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FEATURES

- Global Coal Trades
- Offshore Stevedoring
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Coeclerici Logistics FTS (Floating Transfer Station) **Bulk Irony** *performing lightening operations in Piombino, Italy for ILVA steel mill (Taranto, Italy). Photos: Luca Forno (Genoa, Italy) for Coeclerici Logistics Spa/ All rights reserved.*

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FEBRUARY 2013 issue

featuring...

Bright outlook for coal trade

Many signs pointing to rising commodity import demand around the world are clearly visible. The additional volumes probably will enable global seaborne dry bulk trade to grow solidly in 2013. Prospects for some key elements are not predictable with any precision, however, because of great uncertainties about the pace of progress of importing industries.

The outlook for economic activity, with implications for many users of industrial commodities, remains vulnerable to adverse influences and setbacks. In its January update the IMF estimated GDP growth among the advanced countries (mainly EU, USA, and Japan) at an average of just 1.4% this year, only a minimal improvement from last year's sluggish 1.3% rise.

Coal

Despite strong competition from alternative fuels, and greater contributions from renewable energy sources in some countries, coal trade prospects in 2013 and further ahead look very positive. Overall growth in seaborne coal trade could be 4–5% this year, which represents large extra volumes, because annual trade now exceeds the 1bn tonnes level.

Extra imports into Asian countries are likely to comprise a large part of the incremental global coal trade volume over the next twelve months. Table 1 shows how the region's coking coal purchases have been developing. Although this market segment is much smaller than steam coal, Asian importers (including Japan) appear to have increased their volumes by about 10mt (million tonnes) in the past year and further growth is foreseeable.

Iron ore

Figures now available, covering the whole of last year, show clearly the differing experiences of steel producers in the main raw materials importing areas. Iron ore trade benefited mostly from China's higher purchases. Crude steel output in China was 3% up at 716.5mt. By contrast, Japan's production was almost flat at 107.2mt, while the EU's volume was down by 5% at 169.4mt.

Prospects for steel production during 2013 are mixed as well. Chinese mills could see another sizeable increase, possibly exceeding last year's percentage, resulting from a pick up in economic activity. Japan's output may also grow, amid the new government's emphasis on reviving the economy. But potential for progress in Europe is limited by the continuing recession.

Grain

Expectations for global grain trade have become less pessimistic over the past few months. But a marked reduction is still envisaged. Sharp declines in wheat and coarse grains imports by China, the Middle East area, northern and sub- Saharan Africa, and Mexico, are forecast in the current crop year ending June.

World grain trade in 2012/13 could be 13mt or 5% lower at 256.5mt, based on the International Grains Council's latest assessment. In the new 2013/14 crop year beginning July a stronger trade development may emerge, if larger crops in a number of key exporting countries this year assist in improving world supplies and moderating international prices. Another factor will be domestic harvests in importing countries, which also are currently hard to predict.

Minor bulks

World seaborne trade in bauxite/alumina was affected by negative influences last year, and appears to have fallen compared with the volume of over 110mt seen in the previous twelve months. Primary aluminium production in two of the main raw materials importing areas was lower in 2012, according to International Aluminium Institute figures. North America saw a 2% decrease, while West Europe was down by 12%. Conversely, China's output rose by 11%.

Bulk carrier fleet

The world fleet of bulk carriers expanded massively again in 2012 although, because of higher scrapping, the capacity growth rate was less rapid than seen in the previous year. Deadweight capacity was augmented by a further massive volume of newbuilding deliveries, as shown in table 2, which added almost 100m dwt. In 2013, a much lower newbuildings total is currently expected.

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	51.0
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**	**192.5**

source: various & BSA 2012 estimates * *estimate*

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

	2007	2008	2009	2010	2011	2012
Handysize (10–39,999dwt)	2.3	3.0	5.0	8.3	9.2	10.0
Handymax (40–59,999dwt)	5.3	6.4	10.3	17.9	20.0	17.3
Panamax (60–99,999dwt)	6.7	6.4	7.0	15.4	23.7	29.7
Capesize (100,000dwt and over)	10.4	8.6	21.0	38.6	45.6	42.5
Total	**24.7**	**24.4**	**43.3**	**80.2**	**98.5**	**99.5**
% change from previous year	–5.0%	–1.2%	+77.5%	+85.6	+22.8%	+1.0%

source: Clarksons & BSA 2012 estimates * *estimate*

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

Tough times ahead for sugar industry

The world sugar industry, which found sweetener prices down by over 20% last year, is not going to get any respite in the current season to end in September 2013. White sugar at London Futures Exchange sinking well below $500 a tonne and March delivery raws at New York Intercontinental Exchange quoting less than 18.50 cents a pound mean that factories engaged in crushing sugarcane but with low rates of sugar recovery and not found efficient in using cane by-products like bagasse, molasses and press mud will find themselves deep in the red.

The world's largest sugar producer and exporter Brazil with its efficient farm practices and high sugar recovery rates will no doubt ride out the difficult 2012/13 season (April to March) better than most other sugar-producing countries. "Unlike India, where ethanol production and the biofuels blending with fossil fuel are yet to take off in a meaningful way, thanks to government prevarication, Brazil is using close to half of its sugarcane output to make ethanol. In India, however, we make the biofuel from sugarcane by-product molasses," says industry official Om Prakash Dhanuka. Sugar factories in Indian northern states like Uttar Pradesh and Bihar, which are asked by local governments to pay very high prices for the raw material to placate farmers constituting large vote banks, not even half way through the season are not finding it possible to settle cane bills, says Dhanuka. Payment denials over a length of time make farmers angry creating condition for land shift to other crops.

Losses are extended in futures contracts on certainty of yet another year of global supply surplus. Barclays analyst Kate Tang says, "We expect the third consecutive global surplus in 2012/13... with stronger-than-expected production in Brazil to continue to pressure prices." The Brazilian season to end in March will see sugar production climbing 8.8% to 34.1mt (million tonnes), according to industry and ethanol body UNICA, which earlier forecast an output of 32.7mt. Brazil is likely to harvest a crop 11% higher at 570mt during 2013/14. Consultancy firm Datagro, however, thinks the next harvest could be bigger at 580mt.

But since the world's second largest ethanol producer after the US, which sources the biofuel from corn, is once again to mandate a blending of 25% (against 20% now) of ethanol with gasoline, the next season sugar production will not show much change on the higher side. Brazil's gasoline production is to rise 14% to 25bn litres (6.6bn gallons) from 22bn litres this season. Even then the business intelligence group F.O. Licht sees the possibility of Brazil churning out more sugar in 2013/14 dimming the prospect of any break from the bearish sentiment any time soon.

So in this third season in a row when supply will be in excess of demand, how much surplus sugar will the world have? According to the International Sugar Organization, the world will have a sugar surplus of 6.18mt (raw value) and this will keep prices under pressure at least till the current crop cycle ends. Rabobank, however, thinks surplus could be 6.6mt riding on the back of high Brazilian output. An official of the Dutch bank says, "modest downward revisions to sugar production projections in India [the world's second largest], Thailand and Russia in recent weeks have been offset by upward revisions to estimates for Brazil [mainly], Mexico and others." Pressured by bumper production, Brazil is giving a push to exports resulting in sugar awaiting loading at its main ports rising to at times to about 1.2mt from normal 800,000 to 850,000 tonnes.

Sugar is one of the many commodities in which China will engage in stock replenishment by way of imports when world prices hit low. This was much in evidence last season when Chinese imports amounted to 4.2mt. China, the second-largest consumer of the sweetener after India, has made some contracts for significant volume in December and January for delivery by February end at about $460 a tonne, including freight, for raws. The US Department of Agriculture says Chinese imports this season will be 2mt, down from 4.2mt in 2011/12 when much of stock replenishment happened. Production fall will, however, require of Russia to step up imports by 150,000 tonnes to 900,000 tonnes. However, in 2010/11, Russia — facing a big shortfall in domestic supply — had to import 2.5mt of sugar. Jonathan Kingsman, managing director at research house Kingsman SA, says "now that stocks have been rebuilt, producers are beginning to ask who will buy their sugar in 2013."

In a situation like this, it defies logic that India, which opened the season with stocks of 6.5mt and is expected to produce 24mt, should be importing any sugar at all, says Dhanuka. India's imports till now amount to 500,000 tonnes. The country will need around 22mt for its own use. Unless there are exports, India will end the season with "unmanageable inventories" of 9mt. "Our production costs are relatively high, thanks to state-level arbitrariness in fixing cane prices. At the current low world prices, Indian exports will be feasible only with WTO-compliant incentives from the government. The government could think of defraying transportation cost of cargoes, from factories to ports of despatch and sea freight," says Dhanuka. Last year India exported 3.4mt of sugar but without any subsidy. Admitting that this season is to prove trying for Indian sugar industry, particularly for factories in the north, a food ministry official told *DCi*, "it's time attention is given to bring down cane conversion cost. At the same time, our research institutions will have to develop drought resistant varieties of cane. We must learn to grow the crop with much less water than now." *By Kunal Bose*

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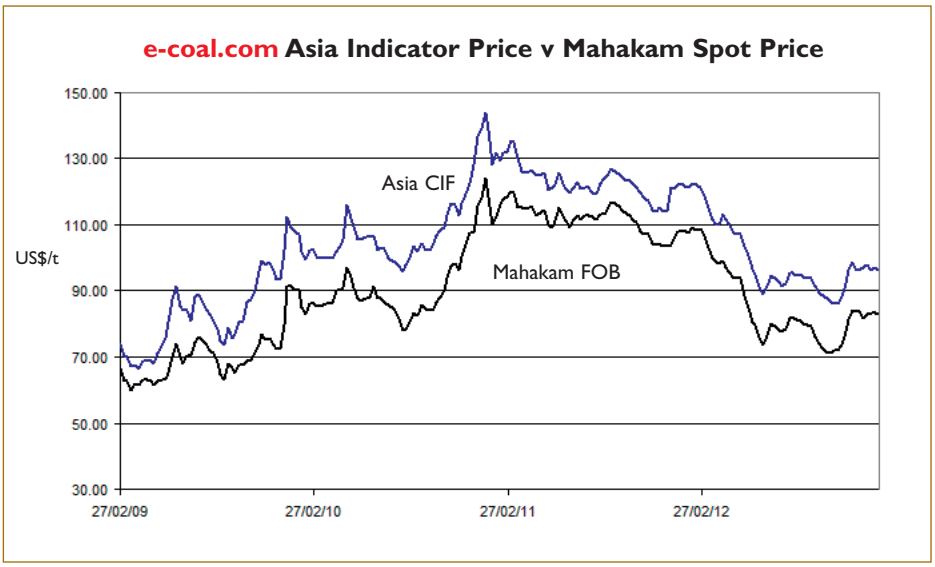
World coal trade 2012

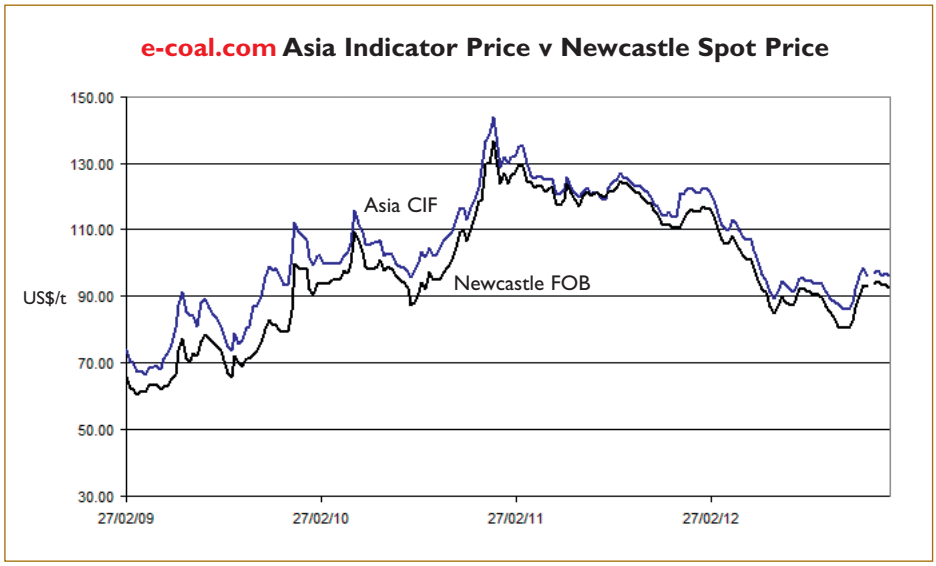
Coal being unloaded at Beelman River Terminals in Venice, Illinois, using an equilibrium crane custom-engineered by E-Crane for the customer.

Dr Tim Jones, e-coal.com

At the beginning of 2012, in terms of the global economy, the new year got off to a better start than was expected in some aspects, with employment data from the USA showing encouraging improvements. Financial markets were showing more positive signs during the first week of 2012 and the mining sector took a boost after some positive trade data was published in China. In the coal sector, the wet season in Queensland had so far not disrupted coking coal production significantly, and with lower demand, there was not likely to be much upward impact on prices. Traders had been anticipating a softening trend in the spot price in the first quarter, with some possible change in March if the Chinese picked up demand. The much milder winter in Europe had kept a cap on thermal coal demand, with consumers having high stocks of coal on their pads. Thermal coal spot markets around the world saw a modest firming in the first week of 2012. Capesize freight markets softened significantly over the holiday period and the approaching Chinese New Year holiday season was to cause the usual lull in international trade. Panamax freight rates had not seen as much of decline on the European route. As the year got under way, thermal coal spot prices began to firm in all the major spot markets. The significant movements in freight rates in 2011 influenced producers' offered prices, particularly into Europe. By the beginning of 2012 there was little differential

between the Colombia — ARA rate and South Africa — ARA rate, although little spot business was being done. Heavy rains were disrupting coal exports from Colombia, with delays of more than two weeks being reported at the ports. Demand for hard coking coal remained lacklustre in most markets, and there were reports that stockpiles of high vol material had been growing at US mines and barge loading points. Many market players were anticipating a quiet first quarter of 2012. There were already plans to reduce output at some mines in the USA amid the weaker market





conditions. Freight rates continued to soften during January, with substantial declines on all the major coal routes since December. The increase in the global fleet due to a record year for newbuilds in 2011 combined to send the freight market down. By the end of January 2012, the average Panamax daily rate was around US$7,850 which was over US$5,000 less than the level at the end of December. Capesize average daily rates slumped from around US$27,000 to US$6,630.

As the first quarter of 2012 progressed, amid relatively quiet spot markets, corporate and economic news was dominating the news. Activity in the mergers and acquisitions sector got off to a strong start in 2012, with the major move being rumoured between Swiss-based Glencore and Xstrata. The cold snap in Europe broke the unusually mild winter weather, and coal burn was boosted during February. India continued to seek energy security in the coming years, with state-owned NTPC actively looking at investments in Africa's coal resources and power sector, presumably to assist the development of the mining sector for its own trade plans. Reports from the Coaltrans USA conference in Miami indicated that Arch Coal believed there could be a shortfall of 300mt (million tonnes) of coal in the seaborne market in 2015. Around 180mt of that would be coking coal. Rising costs, however, were forecast to put the US coal industry at a significant disadvantage in international trade.

By March, the pressure was on for the Australian coking coal exporters as the rest of the world's shippers waited to see what reference price they agreed with the Japanese in the wake of Canadian settlements in Korea. The European thermal coal market continued its long period of lacklustre activity as spot prices softened in the Atlantic. South African spot business was confined to Asia, with the European market having little influence. Prices for coal delivered to Asia in 2013 were about 5% higher than the then prompt spot price at Richards Bay. US shippers of higher sulphur coal were securing some business in Europe, but at a lower price in the spot market.

Thermal coal spot markets in Asia softened by several dollars

OCEAN SPOT FREIGHT RATES (US$/T) 2012

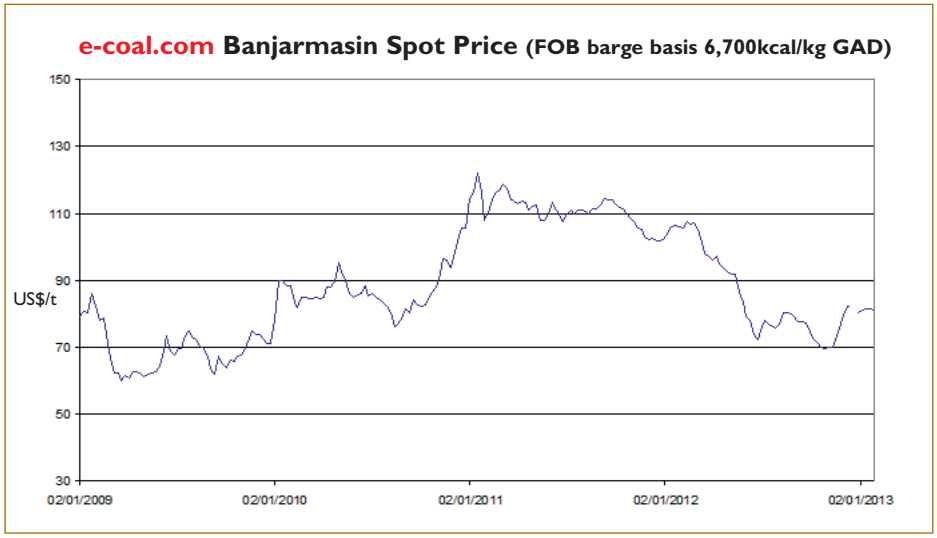
Route	Tonnage	6 Jan	30 Dec	% change
USG/ARA	65,000t	19.50	19.95	–2.26
Roberts Bank/ARA	55,000t	23.90	23.70	0.34
HR+RB/Japan 16m	120,000t	31.50	35.75	–11.39
HR/Rotterdam	110,000t	12.00	14.10	–14.39
Bolivar/Rotterdam	130,000t	12.25	15.25	–19.67
Queensland/R'dam	130,000t	15.75	19.65	–19.85
Rich'ds Bay/R'dam	130,000t	11.15	12.85	–13.23

Source: e-coal.com

OCEAN SPOT FREIGHT RATES (US$/T) 2013

Route	Tonnage	4 Jan	28 Dec	% change
USG/ARA	65,000t	9.60	9.55	0.52
Roberts Bank/ARA	55,000t	15.05	15.00	0.33
HR+RB/Japan 16m	120,000t	23.75	23.60	0.64
HR/Rotterdam	110,000t	8.65	8.10	6.39
Bolivar/Rotterdam	130,000t	8.50	8.00	6.25
Queensland/R'dam	130,000t	13.00	12.90	0.78
Rich'ds Bay/R'dam	130,000t	6.40	6.00	6.67

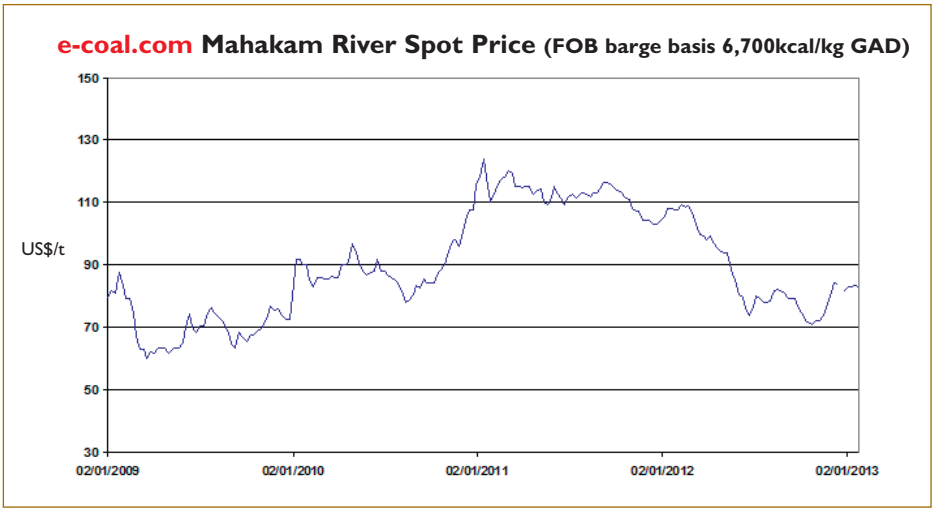
Source: e-coal.com



on weaker demand, while in the lacklustre Atlantic market, prices remained rather flat. The Newcastle spot market decreased to around US$110/t FOB (free on board) basis 6,700 kcal/kg GAD (gross air dried) according to reports from traders in Australia and Japan. Rumours suggested some deals were made for contract supplies of Australian hard coking coal in Europe for the April quarter at about US$210/t FOB which were a premium over the previous deals made in Korea at US$206/t FOB. The European steel mills were aiming for a delivered price of around US$225/t CIF (cost, insurance, freight) during their negotiations.

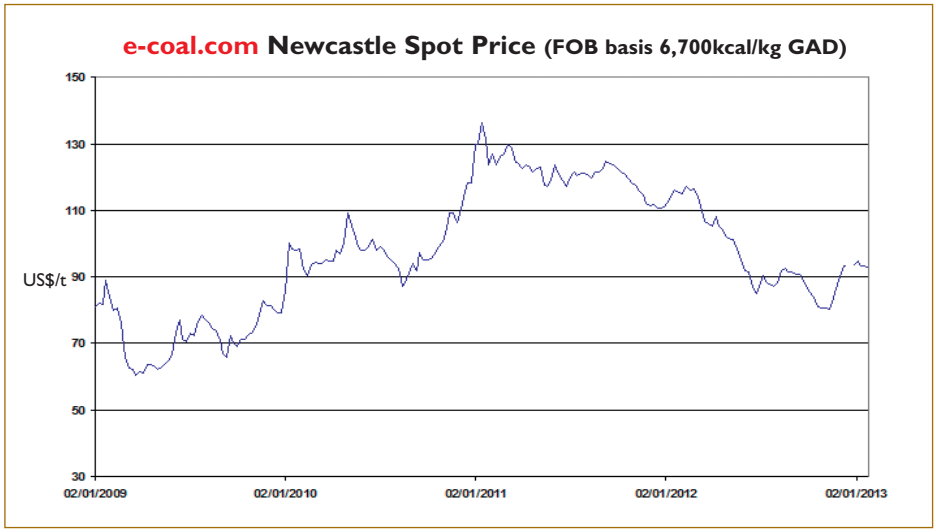
The European thermal coal spot market remained lacklustre as the first quarter drew to a close, with high coal stocks reported on the pads in the Netherlands. Some interest in US coking coal had been reported, with some new business rumoured to have been done. The Colombian exporters were not seeing much activity in their traditional markets in the north Atlantic, and appeared to be looking at opportunities in Asia once more. The Asian thermal coal spot market was also weaker, however, and prices softened in all the main loading areas. South African exporters were finding the Indian market was quiet, and buyers were waiting to see if they could pick up tonnage at under US$100/t FOB basis 6,000 kcal/kg NAR (net as received). Demand for steel in China was forecast to grow by 5.7% in 2012, but while this would still be growth, some players perceived it as disappointing news as the growth rate was about a half that seen in recent years.

Thermal coal spot prices firmed a little in the Atlantic market following the Easter holiday weekend. Russian material was moving as far as Spain, with some more interest in US coal. The Colombians were enjoying renewed activity in Asia, but that spot market softened in mid-April. Demand for coal in China was forecast to remain sluggish during the second quarter amid slower economic growth. The spot market for premium quality hard coking coal continued to firm with some deals reported in Japan at prices above US$212/t FOB. There were reports of the spot price reaching US$215/t FOB and some traders suggested the US$220/t FOB mark would be reached before the end of the first half of 2012. The weather disruption in Queensland, however, was limiting what was available for prompt loading. Although prices were rising, the quantities were not large at that time. BHP Billiton's decision to close the Norwich Park mine also impacted the supply of coking coal. The European steel makers appeared to be in no desperation to secure coking coal, and the situation in Australia was having little impact in Europe. On a positive note, the decision to restart an idled blast furnace in the United Kingdom gave another glimmer of hope that market prospects were improving.



Marketing managers from the Australian coking coal producers were visiting customers in Japan and Korea to negotiate contract prices for the July quarter. The expectation had turned around during May, and was now more positive among the shippers. A contract price above US$220/t FOB for the reference brand was expected to be agreed according to sources in the Asian steel industry. In contrast, thermal coal markets continued to soften significantly during after Chinese customers reneged on contracts when the market moved against them. The entire global coal market, as well as investors in the commodities sector had suffered as a consequence of those contracts not being honoured.

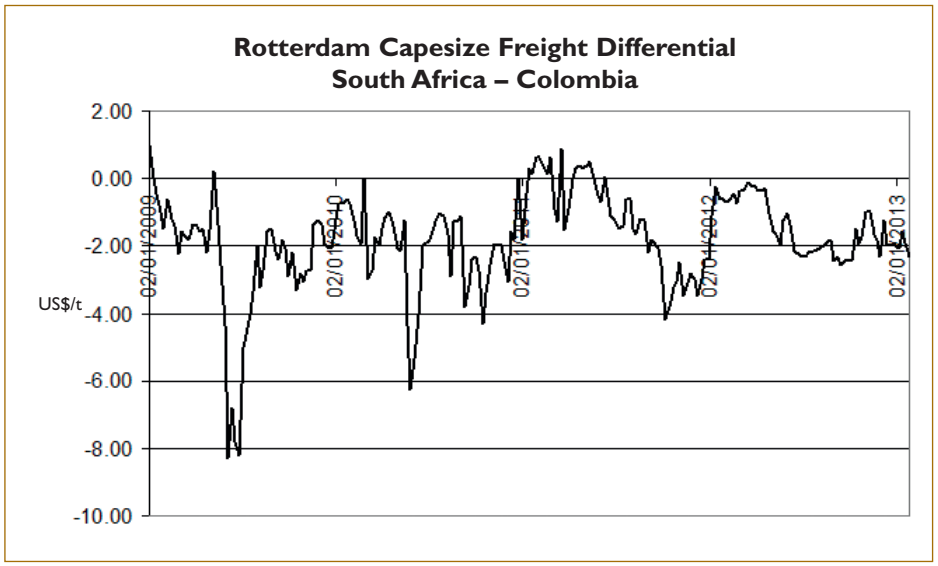
In the corporate arena, the economic climate led some major mining companies to be cautious about spending on exploration and development. BHP Billiton was one example, where its initial expectation of investing US$80bn in project expansion in 2012 was to be reduced. In the freight market, oversupply of vessels in the global market was attributed to a slump in rates, and congestion at ports in Australia, Brazil, China, and India accounted for over 60M dwt at the end of May. This was the highest level for three months.



In June, Anglo set the reference price for hard coking coal with Korean customers at US$225/t FOB. The European steel makers were resisting such an increase in price amid the different situation they are facing compared to Asia. The Eurozone crisis had cast a shadow over much of Europe, and the markets were far from buoyant. Sensible plans by the European Union were being scuppered by opportunist politicians, particularly in Greece, and a bailout for Spain's banks had only a temporary positive impact on financial markets. Following reports of Chinese buyers cancelling coal contracts, there were reports that other buyers were seeking to get out of their contracts by paying a large fee to retain respect from the sellers. The majority of these buyers appeared to be in Europe according to Australian and Indonesian exporters. They realized the damage they would cause for themselves if they dishonoured contracts in the way some other consumers and traders have been doing in China in 2012.

By July, despite the global recession, coal exports through some Australian ports appeared to have been healthy during the previous 12 months, while in Indonesia the government continued to cause uncertainty about its proposed export tax on coal. The South African government was also causing uncertainty, in this case over the proposed carbon tax.

There were growing concerns about the resurgence of terror attacks on coal industry infrastructure in Colombia during the previous few months. Minor disruption was caused on the rail line to Puerto Bolivar, but other incidents had largely been unreported outside the country. The coal industry and international players were beginning to highlight the problem once again, with the government coming under criticism. A

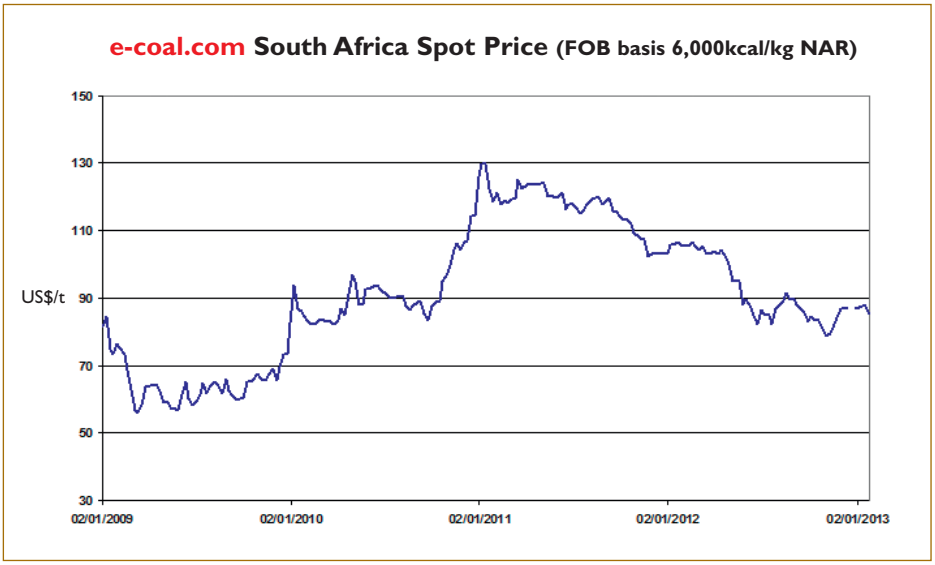


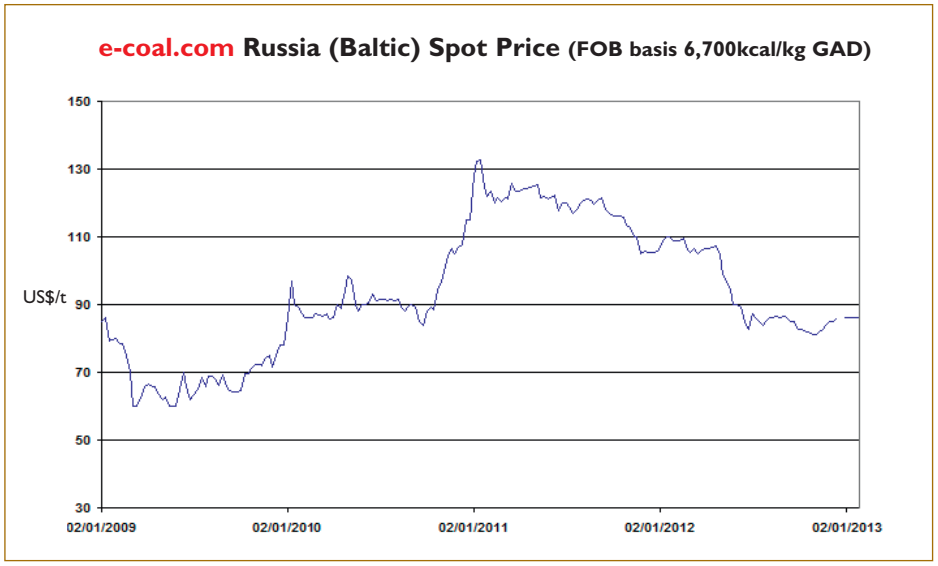
strike also impacted the Colombian export coal sector in July. There were reports that Ukraine was exporting metallurgical coke to India at discounted prices and this was impacting the market for higher quality coke, and consequently the hard coking coal market. The weak market in the USA had led to job losses reaching more than 250 as the situation began to impact coal communities more drastically. Meanwhile, Indonesian coal output was reduced amid the weak market.

Major coal miners were reducing expenditure on project development in Australia amid the weak economic conditions. BHP Billiton and Yancoal were among those reporting their latest position. Freight rates remained close to the lows of late 2008. The Richards Bay–Rotterdam Capesize route at US$6.00/t was priced at about what was the pre-boom historical average. Scrappings had increased in 2012, with 81 Panamax vessels reported scrapped in the seven months to 31 July. Capesize ship owners are understood to have been trading at less than their operating costs in the weak market.

Traders in the Asian region were anticipating a pick up in spot market activity in India as the monsoon season drew to a close. Spot tender activity was relatively healthy, and there were signs of renewed interest from the steel making sector there as well. Indonesia's coal output for 2012 was expected to be reduced further due to the weaker market seen during the course of the year. At the start of 2012, a total of 390mt was anticipated but by September about 340mt was more likely. Settlements on the quarterly contract price for hard coking coal had been surprisingly low. Tonnage commitments were the key point, to enable BMA to proceed in a sustainable way which the Japanese would have agreed is in their interests as well. Forecasts on the price of PCI (pulverized coal injection) material for the new contract period suggested it could be as low as US$120/t FOB based on these settlements. Such a price would be unsustainable for the Australians and Canadians, and rumours suggested one Queensland producer agreed the new contract price at cost for the time being amid low demand for PCI material. The price of coking coal had reached a level which is generally considered to be unsustainable and would need to increase to prevent the collapse of some operations. A number of projects were already being shelved due to the market conditions. In the freight market, there were further decreases in the Panamax spot rate, after the Panamax round voyage rate in the Atlantic had already fallen to a record low.

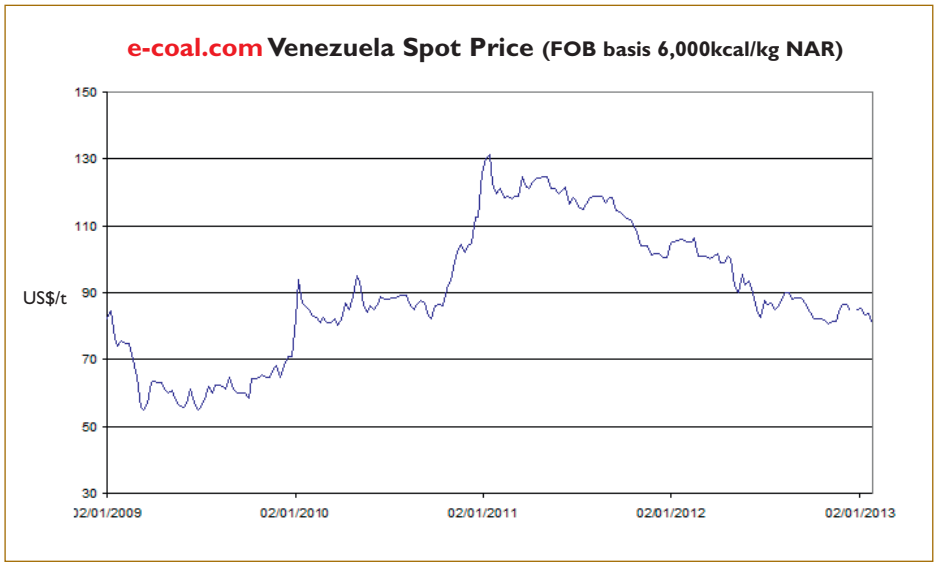
By late September, the rate of decline in Chinese manufacturing





output growth was showing some signs of levelling out. Production cuts, mine closures, and job losses were dominating the news around the world as the coal markets showed no signs of strengthening in east Asia, Europe, or the Americas. While some major producers had given more specific information about their intentions, others including Rio Tinto had only announced more vague indications of job cuts in Queensland and New South Wales. New Zealand's Solid Energy was understood to be reducing its workforce by a half.

In early October, the rate of decline in the international coking coal spot market slowed in the USA. This seems to have been due to a focus on domestic contract negotiations for 2013 which were a major concern for producers as prices were seriously under pressure. Sentiment in the coking coal market in Asia was improving just ahead of Coaltrans in Istanbul.



Delegates at Coaltrans in October appeared more gloomy than at any previous event, including that in the immediate aftermath of the stock market crash of 2008. The general sentiment was that there would be no near term improvement in market conditions, but at some point in 2013 thermal and coking coal prices will firm a little. Delivered prices to the ARA market were expected to reach close to US$100/t CIF. South African thermal coal prices were likely to recover to the low US$90s per tonne in 2013, compared to the low US$80s per tonne seen at the time. Market players felt it would take three years for thermal coal FOB spot prices to recover to levels seen a year earlier. The ongoing financial crises in a number of European countries was attributed to the pessimism, with little confidence in government policies to rectify the situation being evident. Coal companies in the United Kingdom were suffering from the market slump, as well as

PROMPT SPOT PRICES FOR THERMAL COAL 2012

(US$/t)

(FOB basis 6,700 kcal/kg GAD) ash, 15% max, sulphur 1% max

Location	6 Jan 12	30 Dec 11	% change
South Africa	105.90	103.20	2.62
Colombia	104.85	104.25	0.58
Venezuela	105.10	104.65	0.43
Russia Baltic	108.70	106.00	2.55
Poland	108.85	106.10	2.59
Newcastle	112.50	111.00	1.35
Queensland	113.30	111.75	1.39
China	120.00	120.00	0.00
Russia East	115.10	114.20	0.79
Banjarmasin	103.70	102.10	1.57
Mahakam	105.50	104.00	1.44

Prices are FOB vessel except Banjarmasin and Mahakam River which are FOB barge. Source: e-coal.com

PROMPT SPOT PRICES FOR THERMAL COAL 2013

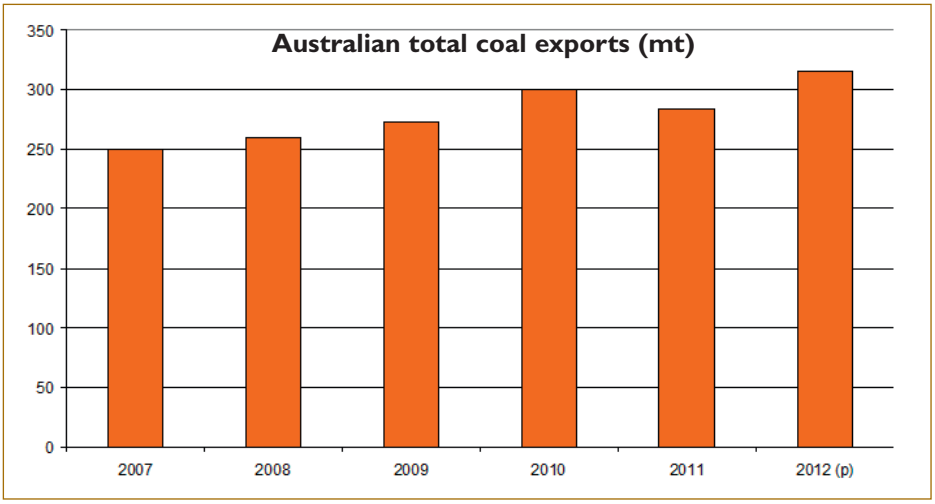
(US$/t)

(FOB basis 6,700 kcal/kg GAD) ash, 15% max, sulphur 1% max

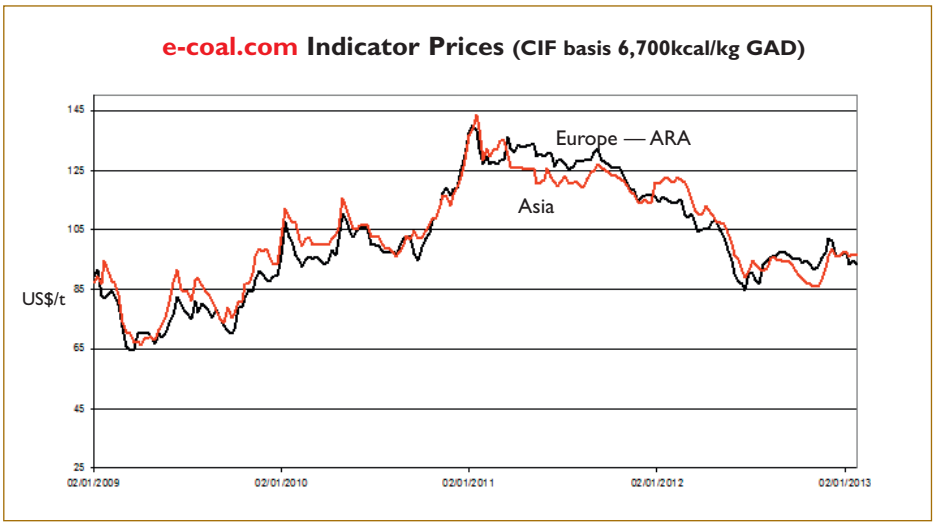
Location	4 Jan 13	28 Dec 12	% change
South Africa	87.15	87.00	0.17
Colombia	88.70	88.65	0.06
Venezuela	85.15	85.00	0.18
Russia Baltic	86.35	86.20	0.17
Poland	86.75	86.75	0.00
Newcastle	94.50	93.50	1.07
Queensland	95.30	94.25	1.11
China	98.00	97.00	1.03
Russia East	96.25	95.00	1.32
Banjarmasin	81.10	80.00	1.37
Mahakam	83.00	82.00	1.22

Prices are FOB vessel except Banjarmasin and Mahakam River which are FOB barge. Source: e-coal.com

unexpected government imposed tax bills. Job losses were continuing in Australia, and BHP Billiton reported a decrease of 20% year on year in coking coal sales during the July quarter.



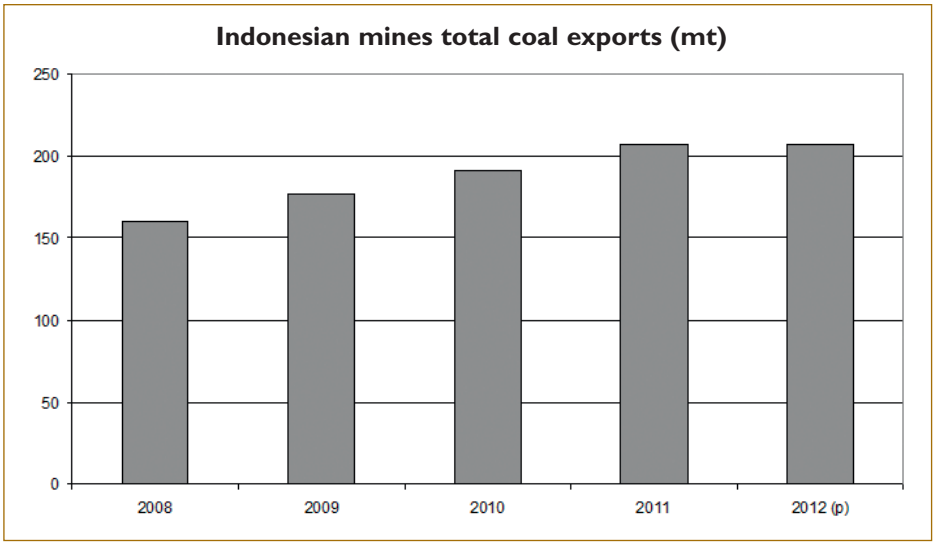
By November, there were signs that the Chinese economy is improving, with the latest financial sector analysis indicating greater output in October compared to September. A pick up in the Chinese economy is a long-awaited condition among commodities markets, so there was some hope that this may begin to occur. With the change in leadership in China, there have been predictions that the country's wealth could double in the coming ten years. Perhaps some of the demand conditions seen before the financial crisis of 2008 will return to the coal and related sectors before much longer. The upturn in demand for coking coal from China was continuing, with prices firming in the Australian market. A small knock-on effect was also seen in the subdued Atlantic market.



A number of key marketing managers and coal buyers had been attending the Carbon Forum in November, and rumours suggested European buyers in Germany, Israel, Spain, and Turkey were actively seeking coal. The potential for growth in coal demand in Turkey had been discussed, and all the Atlantic suppliers were understood to be optimistic for the coming decade. This could not have come too soon for the Colombian producers who were understood to be feeling the pinch of the slump in demand very seriously. Cash was rumoured to be getting tight.

Thermal coal spot prices firmed significantly in the Asian region in late November, with a rise of about US$4/t FOB basis 6,700 kcal/kg GAD or 4.6–5.6% being seen across the main markets. Some observers were now more convinced that the spot prices had seen their lows in this cycle. Thermal coal spot prices also firmed in the Atlantic markets, with spot deals being seen for Colombian coal in the USA, and US coal winning some spot tender business in the Mediterranean market.

Job losses continued in the coal sector, as well as related industries around the world. Australia was particularly badly affected in 2012, with reports of up to 5,000 jobs lost in Queensland alone. There may be more to come in 2013. Despite this, significant coal development is continuing in other parts of the world including Africa.



The coking coal markets were giving a tale of two oceans, with firming in the spot price seen in the Pacific as the spot price fell in the Atlantic. There were differing conditions in each area, with supply and demand factors causing the price movements in different directions. Demand from China's steel makers was continuing to drive the coking coal market up in Australia. In the thermal coal market, some players had begun guessing the contract price for JFY2013 amid a much weaker spot market compared to 2011 when the contract price was set at US$115/t FOB basis 6,700 kcal/kg GAD in Japan. The spot

market had been firming during November. Customers were expected to be told that it is in their interests to pay a sustainable price for Australian coal, with increasing production costs being a major factor affecting operations there. This is also true elsewhere. Thermal coal spot markets had been firming in all major regions, with continued buoyancy seen ahead of the year end holidays. US thermal coal exporters were reporting renewed interest in Europe, with deals being reported there. Meanwhile, economic indicators showed that China's manufacturing sector is growing again, after more than a year of negative growth.

With regard to competitor fuels to coal, the cost of new nuclear power capacity has soared in the wake of the Fukushima disaster due to more stringent regulations in Europe. EdF reported a substantial rise in the cost of its Flamaville project in France to US$10.6bn.

Amid the global recession, Chinese economic growth was 7.7% in 2012, and the government has forecast growth of 8% again in 2013. Traders and suppliers are hopeful that demand for commodities and coal will increase in the coming 12 months.

The year saw a mix of some optimism in the international coal sector to begin with, but this was impacted by a turndown in the economic situation by the end of the first half. Several months of depressed market activity ensued, but towards the end of 2012 there was a distinct improvement in many markets. The conditions cost thousands of jobs in the industry in 2012 and it may be some time before those are regained. When the coal market picks up, however, it can be unexpectedly rapid. So let's hope the recent trend continues. DCi

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Dr Tim Jones is Director of e-coal.com Consultancy and Editor of the weekly publication Coal Market Intelligence *which covers 11 spot markets worldwide, gives key information on the latest deals and tenders, company news, people and jobs, industrial relations, and ports, shipping, and freight rates.*

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Keeping safety at the forefront with RightShip

Since its inception in 2001, third party ship vetting specialist RightShip has helped to improve global marine safety standards. By removing substandard vessels from supply chains, RightShip has placed strong market pressure on ship owners and operators to improve their maintenance and operations.

In eleven years, RightShip has vetted over 200,000 vessels and undertaken more than 14,500 physical vessel inspections. As a result, customers have been able to identify in advance the 25% of the global fleet that are the substandard operators who account for approximately 70% of total casualties.

RightShip's comprehensive online Ship Vetting Information System (SVIS™) uses up-to-the-minute data about 71,000 ships and 120,000+ companies to deliver instant risk evaluations. It analyses over 50 risk factors with proven links to casualties and detentions, covering vessel building and maintenance, ownership and management, crewing, flag, class, Port State Control, inspections and many other aspects of history and performance.

Thousands of users across more than 210 organizations including shippers, ship owners, ship managers, port authorities, terminals, agents, insurers and maritime finance organizations rely on SVIS™ 24/7 to reduce their marine risk. Around 75% of RightShip's business comes from the dry bulk sector. Customers screen vessels using standard or customized criteria, review risk-related data and track vessel or fleet performance. In 2012, RightShip processed 33,504 decisions across 2.66 billion tonnes of commodity and removed 1,158 vessels from customer supply chains.

In recent years, RightShip developed the Existing Vessel Design Index (EVDI™), to provide customers with a systematic and transparent framework for measuring the energy efficiency of the existing fleet. The EVDI™ provides a theoretical estimate of the amount of carbon dioxide emitted by any nominated ship, per tonne nautical mile travelled, based on the engine and vessel design characteristics when the ship is built.

It is based on the same principles as the International Maritime Organization's (IMO) Marine Environment Protection Committee (MEPC)'s Energy Efficiency Design Index (EEDI), but is designed to be applied to the existing world fleet.

RightShip has eight customers, who between them transport 475 million tonnes of cargo per annum, who currently factor the environmental rating into their vessel selection process. This represents around 10,000 vessel movements a year and nearly 10% of global non-containerized trade. Feedback from the early adopters suggests this framework has not only helped to reduce shipping costs, but has also gone a long way to publicly demonstrate their commitment towards corporate social responsibility.

Port representation

The international shipping fleet are in varying conditions and RightShip's SVIS™ protects substandard vessels from entering international terminals. RightShip's user community unite to combat the relocation of substandard vessels. Once a vessel has loaded at a terminal that subscribes to RightShip, feedback from the terminal staff is recorded against the vessel for future reference. In 2012, around 4,700+ terminal reports were submitted to the SVIS™ database.

In 2012, RightShip began facilitating terminal questionnaires to support customers seeking to improve the safety processes of visiting ships, improve efficiency and reduce the risk of delays. Administered by the terminal, the questionnaire process is fully integrated with existing systems and processes thus reducing the administrative process for ship owners.

Main challenges

RightShip constantly seeks to improve the existing service offering by refining the functionality of the Ship Vetting Information System and making improvements to the risk rating. A key challenge is to ensure that any change that is made to SVIS, including incremental refinements, is a value-add. Integrating new data sources that address new and emerging risk factors is another challenge for the business.

RightShip is working on improving the predictive ability of the risk rating algorithm to quantify the residual impact of casualty and PSC detention close out.

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Coaltrans Poland

19-20 March 2013 | Angelo Hotel | Katowice | Poland

Polish–English–Russian simultaneous translation provided

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- Determine **the future of Poland's coking coal production and coke exports to position yourself in this increasingly competitive market**
- Explore how Poland is **investing in port developments and its interior infrastructure to offer logistical solutions**, connecting coal suppliers with end users throughout Europe

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"This was an informative and well organized event. A good opportunity to meet and develop relationships."

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Running a tight ship

the vital role of the ship agent

It's not just about the port calls

Eric Barnard, GAC Group Sales Director of Shipping, explains that the role of the ship agent is much more than providing agency services, it's about helping customers grow.

"As one of the world's largest providers of shipping, logistics and marine services, GAC has over 50 years of experience in delivering ship agency services for dry bulk vessels. During this time the core role of the ship agent — to facilitate the safe and timely delivery of cargoes across the world's oceans and river ways — has remained fundamentally the same. But the business of ship agency has matured, diversified and expanded significantly in recent years in response to changing customer needs.

In today's competitive market and challenging economic times, owners need a ship agent who can provide a complete package of time and cost-effective solutions. At GAC, we believe we can play an important role to help deliver our customers' business strategies. It is not just about providing a service when and where it is needed, but working with the customer to ensure that everything we do for them adds value and helps to realize their commercial goals.

A ship agent needs a varied set of skills and resources to meet the needs of the dry bulk sector, including expert industry knowledge, a thorough understanding of local requirements, a global network, the means to respond to the market's changing needs and the ability to provide a range of supporting services beyond the basic agency role. GAC offers a range of additional services such as maritime security, hub agency, crew travel, spares logistics, ship supply services, bunkering, weather routing and more. Customers can select the extras they need to build a comprehensive package of services — all from a single supplier, saving time and money.

Shipping is in flux. Owners and operators are facing record high bunker prices and restricted access to credit, compounded by tonnage oversupply and depressed rates. Belts are tightening

Eric Barnard, GAC Group Sales Director of Shipping.

everywhere, margins for error or delay are slimmer than ever and their commercial consequences all the more severe.

Smart ship agents have responded to customers' needs with the use of sophisticated IT tools and integrated service solutions. GAC's Global Hub Service comprising of a Global Disbursement Centre in Dubai and supported by four regional Hub Agency Centres, offers a consolidated service for clients wanting to control and save on port call-related expenses, including Disbursement Accounts (D/A) management.

A thorough understanding of the technical and operational requirements in the handling of dry cargoes is essential. For example, all parties involved in the transportation of coal must understand its particular requirements, ranging from monitoring the correct transportable moisture limit to working with ships' Masters to oversee proper handling of debris to ensure there is no contamination of the cargo, vessel or the environment.

The movement of dry bulk cargoes is a fragmented business. More than 40 professions can be involved in loading or unloading shipments, so it is vital that the vessel and its cargo are entrusted to an agent with the knowledge, experience and resources to oversee the entire process.

Supply chains must have the agility to accommodate fluctuations in trade routes. The right shipping agent can make a big difference, if they have the global resources to respond to changing trade patterns and in-depth knowledge of their local markets to respond proactively to anything that might pose a threat to the safe, timely and efficient movement of their customers' cargoes.

A clear example can be seen in India, which has witnessed a big drop in the number of vessels carrying iron ore exports in

recent months as a consequence of the government's crackdown on unsafe mining practices. GAC's 26 India offices, particularly in smaller ports, have diversified to cater to more vessels anchoring at outer port limits waiting to secure cargoes. Limiting costs whilst at anchor means securing the best-value ship supplies in good time, whilst ensuring that cleaning and waste disposal is carried out in full compliance with all the regulations. GAC India's flexibility in meeting those needs is a key advantage.

GAC Australia too has proven its adaptability in responding to the requirements of its coal customers. Australia's coal trade is susceptible to seasonal weather and North Queensland's coalmines and ports can be affected by heavy rain, which disrupts mining and transportation and results in berthing delays. Another challenge Australia will face in the future is the movement of large numbers of vessels on a single tide to maintain the throughput of coal cargoes. Growing coal exports need more port calls, and so the risk of congestion rears its ugly head.

Whatever the circumstances, the shipping agent plays a vital role in minimizing its customers' costs by doing all they can to ensure a prompt departure.

Regulations differ between countries, but also from port to port in the same country. The Port of Geelong in Australia has its own detailed protocol on the handling of dry bulk cargoes covering loading and unloading, dealing with wash-down residues and cleaning the facility, the vessel and local roads. Ensuring that all of the relevant authorities are engaged, paperwork filed correctly, communication with all parties is effective and measures are put in place to ensure compliance is time-consuming and complicated. Appointing experienced ship agents with in-depth local expertise and good working relationships with the authorities reduces risks and saves time and money.

Service standards may vary widely from region to region or even port to port. Whilst the Federation of National Associations of Ship Brokers and Agents (FONASBA) sets best practice guidelines on a global level, regional member bodies can also stipulate their own quality objectives. A global organization such as GAC guarantees the same high level of service quality the world over.

The shipping agent has an important role to play in ensuring that dry bulk shipments make their way around the world in a safe, timely and cost-effective manner. And a global agent with a breadth of service solutions, proven expertise across a range of specialist sectors and understanding of local markets, is a vital ally for shipping companies seeking to control costs, increase efficiency and deliver their business strategy. GAC's extensive portfolio of services delivered from a network of more than 300 offices worldwide does just that."

FONASBA helps shipowners identify quality agents

Headquartered in London, the trade association FONASBA represents the world's ship agents and brokers. From the large global marine service providers with representatives in all the world's major ports, to small family-run concerns, the role of a ship agent is to represent the interests of the shipowner, operator or charterer — 'the principal' — while the ship is in port, and to ensure that the call is completed as quickly and efficiently as possible, but at the same time ensuring all the statutory and regulatory requirements are fully met. FONASBA believes that it is important that principals can easily identify those agents and brokers who are well-funded and demonstrate a tangible commitment to quality and to this end the FONASBA Quality Standard was launched in October 2007.

Working with an agent or broker displaying the FONASBA Quality Standard reassures the principal that they are dealing with a company that is well run and has all the resources necessary to ensure that their requirements are carried out in a professional manner.

The standard is only awarded to those companies that are:

- a member of a FONASBA member association;
- can prove their financial standing in accordance with the accounting laws of their country of domicile; and
- have made a firm commitment to professionalism and the ongoing education and training of their staff.

Why does the industry need this standard?

There is no international regulation governing who can and cannot be a ship agent or broker, yet shipowners often entrust their highly valuable vessels and cargoes to companies whose financial probity or expertise is unknown. By providing the maritime industry with a robust, enforceable and practical Quality Standard, FONASBA has helped to ensure that the activities, responsibilities and liabilities of agents and brokers are subject to scrutiny.

FONASBA also recognizes that some Full Member associations have their own pre-existing quality standards and that some national authorities set minimum statutory standards for the provision of ship broking or ship agency services. Furthermore, it also recognizes that ISO standards have been established for the shipbroking and ship agency professions and the FONASBA criteria include provision for compliance with these protocols to count towards achieving the Quality Standard.

Key requirements

To ensure compliance with relevant national laws and regulations, the national criteria governing the award of the Standard are proposed by the national association and are then put forward for approval by FONASBA's Executive Committee.

The key requirements in all national Standard criteria are that:

- the applicant company must be, and at all times remain, a current member of a FONASBA Full Member or an Associate, Club or Candidate Member;
- the company shall be bound by, and at all times act in accordance with, the FONASBA Code of Conduct;
- ensure that all its operations are carried out to the highest levels of professionalism and in accordance with all relevant national laws or regulations;
- maintain appropriate accounting policies and controls, ensuring that principals' funds are accounted separately from those of the company itself; and
- ensure that all members of its staff are trained to the appropriate level and ideally encourage staff to study for, and pass examinations based on the syllabi of recognized authorities or educational institutions

Companies awarded the FONASBA Quality Standard are subject to at least a biennial audit by their own national association or, in the case of an Associate, Club or Candidate member, by the FONASBA Secretariat.

DA-Desk joints Maritime Anti-Corruption Network

In 2011, when the UK Bribery Act took effect, it had an immediate impact on the maritime industry — and was an underlying stimulus for the formation of the Maritime Anti-Corruption Network (MACN). Today, MACN is a network of socially responsible maritime companies that have joined together to bring the issue of bribery and corruption to the forefront of the industry. DA-Desk, the world's largest independent port cost management service provider which was founded on the principles of transparency and integrity, announced in January that it had become an associate member of MACN.

As an associate member — a company within the maritime industry that does not own or operate ships — DA-Desk will participate in the organization as a whole. The company also will join and actively contribute to one of several specific working groups committed to driving industry consensus, enabling the study of root causes and possible solutions, and developing a system to share information industry-wide.

According to Domenico Carlucci, DA-Desk chief compliance officer and financial services director, "Compliance, which includes anti-corruption, is a priority for DA-Desk and an increasingly complex and costly issue in our industry. Through DA-Compliance℠, we work diligently on behalf of our customers to ensure transparency and integrity in all transactions. We are excited to be able to share our many years of experience and our understanding of best practices with the members MACN — and to contribute to the development of broad-based, effective industry solutions."

This past October DA-Desk joined the United Nations Global Compact Network a strategic policy initiative for businesses that are committed to aligning their operations around ten principles in the areas of human rights, environment, labour and anti-corruption. Joining MACN deepens DA-Desk's commitment to these very important core values.

About MACN

The Maritime Anti-Corruption Network (MACN) is a global business network working towards its vision of a maritime industry free of corruption that enables fair trade to the benefit of society at large. MACN Members promote good corporate practice in the maritime industry for tackling bribes, facilitating payments, and other forms of corruption by adopting the MACN anti-corruption principles, communicating progress on implementation, sharing best practices, and creating awareness of

industry challenges. MACN also collaborates with key stakeholders, including governments, authorities, and international organizations, in markets where corruption is prevalent to its membership, to identify and mitigate the root causes of corruption in the maritime industry.

About DA-Desk

DA-Desk was founded in 2001 on the principle that an independent, distinct disbursement account service — not owned by port agencies or shipping companies — could provide an objective, automated DA process that would benefit both principals and agents. The company's unique concept took hold and today DA-Desk, headquartered in Sharjah, UAE, is the world's largest independent port cost management service provider. The company's flagship service, PortSpend Management, and its companion service, PortPayables, along with other services and tools, deliver operational efficiencies, enhanced security, and cost savings and manage regulatory compliance for more than 160 customers across the globe whose annual port calls range from 100 to 6,000. DA-Desk has 25 senior executives and 350 operations staff working in dedicated teams on behalf of its customers. The company maintains verified details on more than 8,000 agents in its comprehensive Agency Database and processed more than 100,000 port calls in 2012.

For an in-depth report on DA-Desk's activities, please see 'Taking the pain out of port costs: DA-Desk fits the bill,' on p33 of the February 2012 issue of *Dry Cargo International* magazine.

THB — shipbrokers and agents since 1988 & Carl Polzin Logistics

Since 1988 THB has been acting as a shipbroker for numerous renowned groups and medium-sized companies. Today the company is structured in the business segments:

- shipbroking;
- ship-operating; and
- port agency service.

THB is continually on the lookout for suitable and good value shipping spaces of all sizes around the world, in order to transport its client's bulk and breakbulk cargoes to their destination in time.

Shipbroking

THB's primary functions as a shipbroker is the segment of bulk and break bulk cargo.

The company has special expertise in the transport of iron ore, coal, grain, wood pellets, steel, and aluminium and scrap metal, from Handy to Capesize shipments.

It has a subsidiary in Dusseldorf servicing its clients in the Rhein/Ruhr area.

Operating:

THB serves as an operator in the segment of breakbulk and project cargo.

The company has expertise in the transport of steel and steel products as well as plants and machinery. The service portfolio encompasses the surveillance of cargo securing and handling processes.

On behalf of a leading industrial client, THB has operated vessels transporting straddle carriers from Durban to Port Elizabeth (South Africa).

Port Agency Services:

THB also offers Port Agency Services as owners and charterers' agent in Bremen, Bremerhaven, Brake, Wilhelmshaven, Cuxhaven, Stade, Hamburg and Kiel.

The following services are offered by THB:

- inward and outward clearance in coordination with authorities and other involved parties;
- ordering of tug-operators, pilots, moorers etc.;
- co-ordination and documentation of cargo operations;
- delivery of ship provisions (spare parts, food etc.);
- crew change; and
- waste disposal.

Carl Polzin

Carl Polzin Seehafenspedition was established in 1925. The company's focus is on providing logistics solutions for steel industry, machinery and plant engineering as well as commercial enterprises in the natural product sector.

Carl Polzin shipped 60,648 tonnes of pipes from Bremen (Germany) to England and Ireland on behalf of a leading international producer of large pipes.

Carl Polzin also took care of the FOB handling and supervision of handling processes.

The company offers project, sea, air and hinterland logistics from a single source. Its experienced team works with an international network of agencies to ensure that clients receive the best possible solution. Carl Polzin's specialist fields include logistics solutions for steel, machinery and plant engineering and natural product industries.

Seafreight

LCL/FCL

Regardless of whether clients wish to ship LCL (less than container loads), FCL (full container loads) or particularly large and heavy goods Carl Polzin can offer a full spectrum of maritime logistics services.

Its Seafreight department continually assesses various shipping companies for its clients.

As well as economic criteria, the company also sets great store by ecological and social standards to allow clients to select their suppliers on the basis of both budgetary and sustainability.

Airfreight/Hinterland logistics

Carl Polzin can also help clients to plan, organize and realize cost-effective part and full charter flight to transport cargo by air to the destination.

If required, the company also take care off planning, organizing and realizing point to point transportation.

It will also assist with pre- and on-carriage by lorry, rail or inland vessels.

Turkey and the Black Sea covered by Catoni

Catoni provides ship agency services for the vessels calling any port within its agency network covering the entire geographical area of Turkey and Black Sea.

The company's major services under ship agency activity are: are: port agency; transit agency for the Turkish Straits; and agency services for offshore/ drilling projects

Catoni is a Group of companies performing mainly in Transport industry across the world. The long history of Catoni, since its foundation in 1846, is clear evidence of its experience, professionalism and reliability. The transport activities of Catoni can be grouped as shipping (liner agency, port agency, offshore drilling services, chartering) and freight forwarding & logistics (ocean – air – land freight forwarding, warehousing & distribution, supply chain management, customs brokerage, and specialized services).

Catoni is well known with its specialized expertise in ship agency services, which has been its traditional activity since 1846. Benefiting from its 12 offices in Turkey, Georgia, Bulgaria, Romania, Azerbaijan and North Iraq, Catoni is able to supply uniform service standards to its business partners and clients within Turkey and the Black Sea region and recently in North Iraq.

Ship agency services are vital within the shipping industry, as they include the whole process starting before the vessel's arrival and ending with her sailing from the port. During this period, ship agents are responsible for representing shipowners/ operators/charterers in the port, co-ordinating the vessel's operation, cargo movement, documentation and information flow, supplying necessities requested for the next voyage of the vessel, solving problems and managing urgent crises if they occur. Therefore, the selection of the ship agent is a serious decision for a shipowner/operator/charterer for ensuring smooth, efficient and risk free operation.

Ship agents play a crucial role in Turkey and the Black Sea because they are almost the only party that the official

authorities and port authorities deal with for any issue related to the vessel at the port. As an experienced ship agent, Catoni is totally aware of the expectations of all parties including shipowners, charterers, traders, and strives to render exclusive service for its principal.

Port agency is a part of shipping sector where the competition is very severe. The level of competition in Turkey is very high — there are around 600 agents in Istanbul alone. Catoni has an excellent reputation, as well as valuable references and a long history. All these are supported by the core values of the company — transparency, honesty and professionalism — and are Catoni's greatest strengths in the market. Another advantage is that Catoni offers its regional presence all over the Black Sea and Turkey. Through its most valuable asset — highly skilled and experienced employees — the company can manage challenging situations on time and deliver appropriate solutions to its principals.

Catoni is competent to provide ship agency services to all types of vessels including tankers, container vessels, Ro-Ro vessels, general cargo vessel, cruise vessels, seismic research vessels and offshore drilling units. Catoni acts as agent for about 1,000 vessels per year.

The philosophy of Catoni is a customer-oriented business approach and maintaining customer satisfaction. Therefore, the company provides boutique services for its clients and shapes its services according to customers' needs and expectation. This philosophy gives Catoni the privilege of serving reputable shipping/trading companies like NYK, BP Shipping, BAHRI and Hapag Lloyd. Besides global players, Catoni provides customer-oriented services for strong regional companies like Master Project, TMBCL, UECC and UN RoRo.

Celebrating 50 years of cutting edge maritime services

Thome Group, the first independent ship manager to establish in Singapore, proudly celebrates its 50th anniversary this year.

Incorporated in the Republic in 1963 as Thome Co. Pte Ltd, and establishing Thome Ship Management's Singapore headquarters in 1976, Thome attributes its longevity and world class reputation to combining the best from two worlds: generations of family experience in Scandinavian shipping tradition, and the modern drive of a fully integrated Asian private business enterprise.

Thome Group chairman and chief executive officer Olav Eek Thorstensen.

In the decades since 1963, Thome has grown to become one of the world's major international ship managers and is now firmly in the top ten managers globally.

With more than 300 vessels either crewed or under full technical management, around 10,000 seafarers employed and offices all over the world, the group continues to pledge personal service to owners combined with an ability to deliver high value, bespoke technical and operational services.

In more recent times, Thome Group has expanded its ship agency business, moved seamlessly into the offshore oil and gas sector and seen its maritime consultancy arm score notable successes in the area of newbuilding supervision.

At the start of a year of celebration, Thome Group chairman and chief executive officer Olav Eek Thorstensen spoke about what he would like the company to achieve in the next 12 months and beyond.

He said: "Thome Group has come a long way in recent times.

"Two major developments in that expansion have been the growth of Thome Oil and Gas and our decision to expand our presence overseas. While Singapore remains our home base and Manila our main crewing and training centre, more recently we have extended our global reach via new offices and joint ventures."

Thome most recently launched a joint venture crewing operation in India together with several respected partners.

"We have also set up operations in Indonesia, Thailand, Croatia and other shipping centres, plus a recent joint venture in Korea. All are beginning to produce great value for Thome," Thorstensen added.

Looking ahead, he said the global shipping market would most likely continue to face a tough time in 2013, although things look brighter for the oil and gas sector.

He said: "The outlook remains hard for global shipping. Owners rightly continue to seek value from the managers they entrust with their assets.

"At Thome we shall continue to deliver the highest quality management service with the focus on safety and a flawless operation."

He said one of the aspects of Thome's development has been the continuous high level of investment in training and education, and this will continue into 2013 and beyond.

"We firmly believe in the human element in our training. Our focus is on developing our shore-based and sea-going talent as this is something which truly sets us apart from our competitors," he added.

This year will also see Thome build its presence in China. Thorstensen confirmed there is growing interest in third-party ship management services among Chinese owners. A number of Chinese owned 'Kamsarmax' dry bulk carriers have been added to the Thome-managed fleet.

In May, the group will hold a special celebratory reception for Singaporean and international clients. There will be a concurrent celebration in Manila, the group's largest regional operation outside Singapore, celebrating its 25th anniversary this year.

In August, further celebrations will be held in Oslo and Copenhagen. Across 2013, senior Thome executives will demonstrate their industry leadership by speaking about maritime issues and group's global plans at key industry conferences in Singapore, Indonesia, Thailand, China, India, and Russia.

Agency expertise in the Baltic region

INTER BALT is the forwarding and ships' agency arm of major Polish coal trader, the Weglokoks S.A. Group. It was founded as a limited liability Polish company in 2003, with its head office in Gdansk. It also has branch offices in the country's remaining major ports such as Gdynia, Szczecin and Swinoujscie. Today, the company has about 46 employees, including six who are highly skilled and experience in the dry bulk sector of the shipping business.

INTER BALT is the largest supplier of services for vessels loading Polish coal at all Polish ports with an approximate 15–20% share of the whole Polish shipping agency market.

The company's current focus is on providing ships' agency services for the benefit of shipowners.

INTER BALT's success is driven by its people, and by their unrelenting focus on delivering high-quality and comprehensive ships' agency services.

The vessel Solidarnosc *loading Polish coal for export at the Northern Port of Gdansk.*

In 2012, INTER BALT served as a port agent for 300 vessels. About 50% of that volume occurred in the ports of Gdansk and Gdynia. INTER BALT's agency team also supports services in shipyards, and is involved in another branch of activities — shipbrokering.

As the representative of the Weglokoks Company in Katowice on the Polish coast, INTER BALT also provides comprehensive services in the field of coal forwarding in Polish seaports. Apart from forwarding services for Weglokoks S.A. Katowice and other operators, it trades in coal on the local domestic market.

INTER BALT offers end-to-end dry cargo management solutions to principals for the last eight years and provides customized answers, which incorporate procurement, shipping, port logistics, land transportation and shipping consultancy.

Ninety per cent of the dry bulk commodities carried by INTER BALT's customers are either coal, iron ore or biomass.

The role of the ships' agent

INTER BALT recognizes that owners need excellent services, and for that reason its employees work around the clock to find better, cheaper ways to satisfy its principals and to make the necessary arrangements for handling owners vessels.

As the port agent, INTER BALT comes into contact with individuals and organizations. These include ships' masters, officers and crew, customs, immigration, port authorities, towage companies, boatman and stevedores.


The vessel Zina *discharging biomass using grab cranes at PKS at the Port of Gdansk.*

Depending on circumstances, owners need a range of services, including the arrangement of repairs, surveys, medical attention and so forth. This list is by no means exhaustive, but merely serves as an illustration of the diversity of people and organizations that are involved at one time or another with a vessel and its cargo during a port call.

INTER BALT helps its principals to comply with legal requirements, both Polish and international. It is important to remember that, in recent years, new legislation has been introduced which includes PHICS in Polish ports, and the Paris MoU, a new inspection regime. Therefore, as a ships' agent, INTER BALT must take particular note of these developments, and adapt its working practices accordingly.

Major clients

INTER BALT's major clients include the four companies: GFD Suez, SUEK AG, Weglokoks, Vattenfall and SUEK Polska who between them represent 95% of INTER BALT's principals.

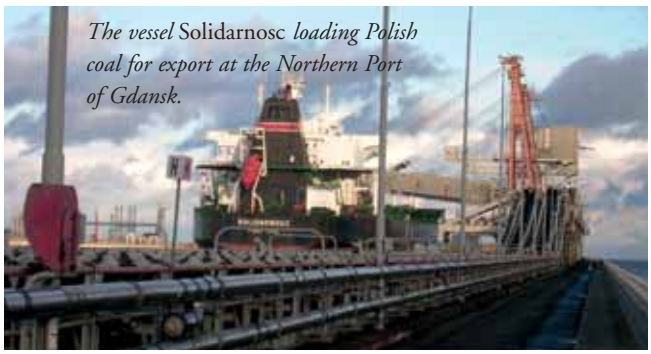
Competition

INTER BALT works hard to remain competitive in the bulk agency market, and must deal with competition from companies including Inchcape, Rentrans and Anchor.

Focusing on the future

In the last few years, there have been changes in the Polish coal industry, with mining experiencing a fall. As a result, INTER BALT must adapt to the changing requirements of the market. Its new focus is therefore on the imported coal market, as well as on the import of biomass, other new materials, project cargoes and fuel, to replace the fall in coal export quantities that are the result of the recession.

INTER BALT is a member of the Polish Shipbrokers' Association and BIMCO.


The vessel Solidarnosc *loading Polish coal for export at the Northern Port of Gdansk.*

Dry bulk key area of growth for Transmarine

Celebrating its 75th year, employee-owned Transmarine Navigation Corporation is a leading bulk cargo shipping agency in the United States. Headquartered in Long Beach, California, it has US offices on the US West Coast, the US Gulf and in Hawaii. Its dry bulk activity consists of its established market position, with grain exports from the Columbia River along with a rising volume of solid fuel, sulphur and other dry bulk commodities from US Gulf, California and Puget Sound ports.

Transmarine delivers value-creating agency service by employing a different model than its competitors: while some companies concentrate their expertise in the office and send entry-level personnel to vessels, Transmarine's boarding agents are trained veterans with an equity stake in the firm, placing experience and expertise aboard the vessel. These agents are backed by highly experienced operations mangers and senior management.

The role of an agency divides into the routine and the exceptional. Routine agency tasks are not dramatic, but performing them poorly results in costly delays and blinding confusion for vessel owners and cargo interests; performing them with reliable consistency creates savings and clarity for the company's clients. However, it is in the exceptional issues when an agency's expertise and collective experience produce value for the client far beyond the cost of the service.

The agent needs to communicate constantly with the vessel operator and the cargo interests to report precise operational facts and also to illuminate possible complications to people in distant time zones who are perhaps unfamiliar with local practices. Empathy is essential. The agent has to communicate a situation and its nuances, provide advice with the aid of his experience and expertise, receive instruction, and act with promptness.

It is vital that an agency have a solid relationship with the people who work at the dry bulk terminals in the port, relationships that come from years of living and working in the same community, sharing similar concerns and interests. Agents also have to have a proper and courteous conduct when dealing with port authorities on behalf of principals. Operational knowledge, communications skills, clear and efficient accounting — these are all agency essentials. But agency is a people business, where honesty and decency are the fundamentals.

Transmarine's clients form a roster of the world's most prestigious and recognizable companies in bulk shipping, commodities trading, grain houses, industrial conglomerates, oil companies (petcoke and sulphur), cement makers, and electricity generation utilities — from all continents.

Transmarine's coverage map includes every dry bulk port on the US West Coast along with the ports in Texas, Louisiana, the lower Mississippi River and Hawaii.

Transmarine is pre-eminent in the tanker market, but its dry bulk vessel volume is growing on all fronts: number of calls, amount of revenue and proportion of calls. Dry bulk is a key growth area for Transmarine. The company does not perform liner container work.

Competitors are well-known dry bulk agencies. All seem to have a regional concentration and try to expand their service offerings into other dry bulk regions of the country.

Transmarine's challenges relate to the competitive conditions of the ports and regions in which it operates, the environmental, labour and economic issues reported in the press. The poor condition of the dry bulk freight market makes cost control an ever higher priority and funds management a crucial factor in the survival of an agency. The agency that is highly disciplined with funding is performing a vital service for his principal and all other industry stakeholders.

Founded in 1938, Transmarine just became an ESOP (Employee Stock Ownership Plan) majority-owned company, as from 1 October 2012. The company believes it is the first shipping agency to achieve this. There are 75 employee/owners across offices in: California: Long Beach, San Francisco, Stockton, San Diego; Oregon: Portland; Washington: Seattle, Bellingham, Anacortes; Texas: Houston; Louisiana: New Orleans; and Hawaii: Honolulu.

Dry bulk contacts are: Peter Whittington, CEO; Jim Papp, President; Mark Hanson: VP Dry Cargo Marketing; Patrick Dunbar: Solid Fuels Marketing; Phil Brotherton: Breakbulk Marketing; Ivan Nikolic: California Dry Bulk Marketing; Scott Sullivan: Puget Sound Marketing; Tony Anderson: Columbia River Dry Cargo Marketing; Kyle Munson: Texas District Manager; and Paul Clancy: Louisiana District Manager.

Shipping.dk: ship agency services in Denmark, Sweden and France

Shipping.dk is a logistics company with its own terminals, trucks and ships. Its line of business is agency (including STS), stevedoring, chartering, air freight, courier service, project cargo and road — both import and export. Furthermore, it offers storage facilities and bagging.

Shipping.dk is part of USTC (United Shipping & Trading Company), which is owned by Torben Østergaard-Nielsen.

Activities

Shipping.dk is one of the leading logistic companies in Denmark. It focuses on:

- ship agency;
- ship-to-ship operations;
- project shipments;
- terminals;
- stevedoring; and
- road division

Coverage/locations

With offices in all the ports mentioned below, Shipping.dk covers all of Denmark's ports and the northern part of the Swedish west coast:

- Frederikshavn;
- Aarhus;
- Fredericia;
- Aabenraa;
- Kalundborg;
- Køge;
- Copenhagen;
- Lysekil, Sweden; and
- Marseille, France.

Role of an agent

The main role of an agent is co-ordination and foresight. Shipping.dk is its principals' local representative, who has the local knowledge enabling us to ensure optimal and smooth operation. The agent has to know all parties involved in the cargo operation and needs to be able to foresee potential problems and prevent them, rather than solving them once they have occurred.

With the increase in demands and new systems from authorities, it is important for an agent always to be updated on this in order to avoid delays on the vessels and penalties for the principals. A good agent can save owners a great deal of money in reduced lay time and in general port costs (reduced number of tugs etc.).

Main agency activities

Shipping.dk handles about 2,000 port calls per year with more or less a 50/50 split between dry cargo and tankers. This gives it extensive expertise and knowledge of the market, which it always strives to extend to all its locations. The company's position within agency on dry cargo vessels has been built up through investments in terminals, warehouses and equipment, which is highly valued by the cargo owners.

Main challenges

With all the new IT systems and registration demands from both Danish Authorities and EU Law, it has become much more complex to act as a shipping agent, and in many cases owners/ charterers can face penalties if they fail to remain up to date. When the shippers and owners take on a shipping agent, the shipping agent takes over some of the obligations otherwise placed on the shippers and owners. Shipping.dk takes pride in the fact that its Agency department is well renowned for always being extremely up to date.

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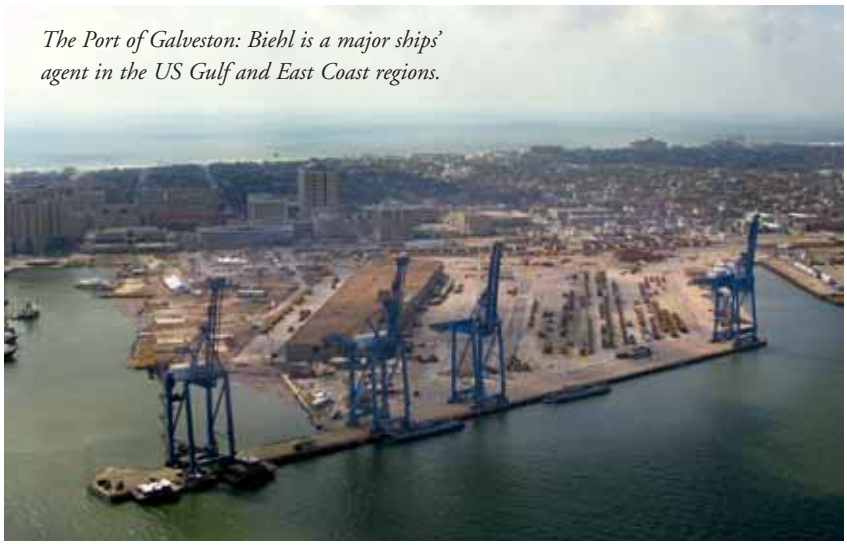
Biehl: steady on course

US ships' agent Biehl has been a recognized entity in the shipping industry since the beginning of the 20th century. Respected worldwide and financially sound, Biehl stands poised to lead the way among ship agencies into the 21st century. Biehl maintains its position by retaining highly qualified personnel and utilizing the latest technology available to assist each principal to conduct business. In addition to offering the full range of ship agency services, Biehl also acts as owners' or charterers' protective agents or as husbanding agents in connection with dry-docking and other special circumstances. Founded in 1905, Biehl's service to the US Gulf Coast in Galveston precedes the establishment of the Port of Houston. Shortly after World War I, Wilkens & Biehl, as it was then known, opened the first office in Houston. Since then Biehl has grown to become one of the largest steamship agents in the US with 17 offices located in the US Gulf and US East Coast. Biehl continues into its fourth generation of continuous family ownership proving that the company can easily adapt to the changing shipping landscape.



The Port of Galveston: Biehl is a major ships' agent in the US Gulf and East Coast regions.

Tradition, performance, experience

Biehl is one of the largest agencies in the US with expertise in handling dry bulk commodities from petcoke and coal to grains and fertilizer. Its customers rely on its value-added services to not only handle their vessels but also provide them with relevant market data and up to the minute information which is critical in handling their business. When requested, Biehl can evaluate project viability, verify design economics and review contractual language to identify potential issues.

Local offices, local knowledge

Serving the needs of its customers throughout the US Gulf and US East Coast, Biehl agents and offices are prepared to address customer needs. Seventeen local offices eliminate the need to travel great distances. The company's offices are plugged into the local community, from the port authorities to terminal operators — it acts as its customers' eyes and ears.

People, education, skills

Biehl invests in its most vital asset: its people. Managers communicate with staff and colleagues to exchange ideas, identify trends and ensure continuity across locations. Conference attendance is encouraged as are opportunities for professional development. The Next Generation Program identifies talent within the organization and selects those individuals for additional specialized training. Biehl is proud of its heritage of family leadership and is eager to develop the next generation of shipping managers from within its own organization.

Proactive, tailored service

Biehl employees are trained to anticipate and proactively address challenges. In most cases, it resolves operational issues so swiftly, its customers are never aware of them. For example, draft bills of lading are prepared well in advance of the vessel's arrival so that, upon completion of loading, only the cargo figures need to be included. Biehl further demonstrates its commitment to advance preparation by providing customers with timely port information, weather updates and most significantly, by offering customers the benefit of years of experience with a particular port, ensuring seamless vessel operation. Biehl can tailor any service or request specifically to the customer's requests. Detailed work instructions (which the customer can revise at any time) are developed and discussed to clearly outline customer expectations. Once completed, these instructions are shared between offices to ensure continuity of service. These work instructions are also regularly reviewed to evaluate customer satisfaction.

Financial controls, insured, bonded

Due to the considerable amounts involved, Biehl places utmost importance on safeguarding customer funds. Both bonded and well insured, Biehl is able to cover whatever issues may arise. Its advanced accounting software enables it to create customized reports and data that can be exported to customers' specifications, eliminating double data entry and saving its customers both time and money. For some large volume customers, it also provides designated accounting services staff that are attuned to a particular customer's needs and is better able to respond to their requests.

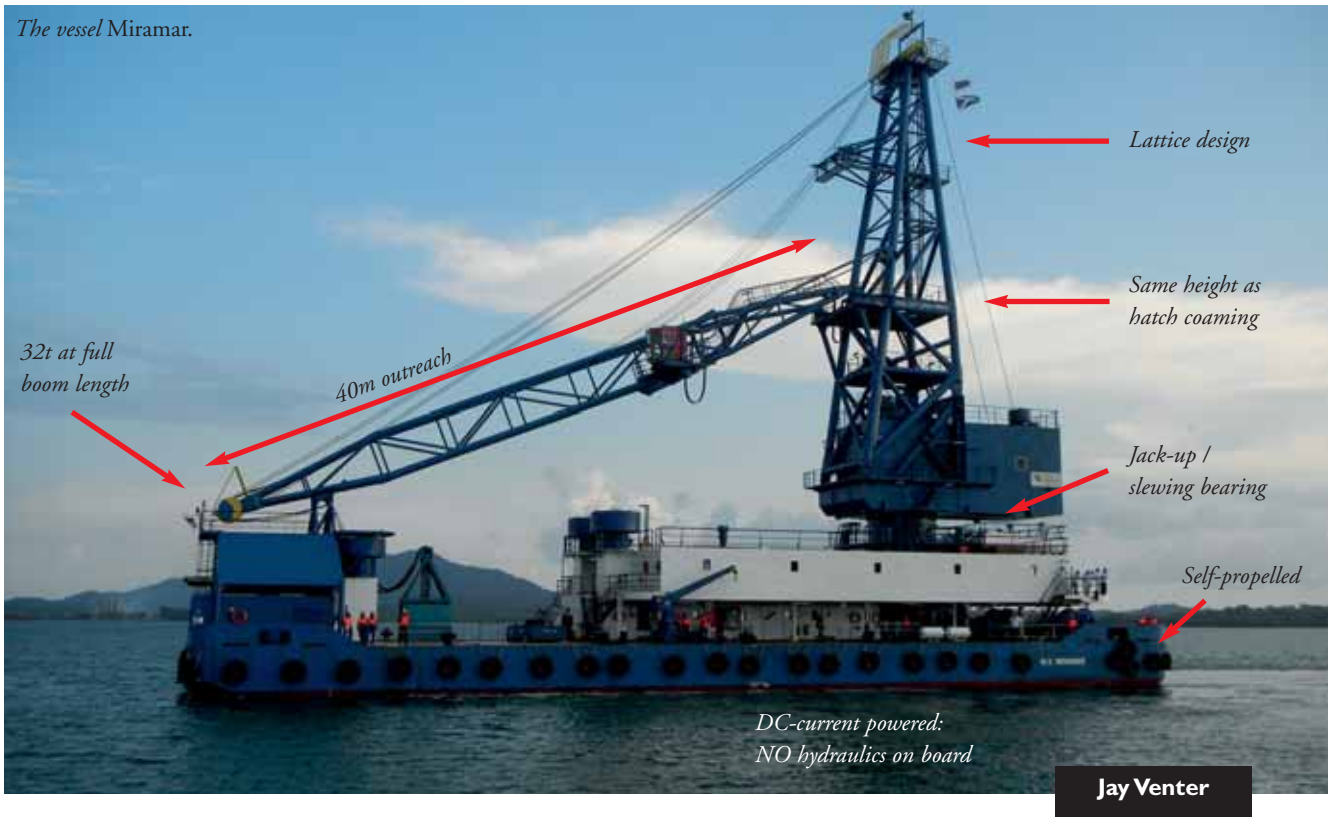
ISO-certified, ASBA-accredited personnel

Biehl is a firm believer in measuring performance. Its ISO system tracks and records multiple aspects of its operations. ISO-dedicated staff visits each office quarterly, and all offices are subject to annual ISO performance audits. Biehl ensures a high level of performance through extensive internal training and by requiring Association of Ship Brokers and Agents (ASBA) testing and certification of all operations personnel.

Independently audited, financially sound

As a member of both Multiport and the Association of Ship Brokers and Agents (ASBA), Biehl annually submits to two independent audits to ensure continued membership in good standing with each organization. This attention to fiscal control contributes to the company's positive financial standing with no debt and ample opportunities for expansion. The company owners allow the profits to remain within the company to be used for expansion both internally and through acquisition.

Transloading, transshipping and offshore stevedoring



The vessel Miramar.

Jay Venter

An innovative and affordable solution for bulk logistics in developing countries

It is arguable that economic growth of a particular country depends on its ability to provide adequate infrastructure to facilitate growth. This statement is especially true for countries that depend heavily on exports of natural resources to boost economic growth. However, supporting infrastructures such as ports, rails or roads does not come cheap and requires great deliberation before commencement of development: think of feasibility studies, environmental impact assessments, delays in political approvals etc. — the main constraint on development is the funding issue. Unfortunately, many countries which depend heavily on such exports are developing countries and, therefore, lack the funds required to build costly infrastructure. Private investors or companies are thus expected to invest themselves in the infrastructures required to exploit the resources. Apart from some of the larger mining companies, few small-to-midsize players have the firepower and risk-appetite to invest in fixed infrastructure in developing countries. Unknown political risks, difficulty of funding in countries with below investment grade credit ratings are some of the main constraints cited by potential investors. Such situations indicate a need for an infrastructure that is not fixed, so that it can be moved and used somewhere else in a worst-case scenario.

Indonesia for example, before becoming one of the fastest growing emerging nations and one of the world's major coal exporters, started its journey in coal exports 20 years ago without a proper coal terminal. Because of this constraint, Louis Dreyfus Armateurs (LDA) started developing innovative solutions to allow large exports of dry bulk commodities (mostly coal and ores) from such areas, without the need to invest the large capex usually required by fixed port infrastructures. In 1991, LDA provided PT Adaro with the first floating crane transshipper unit to reach Indonesia. The transshipper enabled PT Adaro to become one of the key players in Indonesia for innovative transshipment solutions. The country has been a special case for maritime logistics, due to its vast network of rivers accessible for coal miners which made river barging and transshipment a very viable logistical solution compared to trucking and railing, where costly investment in dedicated roads or rails are required. Today, there have been notable improvements in the availability of deep-sea terminals; however, these are mostly built by private developers — with only two common-user coal terminals available in Kalimantan as of now — the problem of high initial capital investment still remains.

Ever since then — through its dedicated subsidiary LD Ports & Logistics and Orchard Maritime Services Pte Ltd (OMS), which handles the Southeast Asia activities of LDPL — LDA has been active in the maritime logistics industry worldwide, acquiring an

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essential know-how in offshore transshipment, and associated barging and port management services. Below is an example of LDPL's approach to provide maritime logistics solutions to a client in India.

Case study: iron ore transshipment in India

The background

A major Indian iron ore producer approached LD Ports & Logistics (LDPL) in 2006 with a need for a suitable logistics solution. The company owns iron ore mine concessions in Goa, India and was looking to export its coal effectively without the need for costly infrastructure upgrades. The bulk of the company's production is exported to countries with smelters capable of handling low-grade iron ore, as low-grade iron ore is not suitable for many iron ore smelters in India.

In addition, the company was looking for a long-term partner with transshipment expertise and — most important of all — a commitment to long-term reliability. LDPL — which shares the company's view on long-term partnership — was therefore ideally positioned to work closely together with the company. Moreover, the enduring history of LDA confirmed the company's need for a reliable partner through thick and thin.

The Problem

When LDPL was approached, there was already an existing port (Mormugao) and a few transshippers were already operating at nearby anchorages. However, Mormugao port was already congested and there was not enough capacity to handle the company's growing exports of cargo. The transshipper units available in the area were floating transfer stations with conveyors and therefore were not suited for the type of low-grade iron ore that the company exports, due to the its inherently high moisture content. Loading interruptions to clean up the conveyor belts and moving parts were frequent, and maintenance costs were high.

Moreover, LDPL identified that the transshippers available at that time had to be partly manned by foreign crews due to the inability to find local crews skilled enough to operate the comparatively more complex systems of a floating transfer station. This contributed to higher running cost when compared to employing local crews.

The solution

Given the characteristics of the iron ore that was exported in the area, LDPL concluded that the most ideal tool to load such material would be a floating crane which utilizes grabs as the main transshipment tool. LDPL specifically designed a floating crane transshipper unit using simple, efficient and robust features to enable handling of sticky cargo. The design is based on a pure electrical power supply distribution with no hydraulics, thus reducing the need for costly maintenance and improving reliability and durability. The floating crane also has its own propulsion, allowing operational flexibility.

With its floating crane transshipper, LDPL also eliminated the difficulty and costs of expat crewing because of the easy-to-operate nature of the floating crane system. With minimal training, local crews can already operate the floating crane effectively and efficiently.

Moreover, floating crane transshipper(s) can cater better to new producers due to their scalability; with the client having uncertain ramp-up volume at the time of deliberation, LDPL confirmed the suitability of floating crane transshippers. Floating transfer stations, with their high transshipment capability and higher capital expenditures, can be uneconomical to operate at first for this specific case as they will be under-utilized during early years of ramp-up.

The technology

Floating crane transshipper units used for this particular project have the following advantages and specifications:

LDPL 32T floating crane transshipper unit

- based on a reliable and proven design with a life expectancy of over 20 years: no hydraulics, 100% DC current PLC controlled;
- low fuel consumption (±3.5 MT/day MGO);
- classed BV/ALM (Appliance for Lifting in Marine environment);
- environmentally friendly: no hydraulics on board and are equipped with grabs specially designed for handling dusty materials (enclosed scales, knife sealing systems for handling fines and free flowing materials);
- Designed to operate with winds up to Beaufort 4 (maximum 16 knots) and sea state up to Douglas 3 (maximum 1.25m waves height); and
- able to handle high-moisture content cargo.

LDPL 32T floating crane transshipper unit

Length	Approx.	56.4m
Beam MLD	Approx.	24m
Depth MLD	Approx.	4.73m
Draft	Approx.	2.65-2.75m
Safe working limit	Approx.	32 T
Maximum working radius (full load)	Approx.	40m
Minimum working radius	Approx.	16.0m
Maximum height	Approx.	30m
Topping stroke	Approx.	22sec
Slewing speed	Approx.	0-1.44rpm
Propulsion speed	Approx.	ABT 9.0 Knots (Beaufort 4)
Hoisting/closing speed full grab	Approx.	0-105m/min
Hoisting/closing speed empty grab	Approx.	0-105m/min
Power	Approx.	2 x 2,150hp (100% redundancy)
Propulsion	Approx.	2 x 720hp
Accommodation for	Approx.	36 persons

The application

At first, LDPL provided one floating crane to match the client's required volume output at that time and therefore the first floating crane transshipper was delivered in 2007 to a newly-formed joint-venture between the miner and LDPL.

Small barges (<3,000dwt) were loaded with iron ore at the barge-loading facility and then transported the cargo offshore to ocean-going vessels via LDPL's floating crane transshipper. The vessels are mostly sailing to China, as India has a freight advantage over other iron ore-exporting regions such as West Africa and South America.

After a few successful years, the client was pleased with the transshipper's performance and with the partnership formed with LDPL. Therefore in 2010 LDPL ordered two more floating crane transshippers to satisfy the client's demand. With multiple units at its disposal, LDPL helped achieve complete operational redundancy of transshipping for the company: internal redundancy for each unit due to the design of its power generation and also redundancy through the presence of multiple self-propelled units. This is also one of the main advantages of multiple floating crane transshipper units compared to conveyor-based transshippers, as conveyor-based transshippers will need to stop the entire transshipment operations in the event of a breakdown of just one of the conveyor systems.

This problem-solving approach and customized solution for

its client is what made LDPL an ideal partner for maritime logistics; to date, LDPL's solution in India has transshipped over 11mt (million tonnes) of iron ore before the Goan Mining Ban took place, and the three floating crane transshipper units have proven to be able to load up to 840,000 tonnes per month, which is equivalent to fully loading five 170,000dwt Capesizes per month, or more than 10mt per annum of export capacity. This has been achieved even though there is a notable increase in handling time: more wheel-loader activity (due to the size of barges), more mooring and unmooring manoeuvres (due to the larger number of barges required), and also more shifting manoeuvres (due to the fact that many vessels have been partially loaded before offshore loading operations took place).

LDA always strives to provide clients an integrated maritime transportation solution with a wide range of logistics services matching the specific needs of each client, whether to a mining company, trader or end-user (industrial users/power plants).

About LD Ports and Logistics

Headquartered in Singapore and France, LD Ports & Logistics (LDPL) is a subsidiary of Louis Dreyfus Armateurs (LDA), an acclaimed leader with more than a century of experience in the shipping industry. It is the only maritime logistics company which is owned by a shipowner.

Known for its consistency, reliability and innovation in the delivery of logistics and port operation services around the world, LDPL is a one-stop solution — design and operate — for all maritime logistics projects.

Self-propelled barges

LDPL has designed its fleet of self-propelled barges in response to the demand for a more flexible, reliable and cost-effective barging solution. Depending on customers' operations, self-propelled barges can be fully customized to clients' needs and entirely operated by LDPL.

The fuel-saving self-propelled barges can sail in both river and sea, with up to 13,000dwt tonnages at 5.5m draught and can sail at a speed of 10 knots — twice as fast as that of towed barges of similar size, more manoeuvrable and 40% more fuel efficient.

LDPL's self-propelled barges are IACS-class sea-going vessels with significant seaworthiness in bad weather that can sail distances of up to 1,000 nautical miles.

Floating crane transshipper units

LDPL floating crane transshipper units are designed to be simple, efficient and robust which are essential features for any logistics operations to be performed at sea.

The floating crane transshipper unit design has been optimized to perform high transshipment rates in loading and unloading all types of vessels, from Panamax to Super Capesize.

Transshippers

A new generation transshipper (floating transshipment unit) has been designed to cater to the needs of exporters with large volumes of dry bulk cargo. LDPL provides two main types of Floating Transfer Station (FTS) – Environmentally Friendly Transshipper, for high-speed loading at areas where environmental concerns are existing, and Separated Hulls with Significant Buffer Capacity for specific operations where cargo blending/storage is required.

Port management

LDPL teams have extensive experience in port management from vessel berthing (using harbour tugs), mooring and stevedoring, maintenance of equipment to the loading and unloading of cargo (using shore cranes). With the objectives to keep efficiency and safety as the main priorities when managing ports, LDPL has proven to be a reliable and trusted partner to its clients.

Self-unloading barges

LDPL has developed a new self-unloading barge design to answer the specific needs of exporters with high volumes of dry bulk cargo requiring a fast and reliable self-unloading vessel system.

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CSL International: transshipment activities on the North American coast

The CSL International Pool offers a transshipment service on the North American East Coast. Using geared Handymax and Panamax vessels specially fitted with side-mounted grabs, hoppers and a boom for single-point discharge, the service allows a gearless Panamax vessel to have its cargo of coal from the Far East transhipped at rates up to 35,000 metric tonnes either into barges for direct delivery to shore based facilities, or by direct delivery from the transshipment vessel itself.

With strict environment regulations continually being implemented, the requirement for 'environmentally friendly' coal from various parts of the world is becoming more and more a necessity. The use of transshipment vessels has now opened the door for this coal to be burned on the North American East Coast. The service allows charterers to by-pass draught limitations and ports that lack discharging installations, both of which have hampered the use of gearless Panamax vessels in the past.

The transshipment vessel works in a variety of ways

Discharging into barges

The transshipment vessel remains stationary and discharges the gearless Panamax directly into barges using its side-mounted grabs, via the discharge boom. As the barges move to the shore facility, the transhipment vessel continues to discharge the Panamax into its own holds. When the barges return, the transshipment vessel continues to discharge the Panamax directly into the barges. Once fully discharged, the Panamax will depart, leaving the transshipment vessel to continue to load the barges from its own holds.

Lightering the Panamax and discharging to shore directly

The transshipment vessel discharges the Panamax directly into its own holds and then proceeds to the berth to discharge at the customer's facility via its discharge boom. When fully discharged, the transshipment vessel returns to the Panamax. When the Panamax's holds are empty, it will depart, leaving the transhipment vessel to proceed to port to complete the discharge at the facility.

Lightering the Panamax and then discharging the remaining cargo on both vessels in port

This situation is similar to No.2 except that once the Panamax vessel is lightered sufficiently to proceed safely to port, it does so and then 'double banks' with the transshipment vessel alongside the customer's facility. The transshipment vessel then fully discharges the Panamax, upon which time the Panamax departs, leaving the transhipment vessel to discharge the cargo remaining in its holds.

Distribution of lightered quantities at more than one discharge port

Using a transhipment vessel, a 'cargo pipeline' can then feed more than one facility by using any combination of the above.

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Bedeschi & BLL in continuous transshipment project

The largest transshipper in the world, Ore Fabrica.

After the successful commissioning of the largest transshipper in the world, *Ore Fabrica*, which is operating in the Subic Bay, Philippines to discharge iron ore from Valemaxes, Vale has appointed Bedeschi to supply cargo handling equipment for another transshipper, *Ore Sossego*. This transshipper is also of about 280,000dwt capacity and is presently under implementation. The *Ore Sossego* will also be fitted with 5 MPG cranes, of Liebherr make, and a cargo handling system comprising of five hoppers, of 50m^3 capacity each, equipped with variable belt drives feeders, conveyors and two shiploaders. The major difference between *Ore Fabrica* and *Ore Sossego* is that while the shuttle vessel receiving the iron ore on *Ore Fabrica* remains stationary and the shiploader moves and travels the length of the transshipper, in case of *Ore Sossego* the shuttle vessel will have to be warped alongside the transshippers and will be fed by two fixed shiploaders.

The basic layout will be such that one section of longitudinal conveyor will be fed by three cranes and the other by two cranes, both moving in opposite direction and transferring the iron ore to a transverse conveyor. The transverse conveyor will have a capacity of 6,000tph (tonnes per hour) and will transport the cargo across the beam of the transshipper leading to a deviator, which will distribute the cargo to either of the shiploaders. These retractable shiploaders of 3,000tph capacity each, will be having an outreach of 44m and will have slewing and luffing capability. Once in operation the transshipper will be able to transfer cargo directly from the Valemaxes into the shuttle vessel in a triple banking operation. In the absence of shuttle vessels the discharging operation of the Valemaxes will still continue and cargo will be stored in the holds of the transshipper, to be reclaimed and transferred to the shuttle vessels later.

Bedeschi has recently completed the commissioning of a Floating Transfer Station — *Princess Victoria*, a sister unit of *Princess Chloe*, which has been in successful operation in Kalimantan, Indonesia, since 2011 for PT Mitra. This FTS is equipped with two Liebherr cranes working with a combination of hoppers, feeders, conveyors and a retractable, luffing and slewing shiploader of 2,200tph capacity, supplied by Bedeschi. The FTS is also equipped with automatic sampling device, on line weighing system and metal detection system. The shiploader of the FTS, which has an outreach of about 38m and an airdraught of 19m, is fitted with a curved delivery chute, which can deliver coal into all parts of the holds of a Capesize vessels, evenly without any broken space. Another important feature is that the shiploader has the capability to lift and transfer a bulldozer into the holds of the ocean going vessels for cargo compaction. These unique features stand out and give the FTS an edge over any competition in terms of loading efficiency. The FTS *Princess Victoria* was constructed in Keppel Shipyard at Subic in Philippines and the equipment installation and commissioning was supervised by Bedeschi technicians. The FTS is now in successful operation in Kalimantan in Indonesia.

Another recent completion of a project by Bedeschi is the engineering, supply and installation of a new shiploader for loading coal for a rechristened FTS *Bulk Celebes*. The client Coeclerici Logistics had requested Bedeschi to study an existing floating transfer station operating in India and supply a new and efficient shiploader to enable it to load coal at 2,200tph i.e. faster and efficiently. The new retractable shiploader, is similar to the ones already operating in Indonesia, is equipped with the curved delivery chute has been supplied by Bedeschi and the FTS was retrofitted in Singapore for coal loading operations in Indonesia.

The newly completed *FTS Royal Sesa* has arrived in India but has yet to commence cargo loading operations, because of the iron ore ban put by the local regulators.

The complete engineering of the systems mentioned above has been carried out in-house by Bedeschi engineers. All the critical components are manufactured in Bedeschi's workshop in Padova, Italy under strict quality control right from the raw material procurement to final dispatch. Bedeschi strives for excellence not only in the field of offshore transshipment, but for shore-based facilities like in Columbia, Turkey, Italy and Israel.

FTS Royal Sesa.

Floating Transfer Station Princess Victoria.

Gaining a strong position in the offshore stevedoring & transshipment market

Samarinda (Indonesia). The Logmarin's K.I.S.S. (Keep It Simple and Safe) principle, just 36 hours to load modern Panamax vessels in tandem.

50 million tonnes of dry bulk commodities have been handled in the last 12 months through the fleet of floating terminals designed and commissioned by the Italian firm Logmarin Advisors (part of Rina group) which has proved to be reliable and efficient.

Over the last years offshore transshipment solutions, as an alternative to shore-based infrastructures, have generated new interest as end users discover the potential opportunities this technology can offer.

The logistic chain is the single most important service function that any business continuously strives to enhance. Improvements in the logistic costs allow companies to gain and maintain a competitive edge, as any savings on the supply chain costs reflect on the competitiveness of the supplier and consequently on the final product price.

Nowadays, dry-bulk dealers may have many difficulties on exporting/importing their commodity as open land next to deep water is not easily available and so, in these cases, floating terminals can provide a viable economically solution to overcome such restrictions and give a real boost to the efficiency of the commodity supply chain.

Logmarin Advisors is specialized in shipping logistics for commodities such as coal, agri-bulk, bauxite and iron ore and it has been involved in most of the major transshipment operations around the world, providing different logistical solutions, both onshore and offshore.

No port? … No problem. Ore Fabrica *is the world's largest and most powerful floating HUB operating in the Philippines.*

For Logmarin 2012 was a year of strong progress and achievements in the supply chain sector — over 50mt (million tonnes) of dry-bulk commodities have been exported/imported in the last 12 months through the 17 floating terminals developed by Logmarin. Each of these has proven to be reliable and efficient thanks to the high performances, exceeding both the contractually agreed performance and expectations, allowing Logmarin to maintain mutually beneficial long-term relationships with its clients.

Nowadays, four floating facilities of different sizes and characteristics are at various construction stages, one unit at conversion stage and one at design stage. Such results show Logmarin's remarkable hand at this market niche

and its strong position.

In spite of being a small company, which includes professionals with wide experience in all facets of naval architecture, marine and civil engineering, as well as staff with marine master background and technical/operative experience, many world class commodities suppliers such as Anglo, Marubeni and Vale; end users including Japan Power, ENEL and Kepco; logistics services providers such as KSA, Mitra Swire CTM and RockTree have opted for Logmarin's design to design or to make more efficient their commodity supply chain.

FC Vittoria *at Adang Bay (East Kalimantan) approaching a cape size for coal loading.*

Software and hardware

When planning a new project development or the improvement of an existing one, Logmarin's aim is to work side by side with its clients to produce tailored solutions suiting the specific client's needs rather than only suggesting general answers. For that reason, Logmarin's service starts from the project outset, with a comprehensive feasibility study and examination of the realities of the requirements, passing through the design stage and the identification of bottlenecks, studying the different ways to overcome them, until the final implementation and commissioning.

Solutions for the logistics supply chain are almost unlimited, therefore it is necessary to produce a solution delivering value to the client and based on a solid knowledge of the market and of the technical and operative expertise. In order to make the customers more aware of the advantages arising from a global view of the supply chain and to support them in their decision-making process, Logmarin has customized a commercial software tool to analyze the key resources of the end-to-end supply chain.

The customized Dynamic Supply Chain Simulator Software (Log.Des) is a powerful tool which enables the companies to create a real and accurate model of their end-to-end logistic process in a dynamic-animated computer model and then evaluate alternative 'what-if?' scenarios to identify the optimal solution and to explore the potential changes' effects on service, costs, sustainability and risk.

Projects in Indonesia, Papua New Guinea and Australia have already benefited of Log.Des results.

As supply chain design is pretty much like a 'human process', it is not enough to simply purchase or develop a software tool or to let specialized software simulation companies model your supply chain, without having a specific and exhaustive awareness of what really happens in the reality.

There is no 'one-size-fits-all' solution for transshipment operations

To serve its customers with a wide variety of products and services whenever is possible or required, Logmarin — together with top-class crane supplier Liebherr and Bedeschi, the Italian conveyor system and storage facility specialist — through its strategic alliance Bulk Logistic Landmark (BLL) can provide advice, design, engineering and cargo handling facilities for storage, shore terminal and floating terminals.

The experience and the know-how of the three companies have been already effectively and successfully deployed.

Examples of representative projects:

The Toros shore terminal.

A project developed for a coal terminal located in the Bay of Iskenderun, in Turkey which brought to the upgrading of the existing terminal by fitting two new travelling cranes and hoppers to enhance the terminal discharging capacity. The terminal now has the capability to unload coal from the largest post-Panamax vessel at an average daily rate exceeding 25,000 tonnes.

The FT 'Princesse Chloe'

The floating terminal devised and designed on behalf of Mitra Swire CTM operating in Indonesia, which is capable of loading over 800,000 tonnes of coal per month. At the time of writing, the *Chloe* was about to cross the threshold of hundred vessels loaded since April 2011 (including 23 Capes), with a daily average loading rate exceeding 53,000 tonnes.

The 'Ore Fabrica' — floating hub.

The world largest floating terminal delivered in February 2012 and operating in Subic Bay, Philippines, has a 285,000-tonne buffer storage transshipper, equipped with Liebherr's cranes and Bedeschi's conveyor system and travelling shiploader with a design capacity of 5,000tph (tonnes per hour).

Value added advice, device and design

Logmarin team deals with their clients with three key success factors:

1. The right technology (Log.Des);
2. The experience acquired in the field and the feedback received from on-going operations;
3. The team-working capability and experience synergies with their clients.

The results that Logmarin has reached are the proof of its professionalism and long experience, and its ability of providing customized efficient and reliable solutions developed on the actual experience gained from on-going operations. Such operational experience is not available in standard engineering firm.

As such, the Logmarin team concentrates all efforts to compete against the commodity supply chain bottlenecks of its clients. In addition to the more traditional markets, Logmarin is involved in transshipment projects where efficiency and price are not the only decisive factors but higher environmental and quality standards are fundamental requirements.

MacGregor transloading technology serves India's booming bulk markets

Transloading technology by MacGregor suits India's booming bulk markets.

Growing coal import and iron ore export industries in India are benefiting from MacGregor's ability to provide efficient, reliable and flexible transloading system solutions.

From a technical perspective, the keys to a successful bulk handling operation are flexibility, reliability and continuity. Combining these efficiently ensures not only the profitability of an operation, but also limits its environmental impact.

To achieve the highest efficiency rates it is important to tailor the technology to an operation, although this has historically been limited by available port facilities accommodating either an operator's desired size of vessel or the self-unloading installation. Transloading is a particularly effective way around this problem.

For transloading dry bulk materials, MacGregor offers complete solutions for floating cranes, transfer terminals, transloading ships and self-unloading barges. Currently benefiting from these are the growing Indian coal import and iron ore export industries. "Whether feeding India's supply and demand markets or exporting iron ore, the whole supply chain has to be an efficient operation," says Ajay Jalali, MacGregor's marketing manager in India. "This starts from mining, to loading mother vessels, and unloading on the East and West coast of India. Due to limited port facilities there is an increasing move to unload imported coal into smaller barges using transloading terminals, transloading ships and floating cranes."

Coal is a difficult commodity to handle and requires tailored technology to overcome issues such as the oxidation of coal at storage yards, flow problems during rainy seasons, blockages at chutes and bunkers, spillages, the problems associated with having combined mixes of differently-sized and different quality coals, and the abrasion of coal handling equipment. "Cargotec is able to overcome all of these issues," Jalali says.

MacGregor has delivered its first order for a complete transloading system to India. The combined transfer terminal, for a leading Indian iron ore exporter, M/s. VM Salgaocar & Bros. Pvt. Ltd., is designed for transloading iron ore into Panamax-sized vessels.

MacGregor scope of supply comprised: two K3028 heavy-duty grab cranes; two hoppers; a belt conveyor system, with a rated capacity of 2,000 tonnes per hour; and a telescopic reversible ship loader. The transfer terminal *M.V. Vishal Hira* is currently in Goa and will be undergoing final product trials in March 2013.

"The system is tailor-made for the customer to suit its intended operations in Goa," notes Anders Berencsy, Cargotec's sales manager for transloaders at MacGregor. "Our customer wanted a solution with the responsibility for the main functions of the systems from one supplier. We are the only company able to supply cranes, hoppers, a conveyor system and a shiploading boom for the transloading system. This is essentially all the equipment that is needed to handle the bulk cargo throughout the entire transloading process."

In Nov 2012 floating Crane Barge *M.V. Narmada Jalprabha* owner by M/s. Ahiliabai Sardesai was commissioned with MacGregor K3035 heavy duty crane, the floating crane barge is designed to handle both coal and iron-ore. The barge is currently used for unloading coal from Capesize vessels in

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the state of Gujarat.

In October last year, MacGregor received an order for a four-wire rope K5036 heavy-duty grab crane from India. The 50-tonne capacity crane will be delivered by August 2013 to an Indian shipyard. The crane will be integrated onto a floating barge, which is expected to be operational by the end of this year.

"This will be the largest capacity bulk handling floating crane in India," highlights Ajay Jalali, MacGregor's marketing manager in India. "Our customer wanted higher capacity coal unloading from Capesize vessels. It chose the Macgregor K5036 crane based on its capabilities, operational performance and the fact that it is backed by a strong service presence in India.

"Until now the largest floating cranes available in the country have been limited to a 35-40 tonne SWL grab operation, so the K5036 offers a substantial increase," adds Jalali.

Coeclerici saves the day after major storm damage at the Port of Taranto

The Bulk Irony, *lightening the* Rigel *(photo: ©Coeclerici Logistics).*

On 28 November 2012, a tornado with winds up to 250km/h hit the South of Italy and, in particular, the city Port of Taranto, *writes Capt. Giordano Scotto d'Aniello, Head of Commercial Department at Coeclerici Logistics, Milan, Italy.*

The storm caused extensive damage to the area, bringing down a chimney stack, a warehouse and a lighthouse at ILVA (Europe's biggest steel mill and a major employer in Taranto) factory docks. In addition to the human tragedy — one person died and 40 were injured — the storm caused heavy damages to the port area. Part of the equipment used to load and unload ILVA commodities was destroyed, with disastrous consequences to the activities of the steel mill.

Among the various vessels awaiting to carry out commercial operations at the berth were two ships in particular. Both were loaded with about 300,000 tonnes of iron ore, and were forced to anchor as a result of the storm damage. They were unable to approach the dock (the only single dock able to accommodate units of that size had suffered heavy damages), and were waiting to be unloaded and to deliver the cargo essential for the proper functioning of the factory.

For the complex steel mill system to operate, it needs a regular daily supply of iron ore pellets. If these were to run low, this could create huge economic damage and result in the closure of the whole blast furnace at ILVA.

While ILVA did all that it could to repair the damaged port infrastructure, an urgent solution was needed to allow ILVA to receive a sufficient quantity of iron ore to keep the steel mill running and to prevent the closure of the whole production chain. If this were to happen, a complex procedure would be needed to reactivate it, with enormous capital loss.

ILVA immediately contacted Coeclerici requesting a logistic solution to solve the difficult situation that it was in. It was essential to find a rapid solution. After an internal study, Coeclerici suggested that the only viable solution was to carry

The use of the Bulk Irony, *prevented a potential stoppage at the ILVA steel mill in Taranto (photo: ©Coeclerici Logistics).*

The Bulk Irony *was obliged to lighten the* Rigel *from both the port and starboard sides, leaving the shuttle vessel always moored alongside the anchored mother vessel.*

out a transshipment operation using the company's FTS (floating transfer station) *Bulk Irony,* which was then operating in the Piombino area in Italy, about 600 nautical miles from Taranto.

The initial plan was to relocate the *Bulk Irony* to Taranto and to perform the transshipment operations in the area within the port. A thorough evaluation of the logistics and the authorizations needed for such an operation at the Port of Taranto took place. It was decided that the operations should take place in Piombino, where Coeclerici has been authorized since 2003 to operate within a 'duly authorized transshipment area.'

The cargo of 'Tubarao blast furnace pellets' that were essential to prevent the closure of the blast furnace was 'stored' in the *Rigel* VLOC (very large ore carrier). The *Rigel* is a giant of the sea — 300,000dwt, 327m LOA, beam 55m, and was immediately redirected to the Piombino anchorage for the lightening operations.

About the 'Rigel' operation

The vessel has six holds and each of them can store up to 50,000 metric tonnes (like a Supramax vessel!). The plan was to lighten as much cargo as possible, and to reload it into shuttle vessels of about 28,000dwt, supplied by ILVA, which would then be transported to Taranto, making it possible to discharge at Taranto's only 'surviving' berth.

However, the transshipment point is an area that is only 0.6nm in radius. This limited the safe anchorage of both the shuttle vessel and the *Rigel* at the same time. Therefore, the FTS *Bulk Irony* was obliged to lighten the *Rigel* from both the port and starboard sides, leaving the shuttle vessel always moored alongside the anchored mother vessel.

The cargo that the FTS *Bulk Irony* helped to lighten made it possible for the ILVA steel mill to continue operating while operations at Taranto were being restored, without having to shut down its activities.

Smooth running…

The smooth running of the operations was achieved through very close interaction between the onboard operators and Coeclerici's shore personnel. The success of the project was attributed to the Master's competence and to Coeclerici's 35 years of experience in logistics operations.

The operations carried out by the *Bulk Irony* are a further example of the flexibility of a 'floating transfer station', which can perform the same operations both 'offshore' and 'onshore', like a port loading/discharging facility.

The FTS *Bulk Irony* is not new to this kind of practice which goes outside its regular operations. In fact, during its first decade in Piombino, the unit was used also as a 'back up device', supporting the shore facilities in any emergency events.

About the FTS 'Bulk Irony'

Coeclerici Logistics developed and designed the FTS *Bulk Irony*, which has been based on many years of experience in operating floating cranes and floating terminals in a wide variety of working and environmental conditions. The Chinese shipyard Nanjing Xinhua constructed and assembled the *Bulk Irony* under the direct supervision of Coeclerici Logistics and Coeclerici patented the advanced and innovative FTS design. After a long journey of 8,603 nautical miles, the *Bulk Irony* arrived at Piombino on 29 December 2002. During the initial commissioning period in which two lighterage operations were carried out, the FTS *Bulk Irony,* immediately exceeded the expected daily unloading rate. The result is that the FTS became an essential and cost effective link in the Lucchini production chain.

The FTS *Bulk Irony* overcomes Piombino's draught restrictions by lightening part of the raw material shipment (both coal and iron ore) offshore Piombino's port, thereby reducing the overall sea freight charge. Once lightened, at a rate of about 1,000tph (tonnes per hour), the ocean going vessel and *Bulk Irony* discharge the raw material onto the jetty. The annual tonnage to be transshipped for Lucchini is approximately 500,000 tonnes, allowing *Bulk Irony* to have a ample spare capacity, which can be utilized by the other users of the Piombino port.

The FTS *Bulk Irony* is self-propelled and is therefore capable of short coastal trade if and when required. In addition to dry bulk commodities, the FTS is also capable of transshipping steel coils on roads and providing intermediate temporary storage. The Piombino Port Authority regards the FTS facility as an important instrument to further enlarge its activities and to attract transit cargo to north and central Italy.

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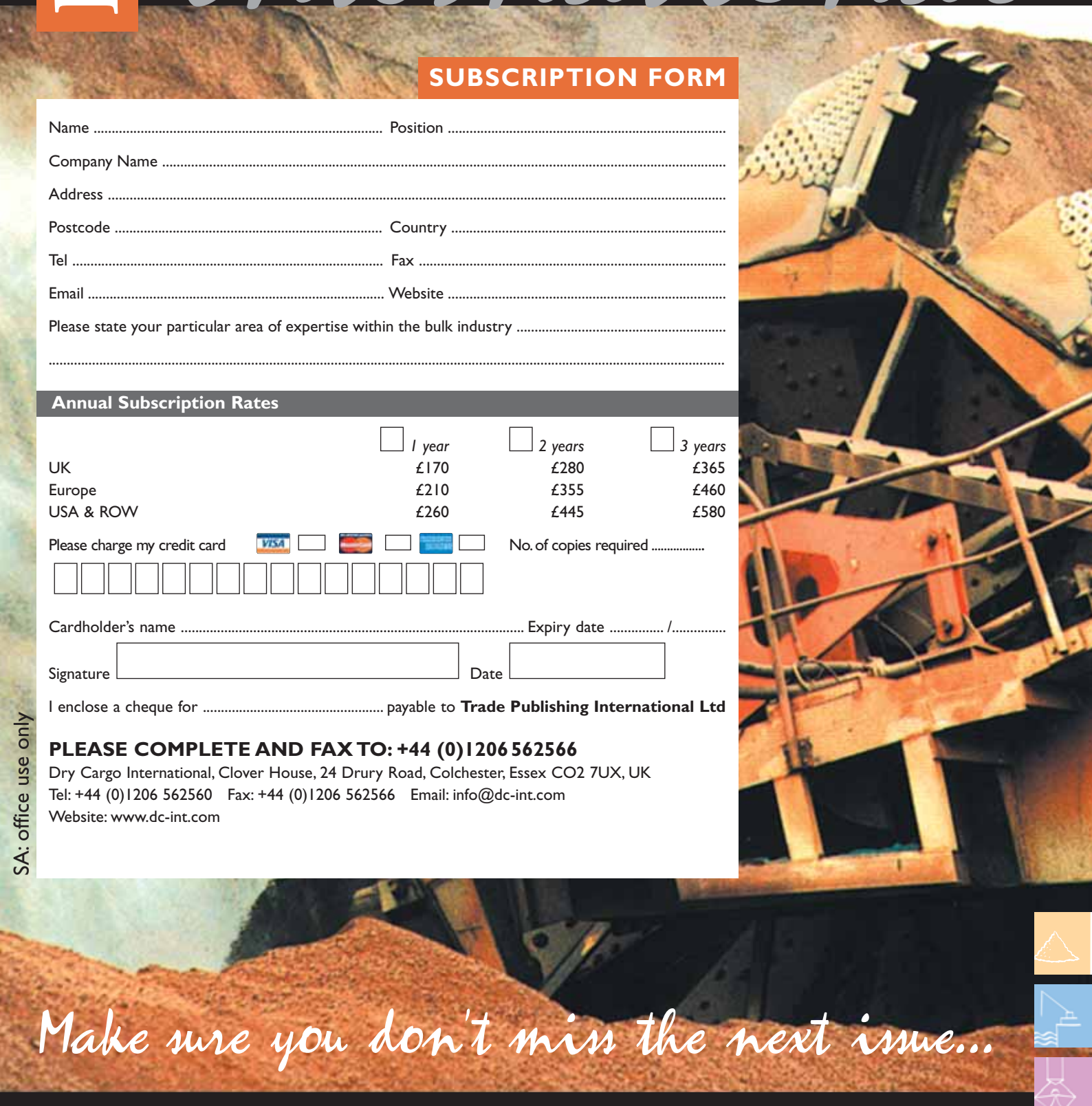

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'Green handling design to operate'

Coeclerici is aware of the impact that dry bulk operations may have on the environment. Handling coal and iron ore can cause environmental pollution, both in air and sea if the utmost care and precautions are not taken. After years of experience in such operations, Coeclerici Logistics is committed to the highest environmental standards and has taken the onus of the maintenance of environmental standards on itself.

Bulk Irony's lighterage operations are carried out in a place which is at a mere step from the Island of Elba and from the Parks of the Val di Cornia, which are rated amongst the best for Italian tourism and historical resorts (from Etruscan times). For these reasons, the area has become an internationally famous tourist resort and the Blue Flags awarded by the European Community indicate an unpolluted sea rich in rare fish species. The environment standards required to operate in this area are extremely stringent. Accordingly, the FTS *Bulk Irony* has an environmentally friendly design, approved by the local authorities such as Health & Safety, Environmental and Coast Guard. The facility also meets the requirements of international classification societies such as IMO, MARPOL, ISO 14001 and the environmental 'EMAS' registration.

The engines and generators meet the most demanding emission control regulations and have a highly fuel efficient and economical combustion system. Coal and iron ore dust emissions and cargo loss are prevented by custom-designed devices, according to Coeclerici's recommendations. These include: spillage-free grabs; receiving hoppers equipped with spill plates to avoid spillage into the sea; windbreaks to avoid airborne pollution; and water spray systems. Fully enclosed

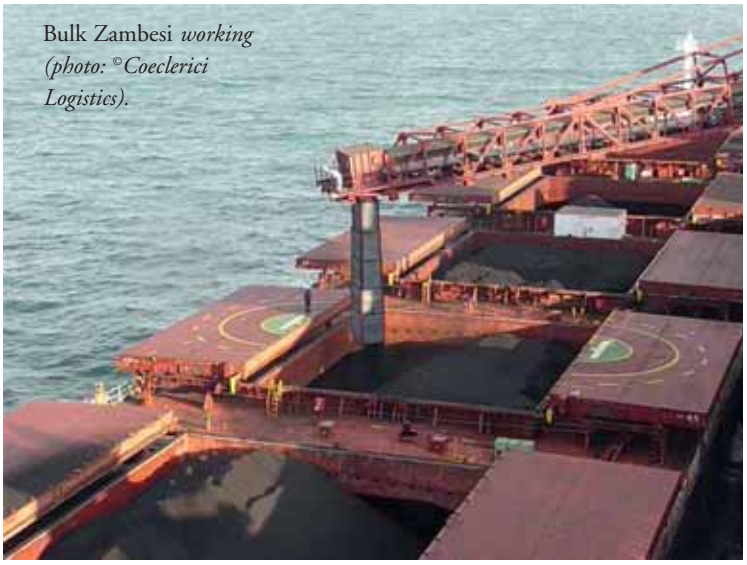
Bulk Limpopo *during operations. (photo: ©Coeclerici Logistics).*

commodities transfer points; conveyor belts and loading booms as well as settling tanks and sewage systems to treat dirty water are also fitted. All personnel are educated and trained to conduct their tasks in an environmentally responsible manner. Nowadays Coeclerici Logistics, which operates with its units worldwide, has attained a formidable leading position in the field of dry-bulk logistics.

One of the strong points of Coeclerici Logistics 'business' is that it is market-oriented and focused on the real customer's needs. "We do not sell standard solutions, because there are no standard clients and bottlenecks," and this is proven by the continuous success of Coeclerici Logistics with new units delivered to clients during the past couple of years .

❖ *Bulk Zambesi* and sister vessel *Bulk Limpopo*: these units have

Bulk Limpopo *during operations (photo: ©Coeclerici Logistics).*



Bulk Zambesi *working (photo: ©Coeclerici Logistics).*

been in operation in Mozambique since 2011 and 2012, respectively, and are both employed by Vale to overcome the draught restriction at Beira port. Both transshipment units, fully designed and built by Coeclerici Logistics, load at Beira berth and transport their coal cargo to a suitable deep water anchorage off the coast, where there are no draught constraints and where the coal is transferred into ocean going vessels (OGV) up to 180,000dwt by means of a sophisticated loading system installed onboard. *Bulk Zambesi* and *Bulk Limpopo* are each duly equipped with heavy duty cranes, grabs, a belt conveyor system capable of transshipping at a peak rate of 5,500tph, and state-of-the-art gears allowing a throughput of around 12mt (million tonnes) of coal per year. The two vessels are in compliance with the latest international code resolutions for ship's safety and security, protection of crew and of the environment.

- The FTS *Bulk Java*, sister vessel *Bulk Borneo* and the FTS *Bulk Celebes* have been employed by PT Berau Coal to perform coal loading operations at Muara Pantai anchorage in Indonesia to support the client's export throughput. The units have been custom-designed and built, by Coeclerici, to solve the logistical problems inherent in a coal production process that is expected to increase to 30mt (million tonnes) in the coming years. The FTS *Bulk Java* and *Bulk Borneo* came into operation in 2011 and 2012 while the *Bulk Celebes* was delivered to the client in January 2013.
- The three units will soon be joined by the FTS *Bulk Sumatra*, scheduled to be delivered in July 2013.

Coeclerici Logistics operates also in Venezuela with the FSTS (floating storage and transfer station) *Bulk Wayuù*, in the Black Sea with *Bulk Kremi I* and in Indonesia with the FTS *Bulk Pioneer*. DCi

Bulk Borneo *transshipping coal (photo: ©Coeclerici Logistics).*

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Programme Highlights

- *Demand outlook for major dry bulk commodities, the rise and fall of the Euro: consequences for the dry bulk trade.*
- *Chinese Macroeconomic Outlook (Dry Bulk Divergence / Capesize Comeback).*
- *Challenges Facing Dry Bulk Terminals in Developing Regions.*
- *Raw materials trades - EU Policy and the impact of developing countries on future trade flows.*
- *Performance Analysis and Benchmarking for Bulk Operations.*
- *Emerging techniques for clean bulk handling in ports.*
- *Advances in Biomass handling at ports and terminals.*
- *Safe Fertilizer Handling at Ports and Terminals.*
- *New developments in environmentally friendly bulk handling using Continuous Ship Unloaders.*
- *Handling and transshipment solutions at bulk facilities to cope with the increased trade of wood pellets from the USA to Europe. From bigger vessels to silos and river barges, the discharge of river barges directly to the power stations and efficient handling solutions*
- *The redesign of bulk terminals (on the design of new or expansions of existing bulk terminals).*
- *Large scale fuel storage silos for coal, petcoke and wood pellets.*
- *Quebec City Terminal management case study: Developments in materials handling equipment installations and analysis of tonnage throughput within the context of the St Lawrence Seaway, the "Northern Corridor" trade route.*

Current Speakers

Olle Östensson, President, Caromb Consulting

Dr Corina Hebestreit, Director, Euromines

Jeffrey Landsberg, Managing Director, Commodore Research & Consultancy

David Peel, European Manager, RightShip Pty Ltd

Prof.dr.ir. Gabriel Lodewijks, Head of Department-Marine and Transport Technology, Delft University of Technology

Han Ozturk, Director, The Nectar Group

David Trueman, Sales Director, DBIS

Geoff Lemont, Vice President, St Lawrence Stevedoring

ir. Thomas van de Sande, Dry Bulk & Logistics Engineer | Business Unit Mining & Heavy Industry, Royal HaskoningDHV

Professor Mike Bradley, Director, The Wolfson Centre

Mr Nicholas Dechamps, Managing Director, VIGAN

J.P.J. Ruijgrok, Managing Director, ESI Eurosilo BV

Dr Holger Lieberwirth, Executive Vice President, TAKRAF GmbH

Philip Waddell, International Sales Manager, Telestack

Belan Velan, Managing Director, Scorpio Engineering Ltd

James Leake, Managing Director, ICAP Shipping Ltd

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DRY CARGO Events

BULK PORTS, TE

Sunday/Registration / Monday/Session 1/Session 2 Confe

Sunday May 12, 2013

17:00 Exhibition Opens

18:00 Welcome Cocktail Reception

Monday May 13, 2013

08:30 Exhibition Opens

09:15 Welcome - Jason Chinnock, Publisher, Dry Cargo International

SESSION 1 - Commodities and trades analysis & Shipping

09:30 Demand outlook for major dry bulk commodities,the rise and fall of the Euro: consequences for the dry bulk trade

China has been driving most of the global economic dynamism in recent years. But China isn't the only story. European weakness has been a major factor behind trade developments through its impact on demand for exports from Asia and other emerging regions. A return to stable growth in Europe would do much to reset the world economy and dry bulk markets and it looks like it may be about to happen. Europe will not in the short term for instance reclaim all of the third of its crude steel production that it lost in the aftermath of the financial crisis. But sorting out its debt management may allow it to become a positive factor for growth. There is still need for caution, however. There are traps on the road back to economic expansion and so far Europe has been good at finding traps by walking into them.

Olle Östensson, President, Caromb Consulting

10:00 Raw materials trades - EU Policy and the impact of developing countries on future trade flows

Dr Corina Hebestreit, Director, Euromines

10:30 NETWORK BREAK (EXHIBITION HALLS)

11:00 Chinese Macroeconomic Outlook (Dry Bulk Divergence / Capesize Comeback)

Presentation will discuss growth trends in China including the emergence of the Chinese middle class and geographical development trends. In addition, the presentation will discuss the current state of the Chinese steel market and will provide our estimates for future steel production. The presentation will also discuss current Chinese iron ore production, prospects for future iron ore production, current Chinese
iron ore imports, and prospects for future iron ore imports. Related dry bulk shipping rates for Capesize, Panamax (and to a lesser extent Supramax market) and iron ore trade will be highlighted.

Jeffrey Landsberg, Managing Director, Commodore Research & Consultancy

11:30 Choosing Green Ships

David Peel, European Manager, RightShip Pty Ltd

12:00 European Dry Cargo Shipping Trends

James Leake, Managing Director, ICAP Shipping Ltd

12:30 LUNCH (EXHIBITION HALLS)

SESSION 2 - Bulk Terminal Management & Logistics

14:00 The redesign of bulk terminals (on the design of new or expansions of existing bulk terminals)

Prof.dr.ir. Gabriel Lodewijks, Head of Department-Marine and Transport Technology, Delft University of Technology

14:30 Challenges Facing Dry Bulk Terminals in Developing Regions

Han Ozturk, Director, The Nectar Group

15:00 NETWORK BREAK (EXHIBITION HALLS)

15:30 Performance Analysis and Benchmarking for Bulk Operations

David Trueman, Sales Director, DBIS

16:00 Quebec City Terminal management case study: Developments in materials handling equipment installations and analysis of tonnage throughput within the context of the St Lawrence Seaway, the "Northern Corridor" trade route.

Geoff Lemont, Vice President, St Lawrence Stevedoring

16:30 Planning the logistics chain from pit to port

Presentation will discuss the total logistics chain from pit to port including the complete logistics management of various bulk types, starting from the pit until delivery to the customer.

ir. Thomas van de Sande, Dry Bulk & Logistics Engineer | Business Unit Mining & Heavy Industry, Royal HaskoningDHV

17:00 NETWORKING RECEPTION (EXHIBITION HALLS)

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RMINALS & LOGISTICS 2013

rence Programme

Tuesday/Session3/Session 4

Tuesday May 14, 2013

07:30 Registration

08:30 Exhibition Opens

SESSION 3 - Commodity Specific Handling at bulk terminals

09:30 Advances in Biomass handling at ports and terminals

Biomass is probably the biggest growth area in ports across Europe right now, and one which looks set to continue growth for a while. However, as a material, biomass is not without difficulty; stowage factors are low and very variable, the handling properties vary enormously and the hazards from dust, explosion, asphyxiation and fire are high compared with traditional fuels, having claimed a substantial number of lives over the past few years. These, together with uncertainty over the long term future, is making it difficult to get investment decisions right. This paper will explore some of these fundamental problems, what methods can be used to overcome them, and examine some of the forthcoming potential technology disruptions that we need to keep an eye on!

Professor Mike Bradley, Director, The Wolfson Centre

10:00 Handling and transshipment solutions at bulk facilities to cope with the increased trade of wood pellets from the USA to Europe.

From bigger vessels to silos and river barges, the discharge of river barges directly to the power stations and efficient handling solutions

Mr Nicholas Dechamps, Managing Director, VIGAN

10:30 NETWORK BREAK (EXHIBITION HALLS)

11:00 Large scale fuel storage silos for coal, petcoke and wood pellets.

J.P.J. Ruijgrok, Managing Director, ESI Eurosilo BV

11:30 New Opportunities in Handling Pelletized Bulk Materials

Recent developments in the field of pelletizing with the target to

- Pelletize different products than common so far
- Reduce the size variation of pellets
- Increase the quality of pellets

Dr Holger Lieberwirth, Executive Vice President, TAKRAF GmbH

12:00 LUNCH (EXHIBITION HALLS)

SESSION 4 - Engineering at the bulk terminal

14:00 Mobile conveyors - an alternative and cost effective way to handle bulk material in ports and inland terminals

Philip Waddell, International Sales Manager, Telestack

14:30 Safe Fertilizer Handling at Ports and Terminals

To be confirmed

15:00 Emerging techniques for clean bulk handling in ports

Belan Velan, Managing Director, Scorpio Engineering Ltd

15:30 CLOSING RECEPTION (EXHIBITION HALLS)

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Copersucar to be expanded

The sugar terminal operated by Copersucar in the port of Santos, Brazil, will double its handling capacity from 5mt (million tonnes) per year to 10mt per year as of the first quarter of 2013. This is due to investment of $60 million made on both expanding the existing area and also on the acquisition of additional equipment.

Above all, the terminal has upgraded its ability to receive inbound rail consignments through the provision of a new hopper discharge facility. Capacity at storage warehouses has also been boosted from 110,000 tonnes to 230,000 tonnes, while a new shiploader has also been put in place capable of handling up to 3,000 tonnes per hour.

The aim is to have the terminal fully operational in time for the next harvest, which commences in April 2013. *Barry Cross*

Soya from Salvador in boxes

Salvador container terminal in north eastern Brazil has commenced the dispatch of soya in containers. Consignments are being exported to the port of Yokohama in Japan. The non-genetically modified soya is being transported by NYK Line and could become a regular feature of the port in 2013. *BC*

New Brazilian sugar and grain terminal

Rumo Logística has inaugurated the first phase of its multi modal terminal at Itirapina in the interior of São Paulo state. There, it has storage warehouses for sugar and grain. This forms part of the company's $100 million investment programme that is being implemented up to 2014. *BC*

Itaquí to boost bulk infrastructure

The Brazilian port of Itaquí is implementing a $3.19 billion upgrade programme, which aims to boost infrastructure. This will fund at least 16 new berths, the rebuilding of existing ones and also dredging work. In addition, a new pier will be built to handle cellulose and pellets, while a dedicated grain terminal is also planned. Overall tonnage handled at the port should increase from 40mt (million tonnes) annually to around 150mt.

The port is the final stop for deep sea vessels using the Paraná-Paraguay waterway, being a transfer point for barges bringing produce from the interior down to the sea. It is therefore hoped that the new Santa Fe port will become a regional hub for products from northern Argentina, Paraguay and southern Brazil. In the main, it will handle agricultural commodities amounting to around 3mt a year. The existing port has capacity for just 300,000 tonnes annually. *BC*

New service linking Brazil with Cape Verde

The Brazilian port of Mucuripe is to be the starting point for a new shipping line service that will link South America to Cape Verde in Africa, which will be a hub from where products will be rotated out to various countries in both Africa and Europe. In the short term, additional trade of around $2.5 million is expected to be generated. *BC*

Topolobampo to build agribulk terminal

Topolobampo port authority in Mexico has issued a tender for the construction and operation of a new agribulk terminal. On offer is a 25-year concession, including a possible six-year extension. The area involved covers 35,360m^2. Bids will be opened on 25 February and 12 March respectively. *BC*

New river port at Santa Fe

Authorities in Argentina are to issue a 33-year concession for $160 million river port at Santa Fe in 2013. A sum of $15 million will be allocated towards the project by the state government and a further $25 million will come from the River Plate Basin development fund, leaving $120 million to be raised by the concessionaire. *BC*

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Developments in coal terminals worldwide

Jay Venter

Port Waratah Coal Services planning Terminal 4 project

Last year proved another strong year for Newcastle coal exports, with Port Waratah Coal Services (PWCS) reporting over 105mt (million tonnes) throughput in 2012, 8.3% higher than 2011.

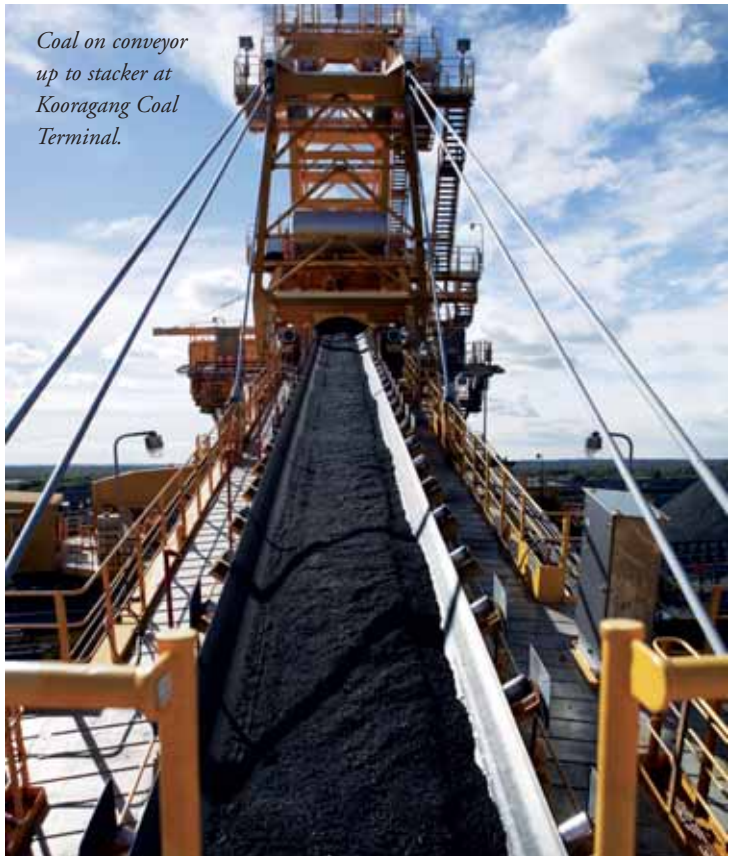
The majority of coal exports from PWCS were bound for China and Japan, with smaller markets such as Mexico, Malaysia and New Caledonia also receiving Hunter Valley coal.

With the expansion project at the Kooragang Island terminal nearing completion, PWCS will be on the way to delivering nameplate capacity of 145mt through Kooragang and the nearby Carrington terminal.

Port Waratah is also working to meet the future needs of Hunter Valley Coal Chain with planning progressing for the proposed Terminal 4 (T4) Project.

The initial stages of the proposed T4 development have the capacity to handle up to 70mt of coal per year. These stages are within a master plan which allows the handling of a potential 120mt a year, subject to further development approval.

This staged approach follows the approach taken at the successful development of the existing PWCS terminal at Kooragang, said chief executive officer Hennie du Plooy.



Coal on conveyor up to stacker at Kooragang Coal Terminal.

Newcastle Port, with the PWCS Kooragang Coal Terminal in the foreground, PWCS Carrington Terminal across the river and NCIG terminal (not owned by PWCS) to the right in the middle. The proposed T4 site will start in the bottom right hand corner, extending west away out of shot.

"Targeting a smaller approval supports delivering this capacity at the lowest possible cost for an industry that is adjusting to a changing economic environment," said du Plooy, adding, "However, where it makes sense to provide for the whole of the master plan — for example in acknowledging and mitigating environmental and social impacts — we will continue to do so."

PWCS is currently undertaking a feasibility study for T4 while the government approvals process continues.

The T4 Project requires approval from the NSW Department of Planning & Infrastructure and Federal Government under the Environment Protection and Biodiversity Conservation Act (EPBC Act).

The initial stage of T4 is estimated to cost approximately $5 billion and deliver up to 1,500 construction jobs.

MTMG plans for storage and quay upgrades

MTMG

Maritime Bulk Terminal Gdynia Ltd (MTMG – Morski Terminal Masowy Gdynia Sp. z o.o.) was created in 1995 during the process of the restructuring of the Port of Gdynia Authority SA.

On 1 September 2011 MTMG became a part of the ATIC Services Group, which covers the entire logistics chain associated with the coal activity, bulk logistics as well as iron and steel products. Ever since it was created, ATIC Services has operated as an international company with tight connections to each of the 11 countries where it is present.

Maritime Bulk Terminal Gdynia Ltd is located at the main entrance to the Port of Gdynia and is directly connected to the railway and road networks.

Within the structure of the Port of Gdynia, MTMG as a universal terminal offers the services of reloading, warehousing, big-bagging and sorting of bulk cargoes in the port and maritime environment.

The terminal works 24 hours a day and offers the handling of: coal, coke, grain and feedstuff, biomasses, ores and other bulk dry and liquid cargoes (including chemicals of the 3rd, 6th, 8th and 9th classes according to the IMDG Code), crude oil and its derivatives as well as general cargo.

Maritime Bulk Terminal Gdynia Ltd obtained ISO 9001:2008 and ISO 22000:2005 HACCP certificates granted by Polish Chamber of Foreign Trade Certification and Bureau Veritas Certification.

Quays

Dutch Quay:

Length:	500m (maximum vessel length 300m)
Draught	13.00m
Equipment:	6 grab-hook cranes with lifting capacity of 10–16t, stationary pneumatic — mechanical conveyor, railway wagon scale
Storage area:	storage yard with area of 6,188m^2, 2 flat warehouses with total area of 5,192m^2

Swedish Quay:

Length:	444m (maximum vessel length 300m)
Draught:	9.50m
Equipment:	5 grab-hook cranes with lifting capacity of 8-40t, device for grain reloading with container scale, truck scale, railway wagon scale
Storage area:	storage yard with area of 13,144m^2, 2 flat warehouses with total area of 12,972m^2

Silesia Quay:

Length:	353m (maximum vessel length 250m)
Draught:	8.50m
Equipment:	4 grab-hook cranes with lifting capacity of 8–10t
Storage area:	storage yard with area of 12,138m^2

Southern pier of the Danish Quay:

Length:	170m (maximum vessel length 150m)
Draught:	9.50m
Equipment:	the base for handling the liquid chemicals is
Composed of:	the post for servicing the tankers, pipelines L1 (heated), L2, L3 and the post for tanks reloading and pumping room - the technological process of reloading is electronically controlled storage area: located on the back of the Danish quay with a total area of 39,396m^2, which is used for handling dry bulk goods, 2 truck scales

Liquid fuels reloading post

The Terminal also renders operating and technical services for the Liquid Fuels Reloading Post on the breakwater. This post serves the tankers with lengths up to 210m (minimum vessel length — 100m) and a draught of up to 11m.

Assets

MTMG assets are:

- quays with total length of 1,657m;
- storage yards with area of 70,866m^2;
- 3 flat warehouses with total area of 15,823m^2;
- four-chamber warehouse with capacity of 20,000m^3;
- 15 grab-hook cranes with lifting capacities of 8, 10, 16, 25 & 40t;

- 1 self-propelled grab hook-crane Liebherr 550 with lifting capacity of 124t;
- 2 self-propelled grab-hook cranes with lifting capacity of 24t;
- specialized post for handling liquid chemicals;
- stationary pneumatic-mechanical conveyor;
- covered device for grain reloading with container scale;
- covered belt conveyor for loading dry bulk goods into trucks and wagons;
- 3 truck scales;
- 2 railway wagon scales;
- hoppers, wheel loaders, caterpillar bulldozers, tractors, platform and box trailers, fork trucks and other auxiliary equipment;
- external parking for 122 trucks; and
- TV monitoring system.

Investments

MTMG is continuously improving the quality of its services by paying great attention to the handling process. Being a universal terminal with a diversification of products, MTMG is investing in new equipment that ensures a good service of various types of cargo which require new technologies and compliance with environmental standards.

What is definitely worth mentioning among new investments planned for 2013 and 2014 is the construction of a new automated, four-chamber warehouse, with a total capacity of 60,000 tonnes, located on Silesian Quay and destined for storage of agricultural products.

At the same time MTMG will modernize the Swedish Quay involving its deepening up to 13.5m and in the long term up to 15.5. Nevertheless it is already able to accommodate vessels up to Capesize.

MTMG TURNOVER (THOUSAND TONNES)

MTMG turnover in 2008-2012

Commodities	2008	2009	2010	2011	2012
Coal and coke	1,352	1,902	1,680	1,153	1,595
Other bulk cargoes	1,058	563	801	1,018	569
Grain	625	686	675	780	767
Crude oil and its derivatives	702	725	879	853	363
Total	**3,737**	**3,876**	**4,035**	**3,804**	**3,294**

Port of Gdansk – an emerging candidate for dry bulk hub in the Baltic Sea?

Ever since coal throughput started in the deepwater section of the Port of Gdansk back at the beginning of the 1970s, coal has been priority cargo, breaking turnover records in the port. At the time of prosperity, the terminal's capacity of handling over 8mt (million tonnes) of coal annually was nearly used to the full.

The economic and political crisis of the 1980s translated into the world markets' interest in Polish coal dwindling year by year. The plummeting coal turnover in the Port of Gdansk was accompanied by shutting down increasingly unprofitable mines. In the first years of this century the port exported 5–6mt of coal, only to report a regular decrease of exports (down to 1.5mt) from the beginning of 2006 until today, with simultaneous imports boom. The public power system, 95% of which is supplied with coal, required the increase of imports. Already in 2008 Poland became (and still is) a coal net importer: Polish mines sell abroad only 5–6mt of coal annually, and the economy imports three times as much. However, the Port of Gdansk could only handle the import relation in the so-called inner part of the port, where vessels of up to 10.2m draught are received.

In order to cater for the new market needs, a decision was made to make a new investment in the deepwater part of the Port of Gdansk. The dry bulk terminal of the Belgian Sea-Invest Group (Sea-Invest handles approximately 120mt of cargo annually in 25 ports across Europe and Africa), whose construction began back in 2012, is to enable the reception of 15m draught coal-carrying vessels yet in 2013. On 10ha of land, stacking yards are being built, with facilities capable of handling 4,000 tonnes of coal per hour.

The terminal is likely to soon become another successful hub in Port of Gdansk. The advantageous hydrographic and navigational conditions, year-round accessibility for ships without the ice class, and a possibility of accommodating the biggest vessels navigating the Baltic Sea not only enable the Port of Gdansk to overcome the economic slow-down, but also provide the basis for its rapid growth. With both the liquid fuels terminal and the state-of-the-art DCT Terminal already in operation, the Port of Gdansk is set to expand its potential with yet another asset, which will consolidate its position on the Baltic Sea.

Port of Amsterdam: expansions on course, optimistic about future

(photo: Liesbeth Dingemans)

Port of Amsterdam is looking forward to a strong year ahead. All envisioned development projects are on schedule, which will further contribute to the port's growth.

Corporatization of Port of Amsterdam

Commenting on anticipated changes in the port's corporate structure, Lex de Ridder, cluster manager Energy at the port, said that the corporatization of Port of Amsterdam as a governmental limited liability company is very well on track.

This move will make Port of Amsterdam a public enterprise, with 100% of the shares owned by the City of Amsterdam. It will enable managers to embark on more entrepreneurial relationships both locally, nationally and internationally. It will also enable the port to enter into more commercial arrangements with port companies and attract investors without loading risk onto the City. "It will boost competitiveness and help us win more cargo currently being moved via other Northern Range ports," says De Ridder.

He adds "It has been decided by the City Council to go ahead. If all goes to plan, we'll be corporatized at the start of the second quarter this year."

IJmuiden lightering facility

The new lightering facility, to be located at a harbour on the North Sea at IJmuiden is also still in the pipeline. According to De Ridder, everything is going to plan and the expected official steps have been taken. "That means that The Dutch Ministry of Transport [Rijkswaterstaat] has made the decisions to continue, despite budget cuts by the Dutch government. So this project is moving along prosperously." De Ridder says environmental impact studies have taken place, and the calculations are looking good. The project is anticipated to be finalized around 2017, with work starting in 2014. The completed lightering station will allow two Capesize vessels to be handled simultaneously, doubling current capacity.

What needs to be done now, is for the port to develop collaborative relationships with regional partners in IJmuiden

PORT OF AMSTERDAM DRY BULK TONNAGES – 2011 & 2012

YEAR	2012 Cumulative report from Jan up to and including Dec	2011 Cumulative report from Jan up to and including Dec	DIFFERENCE ([Cumulative) Jan - Dec 2012] to [(Cumulative) Jan - Dec 2011])	
INCOMING			**Absolute**	**%**
Dry bulk	26,685,011	28,669,238	–1,984,227	–6.9%
Cereals	452,724	475,827	–23,103	–4.9%
Cattle feed	4,398,457	5,129,468	–731,011	–14.3%
Oilseeds	935,684	1,084,963	–149,279	–13.8%
Coal	14,541,416	14,636,221	–94,805	–0.6%
Ores	96,294	34,414	61,880	179.8%
Fertilizers	836,557	801,844	34,713	4.3%
Other dry bulk	5,423,879	6,506,501	–1,082,622	–16.6%
Transshipment at IJ-Palen	2,135,126	1,890,301	244,825	13.0%
OUTGOING				
Dry bulk	3,430,942	3,736,258	–305,316	–8.2%
Cereals	59,021	51,930	7,091	13.7%
Cattle feed	482,656	655,070	172,414	–26.3%
Oilseeds	523,204	615,144	–91,940	–14.9%
Coal	1,016,458	922,947	93,511	10.1%
Ores	678,493	650,601	27,892	4.3%
Fertilizers	281,681	285,471	–3,790	–1.3%
Other dry bulk	389,429	555,095	–165,666	–29.8%
TOTAL				
Dry bulk	30,115,953	32,405,496	–2,289,543	–7.1%
Cereals	511,745	527,757	–16,012	–3.0%
Cattle feed	4,881,113	5,784,538	–903,425	–15.6%
Oilseeds	1,458,888	1,700,107	–241,219	–14.2%
Coal	15,557,874	15,559,168	–1,294	0.0%
Ores	774,787	685,015	89,772	13.1%
Fertilizers	1,118,238	1,087,315	30,923	2.8%
Other dry bulk	5,813,308	7,061,596	–1,248,288	–17.7%
Transshipment at IJ-Palen	2,135,126	1,890,301	244,825	13.0%

who will co-operate in this joint venture to optimize the use of the harbour. "That is the plan for this year. So it is on track, but we have to take a few steps legally, also in terms of cooperation with the regional ports. We are very confident that everything will proceed swiftly," says De Ridder.

Biomass and Coal

Biomass

The port of Amsterdam started doing well in biomass markets last year. In 2012 biomass increased from 40,000 tonnes to 250,000 tonnes. "So steps have been taken: biomass has found the port of Amsterdam," says De Ridder, "but it's not the end of the road, because most of the co-burning of biomass and coal takes place in the south of the Netherlands, north of Belgium and not so much in Germany yet." If Nuon/Vattenfall, one of the biggest energy companies in Europe, starts co-burning biomass and coal at its Amsterdam power station, it would signify a big boost to the port's biomass handling figures.

The port remains optimistic that this will happen, since the central government of the Netherlands has introduced a new environmental policy, which will be implemented in the first half of 2013, and it has also chosen to stimulate biomass. "And I think Vattenfall will then make the decision to start co-burning," opines De Ridder. He adds "We also hope it balances the coal tax in Holland. The last government has set a coal tax and that is also the reason why the energy companies didn't make the decision to invest in co-burning with coal. But if the legislation is more balanced and biomass becomes more attractive, and that is the intention of the new government, then I think this year they will make a decision."

If Vattenfall starts co-burning with biomass, the port of Amsterdam could see biomass tonnage gradually grow to 500,000 tonnes within a few years.

Then, of course, new ways of transshipping the material will need to be found. According to De Ridder, there are a few companies in the port that could step up to the challenge and the port is already in talks with them to accommodate this new cargo flow. The port is also ready to co-operate with them to develop the necessary conditions or requirements in terms of space, warehousing, nautical infrastructure and dredging.

Coal

In 2012, the port of Amsterdam had a very good year in the coal department, especially the first three quarters. The fourth quarter experienced a slight loss due to the strike at Rietlanden Terminals/EDF. The effect was that the port ended up with exactly the same percentages in the end. "We were heading for about 6% or 7% growth, but that disappeared in the last quarter due to the strikes. But we are confident Rietlanden will pick up its volumes as before, now that the conflict is over," explains De Ridder.

Infrastructure

In terms of infrastructure the port is also ready for growth: the terminals have invested very heavily in cranes and internal transportation systems. In the past OBA was the only terminal to offer rail transportation, but now Rietlanden also has its own railway, with the result that it handled quite a bit of additional volume by railway last year. In terms of cranes, OBA added a new gantry crane to its workforce last year.

Barging facilities in all terminals are also completely up to date and the port is ready to accommodate the growth of coal and stimulate the additional growth of biomass. The capacity is already there and is even better than before, because the lightering facilities are better and will reach an ideal lightering condition at IJmuiden in the future.

Good prospects for the New Year

All in all, Port of Amsterdam is looking forward to the new year and with all future expansion projects going according to plan and the added infrastructure being put in place, the overall feeling is that "the port is ready!"

(photo: Piet Lenos)

EMO, 40 years fully equipped to meet its customers' expectations

Since 1973, the EMO terminal in the Rotterdam Port has been a major hub in transporting coal and iron ore from all over the world to the European hinterland. EMO has always been a reliable partner for its customers in helping to control these flows of goods by combining daily processes with a clear vision for the future.

EMO is able to accommodate the world's largest dry bulk vessels, and yet it never ceases to look to the future and plan ahead — now more than ever. In 2012, the terminal significantly increased its storage and transshipment capacity and efficiency by commissioning five new, state-of-the-art projects: its seventh stacker reclaimer, fifth unloader, a second fully automated coal wagon loader, a brand-new sea going vessel loader along an innovative, new quay, and a high-tech operations centre. These projects ensure that EMO is fully equipped to enhance its safety, efficiency and sustainability performance, and to continue to serve its customers as a reliable partner in dry bulk transshipment in the coming decades.

EMO operates 24 hours a day, seven days a week. It handles large bulk shipments; its discharge capacity is 47mt (million tonnes) and throughput capacity is 60mt. It always approaches its work and planning with the greatest care. EMO believes it is very important to remain state-of-the-art.

TERMINAL CAPACITY

Unloading capacity	47mt
Throughput capacity	60mt
Storage capacity	7mt
Trainloading capacity	18 trains daily

EMO – 40 years fully equipped to meet your expectations

Please visit emo.nl to monitor our progress.

LOOK TO THE FUTURE AND PLAN AHEAD

Since 1973, the EMO terminal in the Rotterdam port has been a major hub in transporting coal and iron ore from all over the world to the European hinterland. EMO has always been a reliable partner for its customers in helping to control these flows of goods by combining daily processes with a clear vision for the future.

EMO is able to accommodate the world's largest dry bulk vessels, and yet we never cease to look to the future and plan ahead – now more than ever! In 2012, we have strongly increased our storage and transhipment capacity and efficiency by commissioning five new, state-of-the-art projects: the seventh stacker reclaimer, the fifth unloader, the second fully automated coal wagon loader, a brand-new sea-going vessel loader along an innovative, new quay, and a high-tech operations centre. These projects ensure that we are fully equipped to enhance our safety, efficiency and sustainability performance, and to continue to serve you as a reliable partner in dry bulk transhipment in the coming decades.

EMO

energising your business

stevedoring & warehousing rotterdam

- PROJECT CARGO
- INDUSTRIAL BREAKBULK
- 730 METRES QUAY LENGTH
- HEAVY LIFT STORAGE AREA
- HEAVY LIFT UP TO 1500 TONS

Lifting your cargoes faster

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shorecranes up to 208 tons

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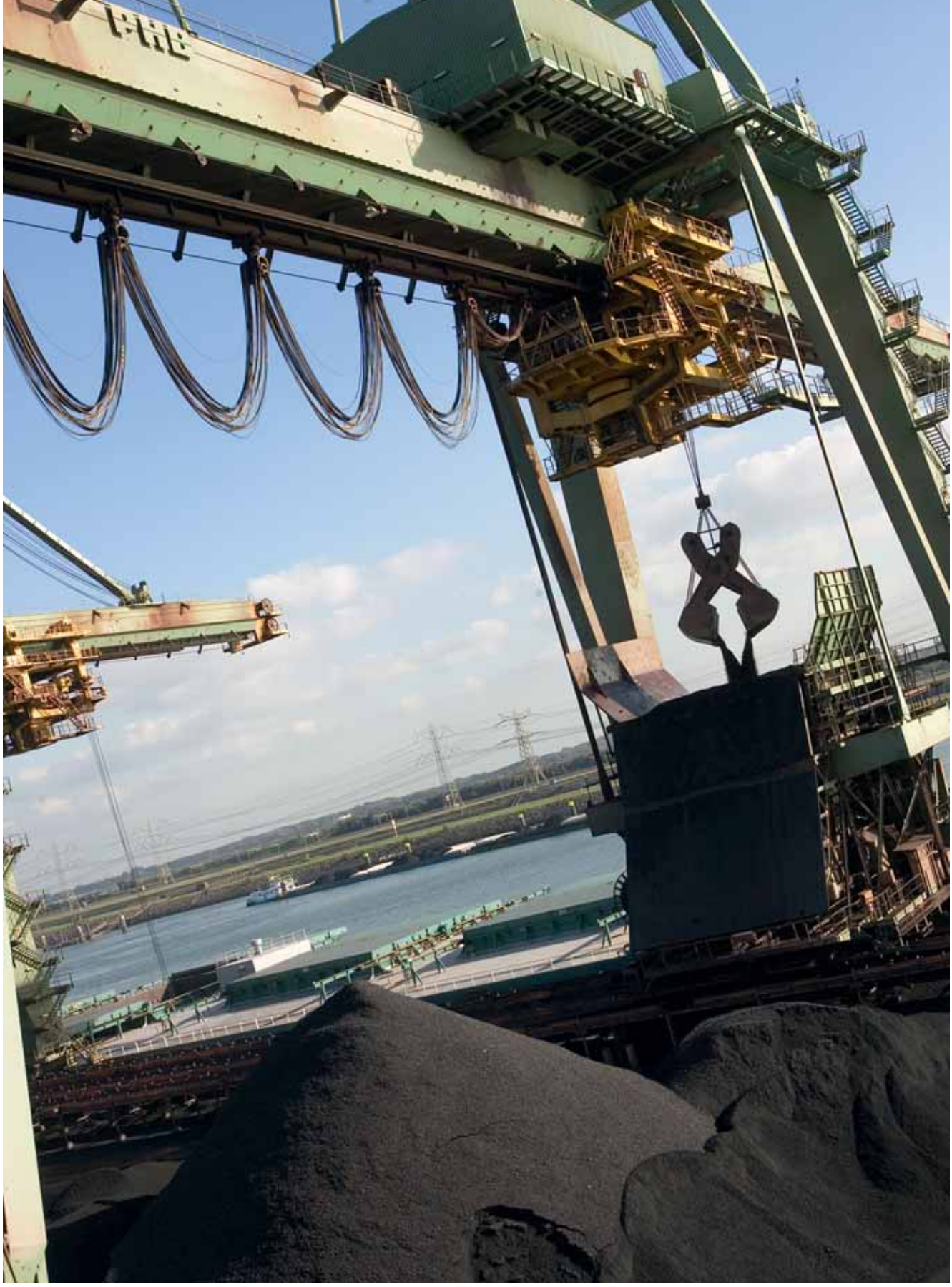

Keeping the terminal state of the art as well as making necessary improvements is its key to serving its customers. EMO's highly skilled trained personnel work closely together. Skilled employees working with innovative technology guarantee high quality, efficiency and sustainability.

Meeting market demands

EMO's 160-hectare area currently offers 7m of storage. EMO 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 is a partner that offers reliability and trustworthiness. The company stays on top of the latest developments in the market. EMO continually analyzes its customers' needs, the quality of its services and its terminal's performance. In anticipation of market trends and customer needs, it is continuously geared towards offering a more efficient, cleaner and safer terminal, one designed to meet all expectations.

OVET

www.ovet.nl

Quality in Bulk

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4538 AR Terneuzen
The Netherlands

Tel.: +31 115 676 700
Fax: +31 115 620 316
E-mail: info@ovet.nl

Contact: Mr. Jan Agten
Mr. Bram Peters
Mr. Sander van der Veeke

- 4 floating cranes
- 80,000 t/day capacity
- Screening/crushing facilities
- Terminals in Terneuzen and Vlissingen
- Draught: 16.50 m SW

OVET starts fast trainloading

OVET Dry Bulk Terminal is a major player in the coal supply chain. It is active in the Netherlands with its floating cranes throughout the entire Western Scheldt area in Vlissingen, Terneuzen and Ghent and also in the anchorage berths on the Western Scheldt itself. OVET has two terminals at its disposal at Vlissingen and Terneuzen. These dry bulk terminals are centrally located in deep sea ports in the ARA range between Rotterdam and Antwerp.

OVET B.V. offers a wide range of stevedoring service. It can handle commodities including: coal, coke, petcoke, ores, minerals and scrap. The main activities of OVET are lightening, discharging, storing and distribution and screening of dry bulk cargo.

OVET operates at two deepwater terminals with all hardened and paved stockyards:

- **Terneuzen** (Panamax) with a capacity of 160,000m² — 600,000 tonnes; and
- **Vlissingen** (Capesize) with a capacity of 315,000m² — 2,000,000 tonnes.

Using four floating cranes (3 x 25 tonnes and 1 x 36 tonnes lifting capacity) with a total capacity of 80,000 tonnes per day,

OVET has also the flexibility to operate at anchorages both in Terneuzen and in Vlissingen. The draught in Terneuzen is set to 12.50 metres freshwater, making the terminal suitable for Panamax vessels. In Vlissingen, the draught is 16.50 metres saltwater. Vlissingen has two Capesize berthing facilities plus one Panamax berth.

The annual handled tonnage by OVET exceeds 10 million tonnes and therefore OVET plays a significant role in the dry bulk stevedoring market.

Terneuzen and Flushing offer excellent connections (inland waterways, rail and road) to Benelux, France and Germany and are also ideally geographically located for overseas dispatch to Scandinavia, the UK and Ireland.

At the Vlissingen terminal OVET operates a warehouse of 6,000m², mainly used for the storing of wood pellets. The warehouse contains six separate cells with a total capacity of 30,000 metric tonnes of wood pellets. Of course, the warehouse can also be used for other products that need covered storage.

Affiliated to OVET is the shipping agency OVET Shipping which offers a reliable 24-hour service throughout the River Scheldt area. This guarantees an efficient and effective handling of customers' vessels.

Another affiliate of OVET is OVET Screening, a company which is specialized in screening, crushing and blending activities. At both terminals OVET operates (mobile) screening and crushing installations. In 2012 investments were made in two new mobile screening installations for the Vlissingen terminal. With these machines OVET is able to screen dry bulk material up to 5 fractions with a maximum input capacity of 400 metric tonnes per hour.

As from 1 July 2013, the OVET Vlissingen terminal will have at its disposal a new train loading facility allowing a 44 wagon train (approximately 2,700 metric tonnes net weight) to be loaded in 2.5 hours. The port delivers excellent rail connections, rail paths and shunting services. Different rail companies are present in the port. With these facilities OVET is able to expand coal rail transport towards the European hinterland, mainly to source the German power and steel industry.

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duisport has gained a reputation as a transportation and trading hub and developed into a hinterland port of strategic importance for the North Sea ports.

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Confident 2013 expected for GIE HAROPA

Gathered within the GIE HAROPA economic interest group since the beginning of 2012, the ports of Le Havre, Rouen and Paris constitute the fifth north-European harbour set today. In 2012, the HAROPA alliance achieved a maritime tonnage of 85,490mt (million tonnes), which represents a fall of 9% compared with 2011. This fall is due in great part to the reduction in bulk traffic. Container exports, however, experienced a rise of +5%.

Better prospects for solid bulk in 2013

The year 2012 was an average one for cereal, which had an impact on bulk traffic. However, the prospects for 2013 are positive, fuelled by exports of dynamic cereal since the beginning of the year.

Cereal: resumption expected in 2013

After a subdued grain season in 2012 (5.45mt, –28% compared to 2011, that is 48% of market share of the solid bulk), and the records registered in 2010 and 2011, HAROPA expects a good first half of the year 2013, the export of cereal having appreciably started again. Thanks to its whole cereal bulk offer and containerization, HAROPA offers its customers an excellent range of services in Europe. Cereal operators are planning to improve and develop their terminals. For example, Sénalia (diversifying in Rouen by handling solid fertilizers with the American group Koch, as well as storing cocoa beans) has invested more than €40 million over five years in its facilities.

Coal: stable traffic

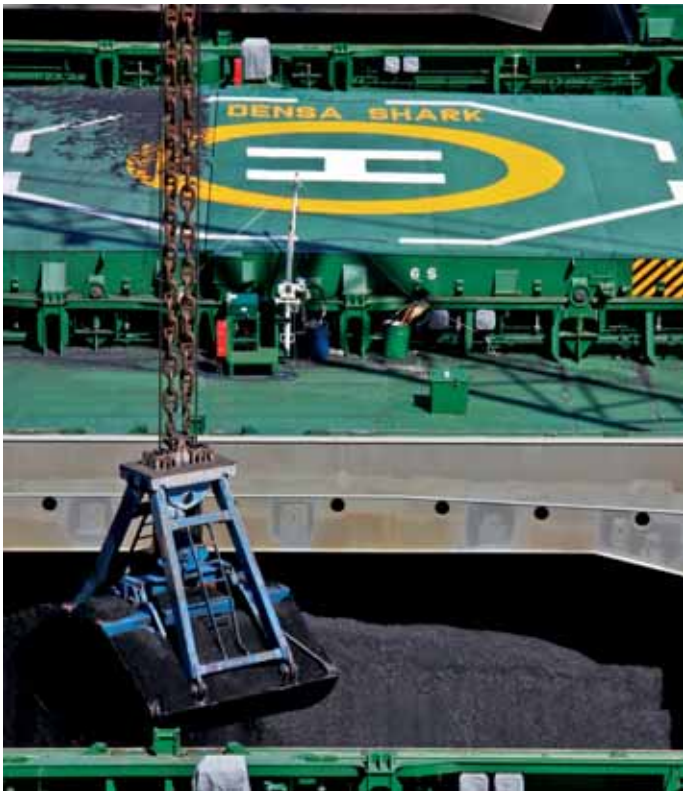
Coal traffic was relatively stable in 2012 (1.6 million tonnes, –9% compared with 2011, 14% of HAROPA's total traffic), in spite of technical breakdowns in several parts of production plants. Long-term perspectives remain on a downward trend, contrasting with the global European market. HAROPA notes the good resistance of the industrial coal market (boiler rooms, industries etc.).

In 2012, 18 coal stopovers were registered at the Sea-Invest terminal of Grand-Couronne, among them, the ship *Cape Elise,* with 76,400 tonnes of coal, and *Densa Shark* with 55,000 tonnes loaded in Richards Bay in South Africa on 26 August 2012. With 292 metres, the *Densa Shark* was about the longest ship ever received in the port of Rouen, on the Seine river, in 120 kilometres of sea. On 25 January 2013, the same terminal, Sea-Invest, received the *STX Joy*, also 292 metres, and unloaded 56,000 tonnes of coal, also from Richards Bay.

Aggregates: a market in development

Over the coming years, there is expected to be a significant growth in traffic. This will be due to the combined effect of increasing demand (housing construction in the greater Paris area), and the depletion of resources in Ile-de-France. In terms of aggregates, in 2012, HAROPA achieved traffic figures of 1.9 million tonnes, –5% compared with 2011, representing 17% of HAROPA's total traffic. Haropa-Rouen registered the starting of the terminal marine aggregates of SPS (CEMEX/GSM) to Saint-Jean-de-Folleville. Another positive element worth mentioning, is a €80 million investment by Lafarge Cements to modernize its factory at Saint-Vigor-d'Ymonville.

Densa Shark *(292m) : The longest ship ever received in the port of Rouen with 55,000 tonnes loaded in Richards Bay on August 26th, 2012 - © GPMR - R. Hondier*



Specialized coal handling at Mariupol in the Ukraine

The Port of Mariupol lies in southeastern Ukraine, by the Sea of Azov north coast.

The port has always dealt with the transshipment of coal, and expects to continue to handle the commodity long into the future. The port was, in fact, constructed by manufacturers in the surrounding Azov region in 1889. The first ship to leave a berth at the port was the steamer *Medveditsa*, and was loaded with a cargo of coal. Today, the port has six coal berths — numbers 11, 12, 13, 14, 15 and 16.

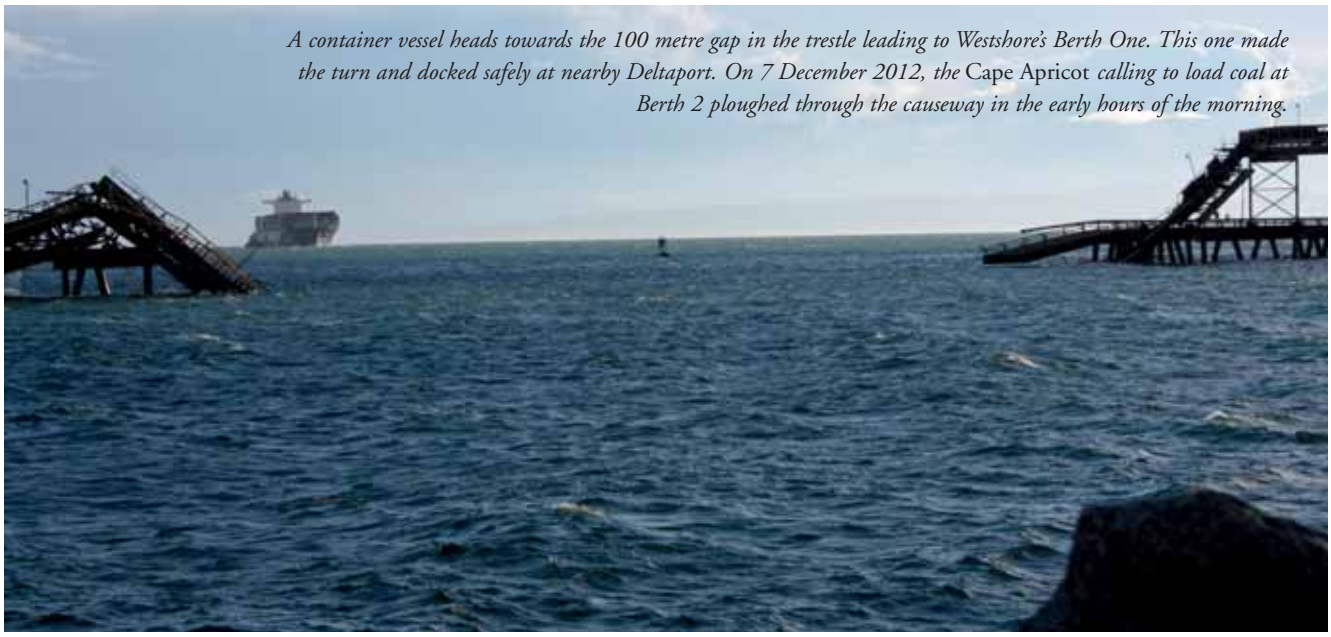
In Mariupol port there is a unique, one-of-a-kind in Ukraine, coal loading complex (CLC) of complete cycle. Specialized coal loading complex enables the handling of up to 4 million tonnes of coal per year.

Within the system, continuous cargo transportation takes place via conveyors. Also in use are lateral railcar dumpers (two units), Mitsui stackers (two units), Mitsui reclaimers (six units) and Mitsui coal loading machines and NKMZ (three units) located in the rear zone of the port, directly on berth 14. Storage capacity in the CLC warehouses amounts to approximately 180,000 tonnes, and total handling capacity on the CLC is 8,000 tonnes per day.

The CLC also includes: a railcar defroster; a water-sprinkling system to suppress coal dust; a magnetic station to clean coal, removing metallic objects which improves the quality of the coal as well as reduces the risk of damage to conveyor lines — both at the Port of Mariupol and at the destination ports and end-users' facilities.

During the last ten years, there has been a significant amount of reconstruction and building work at the port's berthing facilities at berths 11, 12 and 13.

How one night of disaster can change your whole year



A container vessel heads towards the 100 metre gap in the trestle leading to Westshore's Berth One. This one made the turn and docked safely at nearby Deltaport. On 7 December 2012, the Cape Apricot *calling to load coal at Berth 2 ploughed through the causeway in the early hours of the morning.*

What should have been a year of accomplishment in 2012 for Westshore Terminals was overshadowed by disaster for Canada's leading coal export terminal.

Westshore saw its year turn from success to new challenge overnight when a large dry bulk carrier slammed through a causeway connecting the main terminal with its major deep-sea dock.

The unbelievable happened at about 1am on 7 December 2012 when the Japanese-owned, Panama registered dry bulker *Cape Apricot* failed to make a routine berthing manoeuvre and sliced clean through the causeway trestle crashing a high-speed conveyor, power, water, and the connecting roadway into the ocean.

The mishap demolished over 100 metres of trestle and cut off a ship part-way through loading at Berth 1 from its vital coal supply, putting Westshore's most productive berth out of action for weeks.

The early morning incident was enough of a shock that Westshore vice president and general manager, Denis Horgan, called it the "biggest catastrophe in our 43-year history." Luckily, no one was injured in the crash and the vessel suffered only minor damage. In fact, it eventually made the correct docking at Westshore's Berth 2 and sailed fully laden a few days later relatively unscathed, albeit the subject of a gross negligence lawsuit.

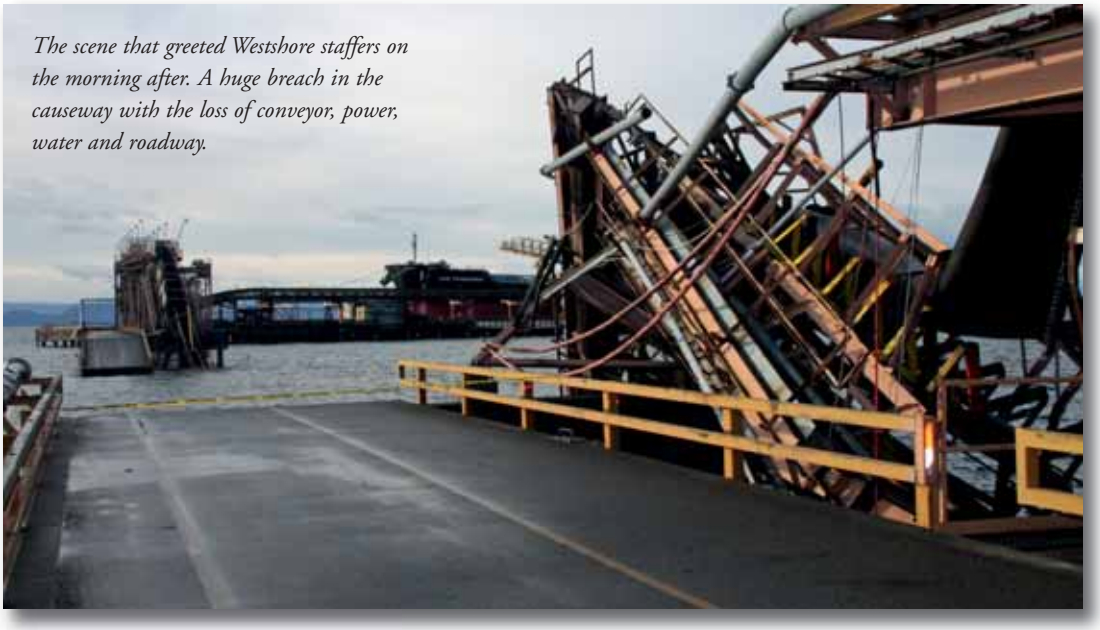
Westshore should have been celebrating the commissioning of a new twin rotary dumper — the final equipment in a five-year, $110 million equipment upgrade — which had just been completed a week or so before through the second of two planned partial site shutdowns. That work, which also included a fourth new stacker-reclaimer, new conveyors, installation of new chutes in conveyor transfer towers, and other projects, was designed to take the terminal's annual capacity from 23.5mt (million tonnes) to 33mt.

But, the new worry was the halving of the facility's capacity because of the causeway mishap and the resulting scramble to

Piles are in and the steel superstructure begins to take shape in the rapid rebuild.

keep customers happy. Horgan and the Westshore team had been expecting to be planning a 2013 with the strong prospect of breaking the 30mt mark in coal exports for the first time.

Instead, they were quickly searching out salvage firms and others to help with the rapid rebuild of the shattered causeway and its coal moving equipment. The rebuild began within hours when salvage cranes mounted on barges reached the site. The rebuild had to be carefully managed so the sea bed would not be disturbed as the tangled steelwork from the causeway and about 30 tonnes of coal off the conveyor were recovered.



The scene that greeted Westshore staffers on the morning after. A huge breach in the causeway with the loss of conveyor, power, water and roadway.

Westshore announced a reduced dividend in late December for its unit holders along with news of the filing of a lawsuit against the *Cape Apricot* and its registered owner Takei Kaiun of Japan, alleging the owner is liable for gross negligence in bringing the ship into the terminal on 7 December 2012. The actual crash is under investigation by Canada's Transportation Safety Board.

At time of writing in early February, Westshore had made amazing progress in the rebuild with new piling in place and other steel structure fabricated up and down the West Coast starting to be erected. Berth 1 was expected to be back in operation by mid-February.

The unheralded causeway trestle mishap — Westshore had handled over 8,300 ships without a serious incident — put a one million-tonne plus dent in the output of the terminal from what could have been a record year. Instead, the year end came and went with total throughput for 2012 pegged at 26.1mt, somewhat disappointing following as it did two back-to-back record years previously, which culminated in a 27.3mt total in 2011.

There was one welcome milestone just the same, and Westshore moved its 700 millionth tonne of coal since opening in 1970 as December came to an end.

"We'd been looking forward to achieving that milestone and a record year," says Horgan. "But, with this new challenge, we've been more concerned about dusting ourselves off and getting stuck in to the rebuild as quickly as possible."

As the busiest single coal export terminal in all of North America, Westshore may still break the 30 million tonne mark in 2013 depending how quickly it is able to bounce back to being a two-berth operation. Before the *Cape Apricot* incident, the terminal was under growing pressure from its major customers such as Teck Coal to get quickly into full production mode after two planned shutdowns were completed successfully in 2012 for the equipment upgrades.

"It has been frustrating seeing our customers forced to scramble to seek tonnage through our rival terminals such as Ridley in the Port of Prince Rupert and to a lesser extent Neptune Terminals, which like Westshore is part of Port Metro Vancouver.

A surveyor sights up the rebuild as the new trestle starts to bridge the gap early February.

"Having a two-berth terminal again just can't happen soon enough for us or our mine customers," says Horgan.

With two twin dumper sets, four new or modernized stacker-reclaimers, more efficient conveyor chutes, and a host of other improvements, Westshore has a lot to prove this year as its shows off the benefits of the $110 million it has spent on the equipment upgrades.

While Horgan says Westshore has no plans to increase the size of its footprint or to add any new equipment to the 54 hectare site, the terminal is keen to optimize its existing leased land and is reviewing the replacement of ageing infrastructure to further improve efficiency.

ProvPort – positioned for bulk trade leadership

The world keeps getting smaller and the East Coast of the United States is getting closer and closer to the rest of the world everyday, *writes Chris Waterson, Marketing Director, ProvPort.*

Global trade is on the rebound from its 2007 highs. The transformation of the Panama Canal will re-calibrate global trade.

Liebherr LHM 550: ProvPort is acquiring two barge-mounted versions of this crane.

Investment in the Future

In Providence, Rhode Island the ProvPort facility is repositioning to lead the resurgence. Already, the second busiest (FC) port in New England, ProvPort is investing $20 million dollars and upgrading its cranes and infrastructure to be a part of the global trade revolution.

Historically, ProvPort has been the leading bulk port operation in New England. As a result of a $20 million investment fuelled in part by federal funding the facility is upgrading with two barge-based Liebherr harbour mobile cranes, type LHM 550.

Convergence

The new cranes give ProvPort a speed and efficiency advantage over other facilities in the northeast. For ports in the Northeast of the United States the challenge moving forward in the next decade will be to create a convergence centre — facilities that offer deep water and are linked to rail and the American interstate system.

ProvPort is striving to be the model facility. Located at the convergence of Narragansett Bay and the Providence River, the deep-water, weather-protected berths with up to 40-foot draughts is uniquely connected to the leading highway infrastructure of the northeast Route I-95, I-295, and I-195.

ProvPort Infrastructure

ProvPort is dedicated to maximizing loading/discharging operations in the most safe, economical and efficient manner possible to expedite vessel turnaround.

The facility and the ProvPort team can count on an experienced labour force to deliver for the leading companies in the world. Fully licensed and bonded, ProvPort has a proven track record of increased productivity. The goal is to provide the highest quality services while controlling the costs of handling.

The ProvPort has over 300,000ft^2 of covered warehouse space available and over twenty acres of open lay-down area for short or long-term storage needs. The covered space also doubles as a storage/distribution centre as needed, with over ten truck bay doors for direct-access loading/unloading, as well as along-side rail for quick and easy transloading.

Coal Import and Export

ProvPort is one of the few (FC) port facilities that is actively importing low sulphur coal for American power plants and is an export facility for American coal fuelling power plants in Europe (FC). As the Northeast's only true intermodal on-dock rail service, connecting our clients to all major national lines that provide rail service to any location in the contiguous US and Canada, ProvPort is the most efficient coal facility. In the spring of 2013, ProvPort plans to invest approximately $1 million on a rail unloading system to further increase export coal efficiency.

The future of coal imports may be tied in port to the efficiency of the ports that service them. With fracking's growth in the United States and greater access to an ever increasing North American natural gas, imported coal must be transported and delivered at a highly efficient cost.

ProvPort's Streamlined Structure

As a result of location, infrastructure improvements, and a management team driven to move materials faster and more efficiently, the ProvPort approach to moving bulk and specifically coal has lead to remarkable growth for the port.

In the past decade, ProvPort's bulk tonnage has increased in excess of 400%.

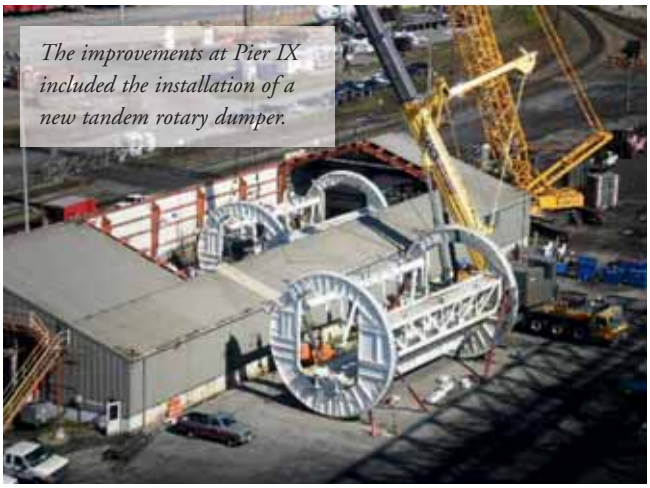
Moving Forward

While data shows that Eastern ports saw traffic grow by 5.5% in Q1 2012 over the same quarter in 2011 — growing at almost twice the rate of west coast ports (3%). Eastern traffic growth is expected to accelerate further after the 2015 Panama Canal expansion is complete.

ProvPort's location, track record of success and investment in infrastructure will create the most efficient port for bulk shippers.

Key port expansions keep Kinder Morgan at the top of its game

Pier IX



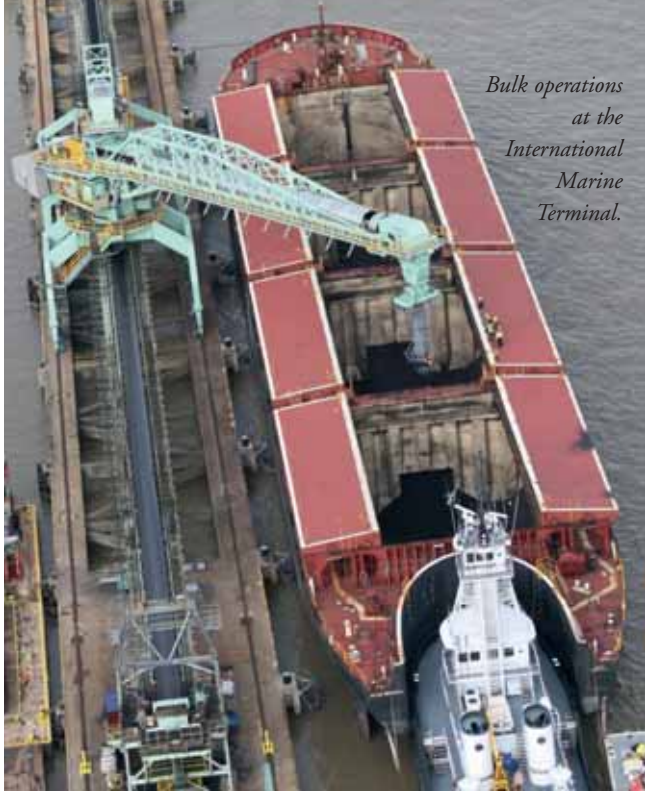
The improvements at Pier IX included the installation of a new tandem rotary dumper.

The international demand for US export metallurgical and thermal coals continues to grow in Europe and Asia at record levels. For the past two years, Kinder Morgan has been expanding a few key terminals to keep up with the increased demand. At Kinder Morgan's terminals, export coal volumes increased by almost 38% for the full year, to a record of approximately 20.7mt (million tonnes) versus 2011. The increased volume was shipped primarily through the Pier IX terminal, with the International Marine Terminal (IMT) and the Port of Houston terminals seeing increases in volume during construction improvements which will increase the throughput capacity at the terminals. At Pier IX, some of Kinder Morgan's improvements over the past few years include a new tandem rotary dumper, upgraded conveyors and coal chutes, a new railcar thaw shed and new mass flow coal feeders. In addition, Kinder Morgan is investing approximately $29 million of additional capital to further expand the overall capacity and throughput of the Pier IX terminal. The improvements will include the expansion of the existing storage yards and the replacement of the existing rail indexer. The additional capacity is fully subscribed and is supported by a new long-term agreement with a major US coal producer. Upon completion of the expansion, the improvement will increase the coal export capacity of the Pier IX terminal by approximately 1.5mt allowing the terminal to handle more than 16mt of coal per year to the export market.

IMT

Kinder Morgan is also investing approximately $400 million to expand its Gulf Coast terminal network. Kinder Morgan's Gulf Coast terminal network is comprised of its partnership interest in the International Marine Terminal, which is located in Myrtle Grove Louisiana, the Houston Bulk Terminal and the Deepwater Export Terminal, both located in Houston, Texas. After completion of all of the export expansion projects, Kinder Morgan's Gulf Coast terminal network will have a coal export nameplate capacity of approximately 27 million short tonnes per year. At IMT, Kinder Morgan and its partner, AEP River Operations, will invest approximately $170 million to increase

Kinder Morgan's International Marine Terminal, in Myrtle Grove Louisiana.



Bulk operations at the International Marine Terminal.

IMT's coal export capacity. The IMT terminal improvements include a new shiploader that will be capable of loading Capesize vessels. The improvements will also include a second continuous barge unloader, improved reclaim and distribution systems, and a dedicated barge loader. These improvements will eliminate technical bottlenecks that have constrained the terminal's throughput capacity in the past. Upon completion of the improvements, IMT will have an export capacity of 16mt.

HSC

One of the biggest changes on the Gulf Coast is Kinder Morgan's ability to export coal out of the Houston Ship Channel. Kinder Morgan's two Houston terminals, Houston Bulk Terminal and Deepwater Export Terminal, provide western producers with the ability to rail their coal directly to the export terminals as compared to railing material to the river and barging it to the lower Mississippi River. Back-stopped by long-term contracts with Peabody and Arch, Kinder Morgan is constructing improvements at its existing petcoke export terminals which will allow them to efficiently and economically export western coal. The first phase of the Houston Bulk Terminal expansion project and the interim improvements at Deepwater are completed, and both terminals will export coal in 2013. At the Houston Bulk Terminal, Kinder Morgan has constructed a new coal receiving, storage and reclaim system. Kinder Morgan is also upgrading the existing shipping system which will increase the terminal's coal and petcoke export capacity.

Upon completion of the improvements, the Houston Bulk Terminal will have the ability to export 3mt of coal annually. The improvements at the Deepwater Export Terminal include a new shiploader capable of loading post-Panamax vessels, new loop tracks capable of simultaneously holding three 135-car unit trains, a new rotary dumper, segregated distribution and reclaim systems, and a new shipping system. Following completion of the expansion, the Deepwater Terminal will have an export coal throughput capacity of 10mt of coal per year.

Safety

All of the capital improvements will be designed and constructed to meet or exceed industry safety and environmental standards for similar facilities. Safety, environmental excellence and compliance, and commitment to its customers continue to be high priorities at Kinder Morgan. In 2012, Kinder Morgan Terminals recorded a Total Recordable Incident Rate (TRIR) of 1.58 which is considerably lower than the industry average.

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Nectar expands its activities to coal terminals

The development of new mines and resources in developing regions such as Africa are providing opportunities for new coal export terminals in either existing ports or as stand-alone projects to support the logistics activity.

There are clear benefits to be gained, even to the untrained eye, by improving logistics of running such operations. The chain between the coal face and the final user involves multiple challenges in relation to handling systems, modes of transport, loading systems and scheduling of all respective activities in relation to each other.

Additionally, each of these activities has its own set of standards in terms of operational, safety and environmental measures which need to be implemented accordingly. In most cases, these activities are carried out by different parties under different arrangements and agreements. The lack of co-ordination of methods and systems employed by different parties involved often lead to inefficiencies and bottlenecks in the system, subsequently leading to delays and extra costs for all the parties involved.

Nectar Group has successfully operated in developing countries since 1972 and has since handled an ever increasing variety of commodities utilizing various handling methods. The Group has gained particular experience in relation to the newly developing coal terminals during the last two years with its involvement in an export terminal in the region.

There are three key areas in the chain which are important for efficient running of a terminal. The first relates to the delivery of coal to the terminal. It is important that any study carried out in relation to the mining capability and the capacity of the transport system to deliver coal to the terminal is carried out taking into account realistic circumstances rather than relying on technical and statistical figures alone. If coal is to be delivered by rail, as mostly the case in newly developing projects, true capability of the line can only be established by careful consideration of the multiple demands on that line by different parties including passenger traffic.

Renovation and adding extra rolling stock alone do not necessarily lead to maximum utilization and efficiency. The important factor of managing the transport link, in this case the rail line, is often overlooked. Extra demand by adding significant volume and frequency of coal movement on to an existing network, increases the demand in terms of capacity significantly. This requires careful managing during a transition period to ensure that the required improvement in capacity is achieved in practice without causing a major bottleneck in the system.

Another important consideration in this respect is the link between the capacity of delivery and the discharge system installed at the terminal. The inevitable bottlenecks in transport network most of the time requires that the delivery system at the terminal to be designed with flexibility in mind in relation to accommodating different modes of delivery of coal to the terminal.

The second key area is the design and operational efficiency of the terminal for handling coal. The uncertainty in relation to political factors, demand projections and regulatory issues in countries of origin are preventing investors from taking long-term decisions in relation to the design and equipment quality of the terminals. The desire to balance the budget in most cases

leads to the design parameters to be planned in accordance with minimum acceptable standards in every respect. The uncertainty is also leading users towards temporary solutions rather than long-term planning in terminal design and operation. In practice, this causes nothing more than false economy. The inferior quality materials used in construction of a terminal normally start to incur extra costs within the first year of operation and they are guaranteed to wipe out any initial savings planned for the project. Another worrying trend is the lack of continuous and effective quality control during the building of a terminal to ensure that good workmanship is exercised throughout.

This is also reflected on the specifications of equipment chosen which in most cases do not leave any buffer to take into account any changes in cargo specifications, for instance even a simple factor such as the moisture change in coal due to seasonal circumstances. The equipment design based on minimum operational and technical parameters quickly lead to problems and increased maintenance expenditure when the demand on capacity starts to peak.

The vital link between delivery, handling and loading capacity is also overlooked most of the time. A bottleneck could be experienced in any of these three points if the operational parameters are not aligned properly with each other. In most cases, design parameters are taken as the leading indicators to calculate equipment requirements, however, practical operational limits taking into account local circumstances are not properly considered. This, in turn, leads to a capacity gap between design and practical capacity of the terminal in real life.

The third area is the connection between the terminal and the quay. This is particularly important if the terminal is developed as a part of an existing port infrastructure. Careful consideration needs to be given to the design and characteristics of the quay to ensure that the quay structure can support the loading equipment as well as the size and type of the vessel that the terminal will be accommodating. The users need to have a dialog with the port at early stages of such a development in relation to the type and size of vessels they intend to trade and discuss issues arising from access point of view which could have significant consequences for terminal throughput and performance. The issues such as tidal conditions, access channels, navigation restrictions and interaction with other port traffic plays an important role in success of a project. There also needs to be a dialogue in relation to the suitability of the vessels to be serviced with the loading equipment to be employed. The incompatibility between the two, too often leads to reduced performance for the terminal.

The overall success in these projects very much depends on having an experienced terminal operator such as Nectar Group to contribute to the development of the project from the very early stages. The developers, designers and investors need to ensure that the planned output for such new terminal developments can match the reality in practice. It is also important to have a long-term perspective in terms of benefits that the terminal would bring to a particular region or country and this in turn needs to be reflected in design and selection of equipment for the terminal from the very early stages of development. Therefore, it is important keep in mind that although these developments offer opportunities, they also call for much needed caution and co-ordination for an investor.

JSC Baltic Coal Terminal – modern coal gateway in the Baltic

In 2012 there were 88 vessels loaded via BALTIC COAL TERMINAL at the Port of Ventspils in Latvia. Coal transshipment increased 18%, year-on-year, to 4.8mt (million tonnes). The total coal volume since the launch of the terminal (since 2009) is more than 14mt of Russian coal. Coal handled by the terminal is exported largely to Netherlands, Belgium, Great Britain, Poland, Spain, Germany, Italy, France.

In January 2013 the biggest volume of cargo since the launch of the terminal was loaded onto the ship — it totalled 88,200 tonnes. The terminal's maximum shiploading capacity is 40,000 tonnes per day; maximum railcar unloading is 500 a day.

The terminal can currently handle up to 6mt per year. When the second phase of the expansion project is completed, the specialized coal terminal's capacity will reach 10.5mt.

In 2013, the BALTIC COAL TERMINAL plans to remain at the same operating rates as 2012. In cooperation with Ventspils Freeport authority the construction of the second berth with a depth of 16m has started, which in future will allow the loading of two Capesize vessels up to 120,000dwt simultaneously.

Puerto Mejillones: strategic partner of Chilean mining

One of the main bulk ports in northern Chile, with over 15 years of operation, has become a leading player in the mining supply chain.

During 2012, the company transferred more than two and a half million tonnes of solid bulks such as coal, petcoke, clinker, limestone and sulphur. In the area of liquid bulk, the terminal transferred and stored in the same year about two million tonnes of sulphuric acid.

The high input demand for mining in northern Chile, especially sulphuric acid to produce copper cathodes and coal for local power plants, have positioned Puerto Mejillones as the leading terminal that provides supplies to this important economic sector.

Located in the north of Chile, in the region of Antofagasta — one of the main centres of mining development in South America – Puerto Mejillones has a privileged location near major mining projects in northern Chile and is connected by road and rail to major mining centers in Argentina and Bolivia. Its setting allows it to have excellent geographical surroundings that protect it from the tides and winds from the south, along with extensive support areas, and excellent weather conditions that allow the port to be closed less than one day a year.

The terminal specializes in handling solid bulks such as coal, sulfur, limestone and clinker, and liquid bulks such as sulphuric acid. It has two sites specially designed to mobilize these substances, allowing fast transfer rates and shorter stay of ships at the port.

Among its facilities, the terminal has ten storage tanks of sulphuric acid of 20,000 tonnes each, with a total capacity of 200,000 tonnes, and an esplanade of 26 hectares that allows future growth to ensure the transfer of liquid and solid bulks.

Challenges for 2013

During 2012, Puerto Mejillones transferred more than 4.5mt (million tonnes), which corresponds almost 2mt of coal, more than a million and a half tonnes of sulphuric acid and more than 500,000 tonnes of zinc and lead concentrates. For 2013, Puerto Mejillones expects to transfer a record load, mobilizing more than 5mt. With those numbers, it will be positioned as a leader in the industry, being the largest bulk terminal in northern Chile and 8th nationally.

Puerto Mejillones takes into account the rise of mining development in the Region of Antofagasta and the challenges this presents. For this reason the port has decided to carry out within its investment plan, the construction of a new site and a new shiploader with a capacity of 3mt of transfer, exclusive for mineral concentrates. The terminal currently has an Environmental Impact Declaration (EID) approved for loading and storage of such minerals.

High Environmental Standards

Puerto Mejillones maintains an integrated management policy, focused on maintaining the quality of its operations, care of the environment, prevention of injuries and diseases, pollution prevention and business growth.

Francisco Ortúzar, general manager of Puerto Mejillones, adds that this policy aims to transform the terminal into a benchmark for the region. "We want to become an example of port on issues of sustainability and growth in conjunction with our environment, both social and environmental. Puerto Mejillones has major expansion projections and will continue to consolidate as one of the main terminals of the region," he explained.

In this line, Puerto Mejillones has conducted various environmental improvements in its facilities, which includes the purchase of modern dredgers for unloading coal, allowing a reduction in the material that falls into the sea, and the installation of collection trays in all short conveyors belts of discharge, eliminating any chance of material falling from the discharge system.

Furthermore, each month the company carries out an 'environmental monitoring programme, which consists in monitoring of the operational processes involving actions that may affect the marine environment.

Another initiative is the 'Air Quality Monitoring Programme', which consists of making continuous sampling of 24 hours every three days, using high purity filters. Since early this year Puerto Mejillones is part of the World Ports Climate Initiative and is pursuing a certification process to measure its carbon footprint.

Coal handling in the Port of Pori 2012

Capesize vessel, Conti Jade, *arriving at Pori in December 2012.*

The total volume of coal and coke handled in the Finland's Port of Pori in 2012 was 0.94 million metric tonnes.

The year 2012 turned out to be drastic to coal handling in the Port of Pori. Volumes of imported coal dropped by 66% compared to the previous year. The drop was caused by the fact that the stockpiles of the coal power stations in the Tahkoluoto area were practically full. The trend in transit coal handling was steadier although the amount of handling dropped also in that commodity. The bright spot of the year 2012 was that the transit coal handling contract was renewed.

In the year 2012 only 616,000 metric tonnes were unloaded in the Tahkoluoto deep harbour of the Port of Pori, whereas in the previous year the corresponding figure was 1.826 million tonnes. It was also unusual that a great deal of the import was coke and not energy coal. This so called transit coal continues after re-loading in Tahkoluoto to the Finnish metallurgical industry farther north.

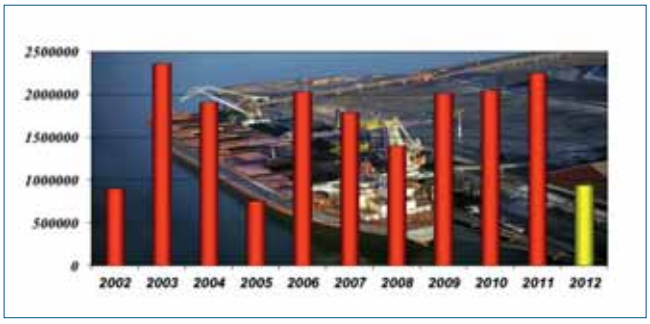
The vessel traffic dropped also significantly. In the year 2012 only 20 vessels carrying coal called Tahkoluoto harbour. In the year 2011 the number of calls was 83. This traffic slowdown provided space for remediation dredging in the deep harbour including the fairway inside the port area. Renovations in the quayside were also made.

During the year four Capesize vessels called Tahkoluoto harbour. They did not take the full advantage of the 15.3 metre fairway but called the deep harbour in lighter load. The last Capesize vessel of the year 2012 called Pori on the 6th of December. The fairway to Tahkoluoto and the basin were completely free of ice, although the winter came early. During the short winter season the traffic continues with ice-classed vessels. The biggest of them are Panamax vessels. Transit coal traffic to the north is based on the ice-classed pusher barges.

There have not been changes in the handling capacity of coal in the Port of Pori during the year 2012. In the short run the output depends on the size and construction of the vessels calling the port. The average unloading capacity in Tahkoluoto coal harbour is 30,000 metric tonnes in 24 hours. Loading capacity is 1,000 metric tonnes in an hour. Tonnes per hour is used as an indicator in loading, because the coke is loaded to the barges.

Large changes in the field of energy are taking place in the near future in Finland. A new sub-sea cable carrying electric power between Sweden and Finland was taken in use in the end of the year 2011. This cable increased the transmission capacity between Finland and Sweden by 40%. The cable connects the electricity markets in the Scandinavian countries tight with each other. According to the strategic plans Finland will increase the share of bio-energy to be one-third of the total energy production by the year 2020. The most remarkable change in the supply of energy will happen, when a new nuclear power station is completed in the year 2015 and starts to produce energy with the capacity of 1,600MW. The Parliament has approved the construction of two additional nuclear power units.

The Port of Pori is preparing for the changes and is looking for new development paths. Regarding energy, LNG is one of the main objects of interest. But the Port of Pori is suitable for all kinds of cargoes. Mining industry is booming in Finland and the Port of Pori has excellent preconditions to serve the whole mining cluster. The strengths and competitive edge of the Port of Pori have not changed. The fairway to Tahkoluoto harbour is the deepest in the Gulf of Bothnia area and easy to navigate because of non-existing archipelago. The Port of Pori is one of the best winter ports in Finland. Infrastructure and suprastructure are in form and the staff is used to handle all sizes of vessels from barges to Capesize vessels. Tahkoluoto has all qualifications to operate as an energy port and a hub also in future. Actually the year 2013 is expected to be better than the year 2012 in the coal handling.



Amount of coal handled in the Port of Pori (Tahkoluoto harbour). Including loading of transit coal (metric tonnes).

During the existence of the coal harbour in Tahkoluoto the large fluctuations have been characteristic in coal handling. One of the main factors in the use of energy coal is climatic conditions during the winter-time. There are large storage fields in the Tahkoluoto area where energy coal is stored to be used during the winter. New land is reclaimed by filling the sea for example with ash originated from the power plants.

The Port of Pori aims to strengthen the status of the Tahkoluoto harbour as an energy harbour by diversifying its activities. The Port of Pori offers free sites to the industry and logistics companies. Tahkoluoto is an excellent choice to the actors in the energy business.

Port of Thessaloniki: major dry bulk port in the Southern Balkans

Dock 24 at the Port of Thessaloniki.

Unloading nickel ore at Dock 24, Port of Thessaloniki.

Ports as crucial nodes of supply chains play a significant role in the world trade, writes *Dr George Vaggelas, Advisor to the President and C.E.O. of Thessaloniki Port Authority S.A.* This is also valid for the Southern Balkan area where the existence of landlocked countries (former Yugoslav Republic of Macedonia and Serbia) increases the importance of ports for the trade and the economy of the region. The port of Thessaloniki is located in Northern Greece (is Southern than its main competitors in the region, thus more close to major sea-trade routes) and is the second biggest port in the country, after Piraeus. The company exploiting the port infrastructures and superstructures, is Thessaloniki Port Authority S.A. which is listed in Athens Stock Exchange since 2001.

The port facilitates any kinds of cargo (dry bulk, general, liquid bulk, Ro-Ro containers) and passenger traffic (cruise and ferry). It has a significant experience in handling dry bulk cargoes as they account for 26.3% of the ports total throughput. The port's main competitors are the port of Durres (Albania), Burgas and Varna (Bulgaria) and Bar (Montenegro).

Unloading coal at the 5th Pier.

Dry bulk statistics

In 2012 almost 3.65mt (million tonnes) of dry bulk cargoes were facilitated in the port of Thessaloniki. The majority of dry bulk cargoes are ores (especially nickel ore) and coal (petcoke, lignite, bituminous coal etc.). Table 1 shows the dry bulk traffic at the port of Thessaloniki for the years 2010–2012 (tonnes).

TABLE 1

DRY BULK TRAFFIC 2010-2012, PORT OF THESSALONIKI

	2010	2011	2012
Ores and scrap	1,676,229	1,918,674	2,115,381
Coal	648,288	479,241	485,254
Grain	160,076	170,112	144,953
Other dry bulk	1,031,548	683,582	904,744
Dry bulk total	**3,516.141**	**3,251,609**	**3,650,332**
Coal as % of dry bulk total	18.44%	14.73%	13.29%
Transit dry bulk	**1,682,681**	**1,626,753**	**1,931,125**
Transit as % of dry bulk total	47,85%	50,03%	52,9%
Total port throughput	**15,548,663**	**13,082,872**	**13,846,419**
Dry bulk total as % of total thoughput	22,61%	24,85%	26,36%

Port infrastructures

The port has six piers with a total quay length of 6,200m, a sea depth ranging from 8 to 12m and is divided in three terminals: the passenger terminal which is located between piers No.1 and 2; the dry bulk and general cargoes terminal which uses the piers 4, 5 and the eastern part of pier 6; and finally the container terminal located in the western part of pier 6. Liquid bulk cargoes are facilitating through a pipeline connecting the storage tanks (private facilities) with the tankers anchorage.

The storage areas (open and indoor) have a total surface of 600,000m^2 square metres while a SILO is located on the fourth pier. As the majority of the dry bulk cargoes (52.9%) are coming or destined to neighbouring countries, the port operates a Free Trade Zone.

Two Handymaxes at dock 24.

Dry bulk and general cargoes terminal: superstructures and cargo handling equipment

Dry bulk cargoes constitute a core business for the port of Thessaloniki. The terminal is equipped with 44 rail-mounted harbour cranes with a capacity up to 40 tonnes and two mobile cranes with a capacity of 100 tonnes, giving the ability to strengthen the cargo (un)loading operations whenever and wherever is needed. Apart from the cranes the terminal operates various cargo handling equipment such as excavators, bulldozers, trucks etc.

The busiest part of the terminal is dock No 24 (the eastern part of pier six). In 2012 it facilitated the 47.06% of the dry bulk cargoes throughput. This dock has a length of 640m, a depth of 12m and a width of 160m. These dimensions allow the facilitation of bulk carriers with a capacity up to 58,000dwt. The dock has six rail-mounded harbour cranes, four of them with a capacity of 40 tonnes and the other two with a capacity of 32 tonnes.

Multimodal transport capabilities

The port of Thessaloniki has a rail network inside the port, reaching all the docks in the dry bulk and general cargoes terminal (as well as in the container terminal) and is the only port in Greece which is directly connected with the national rail network. About 45% of the dry bulk cargoes are transported with rail to and from the neighbouring countries. In the medium term, the port authority in cooperation with railway operators is planning to launch daily scheduled rail services to the port's hinterland (currently the use of rail for transporting dry bulk cargoes is on a case by case basis). It is worth mentioning that the port of Thessaloniki is a node in the Pan-European Corridors IV and X, connecting the port with Central European countries (i.e. Germany, Austria, and others). Moreover, the port has a direct access to the national highway network.

Future investments

Aiming at preserving and expanding its market share as well as increasing its competitiveness, the port of Thessaloniki has adopted an investment plan in order to further strengthen the port's infrastructures and the dry bulk cargo handling equipment. Regarding the port infrastructures, the main investment plan is to expand dock 24 by 300m in length and 160m in width. The expansion will increase also the operational depth of the new part of the dock to 16m, which means that the port will be able to facilitate ships with a capacity up to 80,000dwt. The estimated budget of the project is €50 millions and will be financed exclusively by the Port Authority's equity capitals. This project will give a competitive advantage to the port of Thessaloniki.

Apart from the expansion of dock 24, the Port Authority is planning to invest in the modernization of the cargo handling equipment. A tender for two new (1+1) rail mounted harbour cranes (40 tonnes capacity) is in progress. Furthermore, in 2013 the port authority will launch tenders for five new rail mounted harbour cranes plus one mobile crane. The new equipment will reinforce dock 24 as well as the docks in the fifth pier.

Moreover, the port will invest in various mechanical equipment (such as bulldozers and trucks) which are necessary for handling dry bulk cargoes at storage areas. The budget for the new cranes (2+5) is estimated at €25 millions while the auxiliary equipment will require an investment of up to €5,2 millions. The completion of the planned investments will help the port of Thessaloniki to maintain its role as the main gate port for the Southern Balkan area.

Dr George Vaggelas is an Advisor to the President and C.E.O. of Thessaloniki Port Authority S.A. and a Research Fellow in European Port Policy (EPP) at the University of the Aegean, Greece. He has authored several papers published in scientific journals and conferences. He is member of PortEconomics.eu, a web-based initiative aiming to advance knowledge on seaport studies.

Space-saving and extra quiet: The SENNEBOGEN 850 R in Alkmaar

A new SENNEBOGEN 850 R recently began to unload incoming ships at the waterfront of the Dutch company de Vries & van de Wiel in Alkmaar. Located on the peninsula between the North Sea and IJsselmeer, the machine discharges sand by the tonne. The SENNEBOGEN is something special; the 850 R sits on a rail-guided carriage and can be driven fast on the waterfront. A special noise package permits a very calm and evenly quiet operation.

Excavation work, road and canal construction, and especially sand excavation are the main business fields of Vries & van de Wiel in Alkmaar. In addition, ships with up to 500m³ of sand arrive at the waterfront daily. Recently, a new SENNEBOGEN 850 with double-shell grip began unloading the material. The machine replaces the previously used cable crane and, thanks to its concept, is revolutionizing the processes employed. With the 21m-long boom and a reach of 42m, it can swivel back and forth quickly and safely between ship and hopper. Whereas around 400 tonnes per hour could be transferred previously, the new machine now does up to 650 tonnes in one hour. For SENNEBOGEN and Kuiken, the local sales and service partner, creating this machine was a significant challenge. In particular, the tight space and unusual proximity to nearby residential neighbourhoods had to be mastered. Together, they developed a customer-specific solution like no other. Since strict noise protection regulations allow a maximum sound level of only 51.5dB during the day and just 35dB at night, the partners, in co-operation with the company Cees Benchop, had to isolate the diesel machine in such a way that any nuisance caused to the surrounding area could be avoided. Thanks to its optimized sound insulation, the SENNEBOGEN 850 R fulfills these standards completely.

An additional task was positioning of the SENNEBOGEN on the narrow waterfront. The solution is a rail carriage. In the transfer process, the machine has to work beyond an existing concrete wall and, to let it swivel without hindrance, the track was quickly placed in an elevated position. This variant was ultimately carried out, together with HKS Metals. The rail carriage could be steered directly via the food pedal in the driver's cabin. The track drive with conventional diesel drive ensures that de Vries & van de Wiel enjoys enormous flexibility. Besides its use on the waterfront, the machine can be used flexibly at other locations. Complete handling of the sand transfer can be ensured with just two people. Drivers especially praise the uncomplicated handling and high transfer performance of the new machine. The difference from the previously used cable crane is large, they say. The maXcab comfort cab, which can be driven up, offers a grand overview of both the arriving ships and the hoppers and storage areas. The local sales partner Kuiken is responsible for maintenance and regular service and continues to support customers with words and deeds.

"We did a lot of work before buying the SENNEBOGEN 850. The strict noise protection regulations and our tight space were difficult challenges. Thanks to the competent advice by SENNEBOGEN and Kuiken N.V., we were able to gain a machine that is perfect for us," says Hans Stammes, general manager of Vries & van de Wiel.

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Martin Engineering vibrating tables deliver efficient compaction

Cougar® vibrating tables from Martin Engineering are designed to settle a broad range of bulk materials, helping packagers and manufacturers compact a variety of bulk solids with different densities and particle sizes. All models are equipped with a variable-frequency drive and digital readout for exceptionally consistent vibration cycles. Originally developed for use in packaging applications, the rugged industrial tables are now finding utility in manufacturing precast countertops, architectural panels, pavers and other concrete products.

The heavy-duty construction and reliability of the units are also proving to be key benefits in product testing applications, as engineers employ the tables to develop consistent, repeatable durability testing for components and finished designs. All vibrating tables from Martin Engineering are equipped with Cougar® electric vibrators, an industry-leading brand that has earned a reputation for performance and longevity through six decades of industrial service. Cougar Vibration was acquired by Martin Engineering in 2010.

Cougar® vibrating tables are designed to settle a broad range of bulk materials with different densities and particle sizes.

Available in working heights of 30" and 36" for operator convenience, Cougar® vibrating tables feature pneumatic isolation for quiet, efficient operation. Standard designs can be ordered in 24" × 24", 36" × 36" and 36" × 72" sizes, all with an adjustable table lip that's also easily removable.

"With the variable-frequency drive, these tables are extremely versatile," observed Martin Engineering account manager Larry Horre. "They're flexible enough to use for a wide range of applications and bulk solids. A single regulator makes adjustments easy and ensures equal pressure in each isolator," he said.

Depending on the application, the tables can be equipped with a pair of counter-rotating vibrators to suit specific bulk materials. Martin Engineering offers all models on casters or with bolt-ready feet, in standard voltages from 115V to 575V.

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

Aurecon helps in sugar terminal rebuild

To assist with the rebuild of the Lucinda Bulk Sugar Terminal (LBST) in Queensland, Australia, engineering, project delivery and advisory services provider Aurecon supplied a full suite of services to Queensland Sugar Limited (QSL).

In the wake of Tropical Cyclone Yasi, the facility suffered almost A$50 million in damage to structural, mechanical, hydraulic and electrical systems along the jetty, conveyor system, wharf and ship loader.

The LBST, recognized as one of the world's most efficient bulk sugar loading facilities, has served the sugar industry of the Herbert River region for over 50 years.

Damian Ziebarth, general manager of operations at QSL, said: "Aurecon and QSL have a solid partnership that stretches back decades. At our time of need immediately following cyclone Yasi, Aurecon was there to help."

Aurecon services included damage inspection and causation advice, early advice on repair feasibility, multi-disciplinary detailed design and documentation, contract packaging and expediting, construction supervision and superintendency, and commissioning assistance.

Aurecon's history with the terminal dates back to the 1950s, when the company, (then Macdonald Wagner and Priddle) planned and designed the first stages of Queensland's bulk sugar terminals.

Queensland is a leader in the bulk handling of raw sugar with some of the largest, most advanced bulk storage and handling facilities in the world.

Of the six terminals, located at Cairns, Mourilyan, Lucinda, Townsville, Mackay and Bundaberg, Aurecon has been instrumental in the planning and design of all six to receive, store and out-load raw sugar to domestic and export markets. Aurecon has also designed the majority of expansion stages and modifications to those terminals over the decades since their original construction.

As part of the LBST's Stage 3 development, Aurecon provided studies and planning, as well as design and development of construction techniques and construction supervision. Completed in 1979, the LBST Stage 3 project involved provision of a third 79,000-tonne capacity storage shed, and an offshore berth, located 5.76km seaward of Lucinda Point in natural deep water, capable of accommodating fully loaded Panamax sized bulk sugar ships for overseas export of raw sugar from the Herbert River District.

With its length actually following the curved contour of the earth by dipping two metres from the initial horizon over its length the 5.76 kilometre jetty has been called an engineering masterpiece.

A single conveyor belt runs the entire length of the jetty and back, enabling sugar to travel along the conveyor from the on-shore storage to the shiploader in 22 minutes. The conveyor belt can carry almost 600 tonnes of sugar at any one time. Vessels can load cargoes of up to 25,000 tonnes of raw sugar in less than a day. The berth is capable of accepting vessels with a total carrying capacity of up to 70,000 tonnes.

Following the official reopening ceremony on 1 November 2012, project director, Arne Nilsen said: "It was very rewarding to be part of this project to repair a facility that has an important place in Aurecon's port and materials handling history and in Queensland's sugar industry today."

Dry bulk unloading solutions at E-Crane Worldwide:

Designed specifically for barge and ship unloading, E-Crane is a proven and trusted solution in many bulk material handling industries. Most dedicated systems for offloading coal, limestone and other bulk materials are costly, inflexible and require an expensive, hard to maintain infrastructure. The versatile, flexible E-Crane is just the opposite. E-Crane's modular design and custom solutions make it ideal for any bulk handling application.

The standard E-Crane product line consists of five series of balanced hydraulic cranes (E-Cranes): 700 Series, 1000 Series, 1500 Series, 2000 Series, and 3000 Series. The E-Crane is a truly revolutionary material handling machine as its main design feature is a parallelogram style boom configuration which allows the machine to be in near perfect balance throughout its working range.

The E-Crane is specifically designed for barge unloading processes. Anything from coal to limestone to fertilizer to scrap steel can be handled. The E-Crane is a truly versatile machine in that it can easily switch between commodities and still offer the high production required at many ports and industrial facilities.

The E-Crane is placed firmly between production line excavators (or material handlers) and large scale dedicated unloading structures. Even the smaller E-Cranes offer much more unloading capacity than the standard excavator. The larger E-Cranes can compete with dedication systems in terms of production and come in at only a fraction of the installed cost with even less annual maintenance costs. The E-Crane product line is rated for barge offloading from 500tph (tonnes per hour) to 2,000tph.

The E-Crane series offers models with up to 50-tonnes duty cycle capacity due to their movable counterweight and fixed parallelogram linkage as well as up to 150ft/50m of horizontal and up to 100ft/30m reach below grade. Its modular design allows each E-Crane to be tailor made to the client's specific requirements.

The green alternative

The E-Crane is a truly unique and revolutionary machine with extremely low power consumption cost. The E-Crane runs on clean electric energy, saving customers huge amounts of money when compared to diesel powered equipment. E-Cranes also have very little associated maintenance costs due to E-Crane's innate design. The key to the E-Cranes' efficiency is the

Premier Cement Mills E-Cranes commmissioned

parallelogram design linking the stick to the moving counterweight. This unique four-bar mechanism ensures that the E-Crane remains in near perfect balance throughout its working range. Compared to conventional cranes that require as much as 80% of their available energy just to move the boom, stick, and grab, the E-Crane allows gravity to work for you instead of against you, reducing horsepower requirements and power consumption by up to 50%, reducing maintenance and operating costs.

Case study: Premier Cement Mills Limited

Two new E-Cranes were recently installed and commissioned at Premier Cement Mills Limited (PCML) in Bangladesh. These are both 700 Series/Model 4264 PD-E E-Cranes with 26 metre (86ft) outreach and 5.5 metric tonne (6.0 US ton) duty cycle capacity. The cranes were both installed in October of 2012. After the swift installation of the first E-Crane at the beginning of the month, E-Crane engineers travelled to Bangladesh for the final stages of the project and the second installation.

After the second E-Crane was correctly assembled and installed, start up and tuning began. E-Crane worked closely with the customer in order to guarantee the best possible crane operators' experience and productivity shortly after the initial start-up. The final result: a perfectly performing E-Crane exceeding customers' expectations.

PCML is one of the most innovative cement manufacturers in Bangladesh. It manufactures its product with the best quality raw materials and technical excellence for ensuring dependability and the highest quality cement. PCML products provide strength and

durability to buildings of high dimensions, in infrastructures that speed the lines of commerce, and for housing that provides comfort and security to families across Bangladesh, India, Myanmar, etc.

About E-Crane Worldwide

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

A flexible approach lies behind's Geldof's bulk handling success

Geldof hopper used to handle wood pellets.

Geldof is a major European supplier of solutions for the storage, handling and processing of bulk solids, liquids and gases. It has a strong reputation in the realization of:

- dry bulk storage and handling projects;
- storage tanks, tank terminals and tank maintenance;
- pressure vessels and process equipment; and
- various other engineered solutions that often require a combination of high level competency in diverse technical areas

Geldof mainly design and fabricate custom made solution systems: i.e. storage and conveying systems for big volumes. Cliff Baetslé, the company's Business Unit Manager Handling, explains that the company has a great deal of experience in the development, fabrication and installation of custom-made transporting systems which includes movable discharge points, conveyors for large tonnages over long distances. As an example it has developed a conveyor system that transports product at a rate of up to 6,000tph (tonnes per hour).

Geldof's principal focus is in Europe, where its major clients are active in the storage and handling sector and energy sectors. It faces competition from the major players in the market, most of which are specialized and have their own products, which Geldof doesn't have. In that respect, Geldof is not a direct competitor as it mainly specializes in custom-made installations and sometimes integrates equipment from those equipment suppliers into its designs. In the international market, Geldof therefore needs to compete with smaller players which are more active in the local home market .

Flexibility is key to Geldof's competitiveness in the market. It develops custom-made installations according to the wishes of the client. It has a lot of experienced people in the handling of coal and ores and has been active in this market for several years now. Geldof has the experience it takes to develop safe and reliable installations. The big players in the market partially work with their own products (with adaptations to the client's wishes if requested). Geldof is different, in that it operates more as an integrator of existing equipment combined with the specially developed equipment that is needed to fulfill the requirements of the project. This is where its strength lies. It is not restricted by fixed products but is free to develop on simple demand and create different, tailored installations each time.

Company background

Geldof offers turnkey solutions for the conceptualization, the engineering and the realization of custom-made projects in materials and fuel handling. It is a reputable and reliable partner for all projects that it undertakes; a claim it bases confidently on its long-standing track record as a qualitative builder of equipment for the storage and handling of bulk materials, combined with its innovative process expertise and proven technology.

The strength of Geldof's partnerships and customer relations is due in great part to its flexibility and its ability to think in tandem with its clients. Geldof teams up with its customers to find the best solutions and to apply the best practices, be they mechanical construction, civil engineering works, electrical and instrumentation, integrations of machinery or other challenges.

Using this open and full approach, Geldof develops pioneering devices which it modulates into new and independent installations with proven technology. In this way it has designed and engineered — among other projects — innovative state-of-the-art modular biomass fuel handling, milling and dosing units, enabling it to offer customers a durable biomass power station with guaranteed performance and availability.

Geldof's services include:

- unloading stations, hoppers and stackers;
- storage equipment: silos and bunkers;
- transport systems completely installed employing screw, belt and chain conveyers and elevators and including de-dusting, ferrous/non-ferrous detection, weighing, separation, drying, milling, fire-safety and other equipment; and
- loading stations (for trucks, railcars, barges and seagoing vessels).

Our modular process
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Eurosilos ideal for the storage of a wide

Internal view of a 100,000m³ Eurosilo filled with coal.

Eurosilo is a major Dutch engineering and contracting company that specializes in the storage of non-free-flowing bulk solids.

Today, the company is technically capable of designing totally enclosed storage and handling systems for storing enormous quantities of bulk solids to meet the high demand for energy and mineral resources. The main applications are:

- the power industry for storing coal, petcoke, wood pellets, limestone, FGD gypsum, fly ash, fixated gypsum etc.;
- the chemical industry for storing: fertilizer, urea, minerals and other basic chemicals;
- the recycling industry for storing: filter dust, e-scrap and concentrates; and
- the agricultural industry for storing potato starch, sugar and other agribulk products.

Payback period

It is not only employees, as internal stakeholders, who are affected by pollution in the work environment, but also external stakeholders such as communities affected by local pollution and government regulators, investors, environmental activist groups etc. They will increasingly put pressure on organizations to look for new, creative and cost-efficient ways to manage and minimize environmental impacts.

Totally enclosed storage systems are made possible by using the Dutch Eurosilo® concept. This proven concept meets the requirements of environmental protection agencies worldwide.

Preventing possible contamination of surrounding land by runoff from outside stockpiles, or polluted drain water at the stockyard itself, are major arguments in favour of enclosed storage facilities. Enclosed storage also prevents deterioration of material due to weather conditions such as frost, wind and rain. This is important in order to maintain quality standards, reduce maintenance costs and/or improve operations. It is also possible to save energy, if increased moisture does not need to be removed later on.

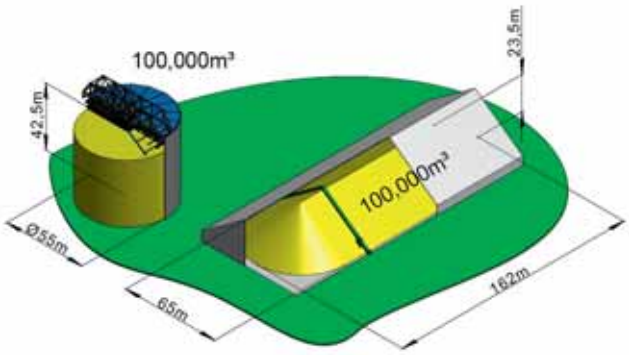
Following this approach, it is often the case that the additional investment made in an enclosed storage facilities pays for itself within approximately ten years.

Minimal footprint

As with many other resources, space is often a restraint when considering expansion. Open-air storage of coal also adds costly environmental drawbacks as well as a loss of energetic value due to moisture increase. Enclosed storage in highly automated silos solves all these problems, with the smallest possible footprint.

Recently the Eurosilo storage system in Lünen (2 × 100,000m³) has been started up. The infeed capacity amounts to 2,000tph (tonnes per hour) and the outfeed amounts to a maximum of 1,000tph which can be reduced to 200tph for blending purposes.

Silo storage implies minimal footprint.

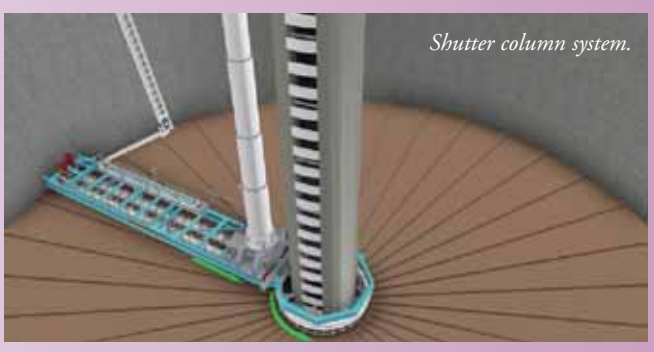


Latest developments in the Eurosilo system.

Filter dust

Thirty-three per cent of worldwide steel production is produced by remelting scrap in electric arc furnaces. The total amount of dust collected at these plants amounts to approximately 5mt (million tonnes) per annum. Instead of disposing of it as a hazardous waste, EAFD (electric arc furnace dust) can be recycled.

A 12,000m³ Eurosilo has been built at the first Zincox plant in Korea. The dust emitted at the plant is very fine (50 microns), and tends to fluidize. Therefore, the shutter column system has been applied. By programming the opening and closing procedure of the shutters, the products can be handled in a controlled manner.



Shutter column system.

variety of bulk commodities

Fertilizer (ammonium sulphate)
CAPRO Corporation in Ulsan will this year start up the third 40,000m³ silo for storing ammonium sulphate. The silo is built as a steel structure with a wooden inner wall to withstand the corrosive characteristics of the bulk solid.

A 40,000m³ Eurosilo for CAPRO Corp. Ulsan, South Korea.

Wood pellets
For storing wood pellets a similar system can be applied. Since the wood pellets have a low moisture, normally around 6–8%, the tendency for self-heating is relatively low. The flat top surface of the material which enables the possibility to provide a cover of foam/gel on top is very effective. It also creates the possibility to use a thermal imaging camera to monitor the surface area.

Due to the fact that the reactivity of torrified wood pellets is significantly lower the large scale storage silos are well suited for storing this type of upcoming fuel as well.

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E-Crane users in the USA benefit from improved customer service

In January of 2013, E-Crane USA Service Group kicked off a new satellite service centre based in Birmingham, AL. The new Gulf Coast Service Group will support 14 clients (15 E-Cranes) in the Gulf Coast region.

E-Crane is excited to be adding Bill McNair to it team. McNair brings with him more than 30 years of crawler crane experience and knowledge of heavy equipment repair. He is also native to the gulf area. In mid-January, he travelled to E-Crane USA headquarters in Galion, OH for E-Crane and safety training. He was also introduced to the entire E-Crane USA team. He is excited to be part of the team and is looking forward to visiting each of the company's Gulf coast clients. To maximize the success of this venture, E-Crane has purchased two heavy duty service trucks equipped with cranes, support equipment, and tools to support on-site field repairs, one of which will be driven by McNair.

There will also be over $25,000 in spare parts and consumables available for emergency service and repairs. This means that E-Crane can now have a service technician on-site in fewer than ten hours, compared with the previous 24 hours. Short response time coupled with on hand spare parts availability saves time and shipping costs equate to a greater overall savings for the company's valued clients.

In one week, McNair has already visited three of E-Crane's clients and has received a warm welcome. The addition of the Gulf Coast Service Group has also generated more than four signed service contracts as well as numerous inquiries for parts and service.

Also, in the last quarter of 2012, E-Crane International USA partnered with Parker Fluid Connections Group and added Hydraulic Hose Fabrication to the Galion, OH Parts & Service Department. This means that at any given time, there will be more than $100,000 in hose, fittings, and equipment on hand at the company's shop.

Three OEM trained service technicians will be on staff to make hydraulic hoses as needed. E-Crane is therefore now able to fabricate, pressure test, clean, and seal all of the hoses required on a typical pedestal mounted E-Crane and package them for shipment in approximately one week. Each warranty hose assembly is certified to Parker standards and comes with its own certification document.

As an OEM distributor, E-Crane can provide a higher quality hose assembly at a lower cost with shorter lead times than in the past. This partnership with Parker, and the direct impact it will have, will increase E-Crane's customer satisfaction and parts availability.

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ELECTRO HYDRAULIC ORANGE PEEL GRAB
MECHANICAL DOUBLE WIRED CLAMSHELL GRAB
SINGLE WIRED TOUCH DOWN MECHANIC GRAB
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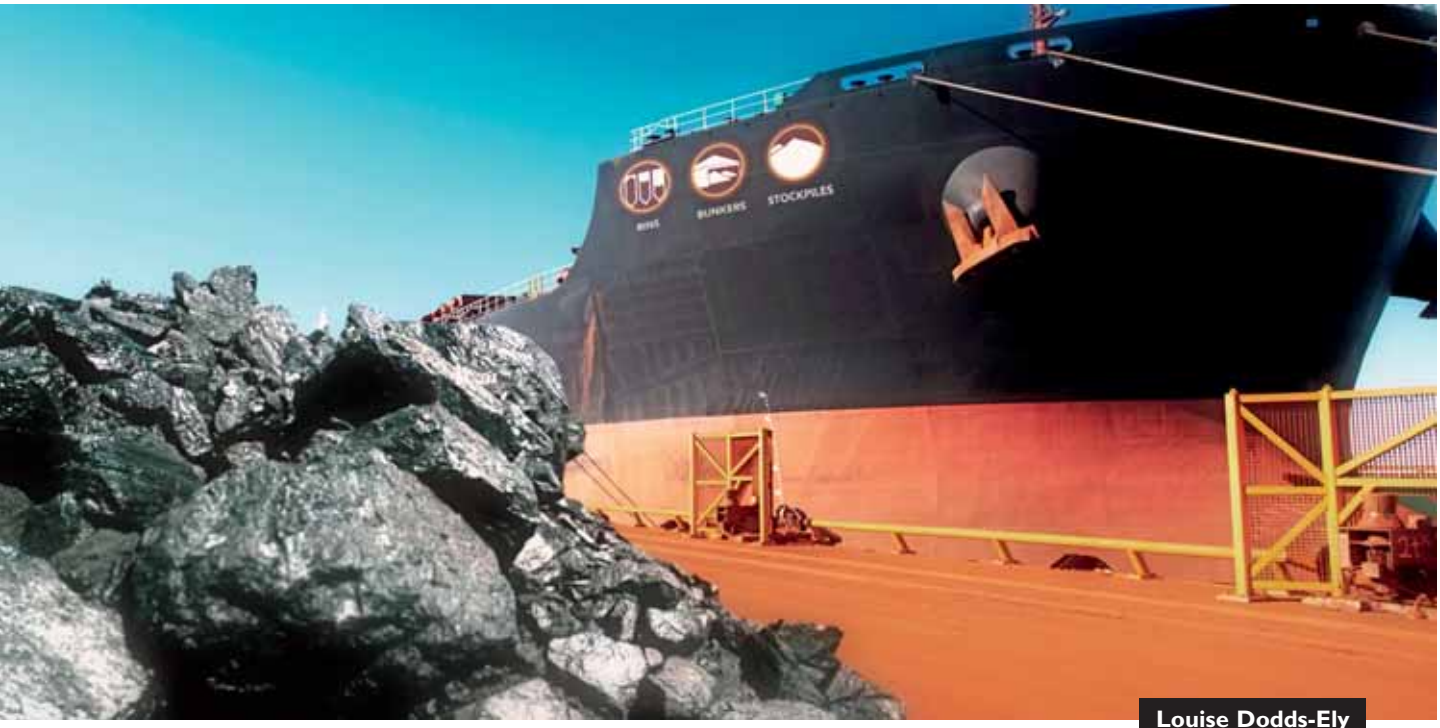
Facing the challenges: coal handling systems



Louise Dodds-Ely

From pit to port: stock management solutions from RONIN

RONIN BULK COMMODITY INVENTORY MANAGEMENT SOLUTIONS

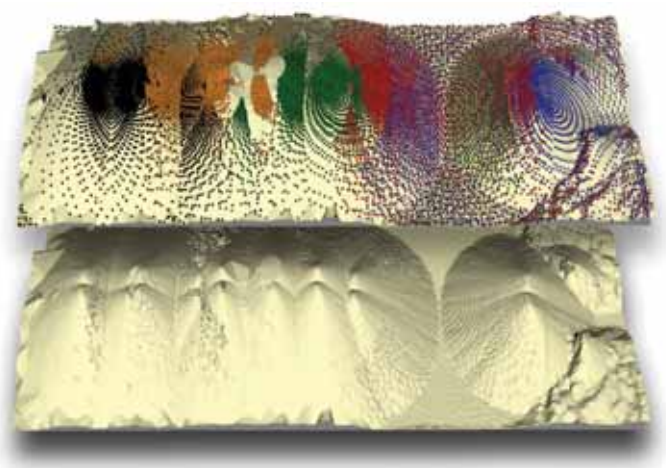
Imagine a pit-to-port stock management solution that provides constant knowledge and control of stock levels, grades, sizing, locations and provides daily reconciliations between book and actual physical values. Imagine having all of this right at your fingertips. This is now a reality, thanks to RONIN's pit-to-port stock management solution.

The pit-to-port stock management solution from RONIN provides constant knowledge and control of stock levels, grades, sizing, locations and daily reconciliations between book and actual physical values. This is done by utilizing the company's ARTEMIS LASER SCANNERS and proprietary software, ART, to enable accurate 3D surface mapping, stock management and accounting.

Whether in the mining, milling, trading, smelting or industrial sectors, production, financial, collateral, marketing and logistic managers constantly have a need for more accurate stock management and technology.

RONIN is a solutions company catering to the needs of these bulk commodity handlers in the form of accurate, laser-based, inventory management systems and surveying. The Ronin group comprises offices in Johannesburg and Richards Bay in South Africa, as well as in Buenos Aires, Argentina and Montevideo in Uruguay. From these locations RONIN is able to service the Southern African and South American markets and port users. Ronin also has representation in Europe and is currently in the process of setting up permanent offices in Mozambique and Zambia.

RONIN's ARTEMIS solution is a surface mapping laser device which scans and plots the entire surface area of a stockpile, using one or multiple scanners. This is accomplished by taking over 10,000 distance measurements, per scanner, over the surface of the stockpile, as seen left. From the plotted surface area, a point cloud is formed creating a 3D profile of the stockpile.



Actual bunker scan done by ARTEMIS 3D laser scanners. Each colour represents a separate scanner. The bottom image is the completed scan.

By using this point cloud and taking into account ground levels, structures present and/or the storage vessel dimensions, RONIN is able to accurately calculate

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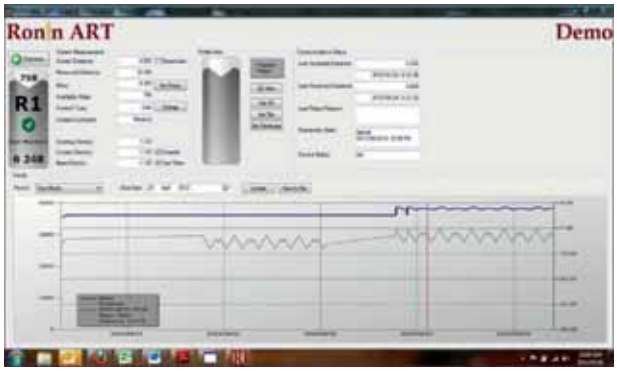
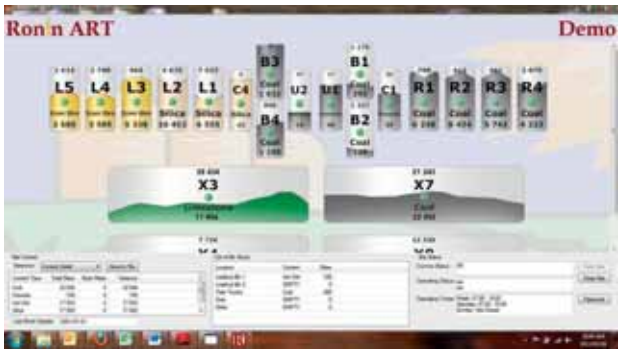
the volume of the stored product.

The ART Software platform is the brains behind the system, providing valuable functionalities to assist with finance, collateral management, logistics, marketing and production. The ARTEMIS scanners communicate wirelessly to a dedicated ART PC on-site. Here all the scan data is processed and displayed on the graphic interface. This interface shows site summaries, occupied and available tonnages, communication statuses, grades, 3D graphic representations and histories. The ART PC is connected to the clients' network so that management can have up to date knowledge of stock locations, quantities, grades, sizing and histories. All this information is ready available on excel spread sheets or any other CSV files the client should choose to utilize.



ART overview screen.

Integrations enable the system to attribute weighted averages of bulk densities, moistures, sizing, calorific values or any other grading the client would like to utilize, to be applied every stockpile, bunker or silo on the network. This enables current and weighted averaged grading/sampling data to be utilized and applied, providing greater accuracies of tonnages and grading figures. This integration also enables daily reconciliations to be done between the book value and actual physical stock.



Detailed ART screen.

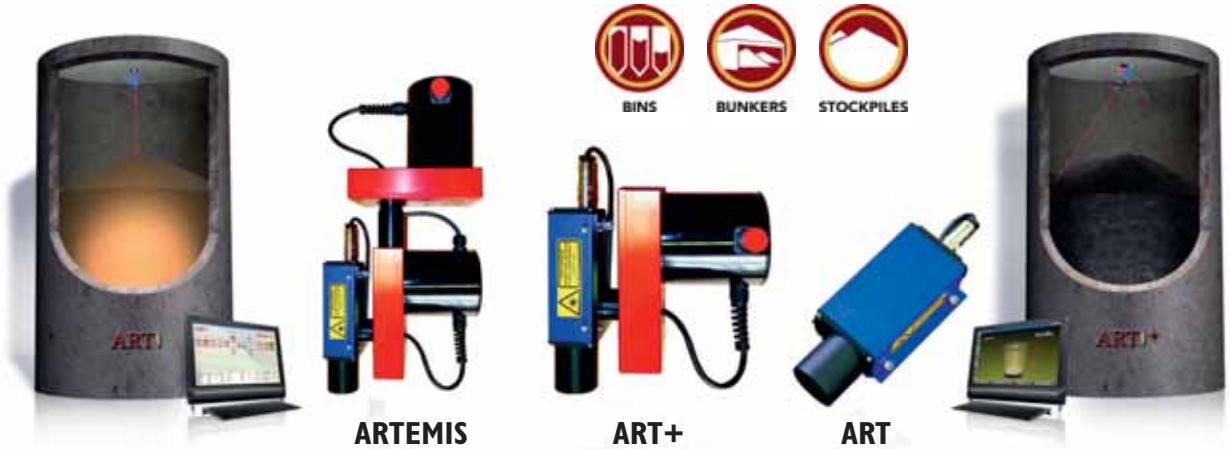
The RONIN ART Head Office Server (HOS) is available for complete control of all the clients operations at a head office level. This is done by networking all the ART PCs on the various sites and processing all the data of each site and stockpiles via a sequel server. This makes daily stock management from a head office prospective a reality.

All hardware and software is developed, manufactured and maintained from RONIN's Johannesburg office. The software platform, installation and reporting is customized per client, per site, taking into account the objective and requirements set out by the client.

AIMS is RONIN's alternative solution to the permanent installations as a moment-in-time stock-verification service. Using the same principles of the ARTEMIS scanner, in terms of surface mapping, AIMS provides accurate volumetric data and 3D graphic representations. This service is available for silos, bunkers, warehouses or open-air stockpiles. Bulk density verifications are also done on each stockpile to enable reports in tonnages. The AIMS report includes volumes, tonnages, 3D representations and any additional observations (i.e. contamination, excess moisture etc.). Dependent on the scope of work, reports are published within 24 hours following the survey.

The company's Richards Bay office, Ronin Independent Surveyors, is in a key position to service the port users of the Durban, Richards Bay and Mozambican ports. In addition to the services and systems mentioned above, they provide an independent cargo monitoring service for in- and outbound cargo. This includes tally services, port superintendence/cargo monitoring, cargo reconciliations, stock auditing, density verifications, marine surveying, quality inspections, sampling and analysis, tarping, ribbed truck cleaning and cargo screening. These are independent services with high levels of service quality, ensuring customer satisfaction at all times.

Quality on-board weighing systems for front-end loaders are available to assist with stock handling and management. These measure the hydraulic pressure needed to lift the bucket, converting the result into tonnages. The Loadmaster 9000i is trade approved in all EU countries and many countries worldwide, which eliminates unnecessary trips back and forth from the weighbridge. With functionalities such as an internal database for up to 1,000 products and/or customers, batch weighing capabilities, target weights, overload logging, tracking and telemetry. The Loadmaster is a simple, cost effective and valuable solution for stock handling and management.



ARTEMIS 3D scanner

ART+ profile scanner

ART level measurement

Cutting coal handling costs with E-Crane: the original balanced crane

E-Crane continuously holds a strong position in the bulk material industry. This is no surprise, because its equilibrium balanced cranes were the very first of their kind. After 25 years of manufacturing, adding new features and further specializing, the E-Crane has evolved into what it is today. More than 200 E-Cranes are operating on all continents, handling a wide variety of various bulk materials. The coal industry, in particular, benefits from all of the advantages the E-Crane has to offer.

Custom engineered to suit any coal facility

When an E-Crane is purchased for a project, it all begins with the initial design. E-Crane engineers visit each facility to inspect the location and to get an understanding of the project requirements and possibilities for the site. If the coal facility requires specific needs, E-Crane engineers custom build the E-Crane to meet these requirements. They help with the entire facility design including hoppers and barge haul systems which are sometimes required at coal handling facilities. The modular design of the machine enables custom solutions with off-the-shelf components and pricing and allows for minimal time between order and commissioning. Coal can be a difficult material to handle depending on the situation. In order to eliminate spills and carry-back, E-Cranes are delivered with a clamshell grab that utilizes a powerful closing force. This gives the bucket excellent penetration and affords maximum fill, which can also be a time and cost saver for a coal handling facility.

With a maximum outreach of 156.8ft (47.8m), the E-Crane is capable of unloading up to Panamax-sized vessels. E-Cranes are also capable of unloading any type of barge or ship with minimal cleanup. Minimizing clean-up reduces the total unloading time saving money on the overall operation. This also leads to a faster turnaround of ships and barges due to greater efficiency.

State-of-the-art technology

Operating and controlling an E-Crane is easy due to its simple, ergonomic and intuitive design. Operators

with little experience handling large equipment become skilled E-Crane operators in no time at all. The simple control system builds operator confidence, allowing for reduced cycle times to maximize productivity.

The innovative, balanced design of the E-Crane contains fewer moving parts than typical material handlers making it easy to maintain. The inherent design of the machine means less wear and tear on main components, providing longer service life with greater availability and reliability for mission-critical unloading. The 'pit-stop' preventative maintenance for the E-Crane is fast and simple, so that the E-Crane runs continuously in a cost effective, 'race car' style operation. This eliminates costly maintenance downtime. E-Cranes now come with the reliable and user-friendly control system called the EMM, or Electronic

Machine Manager. This built in system is a huge innovation in data collection technology, and allows for real-time data collection of things such as running time, how many times the E-Crane hits a fault while in operation, whether there is an overload or overheat, and more. Some even stream live, real time video of the E-Crane while in operation.

Turnkey terminal solutions

A successful operation does not just stop with the E-Crane or material hander itself. Other equipment is necessary to work alongside the material handler or crane to efficiently handle the coal. E-Crane engineers assist in making these decisions for most of their customers. Engineers work with the customer to help them choose the right hoppers, barge haul systems, and E-Crane undercarriage required for an efficient operation.

E-Crane has over 25 years of experience in the coal industry and are the original manufacturers of the equilibrium crane. This invaluable experience and knowledge along with the benefits of the E-Crane prove to be the ideal solution for coal handling terminals.

Case study: Beelman River Terminals

Beelman River Terminals conducts coal offloading operations at its terminal in Venice, IL., situated on the east bank of the Mississippi River just north of St. Louis.

The crane was engineered specifically for the Beelman facility and is mounted on a four-legged pedestal directly on the dock. The receiving hopper is barge mounted and captive between dolphins. This arrangement allows for a full fluctuation of water levels without affecting the unloading cycle time.

At the time of installation, the full facility and infrastructure at the Venice facility was not completed. The E-Crane was originally

working every day offloading coal directly to trucks. Even with five trucks making continuous round trips, the E-Crane was outpacing them.

Operator friendly

The operator, who was new to operating heavy equipment prior to the E-Crane installation, quickly became very productive with the new E-Crane. In less than three months, the operator was already offloading full 1,800dwt barges in less than two hours, including clean-up. According to the E-Crane operator, "The machine is great! Very comfortable to operate." It was also reported that, "The E-Crane does a great job at the bottom, leaving little material in the barge, making clean-up quick and simple. The powered rotator on the grab makes cleaning the

corners quick." The E-Crane at Beelman River Terminals continues to prove itself as an efficient and cost-effective solution to the coal handling operation.

CUSTOM-ENGINEERED: SPECIFICATIONS

Series	2000 Series
Type	15317 PD-E
Location	Venice, Illinois, IL, USA
Application	Offloading coal/coke direct to trucks
Mount	Fixed pedestal
Lift Capacity	22 US tons/20 metric tonnes
Reach	104ft/31.7m
Attachment	19yd³/15m³ hydraulic grab
Power Source	600hp/450kW electric motor

Indonesian coal transshipping made easy with Swire CTM Bulk Logistics

Princesse Abby's *movement-dampening devices make open water transshipment of coal easier and safer.*

The two Princesses continue to excel in coal loading operations in Kalimantan, Indonesia. Swire CTM Bulk Logistics (SCBL) owns the floating crane *Princesse Abby* and the floating transfer station *Princesse Chloe,* in a joint venture with PT. Mitrabahtera Segara Sejati Tbk Jakarta in Indonesia.

The floating crane 'Princesse Abby'

Princesse Abby is essentially a floating crane, i.e. single crane mounted on a pontoon, being used for the direct transfer of coal from the barges to the holds of oceangoing vessels up to Capesize type. What make it stand out is that its hull structure is

A close-up view of Princesse Abby's *transshipment operations.*

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The Princesse Abby *is essentially a floating crane, with a reinforced hull that can withstand the forces experienced when operating continuously in the open water.*

made by duly reinforced longitudinal frame with spoon bow, inclined stern and two skegs aft. Bilge keels are fitted on each side to the extent of about three quarters of the length of the pontoon; structural anti-rolling fins are also fitted in way of the stern skegs. It is equipped with movement-dampening devices and suitable dynamic factors to bear stress and fatigue resulting from continued heavy duty work in open seas. These are all developed and incorporated in the *Princesse Abby*'s design, making it less sensitive to adverse weather conditions as compared with standard floating cranes.

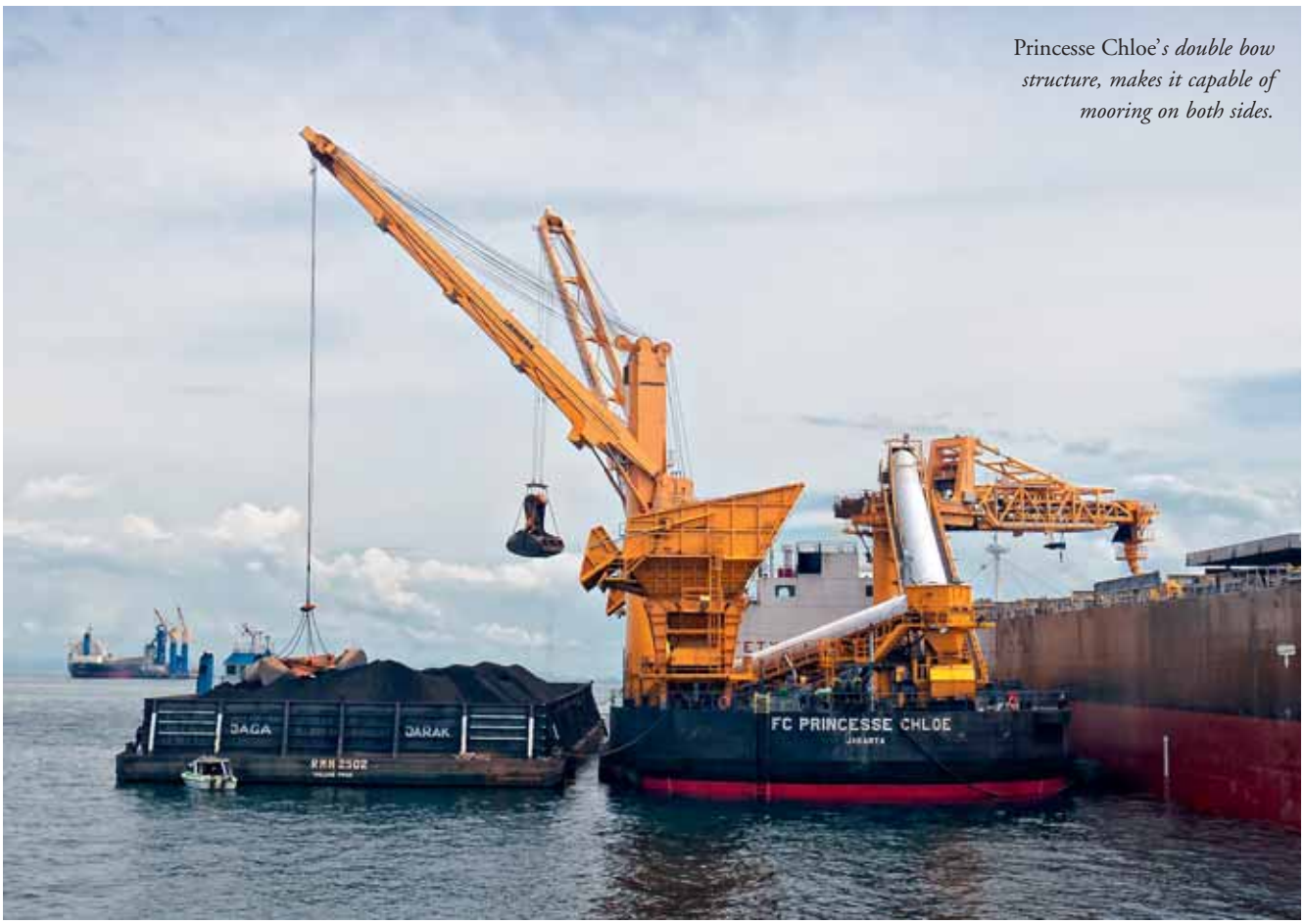
Since the commencement of operations, *Princesse Abby* has loaded 173 vessels, between Panamax and Capesize, transshipping over 10mt (million tonnes). Its best performance rate has been recorded at about 25,123 tonnes per day.

Princesse Abby *has transshipped over 10mt of coal to date.*

Princesse Chloe *has to date handled approximately 7mt, with its best daily performance recorded at 56,500 tonnes.*

The floating transfer station 'Princesse Chloe'

Princesse Chloe is equipped with two Liebherr cranes, instead of just one, which have been strategically mounted on a pontoon, with respect to the hoppers so as to minimize the slewing movement, thereby increasing the cycle time and efficiency. The cranes work in conjunction with a cargo handling system,



Princesse Chloe's *double bow structure, makes it capable of mooring on both sides.*

Princesse Chloe*'s shiploader is capable of swivelling by means of geared slewing rings and luffing by means of hydraulic mechanism.*

supplied by Bedeschi, which consists of two duly designed hoppers and an array of conveyor systems leading to a telescopic/shuttle shiploader. Coal from each of the hoppers is extracted by means of individual variable-speed belt feeders. These frequency-controlled feeders extract coal from the hoppers and transfer it to the longitudinal conveyor. The belt width of the feeders is kept high and the speed is low to ensure uniform extraction of coal from the hoppers. Another conveyor then transports the coal longitudinally through the length of the floating transfer station: from the transfer point, a transverse conveyor helps in crossing over the entire beam of the terminal and joins the final conveyor leading to the shiploader. All the conveyors are enclosed to avoid airborne pollution.

The shiploader is a shuttle/telescopic boom type. It has a 19m air draught, which makes the *Princesse Chloe* capable of loading large vessels up to Capesize type. The shiploader is capable of swivelling by means of geared slewing rings and luffing by means of hydraulic mechanism. The entire cargo handling equipment is constructed and manufactured with the highest classification for heavy duty work in open sea conditions. The equipment has been designed for a heel and trim of 5° and 3° respectively. Another unique feature of *Princesse Chloe* is its double bow structure, which makes it capable of mooring on both sides and thereby increasing its flexibility to a large extent.

Princesse Chloe was delivered in April 2011 from Keppel Subic Shipyard and started coal transshipment operations at the Muara Pantai anchorage in the Sulawesi Sea (East Kalimantan) for PT Berau Coal.

Since then, *Princesse Chloe* has loaded 88 vessels, between Panamax and Capesize, handling about 7mt, with an average daily loading rate up to about 51,000 tonnes of coal, and achieving a best performance rate of about 56,500 tonnes daily. It also has an annual capacity exceeding 9.5mt.

Both *Princesse Abby* and *Princesse Chloe* have been designed by Logmarin and Interprogetti, and have been built under RINA classification and Logmarin supervision. The cranes are designed and supplied by LIEBHERR, which offers proven technologies in the design and operation of off-shore transshipment systems. Included are specific features for open water and heavy duty conditions such as duly designed heavy duty hoisting winches, strengthened boom, the slew bearings conceived with triple roller and four equally distributed slewing motors to minimize the risk of breakdown to one of the most critical components of the crane, four-rope grab configuration, heel and trim alarm systems, thus ensuring high turnover, efficient and effortless loading/unloading from most types of vessels up to modern Capesize vessels, as well as smooth and wider life cycle time.

The cargo handling system on the *Princesse Chloe* has been designed, manufactured and supplied by Bedeschi — an Italian company which specializes in the manufacture of all kinds of material handling equipment for both onshore and offshore applications.

BRUKS Rockwood reports on recent coal equipment contracts

BRUKS Rockwood, headquartered in Alpharetta, Georgia, USA, is a major manufacturer specializing in designing, installing and maintaining bulk material handling systems for the paper, energy, port terminal and minerals industries. Its systems have a wide variety of uses, including coal handling. BRUKS Rockwood is a division of BRUKS Group headquartered outside of Stockholm, Sweden, and part of the JCE Group of companies. BRUKS Rockwood's innovative designs help manufacturers move their bulk materials more efficiently with automated systems that reduce labour and equipment costs, reduce product waste/loss, improve the quality of the delivered material, and reduce ongoing maintenance costs in harsh environments.

Product lines/services

BRUKS Rockwood offers a wide range of product lines for handling bulk materials — including coal — from material receiving, processing, storage, reclaim, and delivering to the process. Although the company custom designs equipment to suit nearly any application; its standard equipment supply for bulk handling includes truck unloading equipment, stacker/reclaimer technology, and shiploaders.

Each play a pivotal role in the successful operation of an efficient bulk materials system, with the most recent projects for BRUKS Rockwood including the handling of coal, sulphur, pril, petroleum coke, wood pellets, and biomass. Careful attention must be paid to each design for handling a variety of goods with differing material characteristics, from viscosity, delicacy, combustibility, and dusting.

Coal activity

Most of BRUKS' recent proposal activity with handling coal has been mainly in export facilities with a few domestic projects. Currently in the construction phase is its circular polar stacker at the Port of Lake Charles. Sitting atop a concrete pedestal this stacker is designed to store both coal and petroleum coke at the port before being reclaimed for export. In order to maximize the storage volume, this stacker is equipped with a shuttling feature that extends the stacking range an extra 70ft. Also coming off the ground is our most recent ship loader project at the Port of Portland. This shiploader is fixed and utilizes both slewing and shuttling to efficiently load vessels with fly ash, a byproduct of coal, at a rate of 2,450tph (tonnes per hour). This is the second shiploader BRUKS has provided for this terminal operator in the last two years; the other installation being at the International Marine Terminal in Port Sulphur, Louisiana. This machine was successfully commissioned in January 2012 and was delivered and commissioned in less than one year. With a design capacity of 5,000tph, this shiploader utilizes travelling, slewing, and luffing features to efficiently load coal into vessels in place. This design drastically reduces dock time and manpower requirements while providing maximum vessel size flexibility.

Another coal project going up is the company's 210ft radial stacker for a large utility company in the Midwest. This radial stacker travels along rails about its axis to build its pile at a rate of up to 1,000tph per hour. The contract was awarded based on the successful delivery and commissioning of a 220ft cantilevered coal stacker in April 2011. This cantilevered stacker is an integral part of the coal receiving system with an automated stacking capacity of 2,500tph. It is designed to build a circular/conical pile without the use of intermediate supports which provides for unobstructed access to the pile and the base of the machine.

Coal outlook

With new domestic coal projects slowing down, BRUKS expects most future projects will involve process improvements at existing plants. Fortunately, the terminal business should remain active.

Keeping control of dust in coal handling operations

The Raring Corporation (TRC) is a specialist in ADS™ fog-based dust control systems, which are ideal for controlling dust emissions in coal handling operations. Founded in 1984 by its president David Raring, TRC has provided dust control solutions in the Americas, Australia, Africa, India and Europe. With experience in both fog and water based dust control systems, David Raring brings experience and expertise to every project TRC develops.

TRC uses Agglomerative Dust Suppression (ADS™) , the *in-situ* collection of dust. Using no chemicals, properly applied fog prevents fugitive dust from contaminating its environs, agglomerating (clustering) with the dust and causing it to return to its source material.

Fog, or clouds, as cleansing agents are daily observed in nature; evaporated water condenses around small particles of dust, then agglomerate until the resulting clusters are large enough to return the pollution to earth as rain.

This technology works well in the most demanding environments, from extreme cold to extreme heat, from arid to humid environs. With a measured efficiency of up to 99.29%, TRC is justifiably proud of the solutions provided to its clients.

TRC's equipment is effectively used in many applications including rail and truck dumps, bins and hoppers, crushers, screens, and conveyor transfer points.

In order to effectively sell and support TRC's equipment, long-lasting partnerships with licensees and manufacturers' representatives exist throughout the Americas, Austral Asia, India, and other parts of the world.

During the past few years, TRC has developed a PLC-based control system which performs diagnostics and self corrective routines. Utilizing 3-D modelling to analyse dust and fog containment ensures optimum nozzle placement. With a constant air purge, TRC's nozzles neither freeze nor plug with dust.

Compared to dust extraction, the capital outlay for an ADS™ system typically costs one tenth to one half as much, operating costs are one quarter to one half as much and maintenance costs are minor, using only common hand tools. In addition to these benefits, the elimination each bag house also eliminates one point source of dust from the system, one less point to monitor and report.

Not only are the systems cost efficient, but they are also safer, as a dense blanket of fog absorbs carbon monoxide, thus reducing explosion risks. And any ignition source entering a fogged enclosure will be less likely to cause an explosion since its radiated heat is lost to evaporation.

Over the years TRC has successfully partnered with many clients to address their dust control challenges. In coal TRC's clients include producers such as Arch, Rio Tinto, BHP, Peabody, Rag, and Consol and users such as Detroit Edison, Southern Companies, Consolidated Edison, and First Energy. And TRC's equipment is used in coal ports from Madagascar to Patagonia.

Two of the company's recent contracts include a rotary rail dump for Detroit Edison and a ship loading facility for Mineria Isla Riesco:

- **Detroit Edison:** replaced an existing baghouse with a PLC based ADS™ system for automated dust control during train unloading.
- **Mineria Isla Riesco in Chile:** provided an ADS™ system to control dust at crushers and transfers to shiploading boom conveyors.

Nozzle boxes mounted on booms for access at barge unloading station.

Tripper conveyor with 'tent'-type enclosure to allow belt lift. Fog follows the coal flow but filters all dust trying to escape the enclosure

Nozzles operating in head box of tripper room conveyor. Note the fog follows the coal nicely into the chute allowing it to work on the dust as it becomes airborne.

High density fog being projected into the dump pocket on the spillside of a rail dump hopper.

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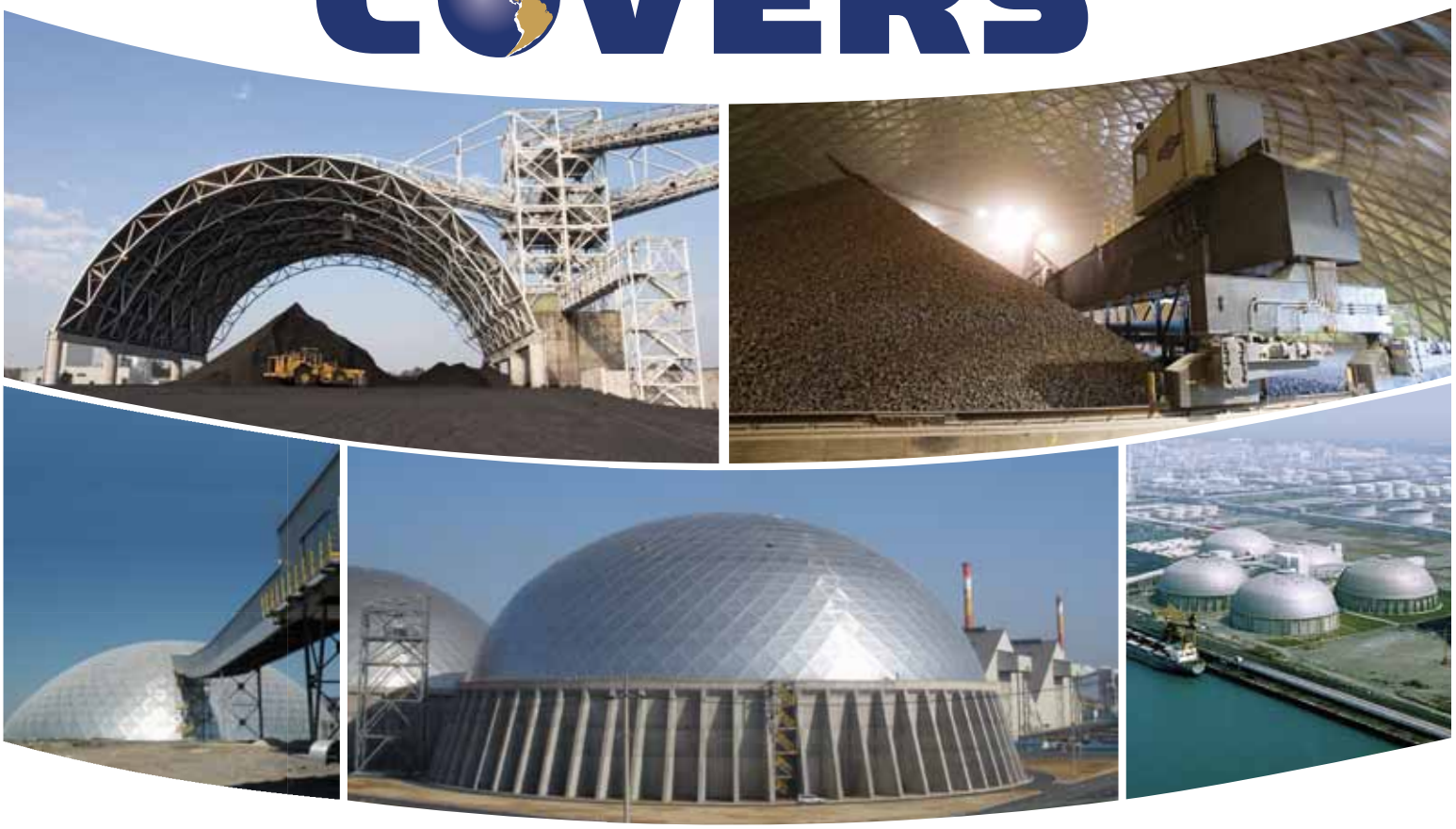

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Sandvik signs major coal mining systems order with Sasol

At the end of December 2012, Sandvik Mining signed a mining systems contract with Sasol Mining (Pty) Ltd for the Shondoni Mine Materials Handling project in South Africa. The value of the contract is approximately 650 million SEK and will contribute to Sandvik Mining's business during the years 2013 until 2015.

The order entails the supply of underground bunker and incline conveyor, surface bunker and overland conveyors for a new coal mine. The scope of supply includes engineering design (E), procurement (P) and construction (C) for the Shondoni Mine Materials Handling system.

"The size and complexity of this system and the fact that Sandvik provides a complete integrated mining system of Sandvik surface and underground mining equipment, again demonstrates our capability to deliver wide-ranging high-tech solutions in the area of continuous mining and materials handling applications," says Gary Hughes, President of the Sandvik Mining business area.

Similar conveyors.

The Sandvik Group

Sandvik is a global industrial group with advanced products and an excellent reputation in selected areas — tools for metal cutting, equipment and tools for the mining and construction industries, stainless materials, special alloys, metallic and ceramic resistance materials as well as process systems. In 2011, the Group had about 50,000 employees and representation in 130 countries, with annual sales of more than 94,000 million SEK.

Sandvik Mining

Sandvik Mining is a business area within the Sandvik Group and a leading global supplier of equipment and tools, service and technical solutions for the mining industry. The offering covers rock drilling, rock cutting, rock crushing, loading and hauling and materials handling. In 2011 sales amounted to about 32,200 million SEK, with approximately 13,200 employees (pro forma rounded numbers).

Verachtert Netherlands BV – specialist in work tools for excavators and wheel loaders

The Netherlands boasts a long tradition of supplying the world with innovative engineers and builders of large infrastructure projects. On the strength its centuries'-old experience in sea defences and water engineering works — brought about by necessity as most of the country lies below sea level — a slew of related supply industries has emerged servicing the country's burgeoning portside and infrastructure industries. One such supplier is the Dutch firm of Verachtert. In 2003, Verachtert became part of the Pon company, one of Holland's largest family businesses and the holding company of a group of companies operating in mobility-related industries in countries worldwide. With 60 years' experience in the trade, Dutch Verachtert has earned international recognition as a specialist in work tools for excavators, wheel loaders and cranes of all brands. From its home base in 's-Hertogenbosch (NL) the company engineers and sells products such as quick couplers, buckets, grabs, shears and hammers, which are widely recognized in the industry for quality and productivity. Its customer base includes international clients operating in earthmoving, road and water engineering, demolition, scrap metal processing, recycling, general industry and bulk handling. In many cases the products are designed and engineered to meet the customer's specific needs and wishes. All work tools are supplied inclusive of an extensive services package, covering expert advice in choosing the best tool for the job through to maintenance and repair services. Moreover, the company prides itself on being a major European supplier of pre-owned worktools.

Expanding grip

With its recent takeover of the Dutch DCC-grabs Verachtert has consolidated its position in the field of mechanical and electro hydraulic grabs. The newly acquired asset enables it to offer customers an even broader product portfolio. The takeover has also paved the way for the crew at Verachtert to start servicing related segments of heavy industry such as mining and quarry operations. The mechanical and electro hydraulic work tools made by DCC Grabs are engineered for maximum operational efficiency in bulk cargo handling, dredging and recycling industries.

High-volume coal buckets

Verachtert designed and sold three special coal buckets (CAT988 and CAT990) to the OBA and EMO terminals at the ports of Amsterdam and Rotterdam, which are part of the HES-group.

OBA's and EMO's activities concern unloading and loading dry bulk cargo from/onto sea going vessels, coasters, lighters, trains and trucks as well as bulk storage. The challenge with this particular order was to design the most efficient type of bucket offering both maximum storage capacity and resistance to wear. The CAT988 coal bucket packs a volume of 16,500m³, whereas the CAT990 bucket holds 22,500m³. The capacity of the machines was enhanced through integrated suspension, large jaw action and smart engineering, resulting in a significant reduction of the operational cost per tonne of bulk cargo handled. The bucket is constructed largely from Hardox and provided with chockey bars for extended operation. A perfect example of the type of customized solutions Verachtert offers for practically every conceivable situation.

Funnel bucket

The Vantec funnel bucket is used for efficient bulk cargo handling and will handle all type of dry, loose bulk cargo transfers. A funnel bucket uses a tipping mechanism along with a hydraulic valve for the controlled loading of bulk vehicles and/or train carriages with a wheel loader. It eliminates the need for expensive investment in a single bulk transport and storage system (conveyer belts, silos, etc.) installed in a permanent location. The funnel bucket is exceptionally flexible and, like any ordinary bucket, can be deployed anywhere. The funnel bucket is engineered and customized by Verachtert to match customers' specifications and the type of cargo to be handled. The advantages cited by the company include the hydraulically

controlled valve underneath the funnel bucket which enables controlled, reduced off-loading without spilling with a minimum of development of dust. Also, the funnel bucket saves on wage costs as only one operator is needed to operate the wheel loader and fill the bulk carrier. Measured loading/unloading of the funnel bucket is very fast (approximately 25–30 seconds for a 3.5m³ load), making this Vantec system highly efficient and the investment is soon recovered.

New Vantec customized products for every application

Verachtert is an official dealer for trusted brands such as Caterpillar and Engcon. With the Vantec range the company complements its portfolio with a line of tough work tool products based on extensive knowledge, built over many years' experience in the trade and reflecting a complete understanding of work conditions, materials, productivity and efficiency. All products are customizable to meet customers' specific needs.

Engineering solutions for coal storage and handling

Often, coal is stored in bunkers, silos or gravity-reclaim stockpiles at power plants. Unless properly designed, the storage system can experience flow problems such as flow stoppages, limited live storage capacity, feed rate limitation, etc. This is also true for self-unloading ships used to transport coal as well as for the surge hoppers and bins used to store fly ash and bottom ash. Similarly, if the feeder and transfer chutes are not designed properly, they can result in flow problems.

These problems can be avoided by properly designing or retrofitting the storage and handling systems.

Established in 1966, Jenike & Johanson is a major technology company which provides solutions for reliable storage and handling of bulk solids.

Problems solved/avoided by Jenike & Johanson equipment:

- flow stoppages or erratic flow due to arching and ratholing, in bunkers, silos and reclaim hoppers;
- limited live storage capacity in silos, bunkers and stockpiles;
- chute pluggages due to cohesive coals;
- limited flow rate, flooding, and dusting of fine coal and fly ash;
- premature wear of material contact surfaces; and
- solids handling equipment failure investigations.

Bulk solids handling problems are often the major cause of costly downtime and demurrage charges for many facilities, especially during startup. These same flow problems continue plaguing on-going operations by limiting throughput and creating safety and health risks, as well as reducing equipment life, increasing maintenance costs and causing premature equipment failure.

To address these costly problems, Jenike & Johanson has developed proven ways to design handling equipment that will promote reliable, smooth and unrestricted flow of bulk solids. Bulk solids handling equipment design should not be a trial-and-error approach; Jenike & Johanson doesn't guess at material properties, it measures them. It has one of the world's largest and most complete laboratories for characterizing the flow properties of bulk solids under representative environmental conditions. For over 45 years, Jenike & Johanson has focused on developing first principle theories on bulk solids flow and conveying behaviour.

Its services include:

- coal flowability study;
- silo, bunker, hopper design review and recommendations;
- belt/apron feeder and interface design;
- transfer chute design;
- calculation of material flow induced loads on silo and hopper walls; and
- training on solids flow and pneumatic transport

Jenike & Johanson combines test results and real world project experience, which yields the best solution in terms of reliability and cost-effectiveness. Its skilled and experienced engineers provide detailed structural and mechanical design of solids handling equipment, and routinely design stockpile and gravity reclaim systems, silos, feeders, loading and transfer chutes and custom equipment (e.g., standpipes, large slide gates, etc.).

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Conductix-Wampfler has one critical mission: To keep your bulk material handling operations running 24 / 7 / 365. You need proven, worry-free energy solutions - and Conductix-Wampfler has them. Our systems provide reliable electric power and water to stacker/reclaimers, barge and ship loaders/unloaders, bulk conveyors, tripper systems, and gantry cranes. Conductix-Wampfler systems are rugged, low maintenance, and time-tested in tough, dusty environments. All products are backed by the largest sales and service network worldwide!

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DELACHAUX GROUP

Bulk handling performance in India – setting new records with Liebherr

Liebherr mobile harbour cranes are mighty tools. In August 2012 Krishnapatnam Port set a new record for unloading coal using advanced Liebherr mobile harbour cranes (LHM). The state-of-the-art machines discharged 122,247 tonnes of coal in just 24 hours. This new record surpassed Krishnapatnam's previous record of discharging 106,171 tonnes in just 24 hours, set in July 2011.

In April 2012, two Liebherr portal cranes of Adani Petronet Dahej Port Pvt. Ltd. (APPPL) broke the old record for coal discharging. A total of 60,077 tonnes of coal were unloaded in just 24 hours with two LPS 600s, the award-winning model in the category 'Crane of the Year' at the International Bulk Journal Awards 2011.

The LHM 600 is capable of handling bulk at up to 1,800tph (tonnes per hour) in standard configuration. The Liebherr Portal Crane (LPS) is an efficient combination of a space-saving portal and the proven mobile harbour concept. Particularly on narrow quays, individual portal solutions permit trains and trucks to travel below the portal. Due to the closed hydraulic system and an electronic system which is military proven and tested, Liebherr technology is absolutely resistant to all types of dust and dirt.

Liebherr's Cycoptronic® ensures sway-free load motion. This optional tool automatically initiates dynamic counterbalancing movements and equalizes transverse and longitudinal sway of the load while operating at maximum speed. Additionally, Cycoptronic® extensions Teach-In and Vertical Line Finder are available. If efficient bulk handling is required, Teach-In feature is an optimal extension to Liebherr's anti-sway system. This point-to-point control for semi-automatic operation pilots the crane to pre-determined loading and unloading points at the highest possible speed. If one of the predefined points is reached the crane automatically stops. Furthermore, automatic steering to target points without any load swing and the possibility to stop crane motion at any time leads to a notable increase in both safety and speed. The Vertical Line Finder guarantees that the boom is exactly vertically above the load, thereby preventing side loading of the crane for a longer lifetime.

Liebherr offers a wide range of mobile harbour cranes and additional supporting tools in order to guarantee efficient bulk handling for ports worldwide.

Liebherr mobile harbour cranes in India

Early in 2004, the first Liebherr mobile harbour crane started operation for South West Port Limited in Mormugao, India. Seven additional deliveries in the same year marked the beginning of a success story. Since then the Indian Liebherr crane population has grown steadily as more and more terminal operators opted for Liebherr's advanced mobile harbour cranes. Now, more than 60 LHMs load and unload cargo, mainly bulk, in Indian ports and 2012 was another strong year for Liebherr

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mobile harbour cranes in India.

Another very positive aspect is the high penetration of electric drive, Liebherr's alternative drive system allowing for eco-friendly land-based power supply. Approximately every second LHM delivered to India is equipped with E-Drive.

Furthermore about 90% of all Liebherr mobile harbour cranes delivered to Indian customers are operated in four rope configuration. This highlights the importance of bulk handling for the Indian port industry.

A close look at the order intake in recent years proves that there is a global trend towards stronger machines. That's why demand for Liebherr's high-capacity cranes increases year by year. The strongest mobile harbour crane, type LHM 600, has a maximum lifting capacity of 208 tonnes.

PLM CRANES

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PLM products:
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- **Mobile cranes**
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Types:
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Capacities:
- **Up to 8000 tm and 5000 ton/hour**

The PLM 4030S (40 ton on 30 meter) with PLM gantry based on its own pontoon.
The pontoon can be moved to surrounding ports or can be used for "Mid-stream operations".

The bucket wheel unloader allows to unload an entire hopper to shore in only two hours (up to 5000 m^3/hour). The ten-metre wide bucketwheel, is moved for-aft on a trolley over rails and then lowered a bit after each fore-aft pass. The bucketwheel discharges onto a hydraulically driven conveyor belt system, ending with a 46 meter long shore belt.

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Two Doosan new generation wheel loaders launched

The new generation DL200-3 and DL250-3 wheel loaders by Doosan Infracore Construction Equipment — which are ideal for handling coal and other bulk commodities — combine high engine power with a number of new features to minimize fuel consumption and provide better operator comfort, exceptional performance, ease of handling, easier serviceability and extended durability.

High operator comfort

The DL200-3 and DL250-3 wheel loaders feature a new cab design offering better visibility thanks to a wider front glass section and an extended wiper blade area. Now that the reservoir for the wiper water is located on the outside of the cab, space inside has been increased, providing more foot room. The air conditioning system is regulated automatically by a temperature sensor.

A new instrument panel has an integrated VCU (vehicle control unit). The control panel has been redesigned for more convenience, allowing the operator to choose the information they wish to have displayed. Using the main menu, the operator has access to several functions and machine information. Data such as pressure, temperature and engine speed can be monitored in real time. The operator and service staff are able to get detailed information via the special menu.

The cab has a new cool box compartment to keep cans and food fresh. There is also more storage room behind the seat.

Access to the cab is easier thanks to an improved hand rail and steps. The width and length of the mud guards have been increased to provide cleaner access to the cab.

Lower fuel consumption

The DL200-3 and DL250-3 are both powered by the Doosan DL06K 'common rail' 6-cylinder turbocharged diesel engine meeting Stage IIIB engine emission regulations through the use of exhaust gas recirculation (EGR) and diesel particulate filter (DPF) after-treatment technologies.

Three working modes — ECO, NORMAL and POWER — allow optimum fuel consumption for different applications. With the 'power-up' function, the operator can manually adjust to the next highest working mode by applying a full stroke of the accelerator pedal. With this feature, the operator can travel in NORMAL mode and switch to POWER mode when it is needed, such as when taking material from a pile. The ECO bar provides information about fuel consumption in relation to machine performance in real-time, allowing the operator to select the driving mode for the best fuel efficiency.

The operator can set a password for machine start. If auto idle is activated, engine speed goes down about 200rpm after 10 seconds if there is no machine movement. Auto idle is ideal for applications with longer waiting times, such as truck loading. Thanks to auto idle, fuel consumption is reduced by up to 8%.

Improved hydraulics and differential axles

Like all the new generation Doosan wheel loaders, the DL200-3 and DL250-3 models are equipped with load sensing controlled, variable hydraulic piston pumps, improving performance and reducing fuel consumption. With load sensing, the hydraulic pumps receive a signal from the MCV (main control valve) informing how much oil is needed. This helps to save on engine performance.

With the clutch cut-off system engaged, the driver is able to disconnect the transmission from the engine by operating the brake pedal in order to have 100% engine performance for the hydraulic system. As a result, movements are faster, breakout force is maximized and fuel consumption is reduced. The brake pressure for activation can be adjusted by the operator.

New ZF limited slip Type II differential axles provide more durability and a longer lifetime. Rolling resistance for the axles is reduced, improving traction and decreasing fuel consumption. As an option, customers can choose ZF axles with a hydraulic differential lock. This function is engaged via the operator pedal or in automatic mode, depending on the torque resistance in first and second gear. The hydraulic lock system offers less rolling resistance than the limited slip system.

The radiator fan is hydraulically driven and controlled by the ECU (electronic control unit). Changing the fan direction for cleaning the radiator can be done manually from the cab without having to switch off the engine. Fan reverse intervals (30 minutes to two hours) can be set via the menu.

Durability and serviceability

On both wheel loaders, the lift arm has been strengthened with thicker metal in the tilt lever.

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FLSmidth

An automatic front control system allows the operator to save one low and one high position. The boom raise 'kick-out' function reduces cycle times. 'Return to dig' positions can also be saved.

New kinematics and a larger cylinder on the lift arm have allowed the main pressure in the front hydraulic system to be increased, with a corresponding increase in breakout and lifting forces.

The SKF Vogel auto lubrication system, which improves the lifetime of the machine and increases operational hours for better productivity, is available as an option.

A larger opening angle for the side door makes it easier to service the machine. Swing-out side doors provide easy access to the rear for cleaning the new one-block radiator.

Increased space in the engine compartment ensures that components such as filters, valves and batteries are within easy reach for service work. The operator can set and monitor the time remaining to the next service. If the maintenance period is exceeded, a pop-up warning will appear.

As well as offering more standard features than some other machines of their size, there is an expanded choice of options for the DL200-3 and DL250-3 wheel loaders, including electric steering. With bucket capacities of 2.0m³ and 2.5m³, respectively, the DL200-3 and DL250-3 wheel loaders are intended to meet a wide range of material-handling needs from loading and transporting granular material to industrial, mining and quarrying applications.

COMPARING THE DOOSAN DL200-3 AND DL250-3 WHEEL LOADERS

	DL200-3	DL250-3
Capacity, heaped:	2.0m³	2.5m³
Static tipping load, straight:	8,906kg	11,000kg
Static tipping load, at 40°	7,760kg	9,500kg
Static tipping load, at 37°	7,900kg	10,000kg
Length with bucket:	7,340mm	7,720mm
Width with bucket:	2,550mm	2,740mm
Height:	3,280 mm	3,280mm
Bucket hinge height:	3,858mm	3,900mm
Dump height (at 45°) with bolt-on teeth:	2,817mm	2,750mm
Dump reach (at 45°) with bolt-on teeth:	1,064mm	1,225mm
Wheel base:	2,900mm	3,020mm
Turning radius, bucket edge:		6,100mm
Maximum travel speed (4th gear):	38km/h	38km/h
Engine:	6-cylinder Doosan DL06K EGR, delivering 119 kW at 2,100rpm	6-cylinder Doosan DL06K EGR, delivering 128 kW at 2,100rpm
Operating weight:	12,300kg	14,400kg
Breakout force:	9,700kg	12,400kg

Optimizing coal supply chains from Pit to Port with QMASTOR software

Triple Point Technology's premier QMASTOR software solutions drive bottom line improvements by enabling mining companies to achieve optimized, efficient, and effective coal and mineral supply chains. QMASTOR solutions manage over one billion tonnes of bulk commodity movements each year with customers including BHP Billiton, Rio Tinto, Vale, Anglo American, Xstrata, and Peabody Energy.

QMASTOR products manage the tonnage, quality, and value of coal and minerals from 'pit' to the point of export or consumption. They help companies reduce operational, logistical, marketing, and commercial costs by optimizing and automating the management of complex supply chains that include multiple mines, stockpiles, transport legs/modes, and ports. Solutions include:

- **QMASTOR Pit to Port™** — a decision support system enabling management to plan, record, track, optimize, account, reconcile, and report the tonnage, quality, and value of materials from the mine to the point of export or consumption. Pit to Port synchronizes operations, logistics, marketing, and commercial functions for a transparent view of export, import, and domestic supply chain operations across the enterprise.

- **QMASTOR PortVu®** — an award-winning integrated bulk terminal management system that manages the complexities of stockyards, inter-modal transportation, and vessels while ensuring equipment is scheduled and utilized efficiently. PortVu integrates terminal operations with suppliers, customers, transport providers, agents, laboratories, and other partners through the use of a common platform. PortVu can be interfaced to a terminal control system to provide necessary information on stockpile position for yard equipment instructions, task and route management, vessel load and hatch plans, and belt weightometers for accurate data reconciliation and reporting.

- **QMASTOR Horizon™** — an advanced planning and scheduling system enabling complex supply chains to be modelled, planned, and scheduled simply and efficiently. The solution utilizes a business rules-based engine coupled with manual and automated scheduling mechanisms for optimized planning and scheduling based upon site-specific sets of strategies and weighted key performance indicators. Horizon can be used across the entire supply chain, or for specific processes and functions including terminal stockyard asset utilization and inventory management.

- **QMASTOR SMS3D®** — a stockpile management solution that tracks and visualizes parcels of material in three dimensional space. Dynamically models stockpile tonnage, grade, and value in real-time to enable proactive grade management and optimize process plant configuration, blend planning, and reclamation/load planning. SMS3D delivers extremely accurate tonnage and quality forecasts, and simplifies blend planning to ensure deliveries are within specification.

Triple Point also offers bulk vessel freight chartering and coal trading and risk management solutions for more broad-based mining companies. Consulting and supply chain management training is also available through Triple Point's QMASTOR QML Services division.

Triple Point solutions have been recognized industry-wide for delivering a significant, measurable return-on-investment with awards including the International Bulk Journal IT Solutions award and the Australian Bulk Handling IT Solutions award.

About Triple Point Technology

Triple Point Technology® is a renowned global provider of on-premise and in-cloud Commodity Management software that delivers advanced analytics for optimizing end-to-end commodity and energy value chains. The company provides innovative solutions for managing all aspects of volatile commodity supply chains: trading, procurement, enterprise risk management, logistics, scheduling, storage/inventory, processing, settlement, and accounting. Triple Point's Commodity Management platform enables over 400 customers in 35+ countries to profitably manage exposure to energy and raw materials across industries including energy, metals, minerals, chemicals, agriculture, shipping, consumer products, food and beverage, retail, and manufacturing. Triple Point was named a 'Leader' in Gartner's ETRM Magic Quadrant for its completeness of vision and ability to execute in 2009, 2010, 2011, and 2012. Founded in 1993, the company employs over 850 staff in 15 offices and support centres around the globe.

Wear-resistant linings improve productivity and reduce equipment costs

Cargo holds being lined with K-PLAS polymer wear-resistant lining systems.

Wear-resistant lining specialist Kingfisher Industrial explains how it has sustained its competitiveness within the dry bulk cargo handling market. By successfully carrying out projects within the UK and overseas, the company continues to be at the forefront of the market, providing turnkey packages for process plants and process equipment.

"Here at Kingfisher, we carry out a number of activities that help us gain that competitive advantage within the marketplace," says managing director John Connolly. "By using our own skilled engineering project management and site-based operatives, we can undertake a vast majority of engineering, design, manufacture and online installation. With the integration of both manufacturing processes and operational activities, we have made continuous investments in new design software and CNC manufacturing machinery, thus reducing the risk of non-conformance through protracted supply chain and eliminating the costs of third-party overheads and margins."

The economic benefits of using wear-resistant linings were proven recently at a major coal import facility within the UK which supplies various power stations with their bulk material. Kingfisher's commercial and exports sales manager commented, "We were assigned the project to reline two ship unloaders on the plant, due to the high levels of abrasion and wear caused when handling coal." Kingfisher recommended lining both unloaders with a combination of its K-PLAS polymer and K-CLAD metallic lining systems.

Many power stations are converting from coal to the use of biomass material. Due to the high abrasive nature of these materials, incorporating a wear-resistant lining system within a plant's process equipment is an ideal solution. Kingfisher has been working with a number of power plants that are converting from coal to biomass. One notable project took place towards the end of 2012, in which it was important to design, manufacture and install spiral chutes to transfer wood pellets into the storage/feed bunkers. The design brief for Kingfisher

The spiral chute designed by Kingfisher for a power plant, to handle wood pellets.

Kingfisher was tasked with designing a spiral chute that would provide an uninterrupted flow of wood pellets, without causing any material degradation.

Industrial was to provide a continuous, uninterrupted flow of wood pellet biomass without causing any material degradation to the product itself. The complete project was contracted to Kingfisher Industrial, whose experience in bulk material handling solutions enabled it to deliver the final solution, from design to installation, within just five months.

Kingfisher's overseas presence has increased over the last couple of years; recently it was approached through an overseas agent to provide a solution for a coal terminal in Asia Pacific. The project involved the replacement of coal transfer chutes. Due to the abrasive nature of the material conveyed, and the existing chute design, the structure of the chutes had been compromised. The result was that the operators were experiencing continual blockages when handling coal from Indonesia, which has a natural high moisture content. With no consistent material flow, this caused misaligned material discharge affecting belt tracking and the life of the conveyor belt.

The solution offered by Kingfisher was to re-design the conveyor chutes. This process incorporated enhanced structural geometry, providing a consistent flow of material through the chute preventing blockages and provided central discharge onto the receiving conveyor belt. By installing a combination of wear-resistant and low-friction lining materials, service longevity and operational availability are both ensured.

Following installation and commissioning, the benefits were immediately apparent. There has been a reduction in demurrage charges, reduced maintenance costs and the elimination of operational downtime, as there has been a significant reduction in the need to unblock the chutes.

In terms of bulk materials, potash is another popular mineral that is considered highly abrasive. Potash is a combination of various mined and manufactured salts that contain potassium. A project carried out in 2012 involved a large bulk cargo handler, which currently delivers 500,000 tonnes of potash by sea each year. The port also handles third-party cargo, including 250,000 tonnes of export grain and other bulk minerals. Kingfisher was awarded the full turnkey project to re-design, manufacture and install another conveyor chute. The company won the contract as a result of successful past projects carried out for the plant.

Kingfisher is able to demonstrate the different types of lining solutions available throughout the process of handling coal within a bulk terminal. Starting when the coal arrives at port, the company has developed various lining solutions that protect and enhance the performance of the reception hoppers, the conveyor system, stacker reclaimers all the way through to the rail loading facility. Throughout the process, equipment is subjected to impact, friction and sliding-induced abrasion. By installing a combination of K-ALOX, K-BAS, K-ZAS and K-CLAD materials, this takes into account the differing levels of wear at various points in the transfer system. The linings are supplied in various thicknesses, offering guaranteed long-term protection against perforation of the fabrication. This protection last 10–12+ years, and gives the end-user a long-term, cost-effective solution.

About Kingfisher Industrial

Kingfisher Industrial provides wear-resistant solutions for process plants used to convey, process or store bulk solid materials, in either dry or hydraulic states. Such plants often suffer premature wear due to handling large quantities of materials at velocity in a constant operational cycle. With its range of ceramic, metallic and polymer protection systems, Kingfisher can overcome wear problems; engineering suitable protection systems that can add many years of life to a plant, and in some cases outlast the design life of a process completely. These solutions cater for the operating criteria, budget and life cycle of either new equipment — particularly when initially installed — or existing equipment, which can be retrofitted with a protection system to add to its current asset value.

SMAG'S PEINER GRABS: seizing the attention of the coal market

For more than 60 years, Salzgitter Maschinenbau AG — SMAG for short — with its product, PEINER grabs, has stood for quality and customer satisfaction in the field of bulk goods handling. The wide range of grabs and lifting equipment (turnover business year 2011/2012 of € 105m) allows SMAG to provide the right answer to every customer request in the field of geared bulk vessels. Owing to its many decades of expertise in development and construction of grabs, its customers have put their trust in the company and relied on PEINER grabs, particularly in the difficult market situation of recent years. To further develop this expertise, the company makes above-average investments in the research and development of products. Thus new designs and alternative materials are continuously brought into serial production. An example of the current development is an orange peel grab with a capacity of 56m³ and a weight of 30 tonnes. The goal of SMAG is to continuously improve its products while taking into account the requirements of the market.

At SMAG, the customer is always the centre of attention. The size, shape and dead weight of grabs may vary and, therefore, be tailored in every respect to the needs of customers. PEINER grabs are adapted both for lifting devices and for each application to always find an optimal solution.

SMAG offers a wide range of grabs suitable for coal handling. PEINER four-rope dual scoop grabs (VSG) achieve maximum efficiency through the optimum balance between dead weight and crane capacity and also require low maintenance. Ideal for loading and unloading coal from ships are PEINER scissor grabs (SCG). Based on the scissor principle and the double reeving of the closing ropes, the SCG is the fastest and most efficient grab for coal handling. It goes without saying that electro-hydraulic grabs from SMAG are a good choice when it comes to coal handling as well. Last year, SMAG manufactured various grabs for coal handling projects in Asia, Europe and South America, for example PEINER four-rope dual scoop grabs with a capacity of 32m³ (Poland) respectively 34m³ (Brazil) and PEINER Scissor Grabs with a capacity of 30m³ (Indonesia).

A well-proven alternative to motor grabs, especially for countries with weak infrastructure, is the PEINER radio-controlled single rope grab. It is particularly suitable in this case because it is not only compatible with many lifting devices (a simple crane hook is enough), but also impresses with its user-friendliness and versatility. Using spill and kick plates, the grab can be adapted for a variety of bulk materials and therefore is suitable for handling coal, too. Thus, within a very short time, any deck crane can be used for bulk goods handling without additional equipment. An external power supply is not required.

The maintenance is reduced to a minimum thanks to the use of high-quality materials such as HARDOX and WELDOX in combination with an optimized design. It keeps the life-cycle costs as low as possible. A modular design allows the use of standard parts in different grab models, which greatly simplifies the storage and results in faster response times in the production of new machines and after-sales management. Thanks to the intelligent design, it is also possible to match up high grab capacities with low dead weight.

Apart from the quality of PEINER grabs, SMAG is notable for its global service and dealer network that offers the customer a round-the-clock customer service. In addition to the assembly and start-up provided by its technicians, the company also offers training for the operating personnel. Thus SMAG's customers get everything from one source.

A very important factor in the entrepreneurial thinking are the issues of environmental protection and sustainability. Environmental protection does not begin only when the grab is finished. Both at the work preparation stage and in the production process, care is taken to reduce the impact on the environment.

In addition, SMAG strives to keep the environmental impact associated with the use of grabs as small as possible. This is especially the case when it comes to coal handling — an environmental friendly solution is very important. A number of features make it possible to minimize the loss of bulk materials and dust. In addition to dust covers, these include special sealing systems on the side and bottom lips. The use of steel sealing strips, rubber-sealed lips, overlapping bottom and side lips or special side toothing prevents bulk materials from trickling down. In contrast to the competitors, SMAG's four-rope dual scoop grabs are also designed with just one, rather than two scoop pivot points. This results in such movement of scoops that ensures a synchronous closing and excludes any offset between scoops.

Dust fogging systems offer safe dust control to Powder River Basin coal users

In the material handing industry, it is no secret that the handling of coal can create dangerous levels of dust and environmental challenges. According to David Gilroy of Dust Solutions Inc. of Beaufort, South Carolina, his clients' safety concerns about coal dust generally falls into two categories: exceeding safe respiratory dust levels that can lead to long term health issues; and explosions or fires that can result in serious injuries, death and/or damage to their facility. Environmental regulations are becoming stricter and public pressure on the coal industry is ever increasing.

In the past ten years, many coal-fired power plants in the United States switched from high sulphur content bituminous coal to low sulphur content sub-bituminous coal from the Powder River Basin (PRB) in Wyoming, in an effort to reduce

Dry foggers using only 3g.p.h./13 litres per hour at head chute feed point

stack emissions. They soon discovered that their existing dust control systems were not able to deal effectively with the dustier, more friable, coal and sought out more effective and safer systems. In many cases these plants and the PRB coal mines that supply them, replaced dust collection systems with more effective, and inherently safer, dry fogging systems.

In 2008, the United states Environmental Protection Agency (EPA) conducted a review of New Source Performance Standards for Coal Preparation and processing plants as required by the Clean Air Act. In reviewing what emission control technologies are available and the cost of the control the EPA issued draft rules essentially requiring bag house dust collection systems for sub-bituminous coal handling and solicited public comments on these draft rules.

The reaction to the draft rules was a flood of end user testimony that detailed major concerns with proposed requirements to use bag houses including worker safety (explosion and dust exposure), end results, cost and ability to monitor dust levels:

Their major points were:

- filter dust collectors pose unreasonable fire/explosion hazard;
- they do a poor job of reducing employee dust exposures; and
- they can episodically cause large purges of uncontrolled dust to enter the environment.

Testimony from one PRB Coal Mine stated that the US Chemical Safety Board data shows that 18 % of all incidents and fatalities involved dust collection devices. That amounts to 21 deaths and 134 injuries from 1980 to 2004, so clearly this is not a safe method of dust control in a combustible dust environment.

Based on this evaluation, the US EPA should be advocating

Dry fog nozzle injects the fog at a conveyor head chute. Inspection door is open with conveyor not running for photo.

replacement of dust collection devices, where possible and practical.

The testimony stated other reasons for urging the EPA to actually ban baghouses from combustible coal dust handling facilities. It indicates that baghouses use 2.5 times as much energy as their fog systems, are extremely noisy, and are dangerous to maintain.

The PRB Mine submitted a cost comparison study on various dust control technologies. It shows fogging as being the lowest O&M cost system over 30 years.

Passive enclosure chutes (PECs) have a higher cost of 1.33 times higher than dry fog. Wet scrubbers come in at 1.54 times the cost, and baghouses vary between 2.57 and nearly four times

Dust Solutions Inc.'s modular system with stainless steel enclosures for marine environments.

the cost of fogging, depending on whether baghouses are upgraded or replaced. The cost benefit ratio ranges from $14.40 per tonne for fogging up to over $57.00 dollars per tonne for new baghouses.

Based on the new testimony, the EPA revised its final rule and identified four technologies that they classified as 'best demonstrated technology' (BDT) for controlling dust from sub-bituminous coal and lignite coal handling.

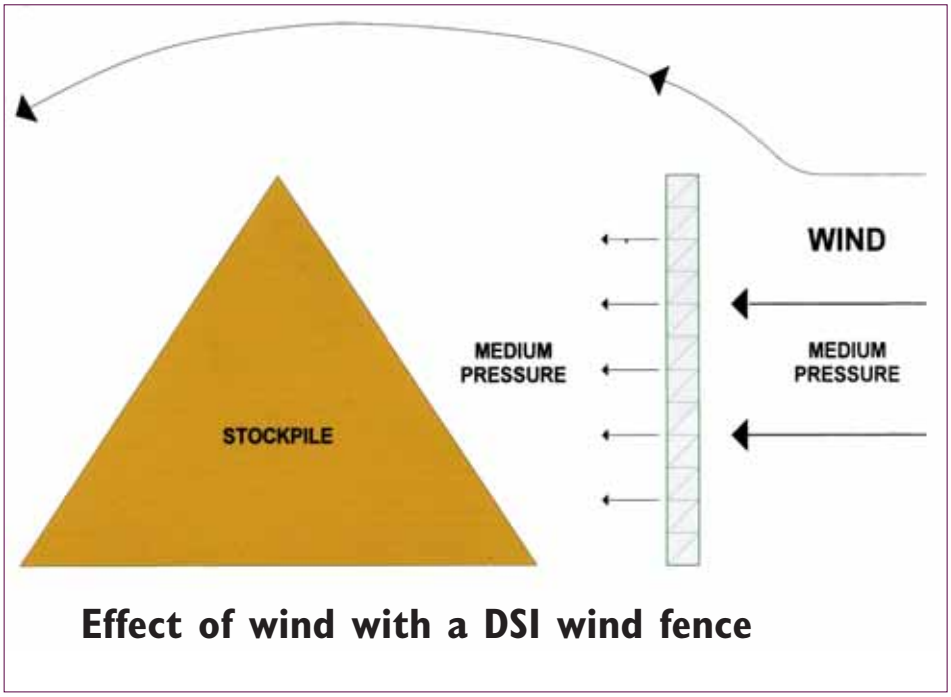
- fabric filters (baghouse);
- passive enclosure containment systems (PECS)
- fogging systems
- wet extraction scrubbers

It should be noted that chemical systems are not part of the BDT for sub-bituminous coal and lignite

Dust Solutions Inc. (DSI), specializes in dust suppression for

PRB coal, as well as for other materials. It has successfully implemented its Dry Fog™ dust suppression system to suppress dust from a variety of bulk material handling scenarios for many years. These include, conveyors, ship and barge loaders and unloaders of all types including grab hoppers, rail car and trucks dumps where dust collection is too expensive or not practical.

The DSI system uses plain water and compressed air to produce a blanket of very dry fog (microscopic water droplets that are the same size as the floating dust particles 1 to 10 microns). These micron-sized droplets are injected at the point of dust creation where they impact airborne dust particles. The slightly wetted particle becomes cohesive enough to stick to other wetted particles where their combined weight makes them fall back into the process. Explosion risks are greatly reduced in part because no explosive waste stream is created as the dust is never collected.



Effect of wind with a DSI wind fence

The mass expansion of the water can produce enough fog to cover the surface area of half a US football field using one gallon of water. Typical moisture addition is less than 0.05% making this system attractive to firms with moisture sensitive materials such as coal, and virtually eliminates any reduction of BTU value. No expensive chemicals are required to make the water more 'wet' to overcome surface tension since the system operates at a sub-micron level. Operating in below freezing temperatures is possible as fog lacks sufficient mass to freeze, a phenomenon know as 'cloud physics'. For cold climates, equipment freeze protection is offered in the way of heated and insulted enclosures and supply lines.

DSI uses a modular format that simplifies installation. This saves time and money by allowing most of the installation to take place with the plant in operation (reduced shut-down time). DSI engineers each system to customer's site-specific requirements.

The EPA also developed new rules for controlling dust from open storage piles. The new regulations are asking for an emissions plan that requires one or more control measures to minimize fugitive dust to the greatest extent possible. Constructing a 'wind barrier' or wind fence is one of the stated control measures.

Dust Solutions Inc. is the only supplier of DustTamer™ wind fence systems using specially designed materials that are typically installed on column supports on the upwind side of the pile. For a wind barrier to be effective, it must allow some air to move through it. A semi-permeable wind fence allows a certain percentage of air to bleed through the fabric, equalizing the air pressure on the down wind side of the fence thus reducing air velocities over the pile. This results in reducing the amount of dust that is typically blown into the air where it can go off site.

DSI wind fence, protecting a coal stockpile.

The benefits of wind fences go beyond environmental compliance. The 'dust' is really product that can be lost at a significant rate. Reducing the amount of product lost can offset the cost of the fence, sometimes in a matter of months or a few years. Worker safety can be enhanced by the reduction of airborne dust and flying particles resulting in less exposure to respiratory dust and eye injuries.

In conclusion, the EPA review process as mandated by The Clean Air Act provided more than just rules, it provided a resource of end user testimony for the coal industry to draw upon and helped identify cost effective cutting edge dust control technology or as they term it 'best demonstrated technology'. Testimony is available online from the EPA. DCi

Mobile shiploading system commissioned

Two mobile hopper feeders and two radial telescopic shiploaders loading the flexible fall pipe vessel at speeds of up to 1,500tph.

Telestack supplies customized shiploading system to Van Oord

Telestack has recently installed and commissioned a fully customized mobile shiploading system for Van Oord, to load over 100,000 tonnes of aggregate to Handymax vessels. Van Oord is a major international dredging and marine contractor, which is known for its marine ingenuity. The project consisted of effectively loading material to vessels for a gravity-based structure for the offshore platform. The material was stocked on site in the Ishikari Bay, Japan, loaded to the vessel via the Telestack mobile shiploading system and transferred north to the off-shore platform for unloading. The material was unloaded with the unique Nordnes flexible fall pipe vessel from Van Oord to act as scour protection as the GBS was accurately positioned and lowered to the sea-bed for its final positioning. The material was also unloaded to the sea-bed to protect the oil/gas lines. This project will form the largest offshore production platform in Russia to date.

The fully mobile systems consist of two radial telescopic shiploaders and two mobile hopper feeders which are used to load 0–380mm (0–12'+) sized material to Handymax vessels at speeds of up to 1,500tph (tonnes per hour). The unique and customized design of the units, comprised of heavy duty designs and engineering to meet the rigorous requirements of loading the large material onto the vessel, while ensuring the longevity of the equipment. This was done through extensive design and engineering by Telestack to meet the needs of the application, directly from initial enquiry through to full installation/ commissioning and operation of the mobile system.

Each mobile system is fed by two CAT 972 front-end loaders

Mobile hoppers and shiploaders loading material ranging in size from 0–380mm to a Handymax vessel.

Heavy duty mobile hopper fed by two CAT 972 wheel loaders to feed mobile shiploader.

at rates of up to 600–700tph each. They feed the wheel-mounted hopper feeders, which include a heavy duty apron chain belt feeder for the large lump size of material which feeds directly to the radial telescopic shiploader. The mobile hopper is wheel mounted, which allows it to be towed easily around the site as required. The feeder belt includes a variable-speed drive to control the speed of the belt, depending on the specific lump to limit any damage at the transfer points and roll back of the larger diameter material.

The 254,000dwt *Nordnes* vessel was loaded/trimmed using the radial and telescopic features of the Telestack shiploader. The flexibility of these features to trim the holds of the vessel makes it possible for all areas to be loaded without stopping the feeding equipment (mobile hopper). All functions of the shiploader and hopper are controlled via an all-function radio remote control; the operator can stand on the vessel and easily trim the holds, while viewing the loading procedure. These features ensure the feeding of the shiploader can be maintained, reducing production downtime and increasing loading rates. Before Telestack was issued the contract, Van Oord had considered fixed length

Radial telescopic shiploader trimming the hatch from one single feed-in point (telescopic arm extended).

Radial telescopic shiploader trimming the hatch from one single feed-in point (telescopic arm retracted).

shiploaders (not telescopic) but decided against this design, because of the inflexibility and loss of production capacity with this design, by having to stop the feeding equipment and move the entire system to load and trim the vessel effectively.

The shiploaders include heavy duty skirting on both the outer and inner conveyor to ensure the larger material is secured on the belt during loading for safety and to ensure material remaining on the belt until discharge into the holds.

Mobile system in operation loading the Handymax vessel at speeds of up to 1,500tph.

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Another key reason for the purchase of the Telestack shiploading system by Van Oord, is the transport of the equipment. Also of great importance is the added flexibility of moving the units around the site and the shipping of the units worldwide, which are both key for Van Oord. The ability of the Telestack equipment to be used on site to finish a project, then either packed into 40ft containers or lifted directly into a vessel, allows Van Oord to easily move these units anywhere in the world, to meet the needs of their diverse range of applications, e.g: from shiploading to stockpiling to reclaiming. This means that Van Oord does not need to own or rent any fixed equipment at specific ports, as it owns and operates it own Telestack mobile shiploading system.

Radial and telescopic features in operation loading the hold of the vessel.

These points are expressed further by Gerry Mensink, Ship Management Department, plant Design and Construction, Van Oord as he states, "The reason we selected Telestack for this project was their track record in working with large blue chip companies and experience of a range of applications within ports, mines etc… The designing and engineering of the equipment was very important for us to handle this size of material, as well as reliability to load the vessel on time, to eliminate the possibility of expensive demurrage charges. Also, we continue to appreciate the on-going commitment of Telestack in our future projects."

The mobile shiploading system is already in transit for another project in Australia, which will be operational in the coming months.

DC

Skip conveying in

Fig 1: Copper mine in Indonesia (photo: Mr Papajewski [TKF]).

Technological approach to optimizing cost and energy efficiency in hard rock mines

Opencast mines for copper, iron ore and other materials, including gold, frequently take the shape of an inverted cone, with the ore and overburden mined by blasting and then transported away by truck/shovel operations, *writes Dr. Ing. Franz M. Wolpers of ThyssenKrupp Fördertechnik.*

Mine trucks weighing between 106 and 260 tonnes and carrying payloads from 136 to as much as 400 tonnes transport the materials from the bottom of the pit via unpaved roads and slowly rising, winding tracks to the dumping area outside the mine pit or to the crusher station several hundred metres above at the top of the mine. The ore is reduced in a crusher station, and in larger mining operations is then transported away via overland conveyors at a rate of 10,000tph (tonnes per hour) and more.

ThyssenKrupp Fördertechnik — a supplier of mining, crushing, processing and materials handling systems — is developing and has patented a mining method that allows ore and overburden in hard rock mines to be transported more efficiently and with significantly lower environmental impact. It involves an integrated conveying and processing system that makes it possible to avoid heavy truck transportation in inverted cone-shaped opencast mines.

A rope-driven conveyor system transports complete truckloads of material in skips travelling on tracks inclined at up to 75° by the shortest route to the crusher station at the mine head. Like a freight elevator, as one loaded skip moves upward, an emptied skip moves in parallel downward to the bottom of the mine .The two skips are connected via a rope system, pulleys, and a traction sheave drive system at the top of the mine such that the dead weight of the skips is fully balanced at all times and no unnecessary lifting power needs to be expended.

This article describes the new system and provides technical and cost comparisons with conventional heavy truck transportation.

The major advantages of the new system are highlighted through a concrete example and may give operators food for thought when planning or redesigning mines in the future.

Fig. 1 above shows a typical opencast mine for copper and gold ore with its steep banks and winding roads. The photo shows one of the world's biggest copper/gold mines in Indonesia. It extracts and processes around 220,000 tonnes of copper/gold ore per day in truck/shovel operation.

Looking at the photograph closely it can be seen that heavy-load trucks or mine trucks are moving up and out of the mine in a train-like formation on ramped roads, travelling at average speeds of around 15–20km/h.

The line of trucks works its way upwards on largely unpaved winding roads with gradients of up to 9% until it reaches the top of the mine. The trucks carry ore from the bottom of the mine to the crushing station at the top, as well as overburden to dumping areas outside the mine.

In the Freeport opencast mine in Indonesia (see Fig 2 on p134), six crusher lines operate in parallel. TKF equipped the mine with the world's biggest ever gyratory crushers, of type 63"x114". To transport ore and overburden the mine uses a fleet of up to 220 trucks. The loading capacity of the individual trucks is between 240 and 400t. Fig. 2 shows one of these trucks with a load of fine ore. For a maximum payload of e.g.

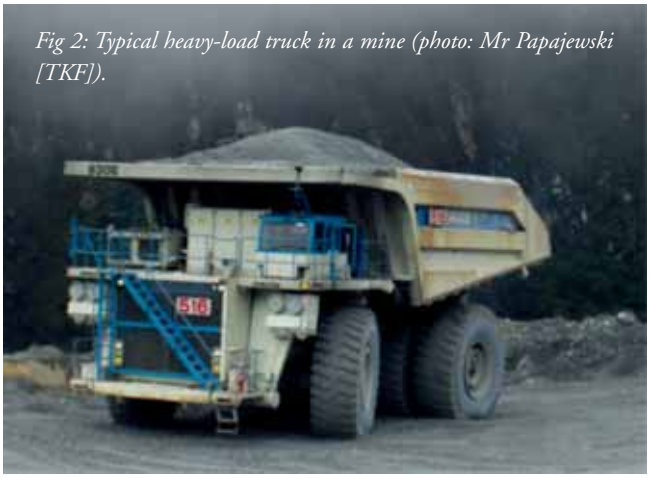


Fig 2: Typical heavy-load truck in a mine (photo: Mr Papajewski [TKF]).

240t the dead weight of the truck is already around 160t depending on truck manufacturer. So to carry 240t of payload, 160t of deadweight has to be moved.

A fleet of fully laden trucks drives up to the crusher station at the top of the mine. After unloading into the crusher or onto the overburden dump, the empty trucks drive back down into the mine by a separate route. One truck cycle in an average pit can take between 20 and 40 minutes.

To reduce the truck fleet and the associated investment, labour and operating costs, larger trucks with payloads of up to 400t are being used as mines get ever deeper and distances ever longer. A truck like this has an average deadweight of 260t and an installed diesel engine output of almost 3,000kW.

In this report TKF presents a technical solution for the quasi-direct transport of the ore from the bottom of the mine or an intermediate level to the crusher station and further transport of the crushed ore or overburden on overland conveyors to processing and handling points or overburden dumps.

To avoid heavy-load truck traffic in inverted cone-shaped opencast mines TKF is developing an integrated conveying and processing method described in detail in the following (see Fig 3, below). To allow technical/financial comparison, the mine is assumed to have an incline of 45–55°. The vertical rise for transporting overburden or ore is assumed to be 200m from the bottom of the mine or an intermediate level to the crusher station at the top.

The conveying and processing system consists of an HLT

Fig 3: Integrated skip conveying and crushing system.

(Heavy Load Truck) tipping station at the bottom of the mine, two skips running in opposite directions on a ropeway system with an average payload of 136t ore/overburden, and a track system for the two skips. At the top of the mine is a crusher station with headframe and discharge equipment for the crushed material. The electromechanical rope drive system is arranged separately from the skip emptying and crushing stations.

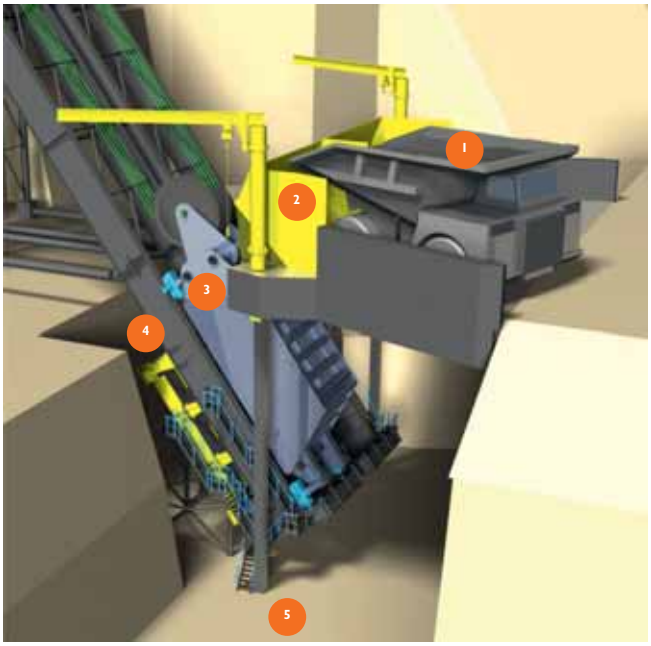


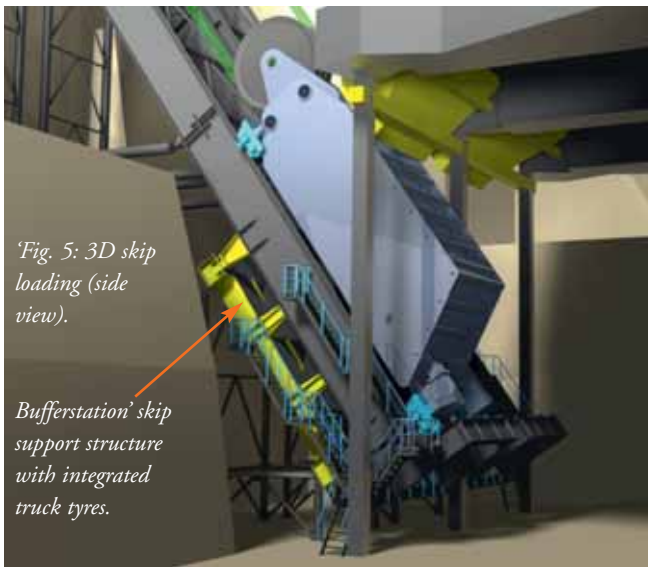
Fig. 4: Bottom of mine – skip loading. 1: Trucks for skip loading; 2. Loading structure with chute; 3. One of the two skips in loading level; 4. Travel track for the two skips; 5. Working field in ground of mine.

Trucks shuttle to and fro over short distances between the point of loading by the mine shovel and the feed station for the skip conveyor. Via an access ramp, loaded trucks reverse alternately into the tipping station. The skip is designed to take the full truck load plus a 10% weight tolerance. Dynamic loads caused by impacting material are absorbed among other things by the skip hanging in the rope system. Impacts on the skip discharge flap are cushioned safely by stationary pneumatic-tired buffer stations. During skip loading, rope sag on the transport section decreases and the ropes undergo additional extension. The resultant positional change of the skip, of up to 900mm, is limited by a stop and is allowed for in the size of the opening of the feed chute.

Figs 5–6 show two views of the loading station in the bottom of the mine for illustration.

Once the skip has been filled by a truck, it is pulled up on a track to the crusher station by a rope hoist, over a vertical rise of 200m.

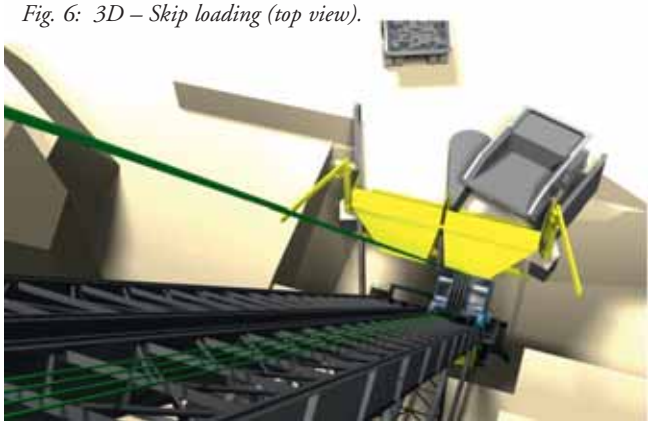
In the skip working sequence (see Fig. 7 on p135), similar to a freight elevator, as one loaded skip moves upward, an emptied skip moves in parallel downward to the bottom of the mine. The

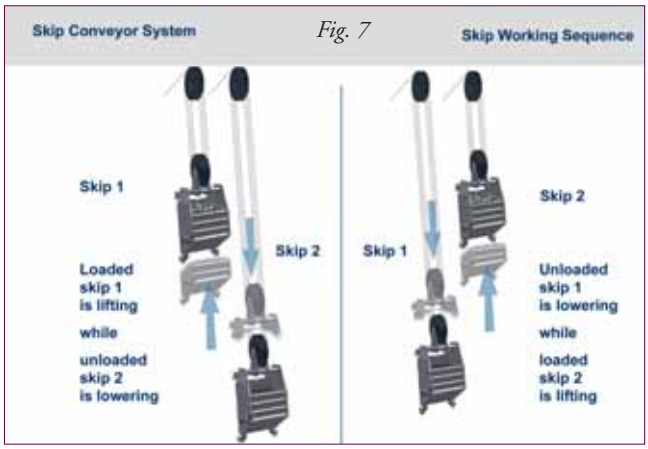


'Fig. 5: 3D skip loading (side view).

Bufferstation' skip support structure with integrated truck tyres.

Fig. 6: 3D – Skip loading (top view).





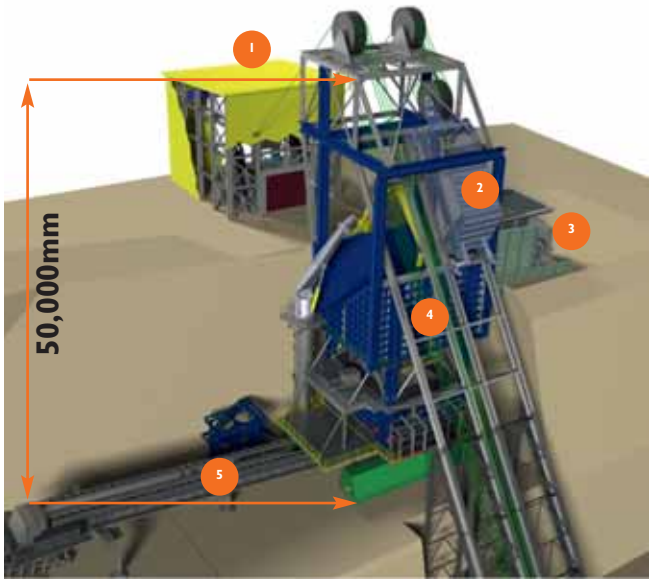


Fig. 8: Skip conveyor system. 1. Drive station; 2. One of two skips; 3. Emergency or redundant truck load off; 4. Crusher with bunker; 5. Discharge and overland conveyor.

two skips are connected via a rope system, rope sheaves and a traction sheave drive system at the top of the mine such that the dead weight of the skips is fully balanced at all times and no unnecessary drive power needs to be expended.

Once it arrives at the top of the mine (see Fig. 8), 200m above, the loaded skip is moved into the crusher station emptying position with a predefined time lag. At the same time the second — empty — skip is positioned in the skip loading station at the bottom of the mine.

The skip headframe with rope sheaves and steel structure is an integral part of a semi-mobile or stationary gyratory crusher station with feed bin, crusher and discharge conveyor.

When the skip moves into the highest conveying position above the crusher feed bin, the skip discharge flap opens automatically or under remote control. Over a period of roughly 25 seconds the material drops out of the skip into the crusher storage bin. While this is happening the second skip is filled at the bottom of the mine.

The crusher or redundant station is additionally equipped with an emergency truck charging system, a crane for maintenance work and a hydraulic breaker for breaking up oversize pieces of ore. Below the gyratory crusher is a discharge conveyor. This continuously feeds a conventional overland conveyor with crushed ore or overburden for transport away from the mine area.

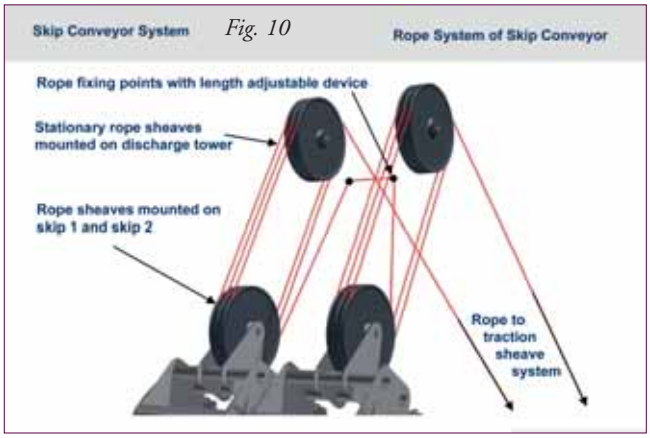
The rope drive system — described in detail later — is anchored in a separate station roughly 30m away from the crusher and the edge of the mine. The overall height of the crusher station with headframe is roughly 50m — pretty tall but not unusually so.

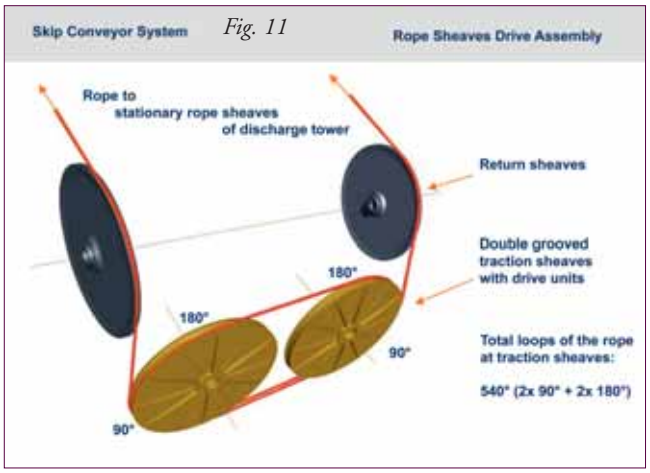
Fig. 9: TKF Freeport crusher.

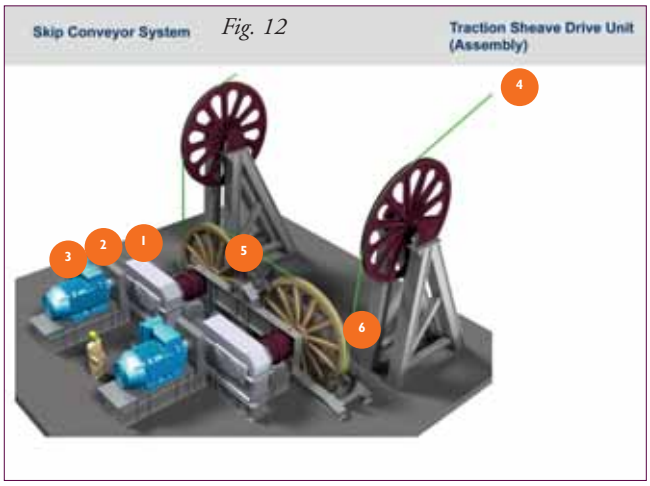
ThyssenKrupp has three crusher stations in operation in the Freeport mine in Indonesia (Grasberg) — see Fig. 9 above. Ore and overburden are crushed by the world's biggest ever crushers of type 63" x 114". A single crusher station has a capacity of 10,000tph. The overall height of the crusher station is 47m, almost comparable with the height of the crusher/skip system described here.

To reduce the rope load and limit the drive moments (see Fig.10 on p136), each skip is suspended in a hoist. In the present case the rope has a diameter of 54mm and runs over six rope sheaves per skip with a sheave diameter of 4,320mm. The two rope ends are firmly anchored in the headframe by means of an adjustable length compensation system.

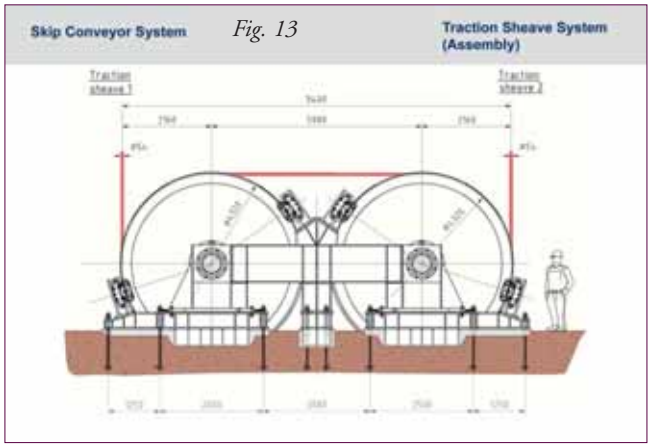
The rope leading from the hoist (see Fig.11 on p136) in the headframe runs over a diverter sheave in the drive station and is





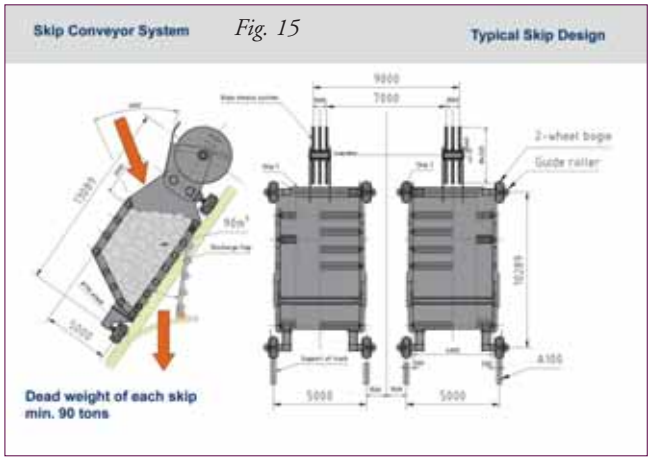


1. Helical gear; 2. Disk brake; 3. AC-motor; 4. Rope (ø 54mm); 5 & 6. Two drive sheaves (ø 4,320mm) with safety brakes.



led over two double-groove traction sheaves and a further diverter sheave to the second skip hoist. The drive moments of the two 1,300kW rated motors are transmitted without virtually any slip through a total loop of 540° by the two yellow traction sheaves.

Fig. 12 shows a top view of the two identical drive units. Each drive train consists of a variable-frequency asynchronous motor, a disc service brake, a helical gear unit, a flexible coupling and a double-groove rope sheave fixed to the drive shaft by clamping elements. The diameter of the rope and traction sheaves is determined among other things by the German mining standard TAS (Technical Requirements for Shaft and Inclined Haulage Systems). This requires the ratio of sheave diameter to rope diameter to be greater than or equal to 80. For a 54mm rope a sheave diameter of 4,320mm was chosen. The rope safety factor is greater than 7.



In addition to the service brakes in the drive train each traction sheave is fitted with safety or holding brakes (see Fig. 13).

The drive system (see Fig. 14) described here is not new. The two-sheave drive system has proved successful in numerous heavy-duty elevators and ropeway systems. Fig. 14 shows a typical ropeway drive system in Switzerland. The drive power is 2 x 1,150kW, the rope diameter 58mm and the sheave diameter 4.6m.

Details of the design of the skips are given below.

In this concrete case (see Fig. 15 above), the skip for a truck load of 136t — corresponding to 75m³ — of ore is 4.0m wide, roughly 13m long and has a fill height of

5.0m. The skip has a design capacity of 90m³ and requires a deadweight of around 90t to guarantee power transmission in the rope drive system. The quantity and size of the bogies are determined by the steepness of the track, the rail profile and the admissible wheel contact pressure. In this case a two-wheel bogie with 710mm wheels was provided at each skip corner, matching the A100 rail. Side guide rollers are additionally fitted on each bogie. Ore is fed into the skip through an opening below the rope sheave system. When the skip moves into the emptying station the discharge flap automatically opens to discharge the material.

The skips have a locking mechanism (see Fig. 16) on either side for unlocking and locking the discharge flap. Once the skip reaches the topmost conveying position an external actuation mechanism releases an unlocking system and an external hydraulically driven opening device opens the discharge flap in a controlled manner. Once the skip is emptied after around 25s and the trip down has begun the flap is closed by thrust rollers activated by the two external hydraulic cylinders and safely locked by the locking mechanism.

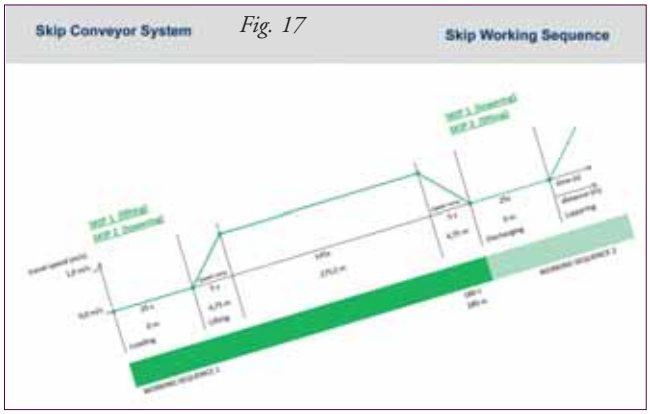


Fig. 17 shows a typical work cycle from skip loading to unloading. For a rise of 200m on an incline of 45° to 55° the skips have to cover a total distance of 285m. With a maximum rope speed of around 11m/s and six-part reeving, the skip speed is 1.9m/s (around 6.9km/h). Skip loading takes 25s and occurs while the second skip is emptied at the top station. Skip acceleration and deceleration require 5s.

A complete conveying cycle from loading to unloading therefore takes 180 seconds or three minutes; i.e. trucks with 136t of payload can drive into the tipping station at the bottom of the mine every three to five minutes.

Fig. 18 summarizes the design of the conveying and crushing system for the chosen example.

FIG. 18: TYPICAL TECHNICAL DATA

Material to be handled:	ROM (run of mine) ore
Material size:	max. 1.2 × 1.2 × 1.2 m, max.1.7m³
Material density:	1.8t/m³
Truck payload:	75m³ (max 150t), rated 136t
Skip loading volume:	90m³ (approx.)
Number of skip	2 (1 of 2 is loaded in working sequence)
Vertical transfer distance:	200m (approx.)
Inclination of travel way:	45–55°
Skip working sequence:	20 x luffing (lowering)/hour (approx.)
Bulk handling capacity:	2,720tph (design) average cap. 2,000tph
Motor power:	2 × 1,300kW
Travel speed of skip:	1.9m/s (approx.)
Rope speed:	11.4m/s (approx.) ≤14 m/s
Rope system:	6×
Rope diameter:	54mm (approx.)
Traction sheave diameter:	4,320mm
Rope sheave diameter:	4,320mm

A system was analysed to convey ore with an average density of 1.8 t/m³. Trucks with an average payload of 136t are used to load the skips. The vertical rise is 200m over an incline of 45–55°.

The rope system and drive system with 2 × 1,300kW drive power is designed for 20 cycles per hour and a handling capacity of 2,720tph. It can be assumed that this design will be capable on average of conveying over 2,000tph of ore or overburden.

The table in Fig. 19 on p138 compares typical parameters of the two systems 'skip conveying' and 'truck traffic'.

For an average handling rate of 2,000tph of ore, seven trucks with a payload of 136t must each travel 2 × 2,500m on a road with an incline of 8% or 4.6° to overcome a vertical rise of 200m.

If the moved payload is set in relation to the deadweight of a truck, which must be multiplied by two due to the empty trip back into the mine, the transport efficiency for the trucks is just 37%.

The ratio of payload to truck weight is a very unfavourable 1.2. With the skip system the deadweight of the skips is completely balanced. The drive system does not have to expend additional energy to transport the empty skip.

The comparison of installed power shows 2,600kW for the skip system and 7 × 1,082kW = 7,574kW for truck traffic, giving a ratio of installed power of 1:2–3.

If we compare the use of manpower — excluding crusher and maintenance personnel — 20 to 25 truck drivers per day will be needed for multi-shift mine operation, plus one driver each for a water spray truck and a grader for road upkeep.

One significant factor with the two systems is their CO_2 footprint. If a skip conveyor is used instead of the truck system in the example discussed with a handling rate of 2,000tph of ore, CO_2 emissions can be reduced by up to 29 tonnes per day.

There are many advantages of the skip conveying system over customary truck transport in steep-slope mines.

The combination of tested technologies for the use of a skip conveyor offers:

- up to 50% lower transport costs within a mine;
- the shortest conveying distance through use of a steep incline conveyor;

FIG. 19 SYSTEM EFFICIENCY

Comparing conventional truck traffic with the new skip conveying system in an opencast mine (2,000tph ore, 0–200m mine level)

	Skip conveying	Truck traffic
System	2 skips, 136 tonnes	7 x trucks, 136 tonnes each
Transport – distance	0.29km (55° slope)	2 x 2.5km (4.6° slope [8%])
Transport efficiency (moved payload/moved power effective total load)	100%	37% (136/[2*113.5+136])
Ratio payload/truck weight	—	136/113.5 = 1.2
Total installed power	2 x 1300 = 2600 kW	7 x 1082 = 7574 kW
Ratio of installed power truck traffic/skip system	1 :	2–3
Manpower (without crusher operation and maintenance staff)	0	20–25 truck drivers per day + 1 waterspray truck driver + 1 grader driver (road-refurbishment)
CO_2 — reduction compared with truck system	29,000kg CO_2/day	—

- energy saving: energy needs to be expended only for transporting the payload. The deadweight in the system is completely balanced by the second, empty skip;
- the crusher station can be positioned at the top of the mine or at an intermediate level; and
- a significant reduction of CO_2 footprint due to reduced truck traffic.

The advantages of skip conveying compared with truck transport include:

- environment-friendly technology with minimum noise and dust emissions;
- higher availability as the system remains fully available in bad weather conditions (snow, fog, rain);
- reduced costs for mine road upkeep and maintenance of remaining trucks to supply ore to the skip system;
- lower operating and personnel costs; and
- last but not least, lower investment costs as the truck fleet can be significantly reduced

As mentioned at the beginning, ThyssenKrupp Fördertechnik is currently developing this innovative skip conveying system with integrated ore/overburden crushing. The company is studying the design of drive and conveying components as well as investigating technical implementation for a suitable mine. Obviously such a system would have to be adapted to actual mine conditions and the technical/financial aspects of using the system would have to be clarified in advance — together with the mine owner. DCi

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