the spring-loaded suspension of the skip in the support frame and subsequently also by the yielding of the track rope line (Fig. 6).

After the skip is positioned in the top station the discharge flap of the skip is opened by two side-mounted hydraulic cylinders with slowly increasing extension speed. Finer material empties through the initial opening. As the opening becomes larger coarser material and individual boulders slide out of the skip into the crusher station bin or onto a waiting truck. The hydraulic closing and opening mechanism is mounted on the skip and is activated in discharge position by a plug in power/control contact (Fig. 6). Opening and closing of the discharge flap takes place fully automatically above a crusher station, whereas operator control is envisaged for truck reloading.

Material to be handled:	**Kimberlite**
Material size:	max. diag. 1,0 m
Material density:	2,5 t/m³
Truck payload:	**max. 45t**
Skip loading volume:	**22 m³**
Number of skip:	2
Vertical transfer distance:	**410 m**
Inclination of travel way:	**45 °**
Skip working sequence:	2 x 11,2 = 22,4 / hour
Bulk handling capacity:	**1000 t/h (design)**
Motor power installed:	**3000 kW**
Power consumption:	**1400 kWh/h average**
Travel speed of skip:	6,0 m/s
Travel rope speed:	12 m/s
Rope system:	2 - fold
Travel rope diameter:	**50 mm**
Track rope diameter:	**96 mm (two ropes)**
Traction sheave diameter:	3200 mm
Rope sheave diameter:	3000 mm

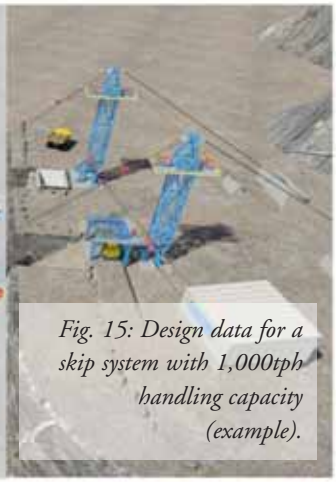


Fig. 15: Design data for a skip system with 1,000tph handling capacity (example).

Characteristic design data for a Skip Way System in a kimberlite mine are shown in the example in Fig. 15.

In the example presented, uncrushed kimberlite with a density of 2.5t/m³ is transported by a tandem skip way system a vertical distance of 410m over a slope with an average incline of 45°. The mine trucks have a maximum payload capacity of 42t, so the skips were designed for a capacity of 22m³ or 45t max. With a conveying distance of 580m and a chosen travel rope speed of 12m/s, this results in 11.2 travel cycles per hour and rope system for a handling capacity of 1,000tph.

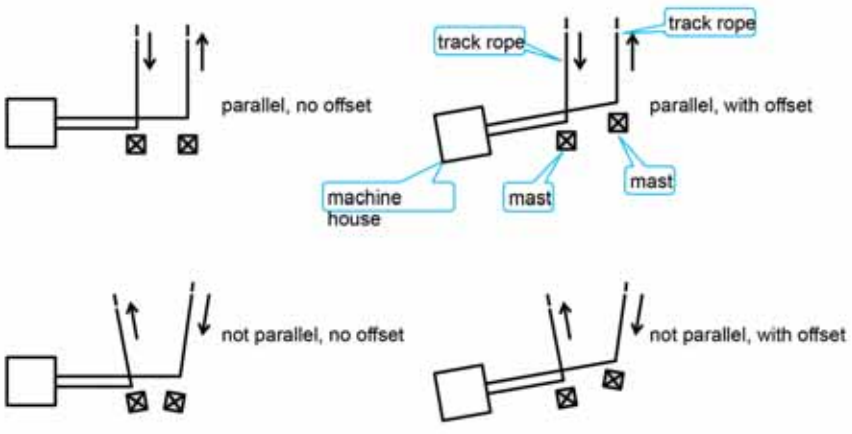
Due to the heavy masses to be accelerated and positioned the drive motor is designed for a power output of 3,000kW. During the steady-state phase, i.e. during constant skip travel, skip deadweight compensation comes fully into play, so the average power requirement — over the full travel cycle — will be only 1,400kW. The deadweight of a skip including deflector sheave and tandem carriage for a maximum payload of 45t is 37t; of this, as much as 22t is accounted for by the skip and hydraulic unit. This relatively high deadweight is necessary to absorb the heavy impacts of individual boulders during loading, but it also serves to tension the travel rope in the wrap drive (Fig. 12). The dead loads of the two skips do not need to be considered, as the masses cancel each other out exactly in operation. The travel rope connecting the skips runs over the traction sheave with a speed of 12m/s and moves the skips after single deflection by a sheave in the skip carriage with a maximum speed of 6m/s.

The travel rope is 50mm in diameter and the two full-locked track ropes in each strand are 96mm in diameter. In accordance with the relevant design standards the design of the rope and the rope diameter require a traction sheave diameter of 3,200mm and deflector sheaves with 3,000mm diameter.

Depending on vertical lift and travel distance a Skip Way System can handle up to 2,000tph. The actual handling capacity and hence the maximum truck payload is limited to 60t per skip and is determined by the rope construction, rope breaking strength, rope diameter and the allowable wheel pressure on the track rope.

The thyssenkrupp Skip Way System is highly adaptable to the topography of the mine. Depending on the location of haul roads, the configuration of the edge of the mine, the slope and space conditions at the bottom and exit of the mine, the drive station can be arranged in different ways relative to the unloading stations in the mine. The spacing and orientation of the two masts and thus of the truck loading and crushing stations can also be varied to suit local conditions. Examples of possible layouts at the rim of the mine are shown in Fig. 16. The spacing of the truck unloading stations at the bottom of the mine and the angle of the rising track ropes can naturally also be varied.

Fig. 16: Flexible layouts of unloading and loading stations and arrangement of drive station.



The thyssenkrupp Skip Way System has been designed for efficient use as a steep-angle conveying system in quarries and smaller but deep open-pit mines. The system ideally complements the "Integrated Crushing and Skip Conveying System [1] with handling rates of up to 5,000tph for uncrushed ore or overburden (Fig. 17) previously presented by thyssenkrupp. In this system skips run in opposite directions on a steel track over a steep slope and can either empty their payloads of up to 250t into the feed bin of a semi-mobile crusher or reload ore or overburden onto correspondingly large mine trucks

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via a special bin station with apron conveyor discharge. This conveying system requires stable ground and there should be no danger of earthquakes and landslides. If there is already a semi-mobile crusher station at the pit bottom or on an intermediate level, a third steep-angle conveying option could be advantageous. Together with the German companies Continental and Siemens, thyssenkrupp is currently developing a continuous steep-angle conveyor, based on pipe conveyor technology, that can transport pre-crushed ore or minerals from depths of 200 to 700m up a 30–45° slope at rates of up to 5,000tph. The s-shaped track is located in the slope by means of a steel structure. The pipe belt conveyor has an inside diameter of 900mm. The centre of the belt has a chevron pattern that prevents bulk material and individual lumps up to roughly 350mm edge length from sliding back at such a steep conveying angle. After material transfer at the pit rim, onward transportation is by means of conventional overland conveyors with troughed belts. Details of the design of this conveyor system are provided in a publication[2]. Fig. 17 summarizes the main data and possible uses of the three conveyor systems.

Fig. 17: Reduction of heavy haul traffic in open-pit mines through use of steep-angle conveying systems.

Returning to the thyssenkrupp Skip Way System, the advantages of the system for handling rates up to 2,000tph and maximum truck payloads of 60t can be summarized as follows:

- reduction of haulage costs in quarries and in smaller but deep open-pit mines;
- reduced operating and manpower costs;
- reduction of capital and operating costs over mine life (CAPEX, OPEX);
- reduced expense for building and maintaining roads in and out of the mine;
- single-lane roads — instead of two-lane roads to allow two-way traffic — are sufficient and permit steeper slopes and therefore either higher recovery of valuable minerals or less removal of overburden;
- the Skip Way System can also be used in very rough weather conditions when truck haulage might have to be suspended (fog, snow, ice and rain);
- use of the system provides a significant reduction in noise, dust and CO_2 compared with truck haulage and could help in retaining mine operating licences;
- the system lends itself very well to partial or full automation;
- in contrast to the alternative systems presented in Fig. 17 the thyssenkrupp Skip Way System can also be employed in earthquake-prone regions or mines with unstable slopes, as the rope support masts are located off the mine slope and are anchored flexibly in ground foundations using pins. From the mine bottom to the unloading station at the top no further support structures for the track and travel ropes are required;
- existing pit slopes do not generally need to be adapted for subsequent installation of the system, nor is it necessary to relocate existing access roads into the mine;
- the system allows the reloading of trucks in the case of overburden (Truck – 2 – Truck Operation) or the parallel charging of a crusher and processing station in the case of valuable minerals (Truck – 2 – Crusher Operation)
- as mining progresses the bottom station can also be relocated to greater depths as the necessary additional rope lengths are stored at the anchorage points when the system is first installed
- the entire system including loading, unloading and drive stations can also be relocated as soon as new anchorage points have been concreted in the mine; and
- if the system is used to feed a crusher station at the mine rim, mine trucks from other mines or higher mining areas in the same mine can also use the crusher's bin feed system (Fig. 9). This provides further redundancy during inspection and maintenance of the skip system.

The thyssenkrupp Skip Way System is a cost-effective and eco-friendly steep-angle conveying technology that can be integrated easily into existing steep open-pit mines or quarries. Many mine operators using truck haulage will face increasing production costs as their mines get deeper. The new steep-angle conveying system now offers an ingenious, cost-effective alternative to truck haulage. Obviously such a steep-angle conveying system will need to be adapted to the conditions of an existing mine and the technical/financial aspects (CAPEX/OPEX) will need to be clarified in advance — jointly with the mine operator.

Author note:
Dr. Franz M- Wolpers is Head of thyssenkrupp Industrial Solutions AG Division Materials Handling and Head of R&D Mining World.

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[2] Minkin, A., Börsting, P., Becker, N.: *A new technology for steep incline high capacity open pit conveying The Chevron MegaPipe – Conveyor by ContiTech, thyssenkrupp and Siemens*, BulkSolids Europe 2016.

Achenbach covers for belt conveyors

LOOP cover with laterals working in Saudi Arabia.

superTec-cover opened and securely locked.

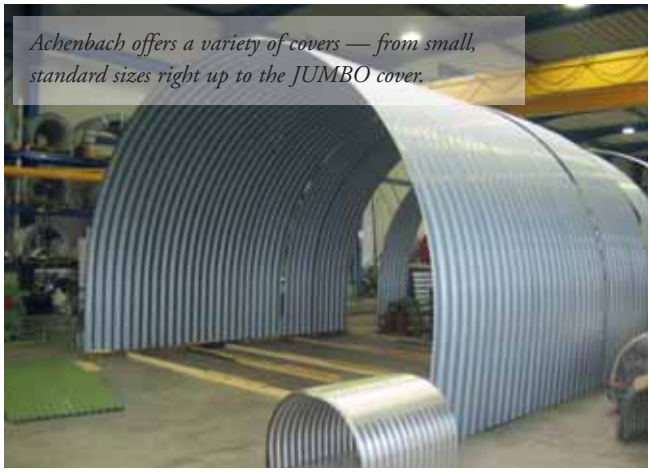
From a small standard cover, right up to a gigantic JUMBO cover to protect one or both walkways: Achenbach, Germany — with the largest variety of covers in the world — offers metal conveyor covers in nearly every size.

Achenbach's protective covers can be manufactured in four different profiles, which means that the user can be guaranteed access to an optimum, value-for-money solution.

At the bauma 2016 fair in Munich, Germany, Achenbach will also be showing two models that are set to become worldwide best-sellers — the superTec cover, and the LOOP cover, for openings on both sides, and offering simple and sure control by only one person.

Achenbach has delivered many kilometres of its LOOP covers and windshields to Saudi Arabia.

Achenbach's offering is completed with its popular Organit covers, made of rigid PVC, and a range of fixings, all of which will be shown at bauma 2016 in April.



Achenbach offers a variety of covers — from small, standard sizes right up to the JUMBO cover.

Dunlop launches range of industrial rubber sheeting

Industrial rubber sheeting may not sound particularly exciting but in actual fact it is widely used in a wide cross-section of industries for a great many different purposes such as chute lining, conveyor skirting, screening and wear and corrosion protection. For some years now, the market for rubber sheeting in Europe has been dominated by Asian-imported product, especially from China. But if Netherlands-based Dunlop Conveyor Belting has its way, then that situation could well be about to change as it has now launched a brand new range of Dunlop Ultima rubber sheeting.

Dunlop's strategy is based on offering a top quality European manufactured product that is competitively priced, totally safe to handle, long-lasting and which has an order and delivery system

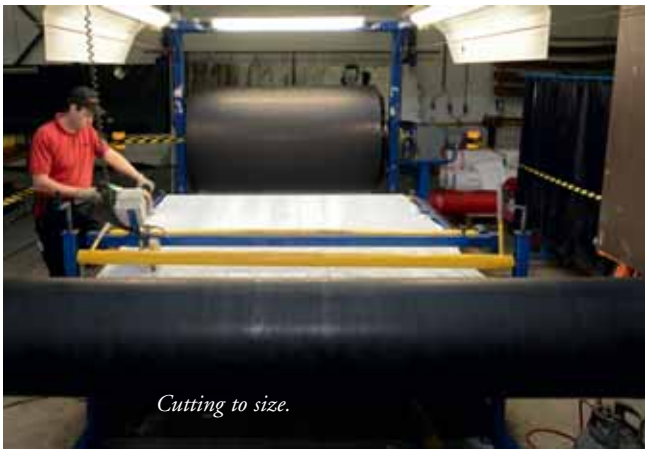
that is flexible, fast and easy. Dunlop believes that this combination will be more attractive than imported rubber sheeting from Asia with all the associated quality, logistical and commercial issues.

Dunlop Conveyor Belting technical director, Dr. Michiel Eijpe, explains why the company is now able to manufacture top quality sheeting at highly competitive market prices. "The quality of any rubber product — especially its durability, wear resistance and strength — is largely determined by the quality of the raw materials that are used. We have managed to achieve greater economy without compromising the quality by investing in brand-new equipment and developing highly efficient new production processes."

Ultima pulley lagging with splice.

Ultima 40 shore in workshop.

Eijpe goes on to explain that the new Dunlop Ultima rubber sheeting range, which is exclusively made in its Drachten factory in the Netherlands, has been designed and developed strictly in accordance with DIN 7715 international standards. "Our Research & Development team has made sure that Ultima is exceptionally resistant to wear and has excellent tensile strength. It is also fully resistant to the harmful effects of ozone and ultra violet, which causes rubber to crack and degrade. This is especially relevant in coastal based operations." Safety is also an important factor. "Like all of our products, Ultima is safe to handle because it fully complies with the strict European regulations (REACH) concerning the use of potentially hazardous chemicals within the manufacturing process. These regulations do not apply to manufacturers located outside of Europe of course".



Cutting to size.

Speed of service

Dunlop feels that it also has a number of other advantages. To make the ordering process quick and easy, it has created a dedicated Internet website and on-line payment system. The website allows customers to select the products and quantities they want to order and even calculates the cost of delivery based on the postal/zip code. Orders are then fed directly to a specially adapted warehouse in Holland for the fastest possible turnaround.

Sales & Marketing Director Andries Smilda is particularly excited by what is a very new approach, not only for Dunlop but by the industry in general. "We have always competed on quality but thanks to a lot of hard work by a lot of people behind the scenes we now feel that we have added competitive pricing and enhanced customer service to the customary Dunlop quality advantage."

Impressive TAIM WESER installation at Porto Sudeste enters service

The conveying circuit at the new iron ore handling and export facility Porto Sudeste.

The new iron ore handling and export facility Porto Sudeste Terminal in Brazil, owned by Trafigura and MUBADALA investment fund, is already in operation.

Spanish company TAIM WESER S.A. supplied the turnkey belt conveying system and stockyard machinery at the facility.

Porto Sudeste is a modern private port terminal located at Ilha da Madeira, in the city of Itaguaí, about 80 kilometres from Rio de Janeiro and occupies an area of 52 hectares, the equivalent of 72 soccer fields. The facility has a storage capacity of 2.5mt (million tonnes) of minerals and initially it will be able to handle 50mt of iron ore per year, with the possibility of reaching 100mt per year.

The terminal is directly linked to the MRS railway network, which allows for the direct arrival of the iron ore wagons from the producers operating in different areas of what is known as the 'Iron Quadrilateral' region of Minas Gerais. These producers were not previously able to export the mineral due to the lack of logistics facilities.

Combined stacker/reclaimer machines at the terminal.

TAIM WESER S.A. SCOPE OF SUPPLY

At this large-scale project, TAIM WESER S.A. took charge of the design, manufacture, supply and commissioning of the complete belt conveyors circuit as well as the four combined stacker/reclaimer machines at the terminal.

The conveying circuit comprises the complete belt conveyors of the terminal, from iron ore reception up to its loading onto ships, including all the conveyors of the two longitudinal storage yards, the 766m-long loading pier and the 1,800m-long subterranean tunnel, which links both areas of the terminal. The circuit consists of 54 belt conveyors with a total length of 13,000m and a rated capacity of 12,000tph (tonnes per hour). In addition, the conveying system is equipped with all the auxiliary equipment, including transfer towers, silos, bypass chutes, monitoring equipment, magnetic separators, weighing systems and two sampling systems.

The four bucketwheel stacker/reclaimers are in charge of the storage and reclaiming of iron ore into the two longitudinal storage yards of the facility, where the iron ore is stacked and separated by customers and products until it is sent on conveyor belts through the subterranean tunnel to the loading pier for its export. The machines have a stacking capacity of 10,000tph and a reclaim capacity of 12,000tph. As outstanding features, each machine weighs more than 2,000 tonnes, has a 60m-long boom and 45m height, the equivalent to a 14 floors building. These machines are the biggest stacker/reclaimer machines supplied in Brazil so far.

COMING INTO OPERATION

This impressive project has been under construction since 2011. TAIM WESER has now completed construction, erection and commissioning — work that involved over 4,500 people. In September last year, the first iron ore shipment was achieved at the terminal; this operation was a helpful way of checking out all the equipment at the facility.

Porto Sudeste is considered to be the most important project implemented in Brazil the last decade, and it has enabled the expansion of Brazilian mining sector, allowing local iron ore producers to increase the mineral export to international markets in a fast and efficient manner.

The Porto Sudeste project has been a big challenge for all departments of TAIM WESER S.A., design, manufacture, logistics, erection and commissioning, as it is the biggest volume, capacity and complexity project developed by the company so far.

All TAIM WESER's staff in Zaragoza (Spain), Bad Oeynhausen (Germany) and Curitiba (Brazil), composed of more than 300 people, worked hard to achieve a successful project: from the company direction and project management, who handled the biggest project in the history of the company; the engineering team, who designed a tailor-made solution for the customer; the specialized workshop team, who manufacture the equipment; the logistics department who co-ordinated the shipping of the equipment to Brazil; and the team that travelled to Itaguai for site supervision, who coordinated more than 500 people at different stages of the erection and commissioning stages.

This project has confirmed the relevance and strong presence of TAIM WESER in the American market, where the company has supplied some projects in the mining, steel, ports and raw materials export sectors.

STM: Italian expert in belt conveyor systems

STM is an Italian company that prides itself on 30 years' experience in the engineering and supply of belt conveyors systems for bulk materials handling facilities. STM offers its customers a full range of project services: engineering, fabrication and commissioning. It carries out every step by developing flexible, individual and effective solutions. In this way, STM succeeds in creating equipment of any size and complexity which fully meets its customers' needs.

The whole supply process, from feasibility study to final delivery and commissioning, is completely implemented in the STM factory, which has its headquarters in Tito Scalo (Potenza). This makes it possible for STM to optimize the design, the industrialization time and the information exchange with the customer.

Cutting-edge solution: rotating and self-elevating conveyor designed and realized by STM.

Applications in 20 countries across four continents

Over these 30 years, STM has developed innovative solutions for bulk materials handling in order to meet the needs of all its customers in 20 different countries across four continents. With its attention to quality, focus on the customer and the uninterrupted improvement of industrial standards and practices, STM is globally recognized as trusted partner in developing custom made solutions.

Thanks to the deep knowledge acquired operating in many fields, applications in the STM portfolio have become more challenging and specialized, with specific and innovative solutions for each applications: mining conveyors, RCC conveyors, tunnelling conveyors, crushing plants conveyors, batching plant conveyors and waste to energy plant conveyors.

The opportunities of the bulk terminal market

In the last years, the economic situation has led to the development of new mineral projects that are ever more technologically complex and efficient from an economic and

STM's conveyor belts in Namibia (Neckartal Dam).

STM's conveyor belts in Namibia (Neckartal Dam).

Saint-Gobain's Termoli Manufacturing Plant.

energy point of view. In this way, STM provides worldwide innovative integrated solutions in order to increase efficiency, reliability and cost savings for its customers' production processes.

Considering the high volume of dry bulk materials involved in the mining and energy sectors, transport by sea is the most commercially and environmentally sustainable viable option. STM is aware of the huge opportunities presented by the need to develop new bulk terminals, or to upgrade existing terminals in terms of increased capacity and to meet stringent environmental regulations, in terms of dry bulk handling.

STM is ready to share its experience in the terminal bulk market, thanks to the great expertise gained operating in many fields, to develop even more innovative solutions for bulk materials handling in order to meet the needs of all its customers. This is why, in the last few years, applications in the STM portfolio have become more challenging and specialized to meet also the demand from grains, cement and biomass handling facilities that are encouraging investments in new terminal ports. In particular, STM has worked to meet the needs of contractors which want equipment able to assure them uninterrupted feeding; it developed the new swinger conveyor: a special conveyor with main features of rotating (even up to 360°) and self-elevation.

Coal handling: from mines to power stations

STM has great experience in the handling of coal, designing and developing conveyor systems to process coal both in mines and in power stations. The conveyors for this application are designed for long lifetime and for minimizing extraordinary maintenance and downtime risk. Thanks to its flexibility and long experience in this field, STM has succeeded in creating and managing equipment of any size and complexity, including mobile plants. This configuration satisfies the plant owner who wants to have freedom to move the plant after limited time usage in determined area.

A valuable example of the long experience of STM in coal handling is the supply of seven conveyor belts to ENEL's Federico II power plant, in the territory of Brindisi (Italy). This thermal power plant, with a total capacity of 2,640MW installed and with an area of about 270 hectares, is the second-largest thermal power plant in Italy and one of the largest in Europe. The material that the conveyor system has to transport is the result of the coal combustion so it appears as light humidified ash. For this reason STM team created conveyor belts able to handle a very hot material with high level of moisture and abrasiveness. Moreover the conveyors are situated outdoors so they are equipped with a rainproof roofing and they are treated so that they can handle different atmospheric conditions like temperature leaps and a saline and industrial atmosphere.

STM: long experience in the mining sector

Based on a modular concept that greatly facilitates relocation or expansion as the mine develops, STM systems can expedite, optimize and economize the process of overburden removal, redistribution and stacking. STM is committed to delivering high-value performance and to meet customers' needs for: excellent reliability, investment cost, delivery time, lower operating costs, high standards of safety and sustainability.

Saint-Gobain's Termoli Manufacturing Plant is a valuable example of the long experience of STM in the mining sector. This is one of most advanced combined plaster and plasterboard manufacturing plant in Europe. The plant is capable of handling and storing raw materials to be crushed, homogenized and conveyed to grinding and calcining mills for manufacturing plaster, pre-mixed plasters and plasterboard.

The plant covers the whole process from supply of bulk materials to the final product.

STM succeeded in reaching these outstanding achievements thanks to its distinguishing features: expertise in every area of activity, strong focus on the customer, passion for innovation and improvement and particular attention to the quality.

STM's conveyor belts in Namibia (Neckartal Dam).

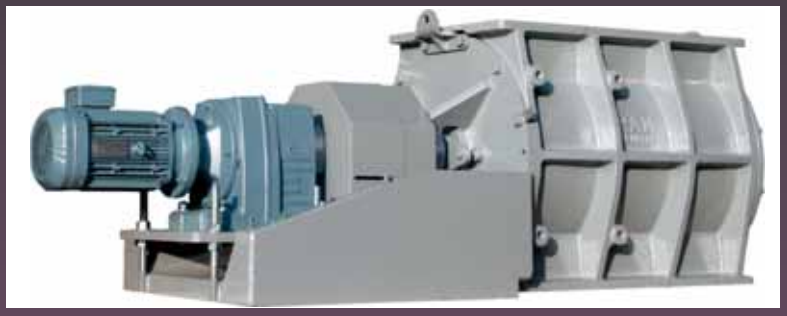
Solutions and components for pneumatic conveying

PAM A/S specializes in pneumatic and mechanical conveyance. It is able to supply high quality products and advice for both solutions.

Top quality

PAM A/S never compromises on quality. It sees its first job as ensuring that its customers are pleased with the product and service it provides. Its continual focus on quality control ensures that it can vouch for the quality of all the products that leave its factory.

All products are made from the best and most reliable materials, and PAM A/S's skilled employees have wide experience of all kinds of jobs: both when it comes to individual components and larger system solutions — nationally and internationally.



All PAM A/S's products and system solutions have been designed, developed and manufactured in Denmark.

PAM A/S offers system solutions in the areas of:

- pneumatic transport systems;
- pneumatic transmission systems;
- pneumatic vacuum systems;
- central dust extraction systems;
- vacuum cleaning;
- recycling;
- mechanical transport systems;
- big bag filling/emptying;
- filter systems; and
- pipe systems.

PAM A/S also offers a range of products to fit its system solutions, including:

- rotary valves;
- worm conveyors;
- compressors;
- cyclones;
- slide gate valves;
- pipe valves;
- 2-way values; and
- screw conveyors.

Tailored solutions to meet customers' needs

PAM A/S is always ready to offer advice and guidance when it comes to pneumatic conveying. Its extensive experience, skilled employees and comprehensive technical knowledge ensure the best, tailored solution for its customers.

Solutions — highly effective pneumatic conveying solutions

As a leading supplier of complete system solutions for pneumatic conveying, PAM A/S's long-standing experience and extremely skilled employees guarantee that all projects are completed with the highest possible degree of efficiency and quality. No job is too big or small. PAM A/S's unique abilities within pneumatic conveying guarantee good results; now and in the long term.

Products — solutions for pneumatic conveying developed in-house

Guaranteed high product quality and reliable experience.

Rotary valves

PAM Rotary valves have been developed and made in Denmark. The high product quality and efficient output ensure a reliable performance throughout the entire service life of the valve. PAM can supply rotary valves for all purposes.

PAM Rotary valves can be used for all kind of powdered materials as well as coarse- and fine grained products. They can be employed as drop-through/metering valves or fitted with blow pipe for pneumatic transport. The crucial feature of the valves is that the increase the capacity and reliability of the system. This is because they are made with high precision and so ensure maximum tightness when it comes to metering and transport.

PAM valve Type UL is robustly made with housing and covers in a heavy cast quality. Also available in AISI 304L or AISI 316L stainless steel. The housing is hard-faced on the inside. The rotor and housing are precision-ground to match, ensuring precise tolerance. Type UL is specially design to satisfy a number of extreme requirements. It is therefore ideal for conveying powdered materials such as flour, hot fly ash and cement, for example type UL is also ideal for materials at high temperatures, as well as for highly abrasive or corrosive materials. Type UL can deal with extreme materials because it has external bearings and stuffing boxes, and because the rotor has 10 steel vanes with a Eutalloy coating.

Other components

PAM's continual focus on quality and product performance since 1935 has made it a leading developer and manufacturer of individual components for pneumatic conveying including everything from filters to pipe couplings and two-way diverters.

Operational advantage

PAM A/S offers Solutions tailored to the specific needs and preferences of its customers. It uses components of the highest quality manufactured in Denmark which come with an operational guarantee. The company has many years' experience with many types of jobs as well international engineering, and advice within all aspects of projects. It develops, designs and manufactures its own system solution.

The 'Mr Clean' of conveyor technology

The proven H-type pre-cleaner is equipped with 200mm-long, individually mounted cleaning blades. It therefore always rests against the belt in an optimum manner, enabling it to be cleaned extremely thoroughly. (photo: Flexco Europe GmbH)

FLEXCO's H-type pre-cleaner removes sticking material from conveyor belts in coal and iron ore mining

With the proven H-type pre-cleaner, the FLEXCO Europe GmbH range includes a solution which enables users to significantly increase the productivity of their conveyor systems. The innovative solution can be used, for example, in coal and iron ore mining. Fitted with 200-millimetre-long, individually mounted cleaning blades, the H-type always rests against the belt in an optimum manner, thus enabling it to be cleaned extremely thoroughly.

Carryback, that is to say material which remains sticking to the conveyor belt, is a cost factor for the user which is not to be underestimated. The H-type belt pre-cleaner is designed for fitting to the head pulley and removes the majority of carryback from the conveyor. The efficient pre-cleaner has proved its worth particularly in the coal, iron ore, bauxite and rock mining industry. The special feature of the unit is that the blades are individually mounted on vibration dampers. As a result, the modules are sprung independently of one another and adjust themselves individually as they wear. This ensures optimum contact at all times.

Depending on the application, Flexco supplies the H-type with high-strength carbide blades for vulcanized belts or low-wear polyurethane for belts with mechanical joints. These are supplemented by protected blades for applications with highly abrasive materials. As the blade is installed 15° below the horizontal centre line of the pulley, the blades do not lie in the conveyor discharge path. They are therefore protected against large pieces of rock and other debris.

The blades are designed either in a V-shape for vulcanized belts or as XF2 blades when used with mechanical connectors, although these are also suitable for use with vulcanized belts.

About the company

Flexible Steel Lacing Company (FLEXCO), headquartered in Downers Grove, Illinois in the USA, is a renowned international specialist for mechanical conveyor belt fastener systems, belt cleaners, belt positioners, impact beds and pulley lagging for light- and heavy-duty applications. With the company's innovative solutions, end-users can substantially reduce downtime and increase productivity. FLEXCO Europe GmbH is the German subsidiary of FLEXCO, and is headquartered in Rosenfeld, where the company currently has 60 employees.

Coal mines are heavy users of bulk conveying systems.

Conveying challenges: Guttridge offers a range of solutions

Every material has its own unique characteristics presenting each conveying project with its own challenges. Undoubtedly, some present more of a challenge then others, for example in the food industry, materials such as flakes, granules, powders and pellets must all be transported routinely without physical degradation or contamination to preserve the materials value. Hygienic transport is arguably even more critical in the pharmaceutical industry as where stringent clean-in-place (CIP) and sterilization-in-place (SIP) are required and product containment is essential, purchasing efficient and reliable conveying equipment is crucial. With the conveying difficulties both industries present, buying off-the-shelf standard conveyors is rarely an option.

Guttridge Ltd is one of the UK's leading manufacturers of bulk materials handling machinery. With a foundation of over 50 years of experience, Guttridge is globally respected for delivering well-engineered and reliable materials handling solutions that continue to anticipate dramatically changing industrial needs.

With design, specification and manufacture all under one roof, Guttridge is able to successfully meet the need for bespoke solutions in an efficient and cost effective way.

For any conveying application it is essential to select the best equipment for the job so experience really does count. Guttridge's technical staff draw on a wealth of technical and operation experience to provide high quality advice and assistance. Its engineers develop each machine design using the latest 3D software which is then manufactured in a state-of-the-art machining, painting and assembly facility. Control over every aspect of a project is beneficial for customers and is particularly important for those facing demanding material handling tasks. Guttridge aims to reach the most reliable and efficient solution for every materials handling project. The comprehensive range of equipment includes:-

- bucket elevators;
- screw conveyors;
- chain conveyors;
- belt conveyors;
- load and discharge hoppers;
- vertical blenders and live bins; and
- ancillary equipment such as spoutings and fittings, slide valves and diverters.

Conveying requirements continue to evolve, both in terms of scale and the range of materials handled.

Guttridge design and manufacture materials handling machinery to suite the requirements of every industry sector:

- **Foods, chemicals & pharmaceuticals:** ideal for feeding packaging equipment, mixers and reactors as well as for general movement of bulk materials around process plants.
- **Animal feeds, cereals & petfoods:** ideal for moving meals, pellets, flakes, seeds, pulses and oil seed products around process plants.
- **Minerals, chemicals & heavy industrial:** cereals, animal feeds, flour milling & malting/distilling.
- **Biomass, waste & recycling:** ideal for moving alternative fuels, waste.

Efficient and reliable conveying solutions is critical but meeting agreed delivery deadlines is equally as vital. Customers must be confident that they can get the solution they need, when they need it.

It is essential to have a reliable partner with the experience to handle an array of materials and the ability to design and manufacture systems that really work. DCi

Telestack bringing innovation to Bauma

TCL 431 tracked conveyor stockpiling from mobile screen.

New products and innovative solutions are the focus of every trade fair and the forthcoming Bauma 2016 promises more of the same. Telestack plans to use the triennial event, held in Munich Germany from 11–17 April, to showcase a range of its products — the TC424 Tracked Conveyor, the TCL431 Tracked Conveyor and the LF514 Train Loader.

In association with its two established and reputable German dealers, Jürgen Kölsch GmbH and Christophel GmbH, Telestack looks forward to presenting an impressive display of machines, dealer support and knowledgeable sales support.

Malachy Gribben, Commercial Director, Telestack comments, "the equipment that we have chosen to display at Bauma demonstrates not only our range of products but also how each product is designed specifically for the need of the application, site and customer. How Telestack differs from our competitors is in the personalized attention to detail in the design. We are the specialists leading the industry and we have a portfolio of installations globally that demonstrates our expertise. In addition we partner only with distributors that keep the customer at the centre of their business."

The LF514 Train Loader is a low feed hopper feeder designed specifically to load train wagons at a throughput of up to 500tph (tonnes per hour). Sold to leading rail construction firm, Zürcher, the LF514 will work on a government project to load aggregate into train wagons. Zürcher's primary business is in track construction and civil engineering and is based in the south/west of Germany. With almost 60 years' experience in the track construction sector, the company has considerable experience and was one of the founders of some of the most innovative technology for track construction sites.

The Telestack Low Feeder range is available in a series of designs and hopper capacities depending on feeding equipment and production rates on site and allows the operator to directly discharge from wheel loaders/grab cranes and excavators at a significantly lower feed in height compared to standard hopper feeders. The unique design of the hopper allows for rear feeding which can be beneficial when operating in constrained areas.

The TC424 Tracked Conveyor has been sold to Telestack's partner in South Germany, Jürgen Kölsch GmbH. As well as stockpiling aggregate, this particular unit has been tailored for use in a recycling application. Typically operating on inner-city sites working after an impact crusher, this unit is fitted with an overband magnet to extract ferrous metals and discharge to one side using the cross belt magnet. By using the TC424, the

MOBILE
COAL HANDLING SYSTEMS

Telestack
Mobile Bulk Material Handling

Radial Telescopic Shiploader and Mobile Truck Unloader loading pet coke to Handymax vessels

Radial telescopic stockpiling coal @ 2000tph
in powerplant receiving from ship unloading system

Hopper Feeder & Radial Telescopic reclaiming/
stockpiling coal in stockyard of powerplant

Telestack **mobile** coal handling systems offer significant **operating costs savings** compared to traditional methods of material handling (e.g wheel loaders, mobile harbour cranes, stacker/ reclaimers etc.) as well as providing **environmental** and **health & safety benefits**. Additonal benefits include **reduced planning** permission required due to product **mobility.** Also the **flexibility** to move Telestack Mobile Conveyors off site. Telestack Conveyors can be **rapidly deployed** on site with handling rates of up to 3,000 TPH.

THE POWER TO **MOVE MATERIALS**

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LF 514 train loader.

operator also removes the need for use of pay loaders to constantly remove material from the crusher discharge conveyor. Less handling ultimately means more profit which is an essential advantage of the unit!

The TCL431 Tracked Conveyor, sold to Telestack's partner in North Germany, Christophel GmbH, is one of Telestack's core products. With a heavy-duty lattice design, the TCL431 has discharge heights of up to 13m (43ft), has 1,000mm belt (40" belt) and a hydraulic folding head and tail section. Also available in a radial version, the Telestack TCL range is designed to maximize stockpile volume. Most manufacturers produce 24m (80ft) boom length conveyors achieving in the region of up to 2,000-tonne stockpile capacities. Telestack however manufactures up to 31m (105ft) tracked conveyors, increasing the stockpile capacity by over 82% to almost 3,900-tonne capacity. The radial 31m version can achieve capacities of up to 20,000 tonnes.

There is no doubt that 2016 will be an exciting year for Telestack. Having recently combined the experience and knowledge that Telestack has gained in material handling over the past number of decades, the Telestack AggStack® range of entry-level radial telescopic stackers, radial fixed length stacking conveyors, truck unloaders, hopper feeders and link conveyors were formalized that were positioned on functionality, strength, performance and price point.

TC424 tracked conveyor stockpiling sand in Australia.

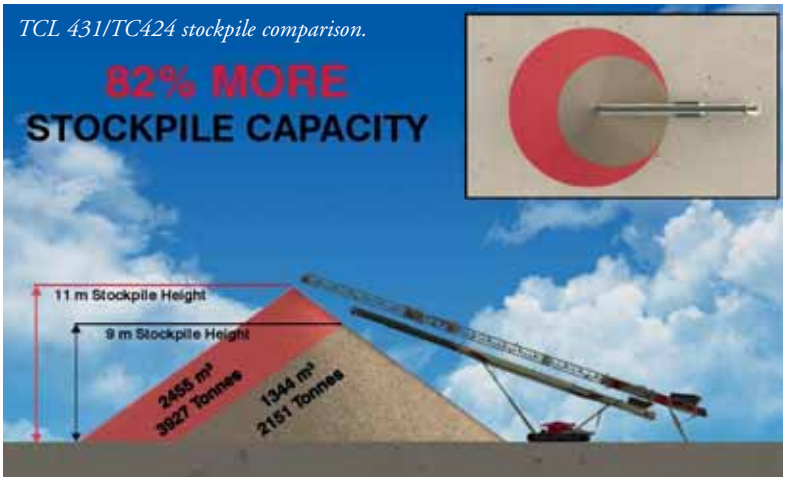
The AggStack® series brings together a range of equipment into one product group, while offering different options to enhance the functionality of each unit, in line with the application.

Commenting on his recent purchase of an AggStack® TS532 Radial Telescopic Conveyor, Alexander Draeger, Managing Director for Christophel GmbH, the Telestack dealer based in Lübeck North Germany, said: "This is a really key gap in the aggregate market now filled by the Telestack AggStack® range. We received the TS-532 AggStack® Radial Telescopic unit in June 2015, and the appetite for this unit in the marketplace is apparent. Its durability, functionality and production rates are really reassuring and I can already tell that this range will sell well in our market. Although it is an entry level unit, you can still add options so that it meets your specific needs. Overall, the customer is really happy with this unit and we are looking forward to additional sales in 2016."

In addition Telestack also plan to showcase an impressive range of equipment at the forthcoming Hillhead exhibition ranging from radial telescopic conveyors, tracked conveyors, hopper feeders as well as the launch of the telestack static truck unloader. The static truck unloader is a fixed bulk reception feeder used primarily in aggregate, cement and shiploading applications and is an exciting addition to the Telestack product range.

Telestack has always been renowned throughout the aggregates industry for the quality of its machines and the company was recently awarded UKAS accreditation covering key global standards; ISO 14001 (Environmental Management), OHSAS 18001 (Health & Safety Management). This is in addition to the Northern Ireland headquartered firm's existing accreditation to ISO 9001 (Quality Management). The Telestack Integrated Management System (IMS) ensures that anything which has an effect on overall business performance is monitored, actioned and improved.

Telestack has just surpassed its 30th year in business and is part of the Astec Industries family of companies. It has a global proven record in the aggregate, mining & ports and inland terminal sectors and its products exist in a range of applications including the coal, mining and quarry industries, stockyard management, ports & inland terminals, power stations, rail yards, steel mills, cement plants and many other bulk material handling industries. It has established a reputation of quality, trust and integrity and looks forward in anticipation to the remainder of 2016 and a future based only on projects that will enhance this reputation. DCi



TCL 431/TC424 stockpile comparison.

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PEBCO®: bulk material problem solver

The PEBCO Cascade Chute®.

PEBCO® is recognized worldwide as a manufacturer of powder and bulk solids handling equipment.

PEBCO designs and manufactures gates, valves, diverters, mass flow feeders, air slides, dustless loading spouts, telescopic chutes, PEBCO Cascade Chute® and systems for barge, ship, truck and railcar loading.

PEBCO equipment is used in industries such as: cement; coal-fired power generation; agriculture; waste water; food; ash; chemicals; fertilizers; petroleum and coal; aggregates & sand; mining; and biomass.

In addition to being recognized as an industry leader, PEBCO has received awards from the United States Government and the Commonwealth of Kentucky. In 1983, the Commonwealth, in conjunction with the Kentucky Society of Professional Engineers, selected PEBCO's 'Uni-Load®' as the 'Outstanding Product of 1983'. The US Department of Commerce in 1985 presented PEBCO with 'Exporter of the Year' for Kentucky. Pebco's engineers hold worldwide patents and have authored a wide range of papers. PEBCO also received a 1997 award from Powder Bulk Solids for the PEBCO Cascade Chute.

PEBCO has become an established leader in the coal and cement industries while at the same time expanding its expertise in other materials such as ferrous and non-ferrous ores, minerals, chemicals, and forest products. PEBCO's products are also used in various other applications such as mining, power generation, waste incineration, lime, fertilizer, and dewatered sludge.

Since 1977, PEBCO's corporate headquarters have been located in Paducah, Kentucky; on the western edge of the Kentucky coal fields and south of the Illinois basin coal fields. The company has been servicing mines, industries and utilities involved in fossil fuels for over 30 years. Through years of experience and service, PEBCO has grown to global prominence with headquarters in the United States and representation throughout the world.

Over the years PEBCO has assembled a team of specialists with a wide array of experience in various types of bulk material control. PEBCO's engineering team treats each application individually and custom tailors 80% of products to exact customer specifications. Seeking solutions to unique material handling problems, PEBCO's experience, versatility, and innovation have lead to the development of several patented products, features and options for equipment used in the dry bulk solids handling industry. As a result, PEBCO has patented products that demonstrate the innovation of the company in the field of moving, storing, and weighing bulk solids. PEBCO patents include: ROLLING BLADE® Gate, Mass Flow Feeder control technology, Uni-Load® Chute and the PEBCO Cascade Chute®.

PEBCO is a company dedicated to endorsing what it designs, manufactures and sells. It offers a wide range of standard products, while at the same time seeking solutions to unique material handling problems. Utilizing the matrix system of management, we coordinate the functions of: engineering, procurement, fabrication, installation, and preventative maintenance and service.

PEBCO's systems are specially designed to best serve the needs of its customers. Each project is evaluated on an individual basis allowing for customer requirements, product characteristics, environmental considerations and other elements. The company's total commitment to the customer is to supply equipment and systems that incorporate the most practical and most advanced technological approaches, yet keeping in mind the economic considerations of the project. PEBCO totally controls design, manufacturing and testing.

Case study: Mt Vernon Transit Terminal

The Mt. Vernon Transit Terminal (MVTT) is a state-of-the-art coal handling facility located on the Ohio River in Mt. Vernon, Indiana and has trans-loaded coal from railcars and trucks to barges since 1983. MVTT has the capacity to move coal from either railcars, trucks, or the storage area at a rate of 4,000tph (tonnes per hour).

In the middle of 2012, PEBCO was contacted by MVTT to replace its barge loading chute and diverter. During an on-site visit, MVTT personnel and PEBCO engineers developed a project scope, along with performance expectations of equipment and delivery. Delivery was a concern to MVTT as it was expecting an end-of-year maintenance shutdown. Performance was a concern due to the volume of coal being loaded at the Indiana facility.

A proposed design was quickly developed using the latest Autodesk Inventor 3-D software and MVTT was able to see the new equipment for review and comment.

After review and comments, fabrication began and MVTT personnel made an on-site visit to PEBCO where the assembled working unit was tested, inspected, readied for shipment and delivered on time to the facility for installation.

After installation and integration into MVTTs control centre, testing was conducted for the barge loadout. The success of PEBCO's efforts was answered when MVTT was asked directly about the project. The answer; "our contractor couldn't believe the assembly went together without the cutting torch and to date all is working well."

CHUTE

- designed for rugged environments and long operational life;
- high capacity flow capabilities
- capable of handling fine and large particle size with equal proficiency
- long extended lengths
- remote mounted or integral winch designs
- auto raise/auto lower controls

DIVERTER

- diverts gravity flow and can be shifted while material is flowing "on the fly"
- heavy-duty components
- abrasion resistant blade and flow surfaces
- various sizes and angles of diversion
- diverter blade shaft support bearings are located outboard to eliminate exposure to the material being handled

Extracted

Extended

Diverter

E-Crane handling grain in Brazil

The E-Crane is ideal for bulk handling applications that require heavy-duty production cycles. Specifically designed for barge unloading processes, anything from coal to limestone to fertilizer to grain to scrap steel can be handled. The E-Crane is a truly versatile machine in that it can easily switch between commodities and still offer the high production required at many ports and industrial facilities. Built for 24/7 duty cycle operation, E-Cranes have unprecedented life cycles, high efficiency, and low maintenance costs.

Recently, the E-Crane has proven to be a top solution for grain handling operations all around the world, particularly in South America. In recent years, many companies have chosen the E-Crane as the solution to their grain handling needs.

STATISTICS

Type	30382 PD-E
Location	Itacoatiara, AM, Brazil
Application	Midstream Transfer
Material	Grain, soyabeans
Mount	Barge
Duty cycle capacity	39.0 metric tonnes/42.9 US tons
Reach	38.2m/125.5ft
Attachment	30.0m³/39.2 yd³ hydraulic clamshell grab
Power source	630kW/845hp electric motor

Case study: Amaggi

Last March, we discussed an application for a 3000 Series E-Crane to transfer material from barges to Panamax ships along the Amazon River. This E-Crane was installed last year, and has now been operating successfully for several months.

Amaggi, a leading company in the Brazilian agricultural

E-HANDLER® by E-CRANE

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

Tom Noble, Department Supervisor, Powersouth Energy

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1. **SHORT DELIVERY TIME**
   Lead time as fast as 3-4 months ex-works
2. **132 Kw ELECTRICAL MOTOR**
   Save money with low energy costs
3. **VERSATILITY**
   Free Standing, Crawlers, Floating, Rail

"WHITE is the New Green"

industry, installed a 3000 Series E-Crane to perform midstream transfer operations on the Amazon River in Brazil. The E-Crane is mounted on a barge (61m × 22m × 4m) and transfers material directly from barges into Panamax sized ships.

This is the largest river midstream transfer operation currently performed by an E-Crane. Equipped with a 30m³ hydraulic clamshell grab, the E-Crane can transfer up to 22.5 metric tonnes of soyabeans in a single cycle. With this machine, peak unloading rates reach 1,400 metric tonnes of soybean per hour!

Amaggi is pleased with this project and with the successful performance achieved by the operation. According to Jorge Zanatta of Amaggi, "With the new direct transshipment barge-to-ship, we no longer need to transfer the cargo to a warehouse on land. This saves time compared to other terminals."

About E-Crane

E-Crane Worldwide is a modern, state-of-the-art engineering and heavy equipment construction company, based in Adegem, Belgium and with subsidiary companies for sales management, technical support and service in the Netherlands (E-Crane International Europe) and Ohio, USA (E-Crane International USA). E-Crane Worldwide develops turnkey material handling solutions with engineering services, equipment manufacturing, erection, operator/maintenance training and custom tailored ongoing service programmes for its clients.

The standard E-Crane product line consists of five series of balanced hydraulic cranes (Equilibrium Cranes): 700 Series, 1000 Series, 1500 Series, 2000 Series, and 3000 Series. E-Cranes provide longer outreach and higher duty cycle capacities than typical material handlers. Outreach ranges from 24.8 to 47.8 metres (82 to 157 feet) and duty cycle capacity ranges from 5.5 to 39 metric tonnes (6 to 42.9 US tons). DCi

PORT OF BLYTH

- Extensive open storage capacity
- Over 10,500 sqm of dedicated bulk storage available
- Rapid bulk discharge utilising grabs up to 20 cbm
- Vessels up to 35,000DWT accommodated
- Modern rail handling facilities for bulk & general cargo

Blyth operate a number of terminals handling a diverse range of cargoes including bulks such as alumina, coal, grain and stone. Bulk imports and exports are largely handled at Battleship Wharf, a rapidly developing deep water terminal with large scale open storage and mobile port cranes for rapid grab loading. Battleship Wharf is rail linked allowing the terminal to handle a wide variety of commodities.

In the last few years Blyth has implemented a major expansion programme providing purpose built bulk warehousing and ongoing investments to provide additional cranage and quays to satisfy the growing demand. Through this expansion the Port now has a wealth of experience in handling some of the more delicate and restricted cargoes including biomass, animal feeds, and fertilisers and consciously monitors quality issues.

- Wide range of plant equipment available
- Regular liner services
- 24 hour port access
- Highly competitive port dispursement
- Specialist project capabilities

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UK regional report

Jay Venter

Port of Tyne announces new contract with International Plywood

The Port of Tyne based at South Shields in North East England has announced a new commercial agreement with one of the UK's leading importers of plywood.

In an initial three-year deal with Gloucestershire-based International Plywood, the Port of Tyne will provide office accommodation, cargo handling, covered storage and onward UK wide road distribution for timber products imported through the port.

Bulk carrier approaching the Port of Tyne.

Ian Attwood, managing director for International Plywood, said: "International Plywood has been importing plywood and panel products for a quarter of a century. We are a family-owned company and in this extremely competitive market, we pride ourselves on always striving to achieve value for money for our customers.

"The Port of Tyne offers exceptional value and customer service with an excellent location providing unrivalled connectivity via road networks."

Multi-geared break-bulk vessels will import plywood and other timber products to the Port of Tyne from the Baltics and as far afield as South East Asia and South America.

Nolan Gray, business development director for the Port of Tyne, said: "The Port of Tyne is unique in its ability to not only manage break-bulk of non-containerized cargo but to also handle containerized products, storage and distribution providing optimal customer service.

"The port's ability to handle larger vessels presents not only greater economies of scale for International Plywood as larger volumes can be handled per shipment but it also creates a positive environmental benefit."

Stuart Watts, director for International Plywood, said: "Working with the Port of Tyne offers the ability to maximize the potential by creating a northern hub with an office based at the port allowing International Plywood to firmly establish ourselves as one of the UK's leading independent suppliers of plywood and sheet materials."

International Plywood has experienced significant growth in the last decade, reporting £130m turnover in 2014. The business supplies products to leading building merchants, housebuilders and various other UK markets.

The Port of Tyne is one of the UK's major deep-sea ports — a vital trading gateway to world-wide markets.

Operating five business areas including bulk and conventional cargo, car terminals, cruise and ferry, logistics and a commercial property portfolio.

Cleveland Cascades Ltd reports strong growth in 2015

Cascade chute loading soda ash.

Product & service development

The company is best known for the Cascade controlled flow technology chute, which uses a series of inclined cones, inside a retractable cover, to control dust pollution at source, while at the same time minimizing both material degradation and stockpile segregation. This technology has established the company as a leading global force in ship and silo loading chutes.

The company's experience and expertise in Cascade chutes has been transferred to Conventional Free Fall chutes in recent years. The investment has enabled the launch of both Free Fall Cone and Tube Chutes. The Cone system utilizes a series of vertical cones suspended from chains or strops, allowing the material to fall vertically to the pile. The Tube System uses of a series of telescoping concentric tubes which remains rigid and is ideally suited to applications which require Trimming Spouts or Jet Slinger devices. The Free Fall Chutes have applications in tanker loading, vehicle loading as well as ship and silo loading.

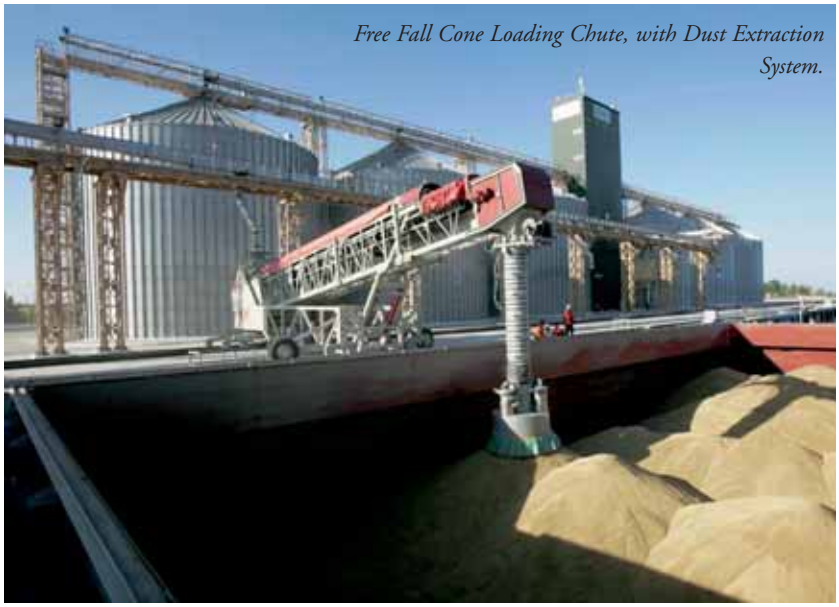
Cleveland Cascades has developed a worldwide reputation for quality, well-engineered, robust, high performance chutes, backed up by excellent customer service and global lifetime product support.

The company prides itself on a strong product support package throughout the lifetime of the product, wherever in the world the chute is installed. Factory trained engineers are experienced installing chutes in dry bulk applications across the globe from Europe to the Middle East, in North or South America or from Africa to Asia and Australia. Manuals are detailed and comprehensive to give operators the information they need to maintain the product and maximize its operational safety and efficiency. Original spare parts are offered either from stock, or can be made to order in the production facility. All parts are available but especially electrical components and other important replacement items, such as strops, shrouds and cones.

Global growth

Despite a challenging year for the Global Dry Bulk market, Cleveland Cascades enjoyed strong growth in 2015. "Our sales in Europe and North America held up well in 2015, but it was sales to the Middle East and South America which moved ahead very well," says Managing Director Matthew Barnard. "Our traditional strength in Cascade Chutes in to ship and silo loading grew nicely, but it is great to see sales of our conventional style free fall chutes move ahead after investment in new product development in recent years."

Cleveland Cascades is a specialist in the design and manufacture of bespoke dry bulk loading chutes. Based in the North East of England, the company has built up a large population of systems, working in bulk handling facilities worldwide.



Free Fall Cone Loading Chute, with Dust Extraction System.

Open vehicle loading shute.

Strong customer base

"The strength of the company is based on our ability to offer a bespoke engineered solution to meet the exact requirements of each application, rather than a list of standard chute models to choose from," Barnard continues.

Based on a comprehensive list of key performance criteria, Cleveland Cascades offer a design to suit precisely the material being handled and the site where the chute will work. Offers take in to consideration the interface with existing loading systems along with the electrical specification and other requirements *in situ*.

The core design is built from a number of different elements, which are proven in demanding applications around the world. The core design can be further upgraded by choosing from a wide range of options, to achieve the specification which ideally suits the application.

This business model has strong appeal to a wide range of companies in the global dry bulk industry from end users such as ports and quarries to major engineering groups who integrate the Cleveland Cascade chute in to their fully integrated conveyor systems.

First SWATH reference for ServoTrim, Servowatch's new trim & draught optimizer

Servowatch, the marine systems integrator and automation specialist, has introduced a new trim and draught stability optimizer, ServoTrim, designed specifically to 'balance the draught' of SWATH (Small Waterplane Area Twin Hull) vessels.

The first ServoTrim system will be delivered to a Taiwanese shipyard for an Ad Hoc Marine designed 26m wind farm supply vessel under construction for a UK- based operator.

Wayne Ross, Chief Executive Officer, Servowatch, said: "The need to calculate ship trim and draught is one of the most important measurements operators take to ensure vessel stability and safety. ServoTrim is designed to control a balanced draught for a vessel, providing automatic flow control after manual trim has been set.

The ServoTrim installation for the SWATH wind farm supply vessel has been purpose built for a four ballast tank configuration, with each tank fitted with a single sensor to provide concurrent tank, pump and valve status monitoring. Draught sensors are sited at each 'corner' of the vessel.

"Other types of vessels can benefit from ServoTrim," said Servowatch Systems' Sales Director Martyn Dickinson. "It can be easily applied to inland waterway barges and heavy lift platforms. Certainly situations may exist where the platform needs a dedicated system which can provide a draught and trim correction function to counter uneven weight distribution."

ServoTrim employs high-accuracy hydrostatic level transmitters to measure ballast tank levels and provide multi-port draught indications. To protect the sensors from external moisture, they are encased in IP68 and IP69K standard stainless steel housing.

Technical notes

When the Servowatch ServoTrim system has been activated, the operator sets the trim 'datum point' when the vessel is at rest after the loading of fuel, commodities and personnel is complete. This is achieved by loading, discharging, or transferring ballast until the optimum trim condition is obtained.

Ship trim and draught conditions can be easily evaluated and optimized using Servowatch's new ServoTrim system

The ballasting data is stored within the memory functions of the control system for the continued automatic control of ballast distribution. The control system takes its reference signal from four draught sensors, typically mounted within a vented pipe within the vessel structure.

Each ballast tank is equipped with a high resolution level sensor which is used to determine the quantity of water in each ballast tank. When the 'automatic' mode function is selected by the operator, the ballast tank content and draught data is used to form the datum point for each ballast tank and preferred trim condition.

The system automatically controls the ballast water level in each tank to maintain the vessel's selected 'preferred trim condition. It automatically checks and maintains the vessel trim every 10 minutes by comparing the live draught level values with the pre-set preferred condition, and responding with the required ballast adjustments.

Another positive year for the five ports of ABP South Wales

ABP's network of five ports in South Wales handled more than 12.5mt (million tonnes) of cargo in 2015 and launched an array of renewable energy projects and significant new investments.

The 12.5 million tonnes of cargo that passed through the ports included a variety of both traditional and emerging sectors. The import and export of steel remains strong at the ports with Newport holding the title of the UK's second-largest steel handling port.

Sectors that have seen the most growth include the animal feed and fertilizer industry which has seen the ports adapt to accommodate these businesses and support local agriculture. The timber sector also generated noteworthy volumes of cargo.

The Port of Swansea also showcased its versatility and skills with the handling of wind turbine components for the Pen y Cymoedd wind energy project that will continue until spring of this year. On completion, this is due to be the biggest onshore wind farm in Wales and England.

A series of renewable energy projects has seen the ports move towards further energy self-sufficiency. Heavy investment has resulted in several wind and solar projects that collectively generated 7.8 million units of electricity in 2015.

Projects include the 4.5MWp Barry solar array that was commissioned in August 2015 and officially opened by Alun Cairns MP and Jane Hutt AM. The solar project was the result of an investment of over £5 million by ABP.

Further electricity was generated by the 2.3MW wind turbine at the port of Newport, and a series of 250kW rooftop solar projects. The ports are also currently trialling the use of electric vehicles.

These projects serve to reduce the amount of carbon emissions produced by the ports with the energy generated used to power port operations. Any surplus energy is then exported to the national grid.

An additional £4 million was invested in new cargo handling

equipment and operational equipment at the ports, including the purchase of a mobile harbour crane and the installation of a new fertilizer bagging line at the Port of Swansea.

This growth has resulted in the permanent workforce at the ports increasing. The operations department has grown by 10% to accommodate customer demand.

As well as welcoming a wide variety of businesses through the lock gates, the ports also serve as a hub for many customers due to their strong network of transport links via road, rail, and sea.

In April 2015 Travis Perkins opened a major distribution centre at ABP Cardiff which represented an investment of £5 million by ABP. This facility resulted in the creation of 100 jobs and is a great example of what ABP's unique logistical network of ports in South Wales can offer customers.

ABP Director South Wales, Matthew Kennerley, is pleased with the developments across the five ports over the past year.

He said: "Investments throughout 2015 have allowed us to further develop a service tailored to our customer's needs. The ports continue to be a thriving and unique landscape where businesses can grow and generate strong trade links. We have further investments planned for 2016 that encompass a wide range of port activity.

"The result of ABP's South Wales operations is an annual contribution of almost £1 billion to the Welsh economy. The vast assortment of businesses that use the ports also means that 15,000 Welsh jobs are supported by them along with an additional 6,000 supported in the rest of the UK."

Port of Tilbury set for expansion following major land acquisition

Forth Ports has entered into an agreement to purchase 152 acres of land, including a further deep water jetty, close to the East of the Port of Tilbury in Essex. The acquisition price is not being disclosed, however it is expected that at least £100m will be invested in infrastructure and facilities on the land.

The land purchased is part of the former Tilbury Power Station owned by RWE which closed in 2013 and is currently being decommissioned. The port has taken ownership of part of the 152-acre site, with the remainder to be handed over following the completion of the demolition process.

This land acquisition brings the total port acreage to 1,100 acres and Forth Ports intends to use this land to extend its current operations with the creation of a new port, to grow to meet the needs of their customers and market demands. It is the intention of Forth Ports for the new port facility to be connected to the national rail and road networks. The port will lodge the relevant planning applications in due course.

Charles Hammond, Chief Executive of Forth Ports, said: "This is a significant land acquisition for the Port of Tilbury. As London's major port, it is a key resource for companies who need to access London and the South East of England. We are acquiring this additional land to extend the port in response to increasing demand from customers who are seeking additional capacity within the port.

"We have an ambitious growth plan for the Port of Tilbury and this land deal will complement our other development projects at the port including the growth of London Distribution Park and the opening this year of the UK's largest port-based chill store, operated by our partners NFT."

Steve Boughton, Head of Business Development UK for RWE, said: "RWE has a proud connection with the Tilbury Power Station site, having generated electricity there for millions of homes for over 46 years. Following its closure in 2013, we are delighted to have sold part of the site to the Port of Tilbury which we believe offers a fantastic opportunity for businesses and employment in the local area and beyond. We will continue to work closely with the port over the coming months while demolition of some buildings take place. We wish the port every success for its future plans."

The Port of London Authority Chief Executive, Robin Mortimer, said: "This is a really important development. The former power station site offers a fantastic deep water berth and the land is ideal for the port centric logistics in which Tilbury specializes. It's all part of a picture of growing trade on the Thames, which we are actively supporting through the Thames Vision project."

About The Port of Tilbury

The Port of Tilbury is London's major port, providing fast, modern distribution services for the benefit of the South East of England and beyond. The Port of Tilbury is a dynamic and diverse port, handling the full range of cargoes with specialist expertise in the handling of paper and forest products, containers, Ro Ro, grain and bulk commodities and construction and building materials.

Stormy times for the steel industry

Ladle charging: moving hot metal to a basic oxygen furnace to make steel. (photo: worldsteel/Seong Joon Cho)

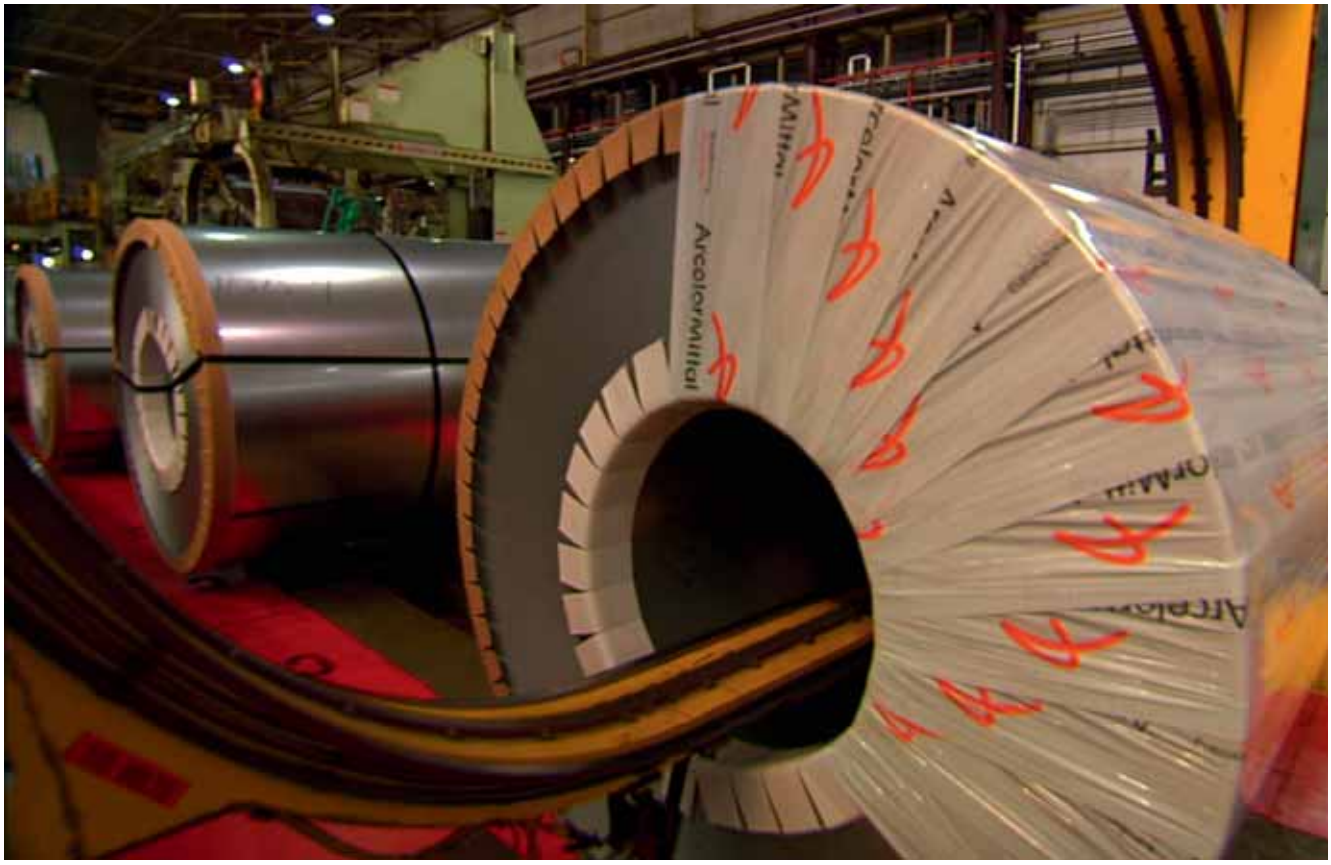
Global consequences of Chinese domination of the steel market

The world steel industry is suffering from steel fatigue, *writes Kunal Bose*. This is brought starkly in focus by working of ArcelorMittal, the world's largest steelmaking group which produces almost as much as India (2015 crude steel output 89.6mt [million tonnes]), losing $7.9bn in 2015. Even while prices of steel and its principal ingredient have started picking up, the outlook for the current year as projected by ArcelorMittal management has disappointed analysts and the market which continues to give the thumbs down to company shares. The ever-unsparing Lex column in the *Financial Times* says in the final quarter of 2015, the company's "market value has shrunk by 29%, a poor showing even relative to its global rivals."

While this is true, capacity overhang, falling demand and steel prices hitting a decade low took the wind out of the sails of every constituent of the steel industry, which stands as a barometer of the health of global economy. US Steel, America's biggest producer lost $1.5bn last year and was recently forced to lay off 1,300 workers. South Korea's Posco, rated one of the most advanced steelmakers in the world, too reported losses in 2015. Leading Indian steel groups from Tata Steel, which bought Corus in January 2007 by paying £6.2bn, since renamed Tata Steel Europe, to SAIL to JSW are moving deeper in the red with no hopes of early revival in sight.

For its sheer size, manufacturing presence in four continents and a rich product profile with leadership status in auto-grade and electrical steels, ArcelorMittal is seen as the bellwether of the global steel industry like Alcoa for aluminium. Not only did the company, which shipped 84.6mt of steel last year, chalk up a record net loss, but its projection of $4.5bn earnings before interest, depreciation, tax and amortization in 2016 against $5.2bn last year will actually work out to a fifth straight year of loss. Explaining the setback in 2015 working, the company said it fell victim to declining steel prices caused largely by a surge in Chinese exports and to large write-offs in its mining business.

Last year saw China's steel exports rising 20% to 112.4mt provoking many countries hosting bruised steel industries to invoke trade defences from minimum import prices (MIPs) to anti-dumping duties. Incidentally China's exports were more than the 105.2 mt output in Japan in 2015 where production fell 5%. According to Aditya Mittal, chief financial officer of ArcelorMittal, "China exporting at aggressive levels throughout 2015 caused steel prices to fall in all of our key markets." To



give one example, prices of hot rolled coils finding use in automobiles and other manufacturing areas was down nearly 40% last year. Chinese provinces hosting steel mills have left the world in no doubt that it continues to provide large dollops of subsidy. Specialist publication *Metal Bulletin* says in a report that Chinese companies are found exporting steel at prices 10% below they charge locally. This, according to *The Economist*, is textbook definition of dumping.

Trade action against imports of subsidised steel mainly from China but also from Russia and some constituents of CIS (Commonwealth of Independent States) is growing. The Indian government recently imposed MIPs ranging from $341 to $752 a tonne on 173 of 343 principal steel products. MIPs are valid for six months. The injured industry both in the US and European Union continues to pursue trade actions against imports. A responsive US government has come to the help of local steelmakers by imposing anti-dumping duties of as much as 236% on some varieties of corrosion resistant steel. The slow-to-act European Commission (EC) has finally introduced provisional 13.8% to 16% duties on imports of cold rolled flat steel (CRFS) from China. Imports of the product from Russia will invite duties ranging from 19.8% to 26.2%. China and Russia combined have a share of 55% of the European Union CRFS market.

The EC has also opened fresh anti-dumping investigations into three categories of steel products, namely, hot rolled flat steel, heavy plates and seamless pipes from China, bringing the total number of anti-dumping measures relating to the steel industry to 37 and the number of open investigations to nine. Mittal's perception is that Europe is less effective in giving legitimate protection to its producers than the US. "Clearly the trade defence instruments that have been developed in the US are better. They ensure a fairer level playing field," he said.

The genesis of present steel problem of excess capacity, falling demand and low prices is to be found in China accounting for nearly half the global production. The estimated excess world steel capacity is about 600mt with China accounting for as much as 300mt. China, which more than two decades ago launched a drive to build a strong infrastructure and become a factory to the world considered it wise to source all the steel needed for the purpose from within. That the country does not own quality iron ore resources has not proven to be a deterrent. So China's steel production rose from 66.350mt in 1990 to 128.5mt in 2000 and to an all-time high of 822.698mt in 2014. Even while its steel production was down 2.3% to 803.8mt in 2015, petering out of construction boom and fall in exports of engineering goods left it with considerable steel surplus which had to be exported.

For China the official purchasing managers' index (PMI) of manufacturing activity and that of leading financial magazine *Caixin* are below 50, the threshold indicating contraction. The January issue of the World Bank's *Global Economic Prospects* says world growth slowed to 2.4% in 2015 and is likely to recover to 2.9% as modest recovery in advanced economies continues and activity stabilizes among major commodity exporters. Yes prices of iron ore and steel have improved in the current year but their sustainability remains in doubt. World trade growing at a lower rate than GDP expansion has negative connotations for the steel industry. Prior to the 2008 financial crisis, global trade would grow faster than GDP. World trade volumes grew by 2% against GDP progress of 2.4% last year.

World Steel Association (WSA) informs that global steel capacity utilization edged up to 66% in January from 65.2% in December. This rate of capacity use cannot but condemn steel mills across the global board to growing losses. Industry experts believe, for steel to stage a decisive turnaround, capacity use must be between 80% and 85%. As it awaits improvement in world economy, the steel industry, particularly in China will have to put its house in order by shaving capacity that has proved to be a burden. Secondly, for steel mills to ride out the crisis they must stay on course in cutting production costs. ArcelorMittal chairman Lakshmi Mittal said "throughout the year (2015) we had rigorously focused on implementing a series of measures

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aimed at reducing costs and ensuring the business is adapted for these tough market conditions."

The good news is China has reportedly eliminated over 95mt capacity since 2010 and it may dump another up to 150mt capacity, mostly environment damaging small mills in the next five to seven years. That some restructuring is finally happening there should gladden every other steelmaking country. China is expected to make 2.2% less steel in 2016 when local demand, according to WSA, is to shrink 2% on the back of a 3.5% fall in 2015. Much global hope is resting on the possibility of production fall reining in Chinese exports. An Accenture official said: "Were this to happen, the modest demand growth increases forecast for the US, the EU and other markets should support operating rate increases and somewhat higher prices."

How is the steel industry going to fare in 2016? Lakshmi Mittal says: "Looking ahead, although we have started to see a recovery in Chinese steel spreads from 2015 lows, 2016 will be another difficult year for our industries. It is clear that China has a challenge to restructure its steel industry for a lower growth economy, but we are somewhat encouraged by recent comments concerning capacity closures. Until this situation is fully addressed the effective and swift implementation of trade defence instruments will be critical and we expect to see more positive rulings in this regard during this year." Mittal is right on trade defence actions gaining in rapidity as recent rulings in EU and India will show. As was in evidence in the past two years, China will continue to grow slowly as president Ji Xinping is moving the country away from an investment-led to a consumption led growth model. This cannot but have a direct impact on global steel demand as manufacturing industries in developed economies feel the heat.

A demand forecast by ArcelorMittal for 2016 shows it will either be flat or at the best growth will be 0.5%. The only bright spot in an otherwise dismal table is the US where steel demand is forecast to rise between 3% and 4%. China will see steel demand deceleration between 0.5% and 1.5%. EU may not show any demand growth at all or a marginal 1% rise in steel use. CIS is to experience a demand fall of up to 6%. But why is not India in the ArcelorMittal table since steel demand there was up 4.2% to 65.91mt in the first ten months of the 2015/16 financial year to end in March? In a demand forecast made in October 2015, World Steel Association said India would consume 7.6% more steel at 87.6mt in 2016 calendar year.

A major fallout of steel crisis, particularly manifest in India is consigning of a number of 'mega' steel projects to cold storage. Posco wanted to build a 12mt steel complex in four modules of 3mt each in India's coastal state of Orissa. The project would have required an investment of at least $12bn becoming the single largest foreign direct investment in India. Though not officially declared as abandoned, it is as good as dead. ArcelorMittal, which during better times wanted to do more than one 'mega' projects in India called it a day early last year. JSW Steel, India's largest private sector steel group, has abandoned two 'mega' projects — one each in mineral rich Jharkhand and West Bengal. At the same time, many expansion programmes of steel groups have been put on hold. It is now to be seen how much of the Indian 300mt steel capacity target will be achieved by 2025.

A big concern in developed countries is ongoing job losses in the once vibrant steel industry. Like in Britain employment in the industry is down from more than 200,000 in the 2000s to about 24,000 now. One in six in British steel lost their jobs last year. Hopefully, Tata Steel will finally find a buyer for Scunthorpe mill specializing in production of plates, wire rods and rails and thereby jobs will be protected. *The Economist* gives the warning "without government assistance, low prices will soon wipe out almost the entire steel industry in high-cost countries such as Britain."

Brazil's steel in the doldrums – and likely to stay there

Hit hard by the sharp downturn in the Brazilian economy during the past couple of years, and by a sharp fall in prices, Brazil's steel industry — a few years ago the world's fourth largest, but now the seventh — is facing enormous challenges, *writes Patrick Knight.*

Close to a third less steel was sold in Brazil last year than in 2014, a reduction of 6.2mt (million tonnes). Although companies managed to export 14mt of steel in 2015, 40% more than in the previous year, the low prices fetched by this steel, caused largely by intense competition from cheap metal shipped by China, meant that most exports were not profitable at all.

Despite the fact that so much more went abroad last year, exports earned 3% less than the much smaller quantity of steel exported in 2014 had done. The profits of most companies have disappeared, causing the price of their shares to collapse to the point that trading the shares of giants CSN and Usiminas on US stock exchanges, may have to be suspended.

With demand at home expected to slow further this year, and with exporting no longer profitable, companies are cutting production.

One of Brazil's largest mills, the 5.4mt-capacity Cubatao complex in the port of Santos, owned by Usiminas, has been completely closed down. The largest company, CSN, has closed one of its three blast furnaces at Volta Redonda, Rio de Janeiro. One of three slab mills operated by Arcelor Mittal in Tubarao, Espirito Santo state, has also been closed.

Sales and activity by all the industry's leading customers, notably the motor industry, which sold 26% fewer cars in 2015 than in the previous year, the fewest for nine years, have slowed sharply. Last year's fall was the sharpest year-on-year for 28 years, and fewer cars will be sold again this year. Sales of other consumer goods, such as refrigerators, and other white goods, have fallen as well.

The construction industry is another leading user of steel, in this case mainly of 'long' products, rather than the sheet steel used by the motor and consumer goods industry, and thousands of construction workers have been laid off. The number of houses being sold and the number of starts made on new buildings, has fallen sharply. The government had planned to compensate for the falls in output by industry and civil construction by encouraging a switch to infrastructure building. But the government's finances are now in such a mess, that no funds are available for this to happen.

The cuts in production, which have helped trigger a reduction in retail sales, coupled with the deep financial difficulties facing the public sector, are causing an explosion in the numbers unemployed.

Like those in most developed countries, many Brazilians had borrowed more to allow them to purchase more consumer goods and houses or flats in the past few years.

But more than two million have lost their jobs in the past few months, and with many more threatened with lay offs, or seeing earnings fall, those millions are having great difficulty keeping pace with debt repayments, so are cutting back on all types of purchases.

The left wing government which has ruled Brazil since 2002 was able to claim that up to 30 million Brazilians had been vertically mobile as a result of their policies in the 13 years they have been in power. But the situation has changed drastically in the past two years and the future looks gloomy. There seems to be little hope of economic growth returning for several years.

Photo: ©worldsteel/ Gregor Schläger.

The steel industry expects to make 6% less this year than it did in 2015, both because domestic demand is expected to continue to slip, while exporting at a loss, as occurred in 2015, is not a long-term solution.

With most companies making losses, the industry has called on the government to raise tariffs on imported steel from the present 6–8% to 35%. But because the Brazilian currency, the real, has lost about 40% of its value against the US$ and other currencies in the past year or so, imports have already become much more expensive. In contrast, most Brazilian-made goods have become more competitive in world markets.

All those using steel have been quick to point out that with demand for so many goods so weak, if the price of a key component such as steel were to be raised at the moment, as the industry would like to do, sell even fewer goods would be sold. So far at least, the government seems to prefer the arguments of the users of steel to those of the steel makers, and has refused to raise tariffs.

As readers of this publication know well, Brazil is a leading exporter of numerous commodities, both of minerals such as iron ore, and agricultural goods, with the leading market for many of these being China.

Cuts in demand by China for several types of goods, notably iron ore, as well as pig iron, have hit the Brazilian economy hard. There is some good news to compensate for this, however. For many years Brazil's imports cost more than its exports earned, partly the result of the currency being overvalued. But now that the prices of all imported goods, notably manufactured goods, have risen sharply, demand has fallen, while export earnings have held up better, aided by the weaker currency.

Because of this, trade moved into surplus last year, easing the pressure caused by the fact that virtually all other economic pointers, notably inflation and the current account deficit, as well as growth have all deteriorated. The slowing of the Chinese economy is not the only difficulty facing Brazil's economy at the moment. Together with the problems faced by the steel industry, the collapse in the oil price is another serious problem, which is affecting the steel industry.

The discovery of very large reserves of high quality crude oil under deep water far offshore ten years ago, encouraged Brazil's state-owned oil company, Petrobras, to embark on a massive expansion programme. Plans were made for building dozens of complex new drilling rigs and production platforms, as well as hundreds of new ships of all types and sizes and four new refineries. Rebuilding of Brazil's shipbuilding industry, which had been in the doldrums for several decades, began. In addition to the new rigs, platforms and ships, millions of tonnes of pipelines and underwater production facilities, all requiring large quantities of steel, were ordered. In an attempt to spread the impact of the windfall caused by the discovery of so much oil as wide as possible, the government decreed that a high proportion of components should be made in Brazil. This was aimed at boosting a wide range of industries, and would increase the demand for steel.

Brazil's original shipbuilding industry had collapsed because vessels made there cost far more than those made in Asian countries. Local shipowners refused to buy them, and the industry faded away. Even before the new oil finds were made, increased demand from oil company Petrobras had helped the industry to recover. But not only has the sharp fall in the oil price hit Petrobras hard, forcing investments to be slashed, the company has become involved in a massive corruption scandal.

It has come to light that numerous top Petrobras directors, most nominated by the political parties which form the government, rather than of experts from within the industry, were siphoning off billions of US dollars. Many suppliers, amongst them many of Brazil's largest companies, were also involved in the scandal.

Petrobras used to be a darling of foreign banks and international capital, and had borrowed several hundred billion US dollars to finance its expansion plans. Following the sharp fall in the price of crude, it became apparent than many projects are no longer viable, so bad news for the steel industry.

Although output by Brazil's manufacturing industry, hit by pressure from lower-cost imports has been shrinking, until two years ago, demand for electricity has been growing fast, boosted by the sale of more consumer goods, notably air conditioning units, as well as informatics and other electronic goods. But as the economic difficulties worsened, demand for electricity has fallen in the past couple of years, so building several large new power stations, a major market for steel, has now slowed as well.

Brazil's political system has come under tremendous pressure in the past few years. President Dilma Rousseff, earlier a minister of energy and on Petrobras's board, is suspected of knowing about the corrupt deals, and has come under strong pressure to resign. The ruling Workers Party, whose policy of re-distributing wealth resulted in many millions becoming better off, is finding it extremely difficult to jettison so many of its cherished policies, such as higher pensions, and various social payments, now that times are tougher. The government's reluctance to change, means that the tough decisions needed to restore the Brazilian economy, and with it the steel industry, have not been taken. So there is little chance of the situation improving for several years yet. DCi

Project Cargo & Warehousing

Over 13,000 sections of steel pipe arrived in the Port of Duluth from Greece last summer in shipments aboard two vessels – the Eider *(pictured here) in June and the* Bluebill *in late July. A fleet of trucks running six days a week had all stacks moved to North Dakota in just 10 weeks.*

Pressure vessels from Spain and another set from South Korea arrived in the Port of Duluth last autumn. At the end of December, all were loaded onto specialized railcars for delivery to oil processing facilities in Alberta, Canada.

A total of 12 Wartsila generators that arrived in Duluth from Finland in October 2015 is shown here being loaded onto railcars for final delivery to a facility in North Dakota.

Trucks were ready and waiting at the Clure Terminal in Duluth when the Fortune *arrived in late July with over 60 Nordex wind tower sections from Indonesia bound for installations out west.*

Jay Venter

DULUTH: project cargo hub for North American heartland

The Port of Duluth-Superior is the most centrally located, multimodal transportation hub in all of North America. It anchors the western terminus of the Great Lakes St. Lawrence Seaway system, connecting the heartland of the continent to customers and shippers around the world.

Last year (2015) was a banner year for moving project cargo through the Port of Duluth. The Duluth Seaway Port Authority's Clure Public Marine Terminal saw a 40% spike in volume of freight tonnes moved across all transport modes (water, road and rail). Utilizing every square inch of enclosed warehouse space (360,000ft^2) and every ounce of existing outdoor storage capacity, Lake Superior Warehousing, the Authority's operating agent, handled some 25,000 truckloads and well over 4,000 rail cars of commodities in addition to maritime traffic.

More than half of all wind turbine shipments on the Great Lakes-Seaway system move through the Port of Duluth. This reflects not only exceptional service but also Duluth's strategic location as the closest inland port to wind energy developments across the Upper Midwest and south central Canada. With the US government's five-year extension on Production Tax Credits (PTCs) for wind energy projects, Duluth expects to handle additional shipments of turbine components in 2016 and looks forward to an increase in those specific project cargoes again in 2017.

The Port Authority also is making great progress on its new Port of Duluth Intermodal Project — a nearly $18 million redevelopment project on a 28-acre pier adjacent to the Clure Terminal, scheduled for completion later this year.

"Once completed, the newly finished area on Dock C&D will triple our outdoor storage capacity for project cargo," said Port Authority Executive Director Vanta Coda. In addition to a brand new Ro-Ro dock, two new berths are being added along a reinforced dock wall — one of which will have twice the heavy-lift capacity of our existing berths. "Putting that dock back into productive maritime service sets the stage to attract even more business to Duluth's industrial waterfront."

Gateway for global commerce

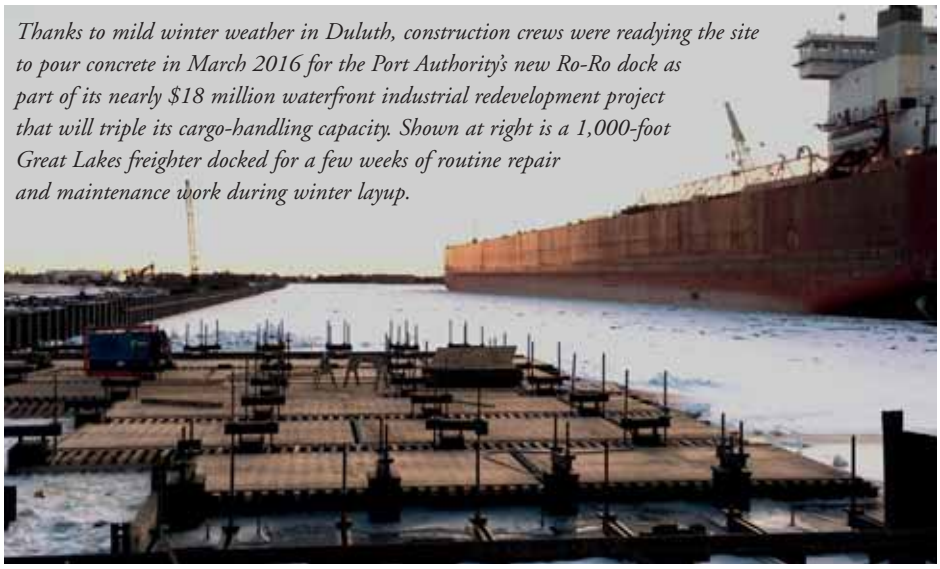
Known primarily for handling non-hazardous dry bulk commodities, the combined Port of Duluth-Superior moves some 38 million short tons of cargo each year — iron ore, coal, limestone, salt, cement and grain — via 20 privately owned and operated docks.

The Port Authority's Clure Public Marine Terminal, the Port's only general cargo facility, is operated by Lake Superior Warehousing. Its crews have earned a world-class reputation for safe and seamless transport of a diverse mix of heavy lift and over-dimensional project cargoes — turbines, pressure vessels, generators and other modules to serve the mining, manufacturing, wind energy, oil/gas exploration and power

generation sectors of the global economy.

In addition to Canada, the Port's main trading partners are located in northern Europe, the Mediterranean, North Africa and the Middle East (15 to 18-day transit times). On a regular basis, Duluth also handles heavy lift/project cargoes from as far away as South Korea, India, Indonesia and Japan plus outbound shipments to Central and South America with up to three shipments a year of inbound Brazilian clay for the region's papermaking industry.

Artist rendering envisions what the dock will look like when the Duluth Seaway Port Authority's $18 million dock redevelopment project is complete.



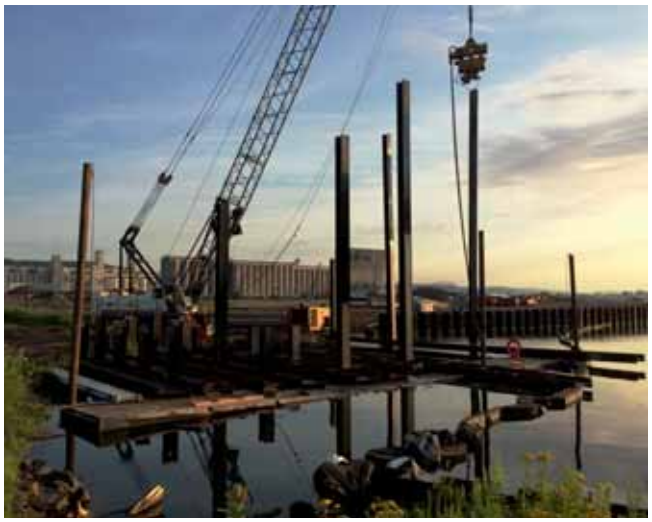
Thanks to mild winter weather in Duluth, construction crews were readying the site to pour concrete in March 2016 for the Port Authority's new Ro-Ro dock as part of its nearly $18 million waterfront industrial redevelopment project that will triple its cargo-handling capacity. Shown at right is a 1,000-foot Great Lakes freighter docked for a few weeks of routine repair and maintenance work during winter layup.

DULUTH: ALL THE RIGHT CONNECTIONS

When it comes to moving project cargo, Duluth has all the right connections. Customers can avoid congestion and costly delivery delays commonly experienced at coastal ports. Here, with direct access to four Class I railways (CN, CP, BNSF and the UP) and to major north/south and east/west freight corridors, the Port of Duluth is one of the least congested project cargo ports in the nation — offering the best road and rail clearances to and from the interior of North America.

"Together, the Duluth Seaway Port Authority and Lake Superior Warehousing have built a solid platform to grow the regional economy," noted Coda, "and to support the supply chain needs of our global customer base."

In addition to overseeing maritime operations at the Clure Public Marine Terminal, LSW handles the facility's warehousing, storage and transload business, as well. This truly has become a regional logistics hub — a storage and distribution centre not only for the forest products industry but also for manufacturers and agricultural groups looking to streamline supply chains as they move commodities inland or overseas.



Steel pilings are driven to support a brand new Ro-Ro dock, part of Duluth Seaway Port Authority's nearly $18 million Duluth Intermodal Project.

In the foreground, sheet pile is being driven along the Dock D section of the Port of Duluth Intermodal Project during summer 2015. The Fortune *can be seen in the background, discharging wind turbine tower sections at the Port Authority's adjacent Clure Public Marine Terminal.*

One-stop-shop solutions for multiple cargo types at the Port of Rotterdam

All photos courtesy of Port of Rotterdam Authority.

Fairplayer *of Jumbo Shipping loading project cargo at Rhenus Logistics' Maasvlakte Terminal.*

Loading of cement ship unloader on Happy Dragon *of BigLift Shipping at RHB Stevedoring's terminal.*

Broekman Project Services indoor warehouse facility, offering overhead crane capacity of max 700 tonnes.

ZPMC Zhen Hua 29 *delivering pontoons and tugs ex Shanghai for Damen Shipyards in Rotterdam.*

The Port of Rotterdam is one of the giants of the dry bulk scene generating an annual throughput of nearly 90 million tonnes. The Port of Rotterdam isn't just Europe's largest dry bulk port; it is the largest industrial cluster and logistics hub in Europe. On the mouth of the river Rhine you will find a complete cluster of terminals, storage companies, maritime services providers and logistics companies for all cargo types. Shipping line operators in the dry bulk sector could benefit from this crossroad of cargo types and its experienced service providers.

In today's market, finding efficient logistics solutions is key. For shipping operators in the dry bulk sector, finding a one-stop-shop solution can be one of them. "The port of Rotterdam is also a port with extensive breakbulk and project cargo facilities and therefore offers the option of combining the transshipment of dry bulk cargo with breakbulk or project cargo in one call," says Robert Jan Timmers Business Developer Breakbulk at Port of Rotterdam Authority.

Loading of storage tanks on Happy Delta *at Broekman Project Services.*

"In the last few years we have seen a healthy growth of the breakbulk figures," says Timmers. "And investments have been made and are being made by both private companies and the port authority, further enhancing the potential of the breakbulk and project cargo cluster." Investments in current facilities include the refurbishing and upgrade of the Broekman Project Services covered warehouse facilities (with a 700-tonne-capacity overhead crane), the construction of a RoRo-ramp at Broekman Distriport and a new 280-metre quay side at Rhenus Logistics Deepsea Terminal.

"Investments are also being made in new facilities such as the SIF Group/Verbrugge International combination for a dedicated terminal for offshore projects (e.g. offshore windfarms). Looking forward we are investigating the possibility of further facilitating the breakbulk and offshore sector by creating additional space for a greenfield terminal location in the Maasvlakte Area. This should present ample opportunities for handling offshore-related cargoes and serving as marshalling yard for large-scale onshore

and offshore projects."

In Rotterdam three independent private companies operate a large number of floating cranes, capable of handling all kinds of cargo, up to 2,200 tonnes. The floating cranes of Bonn & Mees, Boskalis and HEBO Maritiemservice perform excellent services not only to breakbulk stevedoring companies, but to the shipbuilding and manufacturing industry in the Rotterdam area as well. Next to this, their cranes are on call serving the shipment of project cargoes by scheduled container liner services.

Artist impression of production facility and offshore terminal at Maasvlakte 2 area.

One and one is three

Combining the wide range of dry bulk facilities with Rotterdam's breakbulk or project cargo facilities could mean delivering both dry bulk goods and breakbulk cargoes in just the one port. It is even possible to load or unload both cargo types at the same location, at the same time, thereby saving precious time.

Shipping operators like Nirint Shipping, NYK Bulk & Projects, MACS and Gearbulk already integrated this solution in their liner schedules. This can either be done ship-to-ship on one of the many ship-to-ship transfer facilities in the port of Rotterdam, or ship-to-shore, all in one stop and carried out by experienced stevedoring companies and private suppliers. The abundance of onward connections to the hinterland and the short sailing times into the port of Rotterdam make the port an obvious choice.

Port of Rotterdam Authority

The objective of the Port of Rotterdam Authority is to enhance the port's competitive position as a logistics hub and world-class industrial complex. Not only in terms of size, but also with regard to quality. The core tasks of the Port Authority are to develop, manage and exploit the port in a sustainable way and to render speedy and safe services for shipping.

Project cargo handling and more at Maritima Dominicana

Maritima Dominicana, S.A.S. is a ship agency and stevedoring company with 45 years of experience offering a full range of services to the maritime industry, both to ship owners and cargo interests. The agency handles port agency and ship husbandry matters for all kinds of vessels, regular liner, tramp calls as well as cruise ships with passengers visiting the country. The agency also offers all kinds of efficient cargo handling, loading and discharging, achieving rapid turnaround of the ships under its care in all Dominican ports. Furthermore, Maritima Dominicana also offers all kinds of cargo storage and handling facilities at locations at or near the main ports.

Maritima Dominicana offers specialized services for the handling of heavy lifts and oversized project cargo. As transportation and planning of heavy lift cargo projects are among the most challenging and complex logistic services, Mardom Projects, is a dedicated division of the company created to handle all these requirements and follow up on all the special instructions with a team specialized in heavy lift cargo.

Among the services provided are custom clearance, inland transportation, loading and discharging of cargo in ports and at job sites as well as ocean and air transportation. These oversize cargoes require specialized transport as well as detailed planning. Typical items handled are generators, turbines, boilers, towers, and windmills for power generation. The absence of standardization is what makes for individual transport planning. Special trucks or flatbeds are used. The company owns and operates a large fleet of vehicles and lifting equipment guaranteeing the proper handling of the cargo. Among these Maritima Dominicana have two lowboys with capacity of 35 tonnes, one with 50 tonne capacity (three axles) and one with 70 metric tonne (four axles), one multipurpose modular hydraulic trailer (six axles), two prime movers, one extendable lowboy (72 tonnes capacity), one extendable lowboy (50 tonnes capacity) and 10 flatbeds. Rigging is one of Maritima Dominicana's specialties, using Jack and Slide System to avoid the use of cranes while placing cargo onto foundation.

Having this chain of logistics in house the agency can assure its customers its absolute attention to the successful and timely delivery of their cargo.

Storage and warehousing

Maritima Dominicana also provides warehouse services for both long and short-term storage. A consolidation and de-consolidation warehouse which offers container lines, and importers in general a number of services and all types of cargo storage and warehousing. For the clients' convenience there is a Customs House branch office within the premises, in order to expedite dispatch of the cargo. The warehouse has a storage capacity of 4,800m^2 and also has heavy equipment for handling the different commodities that are stored whether they are palletized or not.

Maritima Dominicana bonded warehouse was established to provide a quality service for integrated logistic processes and proper management of the supply chain, for companies operating at a local market, as well as those at the international one. The services offered are: Storage in dry and refrigerated areas as general, bonded, re-exporting deposit, Cargo Management, Stock List Management, Insurance Services, Customs Brokerage, Distribution, and Specialized Logistics for Free Zones.

Warehousing and distribution are key factors in container logistics, hence we also offer off-dock storage for all sorts of imported containerized or breakbulk and project cargo. Container vessels load/unload in Caucedo, Rio Haina, Puerto Plata and Manzanillo. Caucedo is a dedicated container port and in Manzanillo there is constant traffic of reefer containers as fruit is exported. Containers can be moved off-dock, close to their final destination to save cost, enhance/complement the supply chain and facilitate the transport and distribution of containers. The company operates off-dock container terminals to handle empty containers and export cargo located strategically in the close vicinity of the ports of Caucedo, Rio Haina and Manzanillo.

Maritima Dominicana's Off-Dock Terminals were established in Haina, Caucedo and Manzanillo to create the first chassis pool and chassis and container repair facility in the Dominican Republic. The staff attends to all aspects of a chassis and container repair facility. Approximately 2,000 chassis are in the pool. In its warehouse Maritima Dominicana has a complete inventory of all parts required for container and chassis repair as well as the necessary tools and equipment. For major repairs Maritima Dominicana suggests mobilizing the container to its terminal, though minor repairs as well as washing and sweeping (food grade) may be done at the ports.

AS DBT - much more than covered warehousing

AS DBT is focused on the handling of bulk and bagged fertilizers. Its Muuga Harbour is the deepest one among the Baltic ports and it is open for navigation in winter too. This allows DBT to function and carry out loading operations all year round.

AS DBT is focused on the handling of bulk and bagged fertilizers. The company was founded on 10 June 1997, the first terminal line started operating in December 1998. To date, the terminal has handled over 26mt (million tonnes) of cargo.

The terminal enjoys all the benefits of the Customs Free Zone status. The Muuga Harbour is the deepest one among the Baltic ports and it is open for navigation in winter too. This allows DBT to function and carry out loading operations all year round.

All fertilizers arriving by rail are emptied from the hopper cars at two purpose-designed discharge stations with four railway tracks. By means of conveyor system, the cargo is then delivered to the warehouses or directly to a vessel ensuring 'direct transshipment'.

The use of a special fertilizer shiploader guarantees highly efficient services for bulk cargo loading.

Fertilizer blending and bagging (into 500–1,250kg big-bags) services are offered on-site by AS DBT as well as filling of bulk or packaged cargo into containers.

AS DBT has a lot of experience in bulk handling of IMO Class 5.1 (ammonium nitrate) hazardous material as well as freights with high fluidity properties such as SOP.

Competence and efficiency, flexibility and reliability, security and high standard performance are the principles of AS DBT activities laid down since its foundation. The quality and safety of the services provided by the company fully conform to all EU standards and requirements. The company has implemented the integrated management system confirmed by ISO 9001:2008 certificate.

For covered storage of bulk cargo AS DBT terminal offers:

- one warehouse of arched type of up to 70,000 tonnes capacity; and
- eight dome-type warehouses of capacity from 8,500 up to 26,000 tonnes.

The existing storage facilities with total capacity up to 192,000 tonnes allow the terminal to provide extra opportunities for efficient product segregation, ensuring no product cross-contamination, thus securing high safety of their qualities and properties.

In 2015, in order to improve the final quality of the product and a more homogeneous composition of the blended cargo without lumps (which are larger than 10mm × 10mm), a vibrating sieve system was set on the feed hopper in the blending plant and in the device for packaging of goods.

The possibility of accumulation of large consignments, as well as 288 metres long and 14.5 metres deep berthing line, gives the terminal an opportunity to handle bulk carriers of Panamax-size for shipping up to 70,000 tonnes of cargo.

Associated Terminals delivers project cargo and warehousing solutions

Company overview

Associated Terminals offers dry bulk, breakbulk and project cargo shippers comprehensive logistical solutions for the import and export of cargo and commodities to/from ocean vessel to barge, rail and truck at locations across the Gulf of Mexico region. Founded in 1990, the company is the largest stevedore operating on the Lower Mississippi River. Since its beginning, the company has continually expanded its scope and offers project and general cargo handling, midstream transloading, terminal port operations, in-plant services and warehousing. Associated has a fleet of 14 floating Gottwald cranes that can handle bulk up to 1,200 tonnes per hour and steel and general cargo with lift capacity in excess of 100 tonnes.

The company has operational bases in Louisiana at Myrtle Grove, Chalmette, Violet, Reserve, Convent and Port Allen. Between mile marker 56 and 158, the company operates 25 deep draught berths which includes eleven land-based docks and 14 midstream berths. The company can handle Capesize vessels in Myrtle Grove, Chalmette and Convent, Louisiana.

Project cargo handling and warehousing at Associated Terminals' locations

The company has extensive experience in handling project, steel, general and breakbulk cargo and is continually investing in resources to optimize its capabilities to service existing and potential customer needs. From an equipment standpoint, the company's fleet of Gottwald cranes is increasingly being utilized for the handling of general, steel, breakbulk and project cargo. In addition to the floating Gottwalds, the company has three land-based Manitowoc 300 tonne crawler and gantry mounted cranes. In 2015, Associated continued its commitment to offering customers the most efficient means to handle their products by upgrading its equipment. These additions include reach stackers, spreaders, specialized equipment attachments and the expansion of the forklift fleet.

Multiple strategic locations to handle general, breakbulk and project cargo provide Associated and its customers competitive advantages. Located just below New Orleans between mile posts 83.5 and 90.5 AHP, the St. Bernard Port, Harbor & Terminal District is a full-service marine terminal. Associated serves as the exclusive operator of the port's marine facilities. At mile marker 83 in Violet, the company operates four docks that can handle up to Panamax vessels. Between mile markers 86.5 and 89.5, Associated offers three midstream buoys for the movement of bulk and general cargoes. These buoys have a distinct advantage due to the utilization of dual-sided discharge. The terminal has access to all six Class 1 railroads.

Further upriver in the St. Bernard Port's jurisdiction, the

domes and green space with additional property for expansion located adjacent to the terminal. Logistical opportunities are offered by an intermodal transportation network featuring access to interstate highways and multiple Class I railroads.

Associated owns and operates an intermodal terminal in the Greater Baton Rouge area. With more than 45,000ft^2 of warehouse space and 130,000ft^2 of outside storage, tailored solutions can be provided to satisfy customers' storage needs.

While the company is dedicated to providing top-quality equipment, facilities and resources for the handling of cargo, Associated's skilled and productive workforce is the key factor to the success of the company. In the project and general cargo division alone, the senior management brings with it over 100 years of combined experience. Experienced in handling all types of general, project, breakbulk and steel cargo, the team's understanding of complex projects allows it to handle modularized project cargo safely and efficiently for its customers.

When asked about Associated Terminals expertise, President Todd Fuller remarked: "Providing strategic solutions is our biggest strength. We are experts at finding answers for even the most complex cargo handling issues. Our company's safety policies and procedures coupled with our industry-leading equipment and personnel has allowed us to be classified as a certified vendor for the handling of project cargo for oil companies, EPC's and freight forwarders located along the Gulf Coast. Our number one concern is the safety of our team members and the satisfaction of our customers and we focus on doing both at the highest levels." DCi

company operates the Chalmette Slip. The slip is the only slackwater harbour on the Lower Mississippi River. The facility consists of three deepwater docks with an adjacent 250,000ft^2 of warehouse space available presently for general cargo and ten acres for outside storage and laydown area. The site also features truck and rail capabilities. A set of mooring dolphins are contiguous to the dock at the slip and retain a year-round depth in excess of 50 feet.

Associated also operates locations in the jurisdiction of the Port of South Louisiana which is situated in a concentration of heavy manufacturers in the energy and chemical sectors. In this area, new petrochemical facilities on greenfield sites and expansion of existing plants are scheduled for construction. Associated serves as the port's exclusive operator of the Globalplex Intermodal Terminal at 138.5 AHP. The location features a 1,285 foot multipurpose dock capable of working two Panamax vessels at one time. The dock is serviced by two Manitowoc 2250 gantry cranes with a rated capacity of 300 tonnes. In addition, the company also operates a deep draught river dock and a barge loading facility at 138.6 AHP as well as multiple midstream berths in the port's jurisdiction.

Globalplex is an ideal location for manufacturing, distribution and logistics companies. Warehousing, outside storage and logistics options are ample at the site. In order to service the needs of project cargo shippers, the terminal offers 340,000ft^2 of warehouse space, 800,000ft^2 of open storage pad space, bulk

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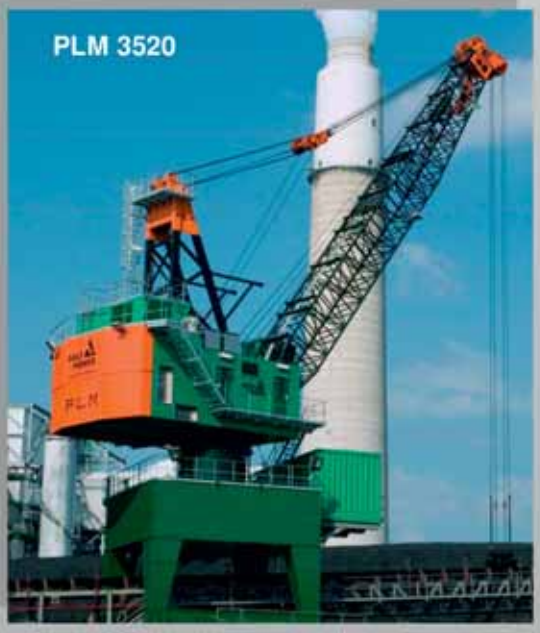

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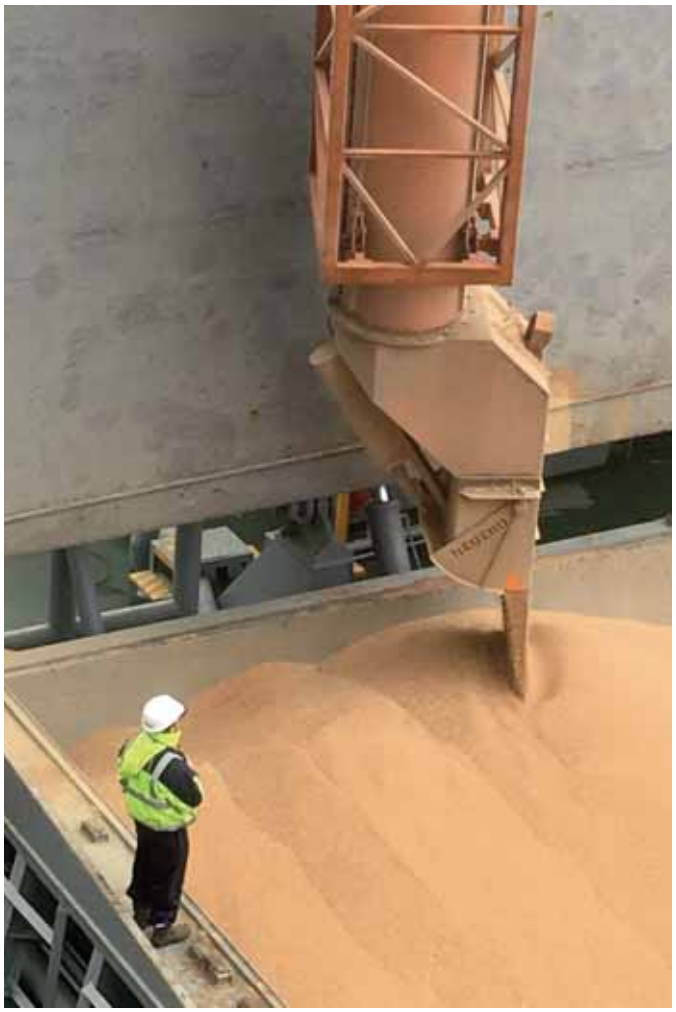





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