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- Iron Ore Trades
- HWY H_2O
- Mechanical Ship Unloaders
- Petcoke: Special Report
- Inspection, Analysis & Sampling

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NEUERO's newest generation Multiport M600 pneumatic ship unloader working at Cairo 3A – Egypt. After supplying the first unloader in 2005 and a second in 2007 (both Neuero M600 unloaders) a third Neuero was installed in 2011. The newest unloader design has shown a remarkable reduction in energy consumption due to the advanced design of the new Turbo Blower direct drive. The unloader also features a 15-tonne payloader lifting winch, and Hardox conveying line pipe system.

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AUGUST 2012 issue

featuring...

Vigorous coal trade growth sustained

Global import demand for dry bulks is still benefiting from a variety of positive influences, resulting in rising trade volumes. Seaborne movements of industrial and agricultural commodities are growing, but some prominent adverse factors are restraining the pace of expansion. A slowing world economy is having widespread repercussions.

The latest (mid-July) IMF update commented that "in the past three months, the global recovery, which was not strong to start with, has shown signs of further weakness". World GDP growth is expected to slacken further to 3.5% in 2012, after last year's sharp deceleration to 3.9%, followed (possibly) by a pick up next year. The problems and persistent recession in the eurozone is a cause for much anxiety, however.

Coal

Signs of increasing demand from a wide range of importers are visible in the coal market. Both steam and coking coal movements are strengthening, amid varying trends among importing countries. Expanding coal-fired power generation, or higher blast furnace steel production or greater reliance on foreign coal suppliers (compared with domestic supplies) are key influences.

Forecasts of coking coal imports into a number of Asian countries are shown in table 1. Recent estimates by Australia's Bureau of Resources and Energy Economics suggest that world metallurgical coal trade (including on land, but mainly seaborne) could grow by 16mt (million tonnes) or 6% in 2012, reaching 286mt. Higher volumes into the Asian region are likely to provide the biggest boost.

Iron ore

Indications of how steel industry raw materials trade is progressing are given by figures for pig iron production at blast furnace mills. In the first half of 2012 China's pig iron output was 4% higher than seen in last year's same period, at 335mt, according to World Steel Association provisional data. South Korea saw a marginal 1% rise, to 21mt.

Developments among other key iron ore and coking coal importing countries were less encouraging. In Japan, pig iron production in the January–June period this year showed no growth, at an unchanged 40.3mt. In the European Union, reflecting the area's very subdued economy, pig iron output actually declined, by 4%, to 47.5mt. Moreover, there are no obvious signs yet of an EU pick-up in the second half.

Grain

Predictions for grain trade in the year ahead were recently marked down sharply. The International Grains Council's latest (end-July) forecast for global wheat and coarse grains trade, in crop year 2012/13 beginning July 2012, shows a 10.3mt or 4% reduction compared with the previous year, to 256.3mt. The preceding forecast a few weeks earlier had indicated little change.

What explains this drastic revision? In the space of just a few weeks it became much clearer that prospective world grain supplies and, in particular, export availability, is likely to tighten greatly. Excessively dry and hot weather has damaged US crops due to be harvested soon, and the outlook for imminent harvests among the Black Sea suppliers — Russia, Ukraine and Kazakhstan — has deteriorated further.

Minor bulks

Global movements of bauxite/alumina reached an estimated 110mt last year, and a further increase may be seen in 2012. But not all signs in the importing countries are positive. North America's aluminium production in the first five months of this year was 1% lower, while Europe's output fell by 8%. In China, by contrast, there was a robust 12% increase.

Bulk carrier fleet

Very high newbuilding deliveries from shipyards are still expanding the world bulk carrier fleet. In the first half of this year 656 ships totalling 56.1m dwt were delivered, according to Clarksons provisional data. As shown by table 2, the annual total for 2012 could be over 100m dwt, exceeding last year's volume. Higher scrapping is offsetting about 30% of this new tonnage.

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

	2007	2008	2009	2010	2011	2012
Japan	79.9	80.7	65.6	76.6	68.7	70.0
South Korea	17.3	19.7	16.0	23.4	25.9	26.5
Taiwan	10.6	10.4	9.4	10.2	10.7	10.0
China	6.2	6.8	34.5	47.3	44.7	52.0
India	23.0	29.0	29.0	35.0	33.0	35.0
Total of above	**137.0**	**146.6**	**154.5**	**192.5**	**183.0**	**193.5**

source: various & BSA 2012 estimates * *estimate*

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

	2007	2008	2009	2010	2011	2012
Handysize (10–39,999 dwt)	2.3	3.0	5.0	8.4	9.2	10.0
Handymax (40–59,999 dwt)	5.3	6.4	10.2	17.9	19.9	18.0
Panamax (60–99,999 dw)t	6.7	6.4	7.0	15.5	23.6	30.0
Capesize (100,000 dwt and over)	10.4	8.6	21.0	38.6	45.6	47.0
Total	**24.7**	**24.4**	**43.2**	**80.4**	**98.3**	**105.0**
% change from previous year	–5.0%	–1.2%	+77.0%	+86.1%	+22.3%	+6.8%

source: Clarksons & BSA 2012 estimates * *estimate*

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CONFERENCE SCHEDULE

4–5 September
China Coal Import and Export Forum
Beijing, China
IHS McCloskey
T: +44 (0)1344 328300
F: +44 (0)1730 260044
E: marketing@mccloskeycoal.com
W: http://conf.mccloskeycoal.com

4–5 September
5th Coaltrans World Anthracite, Coke, Coking Coal and PCI Summit
Hong Kong, China
Coaltrans Conferences Ltd
T: +44 (0)20 7779 8945
F: +44 (0)20 7779 8946
E: coaltrans@euromoneyplc.com
W: www.coaltrans.com

11–12 September
3rd Coaltrans Colombia
Bogota, Colombia
Coaltrans Conferences Ltd
T: +44 (0)20 7779 8945
F: +44 (0)20 7779 8946
E: coaltrans@euromoneyplc.com
W: www.coaltrans.com

11–12 September
2nd Coaltrans Financing & Investing in Coal
Jakarta, Indonesia
Coaltrans Conferences Ltd
T: +44 (0)20 7779 8945
F: +44 (0)20 7779 8946
E: coaltrans@euromoneyplc.com
W: www.coaltrans.com

13–14 September
14th Asia CemenTrade
Yangon, Myanmar
CMT Events
T: +65 6346 9124 / 6346 9132
F: +65 6345 5928
E:sasha@cmtsp.com.sg
W: www.cmtevents.com

25–26 September
Indian Coal Markets Conference 2012
IHS McCloskey
T: +44 (0)1344 328300
F: +44 (0)1730 260044
E: marketing@mccloskeycoal.com
W: http://conf.mccloskeycoal.com

1–4 October
2nd Annual Floating Terminals
Singapore
IBC Asia
T: +65 6508 2401
F: +65 6508 2407
E: register@ibcasia.com.sg
W: www.floatingterminals.com

14–16 October
32nd Coaltrans World Coal Conference
Istanbul
Turkey
Coaltrans Conferences Ltd
T: +44 (0)20 7779 8945
F: +44 (0)20 7779 8946
E: coaltrans@euromoneyplc.com
W: www.coaltrans.com

26–29 November
Global Grains Congress
IBC Asia
T: +65 6508 2401
F: +65 6508 2407
E: register@ibcasia.com.sg
W: www.globalgrainscongress.com

Drought will not affect US fertilizer demand

Fertilizer consumption in the United States is unlikely to decline after the current drought in the Midwest, Citi Investment Research said, upgrading Mosaic Co to 'buy'.

Citi also raised its target price on shares of fellow fertilizer producers CF Industries (CF.N) and Agrium Inc.

"We think investors are over-estimating the potential for demand destruction in North America due to the ongoing Midwest drought," analyst P.J. Juvekar wrote in a note.

Severe heat blanketed much of the US Midwest in late July, exacerbating the region's worst drought in more than 50 years and devastating corn, soya and other vital crops.

The drought is the worst since 1956, the National Oceanic and Atmospheric Administration said in a report posted on its website.

Mosaic recently said the drought would not likely dent fertilizer sales, as the drop in agricultural production this year will force farmers to plant more next year.

Analyst Juvekar said that fertilizer demand on average went up following the two recent drought years in 1983 and 1988. "Total North American phosphate consumption grew about 8% and potash about 2% on average in the year following these droughts," Juvekar said.

Juvekar is rated four stars for the accuracy of his earnings estimates on Mosaic, according to Thomson Reuters StarMine.

The company could also launch a major share buyback programme once the restrictions from the Cargill CARG.UL split-off are lifted in 2013, Juvekar said. US agribusiness and trading firm Cargill sold its stake in Mosaic in 2011.

Approval still in doubt for proposed fertilizer plant

More hurdles remain if a rezoning request for 318 acres of Scott County, USA, farmland for a proposed nitrogen fertilizer plant goes forward.

If the rezoning is approved by the Scott County Board of Supervisors and a special-use permit is issued by the Zoning Board of Adjustment this month, the project would have to go through the permitting process for air emissions, wastewater, stormwater and well drilling with the Iowa Department of Natural Resources.

DNR officials have met with Orascom Construction Industries and Stanley Consultants officials several times.

"What we have is (preliminary applications) for air emission construction permits," said Christine Spackman, business assistance coordinator for the Iowa DNR. "We don't have anything else."

More information regarding construction air emissions is expected soon from Orascom to cover the construction period. The company also will have to apply for an air emissions permit for when it is operational.

Construction emissions information could cover multiple sites, while information for stormwater, wastewater or well drilling is site-specific, Spackman said. The air construction permit would be the first one issued, and can take about six months to complete. Other permits are issued in 60 or 90 days.

Several DNR officials said Orascom officials are still considering sites other sites along with Scott County.

The preliminary information received from Orascom shows the plant would be a major emitter of a number of pollutants, including fine particulates and silver dioxide, said Katharine Fitzsimmons, bureau chief of the DNR's air quality division.

"They would be required to go through the prevention of severe deterioration permitting process," she said. "You have to control things very well. You have to meet what everyone else in the United States does."

The air in Scott County is in attainment for air quality standards and those standards have tightened even more in recent years, so Orascom would be required to reach those standards.

Company officials have said the equipment will use the latest technology for air emissions.

The Quad-City area has been within the national ambient air quality standards for a few years and the requirements for the proposed fertilizer plant would continue to keep it that way, Fitzsimmons said.

"We don't believe there will be any difficulties caused by a new facility," she said. "Wherever they build in Iowa, they have to meet those standards.

"We will never issue a permit to a facility that would contribute to a negative air quality standard," Fitzsimmons said.

The company hasn't provided details on how much wastewater would be created or what type of system could be used, said Satya Chennupati, the DNR's environmental programme supervisor.

"From our initial meeting, the majority of the waste stream would be captured and recycled, so it wouldn't create a lot of wastewater," he said. "It is up to them if they want to combine or separate for domestic wastewater.

"The rest that comes out as waste has to be disposed of like any other industrial waste plant in the state," he said. "We'll be having more and more meetings with the company and their consulting engineers."

In Illinois, the Department of Agriculture permits fertilizer plants as agri-chemical facilities, Kristi Jones, a spokeswoman for the agriculture department, said. Rentech operates a nitrogen fertilizer plant in East Dubuque. The plant must go through a re-permitting process every five years.

The states act as the agents for the federal government on air and water permits such as those needed for these types of facilities, so all the states follow the same process for the same air and water standards, Spackman said.

New Zealand ironsands explorer appoints CEO

Trans-Tasman Resources Ltd (TTR) has announced the appointment of Tim Crossley as chief executive officer, to be based in TTR's Wellington Head Office.

He is to take up the position in early October this year. Crossley comes to TTR from Gloucester Coal, an ASX-listed diversified coal company with open cut and underground mining operations in NSW and Queensland, Australia. Its NSW assets currently produce 5mtpa (million tonnes per annum) of coal.

Prior to this Crossley was a senior executive with Hancock Prospecting and was president and chief operating officer with BHP Billiton's West Australian iron ore business, which shipped 123mt (million tonnes) of high grade ore in FY2008. Before working in the iron ore business Crossley held senior positions in BHP Billiton's manganese and metallurgical coal divisions.

Bill Bisset, the executive chairman of TTR, said he is delighted with the depth and breadth of experience that Crossley brings with him particularly in the carbon steel raw materials sectors. "Tim Crossley is a very experienced senior mining executive with an outstanding mining sector track record that will bring demonstrated skills in managing large complex operations with sensitive environmental requirements. He understands the supply chain and is familiar with broad commercial issues which will be crucial for TTR's future development," Bisset said.

"This appointment marks a convergence of work streams and activities for TTR which are moving the company closer to achieving its objective of extracting iron ore from the iron sands off the coast of the North Island of New Zealand's west coast.


Tim Crossley.

"In addition to the recent strengthening of our board, our environmental, geotechnical and beneficiation studies and trials are progressing well and bring us closer to the time when we can complete our Definitive Feasibility Study and seek consents for production of ore."

Bisset said "It is timely to appoint a chief executive to manage this step change in an organisation which has, until recently, operated with small diversified offices with a strong scientific focus. The evolution from a conceptual to an operational project is a very significant leap, and we look forward to Tim's leadership in leading the company through this important stage in its development." he said.

Trans-Tasman Resources Ltd (TTR) is a privately-owned New Zealand company. It was established in 2007 to explore, assess and develop the potential of the rich offshore iron ore deposits off the west coast of the North Island of New Zealand.

Iron ore miners defy gloomy economy

despite bleak economic outlook, major mining companies pursue ambitious expansion plans

Although a potential hard landing for the Chinese economy and the ongoing threat to prosperity in the Eurozone are casting clouds over steel markets, that is not dimming the faith of the world's biggest miners in long-term iron ore demand, writes Michael King.

As the second quarter financials of the world's leading commodities suppliers started to appear in July, the contrast between the outlook for the global economy — the health of which is usually reflected in steel demand — and the eye-catching optimism of iron ore suppliers was stark.

China, the key buyer of iron ore, saw economic growth slip to 7.6% in the second quarter, and fears of a hard landing were growing as *DCI* went to press. This year global financial markets have also become hotbeds of uncertainty as Eurozone political leaders have attempted — and largely failed — to find ways to lend long-term stability to Europe's more ravished economies. But even as the IMO cut its global GDP growth forecast for 2013 from 4.1% to 3.9% in July, the biggest iron ore miners were adamant that they would press ahead with efforts to boost supplies in the years ahead.

Rio Tinto achieved record half-year iron ore production in the first six months of 2012 of 120mt (million tonnes), up 4% compared with a year earlier. Some 115mt was shipped overseas and the company said it would further expand its Pilbara iron ore business in Australia to increase total annual production capacity to 353mt.

Fortescue Metals Group also reaffirmed, as previously reported in *DCI*, that it would boost output to 155mt by June next year. The firm progress being made by the newest major player on the iron ore block was apparent in the quarter to the end of June when FMG's output reached 17.8mt, up 42% year-on-year.

BHP Billiton, which plans to double its global output in the years ahead, also boosted its output to 40.9mt in the quarter through June, up by 15% year-on-year.

The performance of Brazilian giant Vale was less commanding than those of its Australia-based rivals. Second quarter production rose 0.4% to 80.5mt, although overall Brazilian exports increased 2.1% in the quarter as expanding Asian demand offset a slump in European orders.

The increases in iron ore supply in the early part of 2012 built upon the major output boosts achieved in 2011 when exports increased for the tenth year in a row, expanding some 7.9% to 1,115mt, according to the *The Iron Ore Market 2011–13*, published in July by the United Nations Conference on Trade and Development (Unctad).

Australia's exports increased by 8.9% to 438.8mt last year

Smit Lamnalco brings Sierra Leone ore to market

Smit Lamnalco has played a pivotal role in bringing two export projects to fruition that will see Sierra Leone's re-emergence as a key global source of iron ore.

The marine support and logistics specialist has provided the turnkey services to assist African Minerals Limited (AML) in exporting ore from its Tonkolili mine, whose life expectancy is in excess of 60 years, with resources of an estimated 12.8 billion tonnes.

Smit Lamnalco has been contracted for an initial five years to support AML's fully integrated mine-rail-port transport system connecting Tonkolili to the port of Pepel. Shoreside, Smit Lamnalco has deployed four Damen-built 3212 terminal and towing tugs to ensure that ships enter and exit the port's challenging approaches safely. AML already plans to develop a new rail spur from the existing railway, connecting Tonkolili to a new large deep water port at Tagrin.

Transshipper Freetown Harbour.

Major Chinese investors include Shandong Iron and Steel Group, and China Railway Materials Commercial Corporation, and the exporter expects the operation to ramp up initially to 20mtpa (million tonnes per annum) in its Phase 1 operations, and become by far the largest contributor to GDP in Sierra Leone.

In a second deal, London Mining Plc contracted Smit Lamnalco to provide a complete logistics and marine package to support exports from the upriver Marampa mine. London Mining plans to develop a production rate of 5mtpa of premium sinter concentrate by the end of 2013; this will further increase to 17mtpa in Phase 2 developments of the mine's 25 year life.

The support package includes on-transit tug and barge services along 40km of Port Loko River from the Thofeyim River Port to Freetown Harbour. The waterborne transit involves four bespoke shallow draught Smit Lamnalco river tugs towing four 93m long barges to the coast.

Smit Lamnalco operations along the Port Loko River.

Shoreside in Freetown, Smit Lamnalco has provided logistics support to the commissioning of London Mining's Pride of Marampa transshipment vessel, operated by Bernhard Schulte, to load Capesize ships.

Both contracts have involved extensive masters, officers and crew training for challenging waters, operational procedures including safe vessel loading and discharge, and dedicated onshore management.

Smit Lamnalco regional director, Ian Hugo, said: "These are prestigious clients looking for logistics solutions and the type of integrated marine package that we specialize in: we do not simply provide ships, we provide a full marine package and expertise which is local, regional and draws on Smit Lamnalco's global reach.

"Smit Lamnalco worked closely with both customers to develop operational procedures drawing on our strong SHE-Q culture, extensive experience in Africa and expertise in delivering international best practice in challenging business and operating environments."

Hugo said it had been imperative that Smit Lamnalco deliver assets and services to international standards to match the exporters' aggressive gearing up schedules.

"That has demanded a completely open exchange of views that does not shy away from critiquing each other's operations. We pride ourselves on developing relationships with our clients that allow frank feedback in both directions."

To support both enterprises, Smit Lamnalco has established a nationally-registered operation in Sierra Leone to offer vessel management, engineering and financial services support.

compared with 2010. Brazilian exports, which had suffered a sharp decline in 2009, bounced back with some aplomb, rising 12.1% to reach 348.6mt. However, India, the third largest exporter in 2011, saw its exports fall for the second consecutive year, down 17.8% to 78.8mt.

China remained the driving force in import markets in 2011 when it increased its imports to some 686.7mt, up 11% year-over-year and equal to almost 60% of world imports. Japan, in second place, saw imports fall by 4.4% to 128.4mt, while in Korea imports rose 15.3% to 64.9mt. European imports, still fighting back to 2008 levels, also rose substantially in 2011 - up almost 17% last year to total 156.4mt.

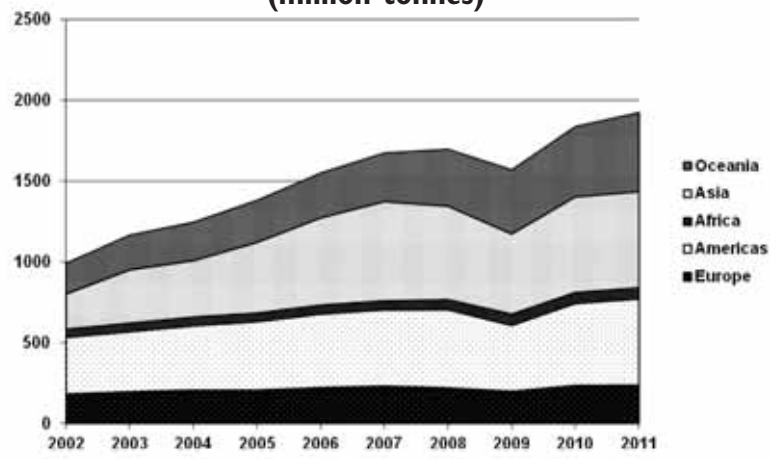
More iron ore capacity will soon be unleashed onto world markets, but the question many analysts are asking is whether steel markets will be able to absorb it.

Unctad notes that as of May this year the total global iron ore project pipeline due to come on stream by 2014 totalled a mighty 796mt. 270mt of this was categorized as 'certain', 220mt

was 'probable' and the rest was classed as 'possible'. "It may, with some degree of confidence, be assumed that around 510mt of new capacity will come on stream in the period up to and including 2014," said the report.

These huge increases in supply were mostly planned as the global economy appeared to be accelerating away from the 2008–09 Global Financial Crisis and subsequent recession which decimated steel consumption. World crude steel production made an impressive recovery in 2010, but since then growth rates have slowed, mirroring the faltering economic steps made in the US, Europe and China. According to the World Steel Association, global apparent steel use increased by 5.6% in 2011, down from the growth of 13.2% recorded in 2010. China, the key to global demand for iron ore, increased its usage by a huge amount in tonnage terms, but year-over-year growth slowed to just 6.2% last year.

Iron ore world production (million tonnes)



In 2012 that pattern has continued. Global crude steel production during the first four months of the year was only 2.1% higher than in the same period in 2011. In China it rose 2.7%, markedly slower than in previous years.

The latest World Steel Association short term forecast for world steel use predicted demand would increase by 3.6% over the course of 2012, followed by an increase of 4.5% in 2013, although continued lower output in China could see that figure revised downwards.

"On the basis of the prospects for a return to stronger growth in the second half of this year, we expect world crude steel production in 2012 to be about 1,530mt, or about 4% higher than in 2011," said Unctad. "Beyond 2012, we would expect steel use and production to increase at an annual rate of just below 4%."

But, Unctad warned, China's performance will be critical to the forecasts given its weight in the global steel market. "We project annual growth in China's crude steel production to be 4.4% over the period 2012–2015, while steel production in the rest of the world would grow at a rate of 3% per year," said the report. "Therefore, the successful reorientation of Chinese growth is essential both to the health of the world economy and to continued steel demand growth."

Apart from the China factor, the other major cloud over the steel market is the potential break-up of the Euro. This, according to most analysts, would produce a global recession of at least 2008–09 proportions, with similarly dire implications for steel demand.

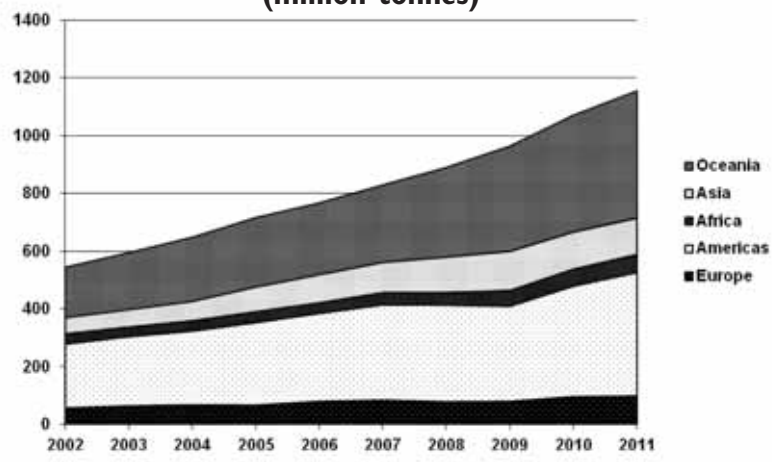
Even if China remains stable and the

Euro holds steady, and assuming Unctad's forecasts prove correct, the rate of growth in steel demand forecasts is still appreciably lower than plans for iron ore expansion by leading exporters. However, the collective optimism of miners is built on firm foundations despite the seeming discrepancy.

Firstly, Chinese steel consumption may have slowed but it is still growing and this will require imports. Not least this is because domestic iron ore suppliers have struggled in recent years to boost output, and the iron content of ore produced at many mines continues to deteriorate. Many are also operating on such slim margins due to cost inflation that any price depreciations hits profits hard. All of this points towards greater imports in the years ahead.

Second is the India factor. India has been a key player in the iron ore markets over the last decade, exporting up to 100mt per annum until recently when Karnatka state, the main source of iron ore in India, increased its export duties. Even though restrictions are set to be removed, with domestic usage growing it is unlikely that India will resume such a prominent role in export markets any time soon.

Iron ore world exports (million tonnes)



CHINA MONTHLY IMPORTS

(million tonnes)

	2010	2011	2012	% Change 12/11
January	46.6	69.0	59.3	-14.0
February	49.4	48,6	65.0	33.7
March	59.0	59,5	62.9	5.7
April	55.3	52,9	57.7	9.1

Source: The TEX Report and China Iron and Steel Association (CISA)

The concept of 'peak steel', which insists that global demand will reach a plateau as Chinese growth slows and European production is cut in the years ahead thereby putting downward pressure on steel and iron ore prices, also contains flaws. Most obviously this is because the size of the Chinese market is now so great that even small steel demand growth can mean a huge boost to iron ore imports. This year, for example, China imported 8.9% more iron ore in the first five months of the year than it did in 2011. At that pace China will import almost 750mt by the end of the year.

The inadequacies of domestic supply coupled with the sheer size of China's steel industry mean that it would take a huge drop in steel output in China for iron ore imports to suffer a major, prolonged volume reverse and this should provide some pricing stability.

The 'peak steel' theory also fails to acknowledge that the world's largest miners have the ability to adjust their output. The Big 3 — Vale, Rio Tinto and BHP Billiton — controlled some 34.7% of world production in 2011. In a declining market they could easily reduce production or slow the pace of expansion.

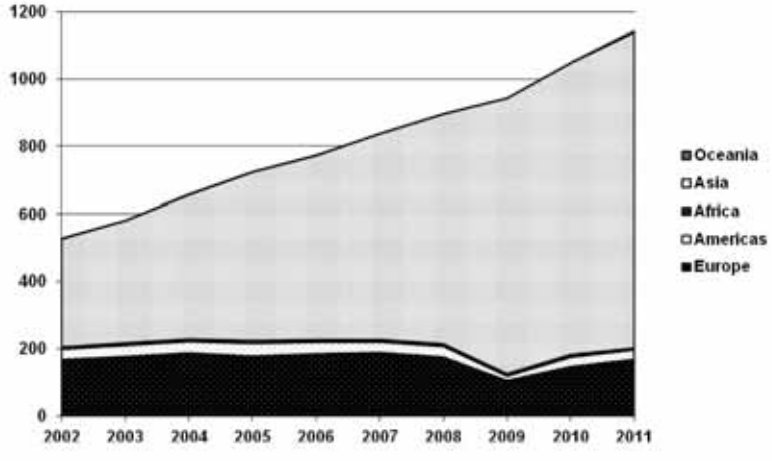
The Big 3 supplied some 60% of China's iron ore requirements last year. For them a bigger concern is efforts by Chinese buyers to diversify supplies. Wang Xiaoqi, vice-chairman of the China Iron and Steel Association, said recently that buyers would try and source more ore from independent miners where possible in the future.

Chinese government policy is also taking a similar direction with China aiming to control at least 50% of its iron ore imports by 2015 to reduce exposure to import price fluctuations. This has been one of the driving factors in Chinese investors' efforts to secure overseas stakes in iron ore mines in recent years. Last year, for example, Hongda secured an 80% stake in the Tanzanian Liganga project for USD$3 billion. Hanlong acquired an 81% share of the Australian junior Sundance which operates a number of high quality projects in Cameroon. And Hebei Iron & Steel Group purchased a 20% interest in the Canadian Alderon project for USD$87 million.

In 2010 a similar pattern was also in evidence. Shandong bought 25% of the Tonkolili project in Sierra Leone, Chinalco acquired 47% of the Simandou project in Guinea from RioTinto, and East China Mineral Exploration and Development Bureau bought Itaminas in Brazil from its private owners.

An acceleration of this dual strategy by the Chinese government and steel industry would reduce miners' ability to control supply.

Iron ore world imports (million tonnes)



However, the overall market looks likely to stay relatively stable, according to Unctad. It estimates that global iron ore use will increase from 1,922mt in 2011, to about 2,000mt in 2012, and to 2,080mt in 2013.

Its latest report admits that while the supply side of the iron ore market looks over-cooked and a surplus looks likely to develop. But Unctad points out that doubts surround a number of expansion projects, especially because of the limited financing available for smaller projects and likely delays in completing many others.

"Most importantly, the market will be tight due to the existence of two mechanisms placing a cushion under prices," said Unctad. "The large iron ore producers can implement their expansion plans with a great deal of flexibility. And a considerable segment of the Chinese iron ore mining industry, probably as much as 200mt in annual capacity, would close if prices were to fall dramatically below present levels."

These factors will see the market moving towards a balanced supply and demand situation, with equilibrium to be reached in 2013 at the earliest. "The market will remain tight, with a strong possibility of modest price increases during the second half of 2012, and the next few years will be characterized by a gradual adaptation of supply — by way of the addition of new capacity — to a continuously growing demand," said Unctad.

"Prices, while declining slowly from 2013 onwards, will stay sufficiently high over the next couple of years to keep the Chinese iron ore mining industry operating at lower, but not disastrously low, levels of output - that is, between the 222mt produced in 2009 and the 322mt achieved last year.

"Prices will remain at levels that must be considered high from a historical perspective, with a floor at around US$120 per tonne delivered in China."

Export duties and punishing restrictions result in falling exports from India

The Achilles heel for the world's leading mining groups like BHP Billiton, Vale and Rio Tinto is their very large exposure to iron ore, the prices of which have dropped over 25% in the past 12 months, *writes Kunal Bose*. What further clouds the outlook for shares of mining companies is that iron ore prices are yet to find the floor. No less a man than BHP Billiton chairman Jac Nasser expects the mineral prices to fall further. At what prices iron ore will sell depends on demand emanating from steelmakers, particularly from the industry dominating China. In its turn, how well steel will do depends entirely on the behaviour of the broad economy. The International Monetary Fund's latest World Economic Outlook update does not bring any cheer to the mineral sector *per se* and the results are abundantly evident in the behaviour of iron ore prices. The CEO of Rio Tinto Tom Albanese says as the global economic condition and sentiment dropped markedly in the past quarter, he is keeping an eye on US recovery, unending crisis in Euro zone and impact of efforts to stimulate the Chinese economy. Unarguably, the last of the three points under Albanese watch has the most significant bearing on seaborne trade in iron ore and its prices.

According to World Steel Association, in the first six months of 2012, the global crude steel production rose 0.9% year on year to 766.9mt (million tonnes), though significantly for the iron ore market the June steel production was down to 128mt from 131mt over the previous month. China, the world's biggest producer and exporter of steel like any other metal, reported a marginal fall in June output to 60.213mt from the earlier month's 61.234mt. A major Indian exporter of iron ore to China says, "any fall in Chinese steel output as we saw in June sends out bearish signals for the ore market. This has come in the wake of large build up of stocks of close to 100mt of iron ore at Chinese ports." China having a share of over 60% of the world seaborne trade will always have a decisive influence on ore price behaviour. Last year, the country imported 686mt of ore, a rise of 11% on 2010. In the first half of 2012, Chinese ore imports rose 9.7% to 370mt from a year earlier. While this may be so, the ore market primarily takes its cue from the performance of the world steel industry and the general economy and at what prices China buys ore.

July's first half saw Chinese steel production crawling up. But as the world's second largest economy grew at its slowest pace at 7.6% in three years in the second quarter of 2012, the demand for steel from the construction, automobile and machinery sectors got drained. No wonder the average price for the benchmark product hot rolled coil fell for many straight weeks in China. This and also grim demand prospects for the rest of the year, have made Chinese steel producers, the latest to join the list is Wuhan Iron & Steel Group, to issue profit warnings. In this situation, disappointingly low rates of Chinese steel futures contracts and spot iron ore prices will not come as a surprise. Unlike in the pre 2008/09 recession times when the Chinese steel industry registering a double digit growth rate made iron ore and coking coal hot commodities, it is now showing a subdued appetite for ore. Traders complain that Chinese clients are checking cargoes, but the genuine interest to make deals and take deliveries is lacking. As one of them says, "the gap between their bids and our offers is quite big up to $7

a tonne. Indifference to buying from stocks at ports is in evidence. In difficult times like now with margins narrowing in steel thinning, it is expected that metal producers will like to do with limited inventories of iron ore and going for replenishments in small volumes. So you find them buying small lots in the spot market."

It almost became conventional wisdom that in emerging economies like China and India, steel demand growth rate will be ahead of GDP's progress. But in now both the countries while GDP growth rate has fallen, steel demand is trailing the former by some percentage points. In fact, the growing slackness in steel demand, particularly in Europe which will be seeing more idling of capacity resulting in iron ore price falls is leading mining groups to go slow with development of new iron ore mines and expansion of operational mines. The major ones held back for one reason or the other include Anglo American's Minas Rio in Brazil, Rio Tinto's Simandou in Guinea, Vale's $8bn expansion of Serra Sul in Brazilian Amazon and Hancock Prospecting's Roy Hill development in Australia. There never is finality about forecasts by research houses, the dynamics of industry working being subject to changes by how the economy fares. At the same time, mining groups are closely looking at a forecast saying that the world steel capacity and production could be nearing its peak level. Earlier, it used to be said that China, which nearly has a 45% share of global steel production would reach its output peak at 1bn tonnes. This now has been scaled back to 800mt. For miners, a big challenge is to correctly anticipate future demand so that oversupply does not play spoilsport for the iron ore market.

The likes of BHP, Vale and Rio also have to take into account the Beijing strategy of progressively reduce its import dependence on big miners by encouraging Chinese companies to go out and buy mineral assets wherever available. Thanks to China liberally extending lines of credit for infrastructure development like building ports and establishing rail and road connections between mines and ports to least developed and developing countries, its companies could pick up some rich iron ore assets in Africa in particular much to the consternation of Western countries.

Chinese companies are also making deals and signing joint venture agreements to get assured supply of portions of mines production. Like Chalco of China is partnering Rio to develop Simandou iron ore project in Guinea. Parallel to overseas initiatives, China is going full blast to raise domestic production of iron ore, much of it though of poor quality. Expect China to produce up to 1.55bn tonnes of ore this year which in terms of quality of imported ore will, however, equal to 591mt. Chinese ore output in 2011 was 1.33bn tonnes.

In the meantime, as India is pursuing a steel capacity development target of 200mt by 2020, the government has thought that it will be in order to scale down the cut off point of iron (Fe) content in locally mined ore to 45% from the present 55%. The mines ministry puts the country's ore reserves at 28.5bn tonnes, which will rise by at least 5bn tonnes with the lowering of Fe cut off point. Welcoming the move, the Federation of Indian Mineral Industries director general R.K. Sharma says, "the supply of low grade iron ore will require of the Indian steel industry to create adequate facilities for beneficiation, sintering and pelletization. There has been some progress in treatment of ore fines for local use. At the same time, I don't find any justification to have such high tariff barrier to India exporting iron ore." Export duty of 30% and punishing mining restrictions in ore rich states like Karnataka and Goa saw Indian overseas sales of ore falling from nearly 100mt in 2010/11 to about 60mt last year. Exports in 2012/13 are likely to fall further to 50mt.

Brazil's 2011 record exports of ore unlikely to be repeated

Nothing is impossible, but the record exports of iron ore from Brazil in 2011 and the record earnings of the year as well, are unlikely to be repeated for some time.

A record 331mt (million tonnes) was shipped in 2011, 20mt, or 6.4% more than in 2010.

The average price of the ore, $126 per tonne, was 36% higher in 2011 than in 2010 as well.

As a result, the sale of iron ore earned Brazil almost $42 billion dollars last year, a record 16% of all export earnings and $13 billion, or 45%, more than in 2012.

The main reason for all the records was, of course, China, which bought almost 165mt of Brazilian ore last year, virtually half the total and paid virtually $20 billion for the privilege.

With the Chinese economy expected to grow by 'only' 7.5% or so this year, compared with 9% plus in 2011, there will be no repeat of last year's records this year, however.

Three million tonnes less ore was exported in the first five months of this year than in the same period of 2011, a reduction of almost 19%, while the average price of the ore had fallen by 18% as well.

The result was that ore exports had earned Brazil almost $3 billions less from January to May this year than in the same period of 2011, a fall of 18%.

There are almost as many opinions as to how the Chinese economy will behave from now on as there are analysts.

The problems in the developed world of the past few years — notably in Europe and the United States, the main destination for China's exports of cheap manufactured goods — mean much less is being sold to these markets, so less is being made.

In China itself, the government took steps to cool the booming housing market at the end of last year, as — with few alternatives — many Chinese had taken to spending their massive savings on buying properties.

Sixty per cent of the 750mt of steel made in China in recent years has been used in the housing sector.

However, the government wants to prevent the housing market falling too far and causing a panic, so measures to ensure it continues to grow have been taken more recently. More cars are now being sold in China than in any other country in the world. Although spending on infrastructure — such as railways, roads, ports, dams and bridges — has slowed from the peak of a few years ago, it is still growing fast.

Demand for steel, most still produced in hundreds of relatively small independent mills, has grown at an annual rate of 15% for the past decade.

In the same way as China's imports of ore from Brazil have increased from the 17.5mt in 2000 — 10.5% of the total shipped in that year — to ten times that amount in 2011, the amount of steel produced in China grew from about 100mt in 2001, to 750mt last year.

Estimates vary wildly as to what will happen from now on. Vale predicts that the price of the ore it exports will return to about $140–150 per tonne by the end of this year. If, on the other hand, it falls to below $120 per tonne, those mines now

EXPORTS OF IRON ORE BY COUNTRY, '000 TONNES

Country	2011	2010	2009	2008	2007	2006
China	164,500	152,561	150,158	96,357	105,026	80,256
Japan	37,335	37,422	23,355	35,767	31,217	33,106
Germany	12,414	20,927	10,807	25,575	24,281	23,691
South Korea	14,229	11,902	9,410	12,926	10,321	13,066
Netherlands	15,666	6,952	3,561	5,983	5,246	3,052
France	7,106	8,110	4,686	11,188	13,229	13,653
United King,	7,224	7,814	7,194	7,507	6,693	7,067
Italy	11,567	8,041	4,665	10,788	11,366	11,323
Belgium	1,672	3,612	923	8,219	8,045	6,627
Argentina	9,334	7,608	3,229	6,932	5,752	5,695
United States	919	1,143	565	2,901	3,573	4,389
Spain	4,049	3,798	2,204	4,167	3,981	3,990
Taiwan	5,227	4,700	2,393	4,158	4,325	5,267
Bahrain	7,005	6,180	3,890	7,965	1,470	2,982
Saudi Arabia	4,426	5,964	3,484	4,892	2,886	N/A
Egypt	2,897	2,716	3,950	2,356	2,576	2,631
Philippines	3,045	2,290	933	4,235	4,161	N/A

Source: Sinferbase

responsible for about a third of the ore produced in China itself, will not be able to compete. Imports of ore would then rise, rather than fall, argues Vale.

Many experts think that the amount of steel produced in China will continue to increase until it about 2020, when it will peak at about 900mt. Others suggest demand will continue to grow until 2050, when it will peak at about 1.5 billion tonnes.

While more than half of China's 1.2 billion population now living in cities, the share will have increased to about 75% by then. This process of urbanization will ensure that demand for housing and infrastructure will continue to grow steadily.

Despite the surge in the number of cars being produced, there is still only one vehicle for every 20 Chinese, compared with one in five Brazilians, for example.

The Vale company, for one, seems to be convinced that China will continue to need more ore from now on.

Vale was recently granted outline planning permission for its second mine in the Carajas project by the ministry of the environment. The brand new 'Serra Sul' mine is expected to start up in 2016, two years later than first planned and to be producing and exporting up to 90mt each year soon after.

Output at the existing Serra Norte mine at Carajas will rise from the 100mt or so of last year, to about 140mt by then as well.

To allow what will eventually be 230mt of ore from Carajas to reach the port of Ponta da Madeira, at the capital of Maranhao state each year, the 890km-long railway linking the mine to the port will be completely duplicated, rather than trains having to stop at passing places, as now. A new 140km spur will be built to the new mine.

Operations at Serra Sul will be mechanized wherever possible. Forty kilometres of conveyor belts will carry the ore from workings to the processing plant and rail loaders, rather than in the huge trucks used at the Serra Norte mine.

Although truck drivers in the Para state mine do not get the $150,000 per year paid to drivers at mines in Australia, the cost of labour has been increasing fast in Brazil and Vale wants to be prepared.

Vale has 25 mines in Minas Gerais state, from where more than 200mt were exported last year, most via the Tubarao terminal in Espirito Santo state.

Experiments are being carried out into mechanizing blasting

IRON ORE EXPORTS

(tonnes, earnings and US$ per tonne)

Year	tonnes '000	US$'000	US$/tonne
2011	330.989	41.817.3	126.35
2010	310.931	28.911.9	92.98
2009	266.040	13.246.9	49.79
2008	281.682	16.538.4	58.71
2007	258.509	13.887.8	53.73
2006	244.594	11.754.2	48.06
2005	223.378	9.415.1	42.15
2004	200.923	4.992.7	24.85
2003	184.442	3.796.6	20.58
2002	170.015	3.293.8	19.37
2001	155,741	3.062.9	19.67

Source: Sinferbase.

BRAZIL'S ORE EXPORTS TO CHINA, MT

(million tonnes)

2011	164.5
2010	152.6
2009	150.2
2008	96.4
2007	105.0
2006	80.2
2005	58.7
2004	46.3
2003	41.0
2002	27.2
2001	28.6
2000	16.8
1999	14.7
1998	10.5

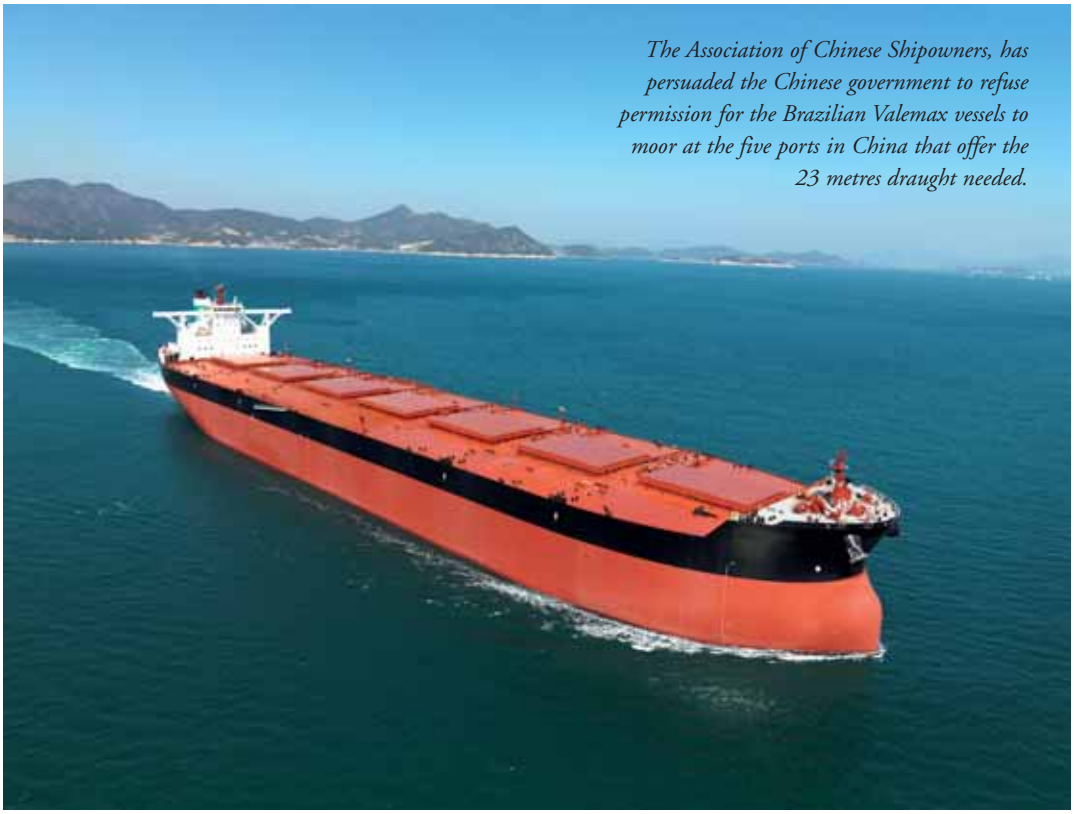
Source: Sinferbase.

and drilling, as well as the operation of cranes and the loading of vehicles to be driverless as well.

Ten years ago, almost 40% of the 160mt of ore shipped from Brazil, which cost $20 per tonne then, went to countries in Europe.

Being far nearer Brazil than most destinations in Asia, Europe was the premium market for Brazilian ore at that time.

Almost the same amount went to countries in Asia, notably Japan, the leading single customer at that time, which took 26mt, 16% of the total. China was in third place.



The Association of Chinese Shipowners, has persuaded the Chinese government to refuse permission for the Brazilian Valemax vessels to moor at the five ports in China that offer the 23 metres draught needed.

Japan is still Brazil's second most important customer for ore, buying 37mt last year, while other countries in Asia — notably Taiwan and the Philippines — continue to be important markets as well.

With a few exceptions, shipments to countries in Europe have fallen steadily and seem unlikely to improve for the foreseeable future.

The past few years has seen the emergence of countries in the Middle East, such as Bahrain and Saudi Arabia, as well as

Egypt, able to take advantage of copious supplies of low-cost fuel in the area to make steel.

Earlier this year, 300,000 tonnes of pellets were shipped from Brazil to India, itself an ore exporting country. But costs there are high, and the Indian government wants to ensure sufficient ore remains in the country for its own steel industry. India may emerge as a major new market for Brazilian ore before long.

It takes 45 days for a ship to travel between Brazil and China, which means it costs about $45–50 to take each tonne of ore there. It only takes about 10–12 days for a ship to travel to China from Australia, so ore can be carried for $10–12 per tonne as well.

The obvious answer was for Brazil to seek to use the largest possible ships, and the solution was to order 35 Valemax vessels. Each of these monsters can carry 400,000 tonnes of ore, or a total of 1.6mt in the four round journeys such ships — many of them built in China — can make each year.

Vale had not anticipated the strong reaction from the Association of Chinese Shipowners, which persuaded the Chinese government to refuse permission for the Brazilian ships to moor at the five ports in China with the 23 metres draught needed to handle the vessels.

Vale is being forced to build transshipment facilities in Malaysia, or to offload part of a cargo onto smaller ships in the Philippines. Similar facilities have been built at Oman, as although the vessels can moor at ports in Italy and the Netherlands, they were not planned for this trade.

The move by the Chinese partly largely negates the cost advantage of the new ships. However, the Brazilians claim that their ore, whose average iron content is 67%, significantly higher than the 62% average of Australian ore, will continue to be competitive, and pressure from the steel mills may force the shipowners to change their mind. [There is some suggestion that change is afoot; please see 'Chinese softening on CVRD VLOCs?' on p63 of this issue. Ed.]

Vale, of course is not the only company active in Brazil, although after the take over of most rivals in the 1990s and early 2000s, it is now responsible for 80% of the ore shipped.

But the Samarco Company, in which BHP is a partner, shipped 22mt via the 520km-long slurry pipeline which runs to the port of Uba last year, while Anglo American shipped 5mt from its mine in Amapa state, in the far north of the country.

The world's largest steel company, Arcelor-Mittal says that mining and selling ore is now more profitable that making and selling steel.

Brazil's leading steel company CSN, which now gets 35% of its profit from the sale of ore, obviously feels the same. Output at CSN's Casa da Pedra mine in Minas Gerais totalled 20mt last year and will soon reach 50mt; there are plans to take it to 100mt before long.

Vale used to provide the Brazilian steel mills with 75% of the 60mt of ore they need each year. But with the price of Vale's ore soaring, mills have all sought to become self-sufficient in ore. Only 50% of the ore used in Brazil now comes from Vale mines, and only 30% soon will do.

In conjunction with the LLX company, in process of building a new port at Acu, in Rio de Janeiro state, Anglo-American will soon be pumping 23mt of ore in a pipeline from its mines in Minas, Gerais to the new port, where there are plans to build a new steel mill as well.

Some other companies, notable amongst them Australia's Cabral Resources, is also planning to open a 50mt a year capacity mine in Bahia state, which will be accessible to a new railway, to reach the sea at the port of Ilheus.

Bulk Connection's manganese ore trade activities

Bulk Connections, Durban's only bulk mineral terminal has handled a record 1.7 million tonnes of manganese ore in the past 12 months. The rapid rise in throughput is largely as a result of a major infrastructure project that has taken place during the past year, which includes the installation of several overhead conveyors, stackers and a new rotary tippler. Manganese ore is delivered by road as well as rail, stockpiled in discrete areas and loaded on board vessels using either the container method for the lumpy ore, or the conveyor system for the fine ore. Part of the upgrade was to increase the shiploading ability on the conveyor system and all conveyors are now rated for 2,000tph (tonnes per hour), which means that the target of loading a vessel in 24 hours is now realizable.

The terminal expects manganese ore throughput to double in the next two years which will go a long way to satisfying the demand for exports from South Africa. However, the rate at which the throughput increases will depend largely on the performance of Transnet Freight Rail (TFR). TFR, which is steadily increasing its performance levels and resources, is committed to assisting the industry by increasing railings to Durban and the statistics show an ever-increasing tonnage being moved through the terminal.

Company background

Bulk Connections is part of the Bidvest group which operates a wide range of specialist material handling facilities in South Africa. The operations are mainly in and around the port peripheries in strategically located facilities.

The Bidvest Group is an international services, trading and distribution company listed on the Johannesburg Stock Exchange in the Industrial – Service sector. The strategy of the group is to be invested in companies operating in the fields of distribution, service and trading.

Bulk Connections has been in business since the early 1900s. Over the years the plant has been maintained, upgraded and state of the art equipment added.

The terminal was originally operated by South African Railways and Harbours. When the Richards Bay Coal Terminal was built, the need to operate the Durban operation was questioned, and a decision was made to phase out exports. This however did not suit many small users of the terminal and after a long struggle, the Durban Coal Terminal Company was formed in September 1988. This company appointed Rennies Terminals now a part of the Bidvest group, to manage the facility on its behalf.

Since the take-over in September 1988, the facility has been continually upgraded and refurbished. Three independent loading routes are now available, storage space has been dramatically increased and the terminal is now the most effective grab discharge facility in the port.

The terminal operates 24 hours a day, seven days per week and will operate on public holidays if cargo is available. DCi

In the past 12 months, Bulk Connections has handled a record 1.7mt of manganese ore.

Bulk connections

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Petcoke

market buffeted by economic uncertainty

Ben Ziesmer & Frank Wilson, Jacobs Consultancy

Petroleum coke (a.k.a. petcoke) prices have been volatile over the last four years, driven by various events, starting with the economic crisis in late 2008/early 2009 and the subsequent worldwide recession (see USGC/Caribbean market fuel-grade petroleum coke prices chart on pxx). Then emerging markets in India and China brought in new demand causing petcoke price to recover in 2009 and 2010. As 2010 proceeded, increased demand from Latin America and Turkey combined with rising steam (thermal) coal prices helped buoy US Gulf Coast (USGC)/Caribbean petcoke prices while high ocean freight costs made it difficult for petcoke to compete against Asian steam coal. In 2011 supply outpaced demand in traditional markets, again driving petcoke prices lower so USGC petroleum coke could once again compete in Asia. Thus, a pattern has emerged: if there is sufficient demand in traditional markets, then USGC/Caribbean petroleum coke prices will rise to levels that are uneconomic for Asian customers, but if supply exceeds demand in traditional markets, then USGC petcoke prices must decline to become attractive for Asian customers.

A key contributor to the price volatility of petroleum coke is that it is a by-product. Therefore, there is no supply side response to the price of petroleum coke. If petcoke prices are high, no more petroleum coke is produced, and, conversely, low petroleum coke prices do not cause producers to reduce production.

Background

Cokers are installed in many – though not a majority – of oil refineries. Petroleum coke is a by-product because the purpose of a coker is not to produce petroleum coke but to increase the production of higher value liquid products. Crude oil is first processed in an atmospheric distillation unit, followed by a vacuum distillation unit. The heavy residuum exiting the bottom of the vacuum tower (i.e. vacuum tower bottoms or VTB) can be used to make asphalt, blended with some light products such as diesel to produce residual fuel oil (RFO), or used as coker feed (see Simplified Coker Process Flow diagram on p19).

Traditionally, cokers are installed in oil refineries to convert VTB and other heavy residual oils into higher-value light transportation products (e.g., gasoline, jet fuel, and diesel fuel). Until recently a coker almost invariably increased refinery profitability because the yield of high-value transportation fuels is

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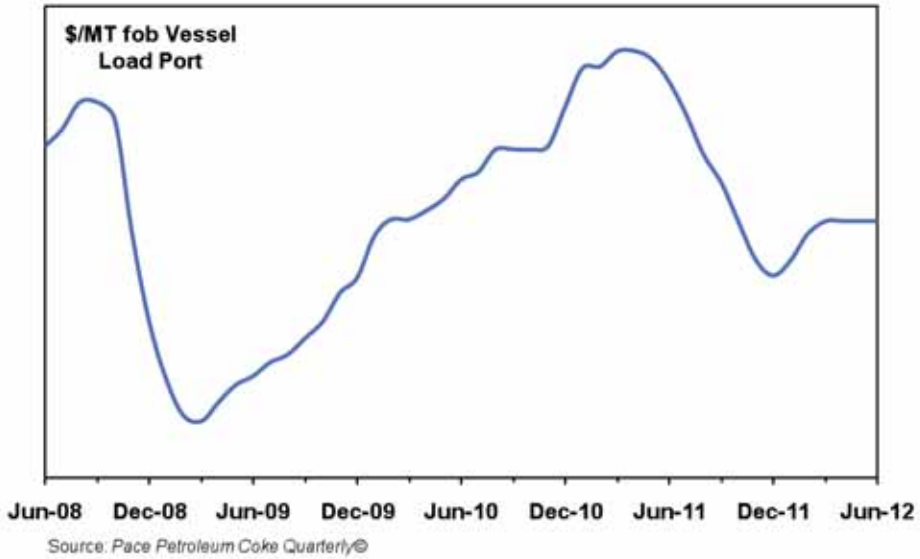
maximized and production of low-value residual fuel oil (RFO) is minimized. While the coking process has been in use since the 1930s, petcoke production has seen its largest growth since 1990 because worldwide light transportation petroleum product demand has grown faster than residual fuel oil demand. Cokers have been and continue to be the preferred refining technology that allows the refining industry to reduce its production of residual fuel oil per barrel of crude oil processed, and bridge the gap between light product and RFO demand growth.

Additionally, beginning in the late 1990s, two new factors have been driving the construction of cokers:

- **Crude oil purchase cost reduction** — coking units allow a refinery to process lower cost, heavy, sour crude oils. This was the driving force for the nine new or expanded cokers installed on the US Gulf Coast from 1996–2004 and for many other coker projects currently under construction.
- **Ultra-heavy crude oil production** — cokers are used in upgraders that produce various grades of synthetic crude oil (SCO) from bitumen or ultra-heavy crude oils. This type of upgrader exists in Venezuela where ultra-heavy Orinoco Belt crude oil is upgraded and exported as lighter crude oils, and in Canada where upgraders are used to produce SCO from the bitumen derived from Alberta oil sands.

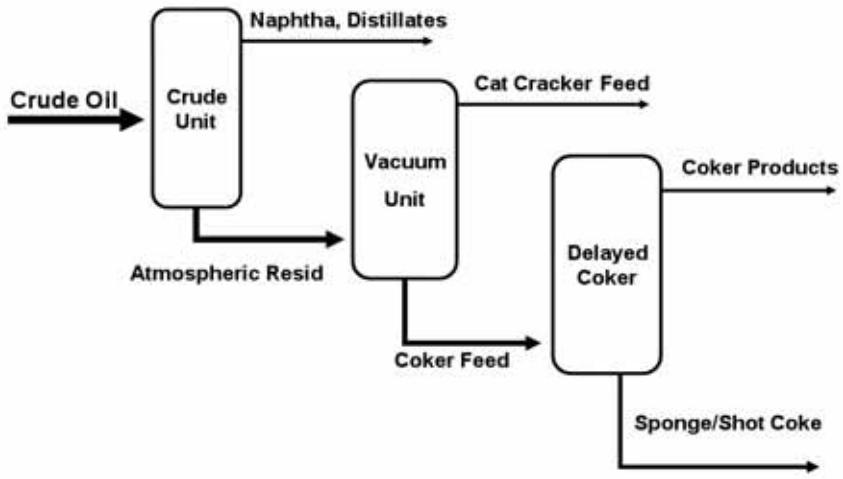
USGC/Caribbean market fuel-grade petroleum coke prices



Source: *Pace Petroleum Coke Quarterly©*

There are two general applications for petroleum coke: one as a carbon source and the other as a heat source. The former requires better quality (e.g., low sulphur and metals) and commands higher prices. Green[1] petroleum coke is usually upgraded by calcination when it is used as a carbon source. Petcoke that has been calcined is referred to as calcined petroleum coke (CPC). By far the largest market for CPC is in the production of anodes for aluminium smelting. Other uses for CPC are in the production of carbon electrodes for electric arc furnaces, titanium dioxide (TiO_2), and as a recarburizer in the steel industry. While there are a variety of value-added markets for higher-quality petroleum coke, about 75% of petcoke is sold into the fuel market, where it competes with coal.

Coker feed flow path



Production

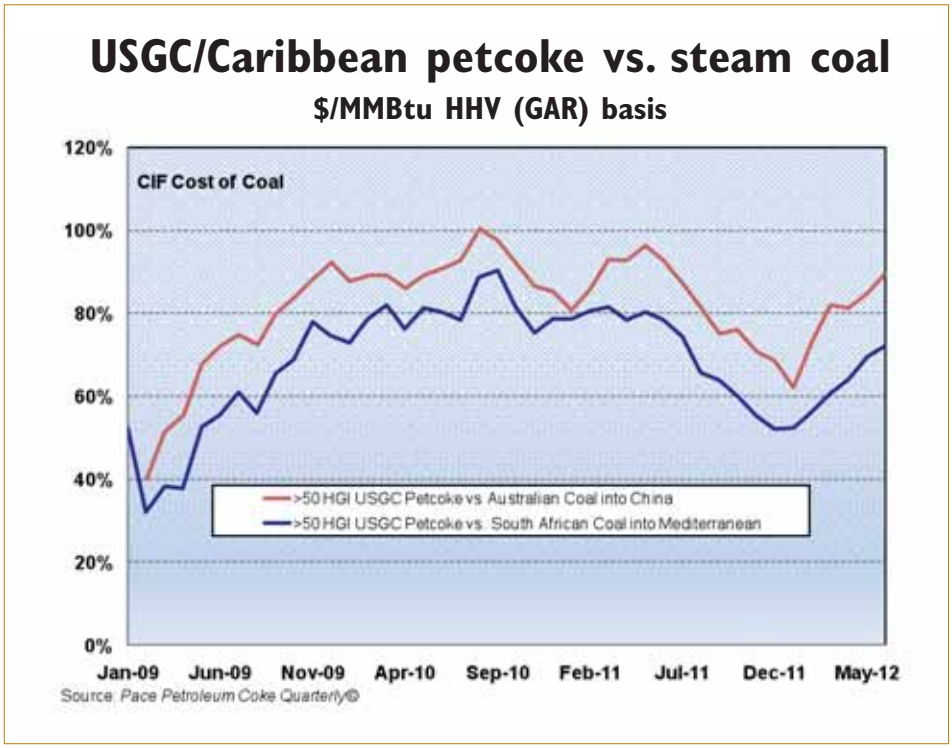
Worldwide petroleum coke production increased 6+% in 2011, to a record 113mt (million metric tonnes) due to more production at existing cokers and coking capacity additions. Petroleum coke production at existing cokers is typically not impacted by recessions because refineries equipped with cokers are generally more profitable than those without coker(s). Thus, during a recession, refineries without cokers generally reduce their production much more than refineries with cokers to balance refined product supply with demand. However, since 2008/2009, the combination of weak refined product demand—especially diesel — and often relatively strong alternate markets for coker feed (i.e. production of RFO and/or asphalt) has left petcoke production much more susceptible to relatively small shifts in refining and coking economics.

This more uncertain economic environment for cokers was clearly illustrated as two refineries with large cokers — Valero Aruba and

1. Technically, all petroleum coke is 'green' when it is produced because all petcoke that has not been calcined is 'green'. However, in the petroleum coke industry the term green petroleum coke (GPC) typically refers to higher-quality petroleum coke used as calciner feedstock.

Hovensa St. Croix US Virgin Islands — were shuttered during the first half of 2012. Another indication is that many USGC refiners were running their cokers at 20–30% below rated capacity during the first half of 2012, as it was often more profitable to divert coker feed to RFO or asphalt production instead of operating their cokers at full capacity.

Longer term, we expect cokers to once again become profitable because people in developing countries like China and India are buying vehicles plus demand for rail and airplane transportation continues to increase, but there are virtually no RFO fired power plants being constructed. Thus, light product demand will grow faster than RFO demand, and it is this demand growth imbalance that will ultimately cause cokers to once again become consistently profitable refinery production units.



Petcoke — a seaborne market

With its cost advantages, water is the primary transportation mode for petroleum coke, given its need to be transported significant distances to reach end consumers. The United States, the world's largest petroleum coke producer, exported over 75% of its fuel-grade production in 2011. Additionally, virtually all of the petroleum coke produced by Caribbean[2] cokers is exported. The US and Caribbean producers account for 90+% of the fuel-grade petroleum coke that is involved in seaborne trade because petroleum coke produced in other parts of the world (e.g., Europe, India) is almost always used domestically. In addition to green petroleum coke exports, 60+% of US calcined petroleum coke (CPC) production was exported in 2011.

Market update

The petroleum coke market's recent roller-coaster ride began in 2008, as energy prices sky rocketed in the period leading up to the economic crisis and collapse. Petcoke prices plummeted in late 2008 and the first quarter of 2009 as demand — especially demand by the key European cement industry — fell sharply due to the worldwide recession. Cement demand is particularly important to the petcoke market because the cement industry is the largest market for fuel-grade petroleum coke. Then, just as petroleum coke marketers despaired that prices might be heading below zero, Indian buyers began to purchase significant quantities of US Gulf Coast (USGC) petroleum coke in late first quarter 2009. Shortly thereafter, China also began to buy USGC petcoke and increase purchases of US West Coast (USWC) petcoke. This new demand from Asia put in a 'bottom' for petcoke prices and fuelled the recovery in petcoke prices in 2009 and 2010.

As 2010 proceeded, increased demand from Latin America and Turkey combined with rising steam (thermal) coal prices allowed US Gulf Coast (USGC)/Caribbean petroleum coke prices to increase, and exports to Asia declined as high ocean freight costs made it difficult for petcoke to compete against Asian stream coal. Then, in 2011 supply began to outpace demand in traditional European/Mediterranean, Latin America, and North American markets and it was once again necessary for USGC petroleum coke to go to Asia in search of additional customers. USGC/Caribbean petcoke prices had to drop to compensate for higher ocean freight cost associated with the much longer distances to Asia.

Thus, a new paradigm has emerged: when there is sufficient demand in traditional markets, USGC/Caribbean petroleum coke prices rise to levels that are uneconomic for Asian customers, but, when supply exceeds demand, USGC/Caribbean petcoke prices decline to levels attractive for Asian customers.

One might think that coal and petroleum coke prices are closely correlated because fuel-grade petroleum coke is typically used as a substitute for coal. Moreover, coal and petcoke prices bottomed in March/April of 2009, followed by stronger pricing for both commodities. While there is an apparent correlation between steam coal cost and the price of petroleum coke, petroleum coke prices do not move in lockstep with coal prices. Petroleum coke is not fungible with coal due to its higher sulphur content, inferior combustion characteristics, different ash characteristics, and various peculiarities of environmental regulations/permits.

If petcoke prices were entirely determined by coal prices, then the value ($/MMBtu basis) of petroleum coke compared to coal would be constant (i.e., a straight line); however, this is not the case[3] (see USGC/Caribbean petcoke vs. steam coal chart, above). In reality, fuel-grade petroleum coke prices are determined by supply and demand for petroleum coke operating in a solid fuel pricing environment determined by coal. To put it another way, it is possible to sell petcoke at $80/tonne when coal prices are $100/tonne, but it is not possible to sell petcoke

2. Aruba and Venezuela; Hovensa located in St. Croix, US Virgin Islands, is included in the US total.

3. The Mediterranean cement market has typically been the clearing market for USGC/Caribbean petroleum coke, so the delivered cost of South African coal into the Mediterranean is of particular importance to the USGC/Caribbean petroleum coke market.

at $80/tonne when coal prices are $50/tonne. However, there is no guarantee that petcoke can be sold for $80/tonne when coal prices are $100/tonne.

When the fuel-grade petroleum coke market is weak, petroleum coke prices tend to fall relative to coal and the value of petcoke compared to coal decreases. One can see that when the USGC/Caribbean market was at its nadir in March/April of 2009, the value of petcoke relative to coal in the Mediterranean ($/MMBtu basis) was below 40%, providing a strong incentive (60+% discount) to utilize petcoke instead of coal. Then, as the petcoke market recovered, the value compared to coal increased. In 2010 petcoke prices rose to the level where petroleum coke was no longer economically attractive for Asian customers, and USGC petcoke sales to Asia plummeted. In 2011, demand in traditional European/Mediterranean, North American, and Latin American markets was not sufficient and petcoke prices dropped so petcoke could be sold to Asia. At the beginning of 2012 USGC/Caribbean market petcoke prices staged a rally due to reduced petroleum coke production and some restocking by European cement producers. Since then, the market has been stable as reduced production has been counterbalanced by weak demand.

Transportation costs become more important as petroleum moves to more distant markets. For example, ocean freight cost can equal, or even exceed, the FOB load port price of USGC petcoke into China, India, or other distant locations. As petroleum coke prices increase, it becomes harder for USGC petcoke to compete against coal in distant markets like India or China.

For decades, Europe was the primary market for USGC petroleum coke production, and Japan was the primary market for USWC petcoke production. In 2009 the market share for Asia (excluding Japan) increased to 24% as China and India became key markets for USGC petroleum coke. Then, increased demand in traditional USGC/Caribbean petcoke markets, allowed petroleum coke prices to continue to increase. These higher prices made petroleum coke less attractive to buyers in Asia (especially India), and Asia's market share decreased to 14% in 2010. In 2011, it was once again necessary for USGC petroleum coke to be shipped to Asia to clear the market and Asia's market share increased (see 'US Green Petcoke Export Destinations' chart, right).

Venezuela petcoke key market driver

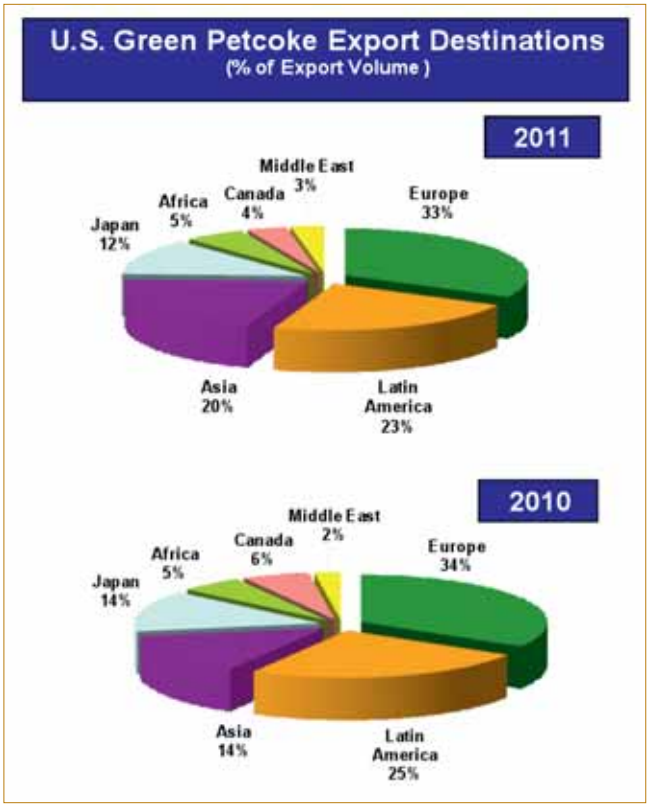
There are four projects in Venezuela — PetroMonagas (formerly Cerro Negro), PetroAnzoátegui (formerly Petrozuata), PetroCedeño (formerly Sincor), and PetroPiar (formerly Hamaca) — that produce SCO from super-heavy Orinoco Belt crude oil/bitumen. Each project has an upgrading plant, located in the Port of Jose, where coking technology is utilized to produce SCO from Orinoco bitumen. Combined, these four projects can account for 25% of the USGC/Caribbean petcoke market seaborne trade through two petcoke terminals located at the Port of Jose. For several years, these terminals performed poorly, loading far fewer vessels than they had in the past. This caused a shortfall in petroleum coke supplied to the market, which helped support prices even as European demand remained weak and US petroleum coke exports increased. Venezuelan petroleum coke tends to be lower sulphur (i.e., 4.0–4.5% S, dry basis) material, so Venezuelan exports are especially important for the lower-sulphur portion of the USGC/Caribbean petcoke market (typical petcoke sulphur ranges from 4.0–7.0%, dry basis).

It was necessary for the Orinoco upgrading projects to place millions of tonnes of petroleum coke into storage while petcoke terminal performance lagged. This massive inventory of petroleum coke could put significant downward pressure on petcoke prices if Jose petcoke terminal performance improves to the point where this petcoke inventory starts to be drawn down. Expectations are that petroleum coke vessel loadings are going to increase from 3–4 per month to 8–12 per month soon, possibly in August, due to the return of the PetroCedeño Terminal from a forced outage and the start-up of a supplemental barge to vessel floating crane loading system.

A 'wave' of petroleum coke

We forecast worldwide petroleum coke production will increase 40% by 2014[4]. Several observations can be made by looking at planned coking capacity additions:

- significant coking capacity additions are proceeding, especially in Brazil, India, and China, and we expect coking capacity additions to continue into the foreseeable future;
- significant coking capacity additions in the United States recently completed[5] or currently under construction will be coming on line during 2012 through 2013. Consequently, Jacobs Consultancy projects that US petcoke production will increase ~25% by 2014;
- two new 400,000bbl/day refineries, which include new delayed cokers in the configurations, are proceeding in Saudi Arabia to process heavy, sour Arabian crude oil. These two refineries could be the harbinger of more export-orientated refineries equipped with cokers being constructed in the Middle East; and
- coking capacity additions recently completed or being installed in Brazil, Spain, and the Middle East will displace



4. *Production increases throughout this article will be compared to 2011, unless otherwise noted.*

5. *Coking capacity additions that start-up during a year (e.g. 2011) will contribute to increased production in the following year (e.g. 2012) when they are operating for a full year.*

some USGC/Caribbean petroleum coke from traditional Mediterranean and Latin American markets.

Chinese and Indian coking capacity additions are driven by rapidly growing light product demand (gasoline, jet fuel, diesel, etc.), whereas US coking capacity is driven by refinery upgrades to handle less expensive, heavy crude oils.

Sharply lower crude oil prices in 2008 caused many Alberta oil sands projects to be delayed indefinitely or deferred. However, with the recovery in oil prices, many projects have restarted or are actively considering restarting. Many Alberta oil sands projects will blend the bitumen they produce with diluents such as natural gas liquids (resulting in a crude stream known as *dilbit*) or with SCO (producing a crude stream known as *synbit*) to produce a blended product that can meet pipeline viscosity and gravity specifications. The dilbit or synbit will be very heavy, requiring refineries to have substantial coking capacity to process the crude oil. This Canadian heavy oil is driving coking capacity additions in the northern United States — BP (Whiting, IL); Phillips66[6] (Wood River, IL); and Marathon (Detroit, MI) — and may drive more coking capacity additions in the future. The controversial Keystone Pipeline, if built, will connect the Hardisty Terminal, in Alberta, Canada, to Houston and/or Port Arthur, Texas, allowing 800,000+ barrels of heavy Canadian crude oil to flow to USGC refineries. Even with the substantial coking capacity additions in the northern portion of the United States, the US Gulf Coast will continue to be the center of US petroleum coke production, with production increasing 20+% by 2014.

Summary

In the first half of 2012, as the result of struggling economies in Europe and the US, the USGC/Caribbean petroleum coke market has been in a state of dynamic balance, wherein anaemic demand in traditional markets has been offset by sluggish production in the US. The near term future direction of the market will depend on the performance of the world's economies economies (especially cement and steel demand in the key European and Latin American markets), how refining/coking economics drives petroleum coke production, and how the start-ups of various coking capacity additions are executed. We expect a period of rapid production growth in 2013–2015, as new coker capacity starts up and production at existing cokers returns to more normal levels. New coker construction will be concentrated in the United States, Brazil, China, and India. Additionally, the Middle East will become a significant new production area. Coking capacity additions in the United States and the Middle East will likely increase demand for seaborne petcoke transportation services. As petroleum coke production rapidly increases, it may be necessary for more USGC/Caribbean petroleum coke to be exported to Asia, forcing yet another shift in where petroleum coke is transported.

6. The refinery is owned by WRB Refining LLC, a joint venture of Phillips 66 and Alberta heavy oil producer Cenovus.

About the authors

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Contributing editor to Jacobs Consultancy's *Pace Petroleum Coke Quarterly*, with in-depth background in the power sector, including experience in procurement, operations, environmental compliance, and engineering. He has been the project manager for numerous studies involving the fuel-grade petroleum coke market, environmental issues, and power generation.

Frank Wilson (Senior Consultant)
Frank Wilson brings years of experience and an in-depth knowledge of the petroleum, chemicals, and energy industries to the Carbon Group. He is a contributing author for the Pace Petroleum Coke Quarterly and is involved with single-client studies of the global fuel-grade and anode-grade petroleum coke markets. Prior to joining Jacobs, he was a Petroleum Coke Marketing Manager for ExxonMobil. DCi

Shipowners stress their role in delivering green growth

In mid-June in Rio de Janeiro, at a high level 'Oceans Day' event during the United Nations 'Rio+20' Summit on Sustainable Development, the International Chamber of Shipping (ICS) presented the views of the world's merchant shipowners on delivering green growth.

On behalf of ICS, the principal international trade association for shipowners, representing over 80% of the world merchant fleet, ICS Regulatory Affairs Director, David Tongue, told Rio + 20 delegates: "Shipping carries about 90% of world trade but is already by far the greenest form of commercial transport producing between 40 and 100 times less CO_2, per tonne of cargo moved one kilometre than cargo aviation and significantly less than trains and trucks. Shipping is the only industrial sector already to be covered by a binding international agreement for the further reduction of CO_2 emissions, which will deliver a 20% improvement in energy efficiency by 2020."

He added: "Other international sectors concerned with the oceans could learn a great deal from the way in which the UN International Maritime Organization successfully regulates shipping."

ICS used the UN Summit to explain that without the low cost of transport provided by modern shipping, the movement of raw materials and energy, in bulk, to wherever they are needed, and the transport of manufactured goods and products between the continents would simply not be possible.

ICS advised that the low cost and efficiency of maritime transport has facilitated the movement of much of the world's industrial production to Asia and other emerging economies in Latin America, which underpins the massive improvements to global standards of living that most people have enjoyed in recent decades. ICS explained that the shipping industry had over 100 years' experience of international governance of its activities, and that the regulatory framework provided by IMO has served the oceans well.

By way of example, ICS reported that the number of significant oil spills has decreased from 233 per year in the 1970s to just 31 per year during the past 10 years, while the volume of maritime trade had more than tripled during the same period. This is because IMO environmental regulations are genuinely implemented and enforced on a global basis through a combination of flag state and port state control.

It was explained that one of the central pillars of IMO regulation, which is ratified and enforced by over 150 nations and applies to 99% of the world fleet, is the MARPOL Convention.

MARPOL comprehensively regulates all aspects of potential sources of ship pollution, ranging from oil and chemicals to atmospheric pollution such as sulphur.

ICS advised that as a result of recent IMO regulation, the sulphur content of ships' fuel will be cut dramatically in emission control areas in 2015, and throughout the world's oceans with effect from 2020. This is in addition to the new rules adopted to reduce shipping's CO_2 emissions that will come into force in January 2013.

It was explained that IMO has also adopted international Conventions governing issues such as ballast water management to prevent the movement of marine micro-organisms that can cause damage to local ecosystems.

ICS stressed that because shipping is an inherently global industry — indeed the first truly global industry — it is vital for governments to recognize the importance of uniform international rules. If different rules concerning ship operation or environmental protection were to apply at different ends of a voyage there would be chaos, reducing the smooth flow of global trade in a manner that was safe, clean and efficient.

ICS suggested that agreement on the need for government support for IMO, with its proven track record of preventing the pollution of the oceans by ships, was vital and should be one of the main outcomes of the Rio +20 Summit.

Wreck of 'RENA' underlines need for passive safety measures

The salvage operations on the container ship *Rena*, which sank on 5 October last year off the Astrolabe Reef in New Zealand, were completed in the middle of June, after more than 8 months of work by the salvage teams. It took 254 days to remove the pollutants and the containers from the wreck. This period could have been halved if the ship had been equipped with Fast Oil Recovery Systems (FOR Systems), one of the major technologies of the maritime passive safety industry.

When pre-installed on board ships, those safety system circuits enable the holds used for transporting goods and the fuel tanks to be secured in order to standardize salvage operations. Thanks to the plans and diagrams that show the details of these circuits and the connectors placed directly on the deck, salvage teams can easily access the tanks and remove pollutants, and thus refloat the ship more quickly. FOR Systems therefore help to save considerable amounts of time and money.

Gilles Longuève, General Manager of JLMD Ecologic Group stated, "The risk of accidents at sea has never been so high: the size of ships is increasing and traffic is becoming even denser. Given the situation it is essential that shipowners, shipyards, insurers and regulators take into account the aftermath of an accident.

Today there are simple solutions. If the *Rena* had been equipped with maritime passive safety equipments such as FOR Systems, managing the consequences of the emergency would have been significantly easier. It would have avoided New Zealand having to experience its worst ever pollution and saved the authorities and the owners of the *Rena* the tens of millions of dollars they had to spend on complex salvage operations."

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Seagull security training gets NMA Flag State approval

Computer-based training (CBT) specialist, Seagull, has been awarded Norwegian Maritime Authority (NMA) approval for a new, comprehensive ship security training package that is in full compliance with the Manila amendments to the STCW Convention and Code. These new security training courses will be available during September of this year.

The revised STCW, which came into force in January this year, introduces more stringent requirements for onboard security training, with particular provisions designed to ensure seafarers are properly trained in case their ship comes under attack by pirates.

Seagull has issued more than 10,000 Ship Security Officer certificates since 2003 and these SSO certificates remain in force until 1 January 2017.

Anders Brunvoll, Seagull Senior Course Instructor, says: "Getting NMA approval is very important for us, as we have in the past issued Ship Security Officer (SSO) certificates on behalf of NMA, the Norwegian flag state. With the new Security On Board training system we offer three courses and, with continued NMA backing, shipowners can be assured that certification through these courses will demonstrate the proficiency, as well as the competency, of their seafarers in security matters."

The new courses have also been certified by classification society DNV through the SeaSkill programme. "This was a challenging process, which effectively required us to start again from basics and produce security training which has been fully checked by DNV against the revised STCW," adds Brunvoll.

Under the Manila amendments to STCW, all seafarers need approved ship security training, varying according to the level of responsibility of the seafarer. All seafarers must receive generic security awareness and familiarization training, while those with specific security related roles need appropriate training for their role. To ensure compliance, Seagull has developed two new CBT training levels — Level 1, covering security-related familiarization and awareness, for all seafarers and Level 2 for seafarers with designated security duties. It has also updated its existing Ship Security Officer (SSO) course, which is the designated Level 3 of the Seagull Security On Board training system, in line with the Manila amendments.

Level 1 includes two e-learning modules; one on security awareness and one on piracy and armed robbery. These are backed up by a work book with practical exercises and a security familiarization checklist. Level 2 comprises an onboard course for personnel with security duties, which includes the same two e-learning modules on security awareness, and on piracy and armed robbery. This is supported by a workbook with practical exercises.

Level 3 training will comprise the same two modules as Level 1 and 2, CBT 115 Security Awareness and CBT 156 Piracy and Armed Robbery, with the addition of a specific SSO e-learning module and workbook. This will be delivered through the CBT 121 Ship Security Officer course.

Brunvoll adds: "A key concept of the Seagull Security On Board training is that seafarers will be able to start at any of the three levels, depending on their position and duties onboard. If required they can then easily move up to a higher level, without repeating any of the e-learning modules they have already taken. The training is also designed so that seafarers are more or less obliged to familiarize themselves with the particular security requirements of the vessel they are on and the company employing them."

The new NMA-approved Security On Board training courses will be released in the third quarter of 2012. In the meantime Seagull's existing SSO course remains valid and any certificates issued based on this course will be internationally accepted until January 2017.

ICS calls for resumption of OECD shipbuilding talks

At the Organisation for Economic Co-operation and Development (OECD) in Paris on Thursday 21 June, the International Chamber of Shipping (ICS) called on governments to resume negotiations on a new global agreement to eliminate market distorting measures from shipbuilding.

Speaking to governments attending an important OECD Working Party, ICS, on behalf of the world's national shipowners' associations (which collectively represent more than 80% of the world merchant fleet) explained that it was a source of great disappointment that the OECD had, three years earlier, terminated negotiations on a new agreement to eliminate subsidies and market distorting mechanisms in the shipbuilding industry.

This was primarily due to differences between the European Commission and Asian governments about the treatment of pricing of new ships in any new agreement, the latter wishing instead to concentrate on the elimination of subsidies, a position that was supported by ICS.

ICS believes that current poor markets are demonstrating just how seriously damaging the oversupply of ships has been to shipowners' revenues, with many companies now struggling to meet their operating costs.

ICS reiterates concern about the overcapacity that exists in many shipyards, with an almost obsessive commitment to market share being displayed by the three major shipbuilding nations: China, Korea and Japan, where 90% of world tonnage is built.

ICS Director of External Relations, Simon Bennett remarked: "Even if shipyards go bankrupt, it is likely that in many cases their governments will step in so that they can continue to produce ships which few people want, other than speculators who may be foolishly tempted by knock down prices."

ICS welcomes the fact that the OECD Working Party on Shipbuilding is continuing to meet, in order to explore further what constitutes market distortion and the means of achieving greater transparency on government support measures.

ICS hopes that the OECD Working Party will work towards the goal of encouraging the resumption of formal negotiations on a new global agreement as soon as possible.

ClassNK releases world's first Harmonized CSR software

In early July, ClassNK Chairman and President Noboru Ueda unveiled the world's first software package for use with the new IACS Harmonized Common Structural Rules (CSR) for bulk carriers and oil tankers, which were released at the beginning of the month. The release makes ClassNK the first classification society to release Harmonized CSR-compliant software for use by the maritime industry.

IACS' new Harmonized CSR have been widely anticipated as the next step in shipbuilding requirements, not only unifying the existing CSR for bulk carriers and tankers, which were introduced in 2006, but also incorporating the IMO's Goal Based Standards (GBS) with the aim of further rationalizing shipbuilding regulations. In order to incorporate input from industry groups and end-users, IACS released the first draft of the rules for public comment on 1 July 2012.

ClassNK Executive Vice President Dr Takuya Yoneya, who oversaw the class society's development of the new software, says that the Harmonized CSR will have a major impact on shipbuilding and design: "As a new set of global requirements for the industry, new software will be essential for yards and designers to efficiently test and implement the new rules. By releasing this new software for use with the first draft of the new Harmonized CSR, we hope to make it easier for yards and designers around the world to familiarize themselves with the new requirements, as well as make use of the rules for new ship designs."

The new software is not just an update but a complete renewal of ClassNK's existing CSR software, which is widely used at shipyards around the world. "Our goal with this new software," says Yoneya, "was to incorporate not only our extensive experiences with the CSR, but also the insights and opinions of leading shipyards and designers in the development process."

As a result, in addition to strengthening features included in ClassNK's existing software, the new Harmonized CSR software provides brand new functions such a 'Case Study' tool, which allows users to rapidly assess the effects of changes to the parameters of initial ship designs, as well as a new function to automatically generate 3-D models for hull structural analysis directly from rule calculation data.

The new software is not only able to make use of data produced by existing CSR software, but has also been designed to smoothly integrate with all major 3-D CAD/CAE software systems and ship performance calculation software, making data transfer between systems an easy process.

"This new software is not just a calculation tool, but a total design support system," says Yoneya. "Thanks to the new features and tools included, we are confident that this software will not only support the development of safer ships, but also improve design quality, and increase the speed of the ship design process. In order to support the implementation and testing of the first draft of the Harmonized CSR, ClassNK is providing its new software at no charge to shipyards and designers around the world.

Sea Marshals expands operations centre

Sea Marshals, the international maritime security specialist, has expanded its UK operations centre and introduced the latest tracking technology for the benefit of the vessels under its protection.

The company has transferred its operations centre to larger premises in Cardiff to accommodate its growing team of security consultants. The unit is staffed year-round, 24 hours per day, seven days a week, by expert personnel, most with naval or army backgrounds and experience in planning and tracking.

Sea Marshals has also introduced a custom-built computerized system to facilitate direct contact with its teams onboard vessels in high risk areas like the Gulf of Aden. The new system allows for automated location tracking of vessels, weapons and personnel.

Through co-operation with regional and international authorities, Sea Marshals is able to give its onboard teams and captains live piracy alerts with range estimation and threat levels.

Advanced notification systems, monitored 24 hours a day, enable operations centre staff to warn ship owners and operators and give route guidance.

Thomas Jakobsson, chief of operations for Sea Marshals, said: "This bespoke system was developed specifically for Sea Marshals. It is really world class software developed in-house to meet the business and customers' needs. We are delighted that it enables us to provide first-rate communications between our operations centre and vessels under our protection, enabling us to keep captains up to speed with updates of threats in the area their vessel is transiting in."

Sea Marshals Ltd operates a complete maritime security service using fully qualified armed and unarmed security teams in the Red Sea, Gulf of Aden, Indian Ocean and Gulf of Oman.

The company uses only government-approved weapons of EU origin which the new computer system tracks by the serial number. Weapons are selected for each mission based on regulations in the countries where embarking and disembarkation will take place. All embarkation and disembarkation points are approved by local officials and supported by local governments. To achieve P&I club and flag state approval, the company supplies the serial number of the weapons it plans to use in good time before embarking.

Cargo movements affected by freak weather over the last year

Dave Alberts, director at Crimson & Co, a major UK end-to-end supply chain consultancy, has commented on the effects of the recent severe weather worldwide.

"Last year's Tsunami in Japan wreaked havoc on businesses and supply chains alike, with widespread affects across the globe. Now the floods in Thailand have caused two-thirds of the country to be affected, initiating factories and supply chains to face disruption as the severe flooding impacts Thailand's economy. Companies such as Western Digital and Honda Motor have been forced to stop production in central Thailand due to disruptions to local supply chains and some Japanese car manufacturers such as Toyota and Nissan are also experiencing production disruptions. Sony temporarily closed its facility in Ayutthaya and Seagate Technology has also said its production of hard drives in this quarter will be effected by supply chain disruptions, and that supply will be constrained until at least Q4.

"Clearly there are disadvantages to sourcing products from countries that suffer from extreme weather conditions, especially when supply is so geographically focused. Astoundingly, a quarter of the world's hard drives come from a relatively concentrated area around Bangkok!

"In other sectors the weather is also already affecting the resilience of global supply chains. Marks & Spencer, Starbucks and The Body Shop are just a few examples of companies who have contributed to research on how flooding, drought and other extreme weather conditions are threatening supply of particular goods.

"Unfortunately, there is no way in which to fully prepare for such natural disasters as they are unexpected. However, the frequency at which these occur validate that contingency plans must be put in place wherever possible and organizations must attempt to protect product supply through efficient, planned out strategies and best practices. Research into the effects is a good start and companies participating in this are clearly at the forefront of successful and adaptive supply chains.

"Is it all linked to global warming? Well we could all break into small groups to discuss. But in board rooms around the globe supply chain resilience is back on the agenda as 'business as usual' status has yet another threat."

About Crimson & Co:

Established in 2003, Crimson & Co is a fast-growing supply chain consultancy with a strong reputation for developing and implementing end-to-end supply chain solutions across the globe.

Crimson & Co helps companies to identify their key business needs and design their supply chains accordingly. Crimson & Co's powerful supply chain improvement approach identifies performance weaknesses and prioritizes improvements, based on process benchmarking. This prepares the ground for major IT implementations or acquisitions, driving longer-term continuous improvements, and essentially, ensures alignment of the supply chain with overall business strategy.

Sometimes these solutions might involve existing infrastructure, such as increasing the productivity of a production line or throughput of a warehouse, while other solutions might include infrastructure changes. The overriding need, however, is always to look at the supply chain as an end-to-end entity, even when the focus for change is in one specific area.

International Paint embraces social media

International Paint's Marine Coatings business is bringing more than a century of expertise to new audiences as well as enhancing its engagement with customers and stakeholders after significantly expanding its online presence.

In response to the evolving information landscape and the shipping industry's increasing use of social media, the business has expanded its outreach to customers and wider stakeholders by consolidating its existing presence on YouTube and adding communities on Facebook and Twitter to engage with the industry on key issues, share visual and video content and provide an insight into its organization.

Cathy Stephenson.

Cathy Stephenson, International Paint's marketing communications manager said, "We've been active in digital communications for some time now and see social platforms as a natural extension of this activity. This move offers an unparalleled opportunity to communicate with our customers and stakeholders in real time, to listen, to learn and better understand their operational needs whilst bringing the maritime industry closer to us by inviting them into our organization."

International Paint's parent company, AkzoNobel, has already established a significant social media presence that has generated acclaim from the global online communications and marketing community for its innovative and informal approach.

Marine Coatings personnel will also engage directly through social media channels. In addition, live interactive Q&A sessions will be hosted to encourage discussion and debate with multiple facets within the shipping industry to support development and raise awareness of the key challenges that ship owners and operators face.

Stephenson concluded, "The benefits of social media as a positive information channel are significant and far-reaching. For an industry going through such significant change there is a real need to continually engage and debate on the key challenges our customers face, as well as ensuring a transparency of information in order to drive positive progression."

Bilge level switches — never compromise on safety

Bilge level switches are a safety critical component for the detection of liquid in dead spaces and voids that are rarely visited or inspected by the crew. They need to be able to withstand years of installation in difficult environmental conditions, yet operate immediately and reliably should a rising liquid level indicate a leakage or flooding hazard.

When considering products such as these, it would be easy for a ship builder or owner to try and make economies by using cheaper devices, often constructed with poor quality materials and construction. PSM has always argued that this approach both comprises safety, and is a false economy as maintenance and replacement costs will always exceed those of installing 'the right device first time'.

The PSM BLS 9200 Bilge Level Switch is designed, manufactured and approved to meet and exceed the requirements for severe service applications on all classes of marine vessels and offshore installations.

Key benefits that the BLS 9200 offer are:

- ❖ rugged all-stainless steel design with EPR cable resistant to seawater, fuel oil and hydraulic fluid ensures reliable operation over years of service;
- ❖ compact in size with a mechanical mounting using a two-bolt mounting bracket means that installation and commissioning is simple and fast;
- ❖ self-draining cage design prevents fouling of the float and interference with operation from obstructions or floating debris in the bilge, as well as protection from false-switching;
- ❖ integral switch test lever allows full testing of the float movement and switch functionality ensures routine safety tests can be carried out for peace-of-mind; and
- ❖ normally-open or normally-closed operation and user-selectable cable lengths ensures the BLS 9200 can be quickly delivered against each customer's exact requirement.

Many major shipbuilders and offshore rig construction companies also agree with the PSM 'safety first' message and now specify the BLS 9200 as standard fitment for all their newbuild and refurbishment projects.

About PSM

Established for over 30 years, PSM Instrumentation is a specialist in the design, manufacture and supply of advanced marine control instrumentation and marine protection systems for the marine transportation industry. PSM offers a range of application solutions for designers, shipbuilders and end-users, to ensure vessels operate efficiently and reliably and are compliant with legal, safety and environmental regulations. Main application solutions include:

- ❖ **ClearView:** award-winning monitoring and control systems for oily water separators, oil record book automation and bunker fuel management;
- ❖ **TankView:** marine tank level monitoring and supervision systems for ballast, cargo, service and bunker fuel oil tanks; and
- ❖ **BulkSafe:** water ingress detection systems and water level alarm systems to protect bulk carriers in accordance with SOLAS regulations

PSM products carry all required type approvals from the main leading marine societies, in addition to many country specific approval standards. PSM is approved to BS EN ISO 9001:2000.

Graig takes delivery of first of Handysize pair

UK, Cardiff-based Graig Group has taken delivery of the 35,000dwt Handysize bulk carrier *Graig Cardiff*, the first of two *Seahorse 35* class vessels building for Graig and partners at Jiangdong Shipyard, Wu Hu, China.

The *Graig Cardiff* is entered into the Lauritzen Bulkers pool and is currently on her maiden voyage from Shanghai to Argentina. Her sister vessel, the *Graig Rotterdam*, is due for delivery later this year. Both vessels have been constructed under the supervision of Graig China Limited and will be managed by Graig's ship management divisions in Cardiff and Shanghai. Both vessels will operate with a full Chinese crew.

Hugh Williams, CEO, Graig Group, says, "This delivery is a significant step in our phased reinvestment into shipowning. We are confident that the design is economical and practical for charterers, we know it is well built because we supervised it ourselves and we are confident in our Chinese crewing and management operation which are delivering excellent results in service for the Chinese-owned vessels we already manage. We believe this and its sister vessel will deliver value for money in the charter market."

The *Graig Cardiff*'s main parameters are economical and efficient operation, environmental friendliness and maintenance, safety, loading flexibility and shallow draught. The cargo capacity is divided into five flush double skinned cargo holds with wide hatches and no hopper tanktops, ensuring easy access and cleaning. The hatches are served by four 30 tonne SWL wire-luffing cargo cranes and remote-controlled grabs.

Short turn-around time is achieved by effective cargo hold cleaning by portable washing machines. Outlets of water and compressed air are arranged in all cargo holds at tanktop-level. A permanent washing water return line is arranged in each cargo hold at tanktop level. Two cargo hold washing water holding tanks arranged for temporary storage enable cargo hold cleaning in sensitive and restricted areas.

The complete double-skin configuration ensures easy access to structural inspection, even when the vessel is loaded.

A slender after body and a high efficient propeller ensures optimal performance with minimum fuel oil consumption. A vertical stem is designed to improve the fuel efficiency in adverse weather conditions. Frequency-controlled SW cooling pumps reduce power consumption by 70% and waste heat recovery on two of the three generators obviates the need to run the boiler when slow steaming.

STATISTICS

Length overall:	180m
Breadth:	30m
Scantling draught:	10.1 m
DWT at scantling draught:	35,000 tonnes
Engine:	MAN B&W 5S50MC-C engine giving a loaded service speed of 14 knots consuming 25 tonnes per day.
Crew:	21

The vessel is DNV class and flies the UK flag.

Graig has active ship management divisions in Shanghai and Cardiff and has considerable experience working with Chinese shipyards. It has built for its own account or advised on and supervised over 130 ships in Chinese yards and currently manages a number of vessels built in China for different investors.

The Graig Group is a broad-based international shipping services, ship owning, and offshore group delivering technical ship management and commercial ship management, newbuilding supervision, offshore support services, expert consultancy, dry-dock management, ship inspections, lay-up services, ship design, ship owning joint ventures and ship finance to global clients who appreciate personal service.

Graig has been building, managing and owning ships since 1919. Today it provides technical and commercial management and crewing for a mixed fleet of vessels on behalf of a number of owners and banks and has supervised over 130 newbuildings for itself and major shipowners. Graig provides technical consultancy and management support services to two major banks with a financed fleet of over 100 vessels and also to a number of flag states. It develops innovative designs such as the Diamond bulk carriers and the Marlin fuel-efficient container ships. It can source yards and finance for all vessel types and provide newbuilding supervision and follow up with in service management.

Graig employs a global maritime workforce drawn from the UK, China, the Philippines, Vietnam, India and Russia and has offices in Cardiff, London, Oslo Shanghai and Hong Kong. Graig Group staff bridge the gap between sea and shore, between east and west to bring the best in innovation, service and partnership to the global shipping industry.

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Grabbing the attention of the shipboard crane market

Jay Venter

Credeblug grabs – designed to guarantee a long working life

Credeblug has for a long time been heavily involved in the bulk handling market. There are many examples of its grabs in successful operation in 52 countries, where the company's products have become a quality product reference.

In the last few years the company has completed its international expansion, and in 2011 it achieved an export percentage of 70%; it expects its international turnover to be as high as 80% in 2012. Blug's products have capacities that range from 50 litres to 45m^3. The company is one of the few worldwide to offer rope-operated, hydraulic and electro-hydraulic or motor grab models. Blug's solutions range from single-rope operated radio controlled and automatic grabs, to four-rope or electro-hydraulic high volume grabs that fit any crane, material and production requirements.

Product innovation

One of the main challenges for current port activity is to increase as much as possible grabs' capacity to achieve the best productive ratios and the fastest return on investment. In recent years Blug, products have been developed using the latest 3-D and Finite Elements Analysis in order to optimize the design of the company's grabs, and to minimize dead weight. The application of high strength materials (with minimum yield strength of 700MPa) allows for a reduction in the thicknesses of the structure and pulley blocks without penalizing reliability. Blug grabs also include abrasion-resistant steel that prevent fast wearing of arms and components that are in direct contact with abrasive materials (hardness up to 600HBW).

Blug grabs are designed to guarantee a long working life and low maintenance requirements, giving priority to reliability in tough working conditions. Their modular conception represents a big advantage as the pulleys' block system can be dismounted, and interchangeable between both references so that maintenance service and spare parts management is significantly improved.

The current market situation also demands fast loading-unloading cycles to minimize docking costs. That's why Blug grabs are always designed giving priority to reducing the time of the opening and closing operations by optimizing fold reeving system.

The company's ecologically friendly range has been specially developed during the last years as efficient use of electricity has become vital to reduce customers' operating costs and the environmental impact of the grabs. Blug's electro-hydraulic range include as standard a variable-flow piston pump operated hydraulic unit. This kind of system adapts and optimizes the grab's continuously developed power during opening and closing operations and reduces the electrical requirement by more than

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Single Line Clamshell Bucket – Model PLSLR-1

40%, comparing it with fixed flow hydraulic systems. According to Blug's estimations, based on certified measurements of its grabs' electricity usage, 25 tonnes of CO_2 emissions are saved per medium-size grab each working year.

Grab searcher and recent orders

Blug's activity is not only focused on developing its products and technology, but is also concerned with giving the customer good service before and after ordering a grab.

That's why Blug has developed a practical web tool to perform fast product searches and grab capacity calculation, just by defining material and crane data which is available on its web page.

In the last few months Credeblug's activity has been related to scrap, biomass and cereal handling applications, providing six 8m³ capacity orange peel grabs for the Mexican steel market industry and three more 10m³ capacity cereal handling clamshell grabs for the Kenyan market. Some important orders related to coal and biomass handling grabs for African and European port market will be manufactured in the next few months.

Cargotec cranes and hatch covers for China bulkers

A new generation of 35,000dwt bulkers will feature MacGregor variable frequency drive cranes and folding-type hatch covers from Cargotec.

A Chinese state-owned shipyard has ordered MacGregor variable frequency drive cranes and folding-type hatch covers for Greek bulk shipping operator Ariston Navigation's six new generation 35,000dwt bulkers. The contract is booked into Cargotec's second quarter order intake. Deliveries are scheduled for 2013 and 2014.

Ariston Navigation Corporation, part of the family-owned Xylas Group, has ordered a series of 35,000dwt Handysize Seastallion vessels from the shipyard. New ships have been designed with a versatile specification and are planned for worldwide trade.

Each will feature folding-type MacGregor hatch covers and four fully electrically-operated variable frequency drive (VFD) MacGregor wire-luffing bulk-handling deck cranes, each with an SWL (safe working load) of 30.5 tonnes at a maximum outreach of 26m.

Ariston Navigation believes that the early involvement of key suppliers is important for delivering vessels fully optimized for their designed functions. "We involved Cargotec as well as all suppliers of critical equipment at the very early stages of our project," said John Xylas, CEO of Ariston Navigation.

The company also sees significant advantages in sourcing major items from a single supplier. "Absolutely: the lower the number of makers, the more efficient the communication in the project," Xylas continued.

Cargotec improves the efficiency of cargo flows on land and at sea — wherever cargo is on the move. Cargotec's subsidiary brands, Hiab, Kalmar and MacGregor are renowned suppliers of cargo and load handling solutions around the world. Cargotec's global network is positioned close to customers and offers extensive services that ensure the continuous, reliable and sustainable performance of equipment.

SENNEBOGEN 880 on the High Seas

The SENNEBOGEN 880 as ship mounted machine - an extremely high-performance and effective solution.

In matters relating to hydraulic engineering, La Dragaggi s.r.l. is the first port of call and one of the most important companies in Venice.

With modern machines and several ships, La Dragaggi covers a broad range of uses, including all kinds of dredging work, sand and stone extraction and filling for beaches or artificial islands and much more. The company is active throughout Italy and beyond.

To reduce the time it takes to carry out the various tasks, La Dragaggi s.r.l. recently decided to replace an old crawler excavator with a new SENNEBOGEN 880. This machine was mounted as a permanent fixture on the ship *Gino Cucco*. The 880 became extremely popular in the team within a short period of time.

The gigantic machine offers outstanding performance, is easy to operate and highly efficient. With a 29 m special equipment with straight jib provides the necessary grab depths with impressive loads. The machine is needed every day for demanding hydraulic engineering tasks and is specially designed and built to meet these challenges. The sales and service partner Cesaro Mac Import won an important customer with La Dragaggi and the company now has a highly effective solution in place in the form of the SENNEBOGEN 880 as a ship mounted machine.

Atlantic equipment celebrates 10 years as a top SENNEBOGEN dealer

Recent sales success rewards Atlantic's pioneering work to establish 'simple' material handlers as the industry standard in America.

In scrap handling facilities from coast-to-coast, the distinctive green machines from SENNEBOGEN are one of the industry's most familiar sights, loading trucks and barges, feeding shredders, stacking bales etc.

Today, SENNEBOGEN is recognized everywhere as a major supplier of purpose-built material handling equipment. However, ten years ago, it was a different story.

"When we began selling SENNEBOGEN, we were taking in a machine that nobody had ever heard of," recalls Garland Miles, sales manager of Atlantic Equipment & Supply Inc., based in Hampton, VA, USA. "Sales were not easy. We were going to the expense and the time to basically give customers a machine and hope we could convert it into a sale once they could see how it worked and why we were promoting it to them."

In 2012, Atlantic has been celebrating its 10th year with SENNEBOGEN after winning the manufacturer's 'Dealer of the Year' award as the top selling distributor in 2011.

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Constantino Lannes, President of SENNEBOGEN LLC, said, "It's a pleasure to have this opportunity to recognize the great work Atlantic Equipment has been doing for us for so many years. They show what can be accomplished if you develop and serve the territory well."

Rooted in equipment service and repair

Jim Smelgus, President of Atlantic, founded the firm as an equipment repair and service business more than 20 years ago. When Erich Sennebogen arrived from Germany looking for someone to help launch his family's material handlers in America, Smelgus' focus on service and parts dovetailed perfectly with the company's blueprint for long-term success.

"These weren't the first true material handlers we had seen," says Smelgus. "But most scrap yards were still using cable cranes and antiquated excavators that were converted with some kind of grapple. Being first doesn't always mean better! The first line of material handlers to come here failed because of service."

Atlantic entered the equipment sales business with customers' confidence that Smelgus and his team would stand behind the product. SENNEBOGEN's plan was to reinforce that confidence with reliable parts supply and excellent application support. Smelgus notes that SENNEBOGEN's nationwide sales success is still rooted in its commitment to the service side of the business. After establishing a base in Charlotte, NC, SENNEBOGEN built a 54,000ft^2 parts warehouse and training facility in the nearby town of Stanley. Recently, Lannes announced expansion plans that will nearly double its size to 100,000ft^2 by the end of 2012. "What they have done to improve the product in just the past five years has been phenomenal," Smelgus says. "It just goes to show you that they are very committed to the North American market and they have listened carefully to both the dealers and their customers. Through that, you can see why so many equipment customers have become SENNEBOGEN customers."

Support leads sales growth

According to Garland Miles, the second key point in SENNEBOGEN's growth strategy was to avoid growing too fast. "Erich Sennebogen's game plan from the get-go was to focus on quality and service. He didn't start off dumping machines with low-ball prices, he did it the old fashioned way: by proving the machine was a good one." The company set a policy that it would not sell a machine until a servicing dealer was in place locally and the complete parts list was on the shelf.

The Atlantic team took an active part in helping SENNEBOGEN refine its programme for the US market. Smelgus' fluency in German helped to establish a close friendship with the founder of the family firm, the late Erich Sennebogen Sr. "Erich Sr. was very personable and as down-to-earth as anyone could be. He was very open-minded to our experience with the material handling industry in the US, so it was a learning experience for both of us."

A winning strategy

The gamble ultimately paid off as SENNEBOGEN emerged as a highly trusted brand, not only in America's scrap yards, but in river ports, waste handling, mills and forestry applications as well. "The scrap business is a real fraternity," Miles observes. "If one guy does something, the others know about it; word just spreads.

"SENNEBOGEN was an unknown then but once when you got around to telling them it was a non-computerized system, that's when they stood up and took notice," he continues. "Especially when the customer had a shredder in the yard. For other machines with a computer onboard, all the fluff would just make a mess of the connections and the normal mechanic had no way to fix them. The simplicity of SENNEBOGEN means that our techs can at least walk their mechanics through some of the less complicated issues in order to keep them operational. With a few minutes on the phone, we can get them up and running, then they turn around and make us look good to the people buying the equipment."

Repeat sales sustain growth

The foundation that Atlantic helped to build with quality and service led the dealership to its highly successful sales year in 2011. Serving a territory that includes Maryland and Virginia, Atlantic still finds new opportunities to expand its customer base. "Most of those early prospects in the scrap business that didn't get on board with us ten years ago have since become SENNEBOGEN customers," says Miles. "Since most of the scrap processed here is going to export, up to 90% of it, we recently took on container tilters so we can deliver a complete top-loading solution for yards shipping through the Port of Baltimore.

At this point in Atlantic's sales strategy, Smelgus and Miles agree that, "… repeat business is our claim to fame…" With commitment to service as their cornerstone, Atlantic and SENNEBOGEN look forward to seeing every sale from the past turn into satisfied customers for the future.

About SENNEBOGEN

SENNEBOGEN has been a notable name in the global material handling industry for over 60 years. Based in Stanley, North Carolina, within the greater Charlotte region, SENNEBOGEN LLC offers a complete range of purpose-built machines to suit virtually any material handling application. Established in America in the year 2000, SENNEBOGEN LLC has quickly become a leading provider of specialized equipment solutions for recycling and scrap metal yards, barge and port operations, log-handling, transfer stations and waste facilities from coast to coast. A growing network of distributors supports SENNEBOGEN LLC sales and service across the Americas, ensuring the highest standard of professional machine support and parts availability. DCi

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Moving cargo along Hwy H_2O

Great Lakes & St Lawrence Seaway System remain vital link for North American bulk

Stretching more than 2,340 miles (3,700km) from the Atlantic Ocean to the heart of North America, the Great Lakes/St Lawrence Seaway System is one of the world's greatest and most strategic commercial waterways.

It is also a highly competitive transportation route serving the US and Canada's largest interior markets.

The Great Lakes alone comprise a one-of-a-kind, freshwater 'Inland Sea'. They cover 95,170 square miles of water surface, about 61,000 in the US and 34,000 in Canada, and define a 10,000-mile coastline, which is longer than the entire US Atlantic seaboard. The system is used by a wide variety of vessel types including Seaway-size ocean ships from all over the world, self-unloading bulk carriers up to 1,000ft (305m) trading exclusively within the Great Lakes, and tug/barge units linking the Great Lakes/Seaway System to the US inland waterway reaching all the way to the Gulf of Mexico.

Opened to navigation in 1959, the St Lawrence Seaway has moved more than two billion metric tonnes of cargo in its four-plus decades, with an estimated value of US$400 billion. About 50% of this cargo travels to and from overseas ports, especially Europe, the Middle East, and Africa. The remainder is US and Canadian coastal trade.

Construction of the 189-mile (306km) stretch of the Seaway between Montreal and Lake Ontario was recognized as one of the most challenging engineering feats in history, overshadowing the Suez Canal built in 1869, and even the Panama Canal built in 1914. Seven locks were built in the Montreal–Lake Ontario section of the Seaway, five Canadian and two US, lifting vessels to 246 feet (75 metres) above sea level.

The 28-mile (44km) Welland Canal is the fourth version of a waterway link between Lake Ontario and Lake Erie first built in 1829.

The present canal was built in 1913, deepened in the 1950s as part of the Seaway project and further straightened in 1973. Today its eight locks, all Canadian, lift ships 326 feet (100 metres) over the Niagara Escarpment.

Passage to Lake Superior, at 602 feet (183 metres) above sea level, is gained through the Soo Locks on the St Mary's River.

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The St. Lawrence Seaway Management Corporation
Corporation de Gestion de la Voie Maritime du Saint-Laurent

HWY GO H_2O

CSL orders two new bulkers as part of fleet expansion

On 19 June, Canada Steamship Lines (CSL), a division of The CSL Group, announced a firm order for two new gearless bulk vessels, bringing to six the number of *Trillium*-class ships to be built as part of its major fleet expansion programme for the Great Lakes market.

The two new vessels will be built at the Yangfan Shipyard in Zhejiang Province, China, and will enter service in the spring of 2014. CSL also has options for the construction of two additional gearless bulk vessels for delivery during the 2014 shipping season.

"These new gearless bulkers continue the momentum created by the construction of the *Trillium*-class self-unloading vessels and further position CSL among the most efficient, reliable and environmentally sustainable fleets in marine transportation," said Dan McCarthy, CSL vice president of marketing and customer service. "Investing in sustainable technologies makes good business sense. It creates a competitive edge with state of the art operational and energy efficiencies. This investment in our fleet will help meet the growing needs of our customers and will ensure superior service for years to come."

The 36,100dwt bulkers will be Seaway max size and feature IMO Tier II compliant main engines with the latest environmental and safety systems.

Canada Steamship Lines is a division of The CSL Group, the world's largest owner and operator of self-unloading vessels. Headquartered in Montreal with divisions based in the United States, the United Kingdom, Norway, Singapore and Australia, The CSL Group delivers more than 80 million tonnes of cargo annually for customers in the construction, steel, energy and agri-food sectors.

Trillium Class is a trademark of The CSL Group Inc.

Seaway cargoes are borne both by ocean vessels flying flags of maritime nations around the world, and by Canadian vessels specialized for the trade. The US-flag Great Lakes fleet is almost exclusively employed in trades within the Lakes.

Highway H2O

Highway H2O is an alliance of transportation stakeholders in the Great Lakes/Seaway System region, working to develop business and deliver greater awareness about the System locally and internationally. Working with its members and partners in a stewardship capacity, Highway H2O leverages its collective knowledge about the System to offer innovative services and incentive programmes to ensure the System remains a competitive gateway into the future.

The Hwy H2O logo on a sign at a lock at Port Weller, St. Catharines, Regional Municipality of Niagara, Ontario, Canada.

Prevalent Seaway trade patterns include:

- upbound (westward) movements of general cargo, including semi-finished steel in the form of slabs, coils, beams and other products, from overseas producers;
- upbound movement of iron ore from mines in eastern Canada; and
- downbound (eastward) shipments of export grain by Canadian bulkers to transshipment points on the lower St Lawrence, and by ocean vessels for direct export overseas.

The Seaway also handles project cargos, containers, forest products, petroleum products, chemicals, edible oils, coal, salt, cement, fertilizers, ores, nonferrous metals and other bulk materials.

The Great Lakes/Seaway System is a true multimodal system. Seamless movements of goods and commodities flow from ship to rail and truck, and from rail and truck to ship in well-synchronized trade patterns. It is no coincidence that the major rail and highway hubs of the midcontinent — such as Chicago, Toronto, Detroit and Toledo — are major Great Lakes/Seaway ports as well.

From Great Lakes/Seaway ports, road and rail networks fan out across the continent. More than 40 provincial and interstate highways and nearly 30 rail lines link the 15 major ports of the system and 50 regional ports with consumers, products and industries all over North America.

The Great Lakes/Seaway System is also the most cost-efficient and environmentally responsible route to the midcontinent. Studies have shown that marine transport uses less fuel, has fewer emissions and is safer than either rail or truck for equivalent cargoes and distances.

Their large cargo capacity relative to engine size and their operating characteristics make Great Lakes and Seaway vessels

TWO-WAY CARGO

The Port of Thunder Bay handles wind turbines and oversized project cargo destined for Western Canada. Grain, coal, and potash exist as backhaul cargoes for European and North African destinations.

PROJECT CARGO

GRAIN

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PORT OF THUNDER BAY

Canada's Continental Gateway

Canada's Continental Gateway and Trade Corridor is an integrated transportation system linking Ontario and Quebec to North America and the rest of the world. Its purpose is to support future Canadian economic growth with a viable, integrated and competitive transportation system for international trade.

The Continental Gateway is also Canada's busiest trade corridor, carrying over 74% of Canadian trade by road, train, ship and air.

One of the key components of Canada's Continental Gateway is public-private co-operation to strengthen the international cargo transportation system. This strengthens the competitiveness of the country's economy and enables Canadian companies to seize international investment opportunities.

Since 2007, the Government of Canada has committed C$4 billion in projects that contribute to improving the transportation system in Quebec and Ontario in support of Canada's international trade.

The government supports Canada's Continental Gateway through several federal funding programmes such as the Canadian Strategic Infrastructure Fund, the Building Canada Fund and the Economic Action Plan.

Infrastructure investment projects

Gateways and Border Crossings Fund (GBCF)

The $2.1 billion GBCF is a merit-based programme used to facilitate the flow of goods and people between Canada and the rest of the world.

The GBCF was launched in 2007 as part of the $33 billion Building Canada Plan. GBCF projects involve investments at strategic transportation and trade facilities including major Canada–US border crossings, strategic segments of the core National Highway System, marine ports, airports, and access to intermodal facilities.

Projects

To date, 40 infrastructure projects across nine provinces have been funded through GBCF, including projects in the Asia-Pacific, Continental, and Atlantic Gateways. Projects funded include improvements to the St. Lawrence Seaway, highways, airports, and the Ports of Montreal, Saguenay, and Sept-Îles.

models of fuel efficiency and cost competitiveness.

It is little wonder, then, that shippers worldwide choose the Great Lakes/Seaway System to move 40mt (million tonnes) to 50mt of cargo a year to and from the US and Canada.

Successful partnership

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

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

The St. Lawrence Seaway Management Corporation

The St. Lawrence Seaway Management Corporation (the (SLSMC), the successor to the St. Lawrence Seaway Authority, was established in 1998 as a not-for-profit corporation by the Government of Canada, Seaway users and other key stakeholders.

In accordance with provisions of the Canada Marine Act, the SLSMC manages and operates the assets of the St Lawrence Seaway for the Federal Government under a long-term agreement with Transport Canada.

The SLSMC's mission is to pass ships through a safe and reliable waterway system in a cost-effective, efficient and environmentally responsible manner for the benefit of all its stakeholders today and into the future.

The SLSMC has:

- an excellent safety record;
- a dedicated professional workforce that prides itself on providing excellent customer service;
- high-quality traffic management, using automatic vessel identification and real-time tracking;
- a reliable operation, with system availability consistently above 99.0%;
- the ability to handle large vessels measuring up to 225.5 metres in overall length, 23.8 metres in beam and 8.08 metres in draught;
- ISO 9001:2008 certification for the operation and maintenance of the Canadian sectors of the St Lawrence Seaway;
- joint Canadian and US government inspections at entry, thus eliminating duplication, including ballast water inspections which mitigate the spread of invasive species into the Great Lakes/St Lawrence Seaway System and;
- a bi-national website, serving as the most comprehensive single source of Great Lakes/St Lawrence Seaway information, with real-time navigation data, links to government and commercial marine transportation sites, pleasure craft resources, and a suite of e-business services.

Studies show that...

- the Seaway is especially cost-competitive for shipping steel, heavy lift and project cargoes to and from Europe;
- Great Lakes ports have lower port costs than competing ocean ports for the handling, wharfage, dockage and stevedoring of grain, iron ore, steel coils and machinery;
- steel shippers save from US$3 to nearly US$50 a tonne by routing through Great Lakes ports rather than through east coast or Gulf ports; and
- stevedoring costs for steel products tend to average about US$2.20 a metric tonne lower at Great Lakes ports.

A USCG helicopter seals a coal pile in Port Colborne (photo: courtesy of Ken Snider, Snider Marine Terminals).

SLSMC business growth

Bulk cargoes — chiefly iron ore and grain — have always constituted over 95% of Seaway tonnage. Given the market trends affecting these core commodities, the Seaway must maximize user benefits, pursue growth in traditional cargo areas and attract new cargoes, new vessels and new services to the system to ensure its sustainability.

Combined traffic in 2011 totalled 37.5mt (million tonnes), an increase of 2.7% or 1mt over 2010, while the total number of transits increased by 7.7%.

Seaway tonnage grew despite the slow pace of the economic recovery. The growth was due in part to new and emerging export markets for iron ore and coal and to an increase in movements of refined petroleum products due to a maintenance shutdown of a major refinery located in the Great Lakes.

Toll revenue in 2011 reached $63 million, an increase of 3.8% or $2.3 million over 2010, due partly to export movements of iron ore and coal that originated on the Great Lakes and transited both sections of the Seaway, thus generating toll revenue in the Welland Canal and the Montreal–Lake Ontario Section. In addition, the cargo mix shifted somewhat to commodities that are assessed a higher toll rate per tonne.

2011 New Business Results

The New Business Incentive programme, offering rebates for specific 'new' cargo movements (defined generally as new origin/destination combinations for existing cargo, or cargo that had not been shipped via the Seaway over a specified time period) attracted 144 applications in 2011, of which 117 were approved.

The 2011 season concluded with 352 movements of new business for a total volume of 2.5mt of cargo.

In 2011, the SLSMC gained $3.6 million in 'new business' (167% of its business plan target).

Over the last four years, the SLSMC gained $12.5 million in 'new business' which represents 132% of its cumulative target.

Seaway toll incentives

The SLSMC announced in early 2012 that, for the fifth consecutive year, toll rates would not increase in order to retain current cargo movements and attract new cargo to the system. The New Business Incentive programme as well as the Service Incentive program continue to generate interest from current and potential customers.

Operational excellence

The St Lawrence Seaway opened its 53rd navigation season on 22 March 2011. The system remained open for a record 284 days in the Montreal–Lake Ontario (MLO) section, and 284 days in the Welland Canal. The last vessel to transit the MLO section exited the Iroquois Lock on 30 December (the last vessel to transit the St Lambert Lock did so on 29 December). The last vessel to transit the Welland Canal exited Lock 8 on 30 December.

St. Lawrence Seaway cargo volumes rise

Total cargo volume at the St. Lawrence Seaway continues to outpace last year's results. The Montreal/Lake Ontario and Welland Canal have handled 13.2mt (million tonnes) of cargo so far this year, an increase of 1.3%, according to the Seaway's monthly report.

General cargo reached 1.4mt by June 30, 2012, an increase of 8.5%, compared with year-to-date results for this period in 2011. Cargoes include iron and steel products, as well as heavy machinery.

However, total transits dropped from 1,448 in the first half of 2011 to 1,393 through the end of June 2012, a decrease of 3.8%

Port of Toronto recovers from recession

The Port of Toronto had a busy year moving bulk cargo in 2011 with the total port tonnage rising 16% over 2010 to 1,775,162 tonnes.

The bulk cargo numbers are starting to rebound to pre-recession numbers with the port projecting continued growth of bulk cargo tonnages in 2012. The Port of Toronto's foremost bulk cargo in 2011 was salt, due to the cold and snowy winter. Total bulk cargo tonnage increased 17% from 2010. The top bulk cargoes in 2011 were salt, sugar and cement.

The port welcomed the 138-passenger *Yorktown* and the 96-passenger *Grande Caribe* in June 2012 as part of their St. Lawrence/Great Lakes itineraries. The 96-passenger *Grande Mariner* also visited the Port of Toronto in July 2012. More four- & five-star cruise ships visit the Port of Toronto as travellers want to explore the majestic Great Lakes.

The port is looking forward to moving high-value project cargo in 2012 as the North American economy continues to improve and the City of Toronto's transit pursues its ongoing expansion plans.

Marine safety and security

Marine transportation is a safe and reliable means of moving cargo. During the 2011 navigation season, there were 11 incidents involving damage to vessels and minor delays, which translates to 1.8 incidents per 1,000 transits.

As the most fuel-efficient mode of transportation, marine transport's environmental footprint compares favourably with other modes. Only one minor pollution incident occurred during 2011. On 25 October, an upbound domestic vessel reported spilling approximately 30–35 litres of steering pump oil into the St Lawrence River near Prescott. The vessel was sent to the nearest anchorage location and the authorities were advised. A visual inspection of the pollution was carried out and the vessel was cleared for transit five hours later.

Workplace health and safety

The SLSMC continues to focus on building a strong health and safety culture.

The Seaway excels in passing ships through a safe and reliable waterway and leverages technology to maximize user benefits and to enhance its position as a cost effective, efficient and environmentally responsible system.

During the period of 1 April 2011, to 31 March 2012, eight lost time accidents were reported, translating into a frequency of 1.7 accidents and 31 days of lost time per 100 person years. This outcome represents a slight improvement over the 2010 results of 1.9 accidents and 38 days of time lost per 100 person years.

Emergency preparedness

The SLSMC held various exercises throughout the 2011 navigation season in order to test its emergency response plan, train personnel, and improve communications and co-ordination with external agencies.

- On 31 October, the Niagara Region conducted a full-scale exercise involving multiple levels of government, supporting agencies, and marine stakeholders. The scenario was based on a simulated vessel and barge collision in the Welland Canal, and a spill which required a timely response to mitigate the environmental impact. A public security element was also included. The goal of the exercise was to manage the response to the incident as the lead agency.
- On 25 October, the MLO Region simulated a spill above the St. Lambert Lock. The objectives of the exercise were to practise boom deployment and to focus on internal and external communication. Both ECRC (an emergency response services provider) and Environment Canada participated.
- As in the past few years, traffic control personnel from the MLO Region participated in emergency exercises prior to season opening. Various scenarios were presented, exposing the personnel to potential issues that could arise.

New international bridge will boost business at the Port of Windsor

The new international bridge linking Windsor and Detroit is expected to produce game-changing future business opportunities for the Port of Windsor, which will play a critical role in its construction, *writes Julia Fields, Marine Delivers*.

The Canadian-funded bridge, which was announced by Prime Minister Stephen Harper and Michigan Governor Rick Snyder earlier this year, and its connecting road interchanges and buildings will not only require millions of tonnes of construction materials that can be delivered by ship but economists believe it will help put the region on the map for new manufacturing and logistics investment.

David Cree, president and CEO of the Windsor Port Authority, said: "We're very pleased that the federal government and the State of Michigan have reached an agreement on how to proceed with a new bridge. We think it will bring terrific benefits to the City of Windsor and the port."

Work has already begun on the Windsor Essex Parkway that will connect Highway 401 to the new bridge and that infrastructure alone will require as much as 2.5 million tonnes of stone, the vast majority of which will arrive by ship through the Port of Windsor.

The Port of Windsor is home to major construction-related companies such as CBM-St. Mary's Cement, Miller Paving, Essroc Italcementi, Lafarge Canada Inc, Southwestern Sales Corp Ltd and Coco Aggregates.

A similar road connection will be required on the US side of the new bridge, along with a new 100-acre staging area for trucks, customs buildings and tollbooths on the Canadian side. Although estimates have not yet been calculated on the total tonnage of steel, cement and stone required for the four-year bridge construction project, Cree expects that it will also provide a big short-term boost to shipping through the port.

More significantly, however, will be the long-term future business opportunities that will come from Windsor having a more efficient cross-border route that serves one of the most populous regions of North America. The Windsor–Detroit region, due to its location west of Chicago and east of Toronto, is within close proximity to a significant portion of the North American population. The existing Ambassador Bridge is already the busiest international border crossing between Canada and the US in terms of trade volume.

Major corporations such as the Chrysler Group and Ford Motors Company have said having an additional second bridge to cut down on congestion and improve the efficiency of their supply chain will be crucial to their future international competitiveness and new investment in the region.

Bill Anderson, director of the Cross Border Transportation Institute at the University of Windsor, said: "The idea of building this crossing is to improve the economy by making it more productive and that in itself will create more investment and job opportunities. An efficient border crossing will make this region more attractive to manufacturing investment and also those companies involved in logistics and warehousing."

Cree believes that the Port of Windsor will be an ideal location for companies that are looking for quick access to the bridge along with water transportation to bring in materials. "The port has a 30-acre parcel of land which is adjacent to the new Canadian truck plaza. Now, that the bridge announcement has been made, we believe our property will be highly desirable for a manufacturing or logistics operation."

The Windsor Port Authority is also working with CP and Borealis Infrastructure to build a proposed double-stacked rail tunnel between Windsor and Detroit. The $400-million project is currently seeking financing from government sources. Known as the Continental Rail Gateway, the new rail tunnel would replace the existing tube constructed in 1909. Despite its age, the current Windsor–Detroit rail tunnel handles 400,000 rail cars and $22 billion in trade each year. But it is too small to handle the growing trend toward larger, double-stack rail cars — many coming from the Port of Montreal.

Cree says that the new international bridge crossing, the proposed rail tunnel and the port together would provide super-efficient multi-modal access between Canada and the US that would be unrivalled in this part of North America.

"The Windsor–Detroit region has the potential to become a multi-modal transportation hub for Continental North America — a region that is both a manufacturing engine and a huge consumer marketplace for Canadian, American and international businesses. The Port of Windsor will play a crucial role in that future supply chain."

In January, 2012, KPMG reviewed the Corporation's Emergency Response Plan and concluded that the plan complies with industry standards and best practices.

Reliable infrastructure

The SLSMC continues to provide its customers with a safe, reliable and cost-effective transportation system. During the 2011 navigation season, system availability was 99.6% exceeding its target level of 99%, while system reliability was 99.71%, slightly below the target level of 99.75%. The SLSMC kept the average delay, attributable to its own operations, at 16 minutes per transit in the MLO Region, which is well under the targeted 20 minutes.

The Welland Canal came in at 24 minutes, which exceeds the 20 minute target.

In order to address the needs of its ageing infrastructure, the SLSMC completed asset renewal projects amounting to $55.3 million over the last year, the fourth of its five-year Asset Renewal Plan (2008–2013). Major projects included:

MLO section

- repair of gate machinery covers at St Lambert Lock;
- major rehabilitation of weir at St Lambert Lock;
- replacement of heating system guard plate and concrete

rehabilitation on downstream side at gate 6 at Côte St Catherine Lock;
- work to ensure proper operation of gate 2, quoin side, at Côte St Catherine Lock;
- refurbishing of valves 3 & 4 at Côte St Catherine Lock, and valves 1 & 4 at Lower Beauharnois Lock;
- repair of upstream corner monolith at Baillargeon Wharf;
- rehabilitation of gates 1 & 2 and gates 7 & 8 mitre sill at Lower Beauharnois Lock;
- replacement of heating system for gates 1 & 2 at Lower Beauharnois Lock;
- replacement of gates 3 and 4 diagonals at Upper Beauharnois Lock;
- replacement of starters and main motors at Bridge 9;
- replacement of lifting machinery/derricks — fabrication of components.

The bulker Heloise, *unloading urea at Snider Marine Terminals (photo: Ken Snider).*

Welland Canal
- stabilization of bank at Weir 2;
- replacement of timber tie up walls at Lock 2 lower West side;
- rehabilitation of valves 5, 6, 7 & 8 side seals and trunnions at Lock 2;
- rehabilitation of gates 3 & 4 quoin, mitre and pintle at Lock 2;
- installation of bubbler system and air curtain at Lock 2;
- installation of a variable frequency drive and rehabilitation of motor at Bridge 3A;
- rehabilitation of monolith at Lock 4 East and Lock 5 East;
- replacement of valve 1 trunnion thrust washer at Lock 7;
- rehabilitation of mechanical drives at Weir 8;
- fabrication of stop logs at Weir 8; and
- repair to cribs 1–4 at Guard Gate wall.

Strategic initiatives

Draft Information System (DIS)

The SLSMC and the US Saint Lawrence Seaway Development Corporation (SLSDC), in co-operation with the shipping industry, equipment suppliers, and the Canadian and US federal governments, have worked on developing a Draft Information System (DIS) to increase the safety of navigation.

DIS is not a mandatory requirement for vessels transiting the Seaway; however, vessels equipped with a certified DIS are eligible for an extra three inches of draught beyond the published maximum draught. It is anticipated that mariners will begin to make use of this system in 2012.

Hands free mooring (HFM)

The year 2011 was successful for the development of the Hands Free Mooring (HFM) system installed at Lock 7.

The main improvements revolved around better waterproofing, reliability, and absorption of vessel movement. Over 230 successful transits proved that the development of the HFM prototypes is moving in the right direction. Some transits registered faster lockage times with HFM compared to transits employing traditional mooring wires. The foundation provided by the prototypes will allow the SLSMC to focus on development of a new HFM system incorporating a series of enhancements, which will allow the equipment to adapt to most vessels.

Vessel self spotting (VSS)

The Seaway continues to enhance the accuracy and reliability of the Vessel Self Spotting (VSS) system. Testing of a new vessel pre-scan sequence has proven to be very effective in tracking the position of tug and barge combinations during a lockage. Plans are in place to deploy this enhanced level of functionality at all existing VSS lock installations.

Information security

The Information Technology Security Group continued over the course of 2011 to refine security. The SLSMC's strategy to protect its infrastructure was reviewed, to ensure that best practices are applied on an ongoing basis. Active monitoring of assets, combined with state-of-the-art intrusion prevention technology, ensures the reliability of daily operations.

Refurbishment of operations control centre — Niagara Region

During the 2011–2012 winter works, Niagara Region's Operations Control Centre (OCC) was refurbished based on key points set out in a 2011 study. Major upgrades include a new overview screen consisting of ten, 60-inch LED monitors, as well as refurbished operating consoles. A new expanded supervisor console, more centrally located within the OCC, allows for more active monitoring of structure operations and vessel dispatching.

Ballast management

For the third year in a row, 100% of vessels originating from outside the Exclusive Economic Zone (EEZ) and bound for the Great Lakes/Seaway System received ballast management exams on each Seaway transit. In 2011, a total of 7,203 ballast tanks were assessed during 396 vessel transits. Of these, some 6,980 complied with ballast water regulations. Letters of retention were issued to address the remaining 223 tanks, from 60 vessel transits, ordering that the non-compliant ballast water be retained onboard the vessels. Those required to retain their

ballast water received follow-up inspections prior to exiting the Seaway to ensure compliance.

Since enhanced ballast water management standards were adopted in 2006, no new invasive species attributable to ocean vessels have established themselves within the Great Lakes/Seaway System.

Moving project cargo at the Port of Duluth.

Greenhouse gas inventory and reduction plan

In 2011, for the third consecutive year, the Corporation has emitted fewer Greenhouse Gases (GHG) than the yearly average compiled from 2003 to 2005 — which is used as the baseline for the Corporation's GHG reduction plan. Emissions in 2011 were 1,933 tonnes of CO_2 equivalent compared with the baseline of 3,204 tonnes. This performance represents the lowest total for a single year since the SLSMC started to calculate its GHG emissions in 2000.

Green Marine

The Corporation is an active member and proponent of Green Marine, a joint Canada–US initiative aimed at implementing a marine industry environmental programme throughout North America.

In 2011, an external audit confirmed the Corporation's performance as measured by the indicators developed by Green Marine for the previous year. These indicators included aquatic invasive species, greenhouse gas emissions, conflicts of use and environmental leadership.

The assessment for the 2011 year demonstrated an improvement for the indicators on greenhouse gases and environmental leadership, bringing the overall score for all indicators to 3.3 out of a maximum score of 5.

Saint Lawrence Seaway Development Corporation

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

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

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

The St Lawrence Seaway is an international waterway, and the SLSDC interacts directly with numerous Canadian government and private entities as it carries out its mission.

The SLSDC co-ordinates its activities with its Canadian counterpart, the St Lawrence Seaway Management Corporation (SLSMC), particularly with respect to rules and regulations, overall day-to-day operations, traffic management, navigation aids, safety, environmental programmes, operation dates and trade development programmes.

The unique binational nature of the Seaway System requires 24-hour, year-round co-ordination between the two Seaway Corporations.

The SLSDC aims to be a model federal agency, leading the Great Lakes Seaway System as the safest and most efficient, competitive, technologically advanced, and environmentally responsible marine transportation system in the world. Its core organizational values include: accountability, competitiveness, customer focus, dedication, diversity, excellence, integrity, operational efficiency, relevance, service, and quality.

SLSDC's Asset Renewal Program

As part of its FY 2009 budget request to Congress, the SLSDC developed an Asset Renewal Program (ARP) to address the long-term asset renewal needs of the US Seaway infrastructure. A perpetual infrastructure asset, such as a lock, needs a capital investment equivalent to its original cost over its design life, which is typically 50 years, in order to sustain itself. The US portion of the St Lawrence Seaway was built in the late 1950s at an original cost of US$130 million. Prior to the start of the ARP in FY 2009, only US$47 million in capital expenditures had been invested in the US Seaway locks since they opened in 1959.

The 57 projects included in the current ARP are estimated at US$186 million and address various needs for the two US Seaway locks, the Seaway International Bridge connecting Ontario and New York, maintenance dredging, operational systems, and Corporation facilities and equipment. None of these investments will result in increases to the authorized depth or width of the navigation channel or to the size of the two existing US locks.

In FY2011, the SLSDC obligated US$15.8 million in other-than-personnel, including accrued expenditures and undelivered orders, for Year Three ARP projects. ARP other-than-personnel accrued expenditures, not including undelivered orders, totalled US$21 million and included primary expenditures of US$5.5 million for the Seaway International Bridge rehabilitation; US$3.6 million for dredging; US$2.7 million for miter gate rehabilitation; US$2.3 million for culvert valve machinery; US$1.9 million for paving and drainage; US$1.1 million for electrical distribution equipment upgrades; US$1 million for floating plant upgrades; US$770,000 for compressed air systems; US$588,000 for wire ropes on the vertical lift gate at Eisenhower Lock; US$430,000 for storage upgrades for lock spare parts at Corporation facilities; US$333,000 for culvert valves with single skin valves; US$300,000 for Corporation equipment; US$155,000 for installation of a new ice flushing system at Snell Lock; US$140,000 for a new elevator at the Administration Building; and US$104,000 for network upgrades.

SLSDC maintains 100% inspections of foreign vessels entering the St Lawrence Seaway

Under the Enhanced Seaway Inspection (ESI) programme, the SLSDC inspects all ocean vessels on their initial transit into the St. Lawrence Seaway. These inspections focus on safety and environmental protection issues and occur in Montreal, Quebec, before the vessels enter the Seaway and US waters. The SLSDC and the US Coast Guard (USCG) signed a Memorandum of Understanding (MOU) in March 1997 to develop the programme of co-ordinated vessel inspection and associated enforcement activities to expedite the safe transit of shipping through the Great Lakes St Lawrence Seaway System. This MOU was developed in conjunction with the SLSMC and Transport Canada and continues to guide Seaway maritime policies and procedures.

ESI inspections are jointly performed by the SLSDC and the SLSMC marine inspectors and cover both Seaway-specific fittings as well as port state control items identified by the USCG and Transport Canada as critical for the vessel to transit to the Seaway/Great Lakes. In the event that major deficiencies are identified, Transport Canada and the USCG are notified and the vessel is detained in Montreal until the deficiencies are cleared.

The proactive approach and continued improvement of the inspection programme has been exceptionally successful in reducing the number and frequency of incidents both on the St. Lawrence River and in and around the lock facilities. In addition, the inspection programme has eliminated the practice of duplicative inspections, which allows for a more seamless and efficient transit of the Seaway and provides an excellent location for repair resources, if required.

The SLSDC's goal for performing inspections of all foreign-flag vessels on their initial Seaway transit each year was achieved during the 2010 navigation season, with 245 inspections conducted by SLSDC personnel. As of 30 September, 180 vessel inspections had been completed in 2011.

SLSDC continues role on Great Lakes Regional Waterways Management Forum

In FY 2011, the SLSDC continued to play a key role in the Great Lakes Regional Waterways Management Forum, a group of US and Canadian federal representatives who work co-operatively to identify and resolve waterways management issues that involve the Great Lakes region. The Forum specifically reviews issues across multiple jurisdictional zones and/or those involving international issues and is further tasked with developing operational solutions that improve the use and effectiveness of the Great Lakes.

SLSDC Participates in tabletop emergency exercise

The SLSDC sustains an Emergency Response Plan that enhances the corporation's ability to respond to a vessel incident that results in pollution. The SLSDC works closely with the USCG, Canadian Coast Guard, and New York State Department of Environmental Conservation to assist with mitigating the impact of an oil spill on the local environment and on Seaway trade and commerce. Annual training and drills are practiced to ensure resources are adequate for an effective response. Most training and drills are multi-agency led and attended by local response agencies and environmental groups.

The SLSDC participated in a tabletop exercise sponsored by US Customs and Border Protection at the Ogdensburg, NY Port of Entry on 3 May 2011. Exercise objectives included evaluating player actions in response to a terrorist attack utilizing a persistent chemical agent, improving participants' understanding of their roles and responsibilities during an act of terrorism at the Ogdensburg Port of Entry, and demonstrating proper incident management by use of the ICS/Unified Command System. This was a multi-agency attended event that included representatives from federal, state, and local response agencies.

SLSDC leads Seaway Trade Mission to Europe focusing on short sea shipping

In November 2010, the SLSDC and SLSMC hosted the 32nd annual Seaway Trade Mission to several core trading partner cities — Amsterdam and Rotterdam, The Netherlands; Antwerp, Belgium; and London, England. The mission provided Great Lakes Seaway System stakeholders with the opportunity to work with European industry leaders proficient in conducting short sea shipping on a daily basis as well as reconnect with current users and prospective customers.

The Seaway delegation consisted of 19 US and Canadian stakeholders representing ports, counties, shippers, and carriers. Short sea shipping symposiums were arranged with numerous maritime industry representatives from the ports of Amsterdam, Rotterdam, Antwerp, and The Associated British Ports, as well as the associations of Freight by Water, Coastlink Network, and The Shortsea Promotion Centre of Holland. Following each symposium, local industry representatives met with the delegation to discuss trade opportunities in the Great Lakes Seaway System.

During each symposium, the Seaway delegation received presentations covering a wide array of topics including: short sea policies in The Netherlands and Europe; sustainable hinterland logistics; environmental innovation; and the promotion of short sea shipping. The presentations provided Seaway delegates with detailed information about short sea shipping in Europe and how it compares to ongoing efforts in North America.

During the mission, the two Seaway Corporations signed a Memorandum of Understanding (MOU) with the Port of Amsterdam to work together to connect a sustainable hinterland logistics network in Canada–United States with European networks, investigate the feasibility of setting up a Customs-efficient 'green lane' between Canada and Europe, and link this joint initiative with current European Union–Canada trade discussions, for the benefit of the Port of Amsterdam and the Seaway System.

Blades to Brazil: Port of Duluth is global gateway for wind energy

The Port of Duluth has become a strategic link in the global wind energy supply chain and, at the end of June this year, 60 wind turbine blades manufactured in North Dakota were exported to Brazil aboard the Dutch-flagged *Alamosborg*. Three more shipments of blades to that same project would follow in July and August.

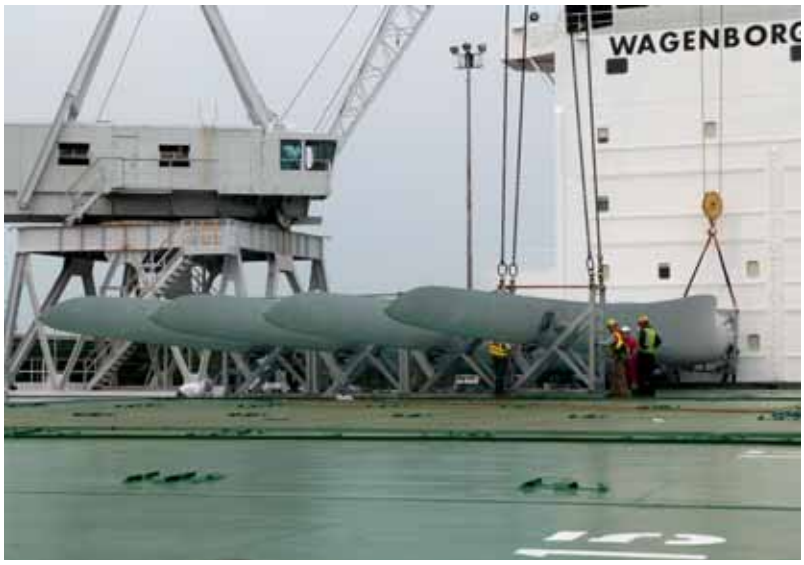
The 37-metre blades — manufactured at LM Wind Power's plant in Grand Forks — began arriving in Duluth on tractor-trailers in mid-June, and were staged at the port's breakbulk terminal awaiting final delivery to Brazil for IMPSA Wind's new CEARA II project in Ceara, Brazil. Dozens of blades were loaded to the top deck of the 469-foot *Alamosborg* before she departed beneath the Duluth Aerial Lift Bridge at the end of June. Arrival in Brazil was set to take place approximately three weeks after departure.

"North Dakota is fortunate to have an international seaport close to our state," said Andy Peterson, president & CEO of the North Dakota Chamber of Commerce. "Nearly 85% of North Dakota's goods are exported around the world. In an era when we can help feed a hungry world with our agricultural commodities and fill the demand for manufactured products like turbine blades, we appreciate the access to global markets afforded by the Port of Duluth."

IMPSA, a global provider of power generation from renewable resources, has made a huge commitment to the expanding Brazilian wind market. "We decided to move these blades

through the Port of Duluth due to its proximity to our manufacturer's plant — LM Wind Grand Forks, North Dakota," said Santiago Delfino, IMPSA Wind International Trade and Logistics. "Duluth has an excellent port infrastructure, spacious road access, expertise in handling oversized pieces and quite good storage conditions. IMPSA is 100% committed in the development of green projects (renewable energy: wind power + hydro power). Duluth's proximity helps us reduce our carbon footprint." When complete, the CEARA II project will include 141 turbine generators (1.5 MW each); phase III is already being planned.

"This shipment is one of over 20 energy-related cargoes on the books for 2012, including four shipments of blades from North Dakota to Brazil," notes Jonathan Lamb, vice president and general manager of Lake Superior Warehousing Co. (breakbulk terminal operator for the Duluth Seaway Port Authority). "Duluth has moved well over a million freight tonnes of wind turbine components from and to Europe and South America since the port first started handling wind turbines in 2005."



Strategically located at the western tip of the Great Lakes St. Lawrence Seaway trade corridor, the Port of Duluth has become a transshipment hub for industries that drive the regional economy including wind energy, steelmaking, forest products, and oil/gas production. In fact, Duluth was voted top port in North America last year by RICA (Railway Industrial Clearance Association).

According to Adolph Ojard, Duluth Seaway Port Authority executive director, "The expertise of Lake Superior Warehousing and our joint commitment to streamlining project cargo handling, makes this terminal very attractive to major manufacturers and logistics experts worldwide who consider the Port of Duluth an ideal gateway in and out of the North American heartland."

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PORT OF QUÉBEC

THE NORTHERN CORRIDOR
FOR U.S. COAL EXPORTS TO EUROPE AND ASIA.

LAKE VESSELS (RAIL)

CAPE-SIZE VESSEL CAPACITY

EXCESS STORAGE CAPACITY

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SHORTEST DISTANCE AND TRANSIT TIME TO EUROPEAN MARKETS

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WE CAN HANDLE IT

PORT DE QUÉBEC

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The Deep Water Gateway: St. Lawrence Stevedoring at the Port of Quebec

St. Lawrence Stevedoring 's (SLS) Terminal at the Port of Quebec is the deepest marine terminal of the Northern Corridor. It serves as the Gateway in and out of this transportation system.

For years, major iron ore producers have utilized this deep water gateway for the import and export of their products. Today, millions of tonnes of iron ore products are shipped from the Great Lakes to SLS via 25,000dwt to 30,000dwt 'Laker'-type vessels where their cargoes are unloaded, stored, accumulated and then reloaded onto Capesize vessels — carrying as much as 148,000 metric tonnes — sailing to Europe and Asia.

As the iron ore producers have been successful shipping through the Northern Corridor, some of the coal industry players have decided to test this route for themselves. Once trial shipments proved successful in 2011, millions of tonnes of coal shall also be transshipped through the SLS terminal this year for cargoes going towards Europe.

Advantages

- **Transit sailing time via the Northern Corridor:** As the below comparison demonstrates, the transit sailing times out of the Great Lakes St. Lawrence Seaway System offer significant sailing time reductions when compared to the traditional Mississippi and new Orleans option.

Distance and transit time to the Port of Québec Via the Northern Corridor (Seaway System)
Superior (Wisconsin) 5.5 days by Laker 1,307 miles

Distance and transit time to the Port of New Orleans Via the Mississippi
Superior (Wisconsin) 21.3 days by barge 1,718 miles

Port of Québec distance and transit time to Europe and Asia
Rotterdam 9 days 3,000 miles
Shanghai 35.5 days 12,200 miles

Port of New Orleans distance and transit time to Europe and Asia
Rotterdam 14 days 4,854 miles
Shanghai 29.5 days 10,067 miles

Total transit time — *in sailing days via*

	Northern Corridor	New Orleans
From Superior (Wisconsin)		
Rotterdam	14.5	35.3
Shanghai	41	50.8

- **Vessel sizes at the Gateway:** the only vessel restriction at the St. Lawrence Terminal is 15m draught at zero chart datum. Depths are as per Chart Datum:

Wharf Length	Depth	
50	300m	12.0m
51	235m	12.5m
52	260m	13.5m
53	325m	15.0m

  To date, the largest vessel to berth the SLS terminal at the Port of Quebec is the *Lan May*, a 206,000dwt vessel (300m x 50m) which was successfully loaded to 15m draught.
- **Storage capacity at the Gateway:** the SLS terminal has over 200,000m^2 of paved storage areas and 10,000m^2 of inside storage area, which combined can accommodate more than 20 different products at any time.

About St. Lawrence Stevedoring

St. Lawrence Stevedoring (SLS), a division of Quebec Stevedoring Company Ltd, has been operating since 1908.

SLS is located in the Port of Québec, the deepest water port leading to the St. Lawrence Seaway and Great Lakes System accommodating vessels draughting up to 15 metres. As such, it is the transloading terminal in/out for oceangoing vessels (Handymax, Panamax and Capesize Vessels) and Laker type vessels (Canada Steamship and Algoma).

- SLS is one of the largest 'dual purpose' transloading terminals on North America's Eastern Seaboard;
- the terminal has a water depth of 15 metres at low tide;
- SLS can accommodate all size vessels: Handymax, Panamax and Capesize vessels;
- the main commodities that transit through the terminal are iron ore, coal, scrap metal, copper and nickel concentrates, alumina, gypsum, salt, raw sugar and alloys;
- SLS receives and ships bulk products from all over the world, and has the expertise to handle products of all kinds; and
- SLS handles over 20 different kind of cargoes totalling more than 9.5mt (million metric tonnes). DCi

EMO, full service gateway for coal and

EMO is the largest transshipment terminal for coal and iron ore in Europe and occupies a top position in the dry bulk market. Modern and multifunctional, the EMO terminal is strategically located at the Maasvlakte in Rotterdam.

EMO operates 24 hours a day, seven days a week. It handles large bulk shipments; its discharge capacity is 42mt (million tonnes) and its throughput capacity is 60mt. EMO approaches all of its work and planning with the greatest care. It ensures that its terminal is state-of-the-art, and is continually improving its facilities so that its customers are served in the best possible way. EMO's highly skilled trained personnel work closely together. Skilled employees working with innovative technology guarantee customers the quality, efficiency and sustainability they seek.

Meeting market demands

EMO provides handling facilities that the world's largest bulk carriers require. Its terminal is a major hub in transporting coal and iron ore from all over the world to the large European hinterland. EMO's 160-hectare area can currently hold 7mt of storage. The terminal is ideally located on a 23m-deep waterway connected directly to the North Sea. Rotterdam harbour has excellent rail and waterway connections to the rest of Europe.

EMO prides itself on being a reliable and trustworthy partner. It remains on top of the latest developments in the market, and continually analyses its customers' needs, the quality of its services and its terminal's performance. In anticipation of market trends and customer needs, it is always geared towards offering a more efficient, cleaner and safer terminal, one designed to meet the highest of expectations.

As a major player in the European market, EMO does everything to keep its terminal in tip-top condition so that it can serve its customers well. The EMO terminal was commissioned in 1973 and, ever since, it has continually adapted its services to meet new market demands. The result: tip-top products and services that match customers' needs. Recent projects and projects under construction are:

Second coal wagon loader with access to European rail network

EMO's second fully automated coal wagon loader, which started operating in July 2011, means that altogether it can load 16 coal trains a day. The extensive preparations for this enormous project began in 2010 and construction took place in November 2010. The infrastructure had to be adapted as well since EMO required new transport conveyor belts and railtrack. A dedicated rail cargo line — the Betuwelijn — connects EMO directly to the European rail network offering fast, clean and cost-efficient access to the hinterland. Both coal and iron ore reach inland Europe by rail.

Fifth unloader

The new 85-tonne fifth unloader increases overall loading capacity. An additional unloader means more capacity and more reliability and flexibility. Manufactured in Europe, the unloader will be operational in the third quarter of 2012 .The five unloaders situated on EMO's deep sea quay running along its waterway (23m deep) have an average unloading capacity of up to 200,000 tonnes a day. Throughout the year, the five unloaders are constantly unloading Capesize ships (bulk carriers). The whole terminal is connected by an internal conveyor belt system.

Seventh stacker reclaimer

Preparations for building the seventh stacker reclaimer started in 2010. This stacker reclaimer is, amongst its other duties, responsible for supplying the coal and biomass-fired GDF Suez Energy power plant. As the stacker reclaimer becomes operational as from this summer, EMO will have seven separate cargo flows served by automated stacker-reclaimers.

New loading berth for sea-going vessels

The Amazone harbour is being widened for the latest-generation vessels of the adjacent ECT terminal. The area where the current sea-going vessel loader is located will be widened and EMO has built a new loader along the Mississippi harbour, east of the unloaders. This sea-going vessel loader in the Mississippi harbour loads coal and iron ore fast and efficiently. This ship loader has a capacity of 5,000 tonnes an hour.

The Rotterdam Port Authority built a new quay, equipped with the most sustainable technology and creating an innovative solution

iron ore cargoes

by integrating the berthing structure with the fender structure. A characteristic of the new structure is that it uses a thin layer of high-performance concrete to line the outside of the quay, instead of a traditional fender structure.

Integrated terminal with conveyor belt system and operations centre

All coal and iron ore is transported by EMO's conveyor belt system. This 47km system connects all discharge, storage and loading equipment within the EMO terminal into one flexible machine. The conveyor belt system is together with the complete terminal and its machinery supervised by EMO's new operations centre. The new operations centre is ready for tomorrow's challenges. To meet present and future developments, it is important that the supervisory role of the operations centre, the nerve centre of the terminal, can grow. When EMO was modernizing the operations centre, it took both existing processes and anticipated future developments into consideration. The smooth transition to the modernized operations centre took place in October 2011. While the new operations centre was being built, the old one remained fully operational and processes continued to work properly. Once the new facility was set up and tested, it replaced the old operations centre.

Hartel strip

By relocating to the Hartel strip, EMO will go on being able to grow and offer a highly efficient service. This deep sea location can be used for specific needs of customers. Biomass used in firing power plants, such as wood pellets, also requires extra space. The new terminal along the Hartel strip will compensate for land lost due to the widening of the Amazone harbour and for land lost to Electrabel's new plant. This strip lies across the existing EMO terminal and was created by filling in part of the Hartel canal.

Port Hedland ships record 246.7mt in 2011

Port Hedland, Australia, has broken its own record. The port has been named as the world's biggest bulk export port for a second year running, beating its previous output by 47mt (million tonnes).

The port shipped a record 246.7mt of product in 2011, in response to demand from China for steel. Steel demand has provided stability for the port, especially as iron ore fluctuated in price over recent years.

With demand for commodities still strong and further planned expansions for the port, similar increases are expected in the coming years, the Port Hedland Port Authority chief executive, Roger Johnson claimed.

At the end of the last financial year, the port's exports had increased by 23% on the previous year. The port previously handled 199mt in 2010/2011.

Two new berths are planned for the port, and Hancock Prospecting has just completed the dredging required for these. FMG is expected to bring its fourth berth at Port Hedland online within the next year.

Antaq gives thumbs-up to new Ferrous port

Brazil's National Waterways Transport Agency (Antaq) has authorized Ferrous Resources do Brasil to build a private terminal at Presidente Kennedy, in the south of the state of Espirito Santo. This follows extensive feasibility and economic viability studies. Now it requires a positive environmental impact assessment after which construction work can begin.

In its initial phase, the terminal expects to handle 25mt (million tonnes) of iron ore annually, later to potentially increase to 50mt.

Ferrous is also seeking a partner in the venture, which will encompass not just the port but also the mineral duct linking it to the mines. The overall project has a budget of $6 billion.

Last year, the company produced 1.8mt of iron ore, of which 1.7mt were exported. For this year, output is expected to be 3.5–4mt.

Barry Cross

ALWAYS ON THE BALL

Football is teamwork, with all team players doing their utmost to pass the ball from one to the next in rapid tactical manoeuvres. The team plays the game to a winning strategy. Just as in football, EMO operates as a team working closely together - from crane driver to barge loader operator. Our planners make strategic just-in-time decisions to utilise the EMO terminal in Rotterdam optimally in serving your business. You can depend on EMO for fast, efficient coal and iron ore handling.

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Cavotec innovative shore power systems for Ports of Oakland and Long Beach

Maritime technology innovator Cavotec has won orders for multiple Alternative Maritime Power (AMP) shore-to-ship electrical systems at two of America's premier ports, the Port of Long Beach and the Port of Oakland, supporting their continuing efforts to improve safety and environmental performance.

"These projects are the latest stage in our on-going work to meet the growing safety and environmental demands of our partners in the ports industry on the west coast of the United States," says Cavotec CEO, Ottonel Popesco.

"With legislation regulating emissions at ports set to tighten in the years ahead, we anticipate continuing to work with our partners in the industry to ensure that these and ports worldwide maintain their position as leading environmental performers," Popesco adds.

The Cavotec AMP equipment being supplied under these contracts includes shore power systems built into the quayside that enable ships to connect to grid-generated electrical power safely, quickly and easily. These units will also incorporate Cavotec's innovative spring-assisted One-Hand-Lift Access Covers.

"Cavotec's One-Hand-Lift Access Covers are safer than many alternatives that are currently available. Conventional systems include covers with very heavy lift weights, while Cavotec's innovative system helps to avoid operator stress and injury by reducing these lift weights to a minimum," explains Rob Thompson, Cavotec USA Inc. West Coast Manager.

Cavotec engineers and naval architects have pioneered several AMP solutions including ship-based systems housed in shipping containers, land-based vault versions and mobile units for maximum flexibility.

Cavotec AMP systems enable vessels to switch off their engines while docked and to connect to shore side electricity. Services such as power supply for reefer containers, lighting, heating, food preparation and cargo handling are then run directly from the port. Switching off ships' engines and connecting to grid-generated electricity reduces fuel consumption and dramatically cuts particulate matter emissions, thus helping improve air quality in ports and surrounding communities.

Cavotec's shore power systems are increasingly widely used at ports on the US west coast, as well as in Canada, Europe and the Far East. The first AMP system became operational at Sweden's Port of Gothenburg in 1984. The Port of Long Beach, the Port of Oakland, and the Port of Los Angeles are among ports on the US west coast that have subsequently introduced the technology.

In addition to shore power systems, Cavotec manufactures a diverse range of advanced technologies that help ports around the world to operate safely, efficiently and sustainably. These products include automated mooring systems, Panzerbelt cable protection systems, crane controllers, marine propulsion slip rings, power chains and connectors, radio remote controls, motorized cable reels and steel chains.

Cavotec is a major global engineering group, developing innovative technologies that enable the maritime, airports, mining and tunnelling, and general industry sectors to operate more sustainably.

Beira exports one million tonnes of coal

By early May, the Mozambican port of Beira had already handled 1mt (million tonnes) of coal, which had been brought to the port by via the Sena railway from Tete province. The coal had been mined by the local subsidiary of CVRD, Vale Moçambique, which operates a fleet of 32 locomotives and 638 coal wagons.

It has been forecast that around 5mt of coal from the Moatize mines will be exported via the port this year, of which 4mt will be transported by Vale and 1mt by Rio Tinto, which exports consignments to Asia, Europe, Australia and Africa. *BC*

Chinese softening on CVRD VLOCs?

The Brazilian mining company CVRD is said to be contemplating the deployment of a second floating storage vessel somewhere in Asia to counter attempts by the Chinese government to prevent its VLOCs from calling at national ports. In February, it deployed its first storage unit to the Philippines, although South Korea is being considered as the location for the new storage vessel.

In the meantime, negotiations continue with the Chinese authorities to have the ban on the 400,000dwt vessels lifted. CVRD ordered 35 of these vessels to enable it to compete with rivals Rio Tinto and BHP Billiton, both of which have a proximity advantage in respect of the Chinese market. Although currently banned by the Chinese government, Chinese steel companies are protesting this decision, pointing out that deployment of these vessels will significantly reduce costs. Nevertheless, it is reported that earlier this year two the vessels were mothballed reflecting a downsizing of demand in China. *BC*

New fertilizer terminal for Brazil's Port of Belém

The Port of Belém in Brazil is planning a $50.2 million project to build a new fertilizer terminal. This is being developed by the state dock company, CDP, which also operates grain handling facilities at the port of Santarém. A detailed analysis of the project is due to be given to the National waterways regulator, Antaq, by the end of the year and the terminal should be operational by 2014. Capacity should be in the order of 3,000,000 tonnes per annum. Funding will come from Brazil's Accelerated Growth Programme (PAC). *BC*

Callao to open minerals belt system

A sealed conveyor belt system to transport minerals at the Port of Callao in Peru, which will require investment of $150 million, is due to open in September 2013, according to the Impala Perú company. The project is being implemented by the Callao Transport Consortium, where Impala Perú holds a majority 30% stake.

An environmental impact assessment has already been approved by the Ministry of Transport and Communications. A concession to operate the 3km conveyor network was granted in January 2011 for a period of 20 years. Once operational, it should replace 90,000 journeys by road, which were due to rise to 130,000 due to expansion of output at the Toromocho mine. In the short term, the network is expected to carry 3.9mt (million tonnes) of minerals, rising to 6mt by 2030. *BC*

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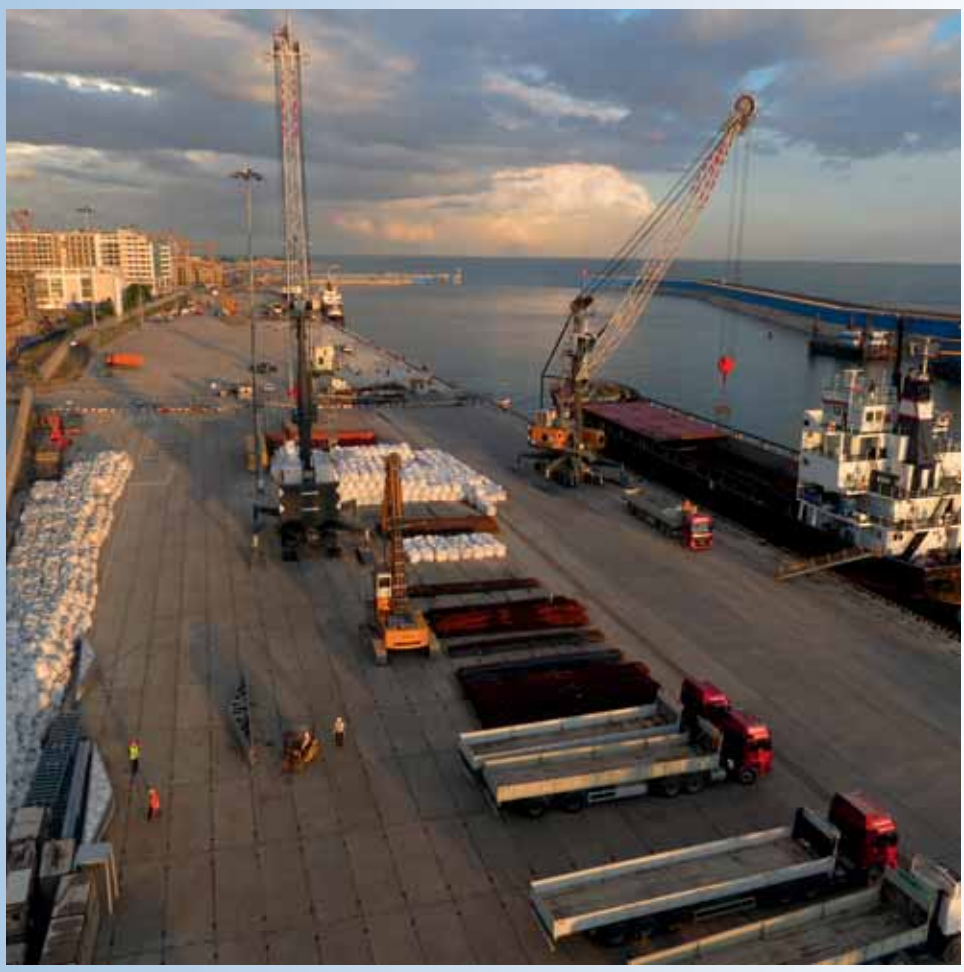
Basic Element completes construction of Russian cargo port



Basic Element Group, a major Russian business group, has announced the completion of construction of the Imeretinskiy cargo port in Sochi. The port's capacity is 5mt (million tonnes) of cargo per year. The port's docks are up to 9.2m deep. Investment in the port construction amounted to US$200 million (RUR 6 billion). The project was carried out by Transstroy, a part of Basic Element and a leading Russian transport and infrastructure construction company.

The port will serve to deliver cargo and construction materials to Imeretinskaya Valley, where most construction sites for the 2014 Sochi Winter Olympic Games are located. The launch of the port will open the shortest track for the cargo delivery to the area. After the Winter Olympics, the port will be retrofitted into a yacht marina.

The Imeretinskiy cargo port is the only versatile cargo port in the Sea of Azov and Black Sea basin to be built in the post-Soviet period. In addition, it is the only port to be built through a public-private partnership (PPP) in Russia. The fact that the port has been erected on the Black Sea coast near underwater canyons, which have a complicated tidal and seismic environment, makes this construction project unique.

The construction works have been completed in accordance with the project statement. There are eight all-purpose mooring facilities to receive general and bulk cargo, the seashore infrastructure has been developed and manufacturing equipment has been set in place. In addition, within the public part of the project, the harbourage has been dredged and the undulatory-proof constructions have been built. The first phase of the port — three moorages with capacity for 2mt of cargo transfer — was launched in April 2010.

The port moorages are equipped with mobile harbour cranes Liebherr (LHM-280 and LHM-180), crane-manipulators, front-end loaders and forklift cargo handlers. The moorages are able to accommodate different loads including bulk cargoes (crushed stone, sand), big bags of cement and other general cargos (including freights in containers) needed to build the Olympic facilities.

The project developer is the Port Sochi Imeretinskiy. The port maintenance is provided by Imeretinskaya Stevedore Company. Both companies are part of Basic Element.

The retrofitting of the port will begin after the end of the 2014 Sochi Olympics. It is estimated that marina capacity will reach 600–700 boats.

Oleg Deripaska, CEO of Basic Element, said: "We are glad to announce the completion of all construction works in the Imeretinskiy port, which is the first cargo port built in modern Russia. The construction of this port is one of the fundamentals for the successful preparation of the Olympic Games in 2014. Development of infrastructure facilities is among the key strategic priorities of Basic Element. Creation of modern and solid foundation for the development of key Russian regions is at the forefront of this strategy."

Egypt to use Poti to handle Kazakh wheat

Egypt says that it would like to make use of the port of Poti in Georgia to handle shipments of wheat from Kazakhstan once upgrading work allowing it to accommodate Panamax vessels is completed. This work is expected to be completed within the next 12 months and will allow Poti to accommodate vessels of up to 60,000dwt. At present, recent upgrades have allowed it to receive Handysize vessels of up to 30,000dwt.

Egypt annually imports around 7mt of wheat. *BC*

Rouen reports major drop in grain tonnage

The French port of Rouen reported earlier this year that exports of wheat had dived by up to 61% during a period of four weeks when Algeria imported no grain at all from France. Normally, Rouen is particularly active in the North African market and accounts for 41% of France's total grain exporter by sea, ahead of La Palice (17%) and Dunkirk (11%). *BC*

Ventspils forestry terminal planned

Ventspils port authority has signed a contract allowing BMGS to build a forestry terminal, following an open tender. The contract is worth $17 million and is part of a total project costing $19 million, of which 62% is being financed by the European Union. The terminal is expected to open at the end of 2013. *BC*

Virginia restarts log exports to China

The US port of Virginia has recommenced the export of logs to China after a 14-month-long ban. This was imposed in April 2011 after hardwood and softwood logs from South Carolina and Virginia were found to be infested by a worm infecting pine trees. Trade has nevertheless resumed for a pilot period of six months although under serious restrictions. Traffic is only expected to be a quarter of what it once was. Only two Chinese ports have been mandated to receive these logs: Shanghai and Jiangsu. All shipments will be subjected to additional inspection and fumigation to rid logs of the pinewood nematode. *BC*

Beira coal terminal opens

A new coal terminal has opened at the Mozambican port of Beira. It will mostly handle export coal produced by the Brazilian company CVRD (68%) and the Rio Tinto mining group (32%). Construction of the terminal commenced in September 2010 and has absorbed investment of $20 million, including handling equipment. The terminal operator is Cornelder Moçambique, although as part of its contract this company can partner third parties with extensive experience in the handling of dry bulk as a means of boosting capacity in the terminal. *BC*

Fourth Newcastle coal terminal opens

Coal exports from the fourth coal terminal at the Australian port of Newcastle are not now expected to commence until mid-2017, which is two years after the initial projected opening in 2015. This has been announced by promoter Port Waratah Coal Services.

This new facility is desperately needed, since two existing terminals at the port — Carrington and Kooragang — are predicted to have reached their maximum export capacity hundred and 45mt (million tonnes) a year by January 2013. Indeed, Terminal 4 already has binding commitments from several coal exporters wishing to make use of it.

The delay has been put down to "sheer technical complexity of the project" and the planning process itself. "It has been an extraordinarily tight timeframe from the outset. There are variables within the planning approvals process and we cannot cut any corners," said a Port Waratah spokesperson. "PWCS is contractually obliged to build Terminal 4 for which coal producers have signed contracts."

In 2012, PWCS terminals are expected to handle 110mt of coal exports against an overall capacity of 133mt, which will expand to 144mt by the end of this year. *BC*

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Adani group eyes Orissa iron ore terminal

India's Adani group is exploring the possibility of buying an export terminal at the port of Dhamra in Orissa state, which opened last September, although has yet to handle significant cargo. The terminal has been offered for sale by the Dhamra Port Company Limited, which has been unable to attract significant consignments of export iron ore due to increased export duty and Railfreight rates. In eight months of operation, it has handled just 200,000 tonnes of iron ore, despite having a potential capacity of 13.5 million tonnes per year.

The Adani group operates India's biggest private port at Mundra in Gujarat state, but wants to strengthen its presence on the Indian East Coast, which would also reinforce its own commodity trading business.

However, selling the terminal at this point in time, although potentially advantageous to the Adani group, will not generate the best possible price, given the current weakened state of the global iron ore market. *BC*

Port of Antwerp steady: dry bulk and ro-ro expand

Handling steel coils at the Port of Antwerp.

The Port of Antwerp in Belgium handled 93,822,976 tonnes of freight during the first six months of this year. This represents a drop of 2.1% compared with the same period last year, due mainly to the Belgian Refining Corporation (BRC) suspending its activities. The container volume expanded slightly during the past half year, demonstrating that the Port of Antwerp is able to maintain its position in the difficult economic situation over the past few months. Ro-ro and dry bulk managed to return good growth figures, of 16.2% and 5.0% respectively. Liquid bulk too has begun to recover in the past month, thanks to BRC restarting.

The volume of liquid and dry bulk decreased overall by 5.1%, to 32,555,938 tonnes. Liquid bulk was down by 9.2%, to 21,976,798 tonnes. Dry bulk experienced a rise of 5.0%, to 10,579,140 tonnes. In this category there were increases in the volume of coal (up 30.5% to 3,677,607 tonnes) and grain (up 7.1% to 538,422 tonnes), while contractions were suffered by fertilizers (down 14.1% to 2,132,093 tonnes) and ore (down 18.1% to 1,306,457 tonnes).

In the conventional/breakbulk field 5,375,642 tonnes of freight was handled, a decrease of 16.5% compared with the same period last year. The drop is mainly due to the lower volume of steel, reflecting the current economic climate. During the first half year of 2012 a steel volume of 3,378,612 was handled, which is 23.4% less than the 4,410,803 tonnes for the corresponding period in 2011. For the rest there were mixed results for fruit (down 4.3% to 666,693 tonnes), paper and cellulose (up 19.2% to 426,073 tonnes), granite (down 26.3% to 111,395 tonnes) and non-ferrous metals (up 30.8% to 214,717 tonnes). The ro-ro volume is up by 16.2% to 2,409,988 tonnes, with the number of cars handled growing by 17.2% to 617,453.

During the first six months of 2012 there were 7,361 calls by seagoing ships in the port of Antwerp, down 5.0% on the same period last year. The gross tonnage suffered a slight contraction of 0.5%, to 157.9 million GT.

The annual study of the economic importance of Belgian ports, carried out by the National Bank of Belgium, shows that the port of Antwerp generated €9.8 billion of direct added value in 2010. This is 60% of the direct added value of all the Belgian ports put together, 9.5% of the GDP of Flanders and 5.4% of Belgian GDP. The Port of Antwerp provided jobs for 145,000 people in 2010, making it an important engine of the Flemish and Belgian economy.

Online Coal Analysis

TBM 210: Moisture Monitor

COALSCAN 2100: Ash Analyser

COALSCAN 2800: Ash and Moisture Analyser

COALSCAN 9500X: Ash, Sulphur, Moisture, Calorific Value and Ash Oxides Analyser

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Scantech is a renowned provider of process control solutions for bulk materials.

The wide range of available technologies and control software ensures that the right solution is chosen in each application. The company's products include solutions for the coal industry, power plants, minerals, cement and steel. It also offers expertise in the monitoring of real time moisture content of conveyed materials.

Scantech is an ideal partner for plants where output may be increasing, but quality assurance is struggling to keep up. Operators must meet product specifications with cost-effective process control, with the scalability to keep plants operating efficiently and effectively. Scantech's process control solutions deliver what's needed. In fact, more coal is monitored each day by Scantech's process control solutions, than by all other companies combined.

The wide range of online analyser technologies available ensures that the right instrument is selected as part of each site's individual solution. Alongside our analyser technology we have developed our own user friendly display and process control software. This ensures complete process control solutions.

Notable among its products are:

- **COALSCAN:** historically the COALSCAN has been Scantech's flagship;
- **Geoscan:** the Geoscan is an on- belt elemental analysis system for monitoring bulk materials such as limestone and iron ore;
- **TBM200:** the TBM200 series of moisture monitors are the result of Scantech's many years of experience developing microwave technology;
- **CM100:** the CM100 coke moisture monitor is a direct, on-conveyor monitor for measuring moisture in conductive materials;
- **CIFA350:** the Carbon in Fly Ash Monitor provides significant benefits to coal fired power stations; and
- **NG Minerals Monitor:** Model 1500 Natural Gamma Minerals Monitor.

This article will focus on Scantech International's flagship product COALSCAN. COALSCAN is available in a range of configurations.

COALSCAN 2100

The COALSCAN 2100 is a new configuration in the Dual Energy Transmission (DUET) ash gauges and offers all the accumulated operational experience gained since COALSCANs were first developed, but at a significantly reduced price.

Scantech has been supplying DUET technology for many years now and these systems have proven to be the most

COALSCAN 2100.

popular of the COALSCAN range.

The optional superSCAN output display system is available or the information from the monitor may be input directly to the plant process control system. The very high speed response of the COALSCAN 2100 makes it suitable for such applications as sorting and run of mine monitoring, as well as product monitoring. As well as building on Scantech's worldwide reputation for reliability, the new generation of COALSCAN 2100s are also amongst the easiest to operate and easiest to afford.

An earlier model of the COALSCAN 2100 was the COALSCAN 2500.

COALSCAN 2800

The COALSCAN Model 2800 is one of the Model 2000 Series ash and moisture monitors.

The analyser includes both gamma ray and microwave absorption techniques in a single integrated enclosure for the measurement of ash and moisture. These two measurements allow a calculation of calorific value.

These instantaneous measurements can be further integrated for output over a user configurable period eg shift, stockpile etc. The optional superSCAN output display system is available to carry out this task or the information from the monitor may be input directly to the plant control system. Scantech's application of gamma ray technology, known as Dual Energy Transmission (DUET), is the most accurate application of this technology commercially available.

COALSCAN 9500X

The COALSCAN 9500X is an on-belt elemental analyser for coal.

The COALSCAN 9500X utilizes a combination of analysis techniques to monitor a wide range of coal parameters. These techniques include Prompt Gamma Neutron Activation Analysis (PGNAA) to determine the elements and ash content and a microwave moisture analyser.

The COALSCAN 9500X provides continuous monitoring of the standard coal analyses ash, sulphur, specific energy/heating value and moisture.

In addition, the COALSCAN 9500X can monitor and report the major oxides in ash, such as: SiO_2, Al_2O_3, Fe_2O_3, CaO, MgO, Na_2O, K_2O, TiO_2, MnO_2, SO_3, and Cl depending on concentration.

The COALSCAN 9500X has been engineered as a compact, fully integrated, single enclosure measurement unit which is installed on the conveyor and monitors the full flow of coal.

The calibration process uses a patented technique that accounts for variations in bed depth and moisture content to provide accurate measurement of ash, moisture, sulphur and other elemental constituents of coal.

COALSCAN 1500

The COALSCAN 1500 is an economical on-line ash monitoring system which is easily installed directly under production conveyor belts.

The major features of the COALSCAN 1500 include:

- easy installallation and simple operation;
- no radiation sources — no requirement for licensing;
- underbelt configuration — suitable for raw coal and high tonnage applications;
- fully automatic operation — no operator intervention required;
- no mechanical moving parts — low maintenance costs;
- automatic electronic stability checks — drift-free performance;
- no operational upper limit to coal size or coal bed depth;
- flexible system interface to suit specific site requirements;
- non contact technique — no high wear components;
- superior total cost of ownership; and
- designed for long product lifecycle .

This same technology is available for gold applications (GOLDSCAN), sugar cane applications (CANESCAN) and iron ore applications (IRONSCAN).

Liquefaction and the risk of disaster

It is one of the most pressing matters currently on the agenda of shippers, ship owners, Protection and Indemnity clubs, hull and cargo insurers, international regulatory organizations and inspection companies – flow moisture testing and the dangers of ships capsizing.

At the heart of it is the problem of liquefaction, that is, the potential for a dry cargo to turn into a semi-liquid state. The consequences can be tragic and besides the material loss of a ship and its cargo can also lead to loss of life if cargoes assume this condition on the high seas. It does not take too much imagination to think of the instability caused if for instance a cargo of nickel ore suddenly takes on this liquid state. Capsizing becomes a real possibility (with very little warning). Indeed, for various market reasons, there has been an increasing regularity of such disasters (including loss of life) since 2010. And even where actual capsize is averted, the financial consequences of a vessel not being allowed to sail (or having to divert after sailing) can be enormous and reverberate throughout a long chain of parties interested in both vessel and cargo.

Nickel ore which has liquefied in the hold.

The Commodities Trade Division of Bureau Veritas, 'Inspectorate' is at the forefront of mechanical testing expertise. This is deployed so that all affected parties can make informed decisions about the safety of materials to be loaded. In particular Inspectorate is continually developing its capability in respect of the measurement of the Flow Moisture Point (FMP) and Transportable Moisture Level (TML) which by calculation builds in head room as a precautionary measure.

Of utmost importance to Inspectorate is a relentless, single-minded drive for consistency across all international laboratories that offer such testing.

Liquefaction is an area fraught with difficulty for all parties. The effect is most obvious in fine particle commodities such as iron and nickel ore, copper and zinc concentrate.

The process of liquefaction can occur through vibration and motion forces during shipping. This can cause the space between particles to contract and compress free water in those spaces. This can impact on the cargo by reducing the frictional force between the particles by acting as a lubricant potentially allowing the cargo to flow. It is friction that normally keeps the cargo in a solid state.

When the moisture levels in the cargo are too high, liquefaction can occur even if the cargo appeared dry when loaded.

There is now a strong drive to improve knowledge of this danger in ports across the world. In 2011 the International Maritime Organization (IMO) Safety Committee commissioned its Sub-Committee on Dangerous Goods, Solid Cargoes and Containers (DSC) with a remit to "develop a scheme for ensuring reliable independent sampling and testing and certification of cargoes; and education for ship and shore personnel involved with the shipment of dry bulk cargoes with an emphasis on accurate cargo declarations to ensure safe cargo is loaded'. Up to this time the shipper has an obligation to provide this declaration.

Inspectorate is fully supportive of this drive. It does so, on the basis of its extensive knowledge, particularly from its work in India and Indonesia. In 2011 it conducted more than 700 FMP tests, the majority (but not exclusively) of which were carried out in these two countries.

Testing is rigorous and involves a number of steps. The 'Flow Table Test' used to determine the FMP and hence TML, as described in ISO 12742, is a technique recognized by IMO. These tests simulate the conditions which a cargo might experience whilst being shipped and gives a measure of a given commodity's potential to liquefy.

Another crucial component is the accurate determination of the inherent moisture, both of the stockpile and when the cargo is loaded. Presented with the data for TML and moisture, port authorities and shippers must decide that the cargo is safe to ship. But — and this is the critical point — before he sails the Master must be confident that the bulk cargo has been rigorously subjected to any necessary liquefaction test.

Sampling presents all parties with significant challenges. One of the most important is achieving representative samples to ensure the most accurate results are possible and the true potential to liquefy during transit is thoroughly understood. There are inherent difficulties in sampling stockpiles and it is important that all parties work closely together to ensure the sample taken is as representative of the whole cargo as is possible. Stockpiles with mixed grades of ore add further to the sampling difficulties. Another factor to be considered is the maximum particle size. The Flow Table Test excludes particles that are greater than 7mm. It is important that the moisture level is determined from samples where the maximum particle size is no more than 7mm; otherwise results could misleadingly indicate safe moisture levels. Where stockpiles contain particles greater than 7mm then it will be necessary to follow procedures as laid down by the port authority.

Inspectorate has rigorous internal standard operating procedures and Keith Blaxall, Inspectorate's global technical director and his team lead a stringent internal accreditation scheme to maintain a consistent service across all its facilities.

At the same time it continues to work on its own and with others in the industry to improve the testing methods.

More than this, Inspectorate seeks opportunities to increase knowledge and understanding of the liquefaction problem.

While Inspectorate provides rigorous results it is important that users should understand the limitations of those results. The final decision on whether it is safe to ship a cargo must be based on a range of information of which the TML and moisture level is important but not definitive.

Sampling based on modern sampling theory

Alex Stewart International employs more than 1,200 people in over 45 countries and operates 17 laboratories, write *Mr. Graham Stewart and Mr. Kozo Matsumoto, Alex Stewart International Corporation*. Alex Stewart International provides its customers with independent verification of the quantity and quality of bulk commodity shipments, as well as geochemical analysis of mining samples for exploration projects. Core business services are for large international commodity trading companies within the agriculture, metals and mineral and oils and petroleum industries.

As a service company, one of Alex Stewart International's core business areas is the supervision of weighing and sampling of base-metal concentrates, where the company considers it most important to rely on modern sampling theory, not on rule-of-thumb.

Total sampling variance is defined as:

- Primary variance of primary increments divided by the number of primary increments;
- + sample preparation variance + analytical variance divided by the number of replicate analyses.

In order to design any sampling scheme, first it is important to decide the target value of the total sampling variance.

Then a decision must be made on: primary variance of primary increments; sample preparation variance; and analysis variance.

Here, in fact in modern theory, there are two schools of thought;

- P. Gy's theory using the concept of variogram; and
- traditional theory stemmed from some of JIS standards.

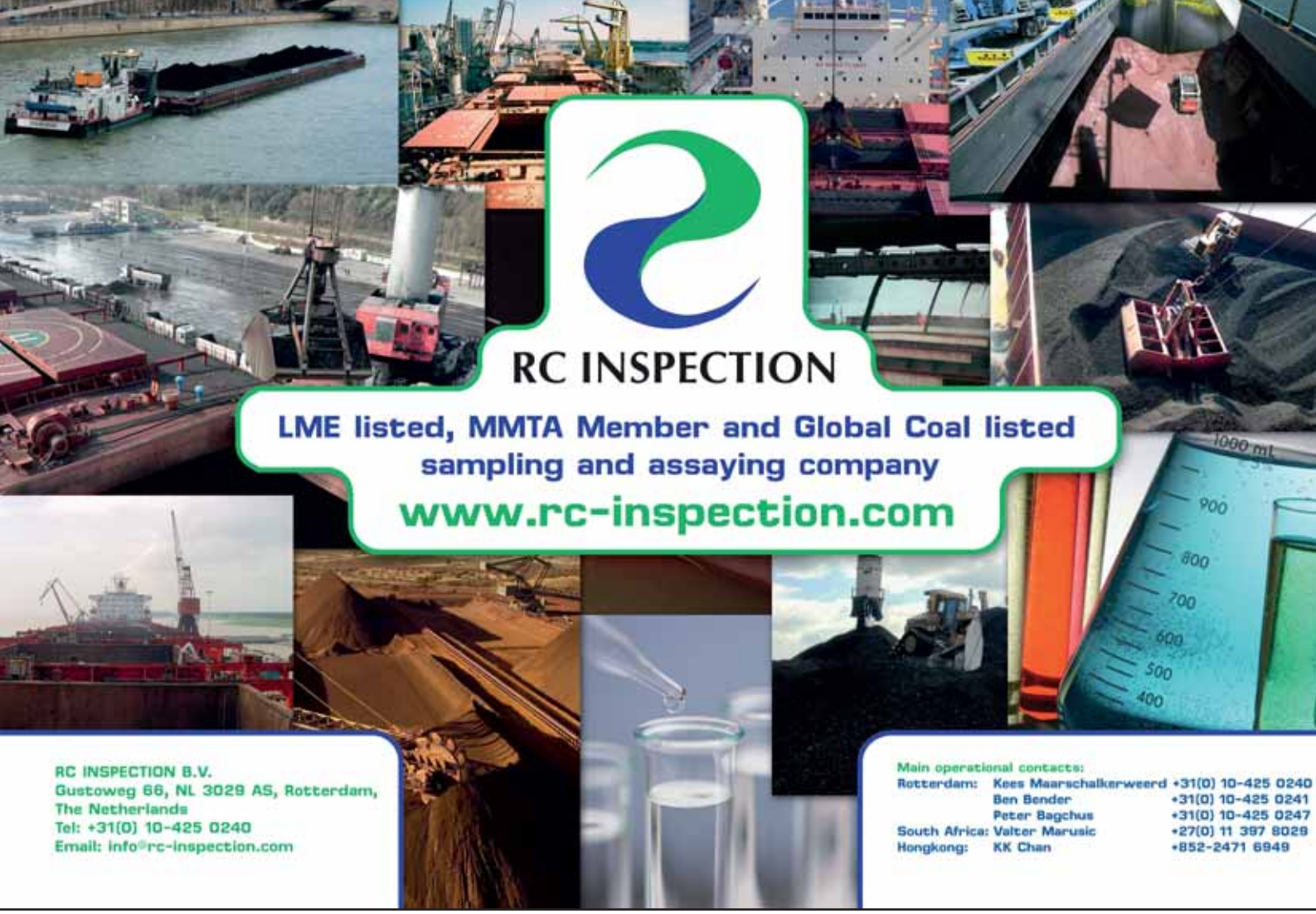
Traditional sampling theory is based on the assumptions that each sampling point is statistically independent of all others and that analysis results at each point are subject to a normal standard distribution.

If this is not deemed to be the case, then it is better to follow Gy's theory.

Following Gy's theory, the required number of sample increments for each lot tends to be much less than the one established by traditional theory. However, at Alex Stewart International, it is believed that the truth lies in-between both theories and that considerable experience in actual shipments is vital.

Also, in actual shipments, correct determination of moisture content of any bulk cargo is extremely important. This point would seem self-evident, but in reality, contrary to expectation, it is rarely carried out at the loading point. Alex Stewart has considerable experience in this throughout the world.

Lastly, it should be emphasized that normally taking many samples will not resolve any sampling issues. Too many samples can create other serious difficulties in sample reduction. This issue will also have to be resolved based on theory and experience. DCi



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Dry commissioning of the second transshipper for Loreto in full swing

In close co-operation with its valued customer Loreto (a fully owned subsidiary of CITIC Pacific) E-Crane senior engineers Paul Hebberecht and Michael Hamerlinck have successfully completed the dry commissioning of *Magdragon 2*, the second transshipper at the Nantong Tongmao shipyard.

It's expected that later this summer this second transshipper will join her sister vessel *Magdragon 1* at the port of Cape Preston, West Australia.

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Highlight of the month

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Hybrid air cannon: more force, lower air consumption

A renowned global expert in material flow aid technology has introduced a new hybrid air cannon design. The Martin® Typhoon Extreme Air Cannon features the simple one-line plumbing of a traditional solenoid operation with the power, efficiency and ease of maintenance advanced centrally-located valve designs. Supplying more force output with less air consumption than traditional air cannons, the Martin® Typhoon Extreme Air Cannon delivers outstanding performance with minimal setup.

The complete valve assembly can be removed in one easy step and replaced within minutes, working from one side of the tank, eliminating the need to ever remove the tank from the vessel for service. Requiring only one air line to fill the tank and trigger valve, minimal plumbing is required. The air cannon assembly features a rigid steel mount that tolerates vibration for improved durability.

The Typhoon Extreme Air Cannon's negative pressure firing provides effective performance in challenging applications with limited budgets. Using the same tank as Martin Engineering's Hurricane Supreme Air Cannon, the Typhoon can easily be upgraded to a positive pressure-firing Hurricane valve to provide even greater output force. The new air cannon system is an ideal upgrade for the Martin® Extra High Velocity Air Cannon.

There are three models available; 35 litre (72 lb/33kg), 70 litre (88 lb/40kg) and 150 litre (124 lb/56kg). Specific launch dates of this new product may vary slightly, depending on the country/region.

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Tenova to supply copper handling system to Chile

Tenova Mining & Minerals has announced that Tenova TAKRAF and Tenova Bateman Technologies will design and deliver a copper ore handling/processing system and a Solvent Extraction (SX) – Electrowinning (EW) plant, to produce 80,000 tonnes per annum of fine copper cathodes for Minera Antucoya, part of Antofagasta plc. The new plant, with a life time of approximately 20 years, will be located at Antofagasta region, approximately 45km east of the group's Michilla mine, Chile.

These contracts will include engineering, supply of proprietary equipment, construction, training, commissioning and start-up supervision. Tenova TAKRAF will provide an agglomeration plant, an on-off leach pad measuring 3,000m by 800m and a waste handling system, and Tenova Bateman Technologies will supply the SX plant based on Bateman Settler™ technology. This is a proprietary reverse-flow mixer-settler (RFMS) technology, which was developed and patented by Bateman and which is used in various plants in Chile, including Codelco's Gaby plant and Vale's Tres Valles plant.

Jointly, the two Minera Antucoya contracts are the largest project ever awarded to Tenova Mining & Minerals, the division of Tenova focused on serving the global mining & minerals and metals industries.

The combination of biddings for the Minera Antucoya project reflects Tenova's strategy looking forward, offering a full range of technologies and engineering services to provide clients with a unique one stop total solution source across the full mining value chain, harnessing the capacities and capabilities of multiple business units strategically located around the globe.

Tenova TAKRAF is a major supplier of a complete range of systems for the mining and bulk handling sector and Tenova Bateman Technologies provides solutions covering; Leaching, Solvent Extraction and Electro-winning, Beneficiation, Purification, Sulphuric and Phosphoric Acid Plants.

Tenova is a worldwide supplier of advanced technologies, products and engineering services for the iron & steel and mining industries providing innovative, integrated solutions for complete process areas. Tenova's network companies operate in 26 countries on five continents with more than 4,900 people.

APW Process Weighers delivered to Egypt

With a reputation for providing precision and versatile throughput weighing solutions in the flour milling sector, Nottingham based Chronos BTH has supplied more of its CHRONO-WEIGH™ APW process weighers to a milling complex in Egypt.

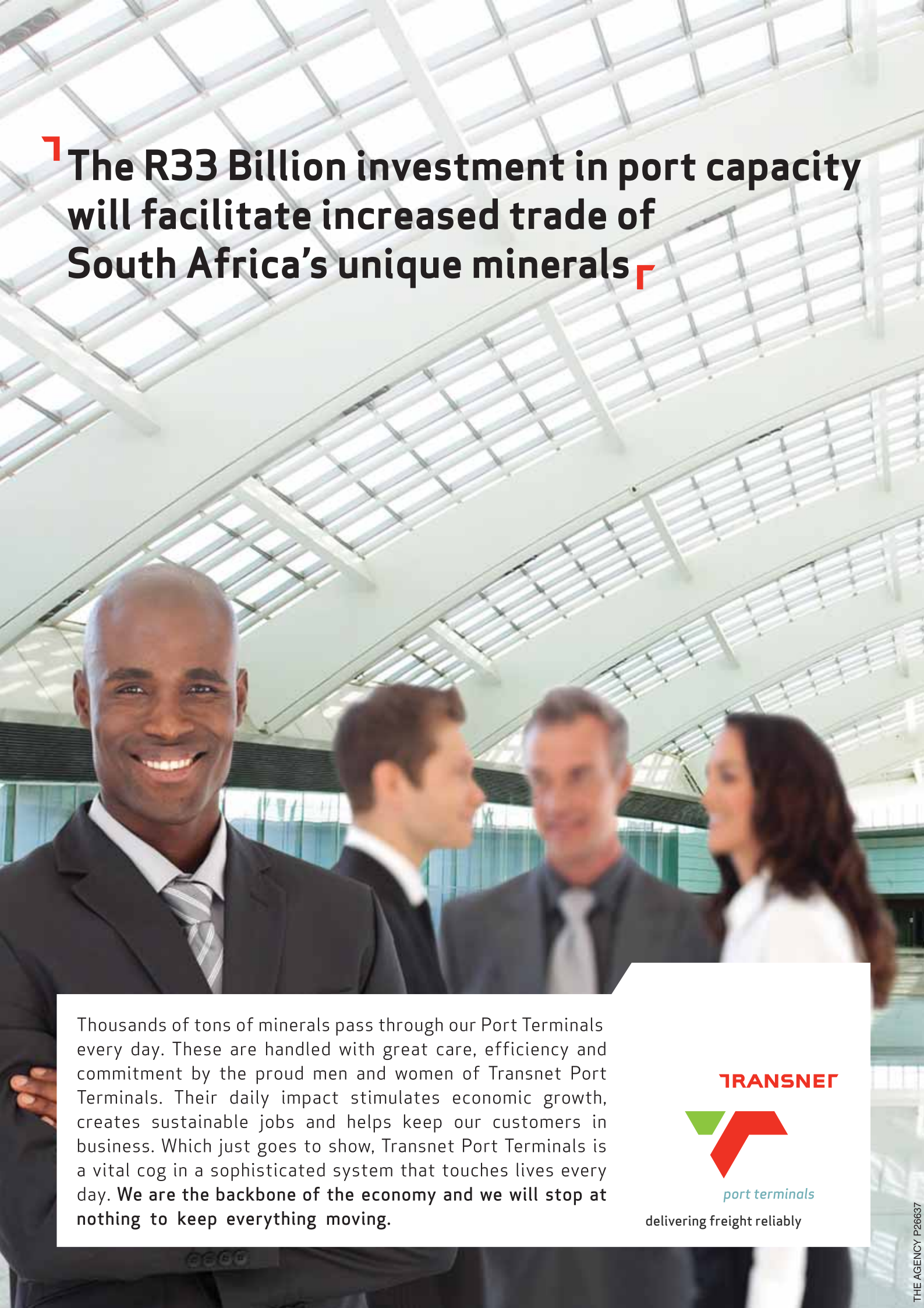
A total of seven CHRONO-WEIGH™ APW process weighers of the latest 3 loadcell design have been installed to provide a variety of roles within this milling complex; from first break weighing through to flour blending. These process weighers form an integral part of the weighing and packaging equipment that have been installed by Chronos BTH.

A CHRONO-BULK™ AW/VW weigher controlled by a PC456i controller is providing bulk intake weighing of grain into the milling complex. Downstream of the milling process a CHRONO-FILL™ K4.2 Carousel packing system with RV packer is providing high-speed flour packing, at rates matched to the output of the mill.

The order was secured by Issam Baydoun based in Jordan and comprises equipment supplied from various Chronos BTH manufacturing locations around the world.

All APW Weighers are designed for simple integration into new or existing mills and are capable of freestanding operation. APWs can also be interfaced with any mill control system and their compact design, features integral feedgate and discharge doors.

Chronos BTH Limited incorporates Richard Simon Limited, Verville and Premier Tech Chronos – America for European spares, refurbishments, service, installation and commissioning.



The R33 Billion investment in port capacity will facilitate increased trade of South Africa's unique minerals

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Shiploader delivery heralds start of multi-billion-rand equipment programme

South African port operator Transnet Port Terminals (TPT) has earmarked the biggest slice of its R33 billion budget over the next seven years for new equipment acquisition projects at Richards Bay, the country's largest bulk export facility.

The last week of July saw the arrival of one of the terminal's largest assets, a custom-built pneumatic ship unloader produced by Swiss shipping manufacturer, Rio Tinto Alcan (RTA) Alesa Engineering Ltd.

The unloader is only the seventh of its kind in the world and its arrival signals the start of the Richards Bay Terminal's ambitious R3 billion equipment replacement programme to

improve capacity, equipment reliability and service delivery. This will better enable the terminal to yield maximum results by meeting the needs its customers.

This machine will be able to unload alumina and petcoke from vessels and will facilitate a homogeneous and dust reduced material flow. It has the capacity to unload at 1,000tph (tonnes per hour) by design, making it a valuable acquisition in improving the terminal's operational efficiency.

TPT client BHP Billiton Aluminium SA expressed its commitment to working with its long-standing partner TPT to ensure the success of the newly acquired pneumatic unloader.

Lucas Msimanga, asset president of BHP Billiton Aluminium SA, said: "We would like to take the opportunity of thanking and congratulating TPT for providing this essential equipment. As BHP Billiton Aluminium SA, we feel this clearly demonstrates TPT's commitment to improving operations and delivery of a high quality service to its partners. The offloader will significantly improve the efficiency of BHP Billiton's operation and will undoubtedly make a positive impact in reducing spillages."

The R3 billion earmarked for equipment replacement in Richards Bay falls within a total of R12.1 billion allocated for the plant over seven years.

Says TPT's Richards Bay Terminal head, Victor Mkhize, "This investment in Richards Bay shows TPT's sound commitment to the terminal and will make a remarkable difference in enabling the plant to achieve improved operating efficiencies and deliver on customer expectations."

"A number of tasks will be executed when the new unloader arrives. This includes assembling, operator training, endurance testing, hot and cold commissioning and handover. This is an historic moment for TPT and an important milestone we can be proud of," he added.

Transnet SOC Ltd's Market Demand Strategy (MDS) will see the company invest in excess of R300 billion on capital projects over a seven-year period aimed at building freight capacity to

support South Africa's economic growth.

Commenting on the seven year capital investment programme, TPT Chief Executive Karl Socikwa says: "The MDS has major implications for our division's responsibility to facilitate unconstrained growth, unlock demand and create world-class port operations through improved efficiencies."

"Acquiring the unloader in Richards Bay is certainly a significant step towards us achieving our MDS objectives and huge thanks must go to the project team for many months of intensive work involved in getting us to this milestone," he said.

TPT has prioritized major MDS projects to be embarked on

in Richards Bay over the next seven years which include:

- R3.7 billion on capital sustaining investments including mobile equipment, quayside equipment and weighbridges. Also included are safety critical projects as well as environmental and legal compliance projects; and
- approximately R1.2 billion to be spent on capacity creation, such as new or upgraded storage areas and re-engineering of the port to create additional capacity.

About Transnet Port Terminals:

Transnet Port Terminals is a division of Transnet SOC Limited, South Africa's state-owned freight transport and handling company.

It provides efficient and reliable cargo-handling services at terminals situated across seven South African ports — Durban, Richards Bay, Cape Town, Saldanha, Port Elizabeth, Ngqura and East London. TPT customers include shipping lines, freight forwarders and cargo owners.

Operations cover import and export operations across the following cargo sectors: containers, mineral bulk and the agricultural bulk and ro-ro sector.

Karl Socikwa is the chief executive. The company has a staff complement of over 6,000.


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Sennebogen 6210 HMC: a specialist at work in Norway

The Norwegian port of Stavanger is the starting point for a large number of supply vessels bound for the North Sea. As port operator, the NorSea Group relies on Sennebogen completely for material handling and loading and unloading the ships. The Sennebogen 6210 HMC is the perfect machine for loading a wide variety of supply goods quickly and easily every day.

The Norwegian NorSea Group specializes in special logistics and supplying off-shore stations. The company relies on flexible crane and loading solutions at its ten sites. The new Sennebogen 6210 HMC is the crane for everyday use at Stavanger in Norway. The machine is characterized by high mobility and large loads. The Sennebogen 6210 HMC was specially developed in cooperation with the customer for loading heavy loads. The supply vessels regularly departing from Stavanger supply off-shore platforms in the North Sea and are loaded with all kinds of materials and containers. The biggest challenge for the port workers is switching quickly between heavy goods and light containers. This is where the Sennebogen harbour cranes really come into their own. The latest model impresses with particularly high loads. Equipped with a 2x 200kN double acting winch and a rope speed of up to 103m/s, the Sennebogen 6210 HMC achieves up to 55 cycles per hour with weights ranging between 5 and 15 tonnes. The local sales and service partner IMB Maskiner A.S. has supplied three machines to NorSea to date. The experiences have been completely positive. One special feature that sets the 6210 apart is the variable ballast. For loading particularly heavy goods, the machine can be ballasted easily with a 20-tonne counterweight, which is positioned on the rear of the upper carriage using a lift truck. With this heavy-lift system, the ballast can be increased in stages from 45 tonnes to 65 tonnes. This increases the load of the machine by up to 40% without restricting the function and mobility. With the mounted boom, the Sennebogen can lift up to 10.4 tonnes at 53.5 metres reach depth. The stable support plates ensure secure standing and the all-wheel drive offers maximum manoeuvrability. NorSea praises the longstanding positive experience with the tried-and-tested Sennebogen machines, the ergonomic design and generous equipment in the driver's cab, as well as the easy access for maintenance and service work.

"With the new 6210 HMC, Sennebogen has developed a machine that fulfills our requirements exactly. Manoeuvrable, mobile and with high loads, we can use the crane flexibly for all loading tasks," states Asgeir Klingsheim, technical manager, NorSea.

Euromec makes a direction connection

Euromec products directly connect the operator to the material handling process. The company's products ensure an ideal solution for optimum output.

Thanks to the mobile counterweight, and the 'arm' balance, HBC series cranes enable energy savings of 30–50% in all positions. At the same time, they offer work speed and control precision, reducing wear on the crane and significantly reducing the need for maintenance.

The cranes can be supplied with fixed base; self-stabilizing base; tracks and even supports for rails. Thanks to its sound insulation, to the cabin comfort and to the wide visibility, operators enjoy ideal working conditions.

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TAIM WESER offers considerable expertise in iron ore market

Bucketwheel reclaimer for iron ore and pellets at a raw materials stockyard in a steel plant.

TAIM WESER is an international company that specializes in the development of turnkey projects all around the world, with headquarters in Zaragoza (Spain) and design facilities in Spain, Germany and Brazil as well as branch offices and representatives in the five continents.

TAIM WESER has consolidated its international position within the iron ore handling market with various turnkey projects undertaken in the last few years all over the world.

In the Middle East area, TAIM WESER has considerable experience in the iron ore market, having supplied various projects such as:

- **Ardakan** — the company supplied the bulk handling equipment at a pelletizing plant, including two stackers with capacities of 700tph (tonnes per hour) and 1,700tph, and a 1,000tph bucketwheel reclaimer;
- **Bandar Imam Khomeini Iron Ore Port Terminal (BIKIOT)** — supply of the belt conveyor system, train loading station, combined bucketwheel stacker reclaimer, with a capacity of 2,400tph for stacking and 2,000tph for reclaiming, as well as a 1,200tph grab ship-unloader;
- **Choghart** — TAIM WESER supplied the handling and transport system at Choghart iron ore complex, including two circular stockyards with a capacity of 360tph for stacking and 1,000tph for reclaiming, a 900tph twin bucketwheel bridge type reclaimer, and a 900tph stacker for ROM Ore.

In addition, TAIM WESER is currently supplying six luffable and slewable combined stacker reclaimer machines, capacity 1,500tph for iron ore, pellets, lump ore and lime at various steel plants in the region.

In North Africa, TAIM WESER has recently supplied one 4,000tph luffable and slewable boom type stacker, and one 1,000tph bucketwheel boom type reclaimer for an iron ore pellet stockyard.

In America, TAIM WESER is involved in a very big project consisting of the turnkey supply of a conveyor belt system and stockyard machinery installation for the new Porto Sudeste Port Terminal, to be built in Itaguaí (Brazil) by LLX.

The new terminal will be for private and mixed-use and will serve primarily to export the iron ore mined by MMX, the mining company of the EBX group, in Minas Gerais, a state neighbouring Rio de Janeiro.

TAIM WESER will be supplying all the equipment needed for transport operations, storage and the loading of iron ore at the port stockyard. The equipment consists of a complete conveyor belt system and four combined stacker/reclaimer machines to be installed in the two new iron ore storage yards.

The transport system is comprised of a complete belt transport circuit for iron ore, from reception up to its loading onto ships, including all the conveyors for the two storage stockyards. The total length of the belt circuit is approximately 13,000m. The conveyors have a capacity of 12,000tph, a belt width of 1,600mm and 1,800mm and speeds of 4.5 and 4.8m/s. It is also important to mention that the transport system will come equipped with all the auxiliary equipment, including transfer towers, silos, bypass chutes, monitoring equipment, magnetic separators, weighing systems, etc.

The four stacker-reclaimers will be responsible for the storage and stacking of iron ore into the stockyard. The machines have a stacking capacity of 10,000tph and a reclaim capacity of 12,000tph. Each machine is supplied with its own rail track. Some of the outstanding features of the machinery include the length of the boom, which is 60m long, and the 12m span between rails.

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Liebherr A 944 C HD for Port of Sunderland

Sunderland City Council has invested in a Liebherr materials handler to help boost cargo handling capacities and business opportunities at the Port of Sunderland, the UK's second largest municipally owned port. The new Liebherr A 944 C HD wheeled industrial rehandler can access all quay surface types, operating free-on-wheels or static with four point hydraulic outriggers and is capable of loading and discharging cargo ships up to 5,000dwt.

Councillor Paul Watson, leader of Sunderland City Council and chairman of the port board, said: "This machine can go, quite literally, along any of the quaysides and working areas in the Port of Sunderland. It's going to bring some significant benefits. Buying this materials handler represents a good investment in the port's handling capacity."

Councillor Mel Speding, the City Council's cabinet secretary and a member of the port board, added "Commodity cargoes are a major part of the port's work and with the addition of this crane there's an opportunity to look at more of this market."

The Port of Sunderland already has rail-mounted cranes at Corporation Quay and other mobile crane capacity includes a Liebherr Harbour Mobile 150.

The Port of Sunderland's new Liebherr materials handler comes with an extremely high specification to ensure maximum versatility and optimum operating efficiency and safety. This machine is one of a comprehensive range of specialist industrial rehandlers, specifically designed and built for materials handling applications at the Liebherr Group's line-dedicated factory in Kirchdorf, southern Germany.

The A 944 C HD Litronic is a 58 tonnes operating weight machine, powered by a turbocharged and intercooled Liebherr diesel engine that complies with Stage IIIA/Tier 3 emission limits and develops 190kW at 1,800rpm. This powerful materials handler features a heavy-duty undercarriage, with 70 tonnes class excavator axles and large solid rubber tyres. The broad support base with four-point pads makes it extremely stable in operation and, as a result, the A 944 C HD Litronic has outstanding load capacities of up to 4 tonnes at a working radius of 18 metres and a maximum lift height of 20 metres. This model has also been supplied with Liebherr's own Kinematics option 3C, which modifies the operating range curve and provides additional reach depth below ground level — essential for unloading ships' cargo holds. The 11.5 metres industrial gooseneck boom is combined with an 8.8 metres industrial angled stick, which is equipped with a quick-change mechanism and electrical system for the range of attachments and magnet operation. The Port of Sunderland has taken the new Liebherr materials handler with a veritable armoury of attachments, including clamshells and five-tine grabs, timber tongs, lifting hook and electromagnet suspension system. Automatic central lubrication is featured for upper carriage and attachments. A 20kW hydraulic generator drive is supplied for the magnet attachment.

The air-conditioned, vibration and sound-dampened cab is typically comfortable and functional, with Liebherr's own highly developed Litronic engine and hydraulics management system ensuring the operator has real-time performance data at all times; this system also includes load diagrams according to ISO10567. An overload warning system has been installed, as has the Prolec Litwatch 5 system which includes the 'load on hook' option. Armoured glass, front and FOPS roof guards have been fitted, as have additional front and rear headlights, plus twin halogen lights on both the boom and stick. A rear-view CCTV camera and in-cab colour screen provides maximum rear space monitoring at all times. The cab can be hydraulically elevated, giving the operator a raised 7.14 metres line of sight of the work area, which is a particularly important operating safety benefit when unloading ships. The ergonomically designed seat in the cab can be moved to a wide range of positions and adjusted to match the driver's weight; the steering wheel is also fully adjustable. Twin joystick controls for slew and attachment movements are integrated into the seat armrests.

Commenting on the new machine, Matthew Hunt — director of the Port of Sunderland — said, "the port board considered the business case, approved the purchase and now we've taken delivery of a very precise and efficient piece of very mobile plant machinery. It's going to provide important new additional capacity to more efficiently meet our trading obligations over the ten-year period".

Keith Middleton, the port's cargo operations manager, added, "It's a very fast and agile piece of machinery, and it is offering us more flexibility."

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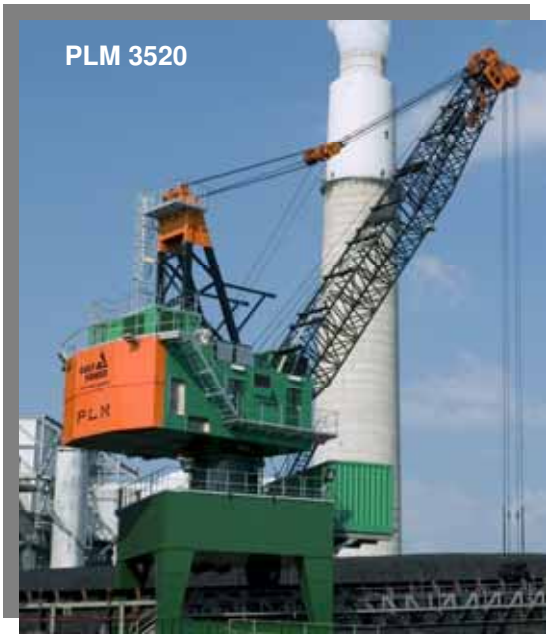

Purpose-built bulk handling, dredging and hoisting cranes.

Tower units extend reach, improve aiming of dust suppression equipment

One of the major manufacturers of open area dust suppression has announced the introduction of a new component in its arsenal of custom solutions: a family of tower mounts for the company's atomized misting equipment, which extends droplet hang time and range, while providing more precise aiming capability. Complementing a product line that already includes wheeled carriages and skid mounts, by delivering millions of 50–200 micron droplets per minute from above dust-generating activities, tower-mounted units help commercial operations achieve superior particle control and prevent dust from migrating off-site.

Dust Control Technology developed the new tower designs specifically to address ongoing operations that generate dust in fixed locations. They are well suited for slag handling, aggregate processing, recycling operations and coal handling.

"The tower mounts can deliver a focused mist to the areas where dust is created," commented DCT general manager Laura Stiverson. "This allows the DustBoss™ units to concentrate virtually their entire output directly to the source of the problem." Designed to withstand wind loads of at least 100mph (miles per hour), the towers are constructed of carbon steel pipe, hot dip galvanized to resist corrosion.

To further customize a dust solution for individual customer sites and conditions, any of the fan-driven units can be modified to address specific particle sizes or service environments. "In some applications such as slag handling, the dust particles can be so small that they are more effectively managed with smaller droplets," Stiverson observed. "In other situations, reduced flow may be preferred to protect moisture-sensitive materials."

In either case, the company can apply its Variable Particle Sizing (VPS) technology to match the dust to the most appropriate droplet size and water delivery. "The most effective suppression takes place when the dust particles and droplets are roughly the same size," she reminded.

Three tower sizes are currently available. The 6" base tube is generally employed on tower heights under 15 feet, and is compatible with the standard oscillation package. For greater elevation, 8" diameter towers are used.

The heavy-duty design is the 10" diameter flange-mounted towers, which are secured directly into concrete. Available in heights up to 20 feet, the large diameter allows hoses and power cords to be routed inside the tower for protection and a 'cleaner' appearance. The flange-mounted units feature programmable oscillation, with a customer-settable range from 0–359°. Climbing rungs, work platforms, booster pumps and additive metering systems are all available as options.

Once installed, users have two options for raising and lowering the tower. The manual jack has a long handle attached, allowing operators to rotate the handle to change the height from the ground. When fitted with the optional electric jack, changes can be made via the control panel or remote control unit. With motion limits set by the program, the operator simply activates the jack until it reaches the desired position, allowing quick and easy adjustments to accommodate weather changes or specific work activities.

The ability to network multiple machines and/or automate the on-off cycles can be a big advantage to large operations. "Automated units can be operated from a single radio-controlled, hand-held remote to conserve resources and avoid over-saturation, with the units running only during dust-generating activity," Stiverson explained. The radio-powered remote control allows rapid start-up or adjustment of the machines by a single operator, without any manual contact.

In fully-automated systems, the network can be equipped with sensors that track wind and weather details, with customized software and programmable logic control via computer. Driven by proprietary software, the resulting 'intelligent' systems can be programmed to manage start/stop cycles based on dust monitor readings, motion sensors or weather input. The technology allows users of DustBoss equipment to automatically adjust elevation, oscillation range and other features on any number of machines to improve suppression efficiency and free up manpower for other tasks.

The tower units provide a versatile, customizable dust and odour control solution. Spraying the worksite from above, the tower units help prevent nuisance dust or odor from entering the air stream, greatly reducing the possibility of fugitive dust leaving the worksite. With the number of tower sizes and available options, the systems are customized based on the needs of the specific application and individual location.

Dust Control Technology is a global provider of dust and odor control solutions for mining, rock and aggregate processing, demolition, recycling and scrap processing. The company's DustBoss® product line helps reduce labour costs vs. manual sprays, freeing up manpower for more important tasks. The automated units also use less water than hoses and sprinklers, with some customers realizing payback in less than six months and netting an annual cost savings of more than $50,000.

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Coal and iron ore loading in Hamburg

new generation of shunting technology with hybrid drive

Next month (September) at InnoTrans 2012 in Berlin, the world's leading fair for passenger and freight transport technology, Vollert Anlagenbau will be showing its new solutions for intra-plant shunting and loading operations. As part of a broader modernization project at the port of Hamburg, HANSAPORT Hafenbetriebsgesellschaft has recently put innovative hybrid shunting technology from Vollert in service for future growth at Germany's largest port terminal for bulk material.

The port of Hamburg belongs to the most important transshipment points for bulk cargo worldwide. HANSAPORT, the largest seaport terminal in Germany for coal and iron ore annually moves approximately 15mt (million tonnes) of imported ship tonnage. Up to 100,000 tonnes of cargo can be unloaded every day along the 1,000m-long pier. For loading the goods in an open space of 350,000m^2, it is necessary to have modern technology and intelligent automated processes between gripper bridges, conveyor belts, and shunting technology to work economically and to protect the environment.

Hybrid drive technology for modernized loading processes

For the modernization of the shunting and loading facilities that have been in service since the late 1980s, particular attention was paid to the creation of a sustainable economic approach and energy-efficient processes with the objective of reducing costs. There has also been a major focus on keeping the environmental impact as low as possible. HANSAPORT has chosen a strategic integrated shunting system with innovative hybrid drive technology for the transshipment of growing bulk volumes from the gripper bridges onto the waiting train wagons and the logistical connection of the intra–plant operations to the rails.

Vollert, the shunting systems specialist, has developed the DER 240 robot as an optimally dimensioned shunting solution for the loading terminal, which uses an innovative diesel/electric drive technology. Key components are the electric motors, housing their own power station in the form of a generator driven by a diesel engine. At variable loading speeds and with a tensile load of 6,000 tonnes, a traction force of 240KN can be reached, says Uwe Krebs, project manager at Vollert. Infinitely variable power is transmitted at starting and braking via a frequency converter. Due to lower maintenance costs, braking is mainly carried out by means of the four electric drive motors. The electrical energy received at braking is retransformed to heat by use of braking resistors. Rubber-metal-suspension

(MEGI-suspension), flanged wheel lubrication as well as sandboxes in case of bad friction conditions between the wheels and the rail provide safe and comfortable best running performances. Ultrasonic sensors constantly monitor the runways.

The drive aggregate as well as all technical components (pneumatic unit, etc.) are supervised and controlled via a central PLC system installed at an operation panel. The operational data, the current speed and the precise position can be comfortably read and adjusted by a touch panel. This enables a reliable and fully automatic loading process of block trains at the bulk bin 365 days a year and 24 hours a day, round the clock.

Lower investment, operational and maintenance costs convince

Fewer legal restrictions (constructed according to BOA regulations) and a maximum speed rated at 10km/h mean considerably lower investments costs compared with traditional tractive vehicles running on the general railway network. By using fully automated and GPS-controlled loading processes it was possible to sustainable rationalize logistical operations in the seaport terminal of Hamburg. The environmental also benefits due to significantly reduction of the CO_2 emissions by lower fuel consumption. Highly sophisticated components as well as the robust, massive technology also decrease costs for maintenance and downtime significantly, which has already shown the trial run. "HANSAPORT achieves the desired cost and efficiency goals with that in a short time. The new hybrid drive technology has convinced us." explains Erhard Meller, managing director at HANSAPORT.

Solutions for all intra-plants shunting and loading processes

At the InnoTrans 2012 Vollert shows more shunting and loading solutions, which are to find worldwide e.g. in mines and refineries. As general contractor Vollert develops stationary shunting systems (standard gauge, wheel acting and small pusher trucks, coupling chain), non-bound shunting systems with different drive technologies (diesel/electric/hybrid) as well as heavy duty conveyor carriages and travelling platforms. DCi

Mechanical and grab unloading

Louise Dodds-Ely

VIGAN's SIMPORTER ideal for very high-capacity installations

VIGAN mechanical SIMPORTER unloader has been designed to meet very high capacity needs. It is able to discharge at rates of up to 1,500tph (metric tonnes per hour), and is particularly suitable for large bulk carriers up to post-Panamax, and when annual intake usually exceeds 1mt (million tonnes).

The twin-belt SIMPORTER system offers major benefits to port authorities and other organizations that handle the bulk transfer of granular materials.

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Feeder

There are now two types of feeder developed for the SIMPORTER. The latest development marries proven vertical screw feeder techniques with the twin belt system. This development increases the efficiency of the SIMPORTER when handling non-free flowing, difficult to handle materials such as soyabean meal.

The original horizontal feeder consists of a rotating shaft fitted with a multi-bladed paddle flanked by two screw sections, one with right hand and one with left hand flights. The arrangement enables material in the hold to be conveyed to the central section of the feeder from which it is projected between the two belts.

The horizontal feeder has, depending on the material being handled, two specific types. The first is the conventional 'fixed speed' type, which is provided to suit particular products. The second is a variable speed feeder for use where the SIMPORTER will be required to unload a variety of products. The feeder outer screw sections can run at a different speed to the main paddles.

This feature is particularly useful where it is necessary to vary the throughput of the unloader or where it is sometimes necessary to unload poorer flowing materials. It is used to adjust the unloading characteristics of the SIMPORTER to achieve the maximum capacity for each individual product and capacity required.

Vertical elevator leg

Elevator leg structure is manufactured from substantial steel sections to give rigidity, to enclose and support the patented air-conveyor system and the feeder. External trip wires prevent collision between elevator leg and the sides of the ship's hold.

The kick-in and kick-out movements of the elevator leg are effected by means of hydraulic cylinders mounted to the top of the elevator leg.

SIMPORTER SPECIFICATIONS

Slewing movement of boom		
Slewing speed	=	0.16 rev/min
Angular movement	=	up to 360°
Luffing movement		
Luffing speed at feeder	=	0.2 m/s maximum
Luffing angles		
Minimum angle	=	30° below horizontal (i.e. lowest position)
Maximum working angle	=	36° above horizontal with belts running
Maximum working angle	=	55° above horizontal belts not running
Kicking-in movement		
Speed at feeder	=	0.2 m/s maximum
Kick-in angle	=	up to 35° to vertical
Kicking-out movement		
Speed at feeder	=	0.2 m/s maximum
Kick-out angle	=	up to 35° to vertical

Horizontal boom

The boom consists of steel sections and plates along with a weatherproof cover for the upper part of the twin-belt conveyor assembly and is complete with walkways. The boom carries a counterweight at its rear end and pivots around a shaft supported by bearings contained at the apex of an 'A' frame.

Luffing of the boom is carried out through the use of

VIGAN recently supplied a SIMPORTER unit (twin belt technology) to South Korea, which is pictured here (right) operating beside an older VIGAN model.

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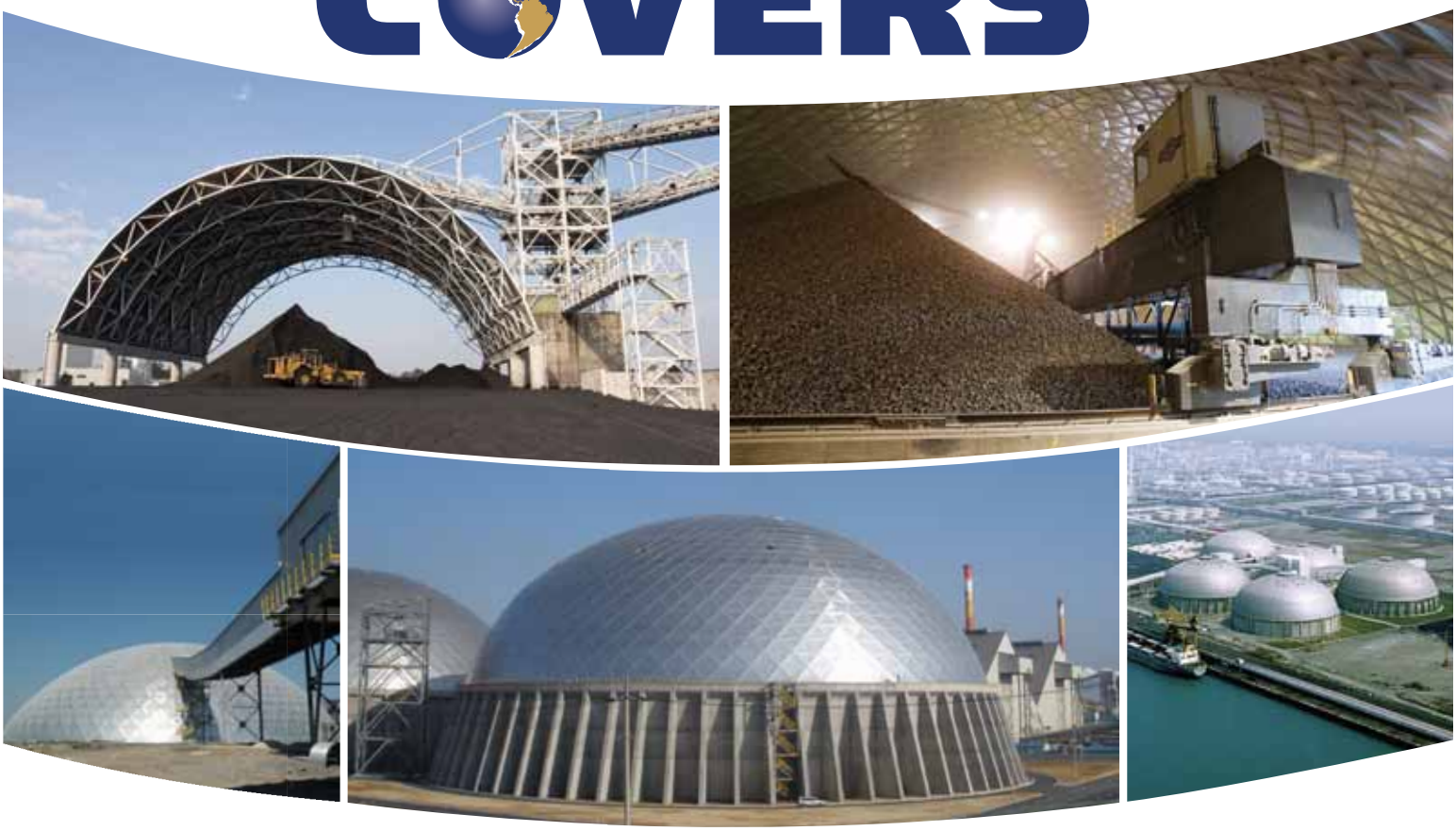

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hydraulic cylinders. The whole boom assembly, including the 'A' frame, is carried on its portal base by means of a slewing ring with integral gear teeth. Each of the two slewing drive assemblies, set diametrically opposite to each other, comprises a vertically mounted hydraulic motor with brake unit.

Horizontal conveyor

The two belts travel along the horizontal boom at a variable speed of about 5m/s. As the cargo is fully enclosed between the belts, there is no dust production, and no product damage or loss.

Pulleys and shafts are calculated and manufactured in EC, to the highest ISO standards under the 'heavy-duty' classification.

Bearings for idler and pulleys are SKF spherical roller designed for a life of 50,000 hours, and protected from water/dust ingress by seals 'for life'.

Every rotating part is carefully statically and dynamically balanced before assembly.

The conveyor is equipped with underspeed sensors, belt tear and belt alignment sensors.

The material is then discharged by gravity from the twin-belt system through a series of chutes to the quayside conveyor system and/or to trucks.

Main advantages of the SIMPORTER

High capacity

The SIMPORTER is capable of the high unloading rates required to discharge the type of modern bulk carrier which is rapidly becoming standard for the transport of grain and other solid bulk commodities and which range in size up to as high as 150,000dwt.

SIMPORTERS may be built for capacities from 600tph up to 1,500tph.

Efficiency

Whereas grabs and most types of mechanical unloader can only convey in a vertical or near vertical direction, the SIMPORTER possesses exceptional flexibility to reach into a ship's hold. This results from the ability of the elevator leg to kick-in and out by up to 35° from the vertical, in combination with luffing and slewing motions as well as travel along quayside rails.

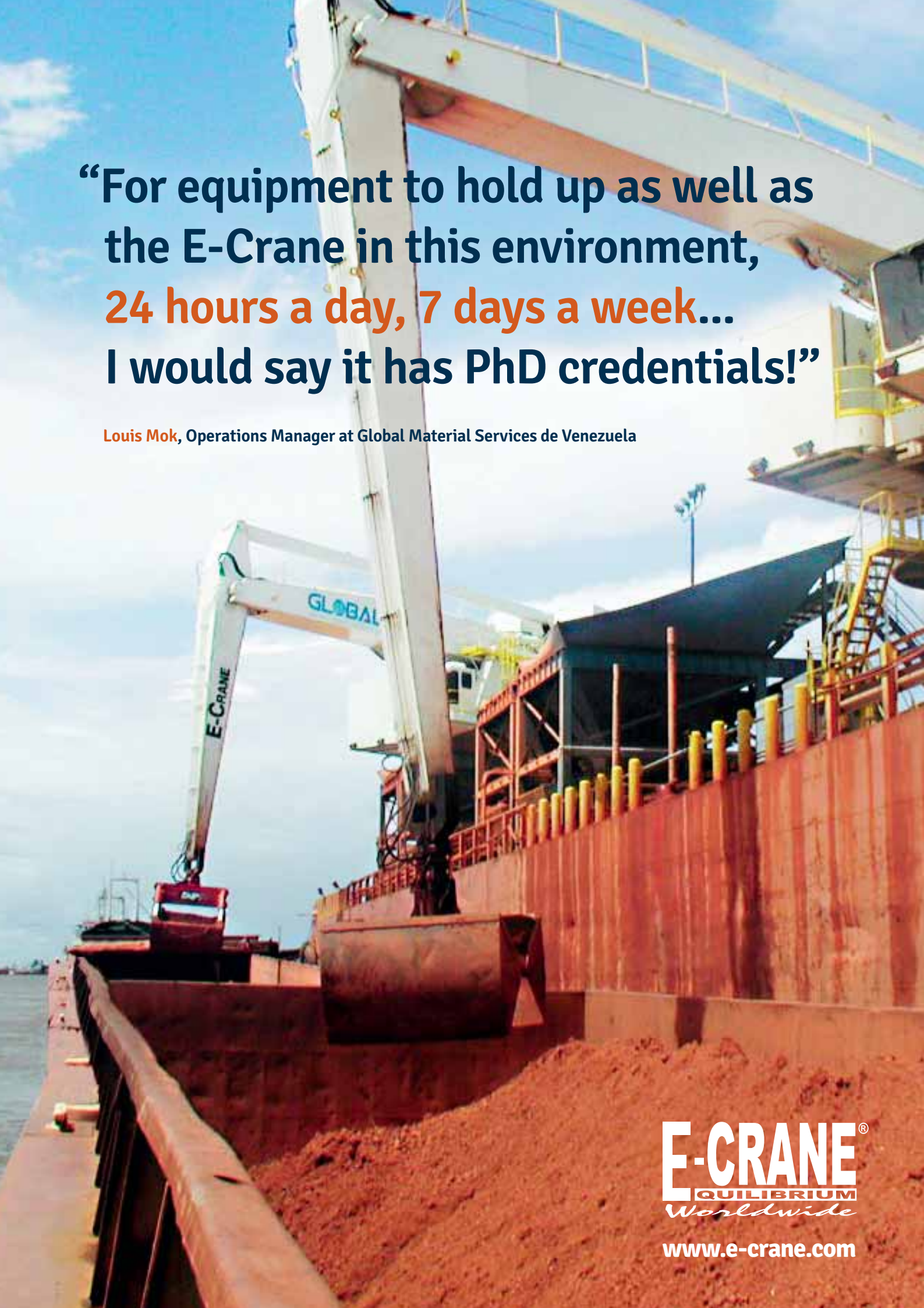
Cost-effectiveness

Not only is the capital cost of the SIMPORTER competitive when compared with other mechanical unloaders, but it offers also other assets such as:

- minimum energy consumption: this is a tremendous advantage in these times of high and ever increasing energy costs. The SIMPORTER uses approximately as little as 0.25–0.30KW/tonne which is about half that of other mechanical systems;
- minimum operating cost: only one operator is required to control all movements of the SIMPORTER, even when unloading at maximum capacity. ;
- low relative weight, which leads to potential savings in the cost of the quay along which it moves; and
- minimum maintenance cost: comparative figures show that the cost of maintaining the SIMPORTER is substantially less than for other mechanical unloaders of equivalent capacity. Maintenance is also easier thanks to its widely-known conveyor belt system.

Environment-friendly qualities

- minimum noise: the SIMPORTER is exceptionally quiet, virtually the only noise being from the main drive motor and air pressurizing fan;
- minimum material degradation: because the material being discharged is transported between two belts moving at the same speed, it suffers virtually no degradation;
- dust control: since the feeder normally lies buried beneath the material being unloaded, which is then held sealed between two belts, dust generation is minimal and its nuisance is virtually eliminated by a dust extraction plant fitted to suppress dust generated at transfer points. Dust laden air passes through textile filter sleeves cleaned by reverse air jets, the collected dust returns into the main material stream.



"For equipment to hold up as well as the E-Crane in this environment, 24 hours a day, 7 days a week... I would say it has PhD credentials!"

Louis Mok, Operations Manager at Global Material Services de Venezuela

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Grabs: floating cranes for economical expansion of handling capacity on the water

Today, ports must face a variety of problems. These include congestion; no land available for expansion; and paying too much for outdated infrastructure with costly maintenance and downtime. Ports confronted with these issues have to search for new and creative ways to tackle them.

One very creative solution is to move port operations to the water. This isn't as absurd as it sounds, and can actually be a huge benefit as it tackles other needs at the same time. Smooth

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material handling operations become difficult when large ships are unable to moor or there are high water level fluctuations due to weather or seasonal changes. All of these inconveniences can be eliminated by choosing a floating terminal for port operations or mid-stream transfer.

One crane to handle them all

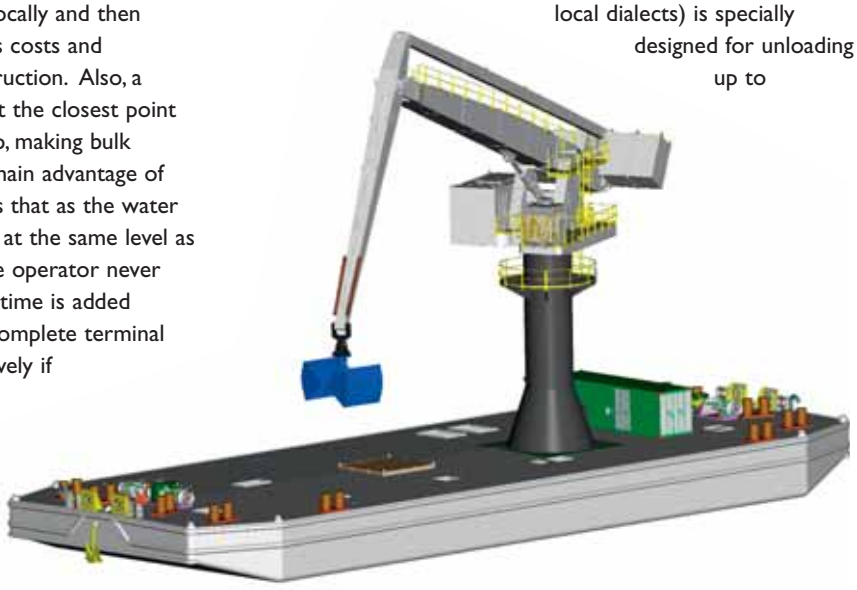
Examining different equipment solutions to handle all of these problems shows that E-Cranes on floating terminals meet all of the needs mentioned above. An E-Crane distinguishes itself by being a fully 'balanced' heavy duty crane. Thanks to the moving counterweight — which is directly linked to the load — the crane remains in perfect balance throughout its entire working range. This unique feature results in an important economic advantage as an E-Crane requires approximately 50% less power consumption compared to competitive cranes, whose counterweights are fixed or only linked to the boom and not the load.

Reducing equipment energy consumption is a major advantage of the E-Crane, but the floating terminal also offers many other benefits. For example, an E-Crane being installed on a barge or pontoon can be built and tested locally and then floated to its final destination. This eliminates costs and difficulties of local logistics and marine construction. Also, a floating terminal can be moved and located at the closest point suitable for the end user, optimizing the setup, making bulk handling faster and more efficient. Another main advantage of mounting an E-Crane on a floating terminal is that as the water level changes, the E-Crane will always remain at the same level as the vessel it is unloading. This means that the operator never has to adjust to this fluctuation and no cycle time is added compensating for varying water levels. The complete terminal can also be relocated quickly and cost effectively if required, because of the modular concept. All of these benefits combined with the relatively low cost and short delivery time prove that a floating E-Crane is an excellent (and 'green') alternative to landside bulk handling equipment.

At this time, there are currently 16 floating units successfully operating worldwide, the first of which was installed about ten years ago. The latest floating E-Crane is operating at Mulzer Crushed Stone, Inc., the largest supplier of crushed stone in the Ohio Valley area. Mulzer delivers thousands of tonnes of state-approved crushed stone on a day to day basis. At the time of writing, another floating E-Crane is being installed at Madina Cement Industries in Bangladesh, Asia and will be operational very soon.

Case study: 'Mama Mobokoli'

A floating terminal also proved to be the best solution for Seaboard's Midema grain handling terminal in Matadi, Democratic Republic of Congo, Africa. Matadi is the farthest inland harbour on the Congo River, and just as many African ports, it was facing problems such as lack of reliable dockside equipment and port congestion. As a result, the client opted for its own floating transloading station. The floating terminal *Mama Mobokoli* (meaning 'caring mother' in one of the local dialects) is specially designed for unloading up to



Handymax sized vessels from ship-to-shore or for transloading them ship-to-ship. The *Mama Mobokoli* is a self-sustaining platform complete with electric genset. The system can also easily be attached to shore power through a built in switch gear. The balanced E-Crane results in very low tipping moments, which means less barge movement and a more stable work platform.

The barge is also equipped with a winch system that allows the platform to shuttle alongside the ship for full access to each of the ship's holds. Installation of the system on site at the port was quick and easy as the entire platform was erected and tested at the port of Zeebrugge, Belgium. From there, a dedicated tow transported the platform to its final destination in the DRC where unloading could begin immediately; a big advantage for Seaboard since the logistics of local marine construction would have been very difficult and costly.

The E-Crane is a 1500 Series model 9359 and is mounted on a 1,000m² (10,763ft²) barge. It has an outreach of 36 metres (118 ft) and a duty cycle capacity of 12.5 tonnes (13.8 US tons). The cab is located 14 metres (46 ft) above water level and can be elevated to a height of 35 metres (115 ft) and the E-Crane has an unloading capacity of 400 tonnes (441 US tons) per hour. A 550 kVA/350 HP generator allows the barge and crane to operate independently.

An open mind to success

The *Mama Mobokoli* now successfully unloads grain from ships with capacities of up to 30,000 tonnes (30,070 US tons) routinely! Jim Gutsch, vice president of Seaboard Corporation stated: "The Midema project was complex and difficult, but the E-Crane team worked and worked on the concept until a commercially viable solution was found and agreed on. Both Greg Stough [managing field director] and I are overwhelmed and impressed with the pride and determination the E-Crane team has shown." This again shows that the E-Crane organization is always open minded when it comes to solving special requirements and needs. The can-do attitude results in cutting-edge solutions that have successfully served customers worldwide.

Cargotec Siwertell systems: unloading coal with ease

Cargotec's Siwertell systems offer continuously high rates when handling the abrasive commodity coal. Next year, it plans to introduce 3,000tph (tonnes per hour) unloaders to cope with the expected substantial increase in demand for coal. A large number of new coal-fired power plants are planned worldwide, so Cargotec intends to be ready for a significant growth in demand. "This is a great challenge and means there is an enormous potential for new coal unloaders to be put into operation," says Anders Paulsson, sales manager, for Cargotec Bulk Handling. "Cargotec, with its unique Siwertell ship unloader programme is well prepared to meet this expected increase in demand and has developed efficient and environment-friendly, high-capacity ship unloaders for coal."

Cargotec Bulk Handling operates under the well-known Siwertell brand name, which is recognized as a major global supplier of dry bulk handling equipment. The Siwertell product range for coal consists of screw-type and screw/belt-type ship unloaders and belt-type ship loaders. Based on the latest technology and design, Cargotec can now offer Siwertell continuous coal unloaders, with capacities up to 2,400tph, and coal loaders, with capacities of up to 4,500tph; both are capable of unloading/loading vessels up to 200,000dwt.

For coal, Cargotec Bulk Handling offers well-proven, high-capacity, efficient and environment-friendly Siwertell systems. In addition, it can deliver conveying systems and stacking/reclaiming and storage systems to provide complete bulk terminals for import, export, or transshipment.

"Quality after-sales service, combined with long-term support, is as essential as a quality product from the first contact through the entire lifetime of an installation, which is why Cargotec Bulk Handling also focuses on this aspect of its business and provides the services and products needed to ensure long-term cost-effective and efficient operations," he notes.

R&D breakthrough

"Coal is an abrasive commodity and the high wear and rather short life-time of screw flights, was initially a big concern, but through intensive R&D Cargotec can now offer screw flights with a guaranteed life time of 10,000 hours, equal to unloading of 15 million tonnes at an average rate of 1,500tph.

"In addition to the improvement of reduced maintenance costs, ship unloaders with a rated capacity up to 3,000tph will be offered by next year. These will meet the requirements for the bigger power stations and consequently their increasing demands for coal.

Clean coal-handling

Stricter rules and regulation for pollution levels have been implemented worldwide. "This means that dust free operation has become an increasingly important factor for all bulk operators today. Since the very beginning we have given the environmental aspect of ship unloading/loading a very high priority. Consequently, Siwertell ship unloaders and loaders are designed with totally-enclosed conveyors and are well fit to meet the most stringent environmental rules and regulations. Subsequently Siwertell ship unloaders have permits to operate in places like for example California (USA), Germany and Singapore."

An impressive record

"In only the last ten years, more than 30 coal unloaders have been sold, of which, 24 are designed for capacities of 2,000tph or above. This is an impressive record and most likely makes the Siwertell coal unloader the world market leader," highlights Paulsson.

In 1982 the first two Siwertell continuous coal ship unloaders were delivered to Hsinta Power Station in Taiwan. Since then, more than 60 coal unloaders have been delivered and more than 600 million tonnes of coal have been unloaded by Siwertell ship unloaders worldwide. "By these references, it's clear that Cargotec Bulk Handling is one of the most experienced suppliers in coal handling."

In mid-2011, Cargotec conducted a performance test for the Taiwan Power Company at its Talin Power Plant, in Kaohsiung, Taiwan. The test was for two Siwertell type-ST940-DOB coal unloaders, each with a rated capacity of 2,200tph. According to the contract, the average through-ship capacity was guaranteed to be a minimum of 70% of the rated capacity.

Therefore, the two units with a combined rated capacity of 4,400tph, should, on average, be able to unload at a minimum through-ship rate of 3,080tph to fulfil this contractual obligation.

"The actual test result was well above expectations," notes Paulsson. "The average through-the-ship capacity achieved for the two Siwertell ship unloaders was 3,339tph, equal to 76% of the rated capacity. One Siwertell unit had an average capacity of 1,592tph and the other unit an average of 1,747tph, meaning that the latter unit had an unloading efficiency of no less than 79%. This is a record performance for a Siwertell coal unloader and probably the highest through-ship capacity figure ever achieved for any type or brand of coal ship unloader."

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Buhler's mechanical unloaders move grain cargoes at high speeds

Buhler Portalink in standby mode.

Mechanical ship unloaders from Buhler — designed to handle a wide range of free-flowing bulk materials — are characterized among other things by being supplied from the single source. From evaluation and simulation of the optimal unloading process to design and engineering, structural analysis, manufacturing, installation, and start-up, Buhler handles the projects as one single, competent and experienced partner. This enables the influence of individual parameters on overall performance to be clearly assessed and evaluated, contributing significantly to optimizing it. Regular servicing and genuine spare parts

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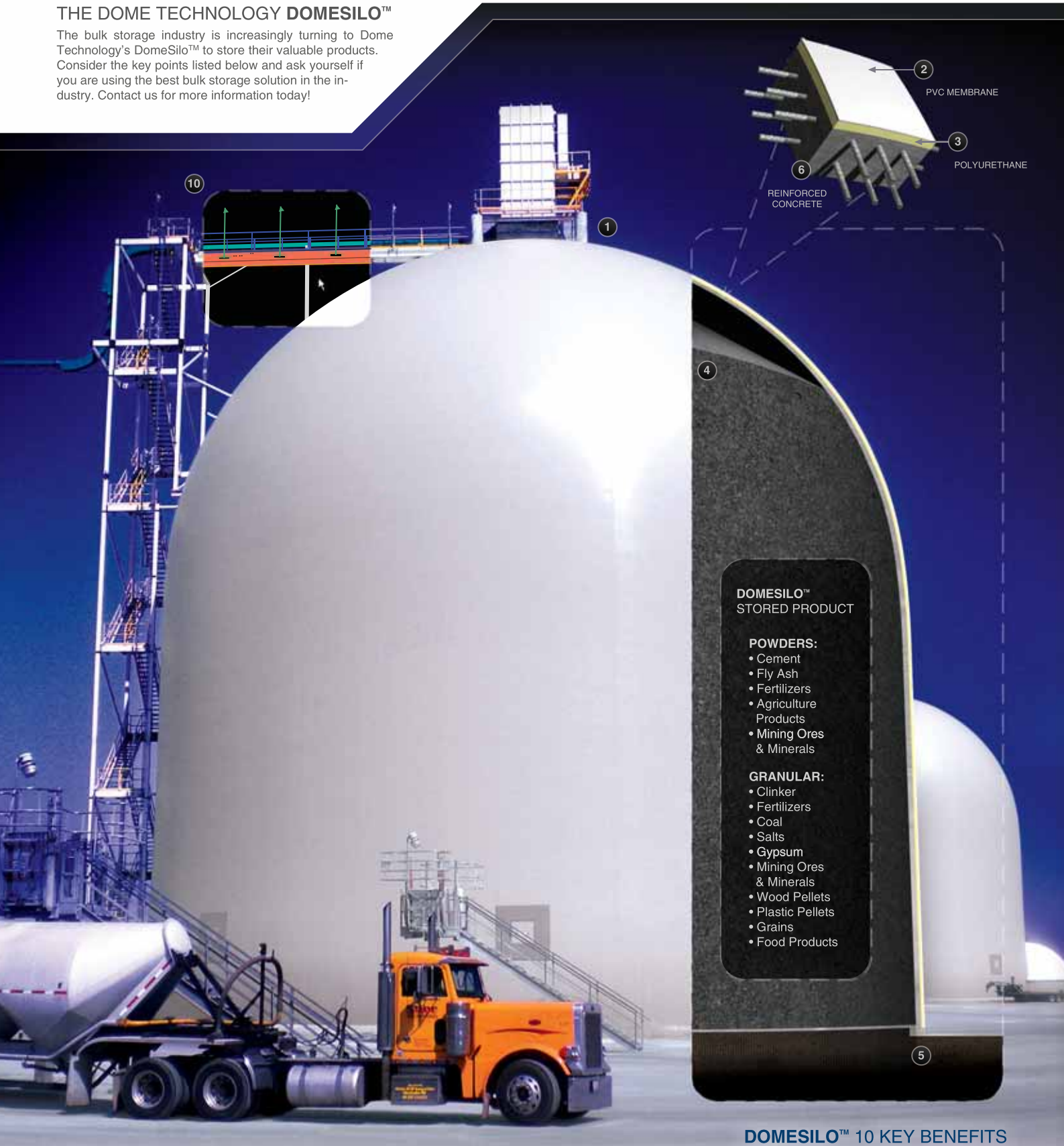

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Portalink.

guarantee a high availability of the installation over many years of service.

Buhler's equipment is used to handle all kind of free-flowing grain products (wheat, corn, barley, soyabeans, oilseeds etc.), as well as byproducts/derivates such as soyameal, pellets, flakes etc. It also handles agro chemical products such as phosphates, fertilizers and biomass.

The company's major clients are grain terminal operators, global and local grain importers/exporters, food processors such as flourmills, feedmills, oilmills etc., and strategic grain reserves.

The term 'Grain Management' in Buhler's Grain Logistics business unit refers to all activities related to the safe and reliable handling and storage of valuable grain in steel or concrete bins or in flat stores. The requirements that modern logistics are expected to satisfy are high. New requirements and expectations are added almost by the day.

Recently, increasingly wide fluctuations have appeared in the global grain streams. All of a sudden, much less grain is being exported from the traditionally strong exporting countries such as Australia or the US. This is because the climatic conditions for cultivation have deteriorated or more grain is being locally processed — for example for the production of biofuels. New producers such as Kazakhstan or Ukraine are increasingly acting as grain exporters in the global marketplace. Countries such as India and Pakistan, which just a few years ago were exporters, have now become importers. The changes in the grain streams have a large impact on the technology applied in new facilities. In the future, many new installations will be constructed to allow both exporting and importing of grain.

A modern bulk storage system consists of far more than mere bins or sheds for the actual storage of grain. Depending on the complexity of a specific facility, the share of mechanical equipment, sensor systems, and control engineering may account for as much as 70% of the investment volume.

As part of the Buhler Grain Logistics business unit the Market Segment Terminals provides solutions especially for the grain trade. Grain Logistics Terminals' focus on the portfolio includes shiploading and unloading, conveying and silo storage equipment.

The main customer benefits of Buhler Grain Logistics are:

- ❖ one-stop shopping for complete solutions — from concept development to commissioning;
- ❖ systems tailored to the customer's individual needs deliver high productivity and excellent product quality;
- ❖ high-performance equipment with a proven track record ensures high system availability and low maintenance costs; and
- ❖ high energy efficiency and low operating costs.

Notable products from Buhler's portfolio including the Portalink and Portalino mechanical ship unloaders.

Portalink

This mechanical ship unloader ensures unloading of bulk materials at high throughput rates.

The HL-SKT is a high-capacity chain conveyor meeting the stringent requirements of efficient and trouble-free bulk materials handling systems.

It is an enclosed, rugged conveyor of rain-proof and dust-tight design. This ensures environmentally friendly and gentle material handling. As a result of its very low power consumption and its easy operation, the HL-SKT has proven itself within a very short time as an efficient unloading conveyor.

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Mode of operation and main elements

The intake boot of the HL-SKT sinks into the material to be unloaded, which must flow freely to the boot in adequate quantities. Non-free-flowing materials must be positively fed to the HL-SKT.

The specially designed, endless conveying chain scoops up the bulk material, forming a compact column of material inside the vertical leg of the chain conveyor. This column of material moves at a continuous and uniform velocity to the outlet at the drive end.

From here, the material is transferred by additional chain conveyors to the truck loading point or the pier conveying system.

The Portalink HL-SKT ship unloader consists of a gantry structure, on which the swivelling top section with trussed boom and kick-in/kick-out system is mounted.

The kick cylinder is attached to the boom and can kick the HL-SKT marine leg in an inclined position from +30° to –30°. The lifting and lowering movements of the boom are controlled by hydraulic cylinders. A hydraulically powered mechanism also swivels the boom.

All movements are protected by overload valves. The swiveling gear is additionally locked in place in its parking position by a hydraulic cylinder. The built-in proportional control valves ensure gentle and continuously variable movements.

The control system is based on PLC components. A display indicates the operating conditions and displays fault messages and the preventive maintenance programme. This data may be printed out whenever required.

In case of an emergency, the boom can be lifted and lowered by the power of a gasoline fuelled engine, which drives an emergency hydraulic pump to enable the HL-SKT to be moved out of the ship's hold.

Portalink 800 in operation.

Portalink 800 in operation.

Notable advantages of the Portalink include:

Highly efficient unloading

The automatic sink-in system of the HL-SKT allows the intake boot to maintain the optimal position inside the bulk material. It also enables automatic unloading down to the minimum bulk material level inside the ship's hold.

The possible movements of:

- displacing the ship unloader;
- lifting, lowering, and swiveling the boom; and
- kick-in/kick-out of the marine leg

all provide a large working range inside the ship's hold.

High availability and low operating costs

- reliable operation even when handling materials with varying characteristics;
- low sensitivity to foreign matter;
- fast changing of chain links;
- easy operation;
- proven engineering with matured mechanical elements;
- low energy consumption;

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Portalino.

- less wear and tear; and
- long service life of the conveying chains

Proven hydraulic system

- soft starting and braking;
- protection against chain ruptures by overload valves;
- short time reversal of the conveying chain; and
- easy adjustment of the chain speed

Reliable operation

The PLC control system with visualization feature allows the display of operating and fault messages.

PORTALINO

The Buhler Portalino is a mechanical ship unloader designed for efficient unloading of grain, oilseeds, derivatives, and non-free-flowing bulk materials. Its unloading throughputs are as high as 330tph (metric tonnes per hour), depending on the flow characteristics of the bulk material. The Portalino is distinguished by its high degree of mobility and availability as well as by its outstanding cost-to-benefit ratio.

Design and application

The Portalino is a self-propelled or stationary mechanical ship unloader powered by a diesel or electric drive. It is preferably applied for unloading ship sizes of 20,000dwt to 40,000dwt.

Rail-mounted or steerable rubber-tyred travelling gears are available. The Portalino is applied wherever existing quay facilities do not allow any permanent installations. The material unloaded is transferred to downstream conveying systems or directly into rail or road vehicles.

Customer service

As a global technology group active in the field of grain handling — supplying everything from individual machines to turnkey grain handling systems — Buhler is always available to its customers:

- as an advisor before investment decisions,
- as a manufacturer of components at its own production sites,
- as an experienced installation and start-up team,
- and as a trainer of customers' personnel.

A reliable, global customer service ensures dependable operation and high availability of the systems supplied.

Gentle conveying of bulk materials

The bulk material is conveyed in the form of a compact column at a uniformly low speed up the marine leg, resulting in gentle conveying action.

Efficient unloading

The automatic sink-in feature of the HL-SKT allows the optimal position of the unloading boot to be maintained in the bulk material.

It also enables automatic unloading down to the minimum bulk material level inside the ship's hold.

The possible movements such as:

- moving the ship unloader;
- lifting, lowering and swiveling the boom; and
- kick-in/kick-out of the marine leg

all produce a large working range inside the ship's hold.

These movements may also be performed by radio remote control. This increases the unloading throughputs and reduces ship berthing times.

High availability and reliability

- dependable operation even when material characteristics change;
- low sensitivity to foreign matter;
- fast chain link changes;
- easy operation; and
- proven technology based on matured machine elements.

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Bargolink makes its mark on the mechanical market

A significant development in terms of Buhler's mechanical unloaders is its Bargolink unloader.
As detailed on p73 of the July 2012 issue of *Dry Cargo International* (Unloading barges more efficiently with Bühler Bargolink™), Bühler has developed its Bargolink to unload barges of up to 5,000dwt at capacities of 150tph (tonnes per hour) to 300tph.

A marine leg is positioned amidships in the material to be unloaded, where the marine leg moves through the product. To improve the feeding of the unloader, the marine leg is equipped with a fixed mounted feeding screw (hinged in order to equalize the inclination of the vessel) which digs into the grain in the ship's hold and lifts it up onto a horizontal chain conveyor that carries the cargo to the port's storage units.

These state-of-the-art ship unloaders are available as mobile or stationary versions. The stationary unit is fixed on the pier and the barge is automatically towed by winches, taking the role of moving the barge for continuous unloading. The mobile version on rails is equipped with a travelling gear, so the barge can stay fixed at the pier.

Hydraulic system

A centralized hydraulic unit supplies the most important users with energy. The unit is incorporated in an insulated cabin. All components are optimally protected, and lateral service openings facilitate maintenance.

The hydraulic drives offer the following advantages:

- gentle starting and braking;
- overload valves provide protection against chain fraction;
- short time reversal of the conveying chain is possible;
- easy adjustment of the chain speed low operating costs;
- low conveying chain speeds;
- low energy consumption;
- low wear and tear;
- low spare parts requirement; and
- long life cycle, and especially long service life of the conveying chains.

Reliable operation

The PLC control system with visualization allows operating and fault messages to be displayed.

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Green is great: Goeyvaerts relies on Sennebogen at the Port of Antwerp

From bulk goods and piece goods to containers, around 160mt (million tonnes) of freight leave the Belgian Port of Antwerp each year for destinations all over the world. Logistics and a good overview are essential in this process. With 13 SENNEBOGEN machines in total, Goeyvaerts R. plays its important part at the site as a service provider for material handling.

With its central location in Europe, Antwerp is an important interface for worldwide goods handling. With a freight volume of around 160mt per year, the port is one of the largest on the continent and impresses in particular with the wide variety of goods handled there. Goeyvaerts R. has been active as a service provider handling goods at the site for more than six years. The company handles bulk goods such as fertilizer, grain or coffee, as well as containers or iron or steel products.

Goeyvaerts relies consistently on material handling machines from SENNEBOGEN to ensure efficient operation. The range of uses is extremely diverse. Equipped with a 3.75m³ clamshell grab, a SENNEBOGEN 850 M unloads an incoming ship with up to 6,000 tonnes of the finest coffee beans. Speed is paramount here — just a short rain shower and the valuable cargo is ruined. The drivers can process around 225 tonnes in one hour. This requires a high-performance machine and robust mechanics. Ships can be reached over an entire width of 23m with the long boom and accessed optimally thanks to the 1.5m raised upper carriage. The SENNEBOGEN 860 M is also at home handling containers. The machine loads dozens of empty 20 and 40- foot containers up to a width of three rows onto the waiting ships. Because the subsurface directly next to the quay wall cannot be driven on, the SENNEBOGEN 860 M bridges a long distance by swivelling between the storage area and the ship. Around 40 containers can be loaded per hour either individually or in double stroke.

For unloading bulk goods from Handysize-class vessels, Goeyvaerts uses a SENNEBOGEN 870. Equipped with a 23m banana boom and the 5m³ clamshell grab, for example, 600 tonnes of fertilizer can be unloaded per hour. The bulk goods are loaded onto conveyor belts or trucks using a funnel. The elevating Skylift maXcab industrial cab combined with a 2m pylon upper carriage elevation is particularly suited to this task. It offers drivers an outstanding overview and visibility right into the hull of the ship — a valuable feature for added safety. Equipped with a MS 100 star undercarriage, the SENNEBOGEN remains stable even under the highest load. Support plates with

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particularly large dimensions guarantee the required stability and protect the subsurface with their weight distribution.

The drivers praise the easy handling of the SENNEBOGEN machines in particular and are extremely satisfied with the material handling performance. The industrial cab with steep standing bulletproof glass pane protects the driver and offers optimal overview. With this large selection of SENNEBOGEN machines, Goeyvaerts has the right equipment on hand for every application and can help their customers quickly in the required tasks. The company rents the machines for all tasks at the port in Antwerp.

Thanks to the competent advice and service provided by the sales and service partner VCM-Cramat Belgium (Kuiken Group), the optimal machines were defined in advance and regular service is guaranteed at all times.

"We use the SENNEBOGEN machines all over the port. Even large ships can be unloaded quickly with the 870 and 860. This offers added flexibility for our customers and saves valuable time. Our drivers praise the elevating Skylift maXcab cab in particular, as comfort and overview are key criteria too," states Kevin Goeyvaerts, singing the praises of the SENNEBOGEN machines.

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Sumitomo Heavy Industries: specializing in ship unloaders

Close-up of L-shaped digging head with catenary

About SES

Sumitomo Heavy Industries Engineering & Services Co., Ltd. (SES) is a company that specializes in cranes and material handling machinery within the Sumitomo Heavy Industries Group, a major Japanese heavy industry concern.

SES's business covers the entire life-cycle of cranes and material handling machinery starting from R&D, engineering, manufacturing, commissioning, maintenance and through to after-sales services. It prides itself on fully meeting its customers' expectations. The company serves a wide range of industries including steel mills, power plants, shipbuilding companies and container terminals.

Main products

One of SES's main product lines is ship unloading equipment. Its product range is extensive, and include grab bucket type, i.e. bridge type, level luffing type, and the continuous type, i.e. bucket elevator type (BE type CSU), vertical screw-conveyor type (VSC), twin-belt type (TBU) etc.

1. Bridge type ship unloader (BTC)

The history of SES's bridge type grab unloaders goes back to 1937 when the company delivered the first man-trolley type unloader. In 1964, SES delivered a 1,500tph (tonnes per hour) crab trolley type unloader, equipped with a rotatable trolley which, at that time, was the largest in Asia.

2. Level luffing type ship unloader (LLC)

SES's first LLC was delivered in 1931, which was a 1.5t x 15m gantry traveling type LLC. Since then, its deliveries of LLCs have reached 900 units. Recently, SES delivered a 25t lifting capacity LLC with a working radius of 50m, having a rated unloading capacity of 1,000tph.

3. Continuous type ship unloader (BE type CSU/VCS/TBU)

Continuous type ship unloaders can be classified into bucket elevator type (BE type CSU), vertical screw-conveyor type (VSC), twin-belt type (TBU) and others. Of these types, SES developed and delivered its first BE Type CSU in 1976 to rationalize ship unloading by unloading coal and iron ore from the ocean going vessels with unprecedented efficiency. Since then, with its strong dedication in this field, the company has delivered many BE type CSUs mainly to power plants and steel mills.

Distinguishing features of SES's BE Type CSU

Environmental friendly:

❖ totally enclosed material pathway minimizes dust emission; and

❖ extensive use of inverter motors instead of hydraulic drives to minimize maintenance and risk of oil spillage.

High unloading efficiency

❖ L-shaped digging head with catenary mode maximizes reach into the deepest parts of the ship hold and greatly speeds up bottom clean-up, thus ensuring total unloading efficiency.

High safety and reliability

❖ overload protection system, preventive maintenance system and operating condition monitoring system, etc. minimizes maintenance burden and maximizes availability and operability.

As a manufacturer of continuous ship unloaders, SES will continue its dedication to product development and after-sales service and meet the needs of its customers.

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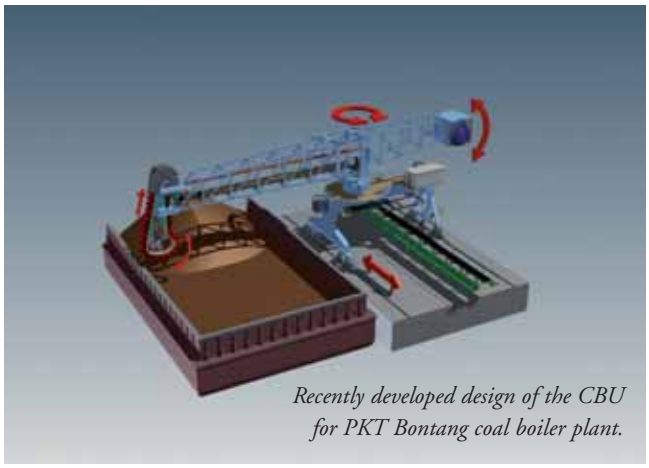

Recently developed design of the CBU for PKT Bontang coal boiler plant.

ThyssenKrupp Foerdertechnik (TKF), Business Unit Materials Handling, Germany, in February 2010 received an order for the design and supply of a coal handling plant; including a continuous barge unloader (CBU), a circular stacker and reclaimer system and the pertaining belt conveyor system. The order was placed by PT. Inti Karya Persada Tehnik (IKPT) on behalf of PUPUK KALTIM (PKT), a key player in the fertilizer industry of Indonesia for the Boiler Plant of Bontang Fertilizer Complex in Kalimantan, Borneo.

Already at the stage of concept design of the coal handling system, the technical development in the field of ship unloading, coal storage and conveying as well as the following environmental and economic aspects were taken into consideration:

- increasingly strict regulations in the field of environmental protection;
- high performance unloading and handling under different geometrical and meteorological conditions;
- high operation efficiency, resulting in cost savings for ship berthing time and operation of the handling plant;
- low maintenance and spare parts costs.

Based on this, the following equipment was selected by the end-user and the EPC contractor favouring high efficiency, environmental protection and operation safety and effectiveness:

- chain bucket elevator type continuous barge unloader (CBU) instead of grab type barge unloader;
- fully covered circular storage with circular stacker and side scraper reclaimer, with full automatic operation;
- covered belt conveyor system for environmental and weather protection.

For this project TKF developed a new generation of CBU which will fulfill all requirements in respect of unloading efficiency, environmental protection and low operation and maintenance cost.

The CBU will be designed for a design unloading rate of 700tph (tonnes per hour) of coal from barges ranging from 7,000dwt to 10,000dwt. The CBU will be of heavy duty design and construction to operate for a continuous period of 18 hours per day and an annual period of 330 days. The machine consists of a rigid supporting frame construction on wheels, which is able to travel along the length of the barge. Reclaiming is done by a chain bucket elevator, hinged onto the slewing and luffing boom. While reclaiming in either longitudinal direction of the barge, the bucket elevator can be positioned sideways of the boom against the coal pile on the barge for effective reclaiming. From the bucket elevators the coal is transferred directly to the boom conveyor, which in turn feeds it to the portal conveyor. The operation is controlled from the operator's cabin or from the pier by remote control. Digging depth, speed of the reclaimer and /or traversing is controlled automatically to achieve the

TKF's CBU during construction on site of Bontang, Indonesia.

A CBU in operation at Bontang Coal Terminal, Indonesia, similar to the one ordered for Arutmin North Pulau Laut Coal Terminal, PT Nusa Tambang Pratama.

required unloading capacity. The reclaiming is achieved in semi-automatic mode, allowing manual positioning and/or operating.

ThyssenKrupp Foerdertechnik's previous references for continuous barge unloaders and their excellent track record, including the recent milestone of a high capacity 4,000tph CBU to Bontang Coal Terminal, were deciding factors in the contract being awarded to TKF. This special design of the continuous barge unloader is the first of its kind in Indonesia, although all critical components have been proven in continuous barge unloaders previously supplied by TKF. In all, TKF has already supplied more than 50 continuous ship/barge unloaders, mostly to clients in Indonesia, Korea, China, Taiwan, the Philippines, Malaysia, USA, Great Britain, Spain and Germany.

Another continuous barge unloader for Indonesia

The year 2012 is a notable one for Indonesian CBUs. Besides the installation of a CBU at Bontang (see picture, above), another construction is implementing for a 3,000tph CBU for coal; destined for Kalimantan in Borneo. It will be the third CBU operating in Indonesia, designed and built by TKF.

For the Arutmin North Pulau Laut Coal Terminal, PT Nusa Tambang Pratama, a company of the well-known Bakrie Group, recently placed the order with TKF. One decisive factor for its decision was, amongst others, TKF's excellent track record of more than 50 continuous ship and barge unloaders in operation worldwide; some of which have meanwhile been in service for more than 25 years.

This latest CBU is designed for unloading 8,000–10,000dwt open coal barges at a rate of 3,000tph or 3,500m³/h. In 2008, TKF received the order for a CBU with an unloading capacity of 4,000tph. This unloader, operated by PT Indominco Mandiri, has now been successfully in operation at Bontang, also in Kalimantan, since the beginning of 2010. Seeing the satisfactory performance of this machine in operation was perhaps what finally convinced the client that the TKF type of CBU design was the right choice. Particular advantages of TKF's type of CBU include not only their high unloading capacity, travelling mobility, low maintenance and installed power and energy consumption, (compared for example to the screw type ship unloader or a conventional grab unloader), but also the efficiency of emptying the hull right down to the bottom of the barges without the use of a Bobcat, and thus making 'sweeping' of the barges practically superfluous.

ThyssenKrupp Foerdertechnik, Business Unit Materials Handling, better known in former days as PHB or PWH, first developed the bucket elevator type of continuous ship unloader (CSU) in the beginning of the 1970s. Its first CSU, designed to unload asbestos, was commissioned in 1974. It took some years before customers, who until then had been working with conventional grab type ship unloaders, saw the advantages of a CSU compared with the conventional grab type mostly used in those days. Since then, however, the TKF type of CSU has made its mark in the field of dry bulk ship unloading.

Today TKF CSUs are designed for handling such products as coal, iron ore, phosphate, urea, sand unloading bulk carriers of up to 250,000dwt. In recent years, in particular in countries which depend heavily on importing their fossil fuels, coal-fired power plants are invariably built directly at deep water sea locations with the convenience of having their own coal unloading terminal facilities. Two such coal-fired power plants for example, are the Tanjung Bin and Jimah power stations in Malaysia. Here, four TKF CSUs are in operation. Another prime example is the Hou Shi Power Plant in Fujian Province, PR of China, where three TKF CSUs are in operation.

However, also large coal import terminals, for example in China, have in the last ten years turned more and more to using CSUs. To date, TKF has already supplied in total 15 CSUs to China. In South Korea there are already nine TKF designed CSUs in operation in coal fired power plants.

Follow-up order from Guangzhou Zhujiang Power Plant, China

Ship unloaders supplied by TKF working at Zhujiang power plant for 20 years.

Back in 1994, the new power plant in Guangzhou City, Zhujiang power plant received TKF's ship unloaders for his coal terminal and put into operation. Since then these ship unloaders have been operating successfully to serve the power plant demand on coals for 3 x 600MW blocks and transshipment of coals for the region. An annual turnover of 6–8 million tonnes is achieved by these unloaders.

With the increase of power consumption in this region, the power plant began work on the expansion project of Phase II for the other 1,000MW block. Through an international tender TKF again won the new order for the two further ship unloaders, and this time a chain bucket elevator continuous ship unloader.

The contract was signed in June 2012 for the supply and installation of two CSUs. These unloaders will be designed for an unloading rate of 1,500–1,650tph and ship sizes up to 70,000dwt, and in the future for 100,000dwt, representing an outstanding success for TKF in China by covering more than 75% of market share.

For TKF, this follow-up order not only means being awarded a further order, but also represents continuity with respect to design, supply, construction and management and demonstrates the client's appreciation of and satisfaction with TKF's performance to date.

The delivery to site and commissioning of the new CSU is schedule for end of 2013, the commercial operation can start from Feb. 2014.

According to one of the decision-makers, Zhujiang Power Plant's selection of TKF as supplier for all of its important ship unloaders was made because of the confidence it has in TKF's advanced technology, ability to execute large-scale projects and first-class technical service. The choice went in favour of TKF after accurate comparisons with several competitors, on the evidence of:

- worldwide and extensive experiences in the development of coal ship unloader technology;
- excellent performance of CSU already built;
- high availability and long service lifetime without intensive repairs;
- reliable technical services during construction, commissioning and operation period; and
- good relationship with Chinese partners for manufacturing and erection

With this contract, TKF, one of the world's foremost designers and manufacturers of CSUs, has once again contributed to the development of China's coal ports and power plants among with other equipment of more than 60 machines for car dumpers, ship unloaders, shiploaders, stacker-reclaimers and so forth. DCi

Three TKF CSUs, similar to those which will be installed at Zhujiang, in operation unloading cargo at Huayang Power Plant, China

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