



DRY CARGO

international

ISSUE NO.177 FEBRUARY 2015



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■ Global Coal Trades

■ Coal Handling

■ India Regional Report

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Coeclerici's Floating Transfer Station (FTS) Bulk Celebes during operations. The FTS is part of a fleet comprising four units working for PT Berau Coal to perform coal loading operations at Muara Pantai anchorage in Indonesia.

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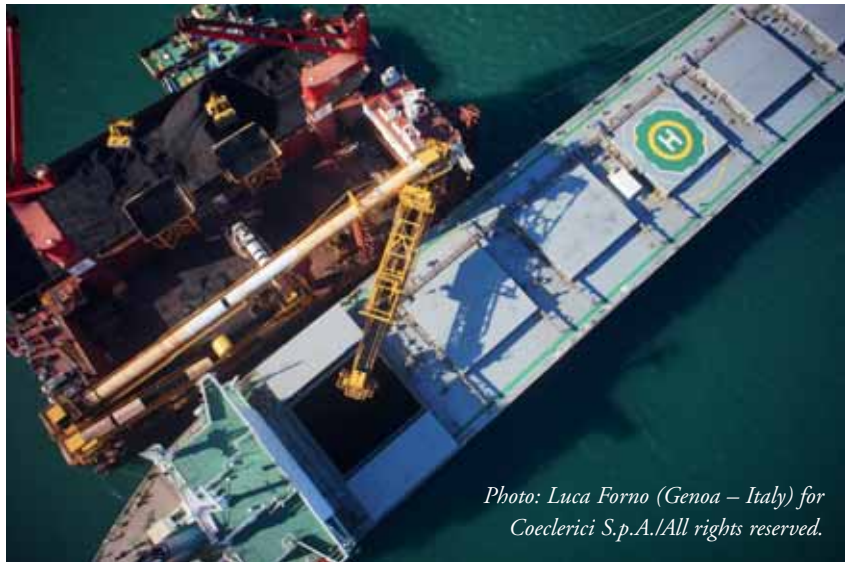


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ISSN 1466-3643

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Coal trade trend changing

Global seaborne dry bulk trade grew fairly briskly last year, but the expansion rate estimated was noticeably lower than seen in the three preceding years. Restraining influences affecting commodity import demand became more prominent, and this slackening pattern may continue during 2015.

The IMF's latest forecasts of economic growth, published towards the end of last month, provide some limited encouragement about the background for trade. World GDP is predicted to increase at a slightly improved pace of 3.5% in 2015, compared with 3.3% in each of the past two years. A boost from lower oil prices is expected to have a favourable impact, but some negative factors including weak capital investment spending could offset the benefit.

COAL

Although the volume of international coal trade in 2014 cannot be calculated accurately until more information is available, it appears that the total was flat or possibly down slightly. This outcome represents a marked change compared with the strong expansion trend seen previously.

Weakness in the steam coal sector was especially evident, and some parts of the coking coal sector also receded, as shown by table 1. One very visible negative influence was a sharp downturn in China's coal imports (including low-quality lignite), from 327mt (million tonnes) in the preceding year, to 292mt, an 11% reduction. Currently there are no clear signs of an improvement over the twelve months ahead.

IRON ORE

Among raw materials importers, steel production in 2014 was only slightly stronger in many countries. Japan's crude steel output was flat at 111mt, while China's vast steelmaking industry achieved a marginal 1% increase, to 823mt. In the European Union, production rose by 2% to 169mt. Larger rises were achieved by Taiwan, up by 4% to 23mt, and South Korea, 8% higher at 71mt.

Despite this fairly subdued backdrop, iron ore trade expanded very strongly, mainly because of China's still rapidly growing import demand. Imports of iron ore into

China jumped by 14%, reaching a vast total of 933mt. The upwards trend may continue during 2015 as well, according to many forecasters. Lower international iron ore prices make imports more attractive compared with ore from Chinese domestic mines, some of which is being displaced.

GRAIN

Since the middle of last year grain trade has weakened, mainly as a result of lower imports into Europe and China. Both of these importers experienced good domestic grain harvests in mid-2014, ensuring ample supplies and enabling foreign purchases to be reduced.

However, earlier forecasts of a 4-5% decline in world wheat and coarse grains trade during crop year 2014/15 ending June are now seen as too pessimistic. Revised International Grains Council estimates published in late January show trade decreasing only slightly by 2%, to 300mt. Currently, it is too early to estimate trade progress from mid-2015 onwards, which is dependent on unpredictable weather in importing and exporting countries.

MINOR BULKS

Weakness in global minor bulks trade, over the past twelve months, reflected a steep downturn in China's imports of several items in which this country has become a dominant buyer. Figures show China's nickel ore imports down by 24% in 2014, to 48mt, while bauxite and alumina imports fell by 45% to 42mt. Prospects for a rebound in the year ahead are unclear at present.

BULK CARRIER FLEET

Additional cargo-carrying capacity joining the world bulk carrier fleet last year was lower than seen in the preceding period, continuing the downwards trend. An estimated 49 million deadweight tonnes of bulk carrier newbuildings was delivered by shipyards, as shown by table 2, a 22% reduction.

Based on order book schedules, tentative indications suggest that in 2015 an increased volume will be completed, possibly accelerating the fleet growth rate.

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

	2009	2010	2011	2012	2013	2014
Japan	65.6	76.6	68.7	70.5	77.0	74.0
South Korea	16.0	23.4	25.9	25.7	26.5	30.0
Taiwan	9.4	10.2	10.7	10.5	11.0	11.0
China	34.5	47.3	44.7	53.6	75.0	60.0
India	29.0	35.0	33.0	35.5	39.0	48.0
Total of above	154.5	192.5	183.0	195.8	228.5	223.0

source: various & BSA 2014 estimates

* estimate

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

	2009	2010	2011	2012	2013	2014
Handysize (10-39,999dwt)	5.3	8.4	10.2	10.4	6.2	5.4
Handymax (40-64,999dwt)	10.5	19.0	22.0	20.9	14.6	11.3
Panamax (65-99,999dwt)	6.7	14.4	22.2	27.0	20.0	13.5
Capesize (100,000dwt and over)	21.0	38.6	45.6	41.9	22.1	18.8
Total	43.5	80.4	100.0	100.2	62.9	49.0
% change from previous year	+76.8%	+84.8%	+24.5	+0.2	-37.2	-22.1

source: Clarkson Research & BSA 2014 estimates

* estimate

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World coal trade 2015



In Canada, plans to double the capacity of Ridley Terminals to 25mtpa by the end of 2015 have been delayed by up to five years.

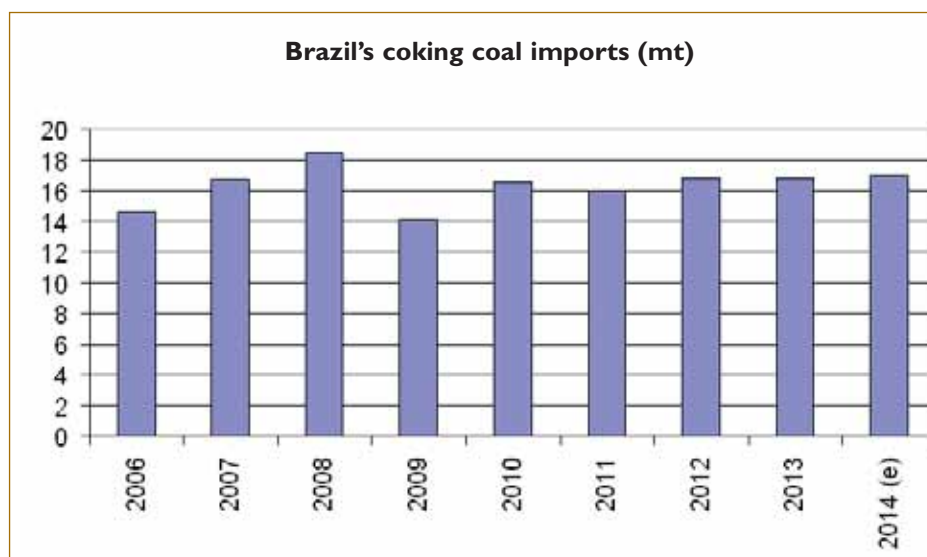
Dr Tim Jones, e-coal.com

The past year has been a struggle for coal producers with depressed prices continuing to hinder the international markets. Those miners who are able to increase volumes in order to survive have been doing so, while others have been forced out of business. Major players have been closing offices in key trading hubs which is an indicator of the state of the industry.

Russia's involvement in Ukraine has been an ongoing concern for the coal industry over the past year, with the major producing region around Donetsk being affected. Economic sanctions on Russia have had a serious impact on some operators and there does not appear to be any sign of improvement there for the foreseeable future.

In the Atlantic market, thermal coal prices for deliveries into the ARA markets have slumped to the lowest level since 2006 recently and have since been volatile in an uncertain market in Europe. Low freight rates are combining with low coal prices to give this result. At the moment, there is likely to be an oversupply situation in this market for some time because the suppliers in Colombia and Russia have not been cutting back production amid the current slump in coal prices.

More coal is available from South Africa as well when needed by buyers in Europe and the Mediterranean. During the past year the price of thermal coal has decreased by some 25% or more for some brands. The slump in the price of oil has helped producers reduce their overall costs and this has not led to significant cuts in output. The Colombians, Russians and South Africans have benefited from weakening currencies as well when they sell their tonnage in the international market in US dollars. Most producers, however, appear to be continuing to operate at



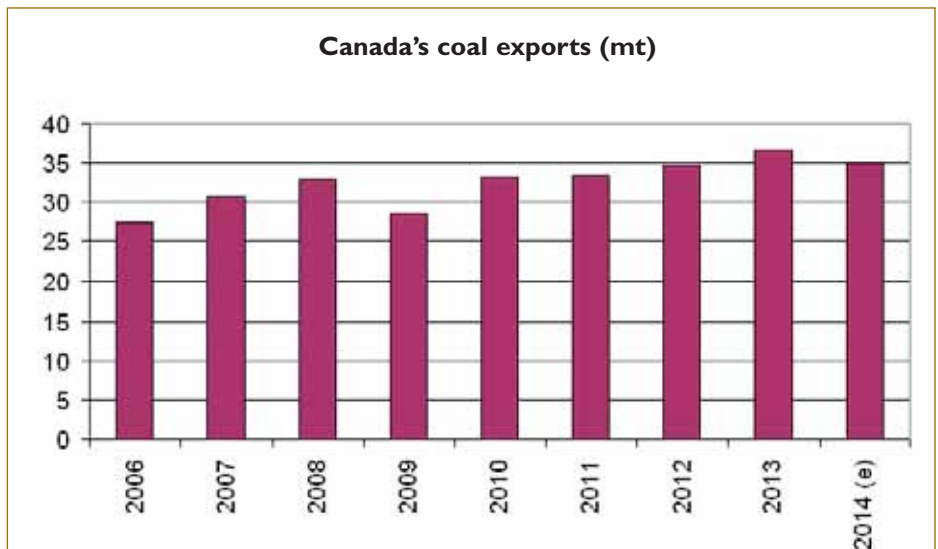
very tight margins. The latest threat to Russian shippers is the increase in rail rates which counters any benefit they have gained from a dramatic fall in the value of the rouble.

The accompanying charts indicate the trend in spot prices for thermal coal in the major markets around the world in 2014 and in recent years.

The latest data from the US east coast ports indicate that coal exports remained lower in November compared to last year. During the ten months to October, coking coal imports had increased by almost 75% compared to the same period last year. Low prices for all grades of coking coal, however, continue to squeeze producers in all regions, and the latest deals show little sign of improvement in the foreseeable future.

In recent corporate news, in Australia the share price of BHP Billiton sank to a five-year low in December. Low oil prices and

Canada's coal exports (mt)

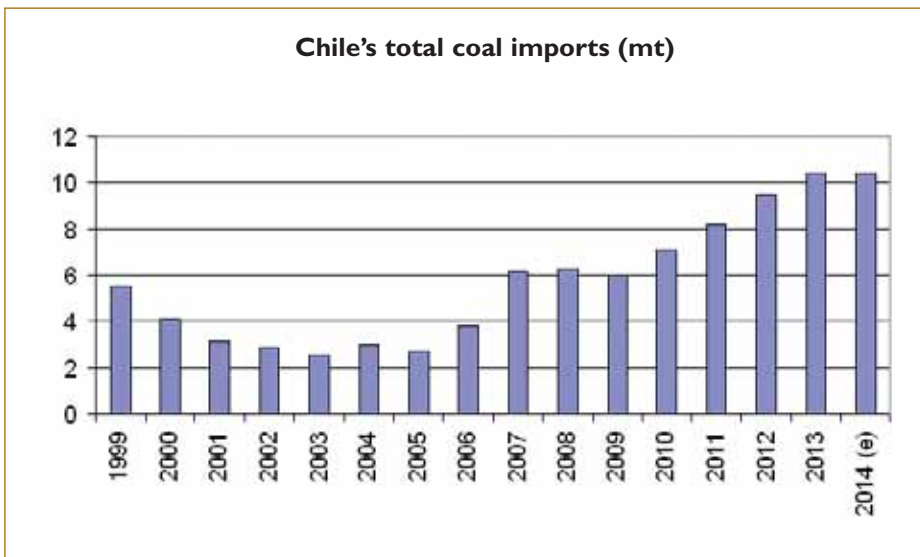


increase of 21.1%. Total sales of hard coking coal reached 19.13mt which was an increase of 25.7% and weak coking coal sales were higher by 12.9% to reach 5.53mt. Meanwhile, thermal coal produced by BHP Billiton recorded an average price of

US\$60/t FOB which was a decrease of 18.9%. Sales volumes were higher in Australia and South Africa, recording an increase of 3.2% and 14.1% respectively, to reach 10.01mt and 17.05mt. Market conditions were not, however, the reason for a decrease in sales from the company's Cerrejón operation in Colombia. This was attributed to low rainfall, and a decrease of 6.6% to 5.81mt was recorded.

In contrast to BHP Billiton, Rio Tinto produced less coal across its operations in 2014. Australian hard coking coal production was 8% lower at 7.1mt but this was due to the company concentrating on its thermal coal operation at the Hail

Chile's total coal imports (mt)

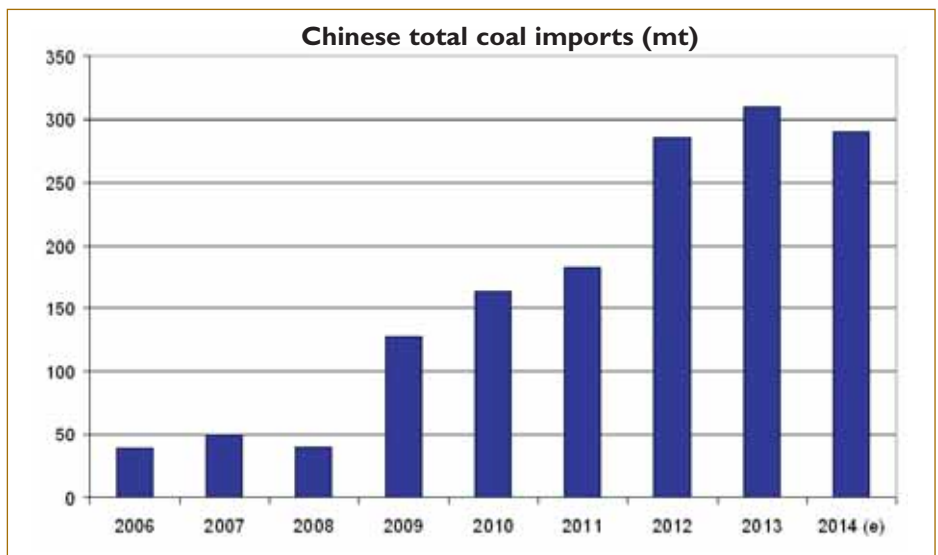


the expectation that iron ore prices will remain historically low have played a major part in the slump over the past few months. The price of coking coal produced by BHP Billiton remains low. The company's average price for coking coal decreased by 23% during its first half of the 2014

financial year. The average price of hard coking coal of US\$110/t FOB (free on board) was down 22.5% compared to the same time the year before. Weak coking coal prices were down 20.7% at an average of US\$90/t FOB. As mentioned above, high production levels are contributing to the oversupply situation in some coal markets, and during the first half financial year BHP Billiton set another production record at its operations in Queensland and the Illawarra region in New South Wales. The company's share of production reached 26.31mt (million tonnes) which was an

Creek mine, and a longwall change at the Kestrel mine. Production of semi-soft coking coal reached 3.2mt in 2014 which was a decrease of 17%. Overall production from Rio Tinto's Australian operations reached 21.5mt in 2014. This was a

Chinese total coal imports (mt)



decrease of 4% compared to the previous year. Meanwhile, Rio Tinto has announced that sustainable returns are to be delivered to shareholders in 2015. The company has also declared a significant increase of its managed thermal coal reserves and resources in the Hunter Valley. Ore reserves increased by 546mt from 1,331mt to 1,877mt. Total mineral resources exclusive of ore reserves increased by 369mt, from 2,349mt to 2,718mt.

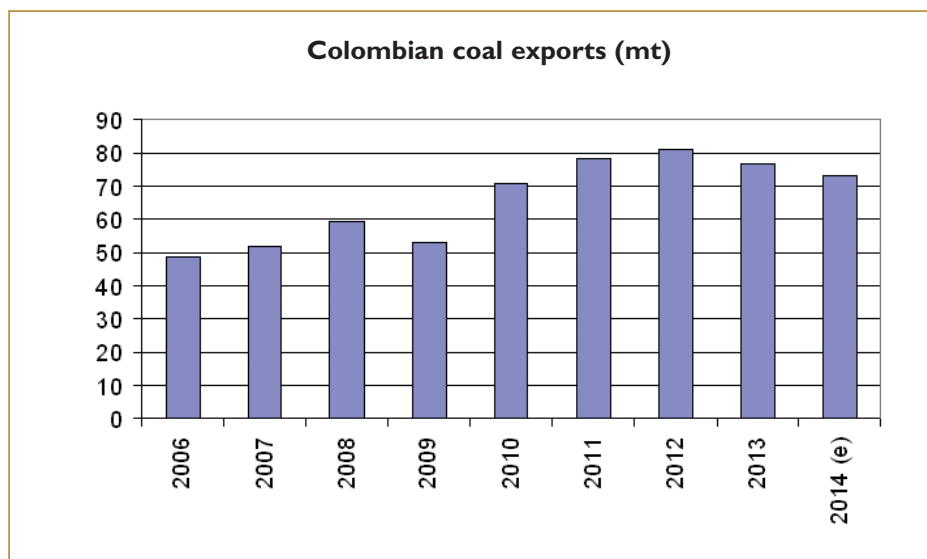
Bandanna Energy in Queensland is in administration and its assets are due to be sold this year. The Springsure Creek thermal coal project and proposed 4mtpa (million tonnes per annum) stage 1 mine was due to begin production in 2015 or 2016. Valuations are being carried out by the administrators now.

Looking at events around the coal world in 2014, in



has been arrested. The Prosecutor General is understood to be investigating the deal which is reported to have involved Ukrinterenergo and Tsentrenergo, and Steel Mont Trading.

In Canada, plans to double the capacity of Ridley Terminals to 25mtpa by the end of 2015 have been delayed by up to five years. Depressed coal prices and lower interest in exporting to the Asian markets have been attributed to the decision. In the ten months to 31 October, some 4mt of coking coal was exported through Ridley, which was a decrease of 40% compared to the 6.6mt recorded in the same period last year. Activity is reported to have been quiet recently, with capacity expected to have reached 18mtpa this year. This is considered to be sufficient until 2019 unless the market picks up substantially.



Mozambique, Japan's Mitsui is to invest almost US\$1bn in Vale's coal projects in the country. The trading house will pay US\$450m for a 15% stake in the Moatize mine and will invest US\$188m in its development. A further US\$313m will be paid for a 50% stake in the Nacala rail and port project. Some 3.8mt of coal was produced in 2013. Earlier in 2014, Rio Tinto sold its Mozambique coal assets for US\$50m.

In Russia, Koks is understood to have been exporting 20kt of metallurgical coke to India in January. The weak international market had seen trade in Asia stop last year, but the resumption could start to affect other buyers including those in Ukraine.

In Ukraine, there have been reports that an employee of Ukrinterenergo who signed the 1mt deal for South African coal in 2014

Russia's exports through Baltic Coal Terminal decreased by 8.9% in the ten months to 31 October to reach 3.08mt. The decrease in shipments to Europe was attributed to the economic sanctions imposed on Russia by



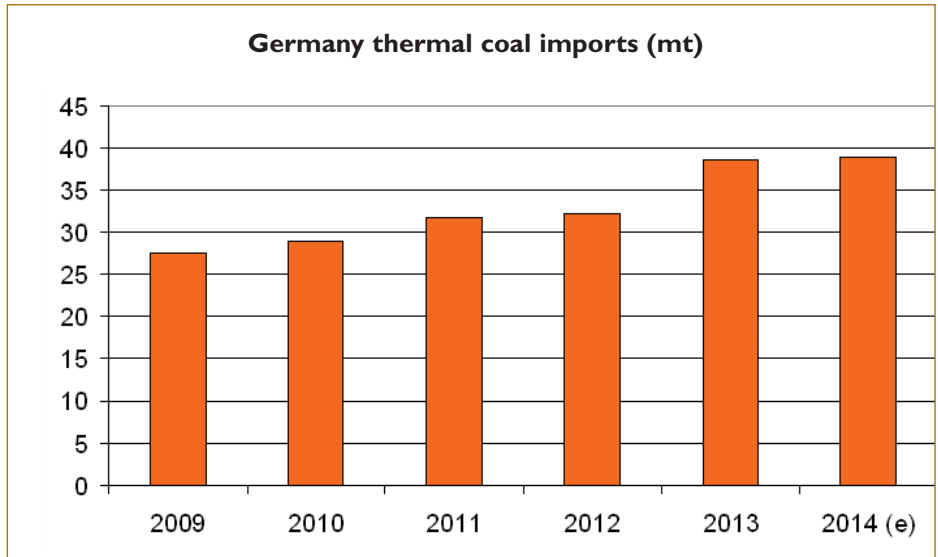
the European Union due to the situation in Ukraine. Total coal exports in 2013 reached 4.3mt.

In the United Kingdom, the Eggborough coal-fired power station has been sold to Energetický a průmyslový holding (EPH) of the Czech Republic. Eggborough Power currently owns the 2,000MW power station in North Yorkshire and the sale must be approved by the European Commission. The price of the power station which supplies some 4% of the electricity in the United Kingdom has not been disclosed.

In news having a potential impact on coal consumption elsewhere, the Sendai nuclear power station in Japan was given approval to resume generating electricity. It will be the first nuclear plant to be reactivated since the Fukushima disaster.

Amid the current market conditions, in Singapore, Peabody

Germany thermal coal imports (mt)

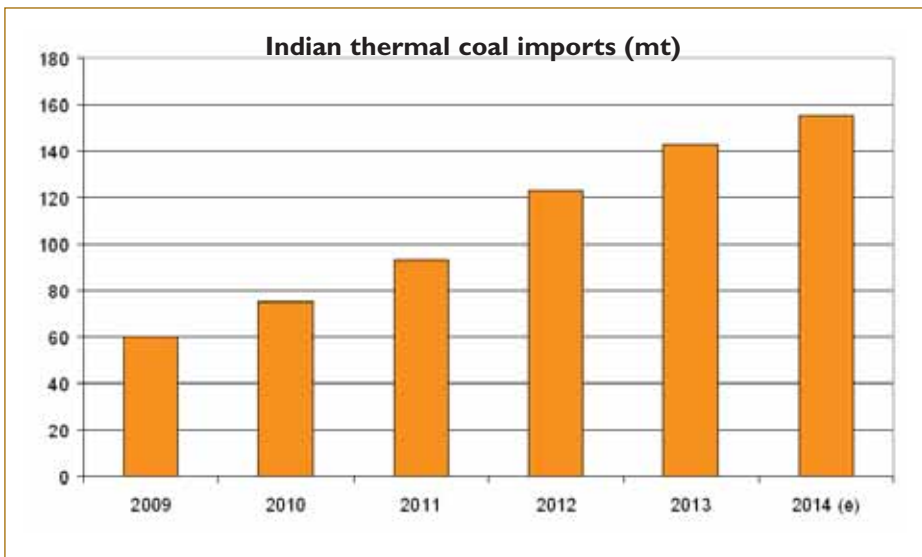


received), sulphur content greater than 1%, and ash above 20% is one limit. Other coal with CV higher than 4,300kcal/kg NAR and sulphur content above 2%, and ash above 30% is another

limit. The Chinese government has also imposed new rules on other elements potentially present in coal, and these include arsenic, chlorine, fluorine, mercury, and phosphorus. The paperwork for shippers has also grown, and requires details on the originating mines of the coal, the location and contact details of the consumer, and the transport distance.

Back in October in China the government re-imposed import duties on coal. The rates were 6% of the value for bituminous coal, 5% for other coal, 3% for anthracite, 3% for coking coal, and 5% for coal briquettes. Coal market players had to wait for months for further clarity on the new regulations on low

Indian thermal coal imports (mt)

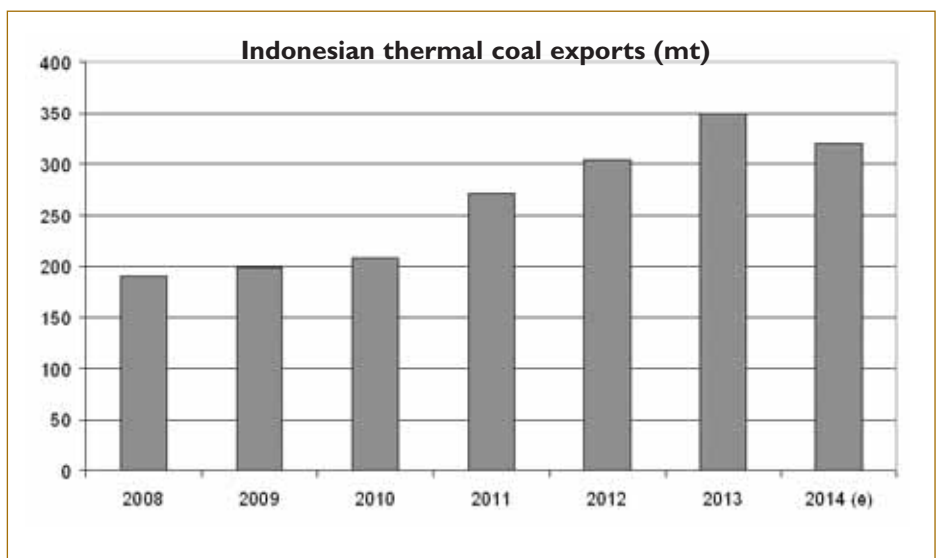


Energy is to close its coal trading office as part of its cost reduction process. The office was operating for just over five years.

Another development affecting coal trade in Asia is the Chinese government's decision to impose new regulations on all imported coal from 1 January 2015. Previously accepted material with certain specifications will no longer be permitted. These include lignite with sulphur content of more than 1.5% and ash above 30%. Any other coal with sulphur content above 3% and ash above 40% is also banned from being imported. There will also be limits on coal specifications if it has to be transported more than 600km from a port or mine to the consumer. Some of these rules are quite cumbersome. Lignite with CV (calorific value) lower than 3,941kcal/kg NAR (net as

quality coal. The smaller consumers appear to be the most affected, which could ease concerns from suppliers overseas who would be mainly marketing their coal to major users such

Indonesian thermal coal exports (mt)



e-coal.com Mahakam River Spot Price (FOB barge basis 6,700kcal/kg GAD)



Vizag were offered the Goonyella reference brand at US\$111/t FOB. Quality adjustments saw Peak Downs offered at US\$114/t FOB, and Gregory at US\$99/t FOB. The Blackwater Soft brand was discounted to US\$93/t FOB according to reports from Queensland. The latest prices indicate a weak coking coal market, but with some firming compared to the November monthly deals between BMA and the Indian steel makers.

Peabody Energy is reported to have agreed the price of Q1 2015 deliveries of ULV PCI coal at US\$99/t

as the power generators.

In the freight markets, Capesize rates have been very weak lately and the sector has been the worst performing in the dry bulk shipping market recently. This year saw the rates at their lowest opening level at the start of a calendar year since the Baltic Exchange started its assessments in the 1990s. The rate was US\$3,580/day for 172,000dwt vessels. Weak demand in the markets has coincided with low oil prices and on some main coal routes the daily rate is about half what it was a year earlier. Some rates are back at the lows seen after the financial crisis in 2008. Panamax rates have also been decreasing to half those seen a year ago. Capesize rates hit a low on 9 January of US\$3,315/day but there has been some recovery since then. There was a hike of US\$4,000/day in round voyage rates in the Atlantic in mid-January which was an increase of 73%.

In recent market news, in Australia, BHP Billiton Mitsubishi Alliance offered several brands of hard coking coal to customers in India for December deliveries. Steel Authority of India and

FOB with Korea's POSCO. Tier 2 PCI product is priced at US\$88/t FOB. These are at rollover from Q4 2014.

Japan's Hokuriku and Tepco EPCs are reported to have

e-coal.com Newcastle Spot Price (FOB basis 6,700kcal/kg GAD)

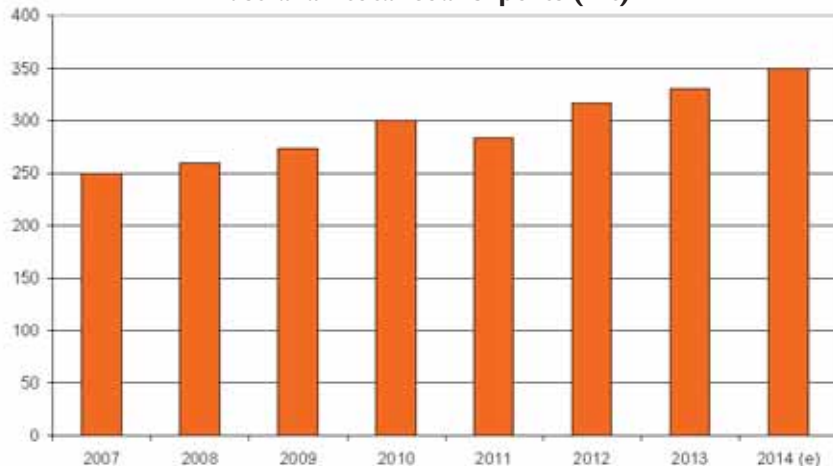


purchased a number of cargoes of Australian coal following their tenders in late 2014. The price is rumoured to be about US\$65/t FOB basis 6,000kcal/kg NAR for delivery during Q1 2015.

India's Malabar Cements issued a tender seeking 30-40kt of coal. Specifications included CV 6,300kcal/kg GAD (min) and delivery was required to Cochin port. MMTC also issued a tender seeking 1mt of coal with CV 5,700kcal/kg GAD (min).

In Korea, Komipo issued a tender seeking 585kt of coal for delivery in three Panamax cargoes plus three Mini Capesize cargoes. Coal specifications included CV 4,600kcal/kg NAR (min) for the former quantity, and 5,700kcal/kg NAR (min) for the latter. Delivery is required during January to March 2015. Meanwhile, the Korean Gencos have awarded the business following a tender, with 440kt of material with CV 4,600kcal/kg NAR

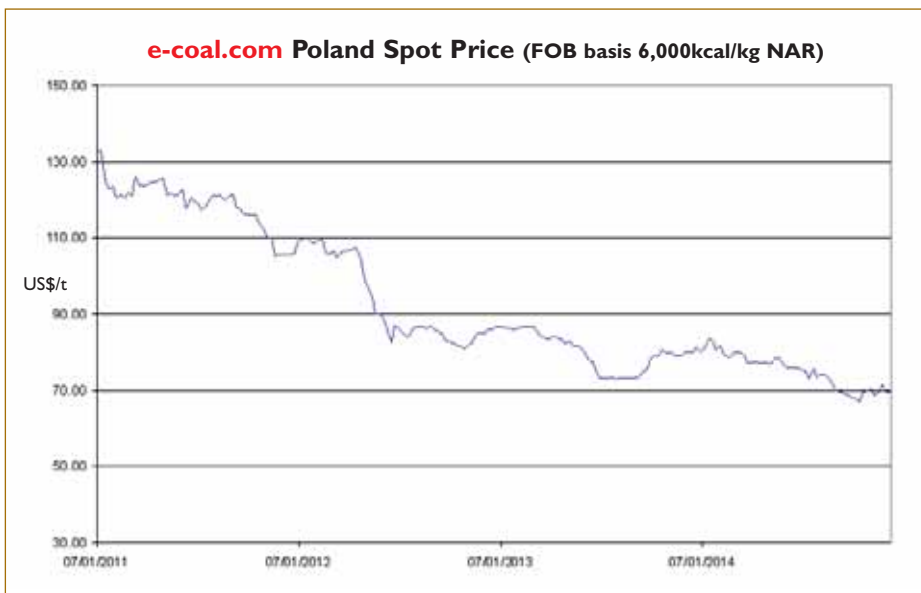
Australian total coal exports (mt)



for delivery in Q1 2015 being priced at about US\$58/t FOB adjusted to basis 6,080kcal/kg NAR. Another 780kt of material with CV 5,800kcal/kg NAR for delivery in Q2 2015 was priced at about US\$59.80/t FOB adjusted to basis 6,080kcal/kg NAR.

Kospo issued tender KOSPO-Coal-2014-SMT10 seeking 80kt of bituminous coal with specifications including CV 5,700kcal/kg NAR (min). Delivery is required in a Panamax vessel during 1–31 March 2015.

In Taiwan, Formosa Plastics Group issued two tenders seeking an unspecified quantity of coal with CV 5,850kcal/kg GAR [gross air dried] (min). Delivery is required during 1 January to 28 February to Houshi port in China. One tender requested offers in US dollars and the other in Chinese



tender. A total of 525kt of Indonesian coal with CV 5,500kcal/kg GAR was purchased at prices believed to be in the range

US\$78.97–79.67/t CIF (cost, insurance, freight) evaluated. Delivery is required during December to May. Formosa Plastics Group has issued several tenders seeking an unspecified quantity of coal. One required coal with CV 6,000kcal/kg GAR (min) for delivery in Capesize vessels to Mailiao port in Taiwan during 15 January to 10 March. Four tenders sought coal with CV 5,850kcal/kg GAR (min) for delivery in Handysize vessels during 1 January to 28 February. Two of these required delivery to Ningbo in China, and two to Shanghai Luojing port.



In Europe, market players have been discussing the impact of the annual winter freeze on coal supplies

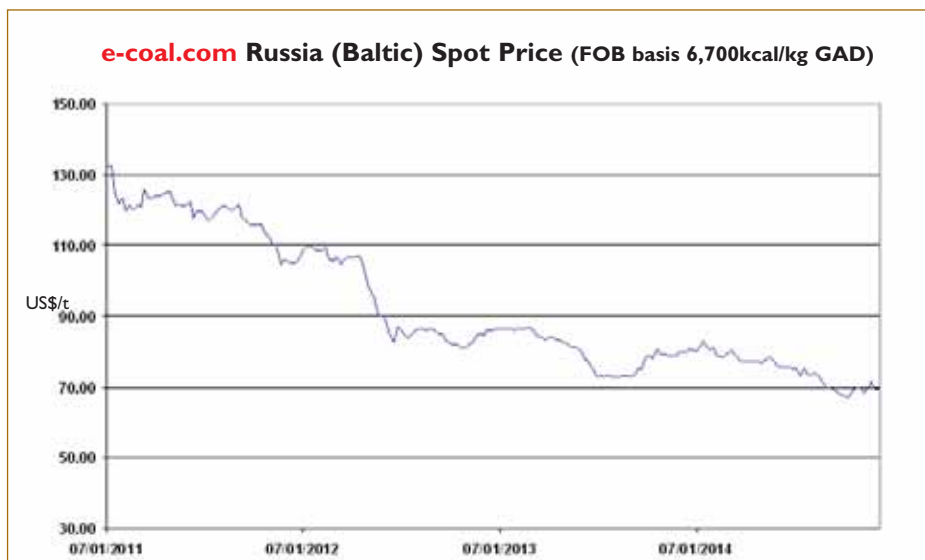
currency. Meanwhile, Taipower awarded the business to Noble (five Panamax cargoes), Mercuria (1), and Vitol (1) following a

from Russia. The United Kingdom has been a major importer of Russian coal over the past year, but over the coming months any



spot market activity will focus on other supplier countries to satisfy needs. Traders are believed to have been assessing the position in Colombia and the USA, but South African coal is also of interest. Delivered prices into Europe are low at present, and buyers are understood to have been seeing prices below the US\$60s per tonne basis 6,000kcal/kg NAR level. The slump in price is likely to have affected a number of traders who may have taken a position a few weeks earlier, believing the market to have bottomed only to find further declines in the price of coal and freight.

Over in Colombia, The National Environmental Licences Agency is understood to be looking to speed up the process of issuing mining permits to new applicants. The permitting process



business. In an effort to bolster prices the government had a production target of 420mt in 2014, which is level with 2013. The impact on illegal mining will be interesting to watch, and is

likely to affect the market. In corporate news in Indonesia, Bumi Resources reported that revenue decreased by 17.3% or nearly US\$500m to US\$2.19bn during the first nine months of its financial year. Costs were reduced however, and net profit grew to US\$13.3m.

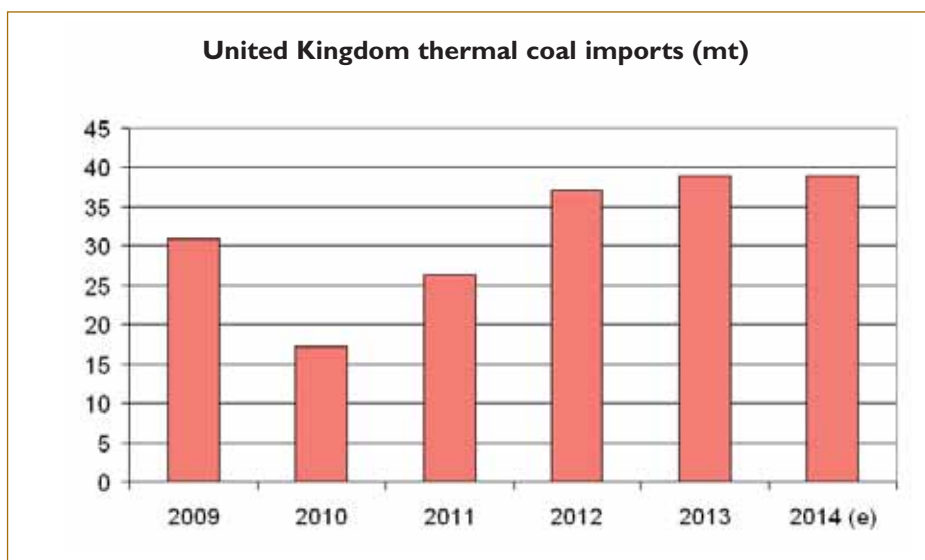
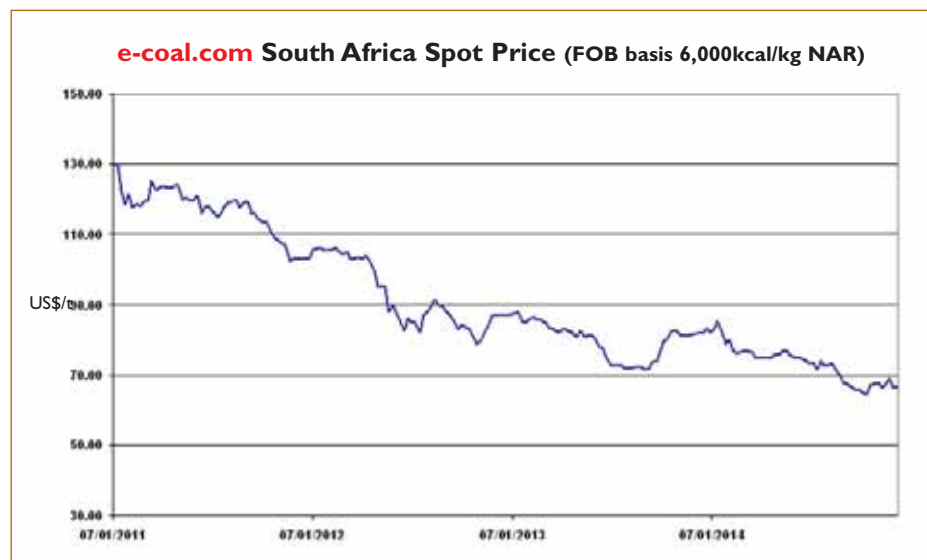
In Malaysia, the new Manjung coal-fired power station has been linked to the national electricity grid. An increase in coal imports for Tenaga Nasional Berhad of up to 3mtpa is expected to be required when the plant reaches full output.

The Russian government published data indicating that the coal sector is doing very well amid the economic sanctions imposed on Russia over the Ukrainian situation in

could be completed in well under six months under the new plans, compared to more than a year in more recent cases. Meanwhile, difficult market conditions have led Australian coking coal developer New Age Exploration to end its JV agreement with Aurora Energy to develop the Terranova coking coal project in Colombia.

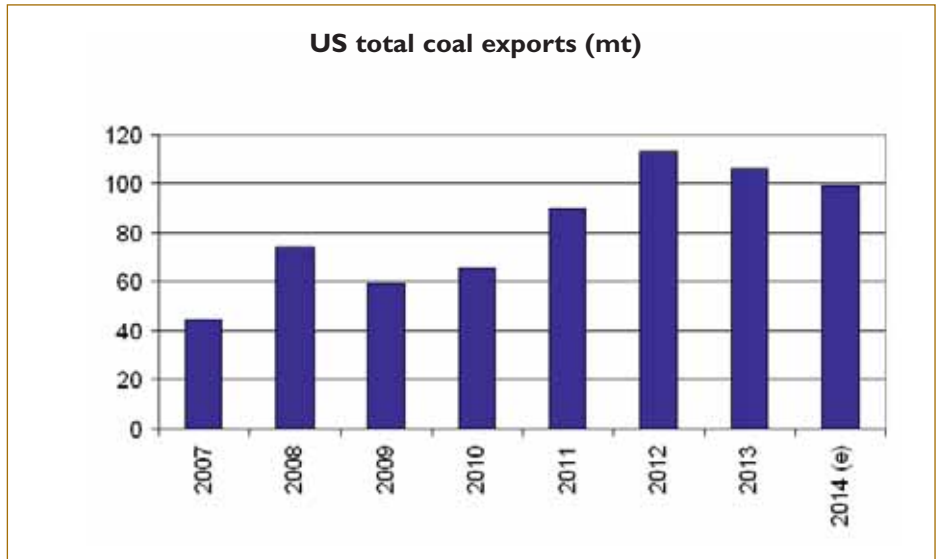
The Indonesian Coal Mining Association is understood to be pleased that their new export regulations and permitting system look set to curb illegal mining. The issue has persisted for a couple of decades and there have been many attempts to stop the practice. The quantity of illegally exported coal is, however, believed to have grown to some 100mt by the end of 2013. The latest system is welcome although delays in providing legitimate exporters with timely permits this time has cost some of them in lost

2014. Total production is reported to have reached 251.2mt during the first nine months of 2014 which is only 0.7% lower than in the same period in 2013. Exports are said to have



increased by 11.3% during the nine months to reach 113.27mt and deliveries increased by 2.1% to reach 233.1mt. The industry even appeared to be accelerating its growth lately, with production in September reaching 30.13mt which was 7.4% higher than in the same month in 2013. Exports in September were reported to have reached 12.33mt which was 3.1% higher than in 2013. Deliveries increased by 7.9% to 27.21mt.

As 2015 gets under way it is once again unclear as to how the year will develop for all those involved in the coal chain around the world. The



the sidelines of the industry who will benefit as players continue to meet up at various events around the world on a regular basis to try to make sense of the situation and to sign more deals at bargain prices. With coal prices and now oil prices at such low levels, those on the production side can only be hoping that the direction the markets can take over the course of 2015 is up.

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,

volume of trade remains high despite the seemingly depressed markets. This at least seems likely to continue, and it is those on

people and jobs, industrial relations, and ports, shipping, and freight rates.

DC





Sugar in crisis?

is revenue sharing ratio the answer?



Kunal Bose

Brazil, by far the world's largest producer and exporter of sugar, is in the horns of a dilemma. The excruciatingly long run of low sugar prices and unchecked fall in crude oil prices are making it difficult for sugarcane crushing factories in Brazil to decide as to what percentages of cane are to be used for making the sweetener and ethanol. Unlike in India where ethanol is extracted from sugar by-product molasses through fermentation, Brazilian factories make it straight from cane. The three-month raw sugar at 15.38 cents a pound on the Intercontinental Exchange in New York and Brent crude at below \$50 a barrel, a toss-up can alone decide the cane use share of two product alternatives — sugar and ethanol. The Brazilian sugarcane industry association Unica says the deadly combination of sugar prices doggedly staying below production cost, falling revenues from both the sweetener and ethanol and soaring debts have left the industry, a major provider of employment in farms and factories and a big earner of foreign exchange into the “biggest crisis in its history.”

The industry's predicament is best illustrated by more than one forecast that a further nine cash-strapped factories in the

country's principal south central cane growing centre are likely to stop crushing this year on top of closure of 11 units in 2014. What is particularly disturbing for the Brazilian sugar economy is that short-of-funds factories and big growers are cutting back on cane plantings and also saving on fertilizer use that invariably results in lower-than-normal sugar recovery from cane. Unica says between March and November, the area under cane plantation shrank by nearly 15% on a year-on-year basis.

No wonder Unica is braced for a near 7% drop in sugar production to 31.9 mt (million tonnes) this year. Brazilian sugar production will, however, finally depend on how much cane factories retain for making the sweetener. Rating agencies like Fitch Ratings have put a number of Brazilian sugar groups on 'negative watch.' The only redeeming feature in an otherwise depressing near and medium-term outlook for sugar is the softness of Brazilian real *vis-à-vis* the US dollar. This will come to the aid of exports. In view of expected production setback, the US Department of Agriculture (USDA) has cut its estimate for Brazilian exports for this year by 1.2mt to a six-year low of 24mt.

Denied of government policy support and a victim of low prices, the Indian sugar mill industry finds itself in the pits, says industry official Om Prakash Dhanuka. He points out “nothing will describe it more tellingly than leading sugar groups losing appetite to grow capacity by acquisition of factories or building greenfield mills. Unlike other industries and services sector, sugar has failed to attract any foreign investment even though the government allows majority ownership of sugar factories by offshore corporate bodies.”

Both Bajaj Hindustan, Asia’s largest sugar producer and once the blue chip Balrampur Chini rapidly grew cane crushing capacity in the past using both brownfield and greenfield routes hoping that at some point New Delhi and governments in cane growing states would come up with a basket of policies rewarding 50 million growers and over 500 operating factories. The self-proclaimed reforms-oriented government headed by Narendra Modi offered some policy support in June by way of raising import duty on sugar, restoring export incentive and offering interest free loans to the beleaguered industry to clear cane dues. But the industry’s hope that New Delhi will sanction linkage between sugar and cane prices and not let the cane growing states to go on arbitrarily decide cane prices remains unfulfilled, says Dhanuka.

A committee headed by eminent economist and former governor of the Reserve Bank of India C. Rangarajan has said salvation of the steadily deteriorating industry lies in a formula under which revenue from sale of sugar and its by-products like ethanol and power is shared between cane growers and factories in 75:25 ratio. What, however, calls for pondering is at current ex-factory prices of sugar, the recommended price sharing formula will leave both constituents high and dry. This then raises the issue of government intervention by way of compensating farmers to the extent that price sharing in difficult years doesn’t cover cane growing costs plus fair margin for growers. In this context, the Thai model of administering price sharing calls for New Delhi’s consideration. Thailand is incidentally the world’s second-largest exporter of sugar.

As if bumper sugar production four years in a row resulting in 2014/15 season opening with overflowing stocks of 7.5mt was not enough of a bearish influence, India will be the only exception among major producing countries to lift output from last year’s 24.3mt to 25.5mt or more this time, according to Dhanuka. Intense liquidity crunch resulting from factories not able to recover cane cost from sugar sale is forcing them to sell forward to international traders at “cheaper rates... Exports haven’t yet started. It’s an unviable situation,” says Indian Sugar Mills Association president A.Vellayan. “No wonder as the government is taking an unconscionably long time seeking clarity on sugar stocks and production outlook in the current season, export incentive has remained suspended since October. Overselling by mills in the domestic market and no export shipments happening in the absence of incentive have caused sugar price collapse without the bottom still to be found” says Dhanuka.

USDA’s Beijing bureau says Chinese sugar production will be down by about 1mt to 13.3mt. Reasons cited for production setback are lower sugar prices causing “returns on cane to fall below competing crops like fruits and cassava and damages earlier caused to cane plantings by “less-than-ideal weather and some typhoon damage” in China’s south eastern growing centres. Interestingly even while Chinese sugar use is forecast to rise 4%, the country, according to USDA, may end up importing 3.8mt down 300,000 tonnes year-on-year and the lowest since



*Sugar industry official
Om Prakash Dhanuka.*

2010/11. China has enormous stocks of sugar and by drawing from the inventory, it is going to keep imports in check. The country has decided to maintain the more than a decade-old annual low-tariff sugar import quota at 1.95mt in the current year. Chinese factories are lobbying the government hard for raising the out-of-quota tariff to 60% from the current 50%.

Dry weather is to limit Thailand’s sugar production in 2014/15 to 10mt to 10.2mt. Even then, Thai export shipments are set to rise 200,000 tonnes to 8.5mt. This is to happen in response to “high Asian demand, particularly from Indonesia and Cambodia” requiring the Thai industry to tap the inventory built from earlier years’ production. Beet sugar production in European Union, where the industry is transiting through a painful restructuring ahead of dismantling of production quotas in 2017, is forecast to rise 12% to 18.6mt in the current season. But the International Sugar Organization (ISO) is anticipating “a significant retreat in sugar output” for the European Union during 2015/16. Australia, expecting sugar production of 4.6mt, is to raise exports by 6% to 3.3mt. Higher exports will more than compensate the Australian industry of falls in sweetener price. Next season, however, it will have to contend with forecasts of below average rainfall and more ominously with *El Niño*.

The current season will be the fifth in a row when sugar production will be in excess of demand. Global surplus estimates vary from 473,000 tonnes by ISO to 600,000 tonnes by commodity advisory group Czarnikow. In the last three seasons alone 21mt (raw value) were added to global sugar stocks. Huge inventories looming over the market will continue to exert bearish pressure on the market through at least most part of this year. The market may, however, perk up next season when due to “possible changes in production and projected consumption growth, a deficit of about 2mt to 2.5mt comes into view, heralding the beginning of a new deficit phase in the world sugar cycle in 2015/16,” says the ISO.

Sinwa commences Thailand operations

Marine and logistics supplier Sinwa is expanding its operations. With the Gulf of Thailand seen by many as the fastest developing oil field in the world, and perhaps even set to eclipse the Gulf of Mexico, Sinwa has recently added this new growing region to its network, complementing its established operations across the Asia-Pacific.

Bruce Rann, CEO, Sinwa Group, said, "It's a great opportunity, and with our major clients already operating in the area, Sinwa is well placed to not only service their growing business but to service other companies and operations in the Gulf of Thailand. Setting up a locally based, professional and efficient supply chain for businesses out there is paramount and, in addition, we bring our established reputation and have the whole Sinwa network supporting this venture right across the Asia-Pacific."

Sinwa (Thailand) Ltd, incorporated earlier this year, will be commencing initial operations in the ports of Ranong and Sattahip in the north, and Songkhla in the south, with Sinwa aiming to eventually also service commercial ports such as Laem

Chabang too. Sinwa will employ local expertise at its distribution centre based in Bangkok, along with administrative office staff at several key locations. "The main focus initially will be in support of one of our major clients, Sodexo and other existing companies we have in the oil and gas sector; however we plan to expand in the coming years to service the shipping clientele in general, just as we do throughout the Asia-Pacific," Rann added.

With regard to future expansion for the Sinwa Group, Rann commented; "We won't rule out further future expansion into yet more new markets, however we have a conservative and methodical approach to our expansion. Opening in new regions and countries is never easy for a whole myriad of reasons, cultural, political and logistical, so these things take time. The venture into Thailand has been two years in the making because we've taken the time to be sure of our sub-contractors. That way we can ensure cold chain integrity for our clients and deliver quality products along with Sinwa's very high level of customer service."

Thome Group appoints new CEO

The Thome Group has announced the appointment of a new Chief Executive Officer, Olav Magnus Nortun, who will take up the position on 1 April, 2015.

Nortun, a Norwegian national, brings with him vast experience in the maritime industry, especially in the areas of strategic development and governance of production, knowledge management and systems related to ship classification.

He has worked with DNV GL for many years in different locations around the world, culminating in his most recent role as Executive Vice President of its Classification Division. He has extensive in-field survey experience and has held management and project management positions in Norway, Holland, Japan, Korea and East Russia. He was Regional Manager, Maritime Korea and East Russia in addition to Board Chairman of DNV (China) Ltd.

He is a Master of Science in Naval Architecture from the Norwegian Institute of Technology with a post graduate in 'Management in a Technological Environment' in addition to attending Senior Management courses at INSEAD, Fontainebleau and IMD in Lausanne.

As part of the new appointment, Olav Eek Thorstensen will step aside as Group CEO but will continue as Thome Group Executive Chairman while Claes Eek Thorstensen will continue as Thome Group President.

President of the Thome Group Claes Eek Thorstensen said of the appointment: "I am delighted to announce the appointment of Olav Nortun as Group CEO for the Thome Group. Olav brings with him a broad international maritime experience which combined with the new perspectives and

ideas he may have will, I believe, benefit the Group significantly in the months ahead."

Thome Group of Companies is a dynamic provider of integrated ship management services to the international shipping and offshore industries. Based in Singapore, and celebrating over 50 years of service, the Thome Group of Companies represents a unique combination of the best elements of Scandinavian shipping tradition with the modern drive of Asian business enterprise.

From ship management to running offshore vessels, FSOs and FPSOs, port agency, vessel inspection, new building site supervision, and crew training, Thome offers a complete range of services and products under one roof.

The Thome Group has grown to be recognized as one of the world's leading independent international ship managers with more than 200 vessels under technical management serviced by 600 shore staff and 10,000 crew members. In addition, the Thome Group has 120 vessels under pure crew management engagements.

Today, Thome Ship Management ranks among, and is recognized by leading industry stakeholders, as one of the best performing global ship management companies with a wide range of clients from every corner of the world.

Since the very beginning when Thome started its ship management operations, the company has built up a solid list of principals, associates and clients from Central Europe, Scandinavia and from across Asia, Japan, Indonesia and Korea in particular. Thome Group Principals are mainly blue-chip, often stock market listed shipping companies and recognized as prominent leaders in their own fields.



Cargo transfers made easy with Coeclerici

Coeclerici's FTS
Bulk Sumatra.



Coeclerici Logistics, the logistics division of Coeclerici Group, is one of the world's leading bulk material transshipment companies with a history of more than 40 years in this specific field, writes *Capt. Giordano Scotto d'Aniello, Head of the Commercial Department at Coeclerici*. The year 2015 will mark an important goal for the whole Coeclerici Group, as it will celebrate its 120th anniversary — over a century of success in various business industries, from trading to shipping, from mining to logistics.

Even during this tough period for the dry bulk commodities market, Coeclerici has been able to maintain and grow its position in the transshipping industry, ensuring for its clients a first-class service and reliable performances.

In order to maintain its brand-new fleet, Coeclerici decided in 2014 to sell one of its older Floating Storage & Transfer Stations (FSTS) *Bulk Wayuù*, which has been operating since 1998 in Maracaibo Lake, Venezuela, loading coal from barges to ocean going vessels (OGV).

During her long career, *Bulk Wayuù* has handled more than 71mt (million tonnes), loading about 1,600 vessels at an average rate of 50,000 metric tonnes a day.

So far, Indonesia has been the most important country for

the Coeclerici logistics business; five Floating Transfer Stations (FTS) are working in Kalimantan area, receiving coal from barges and loading OGVs with best net loading rates of over 50,000 tonnes a day. During 2014, between them, these FTSS handled a total of 17mt of coal.

In order to improve the range of services to its customers, Coeclerici, with the technical department improved the loading equipment on board FTS *Bulk Celebes* to enable it to perform blending operations. This blending capability means it can mix homogeneously two different grades of material up to 20–80%.

Blending is regularly requested by the main players in the Indonesian coal market; it gives them a price advantage due to the ability to offer a better product to the final users.

Last year Coeclerici achieved great results in Mozambique as well, where the two TUs *Bulk Zambesi* and *Bulk Limpopo* are continuing their operations in Beira port, employed for offshore coal loading operations. Thanks to the great performances of the two units, Vale has been able to reach the target output of over 3.6mt of coal during 2014. Each of the sister vessels is able to reach over 5,000tph (tonnes per hour) as peak rates while loading OGVs.

The aim of Coeclerici for the near future is to strengthen its

Coeclerici's FTS
Bulk Zambesi.



position in the transshipment market. It will continuously create innovative solutions, engineer and promote the use of 'floating terminals' throughout the world, designing and developing different types of floating transshipment stations capable of lighterage/top-off operations, cargo transfer and self-unloading of many different dry bulk materials.

These carry out all the same functions as a port terminal but with far smaller investments, lower management costs and less environmental impact.

In terms of self-unloading solutions, the key advantages are:

- ❖ they eliminate waste and cargo contamination;
- ❖ they discharge dry bulk cargo at an unimproved dock without assistance from any shore-side equipment or shore-side

- personnel — they do not require any land-based assistance;
- ❖ they can provide offshore transshipment operations, topping off or offloading into larger vessels;
- ❖ they can reduce a cargo's overall delivered cost per tonne because they are fast, efficient and less capital- and labour-intensive than shore-based systems;
- ❖ the new generation of self-unloader is equipped with advanced dust suppression systems. Dust suppression units are situated throughout the cargo handling areas, and the discharge booms are enclosed and fitted with water sprayers to further reduce dust during off loading; and
- ❖ finally they can also be used for seaborne trading, over dry material handling.

DCi

Coeclerici's FTS
Bulk Java.



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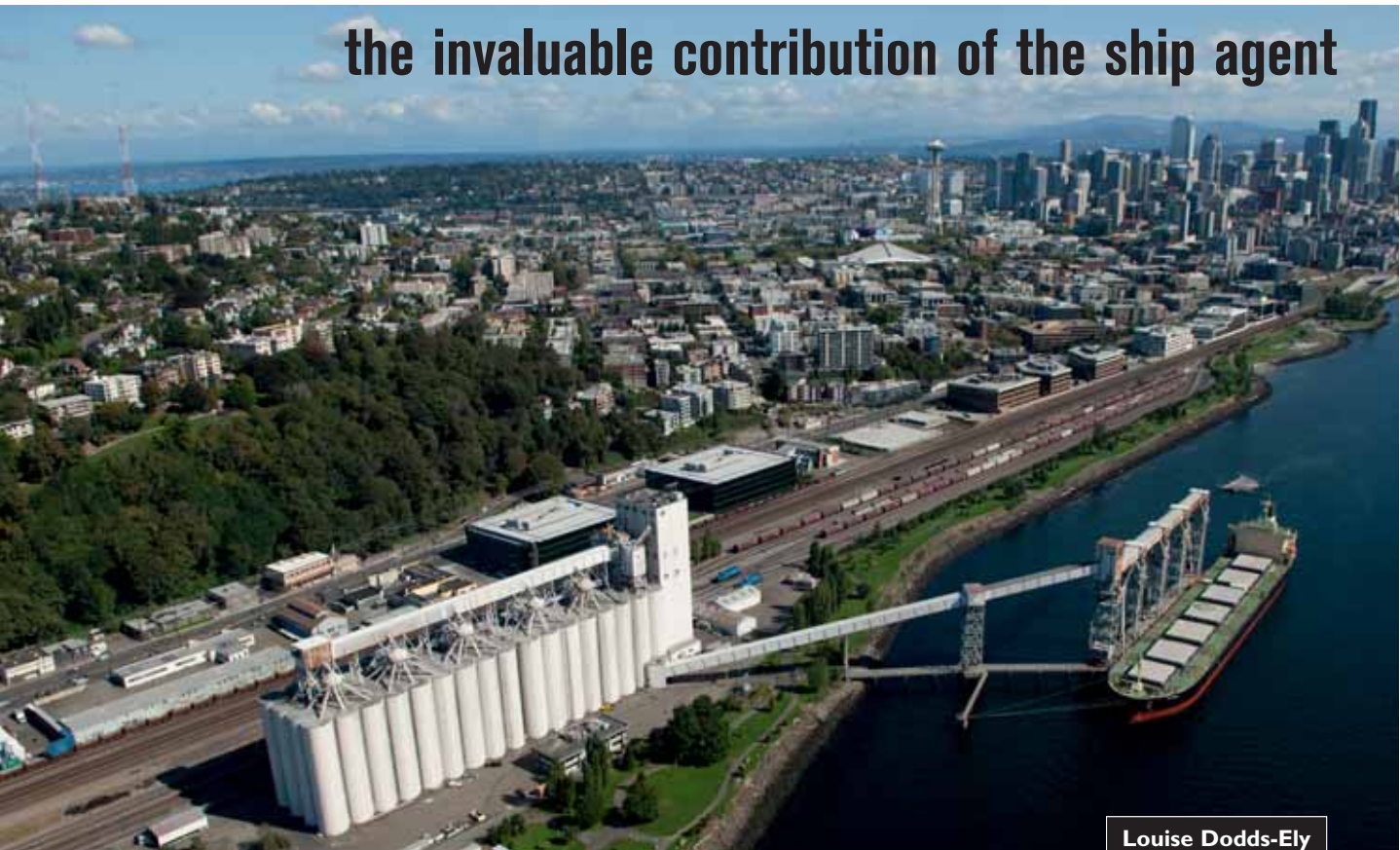
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Louise Dodds-Ely

ASBA's landmark Agent Member Certification celebrates ten years Member ship agents: tested – trusted – certified

In a recent survey conducted by the Association of Ship Brokers & Agents (USA) Inc. (ASBA), maritime principals ranked the qualities deemed most important in their decision to appoint a ship's agent.

- ❖ fiscally responsible company
- ❖ trained boarding agents
- ❖ past experience with the ship agent and the agent's experience with the cargo and vessel type

ASBA's Agent Member Certification, renewed annually, specifically addresses these qualities. This month, ASBA celebrates ten years of its Agent Member Certification. However, in order to describe what it means to be ASBA certified — what, exactly, is an agent, and what does an agent do?

“Except for the pilot, the first and last person to board or depart during every ship's port call is the ship's agent.” The agent is like a control tower for a ship's port call, co-ordinating local scheduling and logistics with the key players — the owner, charterer, shipper, receiver, terminal, and, of course, the ship.

The agent dispatches the local services necessary for a successful port call by arranging pilotage, towage, and customs entry and clearance, while navigating deftly through the myriad

national and local regulatory requirements involving the ship, her cargo and crew. Beyond the commercial operation there is often an extensive list of husbanding requirements that includes co-ordination of ship's stores and spare parts as well as crew changes, crew medical, and service technicians.

An agent's job is to safely and economically expedite the vessel's port call. Understanding the impact of high daily operating costs of ships and marine terminals, the pressures of berth congestion, and contract deadlines for loading and unloading cargoes contributes positively to the success of a voyage. Solid rapport and good standing within the local marine community is critical. The agent stands in the shoes of his, or her, principal, protecting their interest at a specified port.

FISCAL RESPONSIBILITY

ASBA member agents must retain an external Certified Public Accountant to complete a procedural review in order to attest in writing to ASBA that the member maintains separate files by principal and that all financial transactions are properly supported by invoices and receipts that tie back to their general ledger. Fiscally sound accounting practices should be a key component of the principal's risk management strategy.





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dnvgl.com/maritime

TRAINED

Certified Agent Members must maintain a well-trained staff that is service oriented and armed with knowledge to make necessary decisions on behalf of their principals. All member boarding agents and their managers must successfully complete a comprehensive exam administered by ASBA.

ASBA provides a variety of maritime courses and seminars on shipbroking, chartering, and agency to meet the needs of members for initial training and ongoing education. Other courses offered by ASBA include maritime law, marine insurance, and commercial trade transactions. ASBA's Annual Cargo Conference has become the must attend maritime event in the USA and provides member agents with another avenue to expand their industry knowledge. Panellists include charterers, owners, and operators that share their thoughts on the hot topics of the year as well as their views on the market and trends in shipping.



total, approximately 14,000 were dry bulk and breakbulk vessels. Based on the association's calculations, ASBA Certified Agents have represented close to 65% of the dry and wet bulk vessels calling US ports last year. In terms of experience, these statistics tell a clear story.

ASBA was formed in 1934. Members use the Association to address issues affecting their companies and principals on a national level — and to advocate for quality. ASBA's landmark member certification was embraced by its international counterpart, the Federation of National Associations of Ship Brokers & Agents (FONASBA) in 2007, is called the FONASBA Quality Standard and is now being awarded in 22 member countries. Owner's organizations, BIMCO, INTERTANKO, and INTERCARGO, recognized the value of promoting

'quality' in the appointment of ship agents when they endorsed the Quality Standard.

As a best practice that supports operational excellence and risk mitigation, ASBA encourages all vessel charterers, owners, and operators to nominate and appoint ASBA-certified agents at USA and Canada ports whenever possible.

EXPERIENCED

ASBA's 30 member agents handled approximately 43,000 non-container vessel calls in the USA and Canada in 2013. Of this



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North America
Since 1920*



General Steamship: drawing inspiration from John Ruskin

The quote (right) from John Ruskin, a prominent Victorian critic, philosopher and social thinker, is featured on the website of General Steamship Agencies, and is a major inspiration to those running the company.

At General Steamship Agencies, the philosophy is one of risk management. The company considers its primary duty to be the quickest dispatch on the intended business of the port call, while keeping serious complications from occurring. In General Steamship's North American market, there is so much that can go *expensively* wrong, and the maturity of the legal and regulatory systems means that there are often no quick fixes. General Steamship Agencies' +80 years of experience have left it battle-scarred, and proud of it, as it is now able to bring a major benefit to its principals — risk management. The company prefers to compete on sound value judgements, not on cheap price.



Within its three operating divisions, dry bulk constitutes 40% of the vessel calls that it handles. Its service areas range from the mid-Atlantic, the entire US Gulf and the entire US West Coast from San Diego north including the Pacific Northwest and through Canada and all of Alaska. Eighteen offices cover this

Wisdom from John Ruskin

“It is unwise to pay too much, but it is worse to pay too little. When you pay too much, you lose a little money — that’s all. When you pay too little, you sometimes lose everything, because the thing you bought was incapable of doing the thing it was bought to do. The common law of business balance prohibits paying a little and getting a lot — it can’t be done. If you deal with the lowest bidder, it is well to add something for the risk you run, and if you do that you will have enough to pay for the something better.”

broad stretch of North America and provide top-shelf vessel agency service. General Steamship Agencies was among the first agency companies to achieve certification by both ASBA and FONASBA, verifying the standard it carries. Its clientèle includes charterers engaged in coal, grain, cement, petcoke, aggregates, sulphur, ore and fertilizers. It is proud to serve most of the world's vessel owner-operators in these trades, many of them for decades. Their ships run from Capesizes, to Handysizes, from self-unloaders to grab-fitted bulkers.

General Steamship Agencies' philosophy of preventing mishaps has served it well since 1920, as the quality companies that it serves know the wisdom of the quote above. Others can learn from it, and gain benefit for the multi-millions of dollars at risk. Risk management is ingrained in so much of shipping, why not in agency too? In North America when an unforeseen problem strikes an unprepared agent, it is often too late to escape promptly, let alone profitably.



INTER BALT: Polish ship agency offers great bulk expertise



INTER BALT's highly specialized staff have helped the agency to establish a solid reputation.

INTER BALT is one of the leading bulk ship agencies in Poland. Headquartered in Gdansk, the company has been in business since 2004.

INTER BALT is a certified ship agency (ISO 9001), an active member of BIMCO (Baltic and International Maritime Council) as well a member of the Polish Shipbrokers' Association.

The agency's highly experienced teams have gained a good reputation with the biggest ship owners, and they do their utmost to fulfill the company's husbandry mission of 24-hour service. INTER BALT owes its dynamic and continuous growth both to its teams of highly specialized staff, as well as to loyal support from its partners and customers, with which it has built long-term business relations. The agency regularly co-operates

successfully with a number of owners.

INTER BALT aims to be the preferred international provider of high quality, innovative, cost-effective and added-value business solutions for shipyards and shipping services.

The company's primary scope of business includes:

- ❖ ship agency — covering all Polish ports and shipyards;
- ❖ owners protecting agency;
- ❖ chartering and shipbroking;
- ❖ consultancy, agency and representation of other entities of international cargo transshipment;
- ❖ logistics and forwarding services related to sea and land transport.

Locations: INTER BALT can be found in the Polish seaports



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80-750 Gdańsk
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e-mail: interbalt@interbalt.pl



www.interbalt.pl

of Gdansk, Gdynia, Szczecin and Swinoujscie.

INTER BALT, with its offices, provides comprehensive services to principals at all Polish seaports and shipyards. It represents a ship owner's interests from the moment a ship enters the port/shipyard until the moment it leaves. It meets all ship's needs including:

- ❖ clearance in and out of the ports;
- ❖ ordering pilots and tugboats;
- ❖ delivery of bunker fuel and lubricants;
- ❖ organizing and co-ordinating cargo handling on behalf of owners/charterers and on- and off-hire survey;
- ❖ all crew formalities, transportation, hotel bookings, medical assistance etc.;
- ❖ spare parts, parcels, mail and any documentation clearance and delivery to and from the vessel;
- ❖ concluding shipping agreements and collisions on behalf of the ship owner; and
- ❖ shipping consultancy.

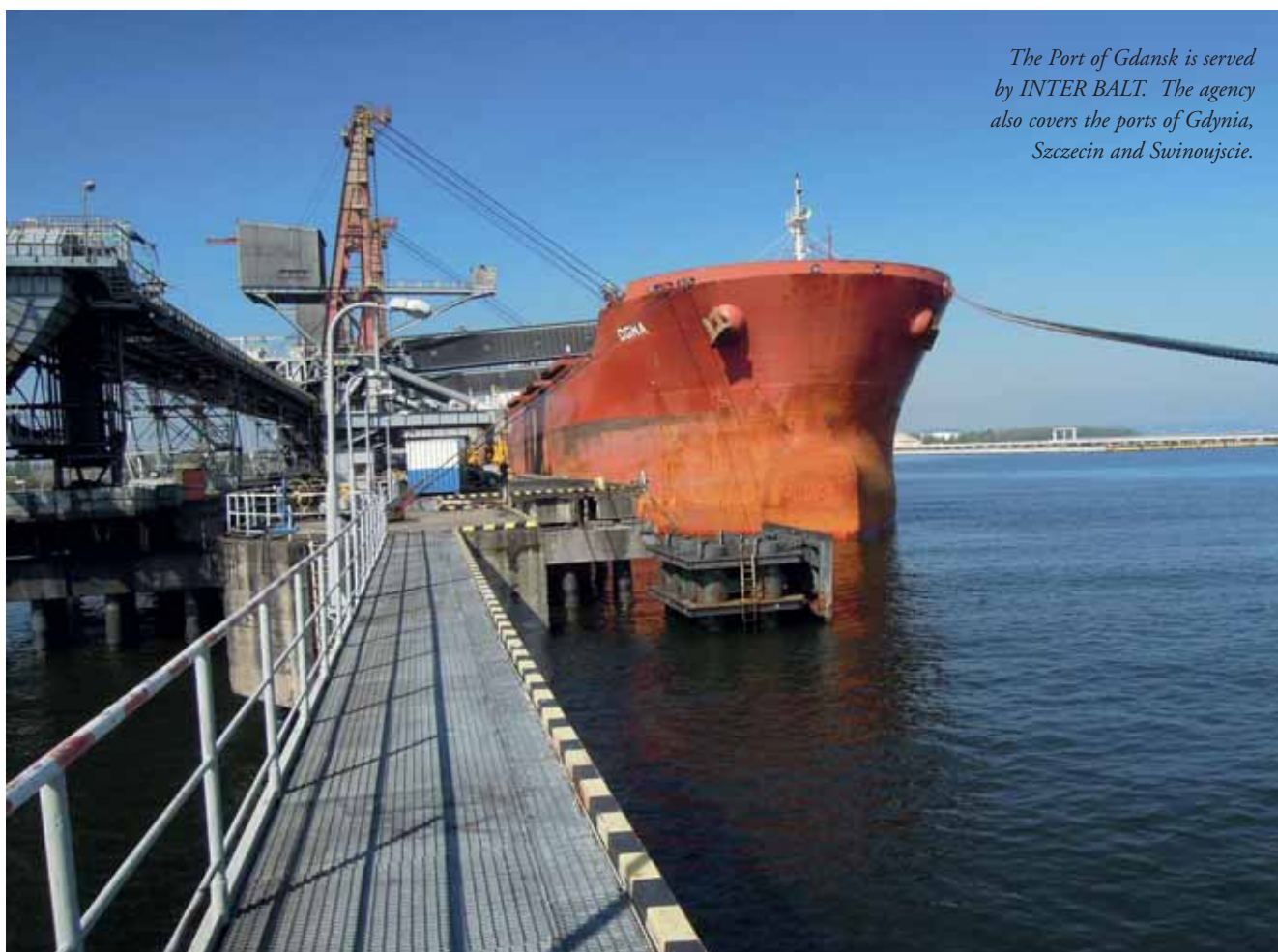
As a ship agency, INTER BALT comes into contact with individuals and organizations. These include ships' masters, officers and crew, customs, immigration, port authorities, towage companies, boatman and stevedores. Depending on circumstances, owners need a range of services, including the arrangement 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.

The company's experience in shipping business, good relations with the companies, institutions and offices dealing with port traffic guarantee that its costumers, expectations are met.

In 2014, INTER BALT's shipping agency branch serviced nearly 365 vessels calling at Polish ports and shipyards and proved that it is one the Polish leading bulk ship agencies.



More than a decade of INTER BALT's ships agency operations allows it to state that it is able to meet the expectations of its costumers. The company is currently a highly respected partner in this field. According to Mare Kowalski, chief executive officer of INTER BALT Poland, flexibility and diversification are key to the success of the agency.



The Port of Gdansk is served by INTER BALT. The agency also covers the ports of Gdynia, Szczecin and Swinoujscie.

Laden: covering Canada and the Great Lakes

Laden Maritime Inc is so much more than just a simple, single port agent. The company services a massive maritime area. Canada has the largest coast line in the world. Laden's reach includes:

- ❖ East Coast—St.Lawrence Gulf—River;
- ❖ Great Lakes — both US & Canadian ports;
- ❖ St.Lawrence Seaway (15 locks one way);
- ❖ West Coast-Arctic Ocean;
- ❖ Hudson Bay (Churchill Manitoba), Hudson Strait & Baffin Island; and
- ❖ Northwest Passage (*Nordic Orion*).

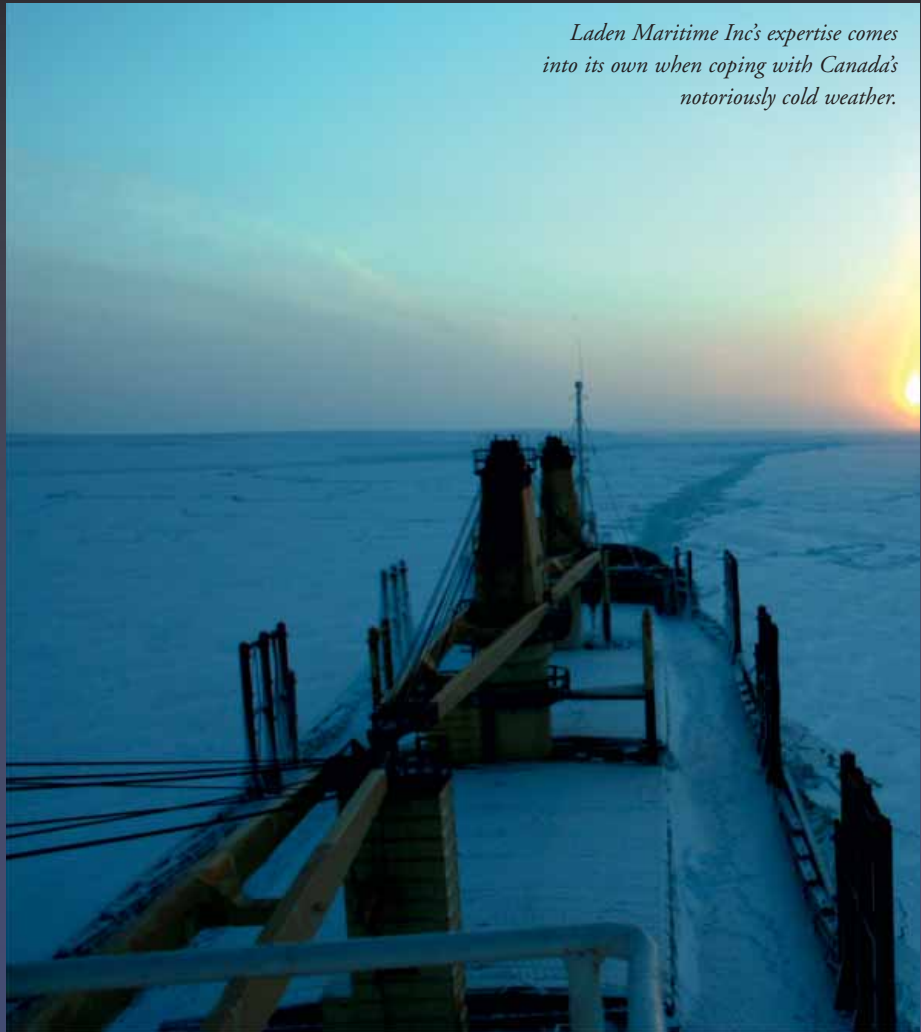
Laden offers pro-forma costs/port restrictions for any and all callers — discharging/loading/repairing/bunkers/ changing flag/crew/supply ice pilot advisors. It provides weather updates, especially regarding ice conditions. It also advises of stevedore costs for discharging of a load. It also advises of stevedore costs/duration for discharge or loading of any materials.

Laden can de-ice vessels if they get caught with freezing sprays over the decks. Another vital service it offers is vessel cleaning — it can clean, for example, green petcoke or worse (in the summer, but also in the winter at temperatures as low as -30°C), to such a high standard that the vessel can afterwards be used to handle grain.

Laden prides itself on its ability to meet all of its clients' needs — no matter how unusual they are. Requirements include all the usual concerns:

- ❖ crew;
- ❖ advances;
- ❖ bonuses;
- ❖ sickness;
- ❖ injuries;
- ❖ urgent attendance (helicopters or launch);
- ❖ major propeller or hull damages;
- ❖ ice/transits through ice-covered waterways;
- ❖ entry into Canadian waters when temperatures are below zero;
- ❖ avoiding frozen systems;
- ❖ arranging sufficient heating/clothing/fighting frozen ballast-sounding pipes; and
- ❖ whatever else needs to be attended to, while ensuring clients/owners/charterers are kept well informed at all times.

Laden Maritime Inc's expertise comes into its own when coping with Canada's notoriously cold weather.



Diversity of weathers is huge consideration to shipping into or out of Canada and in the northern regions. Warm clothing/boots/hats/gloves for crew are vitally important, so Laden ensures that these are supplied to crews when entering the top of a country such as Canada. These are required much more often than some think; even though Canadian weather in lower latitudes can equal Florida in midsummer, in midwinter some of those same latitudes offer temperatures of -20°C to -30°C . Such changes cause huge adjustments in how simple tasks are dealt with.

While tankers, containers, specialized lifts and passenger do call in Canada, by far the most common vessels are bulk carriers; these ships mainly import raw materials and export grains and iron ores, as well as speciality ores/heavy lifts.

Laden staff have many years of experience, during which they have developed useful contacts. They enjoy addressing and resolving shipboard problems on a case-by-case basis, and the company's expertise grows yearly with new ways constantly being found to address old problems. No task is too small nor any too large that Laden cannot find a means of dealing with same to a satisfactory result.

All Laden employees take pride in their work, which ensures that the company's clients are protected. Keeping standards high, each and every day, help Laden to remain strong and at the forefront of the industry.

The French connection: Agena Tramp ship agency services

French port agent Agena Tramp began life as the AMANOR (Agence Maritime Nordique) company. Founded in 1972, in its first years the company focused on liner activities, with first class ship owners showing confidence in its port agents, the professionalism and dedication of which were widely recognized in the market.

First based in the Ports of Le Havre, Rouen and Bordeaux in France, the company quickly became successful and extended its activities to the rest of France's ports.

Since November 1989, the company has been known as Agena Tramp.

CURRENT ACTIVITIES

Agena Tramp, headquartered in Le Havre in France, is dedicated to port agency. Since its creation, the company has built strong relations with all service providers and with the port authorities.

Thanks to its technical expertise and proactive teams which are available 24/7, the company offers a wide range of solutions such as: port information; ship agency; crew changing; project cargo and any handling; husbandry; ship supply; protecting agency; offshore support; supervision of dry-docking and repairs; stevedoring; spare parts delivery and sludge and slop removal.

Its extensive experience in all types of vessels make it a renowned specialist in this field.

Agena Tramps is LRQA certified ISO 9001-2000.

THE ROLE OF A SHIPS' AGENT

The ship agent is 'the eyes and ears' of the ship owner and/or the charterer in port; he acts as a protector and an advisor and is the key player between all parties involved during a call — masters, port authorities, ship-owners, charterers, receivers, stevedores, surveyors and the terminal.

Constantly looking for additional values on information and market intelligence is also a core function of the agent responsibility that can make the difference.

Known for its professionalism and its solid relations in port,



the ships' agent is there to ensure the success of a call. High quality service, productivity, time and cost savings and reactivity are crucial for customers. Availability is essential. An agent works non-stop, 24 hours a day, seven days a week and 365 days a year.

WIDE COVERAGE

Agena Tramp has seven offices in France to cover all French



ports from the North, the Atlantic Coast and the Mediterranean. Furthermore, its port agency activities cover a wide range of countries via its own subsidiaries and network:

- ❖ **Europe:** France and Belgium;
- ❖ **North Africa:** Morocco, Algeria, Tunisia, Libya and Egypt;
- ❖ **West Africa:** Senegal, Ivory Coast, Ghana, Togo, Benin and Nigeria;
- ❖ **South-East Asia:** Thailand and Myanmar;
- ❖ **The French West Indies.**

As a Multiport member, the world's largest independent ship agency network, Agena Tramp is also able to provide port agency services worldwide.

CUSTOMER BASE

Agena Tramp's customers are ship owners, grain traders, mineral importers and exporters, steel producers and fertilizer producers. From small to big companies, the company can respond quickly and reliably to their requests. Agena Tramp can satisfy customer demands from every part of the world.

STAYING COMPETITIVE

Agena Tramp is one of the first ship agencies to ensure the best ports coverage in France. With its own offices and employees based in major seas and river ports, Agena Tramp is one step ahead in services and reactivity. Reputation, experience, connection and a national presence make it one of the leading companies in the sector. Agena Tramp competes with local as well as global companies.

Agena Tramp remains at the cutting edge of the technology and has invested in a global IT system to deliver a high level of service performance. Its priority is to offer complete solutions

to its customers for the carriage of cargo, from the loading port to the unloading port.

The company future plans include the expansion of its worldwide partners' network in order to be a key shipping agent for global accounts and multinational companies.

BULK BUSINESS

About 60% of Agena Tramp's business is related to dry bulk activity, and it is one of the leading ship agents involved in grain and mineral commodities. Dry bulk is a demanding market where knowledge, experience and common sense are an absolute necessity.

Agena Tramp is recognized as a specialist in this market, and major trading houses and ship owners rely on the company's services.

COMPANY STRUCTURE

Agena Tramp is one of the first subsidiaries of the Naxco Group.

Naxco is one of the largest fully integrated shipping and logistics providers. The French private group, founded in 1967, is a leading and innovative global partner, present in all segments of the transport and logistics worldwide.

With solid experience and a reliable network, Naxco offers complete and top-quality tailor-made services, to meet its clients' needs.

Naxco Group, headquartered in France, comprises 22 subsidiaries with almost 450 employees worldwide, all active in shipping, port services, freight forwarding and logistics & NVOCC (non vessel operating common carrier).

Naxco Group continues to expand through acquisitions, joint ventures and partnerships.



Being in business for nearly a century has allowed us to build a solid reputation with our customers and subcontractors. We can charter tonnage, select the right port; find the best terminals, stevedores and process throughput via road, rail and inland waterway to the final destination. We organize and coordinate all freight inspections, customs affairs and paper work. Having the best specialists in the cargo handling and transport business, Gans Cargo Operations is able to provide her customers with competitive prices for bulk-, break-bulk and containerized cargoes. Our strong teams of cargo superintendents monitor all 'on site' transactions in the ports of Rotterdam, Antwerp, Amsterdam, Ghent, Terneuzen, Flushing, Ostend and Zeebrugge, as well as every other European port at customer's request.

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GAC: the world's local agent

Eric Barnard, GAC Group Sales Director – Shipping, explores the role the service provider plays in helping dry bulk operators manage costs

For owners and operators in the dry bulk sector, market pressures have demanded a more agile, efficient and tightly controlled approach to managing operational costs. In the face of volatile freight rates, they have been squeezed from all directions. With rising labour bills and additional charges associated with stringent regulatory requirements, have left dry bulk players with very little room for manoeuvre. Factors such as the impact of seasonal weather also further disturb shipping rates and make it harder for shippers to plan for the future.

Given the pressures faced by all parties across the dry bulk supply chain, ship agents play an important role in helping their customers to control costs, manage their operations and effectively capitalize on periods of positive market growth, whilst protecting them against the swings of fortune that freight rates susceptible to volatility may bring.

One of the world's largest providers of shipping services, GAC represents more than 3,500 customers and handles over 65,000 vessels every year. The global agent provides unparalleled expertise and experience in delivering ship agency services for a diverse range of dry bulk markets, and is a vital ally for shipping companies seeking to control costs, increase efficiency and deliver their business strategy.

Backed by its global network with own offices in key bulk regions such as South Africa, China, Brazil, India, Australia and Indonesia, GAC's local teams help shippers and receivers achieve smooth and rapid vessel turnaround at both load and discharge ports.

“As a global agent with the resources, experience and expertise to help customers overcome the challenges they face, with a breadth of operational services and the flexibility to meet changing customers needs, we are the world's local dry bulk agent. By finding innovative ways to streamline operations,

control costs and pass on efficiency savings to customers, we pride ourselves on providing tangible benefits,” says Barnard.

Testament to this is GAC's new contract with CSC Sugar, one of the largest importers and exports of sugar to and from North America. GAC North America has been focusing on ramping up its dry bulk presence in the region. It is now regularly loading 15,000 metric tonne shipments, loaded in Mexico and discharged in Texas where GAC is also the full agent for discharge operations.

‘INTELLIGENCE-LED’ APPROACH

Additionally, GAC provides flexible, value-added services from crew changes, hub agency to bunker fuels where customers can also benefit from significant cost and efficiency savings with customized packages. Take the innovative and environmentally friendly HullWiper Remotely Operated Vehicle (ROV) by GAC Environhull for example; the brushless, diver-free ROV cleans hulls — boosting vessel speed and fuel efficiency — within a fraction of the time needed for traditional method.

Barnard explains that to handle complex operations, GAC has invested in developing in-house IT solutions, ensuring greater connectivity, control and co-ordination that give its customers a window into their world.

“Using our proprietary ‘GACAgent’ system we utilize real-time information-sharing and data management tools that allow customers to keep track of requirements and costs from any location in the world, giving them far greater cost control.”

CREATING ‘SMARTER SOLUTIONS’

GAC is dedicated to finding the smartest way of working, in order to deliver the most operationally efficient solutions for their customers. This means utilizing the wealth of data collected across each voyage and allowing customers to manage all documentation through a single platform.

That way, if a GAC customer is in London and its ship is in Lagos, it can access live and archived port disbursement accounts, track cargo details, perform KPI (key performance indicator) analysis, control bank transfers and utilize GAC's preferential exchange rates provided by its banking partner. Customers can proactively manage any procurement costs, streamline operations and minimize unnecessary spend and bill through GAC's Centralised Payment Services. Through its real-time port information and alerts services, they can stay on the front foot and work with GAC to anticipate and address any possible delays.

‘FRONT LINE’ SERVICES

GAC understands the complex market drivers, regulatory requirements, environmental pressures and day-to-day challenges of dry bulk operations. Worldwide, GAC applies the most stringent Health, Safety, Security and the Environment (HSSE) standards and compliance to international business regulations in everything they do.

“With highly experienced people on the ground worldwide, we have the local knowledge that binds it all together and ensures that our dry bulk customers are in safe hands, wherever they are,” Barnard concludes.

Owners and operators can focus on securing the best rates for their vessels, managing their fleet and concentrating on building their business; GAC — the trusted ship agent will be on hand to help with the rest.



Eric Barnard, GAC
Group Sales Director.

Maritima Dominicana covers all Dominican ports

Maritima Dominicana, S.A.S. is a ship agency and stevedoring company with over 40 years of experience, offering a full range of services to the maritime industry, both to ship owners and cargo interests. It handles port agency and ship husbandry matters for all kinds of vessels, regular liner and tramp calls. It offers all kinds of efficient cargo handling, loading and discharging, achieving rapid turnaround of the ships under its care in all Dominican ports. Furthermore, it also offers all kinds of cargo storage and handling facilities at locations at or near the main ports.

Maritima Dominicana is the Dominican member of the worldwide Multiport Ship Agencies Network and a member of the Baltic & International Maritime Council (BIMCO). It has been accredited under ISO 9001:2008, ISO 14001:2004 and OHSAS 18001:2007, for its ship agency, cargo handling and warehousing activities. It has also been certified by the Dominican Chapter of Business Alliance for Secure Commerce (BASC), based on the international standards of the worldwide BASC organization. The Dominican Customs has certified it as Authorized Economic Operator of the Dominican Republic (OEA_RD), based on the international standards and security requirements of Authorized Economic Operators, established by the World Customs Organization within the Safe Framework.

The role of the ship agent is to provide all the services required by the vessel in order to have a smooth port stay and efficient cargo operations. In Maritima Dominicana the full vertical chain of service is provided, making the company's logistics service ideal. From the moment the vessel owner appoints Maritima Dominicana, he can rest assured that the proper logistics will be set into motion. The company ensures that essential supplies, crew transfers, customs documentation, and clearances in and out of the port are all arranged with the port authorities without delay. Maritima Dominicana advises the master and principals regarding port restrictions and required documentation of the vessel for said port. It also takes responsibility for ensuring the proper berth for the vessel, arranges for the pilot and tugs, organizes discharge/loading operations, organizes the transport and handling of the goods, liaises between the shippers and the receivers. It provides all concerned parties with updates and reports on the activities of the vessel at the port so that they have real-time information available while the vessel is in port.

Dry cargo vessels represent approximately 20% of the vessels attended by the company every year. The Dominican Republic exports bauxite, cement, building aggregates, sugar, gypsum, clinker, salt, and fertilizer. Corn, coal, clinker, wheat, soyabean meal, pet coke, fertilizer, salt, malt, sugar and building aggregates are imported. Coal vessels discharge in Rio Haina and Barahona. If the vessel is not self-discharging, Maritima Dominicana provides the necessary clamshell grabs for the operations. The company owns and operates a large fleet of vehicles and lifting equipment guaranteeing the proper handling of the cargo. Grain vessels discharge in Rio Haina, Santo Domingo and Puerto Plata. Maritima Dominicana has offices in Puerto Plata, San Pedro and Manzanillo besides the one it has in Santo Domingo. These offices make it easier for it to provide its services in all of the ports as they are strategically set up in different areas of the country.

Over 60% of the vessels Maritima Dominicana attends are container vessels. Containers vessels load/unload in Caucedo, Rio Haina, Puerto Plata and Manzanillo. Caucedo is a dedicated container port and in Manzanillo there is constant traffic of reefer containers as fruit is exported. The office in Manzanillo enables a quick response to this far off port. For that purpose Maritima Dominicana operates off-dock terminals at these ports to facilitate the delivery of empty containers and chassis for export shipments. Maritima Dominicana owns 1,200 chassis for transportation of containers which play a large role in this operation.

Of course, like in any other business, Maritima Dominicana has competition. There are other agencies in the country. The company attends approximately 50% of all the vessels coming into the country. It is committed to providing the best service in the safest way possible, complying with all the regulations and taking care of the environment. Its main challenge is that, as it is often a pioneer in its field, sometimes it has to work doubly hard to get the sector aligned with practices which may be new to the country though they are already common practice in other countries.

Its mission is to provide a complete array of quality services in ocean transportation, cargo handling, warehousing, reefer warehousing and dangerous cargo warehousing, in pursuit of national leadership and international recognition as a ship agent in all Dominican ports.



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Right from the horse's mouth: GAC Belgium managing director answers questions

Mark van den Akker, managing director of GAC Belgium, has taken the time to answer some questions related to GAC Belgium's ship agency activities.

Q: What ship agency services does GAC Belgium offer?

MvdA: We provide the following services: ship agency for all types of vessels, including the O&G industry (project based approach); project logistics; ship spares logistics; bunker fuels; and husbandry services

We are also looking at expanding our service offerings to include door-to-deck ship spares logistics and hull cleaning solutions.

Q: What do you consider to be the role of a ship agent?

MvdA: Relieving captains and customers of the burden of organizing anything required for a port call — including quayside support, tugs, pilots, line handlers, clearance documentation, customs, crew transfers, cash to masters, communication with authorities, etc. — and ensuring that all operations are conducted in accordance with local rules and regulations.

Q: At what ports you are represented?

MvdA: All ports in Belgium.

Q: How much of your business relates to dry bulk?

MvdA: We are currently small players in the dry bulk market, but we have plans to draw on the GAC Group's experience to expand our activities in this sector. It's worth noting that the GAC Group won the IBJ Dry Bulk Agent Award in 2013 and was shortlisted for the same award again in 2014, the same year that we won in the Ship Agent category of the same Awards.

Q: What are your main challenges?

MvdA: We are a relative newcomer in a highly competitive environment. However, as an ISO & OHSAS-certified company we are strongly focused on growth by providing a high level of quality service for safe and efficient port calls. Our highly-qualified and experienced personnel provide 24/7 service with



GAC Belgium team.

minimal turnaround time for each enquiry. We have well-established and good working relationships with the local authorities and take pride in providing a service with a human touch.

Q: What is the general company background?

MvdA: From its office in the busy shipping hub of Antwerp, GAC Belgium offers a range of ship agency, project logistics and dry bulk services at the country's ports.

GAC Belgium is part of the GAC Group, a global provider of integrated shipping, logistics and marine services. Emphasizing world-class performance, a long-term approach, innovation, ethics and a strong human touch, GAC delivers a flexible and value-adding portfolio to help customers achieve their strategic goals. Established since 1956, GAC employs over 10,000 people in more than 300 offices worldwide.

Q: Is there any other information you think may be of interest to our readers?

MvdA: GAC Belgium works closely with GAC Netherlands, combining their experience, expertise and resources to provide a wide range of shipping and logistics services. This synergy effectively gives clients the convenience of a single point of

contact for all their agency, logistics and breakbulk needs both in Belgium and the Netherlands.

ABOUT GAC GROUP

GAC is a global provider of integrated shipping, logistics and marine services. Emphasizing world-class performance, a long-term approach, innovation, ethics and a strong human touch, GAC delivers a flexible and value-adding portfolio to help customers achieve their strategic goals.

Established since 1956, GAC employs over 10,000 people in more than 300 offices worldwide.



Coal handling at the Port of Antwerp
(© Antwerp Port Authority)

Transmarine Navigation Corporation: major US provider of agency services

Transmarine Navigation Corporation is a major bulk cargo shipping agency in the United States. Its offices on the US West Coast, the US Gulf and in Hawaii deliver value-creating agency service for the most prestigious firms in the shipping industry.

The company's market-proven service to customers over the years have given it a solid reputation with US West Coast and Hawaiian petroleum imports and exports, Columbia River terminal grain exports, USWC sulphur exports, and Hawaiian cruise ships. It has a rising volumes of solid fuel exports, and USG petroleum imports and exports. Transmarine takes with seriousness and pride the trust that owners and charterers place in it to positively impact the safe operation of their highly valuable vessels and cargo operations.

Transmarine's service model delivers value-creating agency service by placing experience and expertise aboard the vessel: its boarding agents are trained veterans with an equity stake in the firm. These agents are backed by highly experienced operations managers and senior management.

While routine agency tasks may seem mundane, poor fundamental performance results in costly delays and blinding confusion for vessel owners and cargo interests; reliable, consistent performance creates savings and clarity for its clients. Exceptional issues show when an agency's expertise and collective experience produce value for the client at multiples 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 must communicate a situation and its nuances, provide advice with the aid of his experience and expertise, receive instruction, and act with alacrity.

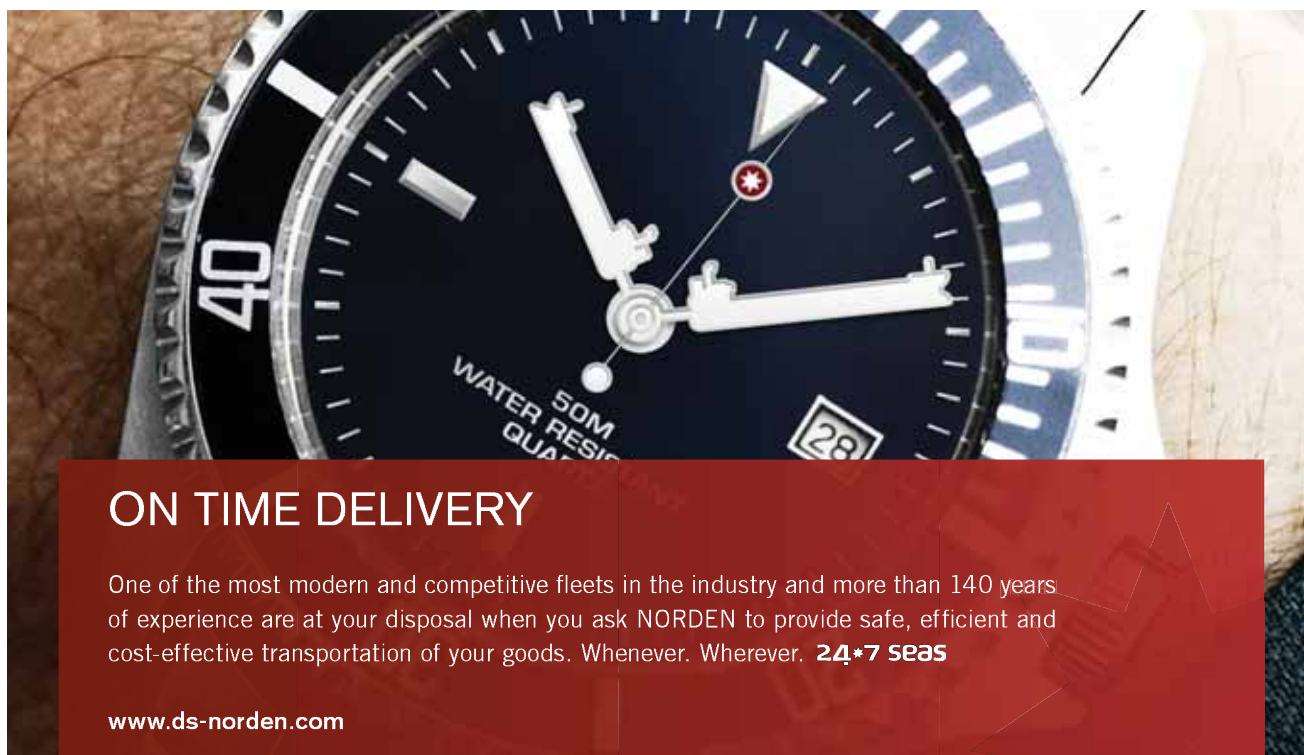
It is vital that an agency have a solid relationship with the people who work at port terminals. These relationships develop over years of living and working in the same community, sharing similar concerns and interests. Agents also must have a proper and courteous conduct when dealing with port authorities 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, national oil companies, 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 of Texas, Louisiana, the lower Mississippi River and Hawaii. It does not perform liner container work.

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 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.

Transmarine is the longest continuous member of BIMCO in the United States and is active in industry associations and local harbor safety committees. It is certified by agency associations ASBA and FONASBA. Founded in 1938, Transmarine today has 80 equity-holding employee 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.



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Boasting over 100 years in business, Biehl is one of the largest US agencies

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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.

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





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.

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

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.

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Wilhelmsen Ships Service serves up fresh ship agency growth

Competing in a congested agency market, increasingly populated by small local players, Wilhelmsen Ships Service is using its expertise, decades of regional experience and global network to continue to grow its ship agency business in Thailand.

Established in 1985, Wilhelmsen Ships Service Thailand operates from three key office locations, Bangkok, Laem Chabang and Maptaphut. From this trio of offices Wilhelmsen Ships Service's (WSS) experienced Thai team offers a complete range of ship agency services, complemented by additional products and services from the wider WSS portfolio.

Handling an even 50/50 balance of dry bulk and tanker vessels for a wide and established international customer base Nigel Goode, Managing Director, WSS Thailand highlights what sets WSS apart from the local agency players in the Thai market.

"Wilhelmsen Ships Service's global reach, coupled with our commitment to eliminating non-compliance activities, offers our customers peace of mind that their interests are being fully protected and represented wherever in the world WSS is appointed as an agent."

Providing such security involves taking on a wide variety of different tasks, tailored to the specific needs of customers, whenever and wherever they take place. "The role of a ships agent (or a port agent) is to take care of all the regular routine tasks, such as vessel clearance, handling shipments and cargo, as well as looking after the general interests of customers quickly and efficiently," explains Goode.

In addition, WSS is consistently adapting and re-designing its ship agency services to enable customers to conduct business quickly, efficiently, consistently and globally. Offering the customer a single dedicated point of contact, responsible for coordinating all port calls around the world, located in the same time zone and speaking the same language, helps simplify multiple port calls. Providing a consistent, transparent pricing structure, electronic disbursement accounts and just one, do-it-all bank account for all port call transactions helps streamline what can be an unnecessarily complex and time-consuming process.

Serving the ports of Bangkok, Kohsichang Anchorage, Laem Chabang, Sriracha, Maptaphut, Rayong, Prachuap Port (Bangsaphan) Petchaburi, Phuket, Songkhla, Krabi, Kantang, Samui and FPSO Goode's WSS team has in excess of 20 years of day-in and day-out experience handling bulk carrier and tanker vessels.

Typically working with a wide range of cargos, such as



*Nigel Goode,
Managing
Director, WSS
Thailand.*

ammonia, chemicals, clinker/cement, coal, fertilizer, iron ore, ethylene/propylene, LPG/LNG, metal, pig iron, rice/grain, soya bean meal, steel/scrap, sugar/molasses, tapioca/woodchips and crude oil WSS has taken advantage of its constant presence in port to offer its customers added value.

Building up vital working relationships over time with the ports, terminals, relevant authorities and of course the local shippers and receivers enables WSS to provide its different customers an array of bespoke services, along with timely port information and updates.

"There are several categories of services, such as full agency, husbandry, protective agency services, hub solution services, each rendering specific services depending on the customer they represent. We provide the customer with updates and reports on activities at load/discharge port so that customers have real-time information available while vessel and cargoes are in transit," affirms Goode.

It's one of the reasons why WSS is a preferred agent for traders and charterers on certain commodities, such as coal, copper concentrates, steel scraps and pig iron where up to date information on terminals, stevedoring, and stockpiling is incredibly valuable.

With Thailand's GDP expected to grow 3.8% this year on the back of increased exports, coupled with the government's ambitious infrastructure investment plans, there's cause for optimism, but significant challenges remain.

Setting aside the ongoing political uncertainty, with the date for democratic elections now postponed to 2016, and the wider general instability of the economic markets, Goode identifies the continued "increase in local agencies and general price pressures" as key challenges for WSS Thailand's ships agency team in 2015. To be expected in an increasingly fragmented, localized and fiercely competitive business, regardless, WSS continues to improve and standardize its services, aiming to constantly re-define what ships agency can offer its customers, wherever in the world they operate.



Peruvian company Canopus SA: more than just a ship agent

The Peruvian company Canopus SA started operations in 1990. As an independent maritime agency, in these 25 years Canopus has been able to earn recognition from shipowners and charters as well as importers and exporters of bulk. It provides a service tailored to each client at all Peruvian ports.

Canopus is not a global maritime agency. However, its excellent staff of professionals, and its very good relationship with the various port and customs authorities means that it has a reputation as one of Peru's foremost maritime agencies.

Canopus operates on the basic principles of excellence in service, reliability and integrity.

Services provided include:

- ❖ full agency;
- ❖ husbandry agency;
- ❖ protective agency;
- ❖ ship-to-ship operations;
- ❖ navy ship attendance;
- ❖ dry-docking agency;
- ❖ spare parts logistics and customs clearance;
- ❖ bunker arrangement and bunkering;
- ❖ ship and cargo surveys by independent surveyors;
- ❖ cash to master delivering;
- ❖ crew change arrangements;
- ❖ crew medical assistance;
- ❖ launch co-ordination service;
- ❖ post fixture/laytime calculation;
- ❖ grab and hopper rent;
- ❖ stevedoring; and
- ❖ fender rent.

In 2014, Canopus provided agency or stevedoring services to vessels carrying close to 3mt (million tonnes) along the Peruvian coast. Commodities carried by these vessels included: wheat, corn, soyabeans, soyabean meal, barley, malt, oats, coal, clinker, cement (bulk and bagged), plaster, urea, fertilizers, fishmeal and others.

As Peru is such a big exporter of minerals, Canopus expects that it will soon be handling mineral concentrates.

In addition to shipping agency and stevedoring services, Canopus has its own equipment for use and/or rent for port operations nationwide. It is one of the largest and most complete companies in equipment rental, and its products include: grabs, hopper, bulldozers, wheel loaders, forklifts, fenders for STS operations, and others.

The company's main office is located in Callao Port, a few minutes from Lima, the capital of Peru and from the main international airport (Jorge Chavez). This enables it to offer a full range of services at all Peruvian ports.

Of particular note, Canopus, thanks to its wide customer base and the expertise it has gained over the years in handling dry bulk cargoes, was the only Peruvian maritime agency to be contacted to participate as a consultant and advisor for the design and construction of Chancay Port. This consultation started in 2012, with the goal of providing a modern port

alternative that is efficient and specialized in handling dry cargoes. The construction of the port is expected to begin by the end of the first half of 2015. The terminal will be one of the most modern on the South Pacific coast.

Due to its participation in the development of Chancay Port, which is now at the EPC (engineering, procurement, construction) stage, Canopus has created a new Consulting & Maritime Engineering division, so that it can participate in this and other projects that are being developed in the country. For example, for this initiative, it has invited the participation of the Ocean Green company, which has had a presence in Peru since 2003. Ocean Green has over 20 years of national and international experience in the field of development studies and marine engineering projects and ports. It has been actively engaged in port investment projects since the initial conception of the idea, serving the largest companies in the world in the industry. This has allowed Canopus to develop specialized studies of natural conditions, and other services such as: climate of operational and extreme waves; studies of ship manoeuvrability; manoeuvring simulations; and vessel mooring; marine geophysics; geotechnical, oceanographic and hydrographic studies.

All this has given Canopus further expertise in developing feasibility studies, pre-location of new port maritime initiatives. It has also made significant investments in marine technology, applied to marine science and engineering, in support of the various studies that it is initiating.

Canopus also participated in the Dry Bulk Europe 2014 conference and exhibition held in Amsterdam. This conference, organized by *Dry Cargo International's* conference department, provided an extraordinary network for its new projects and future innovations, which are key to its continued development.

Canopus is focusing on innovation in the conquest of new markets, increasing productivity volumes and improving competitiveness. This allows it to create an aggregate value which is important for the future of the company. Canopus anticipates the needs of its customers, so that it is more than just a maritime agency for its customers, but can provide complete solutions.



A.R. Savage & Son: ship agent profile

Arthur Savage, president and CEO of A.R. Savage & Son — the largest ship agency, ocean freight forwarding and advisory services company on Florida's west coast — gives his responses to questions relating to ship agency services.

What do you consider the role of a ship agent to be?

AR: A ship agent co-ordinates all compliance and logistical arrangements to get a ship into port, discharged and/or loaded, documented, and out of port. This may include working with USCG, CBP, and Port Authorities, taking care of the crew and required paperwork — such as the shipping manifest, stowage plan, bill of lading, and the like — and working with the captain to get his needs lined up.

Upon arrival and departure, the ship agent also coordinates services with vendors such as tugboats, pilots, line handlers, stevedores and others to get the ships into and out of the port.

These services vary depending on the ship's origin and type of cargo, as well as the capabilities of the staff on board. For instance, for foreign arrivals, ship agents must also co-ordinate with government officials who have to check the ship, crew and cargo.

A.R. Savage & Son is also bonded and insured to work with importers and exporters as well as government agencies, port authorities, and terminals in the shipment of their products in ocean-going vessels, meaning that we can arrange for the ship to be loaded or unloaded and document cargo shipments.

Because of this, it's important for a ship agent to understand the many facets of the port, the cargo, and the vessel. For instance, we work with a great deal of phosphate in Tampa, so understanding how this cargo is loaded and unloaded, which berths are suited to accept dry bulk phosphate, and any intricacies about the vessel in terms of docking or loading are absolutely necessary to effectively serve our clients.

At what ports are you represented?

AR: We are Tampa-based. The majority but not all of the ships we work with are located at Port Tampa Bay, Port Manatee and The Port of St. Petersburg. When our customer wants us to handle ships at other ports, we will co-ordinate with other

ASBA-quality certified agents who are particularly knowledgeable about that port and cargo.

Who are your major clients?

AR: We represent ship owners and charterers carrying the cargoes, as well as the cargo interests themselves. Because we have extensive knowledge of maritime services, as well as the Tampa Bay ports, we also offer advisory services to terminals, cargo shippers, receivers, carriers, maritime attorneys and other interested parties that are in need of guidance.

Who are your major competitors?

AR: While there are certainly a number of other ship agents out there today, we were the first agency in the United States to receive the ASBA quality certification almost ten years ago. This sets us apart from other agencies in Tampa Bay, as does our long-standing history in the maritime community.

A.R. Savage & Son has been providing exceptional service for 70 years, and our team has a deep knowledge and understanding of the industry and Tampa Bay's ports. We are intimately experienced with both the vessels and the cargo that goes through the ports, and have long-standing relationships with the many vendors with which ships may contract.

Because of this, we create cost efficiencies that our clients may not have otherwise realized.

For instance, because we understand the local ports we can ensure timely entry and departure for the ship and help to avoid steep cancellation fees and costly delays. Our relationships with the many vendors a ship may use also allows our clients to take advantage of the volume pricing that these vendors offer us.

So while a ship agency does have a fee, this fee is nominal compared to the savings that we enable our clients to realize.

How much of your business relates to dry bulk?

AR: Roughly 50% of our business relates to dry bulk cargoes such as coal, granite, limestone, phosphates, fertilizers (DAP, MAP, MESZ, ammonium nitrates, potash, and urea), salt, cement, scrap metal, and bauxite. The other 48% is liquid cargo, with the balance being breakbulk and cruise.



Logistics issues can hamper import–export transactions



Direct dry bulk transshipment ship/barge port Antwerp, Intermodal StockCargo.

Some six out of ten import–export goods transactions, cannot be carried up in Europe, because of logistics issues, writes Joe ElliAv, Director Operations, Board member, StockCargo Groupe, Global Maritime Logistics, Europe.

This is because of the following main reasons: the prices are too high; it is not technically or logistically possible to carry out transactions; or the agent/carrier is not sufficiently experienced and professional, “can’t deliver”, and he was chosen as the result of misrepresentation.

Even those who still manage to make transactions still often encounter logistical problems which can cause schedule disruptions — damage to the cargo and, in some cases, direct financial losses.

This is exactly where the shipping and cargo agent becomes vital. His important role is to co-ordinate efficiently and execute the logistical operation process, between the parties involved — ship owner, shipper, and port, or various facilities suppliers.

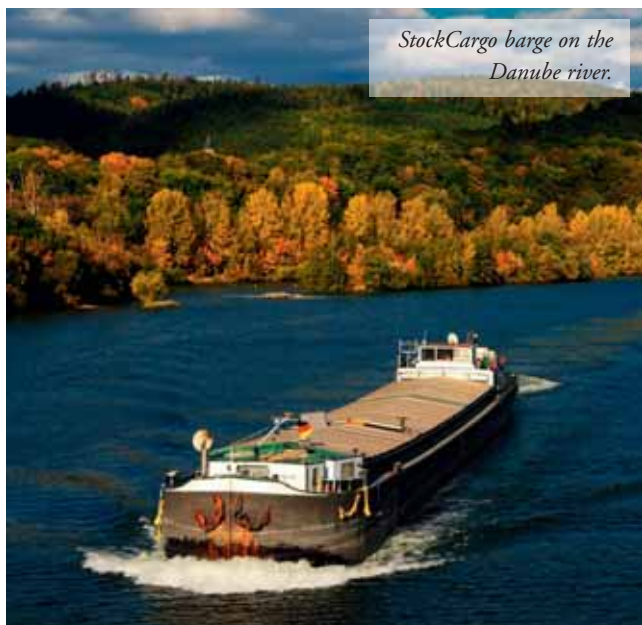
StockCargo intermodal carriers for dry cargo, and global shipping agencies work to improve industry statistics. It is located right in the centre of the supply chain. On the one hand, it deals with the ship-owners port authorities and suppliers; on the other, it takes care of the shipper and its cargo interests.

It is unrealistic to claim never to have had issues with seaborne trade transactions. However, it is the way that problems are addressed that is critical. StockCargo strives to resolve any problem that occurs in a professional, efficient and timely manner.

STOCKCARGO PIONEERS INTERMODAL TRANSPORTATION IN EUROPE

The company wants to be more than just another agent in the industry. It aims to bring the over 50 years of experience gained by family members to its service, and to help reshape the industry. It was therefore a pioneer in the design of intermodal transportation for dry bulk, and breakbulk cargoes on the European continent. As company based assets, it created operational centre-point and supplies complete seamless logistics processes for global maritime transports.

Regardless of actual logistics structures and facilities, StockCargo generates advanced solutions.



StockCargo barge on the Danube river.

Agriculture or mining bulk commodities, usually part of advanced infrastructural consumer goods or high priority energy and technology projects, often need to travel over a large inland distance, to or from a seaport gateway. In many cases, national borders and, sometimes, different continents have to be crossed. Various operations, and types of transport are used, especially road transport, barging-inland waterways, railways, while transshipment operations are also part of the process.



Trucks to ship gravel transshipment port Constanta.



Scrap metal being loaded on a barge at a Rhine river terminal.

StockCargo Vision aims to become a leader in dry cargo intermodal transport, as part of global maritime transport, for the benefits of all parties involved.

From its offices, in the ports of Antwerp/Rotterdam ports (covering the North-Sea), Marghera/Venice ports (Adriatic-Mediterranean), and Constanta port (Black Sea), StockCargo controls three of the main sea gateways in Europe, and shares no less than 80% of the import-export traffic of goods to and from the continent worldwide.

Thanks to its skilled personnel, ports facilities, fleets of trucks and barges, it is capable of providing high quality, seamless and competitive intermodal solutions. It uses various transport options and the most optimal way to transport the goods to their end destination, according to the needs.

In many European seaports, there is insufficient or unsuitable storage space for high volume bulk commodities. The same situation applies in about 300 inland terminals of rail and barges. In some cases also loading and unloading operations are difficult, due to the absence of appropriate equipment. Therefore, external equipment, direct operation and efficient co-ordination and execution with the vessel crew and intermodal mode is required. This can be a complex undertaking, and requires the most experienced and skilled agents in the industry.

The same services can be provided for onward shipping, using short sea shipping, from European seaports to the Baltic Sea, the Black Sea, the Celtic Sea or Mediterranean ports.

STOCKCARGO — DRY BULK AND BREAKBULK, GLOBAL MARITIME SERVICES.

- ❖ **shipping agencies:** for both liners and tramp shipping owners, in European ports. This service includes a barging department for barge principals calling at seaports or river terminals inland along European waterways;
- ❖ **cargo agencies:** as a reputable and experienced agent, StockCargo is regularly chosen by worldwide shippers and cargo owners, to be their representatives in shipping and chartering logistics forms, and charter party legal process.
- ❖ **integrated logistics in Europe:** covered storage and open yards, stevedoring, materials, cargo handling, including dangerous goods. Through its direct worldwide network, contractors and vendors, StockCargo can provide solutions to any logistical need throughout Europe, whether it is a small-size parcel or a heavy lift module.
- ❖ **port agencies:** as part of its maritime services, StockCargo can act as port/owner agents in the ports of Constanta-Romania and port Marghera/Venice, Italy, as well at other Italian/Adriatic seaports. Acting as the local representative of the principal, providing local knowledge and expertise, StockCargo ensures that the principal's requirements are performed with the utmost efficiency and dispatch.
- ❖ **maritime transport and logistics planning:** maritime research and consultancy, focused bulk commodities worldwide projects. StockCargo's senior advisors often act as independent mediators and attributors in the maritime industry.



Coal transshipment train to ship, Black Sea port.

Port agents and their increasing importance to the supply chain: focus on Inchcape Shipping Services

Inchcape Shipping Services (ISS) a renowned marine, cargo and supply chain solutions provider to the global maritime services industry. Covering every key port worldwide, ISS has nearly 300 offices in 68 countries and employs 4,000 people. In 2014, ISS handled 67,000 global port calls across 1,459 ports, in 103 countries. Out of the total ship calls, 24,000 were dry bulk carriers.

PROUD HISTORY

The origins of the company date back to 1874 and James Mackay, who later became the first Earl of Inchcape. Mackay worked as a ship agency assistant for Mackinnon, Mackenzie & Co in Calcutta, rising to become its managing director. In 1914, he oversaw the merger of MMC's British India Steam Navigation Company with the Peninsula & Oriental Steam Navigation Company (P&O) and became chairman of a powerful new group which grew quickly into a network of regional ship agency offices.

In the last 50 years, and under ambitious owners, including currently Istithmar PJSC, a major investment house based in the UAE, ISS has developed itself into the world's largest maritime services provider. The company's diversified customer base includes clients across the oil, cruise, container and bulk commodity sectors, as well as serving naval, government and inter-governmental clients.

ISS provides landside commercial and humanitarian logistics, transit, offshore support and other associated marine services, together with a growing range of outsourcing services, including global crew and marine spares logistics, port agency management, commercial representation and sophisticated Enterprise Resource Planning (ERP).

There are a number of ways in which ISS works with port agency clients, from full agency service, where ISS is appointed to handle all aspects of the ship call, including the supervision and



Inspecting cargo prior to loading at Jebel Ali port.

coordination of all cargo-related activities, vessel movements, documentation, permits and clearances, as well as the ship owner's items, through to charterer's nominated agency. Charterer's nominated agency is where ISS is nominated by the charterer of the ship to attend it as the port agent, normally because the charterer prefers to have an agent that is uniquely familiar with their business. ISS is also often appointed and employed as an owner's or charterer's protective agent to oversee those Principal's interests during a port call.

DRY BULK SPECIALIZATION

In the competitive dry bulk sector, ISS works with trading companies, shippers, receivers, ship charterers and ship owners that are shipping or receiving all types of materials including grain, coal, clay, soda ash, salt, ores, scrap metals, cement and forest products. In terms of the services that ISS provide, the major variance between servicing a bulk carrier or any other type of ship is the significantly higher level of coordination and



Supervising unloading operations.

supervision of surveyors, inspectors, labour, equipment, and documentation.

In the relatively depressed and often low margin shipping sector, ISS is having to continually demonstrate adaptability and innovation to clients. By way of example, faced with a dramatic slump in the oil price and a bottoming out of the global iron ore price, ISS is helping its dry bulk clients to respond rapidly to shifting trade routes, and bring previously uneconomical supplies into the market. And while ISS often competes with smaller regional and local agents, this flexible approach, delivered on a global scale, is an area in which the company's broad footprint and specialist dry bulk expertise comes to the fore.

INNOVATION IS KEY

Ship management services are an instinctive space for further innovation, especially where they can offer commercial opportunities up and down the shipping supply chain. For instance, ISS is currently helping clients to utilize software and data for better voyage planning at the start and throughout transit, to reduce operational costs.

During the financial crisis, when the effective management of working capital became more critical, ShipNet, which is a subsidiary of ISS and specializes in software solutions, helped shipping companies manage their finances more effectively by connecting their operations, technical and accounting departments through use of workflow technologies. This brought tasks to users' attention swiftly by giving greater visibility of cash flow. The software can now be accessed via mobile apps, thus providing easy access to financial data on the move.

In addition to this, companies can capitalize on intelligence that can be gleaned from ERP systems to better understand procurement habits and trends for supplies and spare parts. This means that costs can again be reduced and efficiencies gained through the introduction of an aligned global purchasing strategy.

ISS has recently established a new Chartering Solution division whose sole purpose is to provide a range of specialized services to the Trading and Chartering community. The division's value proposition is delivered by a dedicated team currently located out of Geneva, Hamburg and Singapore, with London and Houston coming online imminently and who offer:

- ❖ local commercial and operational point of contact;
- ❖ single point of access into the ISS network, facilitating easy access;
- ❖ deep understanding of customer operating procedure;
- ❖ delivery of tailor made services for the chartering market; and
- ❖ offering an enterprise value proposition through new technology "Your ISS2".

Last year proved to be sluggish across the board, with 2015 heralding its own fresh challenges and BIMCO recently predicting further slowdown in growth to 4-5% per annum. Uncertainty is also being created through an oversupply of vessels — in the short term at least — a situation that is not helped by ever-larger vessels entering the water. The global appetite for coal, as governments weigh relatively cheap energy production with environmental concerns, will also have a bearing, as will demand and supply issues created by the fast-growing BRICS economies. It all points to further innovation in the sector being essential, something that ISS is well-placed to deliver.

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Port of Gdansk reports record high throughput in 2014

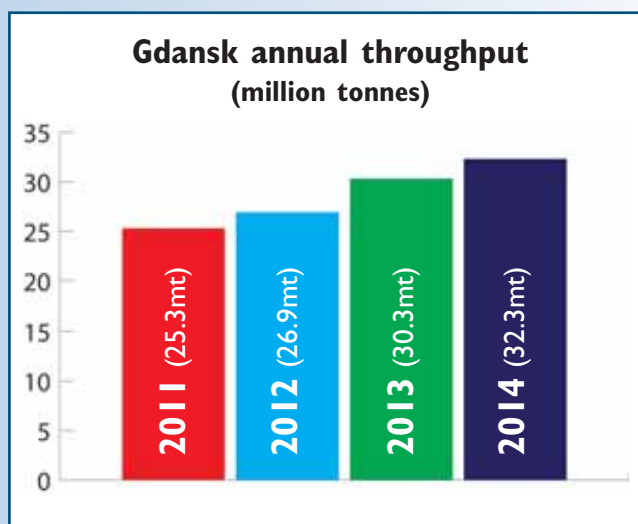
The results show that in the twelve months of 2014, the Port of Gdansk handled 32.3mt (million tonnes) of cargo i.e. 7% more than in 2013.

The most significant factors behind this success include almost 40% growth in the handling of other bulk, more than 13% growth in fuels, 10% increase in grain, and almost 7% rise in general cargo.

Additionally, year 2014 will pass into history thanks to the record high container throughput. While twelve months ago, the port was happy to handle its one millionth container, in 2014 it managed for the first time to exceed the volume of 1.2 million TEU, thus improving the last year's record container throughput by around 3%.

However, comparing the container throughput results in Gdansk over the last five to six years shows that its growth more than doubled, with Gdansk consequently raising its position among the largest container seaports in the Baltic from eighth place in 2009 to second in 2012, subsequently maintained in 2013. As evident in the preliminary results, 2014 was the third consecutive year for the Port of Gdansk to not only maintain, but also strengthen its position thanks to reducing its distance to Saint Petersburg which has proven unrivalled for many years.

The size of ships handled by the Port of Gdansk throughout the last eight years has expanded by almost 70%, with the year 2014 bringing record high results also in this regard, as indicated by the vessel traffic figures.



The excellent performance attained by the Port of Gdansk has coincided with the excellent condition of Poland's maritime economy and its rising importance in the handling of foreign trade. Thanks to the enhanced quality of cargo handling services coupled by the continued improvement of port's infrastructure and accessibility by land and sea as well as its superb hydrographic conditions, Gdansk has ample capacity to handle the increasingly large volumes of goods and sizes of ships with every consecutive year.



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McAsphalt Industries Hamilton terminal lauded for environmental leadership

McASPHALT DIRECTS \$5,000 DONATION FROM ANNUAL AWARD TO COOTES PARADISE RESTORATION AT RBG

Hamilton Port Authority (HPA) has been announced the winner of its annual Environmental Excellence Award: McAsphalt Industries, Hamilton Terminal.

The annual award recognizes a port partner's contribution to respecting and protecting the natural environment.

McAsphalt Industries was selected for the award because it has demonstrated continuous improvement in environmental protection. The company has achieved a Level 3 Green Marine score in the areas of spill prevention, community impact and environmental leadership.

In 2011, McAsphalt's new facility, located at the port's Pier 24, was designed with the environment in mind. An extensive storm water management system was installed, which removes sediment while providing spill control. To address air emissions and odour, a carbon system was added to the truck loading area. The office was built re-using existing structures, and the company has implemented the ISO 14001 (environmental) management standard. The company also participated in the Port of Hamilton's Team Up to Clean Up event this past Earth Day.

"We would like to thank the Hamilton Port Authority for this award and the ongoing support and encouragement regarding sustainable business practices throughout the port lands. Also we are very excited to help contribute to the ongoing stewardship of such an important local ecosystem, the Cootes Paradise Sanctuary; a special thanks goes out to the Royal Botanical Gardens team for all their hard work and commitment, towards environmental protection and awareness," said Joel Gardner of McAsphalt Industries.

"Proactive environmental stewardship of the port's industrial harbour is a job we take very seriously," said HPA President & CEO Bruce Wood. "We encourage a high level of environmental performance on the part of our tenants, and McAsphalt is a superb example of a company that is showing leadership."

Each year, the winner of HPA's Environmental Excellence Award is invited to select a local Hamilton-area environmental organization to receive a \$5,000 donation. McAsphalt has selected the Royal Botanical Gardens (RBG), and its Growing up Green Campaign, with a focus on the restoration of Cootes Paradise Marsh.

"Royal Botanical Gardens is grateful to receive this generous donation to support the continued wetland restoration efforts of Cootes Paradise Marsh through our Growing up Green Annual Campaign. RBG's Growing up Green Annual Campaign raises funds to champion efforts in environmental sustainability by expanding horticultural and conservation projects that ensure our local ecologically-sensitive nature sanctuaries are preserved for generations to come," said Tys Theysmeyer, Head of Natural Lands, RBG.

Green Marine is a voluntary marine industry programme that seeks to reduce the environmental impacts of maritime transportation activities by improving the environmental performance of its participating members beyond regulatory compliance. Green Marine has more than 80 participating members throughout Canada and the US.

The Port of Hamilton is the largest Canadian port on the Great Lakes in terms of both size and cargo handled. The Hamilton Port Authority's strategic vision is to be the Great Lakes port of choice.

Port of Dunkirk signs partnership charter for the welfare of seafarers

On Monday 26 January 2015 Stéphane Raison, Chief Executive Officer of Dunkerque-Port, and Philippe Bertonèche, Chairman of the Seafarers' Welfare Council of the Port of Dunkirk, signed a Partnership Charter for the welfare of seafarers.

In Dunkirk the Seafarers' Welfare Council groups together four associations: La Mission de la Mer, Les Amis du Marin, the Seafarers' Centre and the Seamen's Club. They work all year round to help seamen, visiting ships calling at the port, offering transport to the city and hostels, providing seamen with a place to relax and enabling them to communicate with their families, who are often very far away.

The purpose of this Charter is to set out, formally and permanently, the terms and conditions of the support which Dunkerque-Port gives to the associations for their action in favour of the seafarers calling at the Port of Dunkirk.

Besides the port's contribution, the services and activities of these associations are funded by the subsidies of the local partners and by a system of voluntary contributions from operators in the maritime sector (shipowners and shipping agents).

These provisions are based on Convention No. 163 of the International Labour Organization, ratified by France and incorporated in the Maritime Labour Convention.



Left to right, Stéphane Raison, Chief Executive Officer of Dunkerque-Port; Philippe Bertonèche, Chairman of the Seafarers' Welfare Council; and Eric Sorel, Harbourmaster.

Terminals TIS Group: handling bulk in the Ukraine

Terminals TIS Group is Ukraine's largest dry cargo port. It serves as a gateway to the outside world for the mining and metallurgical complex of Ukraine and much of the coal-mining industry in Russia.

Located on the shore of the Small Ajalyk Firth, 27km East of Odessa, the port is ideally situated in relation to the industrial part of Ukraine.

Terminals of TIS offer access to international markets for the production and consumption of grain, fertilizer, coal, ore, and consumer goods for the hundreds of millions of people. More than 700 ship calls a year link TIS with over 1,500 ports around the world. Freight turnover in 2014 amounted to 25.9 million tonnes.

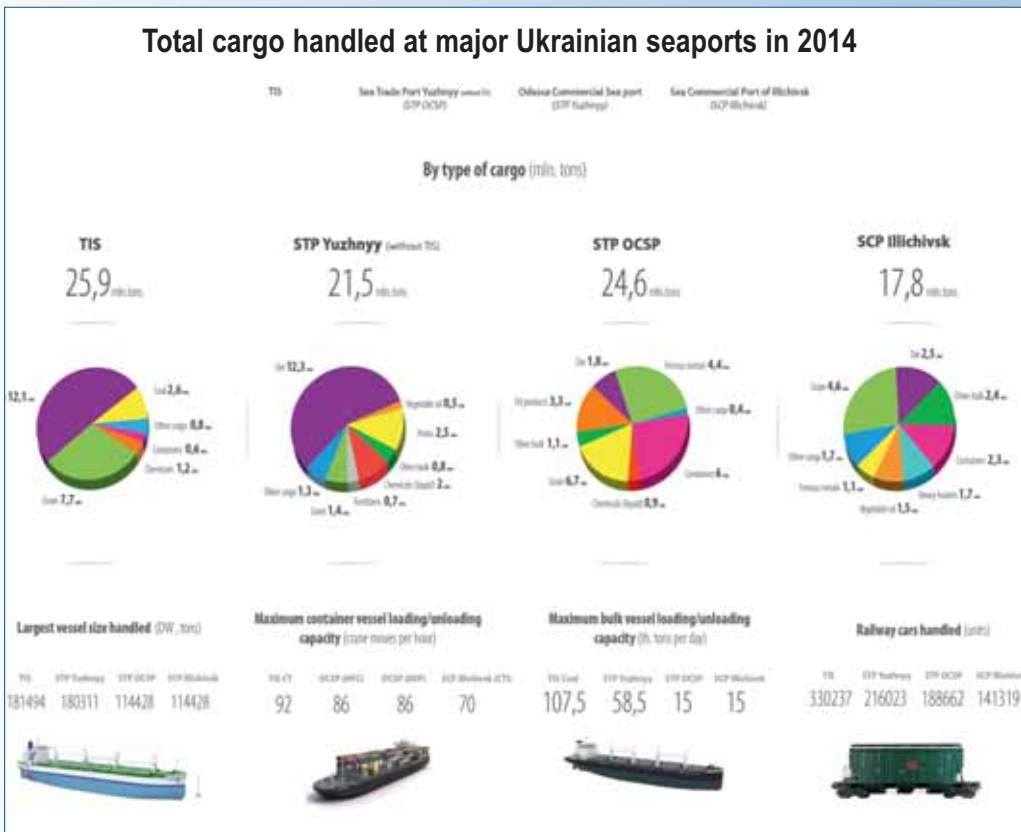
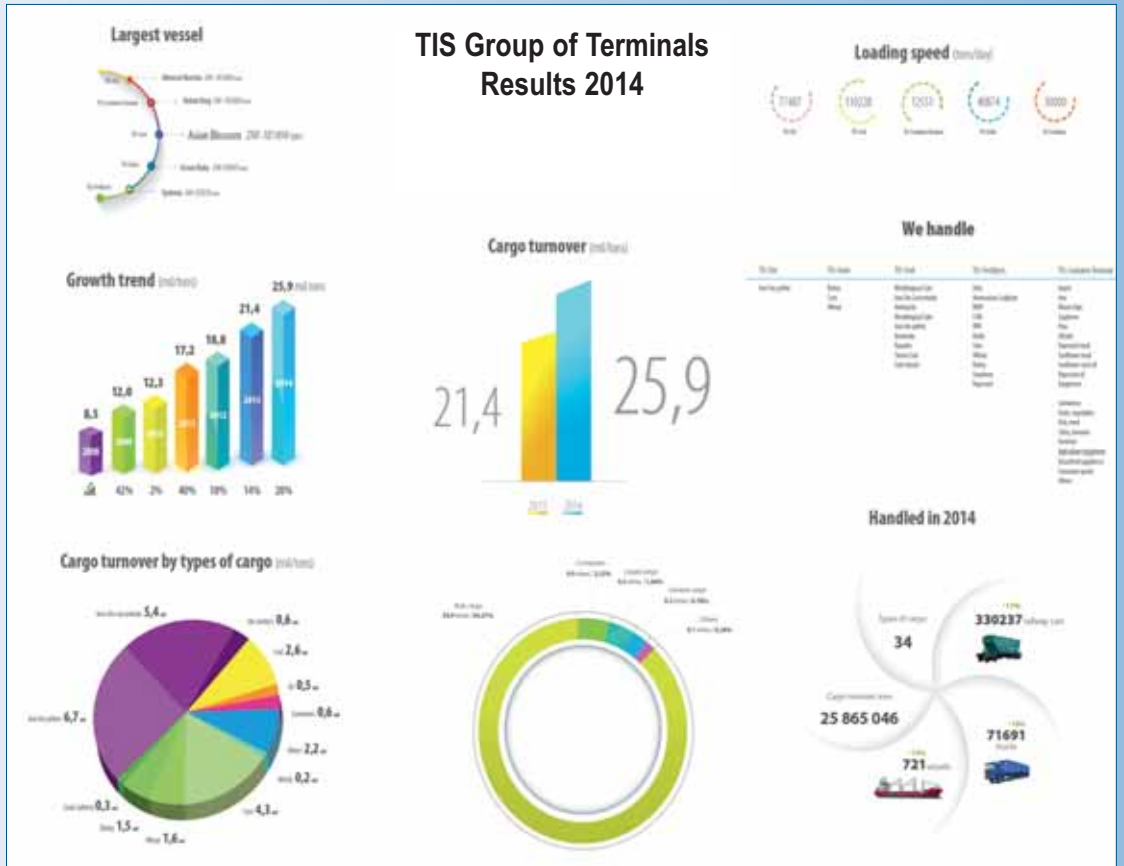
Having berths with the depths from 15 to 16 metres, TIS is

one of the deepest ports of Ukraine, which provides the maximum of product lots and minimum freight costs. The terminals are also widely known in Ukraine; as well as offering high-speed handling of vessels, TIS Group also holds the record for the number of large bulk vessels handled.

The company prides itself on its individual approach to each client and its extensive additional logistics services. As a private company, for decades it has shown the ability to be flexible and responsive.

Eight of TIS Group's berths are over 1,800m long, which can be increased by a further 1,500m. It is the largest port in the Ukraine in terms of area — over 200 hectares. TIS has reserved an area of 400 hectares near the port's industrial park for customs, a project that is unique in the Black Sea area.

TIS is constantly investing in new technologies, expanding terminals, improving its service and attracting new types of cargo. *cont'd*



TERMINALS

- ❖ **TIS – Grain:** — has a capacity of 370,000 tonnes. In the past year, throughput reached 6.5mt. It is the largest grain terminal in the Ukraine, and handles almost every third tonne of grain exported from the country. Grain exports are sent to meet the needs of the Middle East and South East Asia.
- ❖ **TIS – Fertilizers:** Ukraine's largest chemical cargo terminal specialized in the exports of various kinds of Ukrainian and Russian fertilizer requiring private storage. Cargo turnover in 2013 was more than 2.2mt.
- ❖ **TIS – Ore:** This was created in a partnership with FERREXPO, and is the largest and the most effective export terminal for handling pellets. Transshipment volume in 2014 exceeded 6.2mt.
- ❖ **TIS – Coal:** The largest in Ukraine and one of the largest in the former USSR export–import terminal for handling coal, ore and other bulk cargoes with open storage. Able to accommodate ships of over 200,000dwt. It has achieved a national record for shiploading capacity.
- ❖ **TIS – Container Terminal:** new container terminal in the Ukraine, created for the largest vessels that can only enter into the Black Sea, and which can not accepted by any other port in Ukraine.

Malabar Cements begins operations at Cochin

State-owned Malabar Cements is to install an automated cement handling and bagging unit along with a raw material import facility at the Indian port of Cochin. The company expects to handle a minimum of 300,000 tonnes of cement, although facilities could be expanded to accommodate twice that traffic, and this does not include associated products such as clinker, limestone and coal.

Inbound ships will use the Q-7 berth, which can handle vessels of up to 35,000 tonnes, given draught of 10.4m. Its new processing area will cover 7 acres near Ernakulam Wharf. Nevertheless, the port trust has insisted that a zero pollution system be installed for handling clinker because of potential air and environmental pollution.

Barry Cross

Indian coal imports increase

In figures just released from August, the 12 major ports in India noted a 12% increase in imported coal to 9.41mt (million tonnes). Imported thermal coal alone rose 14% to 6.81mt.

Last fiscal year, the same ports watched as imported thermal coal grew by 22% to 71.6mt, while coking coal consignments grew in size by 18.26% to 105mt. The 12 ports handle around 61% of total cargo traffic.

Imported coal is on the rise given that Coal India, the world's largest coal miner, claims that there are insufficient rail links to shift more coal internally.

BC

Vizag sets manganese ore unloading record

Visakhapatnam Port Trust says that it has established a new single day record for the unloading of manganese ore. This amounted to 22,053 tonnes, which was discharged on behalf of Saradha Energy & Minerals Ltd. The previous record, established on 14 March 2010, stood at 19,425 tonnes.

BC

RBCT to offer capacity to smaller companies

In South Africa, Transnet is not now to go-ahead with a new \$1.28 billion coal terminal, which would have been located alongside the existing facility at Richards Bay Coal Terminal. The decision was prompted by an agreement signed between Transnet and many of the country's smaller mining companies, whose allocations at RBCT will now double. These will now be able to annually take up around 19,000,000mt (million tonnes) out of the port's 91mt overall capacity.

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Port of Dunkirk appoints new Finance & Purchasing Director

François Lambert has just joined the Port of Dunkirk as Director of Finance/Purchasing and General Services.

Formerly Councillor for the Sea, Overseas Territories, Ports and Waterway Transport at the State Secretariat for Transport, the Sea and Fisheries, since May 2012 François Lambert has worked in turn with both Frédéric Cuvillier and Alain Vidalies on many topical national documents, including the national ports recovery strategy.

Originally a qualified Shipping Master, before this experience in the Minister's office he had also worked at Boulogne-sur-Mer, within the sea and coastal delegation of the Regional Directorate of Marine Districts from August 2010 to May 2012.

At Grand Port Maritime de Dunkerque, François Lambert will lead a team of 37 people and four departments. The goals of this new directorship will be to define the purchasing and market policies, the financial and budgetary guidelines in relation to strategy, the policy on revenue, and general services.



New shiploaders for Paranaguá

The Brazilian Port of Paranaguá has put into operation two new shiploaders, which are expected to be put fully into service during February in time for the new harvest season. Each of the machines has its own generator, allowing autonomy of operation when mains power is not available.

Given the dimensions of the shiploaders, even Capesize bulk carriers can be handled, with productivity of around 2,000 tonnes per hour. The port believes that this will boost productivity in the region of 30%.

In total, the port authority, APPA, placed an order for four shiploaders, costing \$22.5 million.

BC

Açu now shipping iron ore

The Brazilian port of Açu has begun to ship iron ore, much of which will be bound for China. The port owner, Prumo Logística Global invested \$565 million in the facility in 2014.

The port has two terminals: T1 and T2. T1 is dedicated purely to iron ore shipments and belongs to Ferroport. Much of the iron ore is shipped from the state of Minas Gerais along a 529km pipeline.

According to the port company, the existing breakwater which protects the iron ore terminal, will continue to be expanded. This, in turn, will allow oil exports to commence in 2016.

A multi-purpose terminal (TMULT) will partially make use of T2 when it opens in the first half of 2015. This will be used to export bauxite and import coke.

BC

CMA receives bridging concession in Santos

The Brazilian Aluminium Company (CBA) has been awarded a 20,010m² concession at the port of Santos. This includes Warehouse 32 and its surrounding area.

The concession has been made as part of a transition agreement, allowing the company to operate there for a period of 180 days, although this is expected to become a longer term concession once the government has agreed to implement new legislation.

BC

APPA ports break fertilizer record

In 2014, the amount of fertilizer handled by the Brazilian ports of Paranaguá and Antonina beat the previous year's record. In the first ten months alone, traffic was up by more than 6% over the same period in 2013, when just 7.9 million tonnes were registered.

According to the Ministry of Agriculture and Supply, the explanation for this rise in traffic is the expansion of soya bean planting in Paraná.

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Coal Terminal Developments



Ust-Luga Coal Terminal (Rosterminalugol).

Jay Venter

Capital re-investment and upgrades keep Ust-Luga Coal Terminal successful

Ust-Luga Coal Terminal (Rosterminalugol) is a high-tech specialized coal terminal which handles more than 15.0mt (million tonnes) per year. The terminal is located on the eastern coast of the Baltic Sea, 130km from St. Petersburg, Russia. The advantage of the port is the immediate vicinity of European countries, importing high-quality coal from Kuzbass region and other coal basins.

The process of transshipping coal from railcars to vessels is highly automated owing to efficient coal handling equipment manufactured by leading European companies. The overall procedure includes cleaning coal from contamination, crushing it to the required fractions, continuous sampling and chemical analyses performed by the reputable independent survey

companies Incolab and SGS. In 2013, the terminal was awarded with international certificates ISO 9001:2008 and 14001:2004.

The construction of the terminal began in May 1996. The first stage of the terminal — including the construction of the alluvial area, administrative buildings and two berths — was launched in December, 2001. The second stage of the terminal was launched in January 2006, introducing advanced technology and enabling the company to start automated coal handling operations.

The Rosterminalugol coal terminal was originally designed to handle coal extracted by the Coal Company 'Kuzbassrazrezugol'. The third stage was launched in 2010, including modernization of the railway hub and installation of high-tech equipment that increased the terminal's coal handling capacity to 12.5mt per year.

The simultaneous storage capacity was increased to 600,000 tonnes of coal. The storage area of the terminal became sufficient for ten separate stockpiles. The process of constant technological improvement of handling techniques and modernization of the coal handling equipment enabled sustainable growth of the terminal's overall throughput.

This development allowed the terminal to increase its capacity to 15.5mt of coal per year in 2014, which is the historical maximal volume of coal transshipped by Rosterminalugol.

Over 90% of the overall throughput of the Port is provided by Carbo One Ltd., which is the largest supplier of





high-quality steam and PCI (pulverized coal injection) coal from Russia with annual sales of over 40mt.

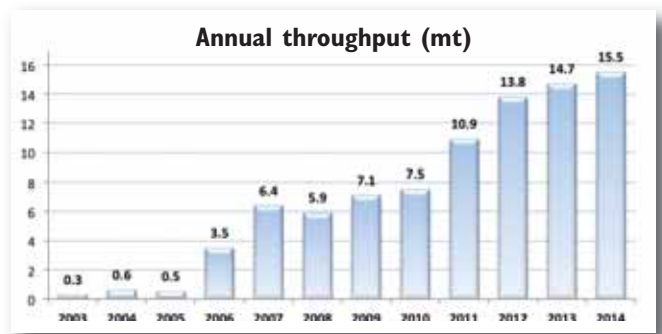
The coal handling equipment of the terminal consists of:

- ❖ two Man Takraf shiploaders;
- ❖ two tandem railcar tippers supplied by ThyssenKrupp;
- ❖ two infrared railcar defrosting devices made by Infracore;
- ❖ two railcar transborderers manufactured by Mantacraft and ThyssenKrupp;
- ❖ belt conveyor system;
- ❖ two combined stacker-reclaimers by Mantacraft;
- ❖ one stacker;
- ❖ one reclaimer;
- ❖ five wheel loaders manufactured by Volvo;
- ❖ Sennebogen hydraulic handling machine;
- ❖ Liebherr mobile crane; and
- ❖ two Disab Centurion Mobile Vacloader for removing coal dust.

The terminal is equipped with a high-tech system of magnetic decontamination. It consists of 12 electric magnetic separators made in Europe with the capacity of 1,200 to 1,760 Gauss and weighing from 10 to 17 tonnes each. This guarantees contamination-free coal. Two magnetic separators produced by UK company Eriez Magnetics were installed in 2013.

In winter, any frozen lumps of coal are milled by a hammer crusher. The terminal is able to crush coal as fine as 0–50mm, which is in high demand on the international coal market.

Independent surveyor organizations perform additional monitoring and quality control of



the stockpiles to guarantee the purity of the coal before loading it onto the vessel.

There are two automatic samplers manufactured by the German company Siebtechnik GmbH, which means that the coal quality can be assessed quickly and efficiently. The equipment is certified with the international ISO 13909-2001 standards and enables non-stop sampling during coal loading process.

Chemical analyses of the samples are performed by the independent survey companies Incolab and SGS. Their



from Russia with coal



Carbo One 

www.carboone.com

laboratories are located directly on site at the terminal. The specialists are skilled to undertake comprehensive chemical analyses of coal using high-quality certified equipment. Their conclusions are ready within 48 hours after ship loading and include all the main coal specifications and sizing of coal.

Ust-Luga Coal Terminal is committed to providing a world-class operation with minimal impact on the surrounding environment. Modern technologies are applied to ensure environmental protection and health care. Each transfer tower is equipped with a highly efficient air purification system which removes coal dust from the air. The effective stockpile irrigation system prevents the spread of dust in the air. The terminal is equipped with high-tech water treatment facilities compliant with the international standards and provides day-to-day environmental monitoring and auditing.

In 2014 Rosterminalugol completed the first phase of

reconstruction of the existing sewage treatment plants. After it was commissioned there was issued the ownership certificate for the two-section storage tank with a working volume of 3,800m³.

Currently, the treatment facilities include two parallel lines for separate purification of household and storm drains.

In 2015–2017 it is planned to launch the second phase of reconstruction, which includes improvement of the equipment intended for technological cleaning lines.

As the major objective of Ust-Luga Coal Terminal is to supply high-quality services to its customers, the company invests in capital re-equipment and sustainability.

Modern and highly effective facilities as well as state-of-the-art technologies are the key factors for the successful future of the terminal, which plans to increase its throughput and strengthen its positions as a reliable coal port in the region.

Ambitious expansion projects at Vostochny Port set to increase throughput



Vostochny Port is a high-tech seaport located in the Far East of Russia. Being the largest coal port in Russia, Vostochny Port handles more than 20mt (million tonnes) of coal annually. About 1,600 skilled specialists employed by the port ensure the highest quality of handling and berthing services for Russian coal mining companies.

In 2014 Vostochny Port handled 21.84mt of cargo (+22.9%, year-on-year) (see Chart 1). About 60% of the overall throughput of the Port is provided by Carbo One Ltd., which is the largest supplier of high-quality steam and PCI coal from Russia with annual sales of over 40mt.

Vostochny port consists of two terminals:

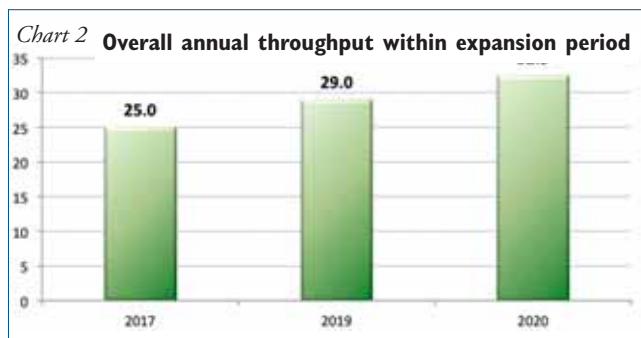
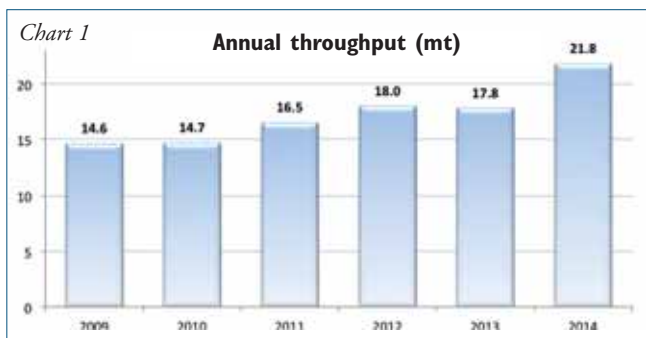
- ❖ **Specialized Coal Terminal:** The terminal accounts for 80% of the Port's overall throughput. The process of coal transshipping from railcars to vessels is highly automated owing to efficient high-tech handling equipment and conveyer belt system.
- ❖ **General Cargo Terminal:** The terminal is equipped with grab cranes which enable it to handle coal and other bulk and general cargoes.

In 2012 the shareholders of Vostochny port took a strategic

decision to expand the capacity of the existing coal terminals. The total space of the terminals is 116.8 hectares: the General Cargo terminal occupies 23.9 hectares, the area of the Specialized Coal Terminal amounts to 44.9 hectares. A total of 48.0 hectares is occupied by the construction area for the expansion of the Specialized Coal Terminal.

The expansion of the Specialized Coal Terminal is the largest and most ambitious project being implemented in the port. The expansion is planned to come into operation in 2017. New high-tech coal handling equipment will enable the port to increase its annual throughput to 32.5mt by 2020 (see Chart 2). It will include a railway station, two railcars heater facilities with a total capacity of 80 railcars, two tandem railcar tippers, a system of conveyor lines, four reclaimers, two stackers, four coal storage sites with simultaneous storage capacity up to 800 thousand tonnes, a deep-water berth of 400m long and draught of 16.5m and two highly efficient shiploaders.

The conveyer belt system is designed to link up the existing conveyer belts of the specialized coal terminal with the new ones, creating a joined-up system. After the expansion it will be possible to distribute the arriving coal between the existing and



new storage areas subject to cargo owner’s instructions, significantly improving the efficiency of handling operations. It will be possible to store up to 1.4mt of coal at the terminal at any given time.

Vostochny Port is equipped with a high-tech magnetic decontamination system. Electric magnets are located on transfer towers — at the point where moving coal is poured from one conveyor belt to another and where they are the most effective in terms of the removal of metal contamination. This guarantees the highest quality of magnetic cleaning of coal from any metal impurities.

Altogether the terminal has 18 modern high-tech magnet stations which include 6 magnets produced in Germany and South Korea which were installed in 2013. Their capacity is between 1,500 and 2,000 Gauss and weight from 10 to 24 tonnes each.

When the expansion of the Specialized Coal Terminal comes into operation the total number of magnet stations will be increased up to 40 units.

At the end of 2013 a new high-performance shiploader *Mitsui Miike* produced in Japan was put into operation at the Specialized Coal Terminal. The capability of the shiploader is 3,000 tonnes per hour.

Currently the loading process is performed by 4 highly efficient shiploaders manufactured by Mitsui and Thyssen Krupp via 2 berths with total length 800m and draft of 16m which can accommodate two Capesize vessels simultaneously.

In 2012 one of the world’s leading shipbuilders Damen yard (Holland) built a new azimuth tug specially designed for Vostochny Port. The tug may be used for fighting fires on vessels

and on shore and is equipped with a powerful fire fighting pump and foam based fire fighting system.

For mooring operations the port uses 4 powerful port owned tugs with combined capacity of over 14,000 horse power.

Vostochny Port is an eco-friendly company. Modern technologies are applied to ensure environmental protection and health care. The port is equipped with a highly efficient air purification system which removes coal dust from the air. The effective stockpile irrigation system prevents the spread of dust in the air. Water treatment facilities installed at the port are compliant with the international standards and provide day-to-day environmental monitoring and auditing.

Sustainability is one of the key elements of corporate strategy of the port which not only strives for prosperity and success in business, but also is committed to minimizing the impact of its operations on the surrounding environment and community.



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Terminal Astafiev upgrade project under way



The development project of 'Terminal Astafiev' JSC, presented at the APEC Summit 2012 in Vladivostok, involves the construction of a closed-type intermodal terminal for bulk cargo at Astafiev Cape in Nakhodka city in Russia, which will completely eliminate harmful effects on the environment. According to the results of the APEC Summit, under the decision of the Governor of the Primorsky Territory, the project became one of the eight priority investment projects for the implementation of socio-economic potential of the Primorsky Territory.

The project provides for improvements of major infrastructure for public railway station Cape Astafiev through private investment. The company, as a partner of Russian Railways JSC, plans to invest more than three billion roubles in expanding capacity and handling ability of the station Cape

Astafiev and dredging of the approach channel in Nakhodka Bay, which will positively affect the capacity of a number of ports in Nakhodka and give a favourable socio-economic effect. As a result of the reconstruction, the capacity of the station will rise from 7mt to 12mt (million metric tonnes) of cargo per year.

At the second stage of the project, it is planned to build closed type reservoirs for bulk cargo storage with the possibility of re-orientation to handling of different types of bulk cargoes, including grain.

In 2013, handling volume reached 1,057,000 tonnes. In 2014, handling capacity amounted to 1,270,000 tonnes, which is equivalent to 174,000 rail cars with coal. During the following years it is planned that the terminal's handling capacity will reach 3mt, and then grow to 6mt.

Noatum Terminal Polivalente Santander volumes to grow in next three years

Noatum Terminal Polivalente Santander has improved its loading service performance for clients through new truck loaders with an efficiency of 2,000tph (tonnes per hour), and has also renewed the intake circuit with antiwear fire proof material to avoid breakdowns and scrap related cuts.

During these last years, volumes in the terminal have been around 500,000 tonnes. The forecast for the coming three years reflects an increase to nearly 800,000 tonnes.

Noatum Terminal Polivalente Santander is an eco-friendly facility, able to handle commodities with almost zero particle emission to the air.

The facilities are highly automated and the terminal is certified with ISO 9001/2008, 14/001/2004 and 18001/2007. This is a consequence of Noatum's policy of taking care of environmental, health and safety issues.

The terminal's specialized and committed professionals combined with the latest machinery and advanced IT systems ensure excellent service.



Record breaker – the Port of Gdansk

The year 2014 was outstanding for the Port of Gdansk in Poland, in terms of cargo volume handled at Gdansk's quays. A magnificent result of 30.3mt (million tonnes) of cargo achieved in 2013 remained the handling record for only one year as in the year 2014 the Port of Gdansk exceeded this amount by a further 2mt of cargo.

In the past twelve months, the Port of Gdansk handled 32.3mt of cargo, a 7% increase on the numbers in 2013.

This year will go down in history as the best year ever in the over 1,000-year old history of the Port of Gdansk, regarding the volume of handled cereals (1,629,212 tonnes in 2014). A nearly 10% growth of cereals compared with 2013 was caused mostly by very good results in exporting Polish wheat (which constituted almost 40% of total exported cereals in the Port of Gdansk) and importing middling which constituted 88% of imported cereals in the Port of Gdansk that year.

Gdansk can also boast of splendid growth in the handling of other bulk (aggregate, sulphur, ore etc.) which increased by nearly 40%. In the history of the Port of Gdansk, this is actually the third-best result after the years 2011 and 2012.

The handling of aggregates was the main reason for the high volumes of other bulk cargo handling last year. It constituted almost 50% of the total volume of other bulk due to commenced and scheduled infrastructure investments in Poland, in the forthcoming period, implemented (among others) within EU programmes for years 2014–2020.

Quite a different situation was seen in 2014 in the case of

coal handling. Despite the fact that the total volume of coal in 2014 was worse than in 2013, it still should be considered as a successful period for the cargo in the Port of Gdansk since the year 2013 was particularly good.

Normally, during the last few years, the Port of Gdansk has handled 2mt of coal annually, but in 2014 Gdansk managed to handle 3.3mt million tonnes of coal.

One third of that volume was handled by a newly opened dry bulk terminal which can accommodate the biggest bulk vessels which can enter the Baltic Sea.

In conclusion, the year 2014 can surely be considered as the best ever for the Port of Gdansk as to total cargo throughput and one of the best as to dry bulk cargo handling.

The very good economic situation of Poland, rising share of maritime transport in the handling of foreign trade in Poland, as well as Poland's firm (second only to Germany) position among world's leading foreign investors' rankings for the most investment-friendly locations (according to a study conducted by Ernst & Young), which favours the subsequent investment projects in the Port of Gdansk, are definitely factors which had positive influences on the success of the Port of Gdansk during the last few years.

According to the expectations of the port, the present year should be at least as good as 2014, both in case of cargo handling in general, as well as the dry bulk cargo handling. In accordance with a popular saying: "Appetite grows with eating", the odds are that the Port of Gdansk is not done eating yet.

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Puerto Mejillones: multi-cargo port committed to environment, workers, community



Puerto Mejillones ended a successful 2014 with management and infrastructure operation advances at the terminal, as well as its sustainability policy which was developed along with the residents of the community and care for the environment.

During 2014 Puerto Mejillones handled 5.2mt (million tonnes) of cargo: 2.8mt of this was solid bulks and 2.4mt liquid bulks, reaching the company's projected tonnage for that year. Sulphuric acid was the main cargo handled during this period, handling 2.4mt, keeping the terminal as the main port in the world in this regard.

The second more handled cargo during 2014 was coal, with 1.8mt, representing 8% more than in 2013. Meanwhile, zinc and lead concentrates loading reached 532,000 tonnes, 4% higher than 2013.

Sulphur was the fourth most-handled cargo, transferring 247,000 tonnes during 2014. It is also important to note that during June the coal transfer record was reached – 300,000 tonnes during the month.

INVESTMENTS

During 2014 the terminal began an investment plan to assuage the major industries demands in the second region of Chile. That is why it started building the eleventh sulphuric acid tank of 20,000 tonnes of capacity, which will be added to the ten tanks that already exist. This will give a storage capacity of 220,000 tonnes during 2015, making it the largest terminal of sulphuric acid in the world.

Additionally, the terminal works on detailed engineering for the extension of site No.2 (liquid bulks) to handle ore minerals.

The project involves the construction of a new berth exclusively for loading of ore minerals with a capacity of 3.5mt per year, which means an investment of US\$100 million. It is estimated that this project will begin its construction during the second half of 2015 and will begin commercial operations in 2017.

COMMITTED TO ITS WORKERS

An infrastructure renewal plan was implemented during 2014, which seeks to promote welfare and life quality of the workers hired by the terminal.

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As part of this plan, a new gym was built, complete with the latest equipment, dressing rooms and showers. A new soccer field was also built with synthetic grass, so that workers can enjoy sporting activities.

The incorporation of women in strategic positions of the operation resulted in the integration of the first woman bulk crane operator in the country.

ENVIRONMENTALLY RESPONSIBLE

The terminal conducted its carbon footprint measurement, for

the second consecutive year, incorporating the results as an effective tool for environmental management. Puerto Mejillones is among the terminals with fewer emissions per tonne transferred in the worldwide port industry.

On the other side, thanks to positive environmental policies established at the terminal, measurements of air quality are below the ones established at international standards, which are even more stringent than national standards.

Puerto Mejillones has a strong commitment to the community and the environment, and is taking action that has a real impact on operations — it is transparent, and is becoming a leading company in the Bay of Mejillones.

COMMITTED TO COMMUNITY

During 2014 Puerto Mejillones has maintained its strong commitment to the community of Mejillones, implementing initiatives and programmes that supported the development of the community and its people.

One of the initiatives carried out by the port is the Ballet School of Mejillones initiative, composed of 33 participants. This initiative recently completed its second school year, and is a successful programme in which the students have progressed and advanced in the development of the ballet technique. During 2015 the learning programme will continue, allowing the integral development of the dancers and contributing to the town's cultural development.

Furthermore, during 2014 the terminal decided to pursue 'Smile with Puerto Mejillones', a programme that sought to prevent dental problems and promote oral health, through to the implementation of a complete dental programme for a group of 180 neighbours of the community and workers of Puerto Mejillones.

Another programme is 'Meet Puerto Mejillones', which is an open doors programme where the company shows the operation, facilities and processes of the terminal to the community. This was carried out during 2014 for the second consecutive year.

Today, more than 500 people have been introduced to Puerto Mejillones' facilities through this programme, one instance of communication, closeness and commitment among public interest, neighbours, authorities, media and business.

COAL INTO GERMANY

via Rhenus Midgard's Seaports

BTW (Bulk Terminal Wilhelmshaven) former Niedersachsenbrücke, Jade Bay (Germany):
 New: Capesize Vessels up to 250.000 dwt with a draft up to 18,50 m (60') sw
 Rail connections into Germany's hinterland and neighbourhood countries

Coal Terminal Nordenham on the River Weser (Germany):
 Rail- and inland waterway connections to Germany's hinterland and beyond
 Panmax- and partly laden Cape Size Vessels with a draft up to 13,10 m (43') fw

Both ports handle more than 5 million tons exceeding 10% of the imported coal into Germany.

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Port of Pori's coal handling: dark clouds, but steady volumes



there is ample free capacity. Coal is handled in Tahkoluoto Deep Harbour. There have not been changes in the handling capacity of coal during the year 2014. In the short term, the output depends on the size and construction of the vessels calling the port. The average unloading capacity in Tahkoluoto is 30,000 tonnes of coal in 24 hours. Loading capacity is 1,000tph (metric tonnes per hour). Tonnes per hour is used as an indicator in loading, because the coke is loaded to the barges.

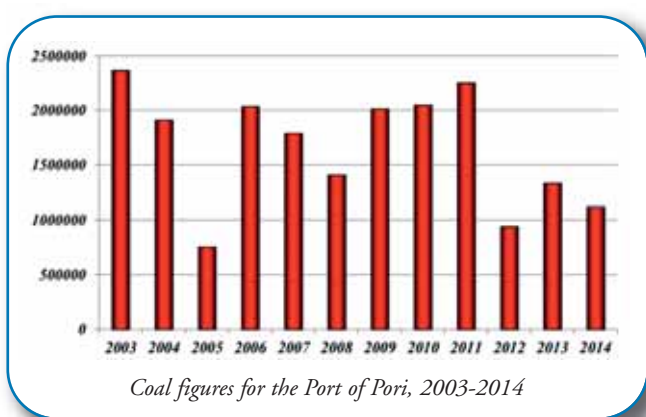
There is a 15.3m fairway to Tahkoluoto Deep Harbour. Capesize vessels annually call Tahkoluoto carrying coal. Are Capesize vessels willing to call at Pori because of the sulphur restrictions? That will be seen after the winter season. Port of Pori is a great winter port in Finland. Ice-breakers are seldom needed, but during the winter time vessels must be ice-classified. Ice-classified Panamax vessels call Pori in winter. For example *Arkadia* of the company ESL Shipping calls Tahkoluoto on several occasions.

Port of Pori has two roles in the coal transport supply chain. In the immediate vicinity of the Tahkoluoto harbour there are two coal power plants. The coal supply is done via the Tahkoluoto harbour. On the other hand Port of Pori is a coal hub in the Gulf of Bothnia area. Coal and coke are re-loaded from Capesize and Panamax vessels to pusher barges and transported to the Finnish metallurgical industry in the north.

The European Union's energy policy is in transition. According to the EU's Industrial Emissions Directive the emission limit values of large combustion plants will be tightening. The directive has been implemented to the Finnish legislation. Investments to the new technology can be made step by step during the period of 2016–2020. After that period in July 2020, the new limits will come into force. The IE Directive affects to the use of the other power station in Tahkoluoto. That power station will serve as a reserve power plant until the year 2020. It might also be closed before that date. Whereas the other power plant is the most modern coal power plant in Finland. It will continue its operation as usual.

Port of Pori's total handled volume of coal and coke dropped a bit in 2014 compared to the year 2013. In 2014 the total volume was 1.12mt (million metric tonnes) and in 2013 the corresponding figure was 1.33mt. Coal import volume abroad was in 2014 at the same level than in the previous year. Around 980,000 tonnes were imported. In comparison, in 2013 one million tonnes were slightly exceeded. The figure was 1.01mt. The volume of so called transit coal, which is loaded to the barges, dropped from 323,000 metric tonnes in 2013 to 141,000 metric tonnes in 2014. Annual fluctuations of coal handling are large in the Port of Pori. The main explanatory factors in energy coal are temperature of the winter, size of the stockpiles and of course the price of the coal. It seems again that the winter 2015 is mild.

In the strategy of the Port of Pori energy is one of the corner stones. As a general port handling all kinds of cargo Port of Pori is diversifying its energy palette to LNG, wind energy and biomass energy. A new LNG terminal will be ready in 2016. Port of Pori also handles a lot of windmill parts in Finland.



Coal figures for the Port of Pori, 2003-2014

For the Port of Pori the year 2015 started with mixed feelings. The Sulphur Directive came into force 1 January. The sulphur limit for marine fuels was cut to 0.1% in SO_x emission control area in the Baltic Sea and the North Sea. Overall costs of the directive to the Finnish industry have been estimated to be between €200 and €600 million. The sulphur directive severely affected the Finnish export industry, which is using Ro-Ro and container vessels. Bulk carriers are more energy efficient, but significant additional costs are to be expected.

In the fall it was estimated in the Finnish Coal Info seminar that the round-trip from Ust Luga in Russia to the Finnish port 150nm north of Pori entails additional cost of €1 per tonne, when the ship takes a full load of 20,000 tonnes coal from Ust Luga. In the calculation the freight costs were €10 per tonne, which means that the additional costs should have been 10% of the freight costs. After autumn the price ratio between heavy bunker oil (=IFO 380) and marine gas oil haven't changed in large scale, but the prices of both qualities have gone down drastically. In these conditions the business will continue as usual, but it is not known how long oil prices will remain low.

The Finnish government has made a compensation package for Sulphur Directive costs. Fairway dues have been halved for the period 2015–2017. The unit prices of fairway dues have also been reduced, so that the emphasis has been placed on cargo vessels and top ice classes. The Port of Pori also has a 'compensation package' to tackle the economical side effects of the sulphur directive. The Port of Pori has been a limited liability company since 1 January. Port of Pori Ltd can serve its customer in a more business-orientated way.

The infrastructure of the Port of Pori is in good shape and



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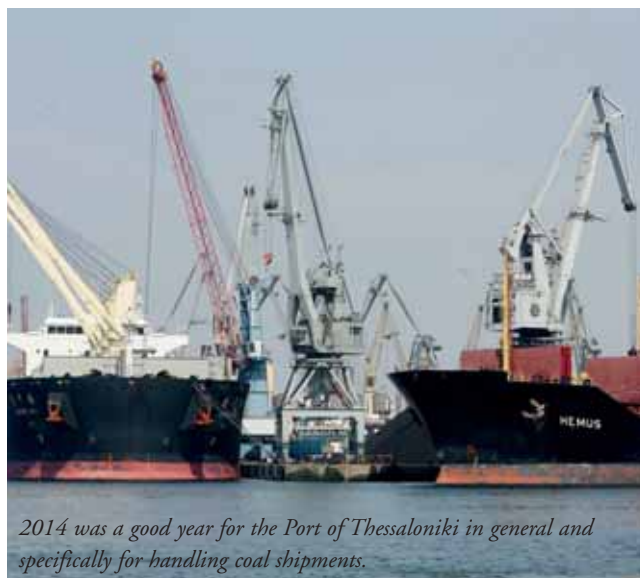
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2014: a good year for coal handling at the port of Thessaloniki



2014 was a good year for the Port of Thessaloniki in general and specifically for handling coal shipments.

In 2014, global coal trade increased by 1%, reaching 1,192 billion tonnes compared with 1,179 billion tonnes in 2013, writes Dr George Vaggelas, a port consultant co-operating with Thessaloniki Port Authority S.A.

Coal constituted 38.96% of all the five major bulk cargoes (iron ore, coal, grain, bauxite and alumina and phosphate) in terms of transported volumes during 2014, showing that coal continues to be a major cargo for the seaborne transport industry, although recent developments in the EU might affect this trend. The European Union is phasing out subsidies for domestic coal plants by 2018 and the European Investment Bank has set an emissions limit for providing preferential loans for energy projects, which means that coal will be excluded. It is impossible to say if and how these initiatives will affect the seaborne coal trade, which is something to be seen.

The Port of Thessaloniki is the second biggest port in Greece after Piraeus port, and holds the first place in handling dry bulk cargoes. The year 2014 was a good one for the port of Thessaloniki in general and specifically for handling coal shipments. Despite the economic crisis in Greece the coal shipments to and from Greece increased in 2014 as 333,971 tonnes of coal have been transported via the Port of Thessaloniki, an increase of 74.07% comparing with the related traffic of 2013. Also the transit coal cargoes showed signs of recovery as 208,923 tonnes of coal have been transported to neighbouring countries via the Port of Thessaloniki, an increase of 105.6% comparing with the 2013 coal throughput. Based on this data, 2014 was a very positive year for the Port of Thessaloniki as it handled 542,894 tonnes of coal compared with 348,996 tonnes in 2013 (+55.56%). The following table presents the throughput statistics for the Port of Thessaloniki during the period 2012–2014.

THROUGHPUT STATISTICS 2012–2014

YEAR	2012	2013	2014
DRY BULK (total)	3.251.609	3.584.503	4.104.151
Coal (total)	485.254	348.996	542.894
Coal (% of dry bulk)	13,29%	9,22%	13,23%
Coal (transit)	229.584	101.614	208.923
Transit coal as a % of total coal throughput	47.31%	29.11%	38.48%

Dry bulk traffic has been significantly increased at the Port of Thessaloniki during the last few years. Coal cargoes increased in 2014 following a significant decrease in 2013, mainly due to a decrease in the production of the Greek metallurgical industry, as well as in the metallurgical industries of neighbouring countries.

The port of Thessaloniki provides five docks for the facilitation of coal cargoes with the following characteristics:

Dock	Length	Depth	Number of cranes
17	190m	11.10m	2 dock cranes of 15t
20	350m	9.70m	2 dock cranes of 25t
21	185m	12m	1 dock crane of 25t
24	635m	12m	4 dock cranes of 40t 2 dock cranes of 32t

The port can also provide two mobile harbour cranes with a lifting capacity of 100t, each of which can be used in any of the above-mentioned docks when there is a need for additional capacity in (un)loading operations. For the storage of coal as well as for any dry bulk cargoes, there are open space areas with a total surface of 3.5ha at piers 5 and 6. It is worth mentioning that the port areas for handling dry bulk cargoes are included at the port's Free Zone, which complies with the EU customs regulations.

Recently the port acquired two new dock cranes with a lifting capacity of 40t which will reinforce the cargo handling equipment for dry bulk as well as for breakbulk cargoes. The new dock cranes will be operational at the end of February and the total investment was €7,000,000.

A major project for the Port of Thessaloniki is the expansion of dock 24, which will give the port the ability to facilitate bulk carriers with a capacity up to 80,000dwt, something that will increase the competitiveness of the port, compared with other major ports in the Southern Balkan area. This project is connected with the ongoing privatization process and is an issue to be agreed with the private investor.

Dr George Vaggelas is a port consultant co-operating with Thessaloniki Port Authority S.A. and a Research Fellow in European Port Policy (EPP) at the University of the Aegean, Greece. He is a member of PortEconomics.eu, a web-based initiative aiming to advance knowledge on seaport studies.

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Coal handling at the Freeport of Riga



Last year was a particularly successful one for the Port of Riga, as the largest volume of cargo in the history of the port was handled at the port terminals. Cargo turnover reached 41.08mt, which is 15.8% more than in 2013.

The Freeport of Riga Board Chairman Andris Ameriks stressed the particular importance of these results in the context of geopolitical developments: “We have proved that the Port of Riga is a safe business partner that is able to change with the times. Economic benefits and cargo security have always been and are the main concerns of our clients — therefore our investment into the port infrastructure and client-oriented approach was justified.”

Coal, which is 100% transit cargo exported from Russia through Riga to the Western markets, is the largest commodity in the port and amounts to 36% of total turnover. In comparison to 2013, volume of coal last year increased by 6.4% and reached 14.9mt (million tonnes), which is the new record in coal handling for the Port of Riga. Among the Baltic Sea ports, Riga is the second largest coal port, after rapidly growing Russian port of Ust-Luga.

There are two main reasons, influencing the increase in coal volumes at the Port of Riga in 2014:

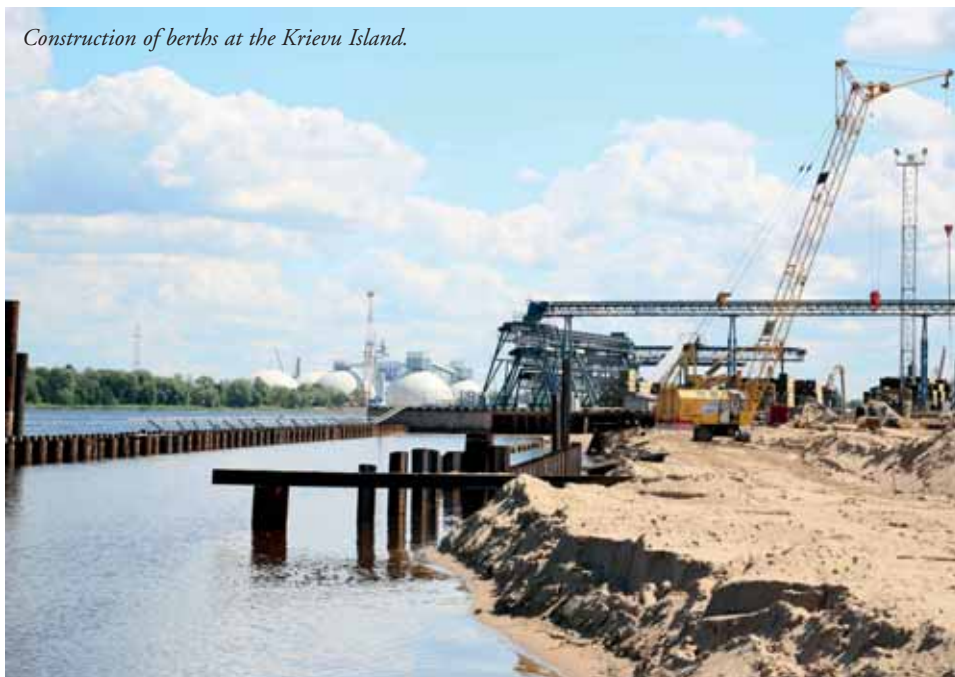
- ❖ Rising Russian coal exports via the ports of the Baltic Sea. In 2014 total exports of

Russian coal increased by 7.6% compare to 2013. Almost one-third of all Russian coal exports went through the Baltic Sea ports and this trend is moving slowly upward.

- ❖ Successful servicing of Panamax- type vessels at the Freeport of Riga, which became possible due to investments made by the port authority in the infrastructure during recent years — construction of deep-water berths, deepening of navigation channel, reconstruction of access roads and other infrastructure objects. This has made the Port of Riga even more competitive and convenient for owners of large ships.

Coal cargo in the Freeport of Riga is handled by three

Construction of berths at the Krievu Island.



stevedoring companies — Riga Central Terminal (RCT) Ltd., Strek Ltd. and LaCon Ltd. With more than 9mt of coal handled in 2014 RCT Ltd. is the leading coal terminal at the Freeport of Riga. The second largest coal terminal — Strek Ltd — handled some 3.7mt of coal in 2014. The company LaCon Ltd. handled more than 1.3mt of coal in 2014.

To enhance coal handling efficiency and increase overall competitiveness of the port, the Freeport of Riga Authority is carrying out an ambitious project, the 'Development of infrastructure on Island Krievu for the transfer of port activities from the City Centre'. The main objective of the project is to transfer the dry bulk cargo terminals of Riga port from Andrejosta and Eksportosta regions that are located in the vicinity to the historical centre of the city of Riga. The intention is to relieve the city centre from cargo handling operations and relevant negative impact on the environment, at the same time enhancing the competitiveness of the port and creating business-friendly environment. The project is implemented with co-



Coal being handled at the Freeport of Riga.

financing of EU Cohesion Fund.

Krievu Island's infrastructure development project is the most ambitious and financially ample project during the period of regained independence of the Latvian state. There will be four

deep-water berths at Krievu Island, thus making it possible to accommodate all types of cargo carriers, operating in the Baltic Sea area. At the same time the speed of cargo handling will increase, reducing vessel's dwell time to one day, instead of the current two to four days. The scheduled volume of handled cargo at Krievu Island will reach 15mt, but in the future it might be as much as 20mt per year.

In the framework of project implementation the main activities of Freeport of Riga Authority to be completed by September 2015 are:

- ❖ implementation of ground levelling activities to prepare for construction works;
- ❖ building four berths with a total length of 1,180m;
- ❖ widening and reconstruction of the main shipping fairway;
- ❖ building of main engineering networks for installation of services; and
- ❖ construction of road and rail infrastructure.

Currently, construction of berths and railway access tracks is going on, while the stevedoring companies start to develop their infrastructure.

"Krievu Island project will be completed on time — in August 2015. There will be no compromise, there will be no alternative. This is the site of the 21st century port. The main benefit of Krievu Island project is the fact that there will be no coal dust in the historical center of the city. This project will also create up to 2,000 new jobs," said Deputy Mayor of Riga and Chairman of Board of the Freeport of Riga Andris Ameriks.

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Terval's reinvestments ensure wider possibilities to clients



Terval, which has been active in the coal industry for more than 30 years, is ideally located in the Port of Liège (Belgium), along the Albert Canal, a hundred kilometres inland from the ARA (Antwerp–Rotterdam–Amsterdam) ports.

Terval has regular arrivals of South African, Russian, American and South American coal.

TERMINAL OPERATIONS AND CAPACITY

Terval is able to receive barges up to a capacity of 4,500 tonnes and has a charging/discharging capacity of 15,000 tonnes per day.

The terminal size on which Terval operates is 14ha. The open storage capacity is up to 500,000 tonnes and the hangars offer a covered storage capacity of about 20,000m².

The port of Liège is spread along the Maas and the Albert Canal. Terval is one of the biggest actors in the annual tonnage passing by Liège and is the only one active in coal.



The Albert canal offers important logistical advantages: there is no problem with high or low water throughout the year. Thanks to its ideal location (river, highways and railways networks), the coal can be delivered by barge, truck or train.

Apart from the Liège-terminal, Terval also operates in ports in Germany (Hamm, Lünen, Dortmund), in Switzerland (Basel) and in France (Rouen, Thionville).

AVAILABLE EQUIPMENT, NEW UPGRADES AND PURCHASES

Terval operates five screening/crushing installations and a homogenizing installation.

A dense medium washing plant with a capacity of 120 tonnes per hour produces 2,000 tonnes per day with an integrated screening for six sizes.

The degree of reinvestment is very high and all installations are up to the most modern standards. In 2014, Terval invested in a new powerful crusher in order to produce coal with a sizing of 0-2/0-3mm. A new screening unit has also been installed, allowing Terval to offer more sizing possibilities to customers.

Terval has the capacity (between 150,000 and 200,000 tonnes) to offer milled coal out of Lünen (Germany) and Liège (Belgium). Currently, different PCI (pulverized coal injection) and steam coal qualities can be offered.

Terval operates a fully equipped laboratory to guarantee the qualities produced and delivered to all customers. All incoming and outgoing goods are carefully checked.

The laboratory is now equipped with a brand new oven for more efficient analyses.

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Innovations for a better world.



Strong global demand for Tenova Pyromet Client Support Service



Client Support Service: Providing a proactive service to ensure that clients' furnaces operate at optimum availability.

High capacity furnace and smelting plant specialist, Tenova Pyromet, is seeing strong growth in demand worldwide for its Client Support Service. Recent contracts range from installing a roof cleaning system for a major platinum producer in South Africa, a world first on a brick roof application, to the design and quality control of replacement transformers for a six-in-line furnace, supplied originally by a competing OEM and located in the USA. Tenova Pyromet is part of the global total technology solutions provider, Tenova Mining & Minerals.

In the African market, over the past year, Tenova Pyromet has also supplied copper launders to a platinum producer in South Africa, a copper and nickel producer in Botswana and copper producers in Zambia. Launderers supplied to Zambian furnaces were redesigned for retrofitting to existing furnaces, phasing out competitors' equipment during the end-of-life replacement cycles. Further work in South Africa has included the supply of various proprietary equipment for chrome and ferrochrome furnaces, with other support including plant optimization and supervision of electrode clamp installations.

In addition, assistance was provided to a global technology house in design and equipment supply for a furnace in Zambia.

In India, Tenova Pyromet Client Support Service has been active with plant inspections, commissioning activities and the supply of proprietary equipment for ferroalloy producers. A plant audit was also carried out for India's largest, fully integrated producer of ferroalloys with the objective of incorporating new technology into its plants.

While Tenova Pyromet has always supported global users of its key technologies with post-project and aftermarket assistance, it refocused these activities in early 2013 to provide a dedicated Client Support Service, assisting furnace operators optimize their operational reliability and efficiencies. The service maximizes the synergies between the company's leading expertise in post switch-in technical support, copper products and spare equipment and technical assistance with close out issues.

"Tenova Pyromet Client Support Service has seen a six-fold increase in demand since early 2013," says Werner Roberts,

Manager: Tenova Pyromet Client Support. "By proactively meeting the increasing need for these services from the global smelting industry, we have captured a major portion of the African market, as well as made significant inroads into the international market."

The client-focused service features rapid enquiry response handling and regular interaction with clients and visits to clients' furnaces to ensure they operate at optimum availability. This is underpinned by Tenova Pyromet's in-depth knowledge and experience in ferroalloys and base metals smelting processes.

"A significant factor in our success is the fact that the Client Support Service draws on Tenova Pyromet's unique source of process, engineering and development capabilities, with this expertise immediately on-hand to resolve client technical issues," notes Roberts.

The service, which is also available to users of other technologies, ranges from on-site technical assistance, through to supply and installation of copper products and spare equipment, on-site assistance during shutdowns and rebuilds, close-out of capital projects and support to clients with cold and hot-commissioning. Operational training for clients on furnace equipment and technical training on equipment maintenance are also offered.

Tenova Pyromet is a renowned company in the design and supply of high capacity AC and DC furnaces and complete smelting plants for production of ferroalloys, base metals, slag cleaning and refining. Tenova Pyromet also designs and supplies equipment for material handling and pre-treatment, alloy conversion and refining, granulation of metal, matte and slag, furnace off-gas fume collection and treatment, and treatment of hazardous dusts and waste. Tenova Pyromet has several technologies to reduce operating costs and increase production power consumption.

Tenova Mining & Minerals is a total integrated solutions provider to the global mining, bulk materials handling and minerals beneficiation and processing sectors, offering innovative technological solutions and full process and commodity knowledge across the mining industry value chain.

Customer satisfaction drives repeat Siwertell road-mobile unloader deliveries

Following an order signed in early November 2013, Siwertell, part of Cargotec, delivered a road-mobile unloader to Muhammet Gümüstas AS in Istanbul, Turkey, in December 2014. This is Siwertell's third road-mobile unloader delivery to the operator since 2012.

"Satisfied customers placing repeat orders are testament to the quality and efficiency of our state-of-the-art unloading solutions," says Jörgen Ojeda, Director, Mobile Unloaders, Siwertell. "As an existing customer, Muhammet Gümüstas is well aware of the advantages of using our mechanical unloading equipment, and has chosen Siwertell as a preferred supplier of unloading systems.

"Our customers are happy to prioritize quality, reliability and excellent service over the short-term attractions of making a slightly cheaper initial investment. Repeat customers also prove the value of our wider strategy of building and maintaining long-term relations with our customers as an effective pathway to success for all parties."

The trailer-based, diesel-powered, Siwertell 10 000 S road mobile unloader will be used to discharge cement at 300 tonnes per hour. The unit was built at Siwertell's manufacturing premises in Bjuv, Sweden. It is equipped with a double bellows system to allow continuous operation, and a dust filter to minimize dust creation.

"The mobile Siwertell unloader was originally designed for handling cement, so it is naturally perfect for the job. With its enclosed conveying line, this system is also environmentally-friendly as it ensures dust-free and high-capacity unloading operations," adds Ojeda.

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



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Special re-handling buckets from KINSHOFER

The requests for special re-handling clamshell buckets that are received by KINSHOFER's Department for Custom Solutions, focus on best quality and longevity. The regular re-handling clamshell buckets of the C-Series are indeed very durable and designed for excavators from 18t/39,600 lbs to 80t/176,000 lbs operating weight. However, more and more customers need even tougher constructions for the extreme demands on their sites. This has led to the heavyduty option which means, that they can get a bucket constructed with special reinforced shells for bulk material — in the excavator class with an operating weight of 25t/55,000 lbs to 40t/88,000 lbs this is the C40HD.

Land Recovery Ltd, one of UK's specialist aggregate handling and recycling companies has continued expanding its modern fleet of plant with the purchase of a new Komatsu PC 360 LC fitted with a new KINSHOFER C40HD-175 rehandling clamshell. The clamshell was delivered and installed by KINSHOFER's independent dealer for the North West, MTK (Breaker Hire and Sales) Ltd.

The Heavy Duty clamshell, which has a 2.1 m³ capacity, was specified with additional bolt-on horizontal and vertical wear blades to help reduce wear caused by material abrasion, a heavy duty 360° continuous rotation system and then fitted to the dipper end of the Komatsu PC 360 before being deployed at a Network Rail Recycling site in Cambridgeshire.

Dan Beecroft, (Managing Director) was very careful in his choice of manufacturer and the support service on offer. "Both need to be reliable" said Beecroft, "I cannot afford for the clamshell grab to stop the excavator working or vice-versa". Beecroft had dealt with MTK in the past, so he knew the company could be relied upon to provide him with the service required. "As a KINSHOFER – Demarec dealer, they arranged for a full assessment of the site and the application, calculating the optimum size of clamshell for the excavator I had in mind, they then went one better by loaning me an attachment whilst mine was built to my specification."

Among the key features of the C40HD clamshell is the wide



The Kinshofer C40HD Rehandling Clamshell Bucket in heavy duty action at a Network Rail Recycling site in Cambridgeshire.

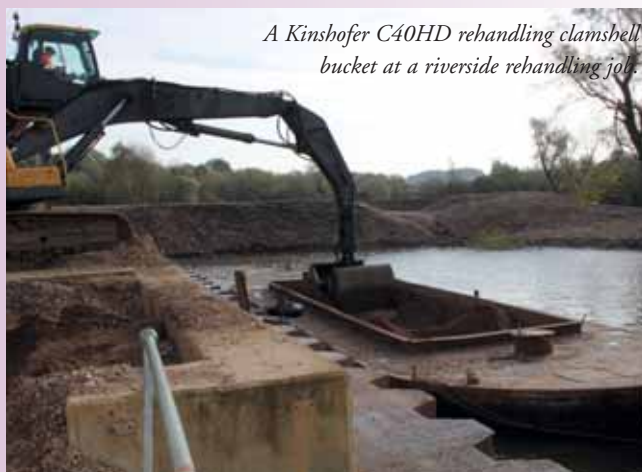
pitch PCD 'slew ring' type rotation device for increased strength and stability, the use of high-strength impact-resistant materials which contribute to a low overall weight of the grab and the 'flat bottom' closing curve which prevents damage to railway wagons, boats and lorries. Bolt-on reversible horizontal and vertical wear blades protect surfaces vulnerable to abrasion, but also ensure rapid down time when being turned or replaced.

KINSHOFER offers two more special re-handling clamshell buckets in this operating weight class, the C40VHD with two vertical cylinders as opened or closed version. Due to the closed shells, the latter is ideal for very fine-grained loads (e.g. fertilizer).

Both types are constructed with integrated rotation, sealed swivel and bevel, a rotary feedthrough and with a motor, which is accessible directly. An integrated non-return valve guarantees the security of the load. Their excellent digging characteristics are the result of high closing forces due to the two vertical cylinders. The integrated rotation enables precise positioning. Long life is ensured due to the use of 500 HB steel in the manufacture of cutting edges. Their shell back walls (8mm/0.31 in, HB 400) also resist highly abrasive materials. Bearing points with specially coated bushings and hardened pins are other details that underline the quality and longevity of KINSHOFER's special re-handling clamshell buckets.



A Kinshofer C40VHD open version with two powerful vertical cylinders in action in The Netherlands.



A Kinshofer C40HD rehandling clamshell bucket at a riverside rehandling job.

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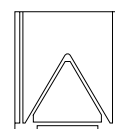
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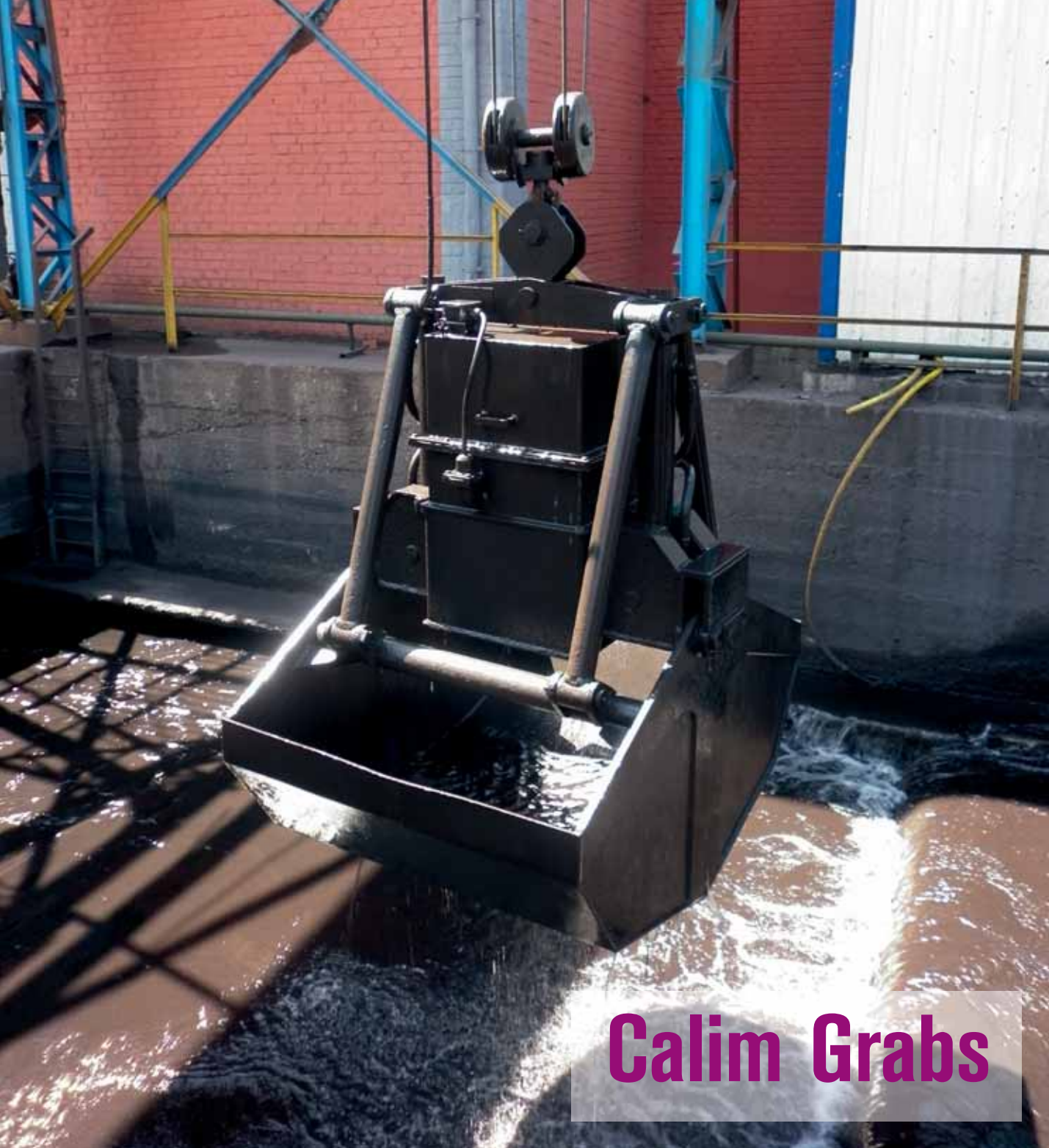
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Calim Grabs

Grabbing the attention of the bulk industry since 1970

Calim Grabs (Calim Kepce) has been engineering, manufacturing and delivering equipment to customers and port authorities since 1970. In that time, the company has earned a strong reputation in the grabs and marine equipment industry.

Calim Grabs specializes in the manufacture and repair of grabs which are used to handle a wide range of materials. Its well-trained and experienced staff work to develop highly efficient and cost-effective grabs. It offers great expertise in engineering and customer-focused developments. The company's product range, one of the most complete on the market, offers high lifecycle value, heavy-duty grabs such as quality rope-operated, hydraulic and electro-hydraulic or motor grab catalogue, radio remote control grabs etc.

A respect for the needs of the market, combined with

incremental improvements and experience gained over the decades, mean that Calim Grabs is able to offer a high standard of technology and reliable products. The number of models developed by the company has now reached 30.

Since the company was founded, it has delivered over 2,500 grabs to customers around the world. As well as its standard product range, it also regularly develops customized, unique solutions for specific situations when the customer needs these.

Calim is independent, experienced and has a high level of expertise. The company has its own manufacturing facility of which it is very proud. This facility adapts very fast to global technological and engineering developments.

The company's domestic and international market activity has been growing since the end of 2011. One source of satisfaction

for CALIM GRAB is the recent sale of ten units to Latin America. Over the last few years, the products have been in operation in the largest ports in the world. Port activity is one of its key sectors and it is very conscious of the market's new demands concerning product efficiency and evolution. Its last project was for a Dubai-owned port and construction site

Calim's products can be seen all over ports, cement and steel factories and on ships world wide. They are especially popular in Latin America, North Africa, Venezuela, the UK, Romania, Pakistan, Singapore, Ireland, Bangladesh, Cyprus, Ukraine, Sudan and more. The company also ships spare parts with any purchased product which may be needed in, say, six months, at no cost.

Calim's main customers are: crane manufacturers; stevedoring companies; dredging companies; shipping companies; fertilizer



companies; cement companies; mining companies; alumina producers; steel manufacturers; and electrical power plants.

Calim Grabs has gained great expertise in handling all types of cargo, including: fertilizer; coal; gypsum; grain; soybeans; sand; scrap steel; rock; clinger; cement; iron; ore; salt; petcoke; wood; chipboard and many more.

EASY ASSEMBLY AND MAINTENANCE

Modularity and operational flexibility

Return-on-investment (ROI) when purchasing grabs can be significantly reduced if the structure can be modified by



detachable plates or arm replacement and use same motion system to handle materials of different shapes and densities. The



design of Calim's products is based on a modular conception so that grab's structure could be easily transformed.

ROI also depends on:

- ❖ grab productivity (tonnes per hour) vs. operational costs;
- ❖ purchase investment vs. maintenance costs;
- ❖ modularity and operational flexibility; and
- ❖ cycle times (opening-closing-transport movements); and material loss during transportation movement

SAFETY FIRST

To guarantee the safety of all workers and operators, Calim's technical specialists carry out regular inspections of all its products. Hydraulic pipes, electrical wiring and connections are fully protected. The cylinders are fitted with oil damping at the

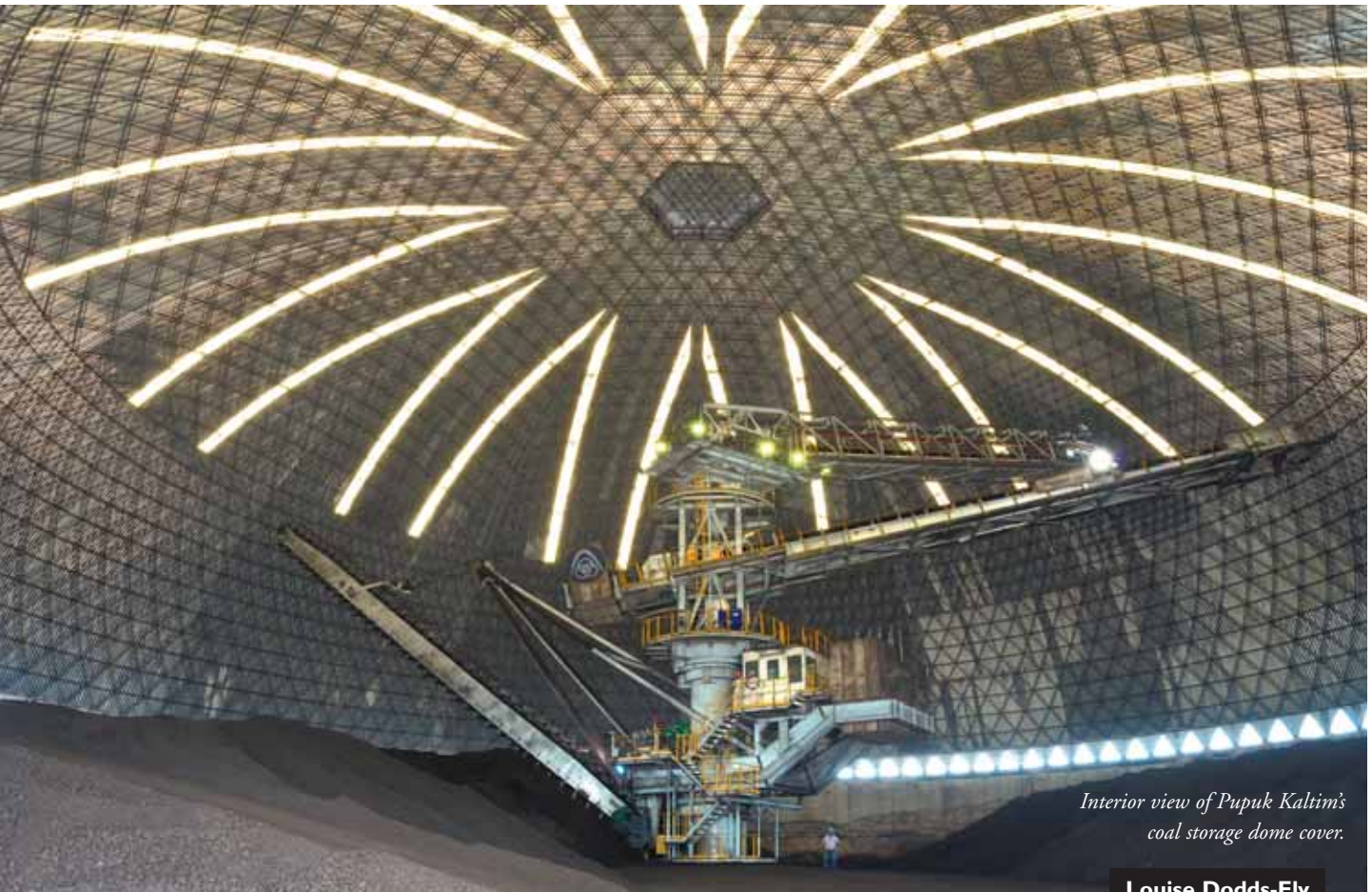


end of the travel to reduce noise and increase durability. The cylinder barrel and piston rod are additionally protected against mechanical damage. High-quality chrome-plated steel is used in hydraulic cylinders. The inside and outside shell plates and grabs' jaws are made of highly wear-resistant Hardox steel. **DCi**



Keeping **bulk** under **wraps**

enclosed storage systems **and**
technologies in the spotlight



Interior view of Pupuk Kaltim's coal storage dome cover.

Louise Dodds-Ely

Coal: clean and covered with domes from Geometrica

Coal piles come in many shapes, from the huge multiline longitudinal piles frequently found at ports, to ring blending beds at large powerplants, to simple conical or irregular piles common at industrial plants, writes *Melanie Saxton at Geometrica*. Sites may include any stockpile shape on any terrain and in any climate, including areas prone to typhoon-force winds, corrosive salt water, brutal snow loads or mountainous topography. All have specific storage requirements for a range of handling equipment and coal or petcoke pile dimensions. The challenge is to cover raw material while respecting budget and other crucial goals. The most stringent environmental, regulatory and operational standards must be met or surpassed.

CONSIDERATIONS IN CHOOSING COVERS

Run-off and dust pollution are often the driving needs when choosing to cover a stockpile. Equipment considerations may yield a parabolic, acute, bent or circular cover that maximizes

storage volume according to pile shape and stacking and reclaiming methods. Those apply to any bulk material cover. But when it comes to solid fuel and combustible dust from raw coal and petcoke materials, special care must be taken in the design and assembly of a storage structure. Coal dust cloud explosions may be generated inside an enclosed space when an ignition source is present. Dust clouds may develop wherever loose coal dust accumulates on structural ledges. This risk factor also exists if there is a nearby impact or vibration due to wind, earthquake, or even maintenance operations.

Thus, the vetting of suppliers and the construction process deserves special attention, including a demonstrable and varied portfolio of projects built worldwide. Geometrica designs coal domes, vaults and freestyle structures in a variety of countries, weather conditions and terrains, after determining which structural shape and application will best protect the combustible materials underneath.





IKPT Pupuk Kaltim fertilizer manufacturing plant with quayside coal boiler storage spanning 81m in diameter, Bontang, Kalimantan Timur, Indonesia.

CIRCULAR SECTIONS AND INTERNAL CLADDING

Industries may choose to utilize either internal and exterior cladding for coal stockpile coverage. The National Fire Protection Association in its publications NFPA 850 and 120, identifies hazards associated with storage and handling of coal and gives recommendations for protection against these hazards. NFPA recommends that storage structures be made of non-combustible materials, and that they are designed to minimize the surface area on which dust can settle, including the desirable installation of the cladding underneath a building's structural elements.

Geometrica's structures are made of circular tubes which present very small surfaces on which dust can accumulate. The structures may be clad internally to provide a sealed, gap-free surface that resists dust accumulation on beams and in crevices to reduce or eliminate the formation of dust clouds. These structure and cladding solutions meet all the relevant recommendations by the National Fire Protection Association and other international organizations. R-type profiled cladding is waterproof and provides uniform strength, excellent drainage and low deflection. FRP panels admit natural light to the interior.

ADDITIONAL COMBUSTION PROTECTION

Additional accessories enhance safety, such as forced ventilation systems to ensure that air exchanges have a continuous perimeter ventilation air intake opening at or near the base. Cupolas are designed to reduce methane or smoke build up for explosion venting requirements.

Ventilation should be provided at the apex to take advantage of the chimney effect. The structure should also be vented at the perimeter to feed the natural ventilation chimney effect. A breakaway panel at the base may provide for accidental overloading, and exhaust fans or ventilation openings insure against methane or smoke buildup. Access openings, conveyor openings, ladders, walkways, and anchoring systems are also designed with safety in mind.

CORROSION RESISTANCE

Corrosive challenges can be monumental. All Geometrica structures are designed with corrosion-resistant galvanized steel and aluminium alloys to ensure years of maintenance-free storage

even in the most brutal marine environments.

Zinc is the most effective way to protect steel. For this reason, the steel tubes used in Geometrica structures are always galvanized. Standard galvanizing has an expected life to first maintenance of over 40 years in storage exposures with external cladding. In aggressive environments, such as damp interiors or exterior structures exposed to pollution, a clear acrylate coating may be applied over the galvanized steel tube for three layers of protection: 1) high-purity zinc, 2) a conversion coating to passivate the zinc and prime the surface, and 3) a third layer of transparent organic coating that seals the surface. The resulting finish is beautifully shiny and smooth, and increases the galvanizing life by four times (per salt spray testing).

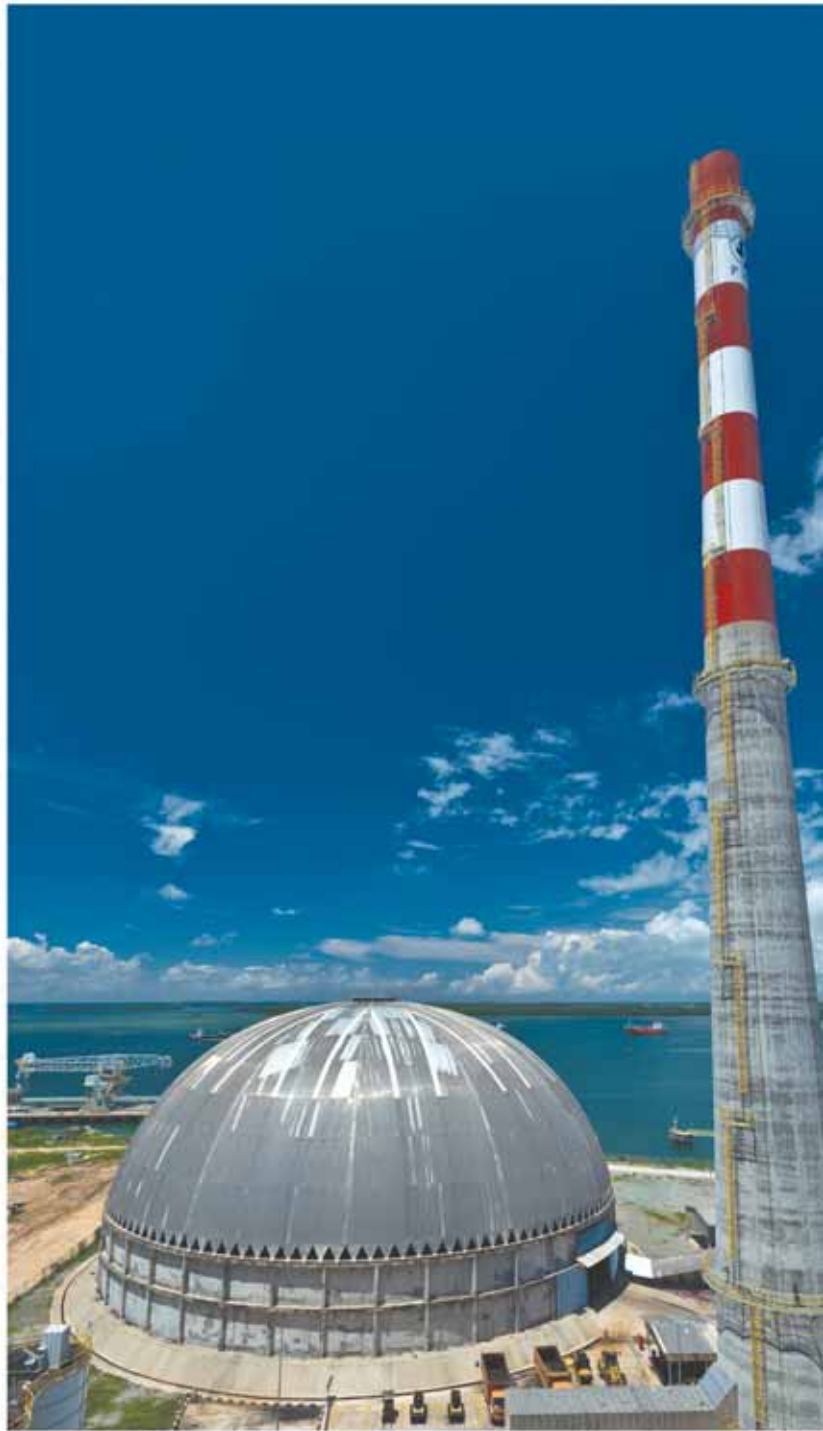
Aluminium structures are available for extraordinarily punishing environments exposed to within 50m of the ocean (such as those featuring internal cladding at a port). Aluminium is naturally resistant to corrosion and may be left unpainted. On contact with air it forms a resistant layer of aluminium oxide that arrests any further attack. Aluminium structures may also be clear anodized to maintain their appearance. All structures may also be powder- or wet- coated in a variety of colours.

FERTILIZER, POWER AND CEMENT INDUSTRIES

Ideally, bulk storage structures are engineered for flexibility and customized to suit each project. For instance, a fertilizer producer may use coal-fired boilers requiring clean coal storage facilities. Perhaps a cement manufacturer has an irregularly shaped pile and needs a cover built over the entire operational stockyard of coal and aggregates — without downtime. A waste management or power generation facility may face a destructive marine environment and require specific metal infrastructure. Following are examples of custom applications for coal storage around the globe, designed to meet the unique demands within various industries.

COAL STORAGE IN INDONESIA

Indonesia's largest fertilizer producer, PT Pupuk Kalimantan Timur (Pupuk-Kaltim), supplies subsidized or non-subsidized sectors with urea, ammonia, NPK and organic fertilizer. The facility owns and operates its own port and special harbor, and provides an excellent example of ship loading and related technologies, such



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122m twin JEA Petcoke Domes with interior cladding, Florida, USA.

as bulk storage. Geometrica provided design and prefabrication services for Pupuk-Kaltim's facility located on an ocean estuary in Botang, Indonesia. The company needed a corrosion-resistant dome for the 10m-high reinforced-concrete perimeter ring wall.

Assembly began at the top of the concrete wall and progressed toward the apex, followed by the installation of aluminium cladding. Pupuk Kaltim chose to use only clean-coal technologies for a circulating fluidized-bed boiler, coal-storage dome covering 40,000 tonnes of coal, continuous barge unloader, coal stacker and a portal reclaimer.

"This project was very similar to domed bulk-storage facilities we have built worldwide," says Jorge Parada, Geometrica's site consultant. "Our galvanized-steel dome technology has proved itself in many environments and applications. Pupuk Kaltim's application along the coast of Indonesia in a tropical rainforest is a great example."

COAL STORAGE IN THE US

Geometrica helped JEA Northside in northern Florida upgrade two ageing, under-utilized steam quayside structures. The new structures used circulating fluidized-bed technology to convert from oil/gas-fired to solid fuels. Geometrica provided the twin petcoke storage domes near wetlands in northern Florida. Each spans 122m of column-free infrastructure. About 66,000 tonnes of solid fuel is conveyed from the loading dock to the domes with a 12,000ft-long conveyor system. Internal cladding prevents fuel dust from accumulating on the structure, minimizes dust pollution, and prevents rainwater runoff from contaminating the wetlands. This effort increased efficiency while reducing both emissions and the cost of electricity.

COAL STORAGE IN TAIWAN

The Hsin-Ta Power Station (Tai Power) in Taiwan also



Interior view of natural lighting within a 122m coke storage domes in Jacksonville, Florida.

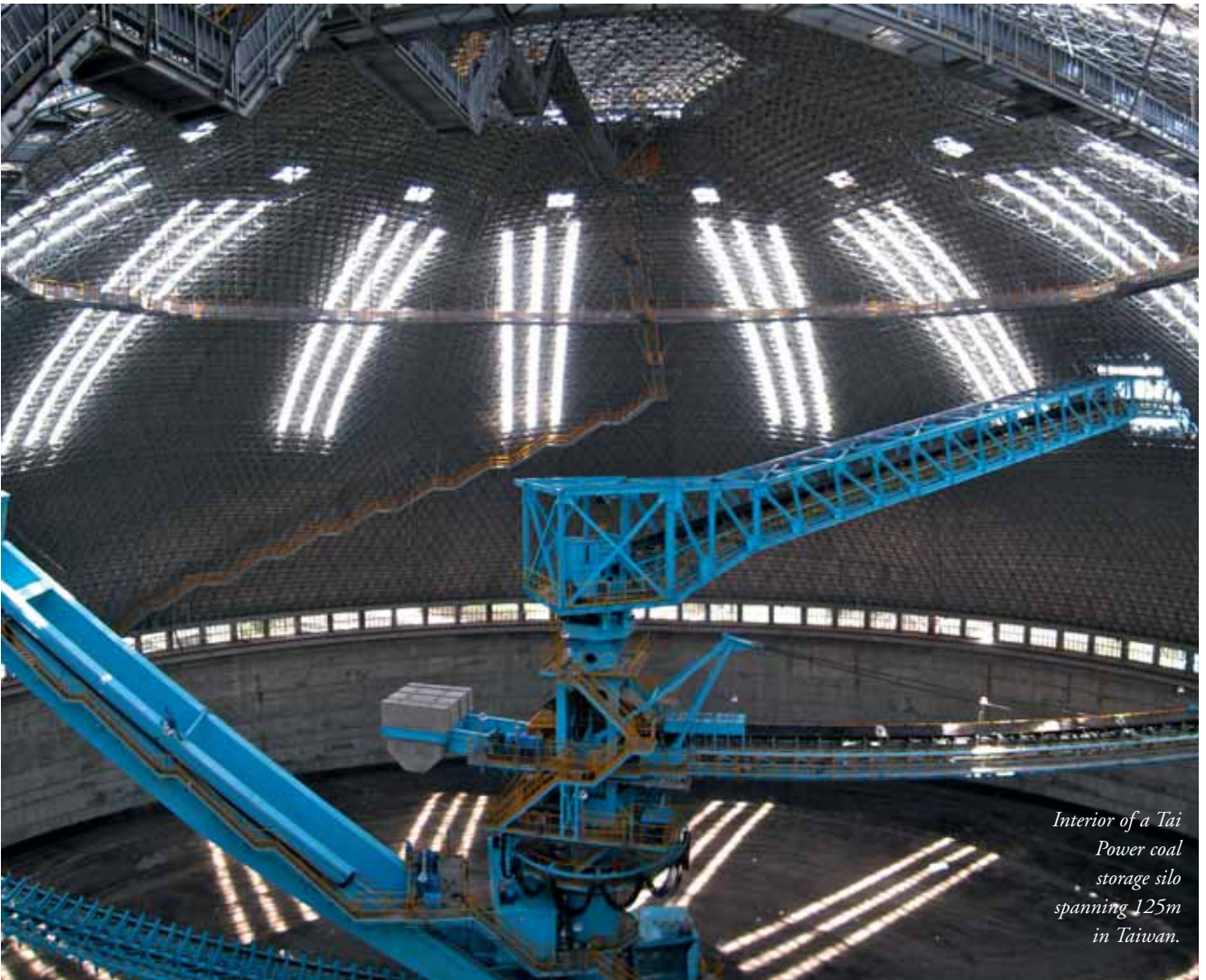
Four 125m Tai Power coal storage silos built to withstand extreme wind loads and defy salt corrosion, containing 180,000t each.



experienced the corrosive hazards of salt water. In addition, the engineer specified an 'extraordinary load' consisting of super-typhoon wind speeds of 65m/s ten-minute mean measurement at 10m above ground, higher than Taiwan's building code requirements. Geometrica won the bid to provide cost-efficient

engineering, manufacturing and technical assistance during installation of four identical domes designed to minimize accumulation of coal dust on the structural members to prevent fire and explosion hazards.

Several additional hurdles had to be overcome. The project



Interior of a Tai Power coal storage silo spanning 125m in Taiwan.

Exterior of the Krupp Polysius Arco barrel vault for coal storage in Palmafa, Mexico.



schedule was very ambitious, and due to scheduling constraints the domes would have to be built after the coal stacking/reclaiming equipment was installed. Each of the four units would store 180,000 tonnes of coal in a live pile, providing a total capacity of 720,000 tonnes.

COAL STORAGE IN MEXICO

Krupp-Polysius was the turnkey contractor for the Palmaritos plant in Mexico. It hired Geometrica to design a barrel vault spanning 65m. Equipment, bulk inventory and storage was

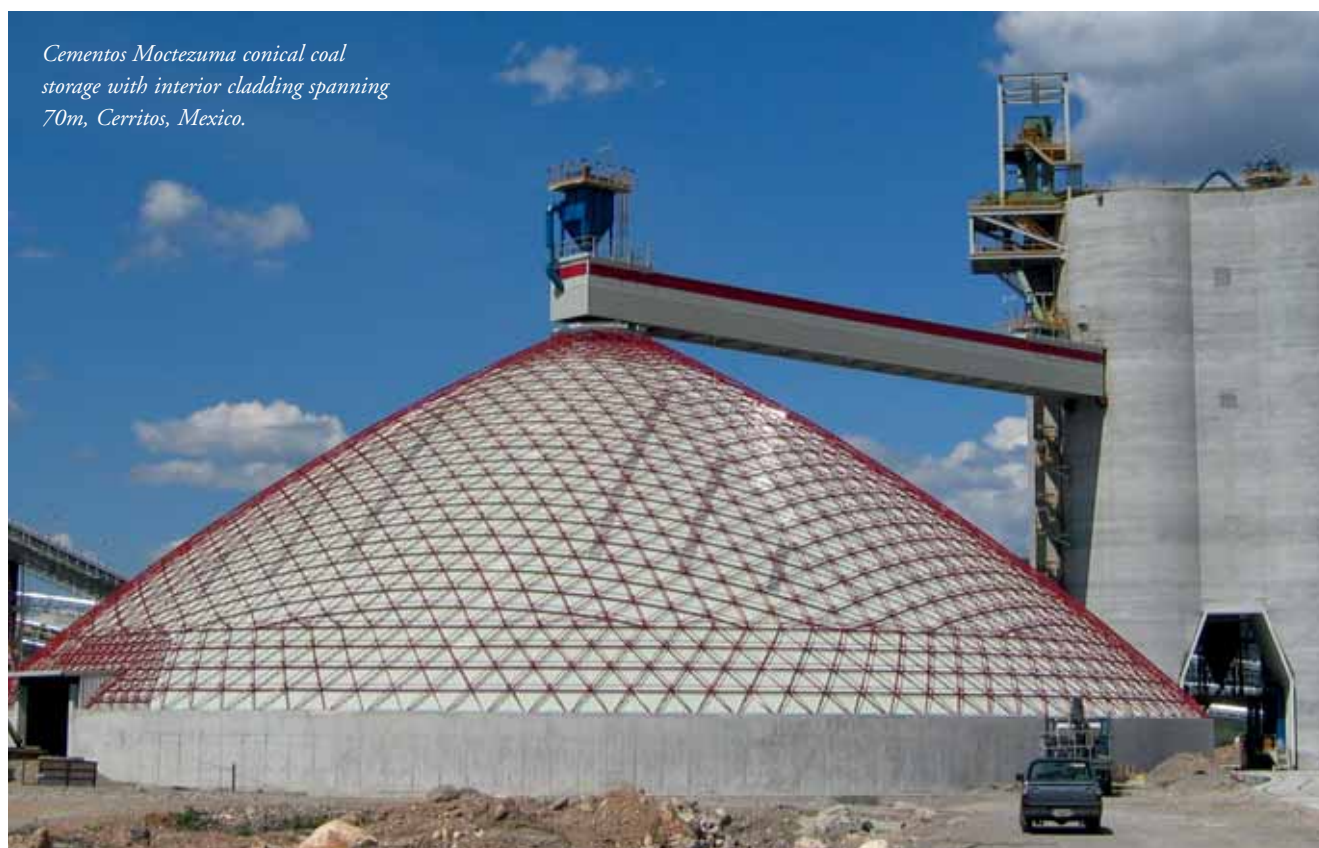
considered to maximize barrier-free work flow and account for the traffic influx and outgo at the facility.

Moctezuma Cement's Cerritos plant in Mexico became a multi-focus project, needing limestone, clay, coal and bagging storage buildings. Geometrica designed and built these structures, including a 65m coal storage dome with interior cladding to deflect coal dust and mitigate combustible hazards.

COAL STORAGE IN TUNISIA

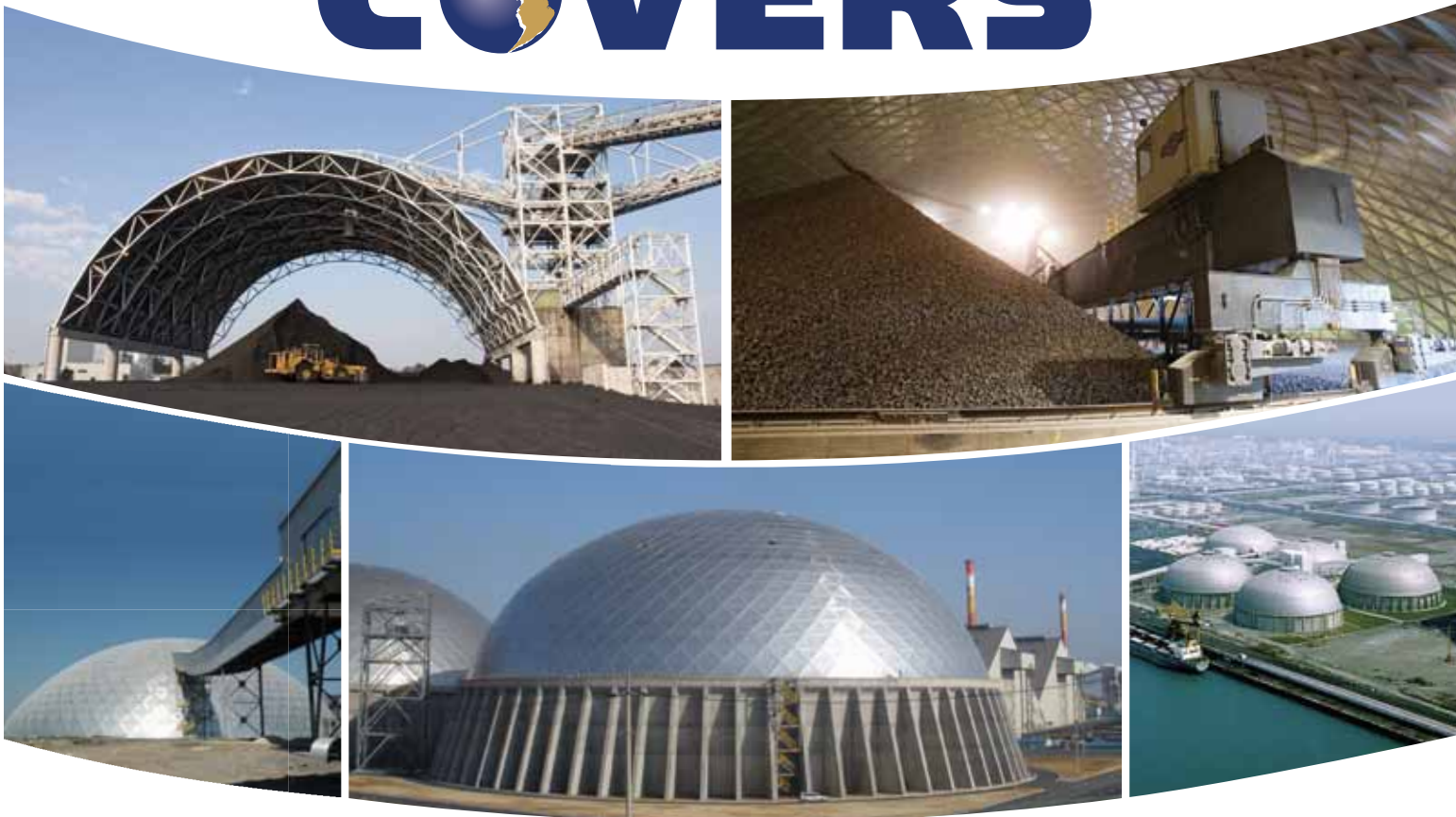
Carthage Cement, located in Djebel Ressay, Tunisia, is an example

Cementos Moctezuma conical coal storage with interior cladding spanning 70m, Cerritos, Mexico.



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Carthage Cement longitudinal domes include additives and coal storage spanning 300m and 200m, respectively.



of one of the world's largest coal storage structures. Geometrica supplied three buildings at the manufacturing facility — a longitudinal coal storage building spanning 200m in length, an additives building spanning 300m, and a limestone circular dome spanning 90m. All were reinforced with arch ribs. “We assembled the domes in half-arch segments on the ground. Then we lifted the arches into place and stitched them to the growing structure. This minimized the amount of time workers had to spend working at heights,” said Fernando Gracia, Geometrica’s lead designer for the project.

Geometrica structures are known for ‘green’ design of eco-friendly domes and to barrel vaults spanning the largest coal and petcoke stockpiles. Health, safety and environment are utmost

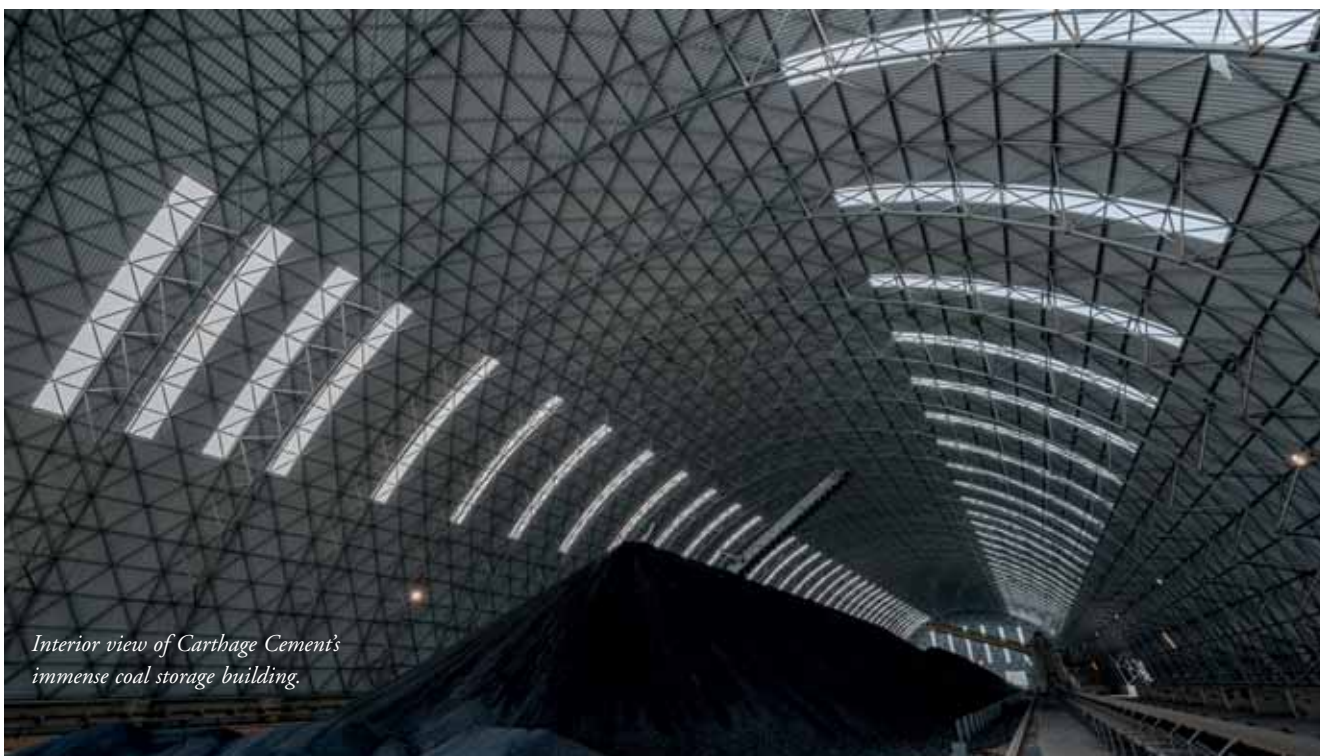
Horizontal view of the immense coal storage facility at Carthage Cement in Tunisia.



priorities. “We have paid particular attention to adopting the latest technology, high economy of energy consumption and great respect for the environment,” said Lazhar Sta, CEO of Carthage Cement.

STRUCTURAL SOLUTIONS FOR ALL ENVIRONMENTS

Structural design, cladding, and ventilation systems for coal storage helps the coal industry meet and exceed both safety and environmental requirements.



Interior view of Carthage Cement's immense coal storage building.

Bedeschi technology for an eco-friendly coal-storage solution

“Coal isn’t dead” headlined the *Wall Street Journal* in an article of John Miller and Rebecca Smith in January 2014. Indeed, writes Pietro de Michieli, Chief Operating Officer, BEDESCHI SPA, thanks to the emerging economies of China and India, coal is expected to become probably the prevailing fuel source in the world. The International Energy Agency has come to envision that the use of coal will increase by 65% by 2035. It is, of course, vital to avoid — or at least minimize — the environmental risks posed by coal, and its effects on climate change. For example, the use of modern technology in treating smoke has greatly reduced the impact of coal-fired power plants. This has resulted in more coal plants in the USA well as in Europe — in Italy, also, as shown in the following case study.

Enel project is a turnkey solution, as it includes the engineering, construction, complete supply of materials, commissioning and starting up of the equipment to fuel a 2,640MW power plant in Italy. South Brindisi is one of the biggest coal-fired power plants in the country. It is operated by ENEL Produzione S.p.a. The power plant will utilize coal sourcing from Indonesia and South Africa. The project considers environmental concerns and will aim to take the place of the current outdoor longitudinal coal storage facility at the power plant.

PROJECT DATA

Material	coal
Bulk density	7.7–10t/m ³
Grain size	0–100mm
Moisture	7.4%
Resting angle	38°
Stacking rate	3,000tph
Reclaiming rate	1,500tph

This will involve the implementation of two new domes with a wooden covering structure and an environmental impact almost equal to zero.

The dome’s dimensions will be

as follows: diameter 150m, height 45m, total stored volume of coal 350,000 tonnes. The implementation of circular technology in the stacking and reclaiming operation will also see an increase in efficiency. The contract issued with Bedeschi, which started in August 2011, includes the supply of all the mechanical components and the electrical and control systems for two STK R 35/2000 circular stackers and two PAL PRD 300/36+240/24 double arm slewing lateral portal reclaimers (one in option) for coal handling at the power plant. These mechanical components and electrical and control systems will be installed into the complete automation of stacking and reclaiming operation. The stackers have been designed for 3,000tph (tonnes per hour) and the reclaimers have been designed for 1,500tph.

The installation also utilizes some of the latest housekeeping and safety/environmental systems to comply with a hazardous area classification (ATEX DUST AND



GAS) such as:

- ❖ a vacuum cleaning system and compressed air system for standard maintenance operations;
- ❖ a water spray fog system for dust suppression;
- ❖ a gas firefighting system for the power and control cabins;
- ❖ a water firefighting system for the coal pile and conveying belts;
- ❖ sensors for toxic gas installed in some key position machine;
- ❖ operator cabin pressurization system with filtered external air;
- ❖ a wooden roof to achieve the necessary fire resistance; and
- ❖ requirement for the OEM to comply with the owner’s ‘One Safety’ programme to verify the security level in the construction site.

In December 2013 Bedeschi, started the erection phase of the first dome, while the second one started in April. The entire project will be finished by the end of the summer. The project is a great success for Bedeschi team.

Concern for the environment is, today, a key element to be considered during any project. Reducing the impact of coal handling and storage requires new and innovative technology. Bedeschi Group, thanks also to the presence of CTP (a leading engineering company in the dust treatment and gas filtration technology), is able to guarantee eco-friendly solutions.





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Sunderland makes Rubb its first port of call in hunt for storage solution

A manufacturer of relocatable engineered fabric structures is showing the way in the space race when it comes to providing storage solutions to the ports and marine sectors.

Rubb was the first port of call when Sunderland City Council required a new cargo facility at Hendon Docks. A versatile storage area was needed to help continue the development of the Port of Sunderland's cargo handling facilities. In conjunction with SGW Construction, Rubb erected a 24m span x 65m long BVE cargo handling and storage facility with 7.65m sidewalls. The design and quality of the structure provided a safe and pleasant cargo storage solution. Rubb's innovative customized structures ensure safe and secure access to the storage area, while the translucent roof provides a natural source of light. The internal clear-span steel framework allows the maximum use of available storage space.

Rubb also helped a port building project grow at the Port of Belfast. Rubb began working with Belfast Harbour Commissioners back in 2001 to ensure that their ever-changing and ever-expanding storage requirements were met as use of the port developed. The first Belfast Harbour warehouse storage facility was erected in 2001 at the head of the dockside area. It measures 24m span x 45m. In 2005 an additional building measuring 24m span x 65m long was erected directly adjacent to the existing harbour structure. In 2003 a much larger harbour storage building measuring 45m span x 175m was installed at a different location on the dockside and in 2004 this was extended to 217.5m in length. In 2005 the Rubb design team was given a brief to erect the largest possible building on the remaining land on this site. Careful consideration had to be given to the design because of restrictions created by the nearby dockside traffic. However, a 32m span x 60m harbour storage facility was installed, maximizing all possible space available, taking the storage area constructed by Rubb to a massive 14,347m².

Meanwhile the Port of Workington offers high quality storage facilities in the form of two relocatable Rubb constructed ports buildings. The ports structures measure 25m span x 32m in length and 25m span x 61m in length. These port facilities provide storage space for animal feed and protection from the elements and light. The design features a split storage capability. As this part of the west coast of England is susceptible to severe winds and rain, the storage systems were constructed on top of 4m retaining walls. The walls consist of a steel support structure complete with pre-stressed concrete infill panels, which allow for quick and easy construction. This method provides a fully sealed facility to prevent water ingress and also allows for internal retaining walls to be built for different storage needs. The client required a dark covered port storage facility as animal feed needs



Interview of one of the Rubb buildings at the Port of Workington.



New cargo facility at Hendon Docks in Sunderland.

to be protected from light, however the translucent PVC material used on other Rubb ports projects provides a brighter working environment without the need for windows.

More recently Rubb has been providing facilities to the renewable energy, alternative fuels and biomass power marketplace. Rubb's bioenergy storage structures can provide customers with the ideal environment for the processing, handling and storage of bulk materials. The company's technical team can offer expertise and experience in the design, engineering and construction of large-scale biomass building projects at port locations. Ongoing product development of biomass energy facilities ensures that Rubb continues to meet its clients' demands. Experience and a flexible approach enable it to efficiently overcome challenges, meet changing needs and requirements quickly and cost effectively.

Rubb Buildings Ltd was also tasked with designing, manufacturing and erecting two crane liftable buildings to cover offshore pile clusters in a marine environment. The two marine manufacturing covers from Rubb's new BLE series for Harland and Wolff feature spans of 30m and each measure 35m in length. To increase the overall internal apex height of the manufacturing bays to 20.2m, H&W asked Rubb to use a 7.3m-high wall constructed out of 40ft containers as the building's foundation. A custom designed supporting frame was created to hold the containers together and act as the fixing base for the Rubb BLE structures.

The buildings are designed with reinforced base beams and anchor brackets so they can be easily lifted from their container foundations and moved to one side. This allows the client to then crane lift materials into the space within the foundation frames for various operations. The building roof is replaced to protect employees and materials from the elements. Each gable end of both paint and blast facilities includes a pedestrian door and a 4m x 4m roller shutter door for equipment access.

THE ADVANTAGES OF RUBB STRUCTURES FOR PORT DEVELOPMENTS:

- ❖ all Rubb products are suitable for ports/logistics/warehousing type applications. The flexibility of a Rubb structure means it can be used to house a wide variety of goods;
- ❖ Rubb's port storage solutions offer a number of advantages to its clients. Its climate-controlled warehouses provide dehumidified storage environments, while its bulk storage facilities are ideally suited for storage of materials under the strenuous conditions of a marine environment;

- ❖ Rubb storage buildings offer marine terminals a solution that allows for maximum flexibility with respect to multiple handling methods and configurations;
- ❖ relocating and re-using these buildings to suit the changing needs of a busy port is easy and cost effective;
- ❖ additional buildings can be added as required;
- ❖ the PVC cladding will not corrode in a marine environment and allows the structure to accept differential settlement without the need for expensive pile foundations. These same features give Rubb an advantage when it comes to preventing leaky roofs — an issue that is common at many port facilities;
- ❖ Rubb structures provide large column-free spaces, illuminated by natural light through a translucent roof. This provides a

safer and more cost effective working environment than some other traditional warehouse buildings;

- ❖ Rubb buildings can be designed, delivered and erected within eight weeks;
- ❖ these semi-permanent structures are designed to stand for as long as the client requires. All steel used in a Rubb building is hot dip galvanized to strengthen the frame and provide a durable maintenance free facility. The high-quality PVC-coated fabric cladding has been proven to last in excess of 30 years; and
- ❖ Rubb's unique custom solutions enable it to handle all types of projects, large and small, from designing, manufacturing and constructing large new plants to extending existing facilities.

ABOUT RUBB BUILDINGS LTD

Rubb Buildings Ltd was established in 1977 and is based in Gateshead, Tyne and Wear. The Rubb Group also has office and manufacturing facilities in Norway and the USA. It specializes in the design and manufacture of custom-made relocatable engineered fabric structures.

Highlights include ground-breaking military buildings (aircraft hangars, shelters, storage facilities), specialist sports buildings and structures for a variety of sectors including aviation, ports, construction, bulk storage and environmental (waste and recycling).

All products are designed and manufactured at Rubb's UK plant at the Team Valley Trading Estate in Gateshead, Tyne and Wear.



DESIGNED TO STORE

Innovative fabric engineered storage buildings

Having the capability to increase storage capacity is critical for many organisations and businesses. Rubb has the storage solutions to help companies optimise their growth and profitability.

Rubb's innovative fabric engineered, high quality structures offer proven solutions for a wide range of warehouse requirements. Our large clear spans and high translucent ceilings provide a bright, efficient working environment. Rubb structures are built to last but are fully relocatable or extendable to meet changing needs.



Geroldinger offers geometric solution to bulk storage problems

Geroldinger is a medium-sized owner-managed company, and was founded in 1921 as a mill construction firm.

The company's employees number around 80, and its premises cover approximately 12,000m². Since the 1970s, Geroldinger has focused primarily on bulk material handing process, including enclosed storage systems.

Geroldinger has patents for its silo (Multigon) and discharging systems (Oszillomat). The company is today a major global provider of technology for a wide range of complex applications.

Whether the bulk solids are cohesive, finest grained, fluidable or hygroscopic, Geroldinger knows how to handle them reliably. The company has successfully completed hundreds of bulk solids automation projects. The commodities handled by the company's equipment include: urea, salt, calcium carbonate, carbon black, calcium hydrates, CaCO₃, chalk, clay, CMC

(Carboxymethylcellulose), kaolin, starches (from wheat, potatoes, sweet corn, etc.) fine lime, talcum, film flakes, foam flakes, various synthetic or natural fibres (glass, textiles, plastic), RDF (refuse-derived fuel), limestone, natriumpercarbonate, melamine, oxalic acid, pet flakes, phosphates, chemical nitrate compounds, sludge, silicic acid, soda, synthetic rubber, TiO₂ (titanium dioxide), XPS-flakes and more.

Even with hard-to-handle bulk solids, Geroldinger is able to handle these almost as standard. Its commitment is to promote its customers business success through outstanding reliable solutions at minimum investment and lifetime operating costs.

Installation areas are almost always angular. Multigon adapts to this according to the requirements and accurately to the centimetre.

Thanks to the octagonal surface area, maximum silo volume in relation to the available space is gained. This is particularly true



*The Geroldinger
Multigon silo.*

when several cells are required, or the silos have to be set up inside. This is because the adjacent cells of the Multigon always use common walls. In this way, no valuable space is lost, while simultaneous gains in terms of hygiene are achieved.

MASS FLOW ENSURES FIRST-IN-FIRST OUT DISCHARGE

Silo walls that are completely smooth on the inside and on the outside, an octagonal cell cross section with 135° corners, and a sophisticated geometry in the funnel area ensure mass flow.

Multigon is therefore emptied without any residues and according to the FIFO (first-in, first-out) principle. Multigon is thus guaranteed to have no residues that might result in the mixing of materials and thus reduced quality. The active silo volume is not reduced but rather used in an optimal manner. Even where bulk solids with poor flowing characteristics are used, it is possible to reliably safeguard against core flow,



Oszillomat live bottom discharge and dosing system.

funnelling and bridging.

The sandwich-wall design ensures high protection against heat, cold and condensation.

Sensitive bulk solids, such as XPS flakes or meat and bone meal, are protected against excessive heat due to high outside temperatures and strong sun radiation.

Multigon is particularly suitable for strongly hygroscopic bulk solids like urea and salt and speciality fertilizers. Handling these materials requires specialist expertise. It is impossible to totally eliminate the influence of ambient temperatures and air supply; it is therefore necessary to develop solutions that reliably destroy the unavoidable lumps and layers, to prevent them reaching equipment further along the process. Geroldinger is able to achieve this, mainly through the optimal design of its bin/silo geometries with layer destroying surfaces, a simple but intelligent discharging system and sophisticated control engineering.

Although the storage period is usually several weeks, the Multigon is completely emptied by the Oszillomat live bottom discharge and dosing system reliably.

The walls of Multigon are of sandwich construction. Additionally the Multigon is clad (except when erected inside buildings). The resulting air layers provide an insulating effect that is usually only available with more expensive insulated round silos.

Using premium stainless steel is much cheaper compared with round silos. The special construction of the Multigon means that it is only necessary to use expensive stainless steels at the parts where the bulk solids (hygroscopic bulk solids are often very aggressive) touch the inner silo walls. So with Multigon, it is possible to have relatively thin stainless steel wall thicknesses.

OSZILLOMAT — LIVE BOTTOM DISCHARGING SYSTEM

To partner the optimal silo geometry, an efficient discharge system is needed. This should discharge bulk solids equally over the whole outlet cross-section, as that is the only way to ensure mass flow in the silo. Therefore, all zones in the silo are in movement. Because there are no dead zones, product accretion and arch formation are prevented. Geroldinger's Oszillomat fulfills all these requirements.

This simple and ingenious discharge system consists of an oscillating beam discharger. The controllable beam floor triggers mass flow, which is essential for the quality assurance of most

complex bulk solids.

The Oszillomat is a safe, all-in-one solution by which bulk solids, however hard to handle they may be, can carefully be loosened, dosed, and gently discharged.

At the same time, the Oszillomat breaks and crushes lumps, without destroying the single particles. All downstream metering and conveying instruments are protected from damage and are able to work more accurately. The downstream processes are fed reliably and precisely.

FLEXIBILITY THROUGH MODULAR DESIGN

With different cell cross sections and construction heights, it is not only possible to create different silo volumes precisely according to customer requirements in one single cell block. It is also possible to economically integrate machine rooms, a staircase, and much more in the silo building.

LOW TRANSPORT VOLUME & CONVENIENT ASSEMBLY

Multigon comprises extra flat components that are manufactured at an automated process and sized accurately. The elements are only mounted on the construction site by joining and bolting, without the need for welding. Worldwide transport is no problem and can be arranged economically.

EASY MAINTENANCE AND OPERATION

On the outside, Multigon is always enclosed by trapezoidal sheet metal. Thus, a building is created in which all fittings are protected against weather. Even if several cells are installed, a single, accessible workspace is created in the top and bottom area. This is practical, and saves on operating costs every day.

BENEFITS

Multigon is perfectly suitable for:

- ❖ the need for various silo cells (particularly for medium-sized or different volumes);
- ❖ bulk solids that need to be protected against humidity/condensation, (flour, grains);
- ❖ temperature sensitive bulk solids;
- ❖ safe storage of hygroscopic bulk solids in large silos (urea, salt, ammonia sulphate, speciality fertilizers)
- ❖ very difficult bulk solids/applications that do not allow for funnels (cone) and use rectangular or square discharge systems;
- ❖ very long transport distances; and
- ❖ as an alternative to systems that need to be manufactured or welded on the construction site;

The Multigon is a safe and durable silo system that will last for generations — up to 30 years and more.

DIFFERENCES TO CONVENTIONAL SQUARE SILO SYSTEMS

- ❖ inside and outside is completely smooth;
- ❖ suitable for bulk solids with very poor flow characteristics, as the round silo effect resulting from 135° bevelled corners produces an octagonal cross section;
- ❖ mass flow ensures discharge in first-in first-out principle;
- ❖ optimal insulation; and
- ❖ more flexible than concrete silos.

Staying in control under your own roof

Bulk commodities are stored in flat warehouses and bunkers primarily to reduce the risks inherent to outdoor storage. Furthermore, this storage method facilitates ease of storage and movement of stock both factors limited by in bin storage. With ease of movement and storage comes the elevated risk of stock losses. If commodities stored in this manner are not effectively managed, the advantages of under-cover storage will be mitigated by the inevitable losses that will occur over extended storage periods.

To effectively manage bulk commodities stored in warehouses and bunkers a new kind of inventory management solution is required — one that is able to deliver volumes at the push of a button and allow for the balancing of book values to actual stock at the end each day. To achieve this level of control more than just hardware is required. Effective software is crucial. Ronin® provides such a solution in the guise of the Artemis®.

Artemis® is a multi-axis laser scanner coupled with Ronin®'s proprietary ART® software that is capable of accurately 3D surface mapping the contents of a warehouse or bunker as a single unit or in network with multiple units, dependent of the size of the storage area. Furthermore, the ART® software; developed over a decade of involvement in the bulk storage

industries, allows for the incorporation of content bounds and floor configurations, which further ensures that the stock you scan is the stock you have and therefore all volumes reported are highly accurate. This solution can be applied to any commodity in storage, regardless if it be mineral or organic. All stock information is recorded allowing for the periodical analysis of trends. Effective bulk commodity management is made possible with solutions like Artemis®.

Another related solution offered by Ronin® is its RDS on-board weighing system. This solution gives the user an enhanced level of control by reaching out beyond the boundaries of the storage area and extending control to the vehicles operating on site.

Ronin® RDS on-board weighing solutions allows each vehicle on the storage site as well as any in the production chain to not only register loads but also to report and record each load. The impact of this is multi-tiered and benefits range from elevated safety to increased productivity and effective asset management.

Incorporating these two Ronin® solutions into a management tool set means that complete control can be at the customer's finger tips 24/7 365 days a year. Not even a bucket load will go unnoticed.

Triodetic: 50 years and still going strong



Since the mid-1960s, US company Triodetic has been an internationally recognized designer and manufacturer of industrial applications to protect processing equipment and stored materials and to minimize dust problems and explosion risks. The company is currently celebrating 50 years in the enclosed storage market. For more details, please see 'Triodetic celebrates 50 years in business,' on p103 of this issue.

A Legacy of cost-effective fabric storage buildings for the bulk industry



Tension fabric buildings continue to grow more popular as a dependable and cost-effective solution for storage of dry bulk materials. The quality of fabric storage structures has come a long way in a relatively short time, thanks to a combination of subtle improvements and dramatic new strides in engineering.

SOLID VALUE

Legacy Building Solutions has set the tone in redefining fabric buildings, pioneering the use of solid frame engineering that utilizes structural steel I-beams in place of the hollow tube framing that has traditionally been used in fabric facilities. This improvement in engineering provides a more structurally sound solution, while offering economic savings that continue to benefit users for the entire life of the building.

A key element of structural steel design is the flexibility to customize building size to the exact width, length and height required, down to the inch. An added advantage of this design for bulk material storage applications is that the sidewalls are straight and overhead clearances tall, meaning that every square foot of floor space is usable. Additionally, where older design standards made it difficult or impossible to build large structures with wide clear spans, structural steel makes it easy to design and

construct such buildings.

This engineering approach also enables users to set up their buildings for maximum operational efficiency. Offset peaks, varying height columns, lean-to's and various size doors can be incorporated into the design to best account for daily storage, loading and unloading practices. Rigid frame buildings can also accommodate additional loads on the structure itself, such as commodity pressures on the sidewalls or overhead cranes and conveyors hung on the frame.

DEFEAT CORROSION

The initial investment in a Legacy fabric building is typically less than a comparable metal building, and when long-term maintenance costs are factored in, the total cost of ownership is much lower. A clear benefit of all tension fabric buildings, in contrast to metal structures, is the non-corrosive nature of the fabric itself. Fabric is simply more conducive to handling bulk storage of salt, fertilizer, minerals, chemicals and other corrosive materials.

By offering solid steel I-beams, Legacy takes corrosion resistance a step further than hollow tube frames, which are vulnerable to unseen moisture and rust originating inside the

tube and corroding from the inside out. Multiple coating options are available to protect the surface of the entire superstructure, with hot dip galvanizing providing a very effective protection in corrosive environments. Legacy also offers fabric liners for the interior of the building, an option that keeps the beams completely out of contact with corrosive elements.

FABRIC EFFICIENCY

The overall quality of architectural fabrics has advanced as well. Both polyethylene (PE) and polyvinyl chloride (PVC) cladding choices are available, and each continue to offer longer lifespans through the addition of thicker coatings



*The bulk storage facility
at the Port of Catoosa.*



and enhanced UV inhibitors. Fabric roofs also offer translucency as high as 12%, allowing natural sunlight to permeate the structure and effectively eliminate the need for artificial lighting during daytime hours.

The speed at which a fabric building can be designed, manufactured and erected is also significantly faster than metal buildings and other storage structures. Legacy employs in-house, professional installation crews to ensure proper building construction, which is usually completed in about one-third the time it takes to erect a similar metal structure.

Even when designed to be permanent, fabric storage structures are still inherently portable. So for dry cargo operations that need to relocate a building after a certain period of use in one location, fabric buildings are easily moved.

PORT OF CATOOSA — TULSA, OKLAHOMA USA

The Tulsa Port of Catoosa opened a bulk salt storage facility for the Oklahoma Department of Transportation (ODOT). Erected by Legacy Building Solutions, the massive tension fabric building

provides 50,000 tonnes of storage capacity for roadway de-icing salt, nearly doubling ODOT's total available storage across the state. After the general contractor completed the footings and floors, Legacy installed the building in just two weeks.

Salt from the building is distributed to maintenance sheds ahead of impending snow or ice events during the winter, according to Dewberry Engineers Inc., the primary engineer/architect for public improvements at the Port of Catoosa. Previously, salt was stored in the open and covered with tarps after being off-loaded from barges. The building now protects the salt supply from being compromised by wind and precipitation.

Measuring 203 feet wide by 400 feet long, the structure features 16-foot cast-in-place concrete walls and a solid frame roof design. A PVC tension fabric roof peaks to a height of 70 feet, and all of the building's steel components and hardware are hot dip galvanized. The structure is ventilated with mesh eaves and is designed to withstand winds of 90mph and snow loads of 20 pounds per square foot (PSF).

*Interior view of the
Catoosa facility.*



This facility, built for Ag Partners in Iowa, can store up to 32,000 tonnes of bulk dry fertilizer.



AG PARTNERS, LLC — ALBERT CITY, IOWA USA

Legacy was contracted to design, engineer and construct a large bulk fertilizer plant for Ag Partners, LLC in Albert City, Iowa. Measuring an impressive 120 by 420 feet with a peak height of 63 feet, the structure features 24-foot sidewalls comprised of 10-foot fabric sides sitting atop a 14-foot concrete wall. The building can store up to 32,000 tonnes of bulk dry fertilizer, which is distributed by rail and truck to retail and wholesale customers.

A previous fabric structure on the site had a hoop frame that had become unsafe due to severe rust issues. The new building has a durable rigid frame, and it was specially engineered to fit on the existing foundation of the previous structure and over an existing conveyor.

The building is fully lined to protect the structural steel from

fertilizer. The polyethylene tension fabric roof uses no winch straps or block to further protect the most vulnerable building components against corrosion. The structure is rated for 90 mph winds and 35 PSF ground snow.

Legacy has improved ventilation at the Ag Partners plant as well, thanks to mesh vents in the endwalls and mesh soffits and peak vents in the roof. While unloading potash cars shortly after the building opened, the ventilation system was found to significantly reduce dust concentration.

Legacy Building Solutions specializes in the innovative design, engineering and construction of fabric-covered buildings. Full construction project delivery spans from concept to completion, including renderings, foundation design, installation and project management.

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Finding the right partner for the job

BULK HANDLING

The Dan Store Terminal in Latvia handles and stores bulk materials such as wood pellets, feed and grain products. After an expansion, the storage capacity today is 90,000 tonnes, while it can handle over 1mt (million tonnes) of product.

For bulk material terminals with high loading and unloading capacity, high equipment reliability are critical preconditions for efficient handling and high turnover rates.

MULTI-PURPOSE TERMINAL

Dan Store is a multi-bulk terminal, strategically located in the centre of the Baltic Region in Liepaja, Latvia. It serves as an outlet for agricultural trade from Latvia, Lithuania, Russia, Kazakhstan, Ukraine and Belarus and handles wood pellets for renewable energy and is also one of the region's main import terminals for soyabean meal and malt barley.

LACHENMEIER MONSUN'S PRODUCTS INSTALLED AT THE DAN STORE BULK TERMINAL

Since around 50% of Latvia and vast areas in neighbouring countries as well as Russia are covered by forests, there is a great potential for increased wood pellet production and thus, room for expansion of the bulk handling of wood pellets, too.

With this in mind Copenhagen Merchants, majority owner of the Dan Store terminal, is looking to grow storage and handling capacity there. However, many factors need to be taken into consideration when embarking on such a project.

As Simon Rodian Christensen of Copenhagen Merchants explains: 'We knew from the very beginning that we needed a partner, not a supplier. A partner to us is someone who takes an

FACTS AND FIGURES

Supplies from Lachenmeier Monsun to Dan Store

Intake system:

Ship unloading: 600tph

Two railway intakes, 200tph and 500tph

Two truck intakes, both 500tph

Dust aspiration has been established to minimize dust problems when handling the product

Storage system:

Three flat storages: 2 x 30,000 tonnes and 1 x 6,000 tonnes

Six silos, each 4,000 tonnes

Flat stores with side and centre emptying system

Filling of silos:

Conveying capacity of 200tph

Discharge of silos:

Conveying capacity of 400tph

Filling of flat stores:

Conveying capacity of 400 respectively 500tph

Discharge of flat stores:

Conveying capacity of 400 respectively 1,000tph

Loading:

Ship loading 1,000tph with hopper scales and belt conveyor gallery

Railway loading 200tph



active part in the design phase and that calls for a certain knowhow in designing bulk handling terminals.'

In addition, Christensen says, its partner must be 'willing to find solutions when inevitable problems occur'. Lachenmeier Monsun, a designer and manufacturer of bulk handling solutions, met all of Copenhagen Merchants' requirements; it designed the bulk handling terminal, manufactured the conveying equipment and supervised the installation.

HEAVY DUTY CONVEYORS

Michael Isaack-Larsen from Lachenmeier Monsun, who was the responsible project manager for the Dan Store project, highlights that the handling of feed and grains differs to that of wood pellets due to the nature and structure of the two materials. Wood pellets, for example, are a hard material and thus the conveyors installed at the terminal must be designed to endure this.

"The chain wheel is designed specifically to handle wood pellets and prevent them from getting stuck in the chain, ensuring a safe and efficient operation," Isaack-Larsen comments. "And since there is high friction created from the pellets, it is critical to avoid this.

"Dust is also on the agenda and reducing this is always taken into account when designing conveying systems; it is a top priority when it comes to biomass handling," he adds.

SET FOR THE FUTURE

Following the expansion in 2011, Dan Store now has a storage capacity of 90,000 tonnes in bulk flat stores and silos. It also features conveyor belts for the reception and delivery of bulk cargoes and a direct railway connection with a handling capacity

of over 1mt of product per year. There are two railway pits with a total discharge capacity of 10,000 tonnes per day. The combination of flat stores and silos and the direct rail and truck access ensure elevated logistical flexibility for the customers.

The draught alongside the quay is 10.5m and can accommodate Panamax cargo vessels at first loading or second discharge port. Loading and unloading are carried out directly from terminal to vessel or vice versa, with a daily capacity of up to 24,000 tonnes.

PREPARING FOR THE FUTURE

With biomass fuels from by-products, wood and wood residues continuing to play an increasing role as a source of energy, Christian Ørskov Pedersen, sales director at Lachenmeier Monsun, acknowledges that this is, of course, affecting the industry.

"As a supplier to the industry we see how power plants are switching from coal-derived energy to wood pellets and waste wood to reduce their CO₂ impact," he says.

He concludes: "Bulk handling of wood differs from other materials and is not quite as free-flowing as grain, for example; it is coarser and more uneven. So we developed a chain conveyor suitable for the horizontal transportation of course pieces of woodchips, cut straw and other complex biomass products to ensure a trouble-free operation. This chain conveyor has a double chain system where the link chains are placed in a shielded rail system in the side of the casing. This prevents large, stray pieces of material getting trapped in the chain. Additionally, sharpened sprockets and special ploughs clean the chain in front of the sprocket to secure a smooth handling of the biomass raw material."

Temperature measurement and safety control in silos and flat storages

Improved and continuous monitoring during storage is essential, and this has been a goal of Agromatic since it started operations in 1979.

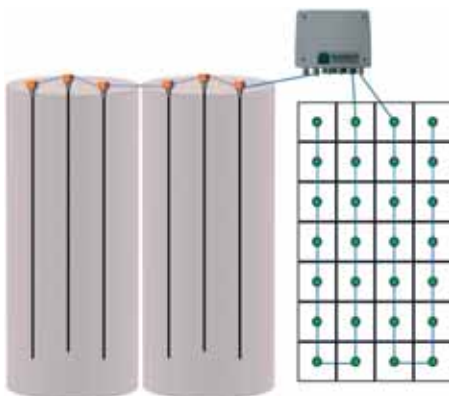
Managing grain in storage pays off. It is vital to enhance the quality of grain from production to processing. Therefore, the safety of grains has to be maintained at every stage, i.e., harvesting, storage, transportation, processing, and storage of processed food. Often the storage quality control is adversely affected, and product can suffer from:

- ❖ unattended temperature effects;
- ❖ operators/workers who ignore worst-case scenarios;
- ❖ lack of competence and management regulations; and
- ❖ the failure to meet regulations.

Today, the most important factor is to avoid personal injury. Therefore it is vital to prevent ignition of a potentially explosive atmosphere, and to

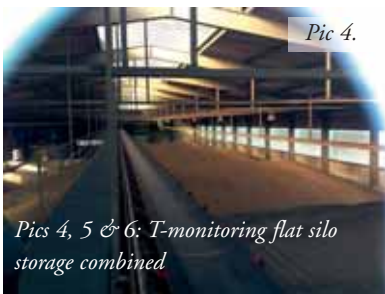
follow all equipment safety procedures during commissioning. All security requirements must be adhered to, complying with ATEX directives as well as international standards and the recommendations pertaining to insurance cover.

*Pics 2 & 3:
T-monitoring plans
Silo AG, Wil,
Switzerland.
Old silo: 18,000 to
134 cells; 20–425
cell sizes. New silo:
24,000 to 92 cells;
65–260 cell sizes.*



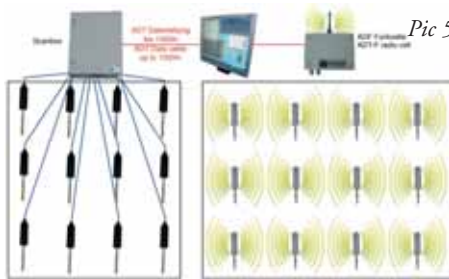
Pic 1: silo plant designed to move 3mt of wood pellets.





Pic 4.

Pics 4, 5 & 6: T-monitoring flat silo storage combined



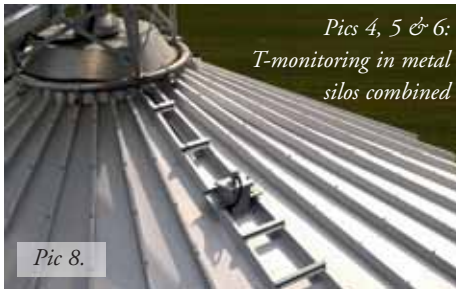
Pic 5.



Pic 6.



Pic 7.



Pic 8.

Pics 4, 5 & 6: T-monitoring in metal silos combined



Pic 9.

Agromatic has renewed certification for all silo temperature cables and control systems, achieving its new ATEX accreditation. The systems are versatile; they can be used in existing plants, in new plants or in plants with periphery expansion. Great

arrangements and to conserve the benefits achieved.

Monitoring over a long period and in very large plants is best carried out either by thermistor systems or, these days, by modern digital sensor technologies, one-wire installation.

Rod cable to protect temperature line is made of precious steel, can be up to 100m long and can contain a maximum of measurement points.

For extensions by flat warehouses, a wire-based installation is mostly impossible due to the loading and unloading of the storage facilities. Here the wireless spear probe system offers an elegant, convenient solution.

All combinations are possible. The new digital wired system, monitored by only one control unit is actually the most common and modular extendable.

Monitoring temperature in concrete silos using Agromatic state-of-the-art sensing technology minimizes installation costs at best performance and value. Combining temperature measurement with Agromatic's high-level monitoring detection systems reduces installation costs.

For data processing, several control systems are available and can be combined in modular construction according to the needs of the customer.

Independent control, or as a web connection, are both possible — modern systems offer all kinds of solutions.

Recording, storing and documenting measurements is possible, in accordance with requirements.

The SM2010 central control system archives the temperature measurement data on a computer, which can be displayed or printed to give instantaneous results.

Agromatic has continuously developed high-value temperature monitoring systems and equipment for plants worldwide. Its systems fully comply with all the latest ATEX guidelines 2014/34/EU, and all the necessary certification can be supplied.



Pic 10.



Pic 11.



Pic 12.



Pic 13.

Pics 10, 11, 12 & 13: T-monitoring in concrete silos combined.

importance has been placed on achieving the best possible cost:benefit ratio, to set a target for modular and efficient temperature monitoring systems, and to meet essential and strategic aims of any type of storage.

The choice of a system should be made based on various provisions and ensure long-lasting results over the years aimed at removing continuous interventions and costs. Further more they should facilitate effective monitoring considering all structural



Pic 14.



Pic 15.



Pic 16.

Pics 14,15 & 16: T-monitoring data processing.

Future proof solution for large scale coal silo

It is technically possible to design totally enclosed storage and handling systems for storing huge quantities of bulk solids to meet the high demand for energy and mineral resources. Over the past decade, configurations have not changed; however, storage capacities and infeed and outfeed rates have increased strongly, and operating flexibility has been optimized using advanced automatic control and monitoring systems.

For many reasons, organizations which handle and store large quantities of bulk solids like coal, petcoke, wood pellets etc. should care about environmental issues. Local pollution affects employees as well as nearby communities, and regulations are becoming ever more stringent. It is therefore important to find new creative and cost-efficient ways to manage and minimize environmental impacts. Following this approach, the additional investment for an enclosed storage facility can have a payback period within approximately the first ten years of operation.

Totally enclosed storage systems are made possible by the application of the Dutch Eurosilos® concept, which meets the requirements of Environmental Protection Agencies worldwide. The latest developments will be shown.

MAIN CONFIGURATIONS

Using covered storage for bulk commodities prevents contamination of surrounding land by dust from outside stockpiles, or polluted drain water; it also prevents deterioration of material caused by weather conditions such as frost, wind and rain. This is important to maintain quality standards; it also means that there is no need to remove excess moisture at a later stage. There are three main enclosed storage categories for bulk product:

- ❖ **silo storage:** bottom discharge type or flat bottom mammoth silo;
- ❖ **longitudinal A-frame type storage shed** (covered stockpile); and
- ❖ **circular (dome) type storage,** (covered circular stockpile);

ADVANTAGES OF THE EUROSILO SYSTEM

In India, for example, coal based projects represent about 59% of

the country's total installed power generation capacity and this percentage is set to grow. Outdoor coal stockpiles are rife with problems, including the high use of water with some dust suppression systems. Minimizing the consumption of water and energy is the need of the hour, and Eurosilos is an ideal solution.

Eurosilos can be a very economical approach, and its small footprint is particularly important where land is at a premium.

OLD SAYINGS PERSIST

Coal has been a fuel for the power industry for many decades or even centuries, and some of the old sayings still persist. However, it is important to realize that some of these are just plain wrong. Eurosilos challenges a few preconceptions:

- ❖ **do not pile coal too high:** though some thought spontaneous combustion increased with the storage height, the contrary is true; the higher the coal is stored, the more compacted it will become especially in the lower layers which eliminates the oxygen and thus the risk of oxidation. In recent decades coal silos have been built successfully with storage levels of over 70.
- ❖ **first-in, last-out is not acceptable:** this is untrue. In sealed silos, coal does not degrade — the lower layers are well compacted and conserved so all the deteriorating factors are eliminated.
- ❖ **coal silos are 'black bombs':** not true. In the past, there have been accidents with silos, but today safety is ensured by installing gas detection systems.
- ❖ **coal silos are too expensive:** not true. Detailed life cycle analysis proves mammoth silos are an attractive option financially.

FIRE PREVENTION

Fire can be a hazard with coal storage. However, using the appropriate preventative measures is effective and eliminates risk. In India, for example, summers can reach temperatures of 50°C. Based on experience with the existing silo installations and IMO (International Maritime Organization) regulations for shipping coal, coal with temperatures under the 55°C can be stored in the



COMPARING STORAGE SYSTEMS

	Eurosilos	Circular (Dome) storage	Longitudinal (A-frame) storage
Footprint	The most compact system	2 x larger footprint	3 x larger footprint
Filling (infeed)	Minimal segregation by equalizing auger	Segregation	Segregation
Operation	Fully automated	Partly automated	Partly automated
Oxygen access	Limited	Severe	Severe
Nitrogen purging	Possible through bottom piping	Not possible	Not possible
Structure	Simple slip form	Complex concrete wall	Standard A-frame shed
Coal monitoring	Continuous monitoring by CO	Only by infrared	Only by infrared
Fuel Management	Fully automated	Partly automated	Partly automated
Dust emissions	NO	NO	NO
Percolation pollution	NO	NO	NO

silos without taking any additional safety measurements. As soon as this temperature is exceeded, the operator gets an alarm. Coal can still be stored in the Eurosilos system, with the use of intensified monitoring of the stored coal. If the temperature of the arriving coal exceeds 70°C, the coal should not be stored in the silos but should be conveyed directly to the boiler(s) or an emergency storage space.

Continuous monitoring of silos, using gas detectors which identify 'hot spots' makes the use of silos safe. A range of suppression measures can be taken to deal with hotspots when they occur, including purging the coal mass with nitrogen to drive the oxygen out. This system has proved to be very effective.

A water-gel system can also be employed, to cool down the heated coal on the (heat resistant) reclaim conveyor underneath the silo(s) a water spraying system is installed above the belt.

SELECTING THE BEST STORAGE SYSTEM FOR THE JOB

Complete lifetime costs must be taken into consideration when selecting the most cost-effective of the three main storage systems — silo, dome and open shed. Using the Environmental Management Accounting (EMA) method, which focuses on physical information including air emissions, risks of combustion etc., and factors in related costs and earnings, it has been shown that the investment in mammoth silos comes with a payback period of just 10 to 15 years.

LATEST DEVELOPMENTS

Over the past two decades, much experience has been gained with the operation of coal silos at several power plants. The coal silos at the Tiefstack power plant have been in operation since 1996.

Depending on the degree of self-heating, several fire protection measures have been applied successfully to slow down the oxidation process or to convey the coal to the day bunkers at the boiler house. The main objective is to achieve a maximum availability and a minimal downtime of the coal handling system.

Over the last decades more than 120 Eurosilos have been built all over the world, ranging from 1,000m³ up to 100,000m³ of storage capacity. The Eurosilos storage system in Lünen (2 x 100,000m³) has been in operation for two years. The infeed capacity is 2,000tph (tonnes per hour) and the outfeed offers a maximum of 1,000tph, which can be reduced to 200tph for blending purposes.

SILLO STRUCTURE

The Eurosilos system for coal storage consists of a concrete slip-formed silo shell, ranging from 30m up to 70m in diameter. The storage height varies from 30m up to 50m, depending on the soil

conditions. The silo building is erected on a concrete foundation including a concrete reclaim tunnel and is covered by a structural steel roof. The roof gallery houses the in-feed conveyor. The bulk solid is transferred into the silo through the transfer chute at the end of this infeed conveyor.

FILLING AND RECLAIMING PROCEDURE

The coal is fed from the top of the silo into a telescopic chute through which it reaches the auger frame on the coal surface. Two main parallel screw conveyors distribute the material over the entire area of the silo, layer by layer, while the auger frame rotates. Reclaiming is done by withdrawing coal from the bottom and by inducing central gravity flow. The screw conveyors then rotate in reverse to feed coal into the formed core flow.

FUEL MANAGEMENT SYSTEM (FMS)

The FMS supports power plant operators with a supply planning and coal silo visualization for silos which store several grades of coal. The FMS solution is fully integrated with the silo automatization technology. The FMS software package makes it possible to plan and control the composition of the silo contents. The visualization provides detail information on coal quality grades and their distribution within the silo. The information can be used to plan ahead based on supply scheduling or to adjust the burning process based on detailed information on present and future fuel input from the silo. This data on the coal flow allows the plant operator to achieve an optimal fuel consumption related to the generating unit performance.

BLENDED OF DOMESTIC AND IMPORTED COAL

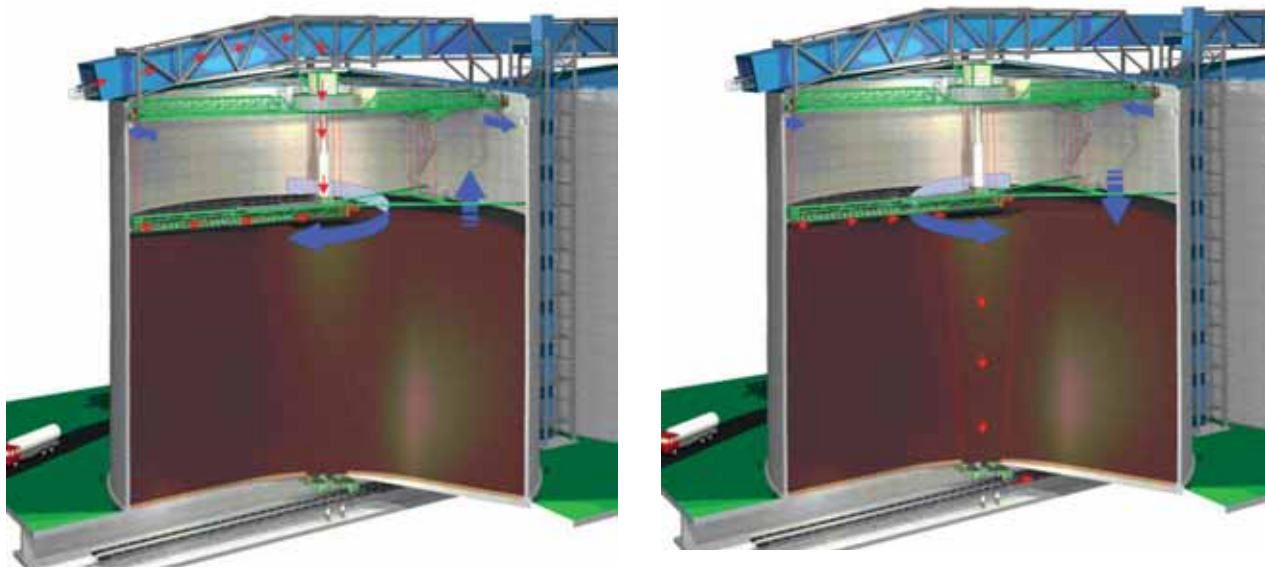
Coal handling plant is considered the lifeline of a coal-fired power plant. The coal handling facility must be flexible, reliable and capable of handling larger quantities of coal in less time. Due to shortage of domestic coal in India, the Government of India has allowed power plants to directly import coal to meet their requirements but the Central Electricity Authority (CEA) had issued an advisory that all new coal based thermal power plants should have provision for coal blending facility for blending domestic and imported coal in the ratio of 70:30.

To achieve such a blend different types of coal can be stored in individual Eurosilos. By adjusting the discharge ratio from each silo a blend by proportioning on the out feed belt conveyor can be achieved. The blending ratio can be adjusted, according to the actual demands by the power plant. The actual blending process is monitored by the FMS System.

RESIDUE STORAGE

The Eurosilos system also offers a reliable system for storing

Eurosilos: filling (left) and reclaiming (right) operations



non-free-flowing bulk materials such as FGD gypsum, fly ash and limestone. In order to eliminate block ups caused by the poor flow properties of these materials, a slotted central column was designed for uncomplicated reclaiming. The material is fed through the slots formed by the horizontal flat rings, and descend freely down the column. The FGD gypsum silos are also

equipped with drainage system on the bottom to avoid a sticky layer in the lower regions of the silo.

By enabling the Eurosilos for the storage of these product the space utilization is maximized. This is especially so for the FGD system where the dewatering station can be put on top of the storage section and the load out station underneath.

DCI



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Stockpile cover expert celebrates 50 years

Triodetic is now growing faster than ever

Triodetic completed this set of three domes in 2008. The Canadian flag on the centre dome is the world's largest, and can even be seen from space.



Triodetic, based in Arnprior, Ontario, in Canada, designs, manufactures and builds:

- ❖ architectural building roofs, walls and entrances;
- ❖ ore stockpile enclosures and tank roofs;
- ❖ interior and exterior displays and features;
- ❖ special applications: waterslides, tensile fabric;
- ❖ structures, golf bridges, foundations, towers, solar; and
- ❖ frames, radar platforms etc.

In 2015, the company is celebrating an astonishing 50 years in business. It owes its success to an innovative jointing system and advanced engineering for tubular structures that allow:

- ❖ any structure, shape, span and loading;
- ❖ optimized minimum mass design;
- ❖ durable materials and finishes (galvanized and stainless steel,

aluminium, composites, and factory-applied finishes); and

- ❖ fast delivery and construction in any location

Throughout its 50 years, Triodetic has been recognized internationally for its expertise in design and construction of space-frames, domes, shell and free-form structures with all products compliant with sustainable building requirements. Triodetic is credited with numerous industry awards and many landmark projects throughout North America, Caribbean, South America, Europe, Africa, Australia & the Pacific, China and the Middle East.

THE TRIODETIC STRUCTURAL SYSTEM

Company profile

Since the 1960s, Triodetic has been an internationally recognized





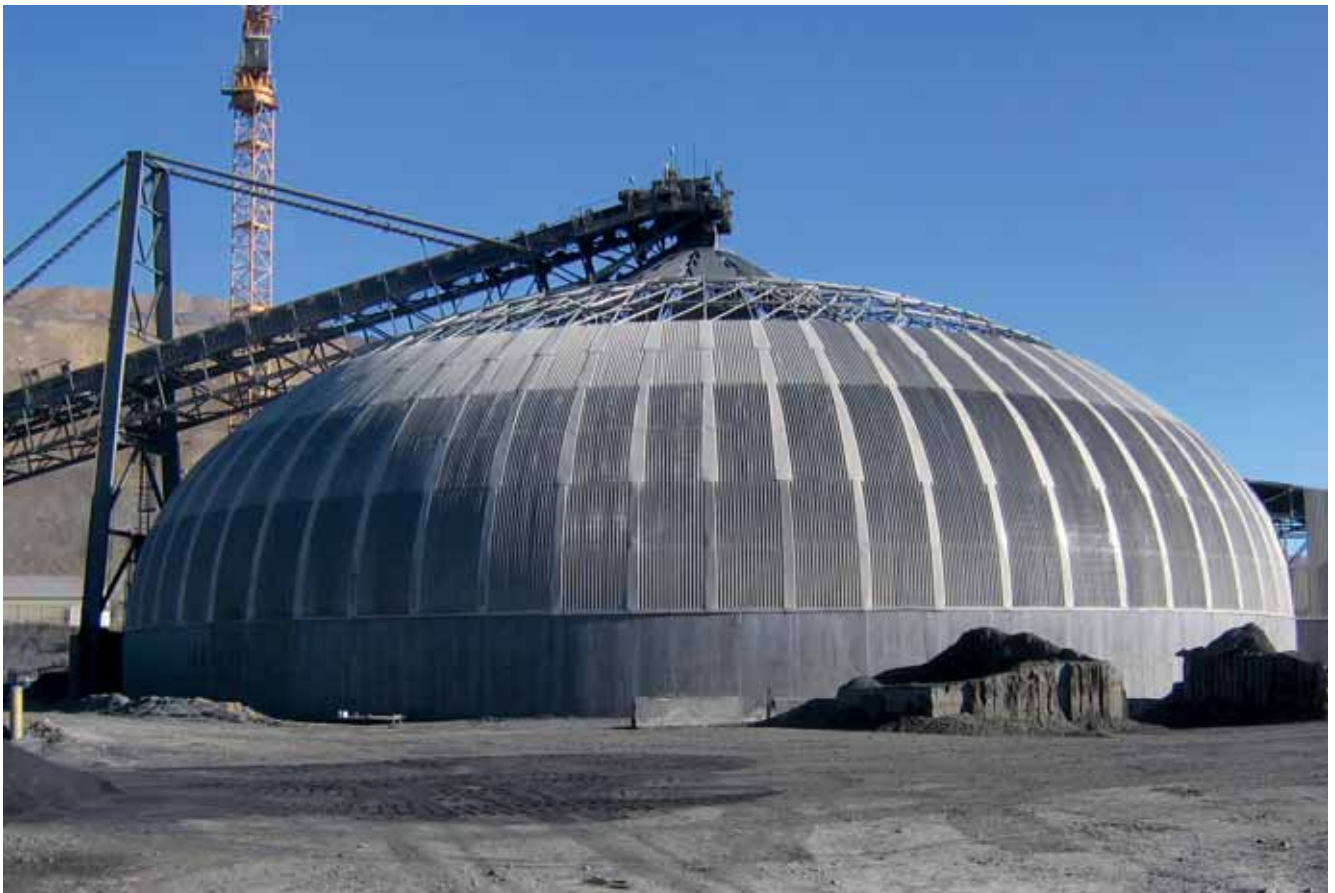
supplier of space frames, geodesic domes, shells, and free-form structures. Triodetic holds numerous patents and trademarks for its technology and all products are supplied in compliance with sustainable building initiatives.

All Triodetic activities are performed in compliance with OSHA (Occupational Safety and Health Administration) requirements and ISO quality management principles.

Triodetic maintains exacting engineering standards and talented management to consistently ensure the design, construction and service requirements of each structure.



One major advantage of Triodetic domes is that they can be built around existing stockpiles, so there is no need to interrupt operations during construction.



Leader in bulk storage solutions for over 50 years

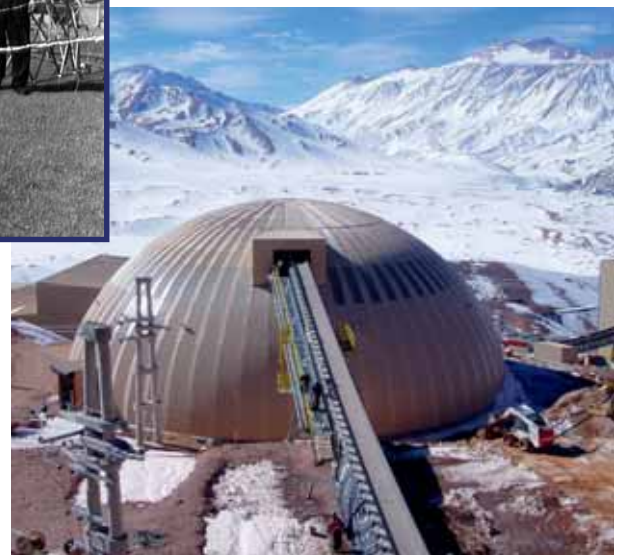
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Barrel Vault



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A SELECTION OF TRIODETIC'S NOTABLE CONTRACTS

Highland Valley Copper	Galvanized steel dome 110m
Highland Valley Copper	Galvanized steel dome 110m
Highland Valley Copper	Galvanized steel dome 110m
Colonsay part one	Stainless Steel Dome 90m
Toquepala Mine — Peru Phase 1	Galvanized steel dome 110m
Toquepala Mine — Peru Phase 2	Galvanized steel dome 72m
Andacollo Dome	Galvanized steel dome 97m
Agrium Dome, Kapuskasing ON	Galvanized steel dome 45m
Bell Creek — Lakeshore Gold	Ore storage dome 55m
Veladaro	Galvanized steel dome 57m
Aginco-Eagle-Goldex	Val d'Or stockpile 62m
Triodetic Space Frames	Barrick Goldstrike
Hatch	Meadowbank Gold 62m
PCS Saskatchewan	Stainless steel dome — Rocanville 55m
Puerto Barquito Dome	One 30m-diameter steel dome structure
Escondida End Wall	Galvanized steel space frame complete with cladding
Pueblo Veijo	2 domes — limestone bin covers
St. Jude's Cathedral	30 MN architectural 'igloo' dome
Egypt Planetarium	30 MN architectural dome

Triodetic offers great expertise and experience in design, manufacture and construction of framing, cladding and glazing for:

- ❖ architectural roofs, walls and entrances;
- ❖ interior and exterior displays and features;
- ❖ special applications: towers, foundations, solar frames, radar platforms etc.; and
- ❖ ore stockpile enclosures and tank roofs.

ENVIRONMENTAL BENEFITS

Triodetic recognizes the value and importance of sustainable building design. Its commitment to the community where it operates and those where its structures are built and used is demonstrated in its design, fabrication processes, products supplied and installation techniques employed.

The following summary identifies the environmental advantages offered by Triodetic technology:

- ❖ 60–90% recycled raw materials and 100% recycling of scrap and waste;
- ❖ up to 60% less material consumption through advanced structural design;
- ❖ reduced energy consumption in fabrication;
- ❖ non-polluting fabrication;
- ❖ up to 50% reduction in freight;
- ❖ reduced project duration;
- ❖ minimal disruption to building site;
- ❖ work provided for local unemployed;
- ❖ reduced site hazards;
- ❖ no site painting; and
- ❖ 100% product re-use.

STRUCTURE GEOMETRY

Every Triodetic frame is custom-designed. Frame modules can be any size.

In many instances cost savings can be achieved through the intelligent use of curvature in building elements and Triodetic takes advantage of this.

The Triodetic joint is ideal for accommodating complex geometry, curvature, uneven support spacing and non-uniform loads, without price premium. The company develops the most efficient frame geometry for each application so that the resulting structure has the least mass.

Triodetic strives to ensure every structure meets the design intent both aesthetically and structurally and reference to its project history will attest how well these designs stand the test of time. Round steel or aluminium tubes are the most common sections used in the Triodetic system. Other sections and materials can be used. In either case, the Triodetic joint offers a streamlined joint that is simple to construct and is readily reconfigured to implement future modifications or alternate use.

FINISHES

Triodetic provides alternative factory-applied finishes which offer better durability as a result of greater control of cleaning, pre-treatment and surface preparation prior to the electrostatic application and baking processes.

Galvanized

- ❖ steel tubes are rolled from hot dip galvanized (ASTM A525-65T) strip with the seam re-metallized after welding to ensure a uniform final coating;
- ❖ the finished product is provided with a chromate conversion coating and an additional lacquer sealing coat; and
- ❖ this pregalvanized product outperforms conventional galvanized coatings by 200% as measured by salt spray testing.

Acrylic, polyester or polyurethane base baked enamel

- ❖ these products offer a wide colour choice and can be applied to steel or aluminium; and
- ❖ special acrylic-urethane finishes using high-build epoxy base coatings are also available.

PPG Duranar (fluoropolymer or 'Kynar 500' coatings)

- ❖ this premium paint finish can be applied to both steel and aluminium. PPG provides colour charts.

Powdercoat

- ❖ factory powder coating is most commonly specified because it provides excellent performance at reasonable cost. Polyester and polyurethane based powder coatings provide exceptionally uniform and durable finish over galvanized steel or aluminium.



Anodizing

- ❖ aluminium structures can be provided with anodized finish, including buffed, textured and polished (mirror) finishes. Anodized finishes are available in clear, gold, light, medium and dark bronze, and black.

Chrome Plating

- ❖ chrome plating can be provided on steel tube components and used in conjunction with polished anodized aluminium connectors. This finish is primarily for indoor decorative applications.



DECKING & GLAZING

All types of cladding and glazing have been used over Triodetic framing, and are listed below in order of relative installed cost.

- ❖ galvanized steel, galvalume;
- ❖ galvanized and painted steel, anodized aluminium, painted aluminium, fibreglass;
- ❖ copper, stainless steel, wood, tensile fabrics;
- ❖ acrylic, polycarbonate; and
- ❖ laminated and tempered glass/
Triodetic develops cladding drawings and will supply all materials for complex shapes.



CONSTRUCTION

Experienced and reliable single-source Triodetic's objective in every project is to perform the functions that best serve the needs of the project manager and owner.

Triodetic can contract to supply and install all frame/decking/glazing, or the frame only, with or without purlins. It also provides supervision when others install its product. For more complex structure geometries, Triodetic prefers to oversee decking/glazing to ensure the work is preformed correctly.

Triodetic has successfully completed thousands of installations in a wide variety of environments. Its experience in design, manufacture and construction has allowed it to refine its methods and techniques, so that all stages of the project progress correctly and expediently. The company works closely with speciality suppliers (e.g. glazing, tensile fabric) to ensure the final installation is completed as specified.

SAFETY

Triodetic's vigilance in ensuring a safe working environment is illustrated by an unblemished OSHA record over decades of projects in many varied locations around the world.

Properly trained personnel follow safe and proven construction methods. In-place assembly is achieved using man-lifts or scaffolding with every worker properly tethered and no component exceeding their lifting capability. Wherever possible, ground-level pre-assembly allows the structure, to be crane-lifted into final position, thereby minimizing hazards to other trades.

SIMPLICITY AND ASSEMBLY GUIDANCE

Triodetic structure assembly requires only simple hand tools and unskilled labour. All components are pre-fabricated, factory coated and supplied as a kit. Each item has a unique identifying mark and a single bolt completes the connection of all members at each node. Triodetic can provide experienced supervision or complete project management if needed.

OPTIMUM PROGRAMME FOR EACH PROJECT

Triodetic will propose the most realistic construction programme based on site conditions such as access, lay-down space, ground condition, equipment availability, and concurrent site work. Project acceleration sometimes is possible by increasing crew size or altering the pre-assembly/lifting sequence. In cases of poor weather or unavailability of cranes, frame construction can continue as remote sub-assemblies by hand.

Triodetic demonstrated its expertise in the winter of 2008. One of the company's major customers was in a dilemma. Not only did it need three existing massive stockpiles covered, but it

also wanted the required domes completed in 18 months' time before the start of the 2008 Olympics. Why was this date important? Because the client, knowing that Triodetic also has an extensive architectural background, wanted these domes covered in the world's largest flag — a flag that could be seen by the flights of foreign visitors coming on for the Olympics (see picture on p103).

Utilizing a number of the proprietary software packages that Triodetic had developed for its architectural customers, Triodetic was able to map out the complex shapes required and send the files to its state-of-the-art laser cutter that was then able to accurately cut the more than 500 sheets of metal required to complete the massive salute to that country's flag.

ENGINEERING AND DESIGN

The structural capabilities of the Triodetic framing system have been established over a number of decades by extensive research and testing. As new materials and technologies evolve, independent full-scale testing continues to be the basis of the design limits adhered to when we design for each application and location.

Triodetic expends a substantial portion of its income yearly to perform research and development of building products and manufacturing processes. Landmark achievements include a number of world-firsts in architectural and industrial applications that accommodate abnormal loads, unusual geometry, and extreme corrosive environments.

All designs are performed and reviewed by Triodetic's experienced professional engineers in accordance with all building codes and standards appropriate to each project. Triodetic uses a suite of analysis programs, refined in-house for every conceivable structure geometry and loading condition. As experts in geometric and structural design of metal frame structures and cladding, Triodetic can provide rapid response to enquiries and with the benefit of decades of experience in which solutions and details work best for each application. Triodetic provides an engineer's stamp from professionals registered in each region for every project.

Triodetic complies with ISO quality management principles and practices. All materials are sourced from approved suppliers, all production is completed and checked by trained operators, and all welding is performed and reviewed by certified welding engineers and inspectors. When required, Triodetic engineers are available to meet with clients at any stage of design or construction to address technical questions or project co-ordination.



From Pit to Port

ThyssenKrupp Industrial Solutions delivers the goods



Circular stacker in operation.

THYSSENKRUPP INDUSTRIAL SOLUTIONS DELIVERS END-TO-END BULK MATERIALS HANDLING AND MINERALS PROCESSING SOLUTIONS, FROM PIT TO PORT, ON THE AFRICAN CONTINENT.

As an OEM developer and supplier of bulk materials handling equipment and system solutions to South and Southern Africa since 1959, the ThyssenKrupp Industrial Solutions comprehensive range of bulk materials handling equipment includes excavators, crushers, feeders, conveyors, stackers, reclaimers, transfer cars, as well as train and shiploading and unloading systems.

“From extraction at pit face to export at port side, we are positioned to offer best-in-class technology and system design for efficient bulk handling solutions,” says Sales Manager at ThyssenKrupp Resource Technologies – Materials Handling, Matthias Göing. “Whether new projects, plant upgrades, refurbishments or improvements, an operation is only sustainable if it is profitable,” continues Göing. “We fully comprehend the importance for customers to achieve maximum efficiencies through optimum production while keeping input and

operational costs to an absolute minimum. Large capital investments made on equipment have to be weighed against operational efficiency and productivity to achieve profitability. So we do not just supply equipment. We look at the operation holistically, from an in-depth analysis of the customer’s requirements to the design and development of the correct systems to optimize material quality, flow and capacities from pit excavation to shiploading.”

According to Carel van der Merwe, Deputy Managing Director, ThyssenKrupp Resource Technologies, correct equipment selection plays a crucial role. He points out that in order to ensure best equipment choice, numerous interrelated factors such as operation lifespan, mine yield, capacity requirements, material characteristics, blending requirements, equipment compatibility, etc. must first be taken into account. “To ensure that all these factors are dealt with to achieve maximum efficiencies demands extremely detailed planning and organization. This does not commence at the pit face as one might think, but at the end of the process i.e. working backwards from port side to pit side,” continues Van der Merwe and

explains, “The material quality required by the end-user, the shiploading capacities demanded by the port as well as the size and loading requirements of individual ships must all be factored in. Multiple factors along each step in the process must also be analysed to ensure best-fit equipment selection.” Van der Merwe adds that during equipment selection one must bear in mind that a mine is not static but is constantly evolving. “As the seam progresses, it moves further away so the equipment must also be able to handle these changing dynamics to ensure continued efficiencies.”

Van der Merwe says material types play a crucial role when selecting suitable equipment for the first step in the process i.e. material excavation at the pit face. “Hydraulic excavators are recommended for selective material excavation and compact mining applications while the higher production efficiencies offered by bucket wheel excavators make them the preferred choice for larger mines.”



Jaw crusher.

“Next comes the choice of transport systems required to move the extracted material to run-of-mine [ROM] crushing stations. Mine life and mine planning determine transport system decisions,” continues Van der Merwe. “While shiftable and extendable conveyors significantly reduce operating costs, they are less flexible and more costly. Mobile conveyors are ideal where more flexibility is required, but the capital costs are higher. For large operations and long distance materials handling, fixed overland conveyors provide the best solution in terms of both capital and operating costs, but limited flexibility is the compromise. In some mining applications such as continuous block mining and where mine life is ten years plus, equipment combinations such as shiftable and extendable conveyors, coupled with fixed overland conveyors to handle the longer distances, will deliver high production and low operational costs.”

Upon reaching the crushing



Crusher plant.

stations, the material is fed into the crushers by feeders at a controlled flow for processing. Best feeder unit choice depends on material composition and required throughput. ThyssenKrupp Industrial Solutions’ feeder range includes reciprocating plate or push feeders (ideal for large lump sizes and low capacities); grizzly screens (best suited to higher capacities but unsuitable for sticky material) and apron feeders (controlled and continuous feed at high capacities and suitable for feeding very large lumps).

“We also supply a wobbler feeder, which, like the grizzly, combines feeding and screening, but it can handle sticky, moist material at medium to high capacities,” notes Van der Merwe.

Göing discusses the advantages of the various crushing equipment solutions. “We provide stationary or fixed crushing plants which are ideal for smaller operations; semi-mobile crushers which can move as the mine expands and finally, fully mobile options for large operations. The fully mobile plant travels behind excavators and, as they are loaded directly from the excavator and only then onto a truck or transport conveyor, the need for double handling is eliminated.”

Roll crushers or sizers are suitable for soft to medium/hard material at high capacities. Jaw, gyratory and jaw-gyratory crushers are ideal solutions for hard materials with large in-feed sizes, large reduction ratios and at medium to high capacities. “We offer a high capacity jaw-gyratory crusher that operates on a progressive crushing principle for handling hard material and very large in-feed sizes. These are similar to gyratory crushers, but with a flared inlet geometry for handling of larger lumps. Göing describes mobile crushers, also available from ThyssenKrupp Industrial Solutions, “as basically travelling hoppers incorporated with crushers designed to reduce coke to a size to facilitate transport to a stockpile or shiploader.”

Three different stockpiles are required between the mine and the port and the selection of suitable stockyard equipment i.e. stackers and reclaimers, is closely associated with the specific

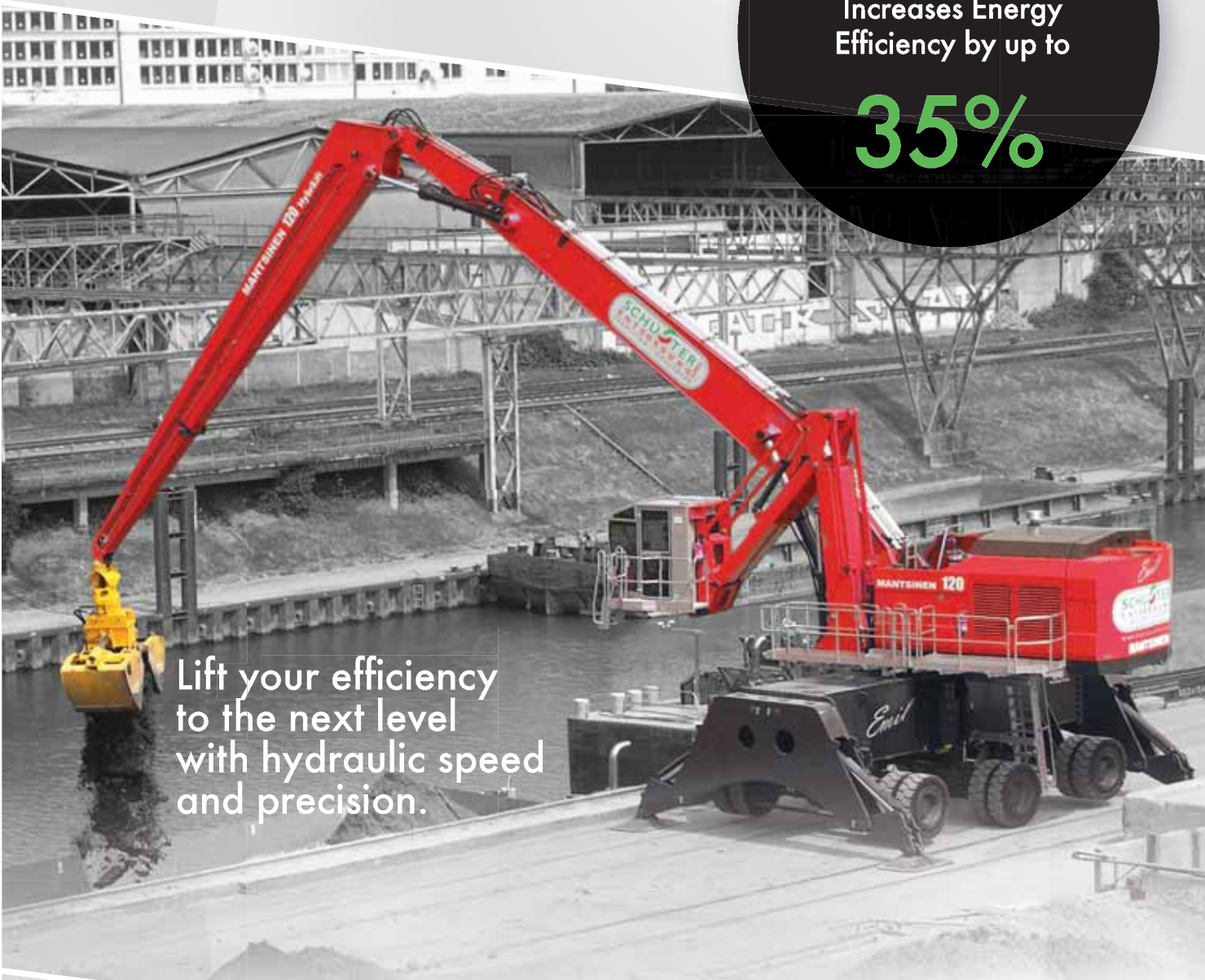


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purpose of the stockpile i.e. storage, buffer stocks or blending. Van der Merwe advises that the different stockpile types (longitudinal, circular, cone, bunker or kidney) must also be taken into consideration during equipment selection. "Again it is best to start at the shiploading process where consideration of port storage facilities, reclamation rates required to load the ships and delivery requirements for material from the mine will determine preferred equipment."

He further recommends to first select the reclaimer before considering the stacker and stacking method. "In addition to the already-mentioned stockyard type, other factors that determine reclaimer selection include lump sizes, material flowability, capacity (tonnes per hour), blending requirements, need for reclaimer to pass over adjacent stockpiles, etc." The wide range of reclaimers include drum, portal, bucket wheel, side arm scraper, bridge-type scraper, bridge-type bucket wheel and boom-type bucket wheel. "South Africa is the global ThyssenKrupp group's centre of excellence for drum reclaimers. While drum reclaimers cannot pass over stockpiles, they offer high capacities of up to 5,500 tonnes per hour, even output, excellent blending and suitability for free flowing, sticky or lumpy materials. For applications which require passing over of stockpiles, portal and side arm scrapers are recommended while bridge scrapers are preferred for better blending. Bridge bucket wheel reclaimers are more suitable for use with sticky materials and offer high, but fluctuating, capacities. For high capacity reclaiming tasks typical of those found at ports, we offer the boom type bucket wheel, which is suitable for all material types."

Stacker types include luffing, slewing, a slewing and luffing combination, wing, radial and circular. Van der Merwe says that blending is the dominant criterion for the selection of a reclaimer and stacker combination. The capacities and blending ratios of each stockpile from the pit to the port must be matched to ensure that all requirements right up to shiploading are met without any delays.

Drum reclaimer.



Discussing the company's train loading solutions, Van der Merwe says that high-capacity operations conduct train loading in motion. "The train travels at a slow speed underneath the loading station while weighed quantities of material are loaded according to each wagon's axle capacity. "We can also offer a less conventional loading solution that uses a conveyor with a tripper moving along the side of a stationary train, filling the wagons one by one. The most suitable unloading system is determined by the unloading capacity that is required. At the mine, a load out station must be selected that can meet the port's capacity requirements. At port side, there are several equipment options available for train unloading including bottom and side discharge wagons, side wagon tippers, end tippers, rotary and tandem rotary wagon tippers."

Moving to shiploading, Van der Merwe says that temporary shiploaders and container tippers can be used for low to medium requirements. "Dedicated systems are preferred for high-capacity loading. While construction of radial type shiploaders is more economical, they are only suitable for single berth quays and dedicated ship sizes. Luffing and travelling boom type shiploaders offer more flexibility as they can load differing ship size requirements. Luffing and slewing shiploaders add the ability to load ships on both sides of the quay."

As an engineering-driven company, ThyssenKrupp Industrial Solutions which comprises Resource Technologies (an amalgamation of ThyssenKrupp Materials Handling and Polysius) and Process Technologies (formerly Uhde), has the capabilities and know-how to support our sophisticated equipment and systems with turnkey delivery, audits, inspections, technical advice, maintenance, repair, spare parts and components backed by highly trained and qualified service engineers and technicians. "We form a long-term partnership with our customers, working closely with them to optimize plant efficiency so they can reap the benefits of lowest total cost of ownership and return on investments," concludes Van Der Merwe.

DCi

Shiploader.



One Source



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FLSMIDTH



In the black?

coal handling systems and technologies under scrutiny

FLSmidth stacker/reclaimer for stockyard storage and homogenization.



Louise Dodds-Ely

Coal – one of the largest minerals industry of the global mining industry

Coal still is and will, for many years, remain the largest mineral sector of the global mining industry in terms of the amount of coal and rock mined and processed. And, despite the continued environmental concern over the use of coal as a fuel for power generation, the overwhelming majority of the world's population still depends to some degree upon coal as an energy source.

FLSMIDTH'S UNIQUE COAL FLOWSHEET

In the past few years, coal has become the third-most important market for FLSmidth, after cement and copper. One of the reasons is that FLSmidth has a unique offering within the coal industry as the only supplier with a complete portfolio of the equipment needed in the coal handling and process flowsheet (see graphic on p116).

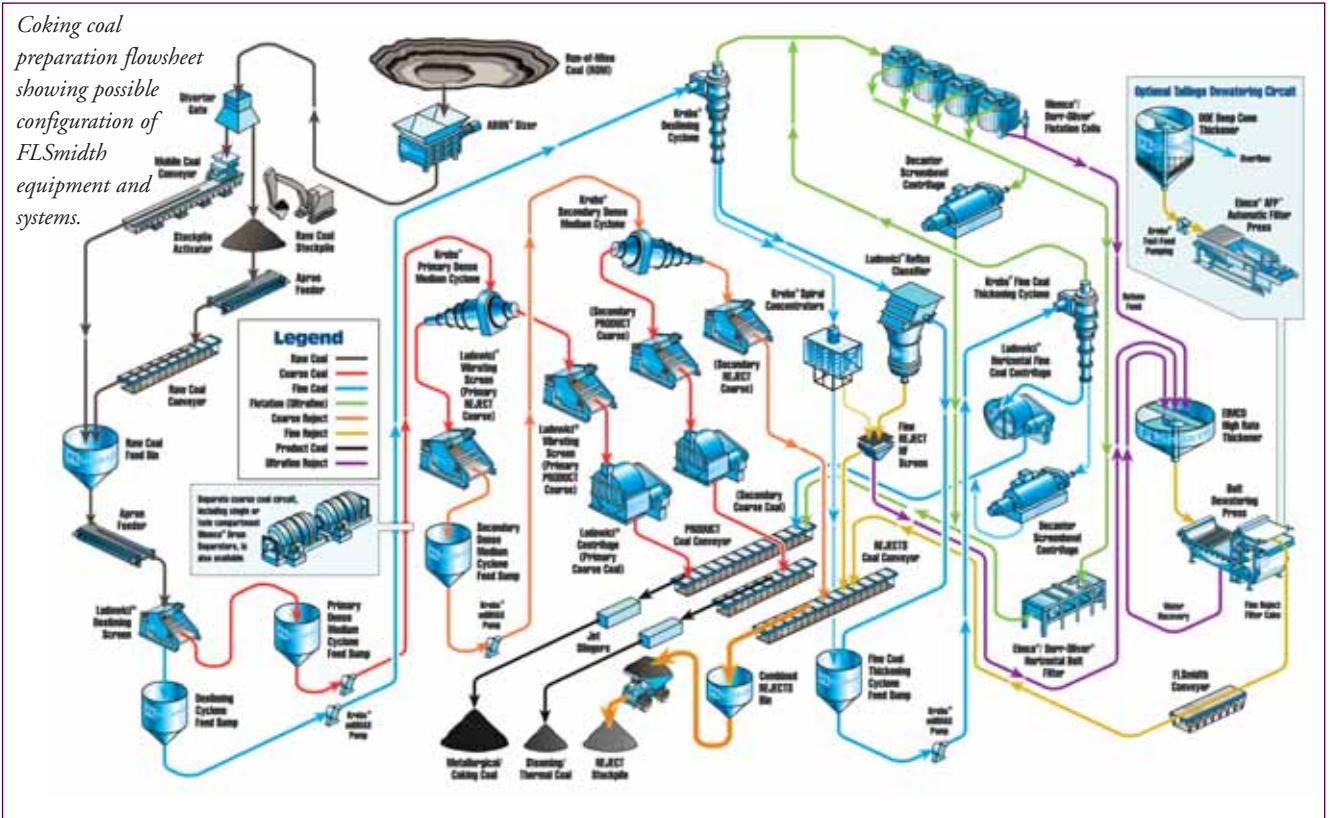
FLSmidth equipment moves coal from the mining process

over long distances; crushes, homogenizes and processes it to remove impurities; and then blends and dispatches it to road, rail or sea for transport. In addition, FLSmidth provides the equipment that can then unload those trucks, trains and ships.

FLSmidth can customize multiple product solutions through offering a range of mobile and fixed crushers, sizers for in-pit or out-of-pit applications, and fixed or mobile conveyors configurable to optimize any mine site.

In underground mines, its Buffalo™ feeder breakers collect the coal, which has been cut by mining machines, and reduces it in size to allow transport to the base of the shaft by conveyor. Here, the coal is elevated to the surface using a vertical conveyance system that is driven by a winding engine mounted on a large head-frame at the surface. The skips that carry the coal and rocks to the surface, and the cages that transport

Coking coal preparation flowsheet showing possible configuration of FLSmidth equipment and systems.



workers to and from the mine, are designed by the Canadian and South African FLSmidth offices. The South African FLSmidth team also designs and supplies the high-powered winding engines that lift the skips and cages.

In modern opencast mines, in-pit crushing and conveying (IPCC) systems are increasingly being used to move the rock and coal instead of the traditional truck and shovel methods. FLSmidth is a leading and reputable supplier of coal mine IPCC systems, which comprise products such as apron feeders,

FLSmidth ABON® mineral sizers, long overland conveyors, mobile conveyors, mobile stackers and Buffalo™ feeder breakers.

Once the overburden is removed, the coal can be accessed and is transported by conveyor from the mine to the processing facilities. Usually the processing and out loading systems for coal are located many kilometres from the mine and therefore reliable conveying systems are needed. FLSmidth not only supplies the well-known KOCH Pipe Conveyor® but also trough belt, overland, and in-plant conveyors for many coal handling

FLSmidth's Vecor mine hoist for underground mining operations.



applications, but also KOCH drag chain conveyor to transport any kind of bulk material. FLSmidth's overland and pipe conveying systems are able to follow the topography of the area with curves and bends to transport the coal efficiently over the long distances.

Prior to processing, the coal is stored and homogenized using FLSmidth's stacking and reclaiming machines. FLSmidth stockyard equipment is designed and manufactured to satisfy the requirements of high capacity plants, with stockpile volumes of up to one million m³ at rates of up to 16,000tph (tonnes per hour).

With a proven range of loading and unloading equipment for ships and barges, FLSmidth provides comprehensive solutions for both seaport and inland harbour handling facilities, including state-of-the-art safety and environmental devices. FLSmidth shiploaders are versatile units that can be tailored to any task using proven components. These units move on rails, and are provided with slewing, luffing and/or telescopic booms as required. They allow faster loading of ships of all sizes up to cape size vessels.

Throughout the process, FLSmidth can support complete quality control surveillance that includes automated sampling, online analysis and automated laboratory facilities.

FLSmidth's BulkExpert™ is a patented solution that complements conventional PLC controls in stacker-reclaimer, shiploader/unloader or train loader applications. This is the only system that uses 3D laser scanning and real-time kinematic GPS technology to provide complete stockyard terrain information. This new and state-of-the-art technology leads to higher equipment efficiency, reduced labour costs, and more homogenous flow rates.



In-pit crushing and conveying system provided by FLSmidth.

Almost all coal separation processes use water and consequently require a great deal of dewatering equipment as well. The combined technologies of Ludowici, Krebs, Dorr-Oliver, EIMCO and Decanter Machine cover the complete coal preparation process from screening, classification, flotation, centrifuging and thickening through filtration dewatering.

With both mineral processing and material handling technology FLSmidth is capable of offering a complete flowsheet solution.

PRESENTLY EXECUTED AND RECENTLY FINALIZED LARGE-SCALE COAL HANDLING PROJECTS

- ❖ supply of coal handling equipment for a power plant in Vietnam which includes various grab unloaders, portal scraper reclaimers, tripper cars and belt conveyors. The equipment will have an unloading capacity of 1,400tph and a reclaiming capacity of 1,200tph;
- ❖ in December 2014, two grab ship-unloaders and one

shiploader for a coal-fired power plant in Germany were commissioned;

- ❖ out-of-pit crushing and conveying project in Indonesia was recently completed; and

- ❖ crushing plant, in-plant and stockyard conveyors for a coal mine in Mozambique

CUSTOMER SERVICE

FLSmidth customers receive more than just reliable and high-quality capital equipment. Its world-class aftermarket support is customized to each customer's needs and expectations.



Two FLSmidth grab ship unloaders.

Blug grabs – 50 years of handling experience

Credeblug is heavily involved in the dry cargo handling equipment industry; examples of its grabs are working successfully in over 52 countries, where the Blug name has become synonymous with quality.

Over the last few years, the company has completed an international expansion, achieving a staggering 80% increase in international turnover in 2014. Blug's products range in capacity

from 50 litres to 150 tonnes, and the company is one of the few manufacturers in the world that offers a quality rope-operated, hydraulic and electro-hydraulic or motor grab catalogue. The year 2015 will be an important one for the company due to its 50th anniversary celebration.

The company's history dates back to 1965, when its main focus was on special products for the steel industry. From the

Picture 1.



very beginning, Blug's equipment has been highly specialized and manufactured to a high quality, and focused on the handling industry, which is today a core business for Credeblug.

With a strong position in the port handling sector, Blug's equipment is used increasingly often in bulk handling applications where reliability is a key factor, helping Blug to maintain its strong market reputation.

COAL HANDLING APPLICATIONS

Coal represents major volumes in bulk port applications. Historically, it has been one of the 'star commodities' often handled by grabs. Therefore, grab solutions have continuously evolved and specialized to improve loading cycles for this material.

Based on a 0.8–0.9t/m³ average density, Blug's range for coal handling offers a wide variety of options depending

on the crane and capacity requirements. The key factor to obtain a fast return on investment for this kind of application is to optimize a grab's capacity/self weight ratio and offer the highest lifetime versus purchase, start-up and maintenance costs.

Credeblug has been continuously adapting and developing its rope-operated product range to progress on loading capacities and environmental impact. One of the aspects that has been specially developed during the last years has been the ecologically friendly grab range. Due to pollution that bulk material loading can produce in the environment, Blug products include dust-proof closed valves structure (see image of a closed valve structure in Picture 1).

The C4, CV2 and CM4 grabs are the most representative models of Blug clamshell grabs for coal and bulk handling applications.

COMPANY EXPANSION

Following the expansion and product developments of the Credeblug company, its customer portfolio has included during 2014 some of the principal European crane manufacturers as crane/grab perfect combination is one of the key aspects to be considered for the profitability of any shipping contract. In 2014, the port cargo handling business has represented the biggest income within company's portfolio (see different examples in Picture 2) and the incoming deliveries for the first quarter of this year represent the best figures in the company's history so far.

These orders' figures show the market tendency and Blug products' market reference position for the biggest lifecycle value solutions. Fifty years of experience, in addition to continuous product development, makes Blug a very competitive option that offers a step forward in the grab business.



Picture 2.

don't play with your cargo

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Liebherr mobile harbour cranes set all-time record

Liebherr mobile harbour cranes have set the benchmark in terms of annual deliveries, supplying more cranes per year than any other manufacturer has ever delivered before. A staggering 112 units were supplied to the six continents in 2014, many of which are currently in use handling coal.

The year 2014 was one of celebration for many reasons. Exactly 40 years after the delivery of the first Liebherr mobile harbour crane (LHM), these advanced machines are more in demand than ever before.

“For a fantastic year like 2014 several factors have to come together. We started with a record order backlog into the year. Throughout the year demand for our state-of-the-art cargo handling solution was very stable on a high level. Moreover, large orders helped to significantly increase the population of Liebherr mobile harbour cranes. Finally, we broke the existing record by nearly 10%, which is amazing considering the economic environment,” said Matthias Mungenast, sales director for Liebherr mobile harbour cranes.

MAJOR ORDER FROM ALGERIA

One highlight in 2014 was the large order from Algeria, Africa. A purchasing association of Algerian port operators opted for 20 Liebherr mobile harbour cranes. The mobile harbour cranes were delivered to seven destinations at the Algerian coast. The tasks of this impressive and highly efficient mobile harbour crane fleet include the handling of general cargo, dry bulk operation and container handling.

Liebherr mobile harbour cranes have a long tradition in Algeria, with the first units delivered almost 20 years ago. Thanks to this major mobile harbour crane order, the total number of LHMs delivered to Algeria nearly doubled and jumped to 43.

SMARTGRIP® — THE EVOLUTION OF BULK HANDLING

In June 2014, Liebherr introduced a new technology for even more productivity in bulk handling. SmartGrip® operates as an intelligent system which optimizes grab filling rates in a self-learning manner. There are many factors why the grab is not operated at full capacity, including suboptimal grabbing angle and varying material density. SmartGrip® automatically optimizes filling to maximum capability taking grab size and outreach into account. Right from the second load cycle, SmartGrip® ensures that the grab filling rate is above average. This unique technology provides a number of valuable advantages, including higher performance, zero overloads and less stress for crane drivers. Operators of older Liebherr machines can equip their existing cranes with this unique feature for more bulk turnover and the installation of SmartGrip® is fast and easy.

SALES REVIEW

In 2014, exactly 112 units were supplied across the globe. In other words, throughout the year, almost every third day a new



Two LPS 600s equipped with SmartGrip in Poland.

Liebherr mobile harbour crane unit was delivered. This is the highest number of annual deliveries ever achieved by a mobile harbour crane manufacturer and clearly tops Liebherr Maritime Cranes' old record when 102 units were supplied in 2008.

The LHM 550 was the most successful model of the year. In 2014, 35 units were shipped to customers worldwide. Five of these are portal solutions.

The LHM 280 also experienced a jump in demand in 2014, with 23 units sold to eight countries. This is more than double compared to 2013. One reason for this positive development is that this model was the favourite choice in before-mentioned major order from Algeria.

A geographical breakdown shows that Europe (including Russia) is again the main region for mobile harbour cranes. In total, 42 units were supplied to this area, which is nearly 38% of all deliveries in 2014. Second is the African market, where 33 units (almost 30%) started operation last year. Thus, the annual number of units supplied to Africa has tripled, compared with 2013. Customers in Latin America opted for 14 units in 2014, which equates to nearly 13% and is exactly the same amount as for Asia. Further deliveries to the Middle East, North America and Oceania complete the picture.

SALES OUTLOOK

Particularly the strong expansion in iron ore, coal and other major bulks drove seaborne trade, which grew an estimated 4.2% in 2014. The importance of bulk handling as an application is reflected by the fact that almost two thirds of all 2014 mobile harbour crane deliveries are used for bulk operation, either bulk only or in combination with container and general cargo handling. For 2015, strong growth of 5.3% is forecast in terms of world merchandise trade, which also is a positive signal for shipping.

The LHM order backlog for 2015 is in line with this positive forecast and is one of the highest ever. Throughout the world, the demand for Liebherr mobile harbour cranes and their innovative features is on a very high level. For that reason, Liebherr is optimistic that 2015 will be another great year for its mobile harbour cranes.

dbd global dust control systems helps keep coal clean and safe



Den Bakker Dustcrusting technology b.v., (dbd global), is an expert in dust control and prevention. The company originally started in 1948 and has now expanded into several companies, each with a different type of specialization.

MAJOR CLIENTS

Dry bulk terminals, power plants and emergency services are the major clients at the moment.

dbd global specializes in the control of dust, not only by cleaning areas that are already dusty, but also and most importantly working to ensure that dust in any form, does not become a problem in the first place. Therefore the solutions it offers are widely applicable for use handling coal, iron ore stacks, sand, glass fabric and ash — for example after a big fire to prevent the ash from spreading into the area.

Ever-more-stringent environmental legislation regarding dust control is creating difficulties for many companies.

Being heavily involved in this matter as a contractor for some 30 years, dbd global has developed a range of solutions to help with dust control, including a range of specially designed water spraying vehicles, each having particular capacities and performances to suit the needs of a specific site or condition. The constant desire to improve led to the development of a very effective method to control dust on most of the sites where it is needed: the Dustcruster® technology.

COMPETITORS

Although there is not a product that has the same equation, at the moment the products that are the most comparable with Dustcruster liquid® or Dustcruster dry® are the chemical products such as latex. dbd global has a lot of clients that used

the polymer products before they discovered the many advantages of the Dustcruster® technology and started using only the Dustcruster® technology. The big differences and advantages in comparison with the polymer products are; the long endurance of the product; the price that is more attractive and the fact that it is environmentally friendly.

DUSTCRUSTER LIQUID®

Dustcruster liquid® is an inexpensive and environmentally friendly (natural) product. After spraying onto coal and iron ore stacks, it forms a real 'crust'. Rain barely affects its effectiveness.

Only after digging into stockpiles is it necessary to repair the crust by spraying on a new layer at the disrupted area. Dustcruster liquid® has also proven to be a very effective means of settling large sand areas around infrastructural projects and has successfully been used to prevent the escape of dangerous fumes during soil cleaning operations.

Dustcruster liquid® is mixed in a special installation. It has proven to be highly effective, because of its longer setting time. Dustcruster liquid® can be transported to most locations all over Europe where it is then transferred into large containers, equipped with stirrers and sometimes even with heaters to allow work at near zero conditions. The company sells and rents the containers. For the spraying of Dustcruster liquid®, the specific spraying trucks are required, mostly agri-tractor towed.

DUSTCRUSTER DRY®

In order to reduce transport charges and to allow the use of the technology on a world scale, dbd global has created Dustcruster dry®. This is a mixture of different fibres which are crushed into pellets and are transported in FIBCs (flexible intermediate bulk

Dust, the headache of each terminal operator! We have the solution! **Dustcruster®**



For more details, contact:

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den bakker dustcrusting technology b.v.

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containers) or containers. On location, the Dustcruster dry[®] pellets are dropped in a special mixing tank with clean water where they transform into a liquid suspension, Dustcruster liquid[®], ready for use.

Here also, the special spraying trucks are required to successfully cover the coal/iron ore stock piles creating a tough and long-lasting crust.

CONTROLLING DUST WITH FOAM DBD FO 312[®]

Den Bakker Dustcrusting has created a system where only a small amount of water is needed to create a large amount of foam. Dust control when handling/crushing wood and stone is particularly problematic, as using water can cause humidity problems. This larger foam surface is an excellent dust collector, and results in a better dust-free working environment.

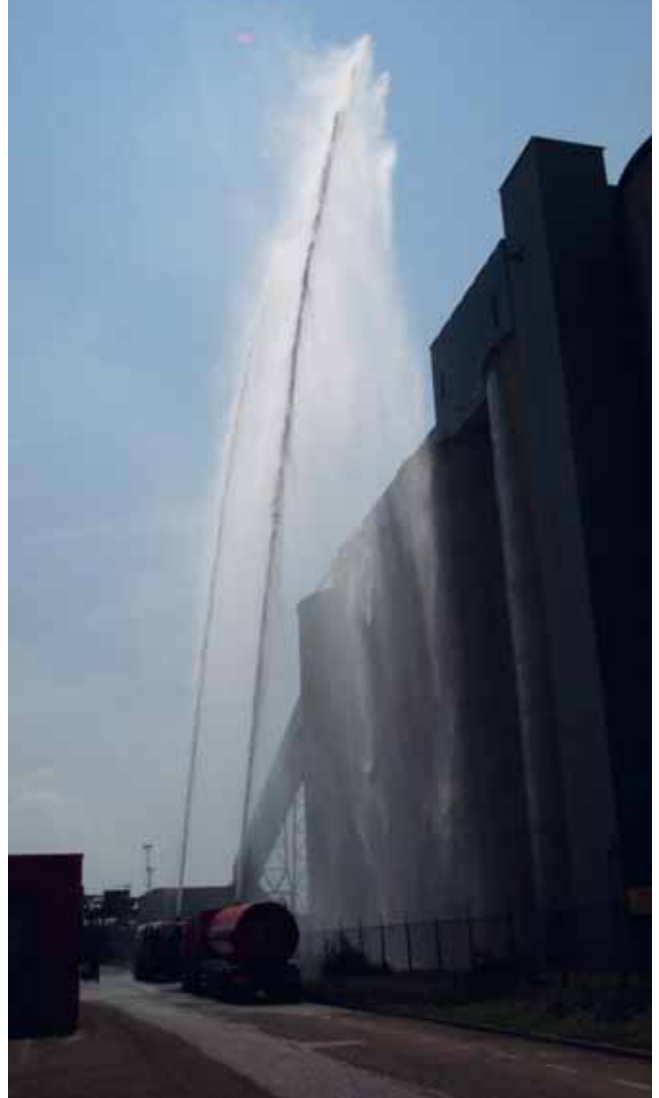
RECENT TECHNOLOGIES

In consultation with a client dbd global is developing an automatic spraying system for Dustcruster liquid[®] to apply on a coal wagon loader. The installation could be interesting for more coal terminals. This spring, the installation will be ready and dbd global will then give more details.

WIDE EXPERIENCE

Den Bakker Dustcrusting technology has gained vast experience internationally in the control of outdoor dust and uses very advanced systems, stationary as well as mobile, with natural fibre and/or with polymers or other products, and which can operate under the most severe conditions, such as frost and strong wind.

The dbd global demo team is ready to go to any site in the world in order to analyse specific conditions and offer a solution.



Heyl & Patterson announces sale of railcar dumper equipment in Argentina

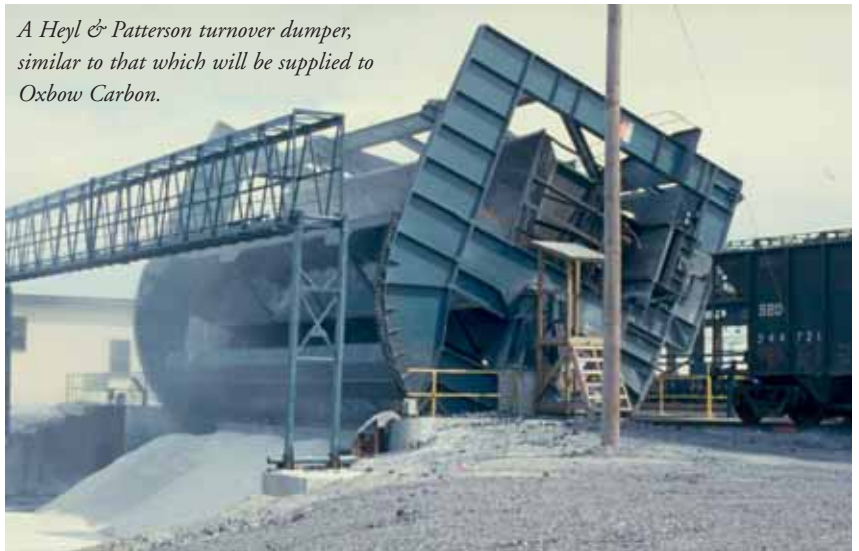
Heyl & Patterson Inc., a major supplier of bulk material handling and thermal processing systems, has announced the sale of a turnover railcar dumper barrel to Oxbow Carbon LLC.

The unit will be installed at an Oxbow facility in Argentina, and will be used to unload fuel grade coal for use in its production facility. The new steel structure, including an upgraded clamping system, will replace a Heyl & Patterson dumper that was originally installed at the site in 1980. The unloading system will continue to use the existing electrical and mechanical drives.

The barrel is scheduled for delivery in the fourth quarter of 2015, with installation to take place in the first quarter of 2016. The order includes technical assistance for installation, pre-commissioning and commissioning. Heyl & Patterson also plans to support Oxbow Carbon with spare parts, upgrades, retrofits, field service for the life of the equipment.

A turnover dumper picks up an open-top railcar gondola and spills its contents to one side, into a shallow receiving hopper adjacent to the railroad tracks. During the operational sequence, a railcar is positioned within the dumper, clamps lock it into place, and the dumper inverts it in an arching movement to a maximum angle of 180 degrees. Each car must be uncoupled and unloaded individually in a turnover dumper.

A Heyl & Patterson turnover dumper, similar to that which will be supplied to Oxbow Carbon.



ABOUT HEYL & PATTERSON INC.

Founded in 1887 in Pittsburgh, PA, Heyl & Patterson Inc. provides high quality, custom engineered solutions for thermal processing and bulk material handling applications around the globe. Heyl & Patterson is the innovator the rotary railcar dumper and offers a wide range of bulk material handling equipment, including railcar & barge movers and barge unloaders. Thermal processing products and services include some of the largest high-efficiency dryers and coolers in the world, as well as calciners, bulk material processors and pilot plant laboratory testing systems.

Engineering solutions for coal storage and handling

Coal is often 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. 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.

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. In fact very recently, the Environmental Protection Agency (EPA) issued regulations on the disposal of coal ash. These are the first national regulations to provide for the safe disposal of coal combustion residuals. These rules will need utilities to consider their ash handling systems to see if changes are needed.

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

Problems the company solves/avoids:

- ❖ 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 start-up. 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 a very large and complete laboratory 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 combine 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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Dust Solutions, Inc. – providing the driest form of dust suppression available

The effect of moisture on coal can be substantial and problematic. From an operations standpoint, when coal becomes too wet, transportation through chutes, conveyors, and feeders can be hindered or blockages can occur. From a production standpoint, moisture removal is an important step in almost any process for upgrading or utilizing coal.

Dust Solutions, Inc. (DSI) works with coal production and import/export facilities globally to resolve emission issues and suppress dust without wetting the material during the handling and production process. DSI systems use dry fog, a highly effective dust suppression method that has little to no moisture impact on the material.

HOW DOES DRY FOG WORK?

DSI dry fog systems have proven to significantly reduce fugitive dust from a variety of material handling points such as truck dumps, rail dumps, reclaim tunnels, crushers, screens, stack outs, ship loaders, and truck loading silos and conveyor transfer points.

DSI's technology uses a special type air-atomizing nozzle that produces a very dry fog (water droplets 10 microns or smaller)

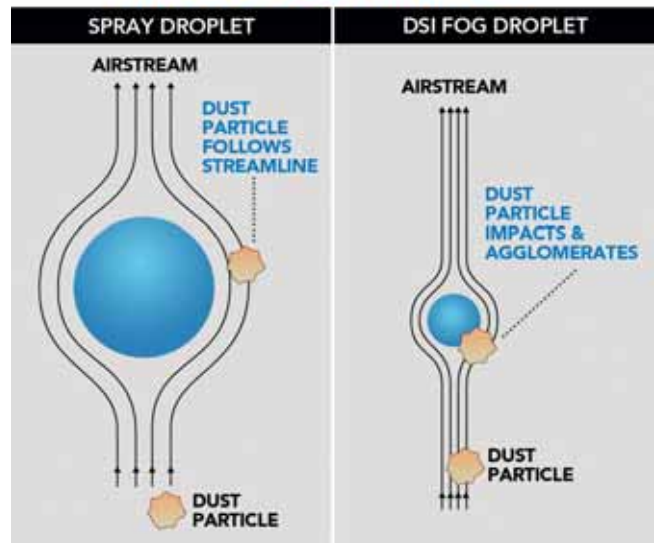


to agglomerate and remove airborne dust particles (PM-10) from various material handling and processing operations. These ultra-fine water droplets attach (agglomerate) to like size dust particles, particulate matter 10 microns or smaller (PM-10). The slightly wetted dust particles are then heavy enough to be removed from the air by their added weight and fall back into the process.

It is important to note that the systems only wet the dust, not the material, unlike conventional water spray and chemical spray systems. This makes it an ideal solution to combat dust generated from moisture sensitive materials such as coal, coke for fuel, copper concentrate, clinker and cement. Moisture addition to the material is typically less than 0.05% by weight and is often undetectable. Dry fog is the driest form of dust suppression available.

Another advantage of dry fog is the amount of surface area of coverage provided versus water spray or misting systems. As smaller droplet sizes are created, the surface area of coverage increases while using the same amount of water volume. A simple way to calculate this is by dividing a gallon of

HOW DROPLET SIZE AFFECTS AGGLOMERATION



water (in one sphere) 15 times to achieve a droplet of approximately 5 μ m in size. This will have an actual surface area of 3,848m², which is half the size of the Santiago Bernabeu stadium in Madrid.

DRY FOG SOLUTION

At the writing of this article, DSI implemented dry fog systems at two coal handling terminals. Both terminals were required by local governments to put dust suppression systems into place. At the first, a DSI dry fog system was deployed at the railcar unloading system up to the ship loading area.

At another coal terminal and port facility, DSI dry fog systems replaced water sprays which were previously ineffective due to humidity and high winds coming off the water. The client was also extremely sensitive to the extra weight being added to the material due to moisture. Two dry fog systems were deployed—one at the exit of the chute of the shiploader and the other at discharge chute into the ship.

In both instances, chemical systems, water sprays, dust collectors, and dry fog were all evaluated as viable options. Dry fog was ultimately selected for its ability to effectively suppress dust coupled with low water usage and the lowest calculated operational cost.



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Conveying coal: impact cradles control spillage and preserve belt integrity

A global innovator in bulk handling technology offers a family of impact cradles engineered to prevent belt and mainframe damage and eliminate spillage of heavy materials, including coal. The Martin® Impact Cradles Heavy Duty (HD), Medium Duty (MD) and Light Duty (LD) feature a bed of steel angles lined by energy-absorbing impact bars with a top layer of low friction, ultra-high molecular weight (UHMW) plastic. The result is longer lasting conveyor belts and components, with less fugitive material and a safer work area.

“Fine material discharged from a height can have just as much force as a coarse load,” explained product engineer Daniel Marshall. “Without proper impact absorption and distribution, all of that force is exerted on the belt, essentially crushing it against a rigid surface underneath. The impact beds absorb the energy, so the belt doesn’t have to. It also creates a flat edge for the apron seal, to prevent spillage and fugitive dust.”

The Martin Engineering cradles are designed to be located at transfer points of receiving conveyors, under the hopper and



Martin® Impact Cradles feature a bed of steel angles lined by energy-absorbing bars with a top layer of ultra-high molecular weight (UHMW) plastic.

chute box, close to the tail pulley. Depending on the force of the discharged material, they can possess different structural qualities. All three Martin Impact Cradles feature wing supports, which adjust to match CEMA standard trough angles, as well as a 5% fine-tuning adjustment angle. This allows for the cradle to accommodate the idler profiles of different manufacturers and assure a tight belt seal.

The Martin® Impact Cradle HD is the company’s most rugged design, able to withstand impact forces from 12,000 to 17,000 lbf. (53.4 to 75.6kN) and drop heights of light material up to 50ft (15.2m). Classified as Heavy-Duty (H) in CEMA Standard 575-2000, it fits E-6 and E-7 conveyor configurations. Support beams in the centre of the cradle are set 3/4” (19mm) below the receiving belt’s line of travel, allowing the belt to avoid sustained friction when running empty, yet absorbing significant impacts during loading while still retaining a tight seal.

“The HD Cradle is designed to handle a load equal to a full-sized refrigerator being dropped from a height of ten feet,” said Marshall.

The unit is equipped with 7–13 heavy-duty impact bars, depending on width. Installed perpendicular to the belt path, the bars are reinforced by a steel support structure with a base of impact-absorbing 50-durometer styrene-butadiene (SBR) rubber and a top layer of slick UHMW plastic. They are engineered to withstand dynamic energy and a heat range of –20° to 140°F (–29° to 60°C) without compromising the structural integrity of



The cradles are designed to be located at transfer points of receiving conveyors, under the hopper and chute box, close to the tail pulley.

the conveyor frame. The cradle is on a Trac-Mount™, allowing it to slide out for easy bar replacement.

The Martin® Impact Cradle MD is designed for medium duty applications, suitable for use with belts travelling up to 1,000ft/min (5m/s). Mounted on four rugged steel I-beam supports, the cradle is able to sustain a maximum weight of 12,000 ft/lbs (53.4kN) with light material drop heights up to 26ft (7.9m). Classified as Medium-Duty (M) in CEMA Standard 575-2000, the unit is available for belt widths from 24” to 72” (500 to 1,828mm).

Depending on width, the MD Cradle is fitted with 6 to 16 durable impact bars. They are composed of an aluminium T-slot surrounded by energy absorbing 83A-durometer urethane, coated with a layer of low-friction UHMW plastic, which prevents belt fraying while retaining a tight seal at operating temperatures of –20° to 180°F (–29° to 82°C). Each bar is reinforced by a bed of steel ‘wing’ supports, which can be adjusted to match any CEMA standard trough angle, with five degrees of wear adjustment.

“The MD model can withstand a weight of 90 pounds (40.8 kilos) dropped from a 10-foot height,” Marshall added. “That’s roughly equivalent to a bag of ready-mix concrete, or around 12,000ft/lbs.”

Like the MD, the Martin® Impact Cradle LD conforms to CEMA No. 502-1998 & 575-2000, but the Class L design is made for lighter materials with impact forces that could still affect the belt and conveyor over time. Utilizing the same impact bar technology, it is able to withstand a maximum weight of 8,500ft/lbs (37.8kN), equal to 50 pounds (22.7kg) being dropped from ten feet, with light material drop heights of up to 12ft (3.6m).

Mounted on three steel channel beams, the LD is available for belts from 24 to 48 inches (610 to 1,219mm) wide, with 6–10 impact bars. The unit controls the spillage of dust and fines at belt speeds as high as 1,000ft/min (5m/s).

“Almost all bulk material, no matter the settled weight, has some form of impact on receiving belts at transfer points,” Marshall concluded. “Left uncontrolled, the constant force and spillage on the belt can bring about gouging and fraying, which can cause misalignment that leads to expensive system damage and a potential workplace hazard.”

Transporting coal combustion residues using pipe conveyors

Coal Combustion Residues (CCR), such as fly ash, are generated during the burning of coal, writes R. Munson, BEUMER Kansas City LLC. Many projects are contemplating the design of CCR handling systems to comply with EPA regulations and to relieve pressure on existing ash ponds. For each of these projects, one critical aspect of the feasibility is to determine how to store the CCR at the point of production and how to transport it to the new landfill.

Storage options vary based on the type of CCR. There are several transportation options including trucking, curved trough conveyors and pipe conveyors. The design of a CCR handling system is thus complex, requiring significant capital outlay to house the CCR during production and to move it to the transport mechanism no matter how it is transported. For many applications, pipe conveyors can be most beneficial in terms of installation and cost per tonne to transport it.

TRANSPORT OPTIONS TO THE LANDFILL

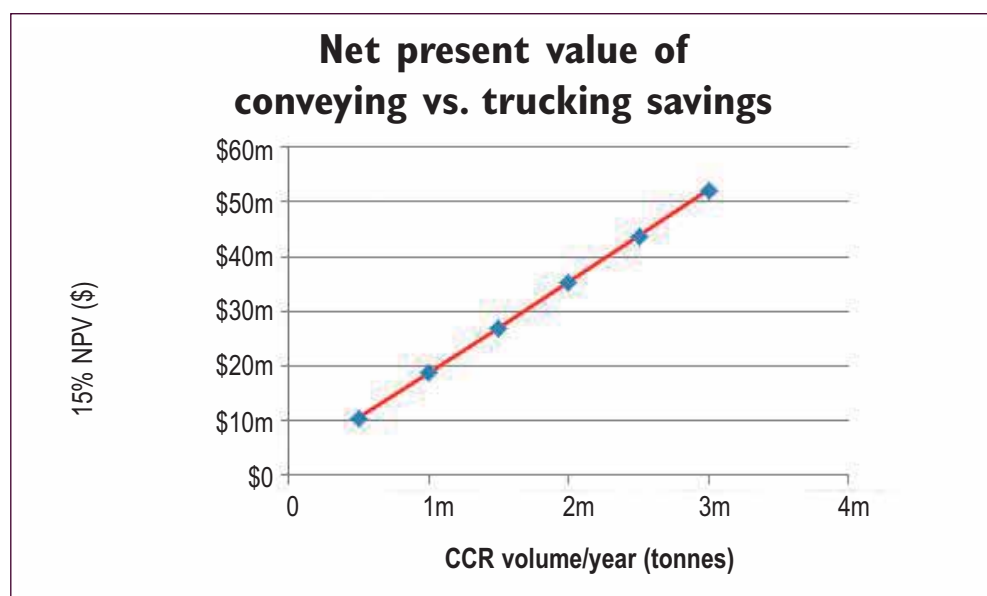
There are generally three different transport options for long distances to new landfills: trucking, curved trough conveyor and pipe conveyor. Trucking offers benefits like high capacity and no installation cost, but has issues including a high transport cost per tonne, no enclosure of the material and frequent required maintenance. A curved trough conveyor is advantageous because of its simple installation, low power requirements, unlimited capacity and partial enclosure of the material; however, this solution does not totally enclose the material and cannot navigate sharp curves.

For most applications, the pipe conveyor provides a better option than either trucking or a curved trough conveyor. The pipe conveyor can negotiate shorter vertical and horizontal curves and it encloses the material in both directions of travel. Additionally, the dirty side of the belt always faces inward, and contents are always fully enclosed. This feature means pipe conveyors and their contents pose no risk to the environment by means of spillage. This ensures that pipe conveyors are environmentally safe and compliant with current and proposed EPA regulations. All of these properties make the pipe conveyor an ideal choice for most long routes to new landfills.

The pipe conveyor offers:

- ❖ simple installation, hugs the grade;
- ❖ capacity up to 1,500tph (tonnes per hour);
- ❖ total enclosure of the material, and protection from spillage;
- ❖ shorter curve radii, and the ability to move over horizontal and vertical curves;
- ❖ cost-saving opportunities; and
- ❖ EPA regulation compliance.

The economic incentive to install conveying is very high if sufficient CCR volume exists. There is no hard-and-fast rule to dictate when pipe conveying is best, because there are too many variables such as trucking distance, infrastructure costs and



conveyor operating and maintenance costs. But pipe conveying does offer huge savings opportunities. The power cost to convey one tonne of material by conveyor is very low — about 10 cents — compared to a range of \$2.25 to more than \$4.00, all in cost to truck the same amount of CCR across the same distance.

ECONOMIC ANALYSIS OF CONVEYING VERSUS TRUCKING

When it comes to transporting CCR, the key variable is tonnes per year that need to be transported to the landfill. Volumes range tremendously from several hundred thousand tonnes per year to more than 3,000,000 tonnes per year. For higher-volume plants, where the landfill is a substantial distance from the plant, conveying makes more sense because the power cost to convey one tonne of material by conveyor is very low compared to what it costs to transport the material by truck, typically a \$3.00 per tonne difference. The economic incentive to install conveying is even more valuable if sufficient volume exists. The very important question is what kind of capital investment for the installation of the conveyor system can be justified by the cost differential. Figure 1 shows the net present value of the difference between trucking and conveying. This is the difference in costs brought back to present day at a 15% discount rate meaning this is the equivalent to the capital cost that would return 15% over a 20-year project life. For a plant that has 2mt (million metric tonnes) per year of CCR, this shows a justifiable capital cost for conveying of \$35,000,000. There is no hard-and-fast rule because there are too many variables to consider such as trucking distance, infrastructure costs and operating and maintenance costs the plant wishes to apportion to the conveying system.

SYSTEM DESIGN OVERVIEW FOR UTILITY COMPANY

A utility company recently finished its CCR dewatering, storage and transportation system for its power station, choosing a pipe conveyor because of many of the stated benefits. The plant houses systems for gypsum dewatering and storage, fly ash storage and conditioning, and bottom ash collection and dewatering areas. After each waste product is readied for transport, the material is put on conventional conveyors to move it to the tail end of the overland pipe conveyor for co-mingled transport to the landfill.



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The footprint required for this type of system is quite large because the gypsum must be dewatered in a dewatering building and then transported to a separate storage building housing an overhead stacking system and a portal reclaimer. The fly ash is stored in two concrete silos with conditioners located under each silo. The footprint of these silos is relatively small compared with the gypsum handling facilities. The bottom ash design has a separate building housing the submerged flight conveyors which feed another enclosed area where the bottom ash is placed on concrete pads for further dewatering. The plant is designed with plenty of contingency storage room for each material, with a system capacity of 1,200stph (short tonnes per hour).

The fly ash and bottom ash are moved to the loading end of the pipe conveyor on the same conveyors. The gypsum is moved to the loading end of the pipe conveyor on a separate reclaim conveyor. The system also has an emergency truck load out building and another truck unloading feeder to move trucked



When installing a conveyor system, determine what kind of capital investment the cost differential can justify.

material onto the pipe conveyor.

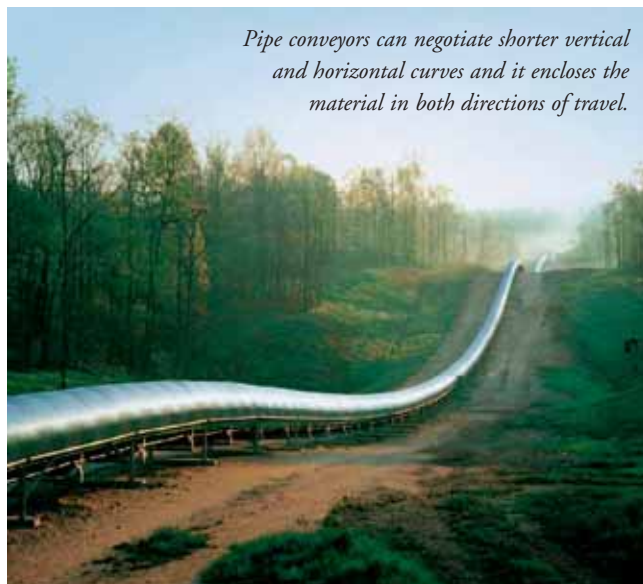
The actual route has steep inclines and many curves. Any future project will want to achieve a low cost per tonne to transport the waste and build sufficient backup or storage volume to assure reliable operation and a system with enough capacity to assure that all waste can be moved during daylight hours.

The pipe conveyor moves the waste to the discharge tower located on the edge of the landfill. It can move each of the three waste streams independently or co-mingled. The conveyor runs approximately 7,800ft — about 1.5 miles — and the final elevation of the discharge is approximately 400ft higher in elevation than the loading zone. The grade is undulating and some areas are very steep. The pipe conveyor was able to follow the grade in many cases, which reduced civil works and bent heights.

Overall, the pipe conveyor is working well and serves as a good option for any company transporting CCR to landfills. Pipe conveyors are an efficient and cost-effective method of transporting CCR across a long distance from storage facilities to new landfills. While trucking remains an option, the economic payback to invest the capital in a conveying system can return millions of dollars in savings.

ABOUT BEUMER CORPORATION

BEUMER Corporation (Somerset, NJ) a subsidiary of the BEUMER Group (Beckum, Germany), specializes in the design and supply of conveying and loading technology and systems;



Pipe conveyors can negotiate shorter vertical and horizontal curves and it encloses the material in both directions of travel.

palletizing and packaging technology; and sortation and distribution systems for logistics and airport baggage handling applications. BEUMER Corporation also offers a full range of customer support services that keep systems optimally productive.

The BEUMER Group is an international manufacturer of intralogistics for conveying, loading, palletizing, packaging, sortation and distribution technology. Together with Crisplant a/s and Enxco Teknologies India Limited, the BEUMER Group employs about 3,000 people and achieves an annual turnover of about €450 million. With its subsidiaries and sales agencies, the BEUMER Group is present in many industries the world over.

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MOBILE COAL HANDLING SYSTEMS



Cascade Chute and Trimmer options



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



Radial Telescopic stockpiling coal @ 2000 TPH in powerplant



Hopper Feeder & Radial Telescopic reclaiming/ stockpiling coal in stockyard

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

Telestack: a global partner for the coal industry

A TS 2058 radial telescopic stacker in Chile for AES Genera, a coal-fired power station in the Port of Ventanas, part of a complete vessel unloading and import material handling system upgrade.



Telestack mobile bulk material handling equipment works with all coal handling applications following the logistics chain from pit to port. The global coal industry is an important sector for Telestack. Telestack uses its experience of working with clients in the coal sector around the world to enhance productivity, flexibility and efficiency in coal operations.

Telestack installations in the coal industry include open pit link conveyors, open pit stacking, open pit reclaiming, unloading at inland terminals and sea ports from rail wagons, trucks and barges, port stacking and reclaiming and vessel loading.

The key to Telestack's success is the mobility and flexibility of its products. Mobile bulk material handling equipment requires reduced planning permission and can be moved/relocated off site quickly and cheaply. Telestack equipment is flexible, allowing it to work on different applications and different materials.

Telestack produces radial telescopic conveyors, link conveyors, tracked telescopic conveyors, radial telescopic stackers, shiploaders/unloaders, truck unloaders and hopper feeders. Each client's application is different and Telestack takes this on board by producing innovative solutions for each project using an array of options available.

The following case studies illustrate how Telestack designs, manufactures and installs systems individually tailored to meet the needs of each client and application.

TELESTACK TS 2058 RADIAL TELESCOPIC STACKER FOR AES GENERA POWER PLANT, CHILE.

Telestack commissioned a TS 2058 radial telescopic stacker in Chile for AES Genera, a coal-fired power station in the Port of Ventanas, Chile. The stacker was part of a complete vessel unloading and import material handling system upgrade carried out to replace the existing ageing

infrastructure.

Once the material enters the stockyard it is transferred to the TS 2058 radial stockpiling conveyor. The TS 2058 radial telescopic conveyor has a capacity of 2,000tph (tonnes per hour) of coal with a density of 0.85t/m³ (2,500m³). The machine incorporates a 1,400mm-wide conveyor belt with a 35-metre outer conveyor and 23-metre 'stinger' extending conveyor to maximize stockpile capacity. The telescopic conveyor enables an additional 30% of material to be stockpiled within the same footprint. Total stacking capacity of the TS 2058 on a 180° radius is 136,360m³ or 109,090 tonnes of coal (density of 0.8t/m³). AES Genera was able to further increase this capacity by placing the TS 2058 unit on an elevated two-metre concrete radial plinth. With the integrated windrow stockpiling programme, the machine is able to automatically stockpile coal with a minimum drop height, thus ensuring product integrity is maintained and dust emissions are minimized.



HF521 hopper feeder reclaiming coal into TS542 radial telescopic.

Telestack supplied the equipment to be compliant with local Chilean structural standards for earthquake conditions. These structural standards are some of the most stringent standards in the world in order to comply with local seismic conditions in event of an earthquake.

As the machine was to operate in a coal-fired power plant the equipment also had to be compliant with ATEX standards due to the combustible nature of the material being conveyed.

Telestack delivered the equipment to site in Chile in seven 40ft-high cube containers, thus minimizing freight costs for the client. The modular nature of the equipment with quick and easy to assemble sections enables the machine to be assembled in a short period.

TELESTACK MOBILE EQUIPMENT FOR COKE LOADING AT PORT KEMBLA

Before the installation of Telestack's mobile equipment for materials transfer and shiploading system for coke loading at Port Kembla in Australia, the handling method used by the client was labour-intensive and very expensive.

The Telestack TU1015R mobile truck unloader has variable speed on the hydraulic pump to drive the feeder, allowing the client to alter the speed depending on the material being handled. The range of materials being handled varied from 0.45t/m³ to 2.8t/m³ density. This feature proved invaluable to allow the operators to control feed rates to the shiploader. When designing the shiploader, Telestack engineers were faced with several application challenges which they had to overcome such as a narrow jetty, weight restrictions, the need to minimize degradation and the extremely abrasive nature of the material.

Therefore, a unique and innovative design was manufactured to overcome these challenges. The TS 1242 radial telescopic shiploader incorporated full dust suppression features including removable undertrays, telescopic dust covers and a cascade chute with a trimmer at the discharge point. The cascade chute allows



A TS 850 used to stockpile coal.

for the soft loading of the material and the trimmer enables the operator to easily reach under hatch coaming when finalizing the loading process. This, along with the standard feature of a 17m telescopic boom, allows for effective trimming.

The shiploader also incorporates a variable-speed drive on both the inner and outer conveyors to cater for material ranges in density and also accommodates soft transfer point loading to minimize degradation by reducing belt speeds. The shiploader has 1,800mm-diameter radial wheels at the front to minimize loading at the jetty due to weight restrictions. The unit is fully self-contained and fully mobile with an onboard 180kVA enclosed Cat genset with full remote control of functions.

When the shiploader is not in use shiploading, the client can remove it from the berth for routine maintenance and washdown, leaving the jetty free for other port activities.

INNOVATION IS KEY TO TELESTACK

Innovation is key to the way Telestack work with clients to deliver the best solution to an application. Coal clients from around the world such as AES, SUEK and Mechel trust working with Telestack to deliver increased productivity, flexibility and efficiency in coal operations.



A Telestack TU1015R mobile truck unloader TS 1242 radial telescopic shiploader working in tandem to load coke at Port Kembla in Australia.

Dust-controlled loading of coal with Cleveland Cascades

The loading of coal poses many challenges for the bulk materials handling industry. Coal is loaded in many different ways, such as into ships, trucks, stockpiles and many more, all with a requirement of minimizing dust emissions and product degradation. These challenges are well known to Cleveland Cascades Limited, the Teesside (UK)-based manufacturer of bulk materials loading chutes.

Since 1992 the company has been involved in the design and manufacture of loading chutes, with its unique 'Cascade' system being at the forefront of the industry. The loading of coal seems preferred through the Cascade system due to its emphasis being around preventing product degradation and dust emissions. Loading material through oppositely-inclined cones at low velocity yet high volume results in minimized dust emissions and removes the requirement of expensive dust-extraction systems.



Fig 1.

Coal is generally more valuable in larger lump sizes, as it has better burning qualities than smaller lumps or lumps that have

suffered damage due to free-falling and smashing to pieces/dust. This is where the Cascade system provides extremely effective results as the product is supported the whole length of the chute by oppositely inclined cones, ensuring a soft delivery from outlet to material pile every time.

With over 600 systems operating worldwide with applications in ship, silo, road, rail & tanker loading, the company's key to success is its proven ability to provide a well-engineered solution with professional and committed support.

Cleveland Cascades Ltd has worked with some major companies on coal loading projects, including the Israeli Electric Corporation, Tenova, PHB Weserhutte, FAM and Puerto de Mamonal.

Coal loading has always been a significant part of Cleveland Cascades, with the company providing its first coal-loading system in 1996; a shiploading chute for use in South Africa. Most recently, the company has been involved in coal shiploading in particular, for use with many companies in South America.

Fig 2.



Recent coal loading projects include a project for FAM in Colombia. This 18.5m-length application loads ships at up to 2,750tph (tonnes per hour). This project is unique to Cleveland Cascades as there was the requirement to include a trimming spout that will achieve five metres trajectory from the centre-line of the loading chute (see fig. 1). Another recent project for the company was another shiploading system, again for operation in Colombia. This is a smaller system loading at 1,000tph. The chute again includes a trimming spout, at a standard 1.5 metre trajectory (see fig. 2).

The company has also provided conventional freefall loading



systems (see fig. 3), stockpile loading systems (see fig. 4) and Vehicle loading systems to handle coal, all with the with the same attention to detail, thorough engineering process and high standards of quality, believing that every system produced is a direct reflection of the company and the best possible form of advertisement to potential new customers.

Cleveland Cascades Ltd hopes to remain at the forefront of innovative design within the bulk industry, taking our technology and experience and applying it where possible to solve dust and material degradation issues.

With this ethos of continual improvement and expansion, CCL hopes to further develop itself into and continue to be a well-established figure within the bulk industry.

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Keeping coal moving with AMECO



AMECO supplied two 1,000tph single-boom portal reclaimers to handle coal to Mitsui-Daewoo for the expansion of the Jorf Lasfar power station in Morocco.

AMECO was founded in 1932 in Alsace, a French region that lies in between the Vosges Mountains and the Rhine River, bordering both Germany and Switzerland. The company's headquarters are still located there today.

Initially, AMECO was part of the Alsatian potash mine corporation. The company went from providing them with maintenance services, to supplying them with conveyors, to eventually delivering all types of equipment to fulfil their material handling needs.

By the 1960s, AMECO specialized in three products: stackers, reclaimers and shiploaders, for commodities including coal. Its customer base expanded significantly. AMECO now not only provided equipment to the pan European mining industry, but also to an abundance of other industries worldwide. These include:

Industries	Examples of materials handled
Mining	Coal, copper concentrate, iron ore, potash
Power generation	Coal, bark, biomass
Cement	Clay, gypsum, limestone
Fertilizer	Urea, phosphate, ammonium nitrate
Pulp and paper	Woodchips

Nowadays, AMECO globally has more than 380 machines in operation with its satisfied customers. Further, the company has representative offices in countries such as Brazil, Chile, China, India, Iran, Japan, South Korea, Thailand and USA to help expand its business.

EQUIPMENT

AMECO designs and manufactures bulk material handling equipment for indoor and outdoor applications. The company has three major products:

- ❖ **Reclaimers:** to recover bulk material from stockpile. Types include: portal and semi-portal reclaimers; side scrapers; travelling and slewing reclaimers located centrally to the pile; blending type bridge reclaimers; and prilling tower extractors.
- ❖ **Stackers:** to pile bulk material onto a stockpile. Types include:

travelling, luffing and slewing stackers.

- ❖ **Shiploaders:** to load bulk material or bagged products into ships for transportation by sea. Types include travelling, slewing and luffing shiploaders.

AMECO can supply conveyor systems that are integrated in the stacker, reclaimer or shiploader systems. Additionally, AMECO offers erection and commissioning supervision as a turnkey contract.

CLIENTS & CONTRACTS

AMECO is a supplier with a proven track record; worldwide it has more than 380 pieces of equipment in operation.

The following AMECO machines will, among others, be commissioned in 2015:

- ❖ portal reclaimers for handling urea for Azerbaijan's largest ammonia and urea integrated fertilizer plant, owned by the State Oil Company of Azerbaijan Republic (SOCAR);
- ❖ portal reclaimers for handling urea for Yacimientos Petrolíferos Foscales Bolivianos' (YPFB) new fertilizer complex in Bolivia's Cochabamba Department;
- ❖ portal reclaimers for handling urea for Agrium's Lone Star Project in Borger, TX, USA.

As these examples show, AMECO is currently collaborating with the world's top enterprises on large-scale projects across the globe.

Next to this, coal is an important market for AMECO. A 2012 report by the World Resources Institute shows that 1,199 new coal-fired power plants with a total capacity of 1,401,268MW are being proposed globally. This indicates coal will still play a significant role in the global energy mix for years to come.

A total of 76% of the proposed power capacities in the world are located in China and India'. AMECO, however, still sees opportunities for coal in Europe. Currently, the company is in confidential negotiations to provide equipment to several coal-fired power plants in Eastern Europe.

Prestigious coal-based contracts AMECO has been awarded in recent years involve, for instance, the delivery of:

- ❖ two single boom portal reclaimers, each with a capacity of 1,000tph (tonnes per hour), for handling coal to Mitsui-Daewoo for Jorf Lasfar Electricity Company's new units 5 and 6 in Morocco; and
- ❖ one shiploader to load coal at a capacity of 2,400tph into sea vessels for Store Norske, the world's northernmost coal mine in Svea, Svalbard. Due to the harsh polar weather conditions, the company had to respect very strict delivery dates, completely rethink its design and ship the machine fully assembled. All these challenges AMECO took in its stride and were completed to the client's satisfaction.

As a corporate citizen, AMECO is wary of the greenhouse gases coal-fired power plants emit. That is why the company has a keen interest in projects with improved efficiencies and carbon capture and storage technology. Furthermore, biomass power plants are also becoming important customers for the company.

COMPETITIVE ADVANTAGE

AMECO's customers expect reliable and easy-to-operate machines at sharp prices. To meet and eventually exceed these expectations, AMECO heavily invests in innovating its designs. AMECO has, for instance, introduced state-of-the-art dust-suppression systems that help to protect the environment from undesirable dust emissions. The company is also continuously

AMECO supplied two 1,000tph single-boom portal reclaimers to handle coal to Mitsui-Daewoo for the expansion of the Jorf Lasfar power station in Morocco.



gathering customer feedback to keep the machines' design simple and maintenance friendly.

Next to this, AMECO has acquired a workshop in Eastern Europe. This allows the company to sell its equipment at competitive prices, while ensuring that its products are in compliance with the most stringent quality norms.

AMECO's machines can be fully customized to its clients' requirements. In agreement with the customer, the company can however re-use basic designs to reduce engineering costs.

Finally, AMECO offers extensive after-sales services. These include, for instance, yearly mechanical inspections that are free of charge. With these inspections, AMECO helps clients identify worn out parts. This is also the moment the company shares technological advancements (e.g. software updates; energy saving and therefore operating cost reducing methods) with its customers and gains valuable feedback from them. This feedback is used for the continuous improvement of its machine designs.



AMECO is particularly proud of the 2,400tph coal shiploader it has supplied to Store Norske, the world's northernmost mine in Svea, Svalbard. Due to the polar weather conditions, the company had to respect very strict delivery dates, completely rethink its design and ship the machine fully assembled.

Quick-release manifold bracket for dust suppression

The new bracket design allows removal and replacement of the manifold in about five minutes, with no tools required.



Dust suppression is vital when handling coal, to protect employees and the environment. An innovator in open-area dust suppression has introduced a new quick-release manifold bracket, engineered to limit worker exposure to harsh service environments and potential safety hazards, while minimizing

process downtime. Designed to fit all fan-driven models of DustBoss™ atomized mist dust suppression equipment, the new bracket design allows removal and replacement of the manifold in about five minutes, with no tools required.

The stainless steel bracket and pin mounting system from



The stainless steel bracket and pin mounting system secures the manifold in position.



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Dust Control Technology (DCT) secures the manifold in position, allowing maintenance personnel to remove and replace quickly for routine cleaning or other service. Initially developed in response to customer input for use in harsh service conditions to reduce potential risk to employees, the design is expected to find utility among any customers wanting to avoid work stoppages and maximize process time.

"The nozzles are one of the critical elements of atomized mist technology," explained Carl Harr, sales representative for Dust Control Technology. "No matter what water source is used for dust suppression, it's going to contain minerals and other dissolved solids, which build up on a microscopic level until eventually the accumulation will interfere with droplet production," he said.

"In the past, some customers have purchased a spare set of nozzles, which helped reduce downtime by allowing maintenance workers to install clean nozzles on their own schedule, rather than when the nozzles were getting plugged," Harr continued. "But in some industries, that still required a worker to shut down the machine and spend 20-30 minutes in hostile conditions to remove and replace nozzles for cleaning. And in many cases, if the dust suppression stops, the operation went on hold."

The new bracket can be retrofitted to any of DCT's existing fan-driven designs. Customers can order one mounting kit to fit DustBoss models DB-45, DB-60 or DB-100. The smaller DB-30 incorporates a different stud size and pattern, requiring its own mounting kit. Both kits feature the pin mounting system with no-tool removal. The specially-designed pin is permanently affixed to a lanyard.

Harr said that depending on the type of accumulation which

accrues, customers have used wire brushes, lime-dissolving products and even sonic cleaners to remove build-up. Some choose to have a spare manifold on hand for each DustBoss machine, while others stock just one. "As long as you have one extra, you can rotate it into service at your discretion," he continued. "You can plug in the new one and take the one that was in service back to the shop for cleaning. Once the nozzles have been cleaned, it can be installed on another machine to permit cleaning of that manifold, and so on."

With worker safety foremost in the minds of customers, the new design is already gaining popularity. Said one customer, "It makes changing the manifold a 2-minute job. We switch them out every three months because of the operating conditions, so we can inspect and clean as needed. Having a spare manifold on hand facilitates quick replacement on our schedule, rather than when we're forced to do it."

Dust Control Technology is a global leader in dust control solutions for coal, demolition, slag handling, material recycling, petcoke and ports / shipping. The company designs and manufactures customized equipment utilizing atomized mist technology for dust and odor suppression. All of the firm's R&D, experience and expertise is centred completely around those applications, and its staff helps customers analyse particle sizes, working environments and other factors to ensure effective performance under real-world conditions.

The units are far more effective and efficient than manual spraying, with some customers realizing payback in less than six months. DCT equipment carries the industry's longest warranty, and can be purchased outright or rented from an extensive fleet of dust suppression equipment.



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Asia's largest bucketwheel excavator system supplied by Tenova TAKRAF



The 7,900m³/h Tenova TAKRAF spreader at Zhahanaoer open pit mine in China. (All photos: Tenova TAKRAF)

ASIA'S LARGEST BUCKETWHEEL EXCAVATOR SYSTEM IN OPERATION: SUCCESS FOR TENOVA TAKRAF'S BWE SYSTEM AT ZHAHANAOR MINE IN CHINA

Open pit mining and underground solutions provider, Tenova TAKRAF, has completed the supply and installation of a complete bucketwheel excavator (BWE) system for Zhahanaoer open pit coal mine in Inner Mongolia, China. The system, which features the largest bucketwheel excavator-conveyor-spreader-combination of its kind in Asia, was inaugurated with a celebration held on site in late November 2014, attended by representatives of the client, CPI Mongdong Energy Group. The inauguration followed successful performance testing, which confirmed the high efficiency and reliability of the entire system and exceeded the expectations of all parties.

The system consists of a large-scale bucketwheel excavator SRs 2000 (rated capacity 6,600m³/h) with loading unit, a 7,750m-long conveyor system consisting of five flights as well as a compact spreader with tripper car on rails. The bucketwheel excavator reaches 30m digging height and, although it has a service weight of about 3,300 tonnes, it has a ground pressure much lower than that of a D11 dozer. In order to properly handle peak capacities the conveyor system, as well as the spreader, have a design capacity of 7,900m³/h. Those conveyors running along the excavator bench and along the waste dump are shiftable.

The project commenced in September 2009 with the bucketwheel excavator,

spreader and conveyor system awarded in three stages from 2009 to 2011. The complete turnkey project covered design, supply, transport, on-site installation, commissioning and testing.

The project site is located approximately 700km from Beijing in remote northern China, where the extreme climatic conditions see winter temperatures of down to -40°C and summer temperatures of up to +40°C. Despite this and other highly challenging conditions, the project teams achieved a smooth erection and commissioning process, completing the project on schedule in early November 2014.

The project is regarded as an important milestone in the development of China's mining industry, typified by a trend towards larger-scale mines and mining equipment. It also provides a good example of successful German-Chinese co-operation, which was celebrated in an impromptu couplet by



Another view of the 7,99m³/h spreader.

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The 6,600m³/h Tenova TAKRAF bucketwheel excavator at Zhabanaoer open pit mine in China.



the client representative at the inauguration: “Casting a New Chapter of China–Germany Cooperation on the Grassland, Dancing a Big Dragon of Hand-in-hand in Sea of Coal!”

For Tenova TAKRAF, the project continues its success with the supply of Bucket Wheel Excavators to China, and follows the delivery of two BWE systems to Yuanbaoshan in the 1990s.

Tenova TAKRAF is a key supplier of equipment and systems for open pit mining and underground solutions and bulk handling, having provided hundreds of complete systems, as well as individual machines to clients all over the world in all climatic conditions. Globally sourced air pollution control, specialized handling equipment, and technology for the cement and fly ash industries ensure selection of optimal processing options. Together with Tenova DELKOR, which has been fully integrated

into Tenova TAKRAF, complete systems for coal washing and solid-liquid separation can be offered.

Tenova is a worldwide supplier of advanced technologies, products, and engineering services for the metals and mining and minerals industries.



The 7,900m³/h Tenova TAKRAF conveyor system at Zhabanaoer open pit mine in China.



Sumitomo helps Japanese power plants replace ageing equipment

It has been over 40 years since the power plant boom in Japan, and some of the equipment working at these plants is now ready for replacement.

Continuous ship unloaders (CSUs) operating at these plants are no exception. There are many replacement projects under way. Sumitomo Heavy Industries Material Handling Systems Co., Ltd. was successful in winning the bid to replace CSUs for Tokyo Electric Power Company in 2010; in 2013, Sumitomo delivered two 2,200tph (tonnes per hour) bucket elevator CSUs. These are now operating successfully at the Hitachinaka Thermal Power Station (see pictures).

Two more bucket elevator CSUs are now under construction for a domestic power station. Sumitomo is widely recognized as a manufacturer of high-quality unloaders with extensive experience in the Japanese material handling market.

Focusing on markets outside Japan, there are similar plans to replace equipment in power plants. For example, for Taiwan Power Company's Lin Kou Power Plant Renewal Project in Taiwan, Sumitomo signed a contract in 2013 to supply two 2,200tph bucket elevator CSUs. These units are now under construction.

Throughout the bidding stage in Japan, as well as with overseas contracts, Sumitomo's CSU proposals received high marks for the high unloading efficiency, operational advantages and low maintenance costs being offered. It is expected that the need for replacement and refurbishment of equipment at power plants and new coal terminal projects will remain high. Sumitomo will continue to supply efficient and reliable CSUs to its worldwide customers to meet this demand.



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ThyssenKrupp

ThyssenKrupp Industrial Solutions reports on latest coal handling developments

As a major supplier of materials handling equipment, ThyssenKrupp Industrial Solutions, Business Unit Resource Technologies (TKRT, formerly TKF) has developed a complete range of products for bulk terminals, stockyards and coal-fired power plants. The company has over 100 years of experience.

Recent technical achievements and contracts highlight TKRT's development work for the coal handling in terminals and power plants.

A BREAKTHROUGH SUCCESS FOR COAL TERMINALS OF CHINA

From 1999 to 2008 ThyssenKrupp supplied successfully more than 18 high-capacity shiploaders for ships of up to 200,000dwt with capacities of 6,000 to 8,000tph (tonnes per hour). The supply also included more than 12 high capacity car dumpers to the ports around Bohai Bay of Northern China, the country's largest coal terminals. This success story continues with the award of contracts for a further four shiploaders and two quadruple car dumpers which are proven to be the largest ones in China.

At the end of 2013 two milestone contracts were awarded to ThyssenKrupp for the design, supply and installation of four 6,800tph shiploaders and two car dumpers for coal by Huaneng Corp. China for its new coal terminal, Caofeidian No. IV Coal Terminal.

Car dumpers

The award of the contract for two quadruple car dumpers by Huaneng Corp. China for its Caofeidian IV Coal Terminal is a breakthrough achievement for TKRT in China for this kind of car dumper, in following up the success story in China that dates back to 2000. The expansion project will make it possible for Huaneng Group to export 40mt (million tonnes) of coal a year.



High-performance rail car dumpers in operation at Huanghua Coal Terminal, China.



TK's giant shiploaders at the port of Qinhuangdao, similar to that for Caofeidian IV.

Each new car dumper has the same unloading capacity as the existing one, but with increased capacity of hauling railcars of longer and heavier trains arriving at the port.

Each car dumper will simultaneously unload four rail freight wagons, each weighing a maximum 100 tonnes, at a rate of up to 28 cycles per hour, thus unloading an average 8,000 tonnes of coal per hour with a maximum capacity of 8,600tph. The systems are equipped with a positioner to position the wagons correctly, wagon weighing bridges, hoppers, discharge feeders and dust control systems

The new car dumpers will be designed on the basis of the car dumpers that have been built for China since 2000; however, they will include many improvements in the hydraulic system, special mechanisms for the rotor and drives and in the environmental facilities. These measures will ensure high reliability and performance, so that the annual throughput of 40mt will be made possible using only two car dumpers.

In 2015, both car dumpers will be installed and commissioned for commercial operation at the terminal, and an annual throughput of coal of more than 100mt, delivered by the company's own railway and unloaded by the eight car dumpers supplied by TKRT, will be reached.

Giant shiploaders

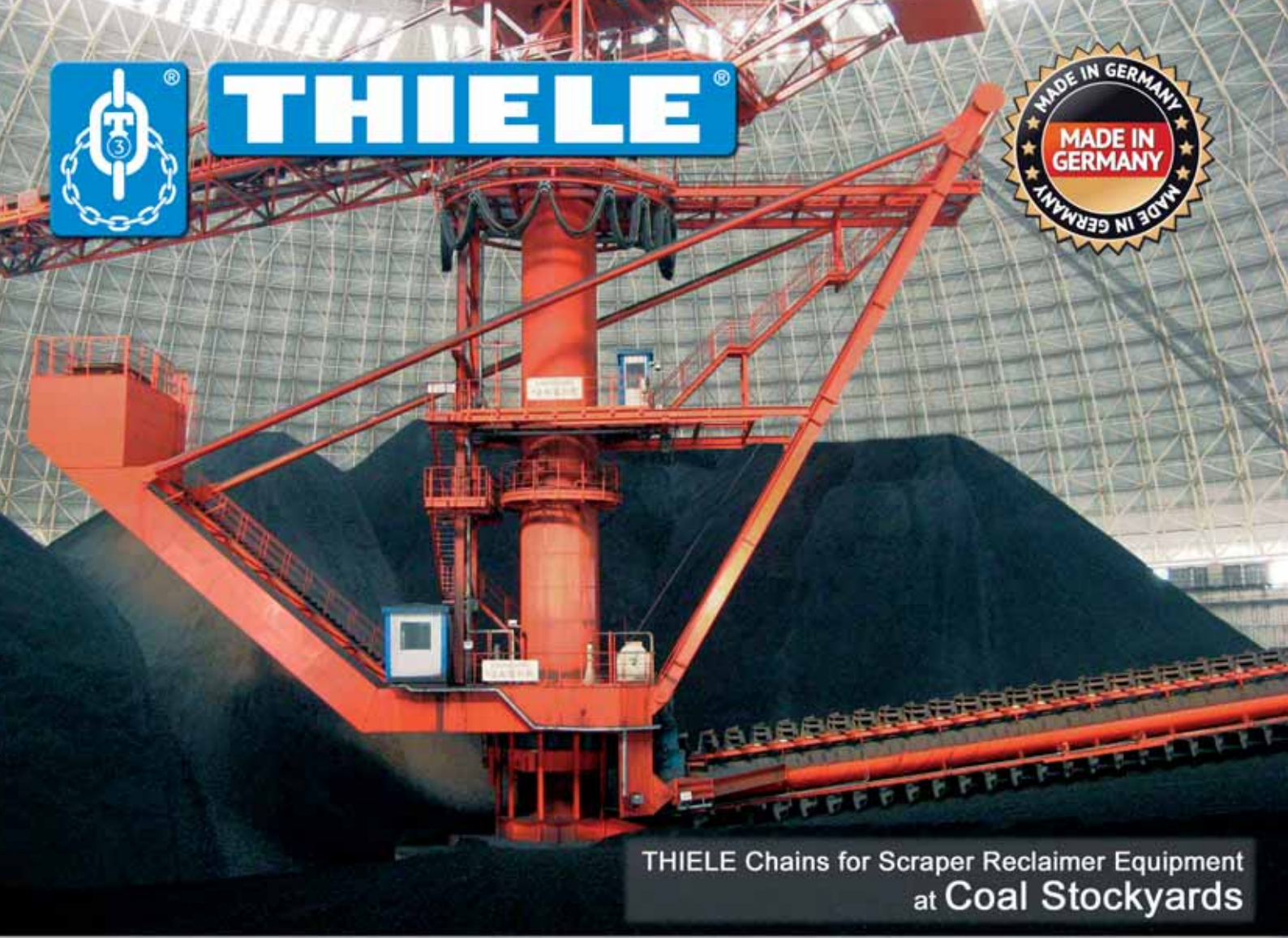
The success story for shiploaders in China continues with the award of contracts for a further four shiploaders which are the largest in China (see picture at the top of the page).

These machines are designed to load ships at a rated capacity of 6,000tph. (maximum 6,800tph) and ship sizes up to 150,000dwt. They are equipped with portal travel gears, boom with shuttle head and a loading device with trimming spoon, which allows 360° slewing. With this option, it is possible to achieve homogenous filling of the corresponding ship holds up to the uppermost edge, at a high nominal loading capacity. All mechanisms including for the belt conveyor are equipped with variable speed drives by means of frequency converter.

To serve the different sizes of ships, a shuttle with rack and



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Coal-Fired Power Plants

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pinion drive, controlled by frequency converter, is incorporated in the luffing boom, varying the outreach from a minimum for matching small ship size to a maximum of Capesize ships.

Modern drive controls and PLC system are incorporated in the shiploaders; operation is mainly controlled via the computerized operator's panel in the operator's cabin. The high degree of automation and the visually assisted operator's guide in Chinese allow the operating staff to operate the machines easily and in a comfortable fashion.

For environmental protection, a dust suppression system using water spray is installed with a suction pump, water tank, spray pressure pump and spraying nozzles for all transfer points and the loading spout and cleaning compressed-air line. Special measures are also taken in the design to the transfer points and materials flow for a better and functional sealing of the chutes and skirting.

These giants are taking shape, and commissioning is expected in 2015 for putting into commercial operation.

COAL HANDLING PLANT FOR POWER PLANTS IN MALAYSIA



Coal handling plant at Tanjung Bin 1-3, Malaysia, built by TKRT between 2004 and 2006.

The Tanjung Bin No. 4 Power Station, which is an expansion of the existing power plants with three 700MW blocks — one having one modern unit of 1,000MW — is situated besides Tanjung Bin Power Plant 1–3. Following the successful provision of coal handling plants to the Tanjung-Bin and Jimah Power Plants between 2005 and 2008, TKRT and its partner, TKIIL (ThyssenKrupp Industries India) have been awarded a follow-on contract for the coal handling plant for the newly built power station block 4.

The coal handling system comprises the following major parts:

- ❖ connection to the existing coal handling plant;
- ❖ two combined bucketwheel stacker-reclaimers;
- ❖ incoming conveyor system in two lines from the jetty to the coal stockyard;
- ❖ coal conveyor system in two lines from the coal yard to the bunkers;
- ❖ crusher and screens; and
- ❖ overall electrical and control system for the automatic operation of the coal handling plant

All of the tailor-made equipment and machines in this coal handling system will be supplied by TKIIL and TKRT itself with the latest developed technology for bulk materials handling, taking into account the high performance, efficiency and availability requirements, as well as a high degree of automatic operation and

environmental protection against dust and noise emissions, which are necessary in a modern power plant.

The materials will be taken over from the existing conveyor system at the connection point and then be delivered to the stockyard, with four stockpiles for the different sorts of coal, which will be served by three identical combined bucketwheel stacker/reclaimers. The coal yard has been designed to carry out simultaneous receiving and reclaiming of material, which means one machine carrying out stacking while the other two machines are reclaiming. In order to achieve the best simultaneous operation with the best use of the stockyard area, the boom length of each stacker/reclaimer will be 46.5m.

Each machine will basically consist of:

- ❖ undercarriage with three-point supports and long travel gear;
- ❖ slewing superstructure with pylon and counterweight boom;
- ❖ hinged boom with bucket wheel and reversible belt conveyor; and
- ❖ retractable tripper car and intermediate conveyor

An HMI (human-machine interface) panel will constantly inform the operator of the operating condition of the machine. A communication system between the operator's cabin and the central control room of the loading and unloading plant will ensure a fast exchange of information and therefore an economic use of the machines.

Three modes of control are provided for:

- ❖ local control in case of maintenance and repair work;
- ❖ manual control; and
- ❖ automatic control

During manual operation, the operator controls the individual motions from the driver's cabin.

In automatic mode, all operating sequences are carried out automatically. However, this is only possible after manual selection of the stockpile area and height and during reclaiming, after the first cut across the pile has been carried out.

The main tasks of the combined stacker-reclaimers are:

- ❖ stacking coal from both ship unloaders using one machine at a rate of 4,000tph (peak 4,200tph);
- ❖ feeding the coal bunkers of all three units within 12 hours at a rate of 1,400tph; and
- ❖ blending different sorts of coals for blending ratios of between 10:90% and 50:50%.

To achieve the required blending effect, the reclaiming rate of each machine will have an accuracy of 0.5% for the range of



Similar coal yard arrangement with bucketwheel reclaimer machines.

TK's bucketwheel stacker/reclaimer after erection and ready for commissioning.



30–100% capacity. Site construction began in 2013, and the coal handling plant will be ready for commissioning and putting into operation in spring 2015.

Without doubt, this outstanding reference and the previous success with the Tanjung-Bin and Jimah power plants will enhance TKRT's chances for further contracts, in particular in this part of the world.

COAL EXPORT TERMINAL POSJET, RUSSIA TAKING SHAPE AND GETTING READY FOR OPERATION

Increased demand on the world coal market is putting pressure on Russia to increase annual coal production. In order to handle this increased coal demand in the ports, all major coal producers are investing in the infrastructure of their port handling facilities.

One of these is Posjet Port, located in the very far east of Russia, close to the Chinese and North Korean border. From this location, one of the important players on the coal market, Mechel Group, is handling its bulk coal shipments to Japan, Korea and South East Asia.

To increase its competitiveness in the market, Mechel Group is investing heavily in the upgrade of Posjet Port and contracted TKRT for engineering and supply of all necessary bulk material handling equipment for the upgrade of the port.

The scope of work comprises delivery of: a railcar unloading facility (twin side discharge tipplers) unloading simultaneously two railcar wagons, one transfer car, two bucketwheel stacker-reclaimers, one shiploader, crushing- and a complete conveying system, including all galleries, transfer towers and conveyor bridges.

To protect the environment, special requirements had to be taken into consideration when designing and configuring the handling system, in particular for environmental protection against dust and noise emission.

The handling capacity of the equipment is designed for 3,000tph and an overall handling capacity of 7mt per year.

Considering the fact that the present handling capacity is between 2mt to 3mt per year, the expansion of the port increases the handling capacity by more than 1.5 times.

As TKRT, as one of the few suppliers in the world, covers the complete production programme of the bulk materials handling sector, the complete handling facilities of the port system will be based on TK's own expertise. Therefore the client can rely on a tailor-made system coming from one source.

Currently TKRT is assisting Mechel Group in the construction of all necessary bulk material handling equipment, and the coal terminal is taking shape ready for operation.

In order to ensure the total throughput of coal (7mt a year) by a single railway line, the client has requested that the system design have the following features:

- ❖ side discharge car dumper instead of rotary car dumper should be adopted, so that the receiving hoppers are kept flat to reduce the costs in civil works and to avoid the influence of high level ground water; and
- ❖ high throughput of the wagon unloading is achieved;

Bearing these requirements in mind, TKRT has developed a design of so-called 'twin side discharge car dumpers' on one railway line for this special case.

The twin side discharge car dumper for wagons with 75-tonne payloads can reach a maximum cycle time of 2 × 20 wagons per hour, corresponding to a maximum of 3,000tph, which is the highest handling capacity ever built by TKRT for side discharge car dumpers.



Twin side discharge car dumper installed at Posjet Coal Terminal, Russia

Innovative solutions keep iSAM at the forefront of advanced technology

ADVANCED AUTOMATION SYSTEMS SERVE RELIABLE, SAFE AND PRODUCTIVE MATERIAL HANDLING OPERATIONS FOR SHIPLOADER AND UNLOADERS

I. Introduction

iSAM was founded in 1983 by Dr. Jürgen Hellmich in Mülheim an der Ruhr, Germany. Since it started operations, it has focused on advanced automation systems.

Today the iSAM Group has nearly 100 employees in four global offices in North America, Asia-Pacific and Europe servicing customers in more than 20 countries.

iSAM holds several patents in the port and shipping industry and was the first company to use GPS and 2D/3D vision technology for terminal handling automation. With an installed base of more than 40 fully automated machines including 25+ stacker/reclaimers, the world's first operator-less grab ship-unloaders and the world's first operator-less shiploaders, iSAM has wide experience handling nearly all terminal facilities.

iSAM serves both export and import terminals, and has delivered automation systems to countries including: Germany; The Netherlands; Italy; Canada; Australia; the USA; Brazil; Malaysia; and Indonesia.

Since 1983, a team of specialists from the fields of engineering, IT and physics has been working with business economics experts as well as process and project managers to provide intelligent solutions to industry.

Advanced anti-collision system for bulk material shiploaders with an option for fully automatic operation



Combination of the iSAM® 3D ship model and a 3D CAD model of a shiploader, displayed as the operator interface, exemplary.

System specifications:

- ❖ 2D laser scanning system for boom protection;
- ❖ 3D laser scanning system for ship modelling;
- ❖ RTK-GPS system for machine positioning;
- ❖ suitable for ship sizes ranging from small barges to Capesize vessels, including ships with deck cranes and butterfly hatches;

- ❖ software for sensor data evaluation and detection of possible collision hazards;
- ❖ interface with existing machine control systems; and
- ❖ visualization of ship-model and collision information in the operator cabin or at a remote control centre.

The industry

Bulk export and import terminals typically have extreme levels of equipment utilization. At most locations, the equipment is utilized 24/7, when any downtime creates a considerable impact on the profit margin. One of the major business risks is the breakdown of critical equipment. A common, worst-case scenario is mechanical damage to a shiploader caused by a collision, e.g. with the superstructure of a ship. The protection of those valuable assets is therefore a top priority, second only to the safe operation of the terminal.

The task

In general, most shiploaders are equipped with simple sensor systems such as microwave barriers or pull-cords along the boom to prevent collisions between the boom structure and a possible obstruction in the work area of the machine. Those systems are designed to stop critical movements but not to predict collisions or to alarm an operator before a collision happens. For both the manual operation and specifically for a fully automatic operation of a shiploader, it is crucial for the automation system to 'see' in advance a collision hazard and to be able to calculate future machine movements to prevent collisions. Therefore, sensor and evaluation systems must be implemented that:

- ❖ work reliably in an industrial 24/7 all-weather production environment;
- ❖ provide the required accuracy to detect typical obstructions such as light towers, radar masts etc.;
- ❖ require minimal maintenance; and
- ❖ perform under critical environmental conditions.

The solution

iSAM has developed and implemented a sensor and evaluation system which enables a shiploader control system to obtain complete information about its own position and also of all other objects in the vicinity. For the first time, this allows for the effective protection of the shiploader boom in manual mode. It also creates the foundation for remote or an even fully automatic operation. To do so, the system integrates data from three main sensor components:



3D laser scanning system mounted below the boom.

- ❖ 2D laser scanning system for boom protection;
- ❖ 3D laser scanning system for ship modelling; and
- ❖ RTK-GPS system for machine positioning.

The two-dimensional laser system scans a defined surface underneath the boom to protect it against high air draught of ships in case of rising tides, or over-rapid emptying of the ship's ballast tanks.

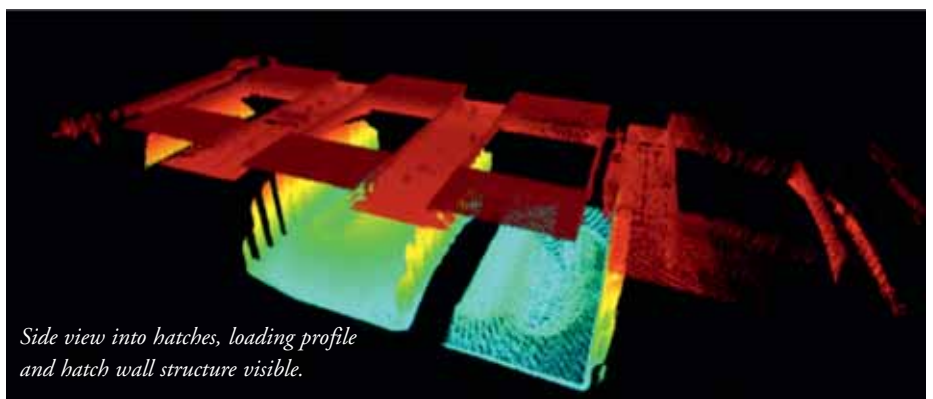
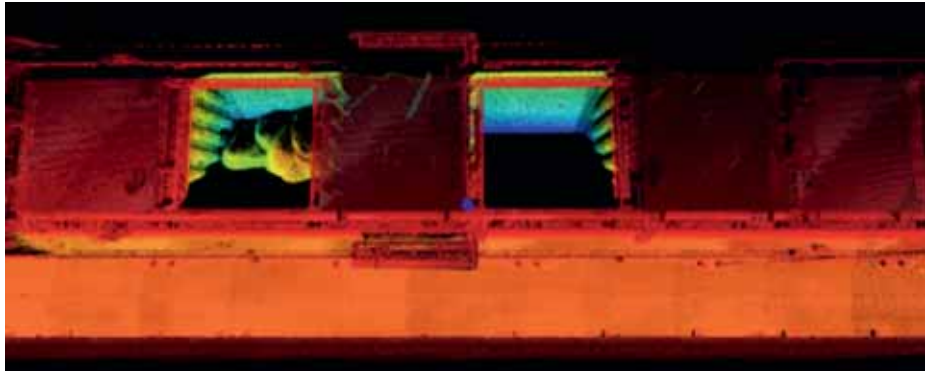
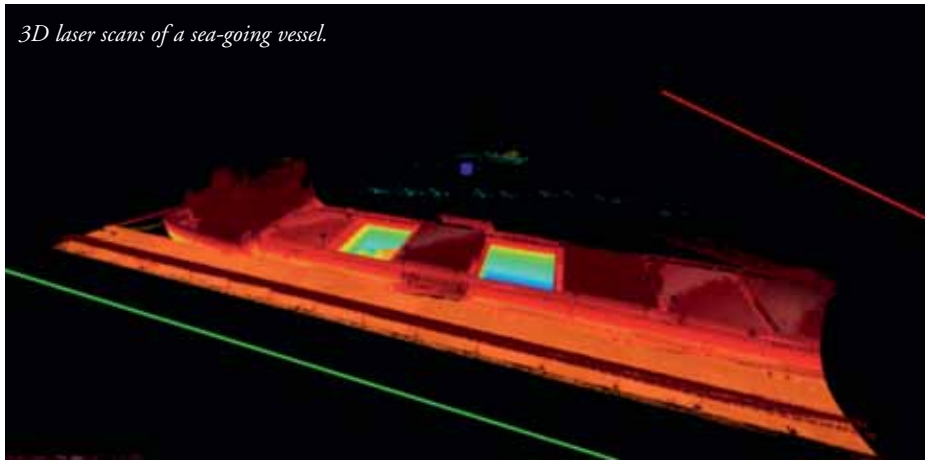
It also defines slow-down and final-stop zones on either side and in front of the boom to avoid collisions with deck obstructions such as deck cranes, light masts or open butterfly hatches. The system provides the distance to the closest detected collision hazard to the machine PLC and a stop signal in case the obstruction violates the defined final-stop zone.

In addition to the two-dimensional collision protection described above, a three-dimensional safety zone is defined around the shiploader boom. This zone is protected using a three-dimensional ship model calculated from laser scan data and RTK-GPS position measurement. Should the machine be equipped with a shuttle, the zone is automatically adjusted to match the actual boom length.

The system provides all necessary data to the machine control system to ensure a safe stop of the shiploader before a collision occurs.

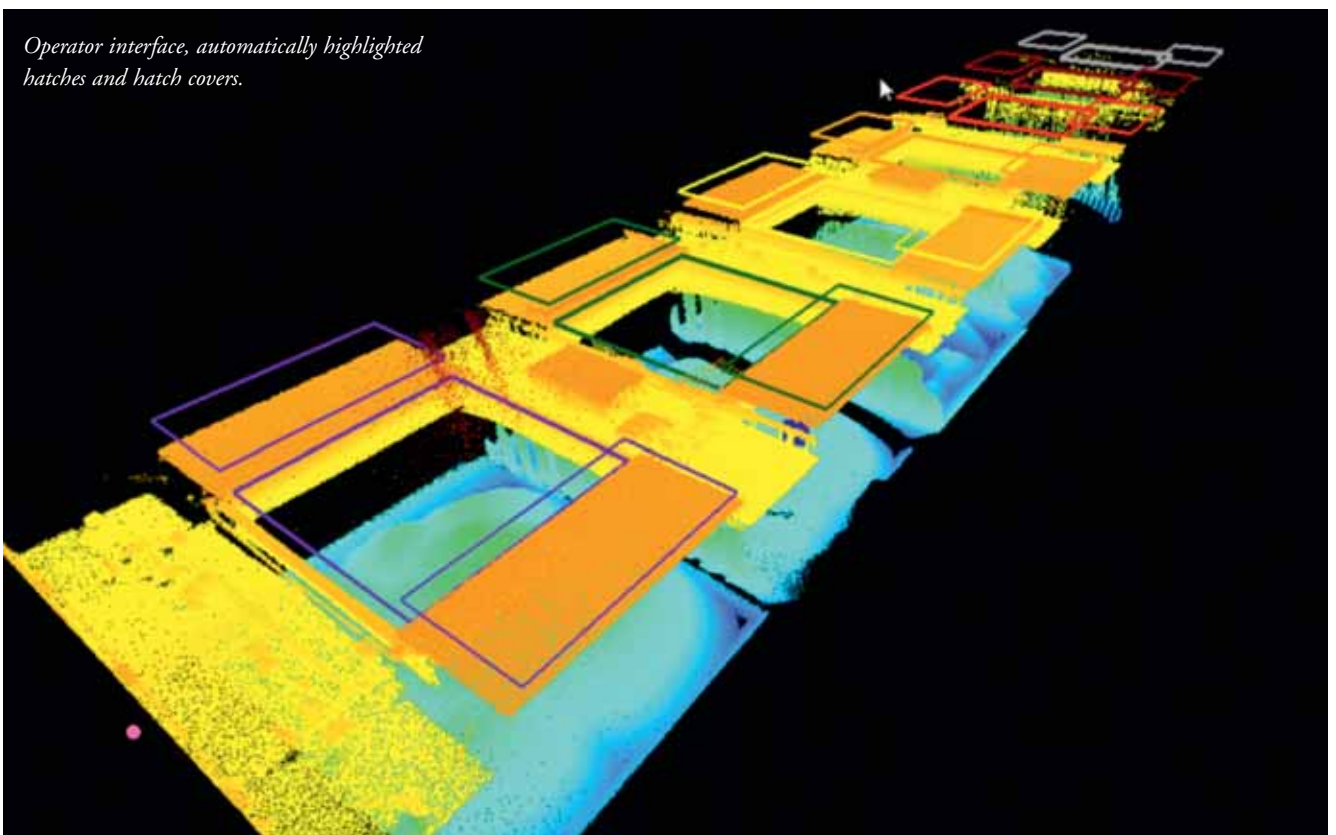
A standard industrial PC can be used to display the 3D model in the operator cabin or a remote control

3D laser scans of a sea-going vessel.



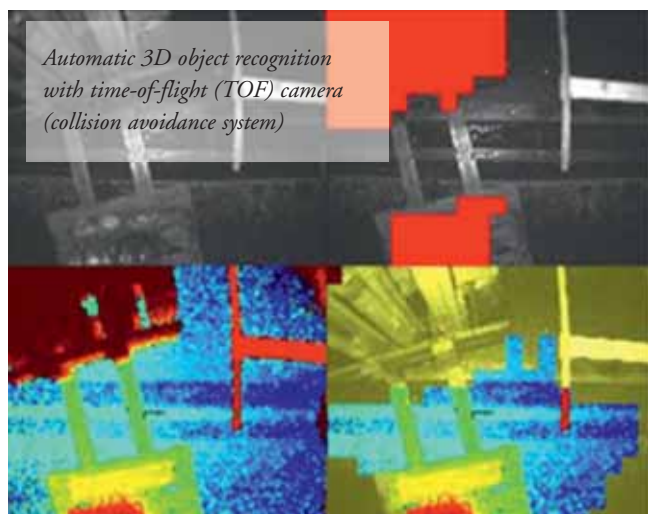
Side view into hatches, loading profile and hatch wall structure visible.

Operator interface, automatically highlighted hatches and hatch covers.



room. The **iSAM**® visualization client provides the following main views:

- ❖ 3D ship model in a pan/tilt/zoom view;
- ❖ precise position of hatches;
- ❖ highlighting of collision hazards based on current data;
- ❖ material distribution within a hatch; and
- ❖ distance and direction of nearest collision hazard

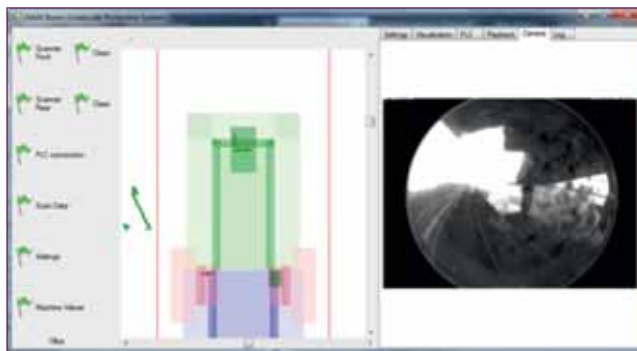


Automatic 3D object recognition with time-of-flight (TOF) camera (collision avoidance system)

The **iSAM**® advanced anti-collision system can be upgraded to facilitate fully automatic shiploading. This system utilizes the 3D ship model and the 2D boom protection system and hence makes it possible not only to control the entire loading process from a remote location but also provide an unprecedented level of automation, enabling one operator to easily control several shiploaders from a central control room.

The benefit

The system provides a comprehensive protection of the complete boom structure by providing collision hazard information to the machine control system as well as to the operator. Optionally, it can be used to fully automate a shiploader, running several shiploaders from a central control station at a remote location.



Visualization of 2D laser data and highlighting of collision zones.

Maintenance cost savings

Experience with already completed projects has shown that after installing a 2D/3D-based protection system there was a significant reduction in maintenance costs for those machines.

By replacing positioning sensors of the shiploader with a RTK-GPS system the maintenance costs for those sensors can be reduced by approximately 90%.

Advantages of the system

- ❖ automatic identification of all collision hazards;
- ❖ timely warning to the machine control system to stop critical movements before a collision occurs;
- ❖ customer-defined slow-down and final-stop zones to operate the shiploader as close as possible to obstructions;
- ❖ prevention of damage to valuable assets;
- ❖ prevention of downtime;
- ❖ reliable sensor equipment while loading during obstructive weather and environmental conditions such as rain, wind, dust, fog or snow;
- ❖ optional upgrade to fully automated; and
- ❖ shiploading from remote locations.



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- Henry Ford

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Coal handling solutions with Kinematics

REPUTATION AND RELIABILITY

When deciding on capital equipment purchases, a lot is on the line, writes Amy Donahue – Marketing, General Kinematics. Will the equipment work as promised? Will the equipment be reliable? Will it be a maintenance nightmare? What if it doesn't work? General Kinematics (GK) has proven through one successful installation to the next that its solutions reduce its clients' risk of buying while helping to improve processes and increase profit to the bottom line.

Founded in 1960, GK engineers, designs and manufactures vibratory process equipment based on the unique principles of Two-Mass technology. Two-Mass refers to a style of vibratory equipment where one mass (an exciter) is used to drive a second mass (trough). The exciter mass typically contains a motor and is connected to a trough using a combination of springs. Combining the two masses and the springs, a responsive sub-resonant system is created which is uniquely capable of handling coal and other materials.

So, why choose Two-Mass technology over typical brute force vibratory equipment? GK's Two-Mass system requires up to two-thirds less horsepower to achieve the same amount of work as a single mass (brute force) system, thereby reducing energy consumption and related electrical costs. By utilizing the Two-Mass drive design, machine stresses are spread throughout the machine, reducing fatigue and stress concentrations found with most brute force designs. More importantly, Two-Mass equipment is capable of compensating for changes in material loads and surges, preventing dampening under full load and surge conditions. Maintenance costs are also reduced, as belts, large motors, and bearings are eliminated.

TWO-MASS IN ACTION

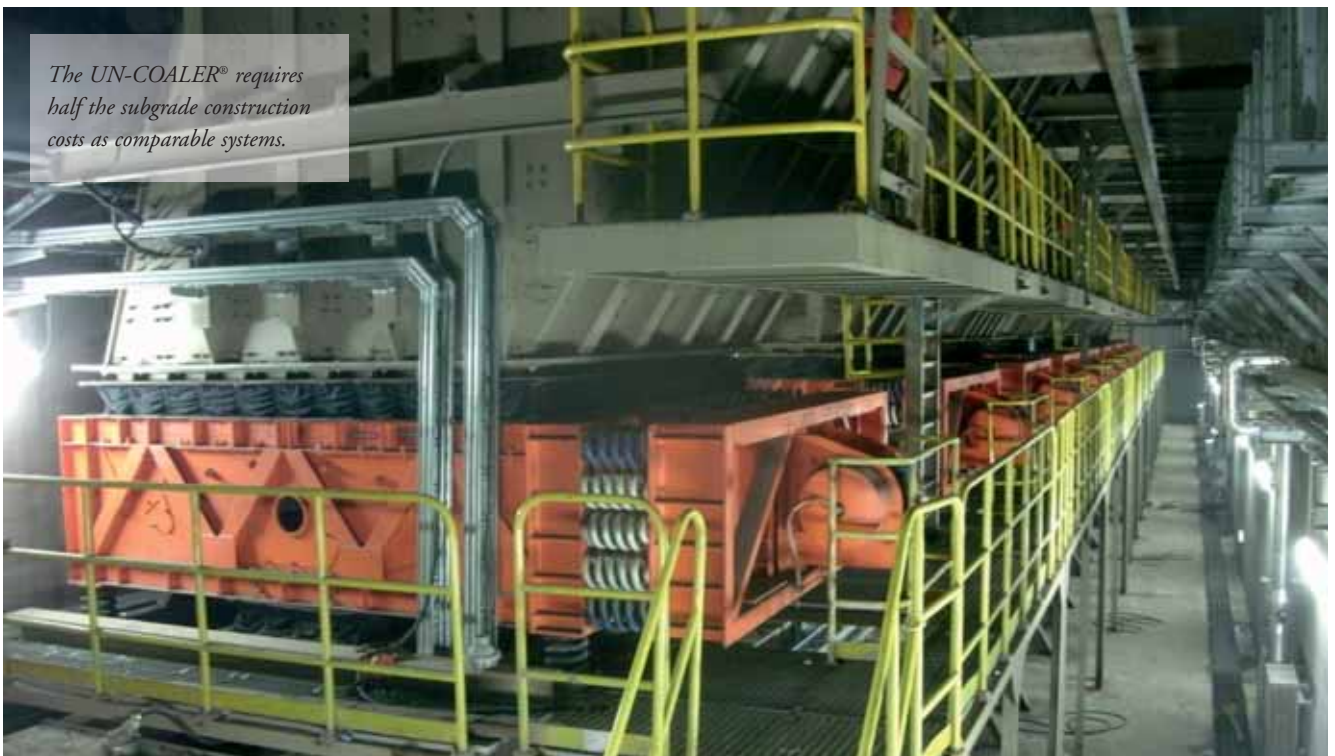
General Kinematics supplies a variety of Two-Mass equipment for coal handling applications. GK's Para-Mount II® Vibratory Feeders



are renowned for their ability to handle coal effectively. Some of the principle advantages of GK vibratory feeders over other types of bulk feeding devices include the ability to utilize full sized hopper openings, which reduce bridging and assure free flow of material. The vibratory feeder pan eliminates, in most cases, requirements for rack and pinion gates, bin vibrators and other devices above feeders since the feeder pan functions as an activator and shut-off plate. The design of the unit permits replacement of the drive mechanism without removing the feeder trough. Eliminating gates also promotes the free unobstructed flow of material. The addition of GK's Variable Force (VF) wheels offers the ability to vary the feed rate of material from near zero to maximum in response to instrumentation signals to meet the process requirements for automated blending and reclaim systems. GK's vibrating feeders are also available in fully-enclosed designs for dust-tight applications.

Another coal handling solution from GK is the UN-COALER® activator/feeder, which combines a pile activator and two feeders

The UN-COALER® requires half the subgrade construction costs as comparable systems.



into a single unit. The UN-COALER® combines the flow control characteristics of a totally enclosed vibrating feeder with the material activating action of a vibrating bin bottom to assure maximum material 'drawdown' — all without the attendant problems of flushing or compacting.

The construction consists of a square or rectangular box structure with two symmetrical 'feeder' pans in combination with a centre dome. The geometry of the material flow path is similar to the requirements for open pan feeders. The centre dome is part of the box structure and functions as a pile activator or vibrating hopper bottom. The entire assembly is vibrated horizontally by GK's proven Two-Mass drive mechanism identical in design to a coil spring feeder drive. The bottom slot opening feeds the material to the belt to deposit the coal symmetrically and centrally to develop an ideal belt loading. The centre dome induces vibratory energy into the material to reduce the possibility of bridging and induce material flow in the storage pile.

The UN-COALER® activator/feeder, when applied to coal handling, will increase the amount of reclaimable live storage. Units are available up to 17 x 17 and up to 5,000tph (metric tonnes per hour), depending on application and material characteristics. Most UN-COALERS® are foot-mounted on steel

coil isolation springs, thus the tunnel roof does not have to be designed to withstand the weight of the unit or any dynamic forces. Automated control systems arranged to respond to belt scale, load cell or computer signals, allow individual or multiple unit control of the UN-COALER® for selective reclaiming from virtually any point or combination of points along the tunnel. The controlled rate of feed can be set from near 0 to 100%, depending on flow. The low-profile design of the UN-COALER® significantly reduces the cost of foundation excavation since the tunnel does not have to be as deep. Straight-line surfaces eliminate elaborate concrete forming and other civil work. The savings associated by significantly reducing the costs of subgrade construction make the decision to switch from vibratory feeders to the UN-COALER® easily justifiable. In addition, there is virtually no maintenance, no wear parts and service life has been proven to be greater than 30 years! Built to perform, the GK UN-COALER® will move its clients' coal for a long time.

Finally, General Kinematics all new STM™ line of vibratory Screens also utilize GK's Two-Mass drive, and are available in standard sizes with single or dual deck configurations. The design of GK's STM™ Screen spreads the energy evenly over the body of the machine, significantly reducing fatigue of the screen body.

Two-Mass technology can be seen in action as the unit is load responsive and more energy is transmitted into the material. As load increases, material remains on the screening surface five times longer than competitive designs, which works the material longer. STM™ Screens are capable of screening, washing and drying unlike any other screen in the industry, and are capable of material volumes up to 4,000tph. Dual in-board vibratory motors eliminate expensive belts, shafts, and bearings for increased uptime, longer service intervals, and the lowest cost of ownership available in a vibratory screen package. Available in standard sizes and custom sizes, various decks and other options, the STM™ Screen is the new trend in screens for coal handling applications.

CONCLUSION

General Kinematics Two-Mass engineered solutions for coal handling are a high performance alternative to traditional brute force vibratory equipment. Machines offer increase throughput while utilizing lower energy, and deliver extended uptime and machine life through low stress design and construction. GK's Two-Mass solutions also are responsive to changes in load, ensuring consistent material flow. Most importantly, all GK vibratory equipment is backed by its international team of vibratory experts, who are available to help 24/7/365.



STM™ Screen replacing one of eight competitive screens.

Staggering turnover increase for Latvian equipment supplier

TTS (Transportation Technology Systems) is a manufacturer of transportation technology systems and non-standard equipment. Its equipment can be used to handle a wide range of materials, including coal. The company is affiliated with the construction and manufacturing group LNK Industries, which is part of the LNK Group holding company.

TTS is a rapidly growing enterprise that utilizes a modern technological base, allowing the factory to carry out the entire cycle of manufacturing of non-standard conveyor equipment independently. The factory includes two production facilities with a total



area of 20,000m². The credit for successful implementation of modern technologies and the high quality of equipment produced at the TTS factory is due to its more than 200 skilled workers. TTS increased its turnover by 183.9% in 2013, which is the best result among the metal-processing industry enterprises in Latvia. It puts the company in a very creditable tenth place in the metal-processing industry TOP.

TTS is today manufacturing ever more complex equipment with higher value added, thus increasing

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handling equipment supplier for major projects such as the coal terminal in Ventspils, Latvia (Baltic Coal Terminal), a terminal for the transshipment of mineral fertilizers in Riga (Alpha Osta) and many others.

In 2013 TTS, along with the affiliated companies of LNK Industries group, completed three turnkey terminal projects: the mineral fertilizer handling complex for Riga Fertilizer Terminal, Riga Bulk Terminal (Latvia) with up-to-date terminal systems for cargo transshipment that comply with all international standards thus ensuring both safe and effective terminal operation and a passenger-cargo terminal at the Port of Klaipeda, Lithuania.

the turnover. The company has operated successfully for more than 20 years. Throughout this time, it has striven constantly and systematically to be the best that it can, by manufacturing more and more complex equipment, accumulating knowledge, conducting research and developing its own solutions.

TTS successfully operates in the field of equipment manufacturing for cargo handling in Latvia, as well as in other EU and CIS countries. Production of equipment for sea ports is a relatively new field of activity for TTS. However, the company has already participated as a steel structure and material



In implementing projects related to heavy equipment manufacturing, the company uses the capacity of the bridge and construction structures workshop, equipped with 30-tonne cranes, large-scale horizontal boring mill TOS Varnsdorf WRD-150 — the largest in the Baltics, brand new shot blasting and painting/drying chambers for flawless anticorrosion treatment and supreme welding equipment.

The plant's advantageous geographical location facilitates the delivery of the ready-to-operate product to any location in the world within the shortest possible time.

TTS is a company of the LNK Industries group that also includes Latvijas Tilti (Latvian bridges), a company with extensive experience in bridge, berth and other metal structure construction and installation.

TTS always co-operates with the best Western component suppliers, such as SEW, Flender, Metso, Sandvik, Bosch-Rexroth, Festo and others to provide maximum reliability and high output of its conveyor systems.

Millions of tonnes of bulk materials are transported annually using the equipment produced by TTS. Whether it is a belt conveyor or a scraper conveyor, the company is ready to design, manufacture and install it in the shortest time possible.

TTS offers a full range of services — 'one stop shop', starting from design to installation and training of personnel. It introduces new technologies, optimizes of production processes and uses modern technologies and the latest equipment.

DCi

Telestack boosts efficiency at Imbituba



Telestack shiploader and truck unloader are fully mobile and require only a single operator using a hand-held remote to oversee loading to fully trim the vessel.

shiploading solution offers high-speed loading, flexibility and mobility

Loxus, which exports various dry bulk commodities, including petcoke, calcinated coke, corn and soybean, from the Brazilian port of Imbituba, concluded that using mobile harbour cranes to load consignments was inherently inefficient, and wanted to explore alternatives. Given the type of commodities that it dealt with, a shiploader appeared to offer the upgrade needed.

However, the company wanted a highly flexible and, above all, mobile solution that could guarantee loading rates of at least 750m³ per hour. It was also vital that any equipment deployed would not cause damage to the quay, while Loxus was insistent that loading had to be as dust-free as possible.

It therefore approached Telestack to see whether its requirements could be met at a price that would allow the company to make a reasonable return on its investment.

“The problem with its existing mobile harbour cranes was that they were simply not fast enough, resulting in vessels spending too much time in port. Loxus therefore needed a system that could guarantee faster turnaround times,” explains Padraig McDermott, Telestack’s technical sales manager.

Prior to putting forward possible solutions, extensive

consultations took place. McDermott twice flew out to Brazil to better understand the working environment at Imbituba. Loxus also sent its own team to the Telestack facility in Omagh, with the client reviewing details of the equipment at each stage of the design.

Given the fact that Loxus handles a wide variety of dry bulk materials, the Telestack solution also had to take into account product density, physical size and material conveying angles when coming up with the final design.

The eventual design proved to be a unique and innovative solution, encompassing both a mobile truck unloader (TU 1016R) and a mobile shiploader (TS 1242).

“The two components were not developed in isolation, but rather designed to work in tandem,” stresses McDermott.

The truck unloader was unique in offering triple-entry truck feeder points, effectively meaning that inbound trucks arriving at the port could be swiftly dealt with, thereby minimizing costly queuing, which so blights many Brazilian ports during the harvest season.

“Having trucks sitting waiting for an unloading slot is both

time-consuming and costly. The Telestack solution at Imbituba virtually eliminates that by providing three discharge points, thereby ensuring a constant flow of materials into the machine, keeping any non-production time to an absolute minimum,” stresses McDermott.

Of equal importance was the fact that Telestack’s design was specifically tailored to ensure that the size and structure of trucks used by hauliers in Brazil to bring bulk materials into the port could be easily accommodated.

WANTED: A GREEN TECHNOLOGICAL SOLUTION

Loxus specifically wanted a ‘green’ solution, requesting that any equipment be fully enclosed to encapsulate dust generated by the movement of inbound commodities.

The tipping area for trucks is therefore housed and full dust containment measures built into the conveyors and transfer points.

In terms of technology, the truck unloader is electrically driven, being powered by a CAT Olympian GEP165-I generator. It incorporates a variable-speed drive (VSD), allowing the customer to adjust the speed of the belt to match tonnage and throughput requirements.

“By building in this high degree of flexibility, the customer can load various commodities at different densities whilst maintaining the system at a constant volume,” says McDermott.

Loxus was also insistent that the mobile solution should cause as little damage as possible to the quayside. After extensive research, the engineering team added rubber pads to the tracks, which provided extensive protection to the quayside paving.

As for the TS 1242 shiploader, it is also an autonomous unit, powered by its own generator and entirely self-contained. Part of the remit was to ensure that the unit does not emit dust and therefore has full dust containment measures in place on the

Telestack TU 1016R innovative triple-entry truck feeder points ensure constant flow of material to the Telestack shiploader.



inner and outer conveyor.

“After researching different chutes and methods of controlling and maximizing dust containment, the engineering team designed and developed a freefall chute. This concept helps to guide the material to the vessel, while reducing the levels of dust escaping into the environment,” says McDermott.

The tracks fitted to this unit were also manufactured using rubber, thereby minimizing the levels of damage it could potentially cause to the areas where it is deployed.

MOBILITY GIVES FLEXIBILITY

Despite its size, the shiploader is fully mobile and requires just a single on-board operator to oversee loading, using nothing more complicated than a hand-held remote control. It can be moved from left to right, extended or extracted, and raised or lowered during the loading process to fully trim the vessels. The system easily moves from hatch to hatch.

“Another key point is that the machine doesn’t need to be stopped to make these adjustments, eliminating any costly downtime. The remote control also gives the operator the option of speeding up or slowing down the system. Being interconnected electrically, the truck unloader and shiploader speed up and slow down simultaneously,” explains McDermott.

Also significant is that the TU 1016R truck unloader can sit at an angle of 90° to the shiploader, minimizing its quayside footprint.

Both the TU 1016R truck unloader and TS 1242 shiploader have been built using widely available parts and components sourced from global suppliers. The units were provided under a standard guarantee, with Telestack able to provide technical assistance both remotely and using a service partner located in Brazil. Furthermore, both units have been



Telestack TS shiploader fed from triple entry truck unloader — designed specifically to fit local trucks.

specifically designed with ease of maintenance in mind so as to avoid costly downtime.

THE BOYS FROM BRAZIL

Nevertheless, because Telestack places great emphasis on pre-despatch training for its customers, two members of the Loxus crew that would operate and maintain the equipment spent two weeks with the company at its Omagh base, in Northern Ireland. They oversaw both the final stage of the build and all subsequent machine testing.

“They work-shadowed our experienced engineers to get fully acquainted with the equipment. We also organized classroom training sessions with our electrical, hydraulic and mechanical teams. The idea was to get them fully up to speed with the equipment, so any later issues on site could be resolved without delays,” says McDermott.

Loxus also invested significantly in spares and service parts, which were shipped with the machines. Any subsequent component failures can therefore be replaced from inventory. At Imbituba, this is very important since the port is so remote that even getting one of Telestack’s local partner engineers on site would take at least a day.

“If there were to be a problem with the equipment during vessel loading, it needs to be resolved rapidly to prevent rising costs, since vessels stuck in port incur expensive demurrage costs,” says McDermott.

Should a major problem arise that cannot be fixed locally, he stresses that Telestack would be prepared to fly an engineer out

Telestack TU 1016 R truck unloader and TS 1242 radial telescopic shiploader — shiploading at Port of Imbituba, Brazil at 750m³/h.



from the UK.

Summing up, McDermott notes, “This project has been one of the most diverse and challenging ones Telestack has carried out to date, and the success of the project highlights our commitment to developing and manufacturing tailor made systems to serve the needs of our customers.”

TELESTACK

Telestack specializes in the complete design, manufacture, installation and commissioning of mobile, bulk material handling systems.

Telestack has a global proven record in a range of applications including the coal, mining and quarry industries, stockyard management, ports and inland terminals, power stations, rail yards, steel mills, cement kilns and many other bulk material

handling industries.

Its mobile solutions offer significant operating cost savings compared to traditional methods of material handling (wheel loaders, haul trucks, static conveyors), as well as providing environmental, health and safety and other benefits. Other significant benefits include not requiring planning permission due to product mobility and flexibility to move Telestack products to work on other projects. DCi

Telestack engineers designed a free-fall chute for the TS 1242 shiploader to maximize dust containment and to guide material into the vessel.



E-Crane holds technology showcase in New Orleans



During the first week of December last year, E-Crane agents and special guests attended the E-Crane Technology Showcase in New Orleans, Louisiana, USA. The event took place in conjunction with the International WorkBoat Show (IWBS) which was held during the same week (3–5 December) at the New Orleans Convention Center. The three-day event consisted of a dinner reception and presentations on the evening on Wednesday, December 3, as well as two site visits on the following days to see actual E-Cranes in operation.

E-Crane guests and attendees were also given special access to the WorkBoat Show, and were able to attend the exhibit hall throughout the week. The show was well attended. Over the course of three days, over 1,000 vendors exhibited, including E-Crane, and more than 7,000 attended. The WorkBoat Show is the largest marine trade show in North America, serving the people and businesses working on both the inland and coastal waterways.

The dinner and reception on 3 December took place at the historic Hotel Monteleone, located in the French Quarter of

New Orleans. The evening reception was attended by about 50 people, including E-Crane agents, clients, and special guests. During the reception, guests were able to view presentations



E-Crane was well represented at the WorkBoat Show.



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Day 1: The dinner reception held at the Hotel Monteleone was well attended.

about barge mounted E-Cranes and learn more about floating solutions. Once guests were seated for a plated dinner, Mark Osborne, President of E-Crane International USA, gave a presentation featuring several floating E-Cranes currently in operation. A presentation was also given by Steve Osborne about an upcoming project, and about the latest technological advancements with floating E-Crane applications.

On 4 December, guests were taken to visit a floating 2000 Series E-Crane operating at the Charles R. Lowman Power Plant on the Tombigbee River in Leroy, Alabama. Attendees were transported from the hotel by charter bus over to the plant where the terminal was in full operation. Guests were able to walk down to the crane barge to see the E-Crane up close. The E-Crane floating terminal consists of two barges, one for the E-Crane, and one conveyor barge, a hopper that sits on the crane barge alongside the E-Crane, as well as a barge haul and breasting system. The entire floating terminal was designed, engineered, and provided by E-Crane as a turn-key solution. Guests were able to witness first-hand the high productivity of this setup. The E-crane unloads coal at a rate of over 1,500tph (tonnes per hour) with staggeringly fast cycle times in the 25- to 30- second range.

On 5 December, guests were taken to see two MH1200 Series E-Cranes operated by Kinder Morgan at the International Marine Terminals (IMT) in Port Sulphur, Louisiana. Attendees arrived at a dock nearby to IMT where they were taken by boat to see the terminal. It was a beautiful, clear day on the Mississippi River, and guests were able to admire both E-Cranes



Mark Osborne, President of E-Crane International USA, speaks about barge mounted E-Crane projects currently in operation.



Day 3: E-Crane guests visit two MH1200 E-Cranes operated by Kinder Morgan at IMT in Port Sulphur, Louisiana. It was a beautiful day to see both E-Cranes from the Mississippi River.

from the water. One of the cranes at IMT is mounted on a barge which was custom modified to support the E-Crane. The other E-Crane on site is dock mounted. Both E-Cranes are used for a barge cleaning application.

The 2014 E-Crane Technology Showcase was a great opportunity for attendees to network with E-Crane employees and representatives along with current E-Crane owners and operators. Guests were able to learn more about the E-Crane company and products, specifically E-Crane floating solutions. It was also a great chance for attendees to see an E-Crane operating in person and learn more about the latest technological advancements that E-Crane has made.

DCi

E-Crane enjoys lasting relationship with J&B

E-Crane has worked together successfully with many grab suppliers worldwide. For almost two decades, there has been a regular co-operation with the Dutch grab supplier J&B Grabs. Valuable input from customers, combined with E-Crane and J&B expertise, results in best value 'bulk grabbing solutions'.

J&B Grabs will shortly celebrate its 70th anniversary, and E-Crane is among the many who would like to congratulate J&B on this milestone.



Day 2: E-Crane guests visit a 2000 Series E-Crane at the Charles R. Lowman Plant in Leroy, Alabama.

DHHI: Chinese giant makes its mark on the bulk market



Dalian Huarui Heavy Industry International Co. Ltd, is a subsidiary of the Dalian Huarui Heavy Industry Group Co. Ltd. (DHHI). Its main focus is the sale of DHHI products and their marketing overseas.

DHHI has over 10,000 employees. Its headquarters and five manufacturing bases are based in Dalian, China. The company's main dry cargo products include: stackers, reclaimers, stacker/reclaimers, shiploaders, ship-unloaders, car dumper systems and cranes. It also manufactures quayside container cranes, yard-side container cranes, metallurgical machinery and more. The company is an experienced machinery manufacturer, and it now has EPC (engineering, procurement & construction) capability for material transfer systems in ports, steel plants and so forth.

The company's main clients are:

- ❖ port companies;
- ❖ steel plants;
- ❖ electric power plants;
- ❖ raw material suppliers (including VALE, its biggest client, BHP Billiton Ltd, India JSW, and Nippon Steel).

DHHI operates in a very competitive market, with major competitors including ZPMC, which also manufactures port

machinery and bulk material handling equipment.

The last year has been a very successful one for DHHI, and it has enjoyed many successful projects, a few of which are noted below:

SEPTEMBER 2014

The company held the launching ceremony for the modular final assembly of large-size bulk material equipment of the Australian Roy Hill Iron Mine Project

On 24 September, DHHI held a grand launching ceremony for

The first stacker made by DHHI for Roy Hill Holding Pty Ltd is sent to Australia, creating a precedent for the modular final assembly of large-size bulk material equipment in China.





the modular final assembly of large-size bulk material equipment of the Australian Roy Hill Iron Mine Project on the site of final assembly of equipment of Roy Hill Iron Mine Project at the general cargo wharf of Dalian Port (Monk Island). The fixed stacker, with a production capacity of 13,700tph (tonnes per hour), manufactured by the company for the Australian Roy Hill Iron Mine Project was being shipped with modular final assembly completed therein. This project is an example of the success of such new operations and that of modular final assembly of large-size bulk material equipment in China. This is very important to



DHHI, as it demonstrates the company's R&D level in major equipment, enhancing its competitiveness in domestic and foreign markets. This is helping to enhance its international reputation, and is furthering its move into the markets of developed countries including Australia, Brazil, Canada, the USA, etc..

NOVEMBER 2014

In late November last year, a freighter was loaded with two sets of 5,000tph stackers which DHHI manufactured for the Roy Hill project in Australia. It took three months to ready these two sets of stackers — installation work began in August last year. During these three months, there were many revisions and improvements that took place in the installation and

commissioning phases, to ensure that the equipment was delivered to the client working at maximum efficiency and highest quality. At the time of writing, the 14,400tph reclaimer, which is part of this project, was expected to be shipped at the end of 2014.

JUNE 2014

Three devices made by DHHI have been put into use in the first phase of the Vale project.

The Handling Machinery Division, a subsidiary of the DHHI Group, has designed and manufactured a total of 11 sets of



stackers and reclaimers for Vale. Recently, three sets of 8,000tph slewing stackers, which were made for the first phase of the Vale Project, have been installed and put into use. All machines are running well, in good condition, and have gained a solid reputation with the customer.

DCi



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Bright future ahead for India

It is intended to increase capacity at Dhamra Port from 25mt/year to a staggering 100mt.



Kunal Bose

Port building and modernization programme key to Indian plans

After two years of disappointing sub 5% GDP growth, India is getting primed for better times. The International Monetary Fund (IMF) in its latest World Economic Outlook report says India will be growing 6.5% in 2016/17, thereby overtaking China which then is expected to see its economy expanding 6.3%. IMF projections about India are more or less in line with the World

Bank saying the country, benefiting from a raft of new economic reforms, will grow 6.4% in 2015. 'Make in India' programme launched recently by prime minister Narendra Modi has caught the fancy of domestic and foreign investors. What investors also find encouraging is Modi's promise to do away with 'red-tapism'. The prime minister is acutely aware that for sustainable high

economic growth, which can alone lift one-third of the country's population from below the poverty line, the country should have a strong supportive infrastructure. This includes ports to be made comparable with the "best international ports in terms of performance and capacity" along with good road and rail connectivity with the hinterland.

In the year ended March 2014, Indian ports, including 13 major (arbitrarily so described) and 200 non-major ones handled 976mt (million tonnes) of dry bulk, liquid and containerized cargoes against 933.66mt in 2012/13. The issue of arbitrariness arises because some of the so-called non major ports not only have bigger capacity than the major ones but they also have massive expansion programmes actively pursued. To give one example, soon after the acquisition of Tata Steel and Larsen & Toubro promoted Dhamra Port on India's eastern coastal state Orissa in May 2014, Adani group said in less than three years it would expand the port capacity from 25mt to 100mt. The expansion will require building 12 new fully mechanized berths to the two operating now handling dry bulk cargoes like coal and iron ore.

Acquisition cost of Dhamra was Rs55bn (\$887m) and Adani will be required to spend in multiples of that to achieve 100mt capacity. By replicating the success the group has achieved with its port on the western coast in Gujarat, it is confident of becoming a "200mt ports business ahead of 2020," says chairman Gautam Adani. An official of Orissa government told *Dry Cargo International*, "wait for a while, you will see great things happening with Gopalpur port once Tata Steel gives shape to its multi-product special economic zone project over 3,000 acres of land." The advantage with both the ports and also with the vibrant Paradip Port in Orissa is the availability of deep hinterland highly rich in natural resources like coal, iron ore, chrome and manganese ores and bauxite and farm products. All this besides, the hinterland houses some very large producers of steel, aluminium and ferroalloys. They all need good access to ports and efficient handling of inbound and outbound cargoes.

The last government headed by Dr Manmohan Singh formulated a perspective plan for the maritime sector running through 2020 in consultation with all stakeholders. Hopefully, the plan will hold good in the new regime. The three principal objectives of the plan are: (i) build capacity of 3,200mt for the ports to handle an expected traffic of 2,500mt. (ii) Local and foreign shipping lines and shippers want considerable improvement in port and related services at several Indian ports. Full mechanization, a shift to computer-controlled operation and major labour productivity improvement will bring Indian ports at par with the best international ports in terms of performance. (iii) Besides a 7,510km-long coastline, the country is criss-crossed by a good number of mighty rivers, including the Ganges, the Brahmaputra and the Narmada flowing into the Bay of Bengal or Arabian Sea. A number of committees in the past have said that the country stands to save on fuel and thereby restrict carbon emission and avoid a good deal of road decongestion if well-dredged rivers are used for goods transfer



Dhamra port.

from one point to another. The perspective plan wants coastal shipping to be promoted in a big way.

Speaking to *Dry Cargo International*, an official of Confederation of Indian Industry (CII) said "the Indian port sector offers many investment opportunities to build greenfield port projects, preferably deep sea all-weather ones along its long coastline and in terminals and berths." Government-controlled and also privately owned ports are open to offer space to groups to build berths and terminals for captive use. The task of raising port capacity from 1,430mt to 3,200mt in a short span has made it imperative for the government to invite private sector to invest in a "very big way" and thankfully it is obliging.

The CII official said the states must be proactive in making available large tracts of land the way Gujarat had done in the case of Adani and Pipavav ports to realize the country's ambitious capacity target. Dredging and connectivity between ports and hinterland also offer major investment opportunities to the private sector. Draughts in major ports are between 10 and 14 metres. The shipping ministry wants the draught in all major ports to be over 14 metres and more than 17 metres in hub ports. The task is too big for the government-owned Dredging Corporation. Foreign investment will be particularly welcome in this area. Shippers go on asking the government to give priority to make all ports to be connected with hinterland by at least four lane roads and double rail line. Isn't cargo traffic to ports slowing down because of 35% dependence on roads? The available situation calls for adequate nodal shift to railways, coastal shipping and inland waterways from roads.

In the meantime, feasibility studies are ready for building a deep draught port at Sagar Island in West Bengal with capacity of 54mt and requiring an investment of Rs78bn and Dugarajapatnam port in Andhra Pradesh. The latter will have capacity of 25mt in the first phase. The outer harbour project at Tuticorin port in Tamil Nadu conceived to bring in coal from Australia, Indonesia and other places to make the southern state a major power hub with capacity of 15,954MW is among the country's most ambitious port projects. Execution of 97.5mt-capacity in the first phase will call for an investment of Rs72.41bn in breakwaters and capital dredging and nearly Rs44bn in berth construction. Being close to many international shipping routes, Tuticorin port since renamed VO Chidambarnar is strategically located for coal imports.

Coeclerici – steady position in India

Coeclerici's FTS Bulk Challenger.



Coeclerici's Logistics Division, which specializes in providing custom-built marine solutions, including dry bulk transshipment services, spotted an opportunity in India in early 2000.

At that time, Indian ports were facing severe draught restrictions, coupled with slower handling rates. After detailed discussions with large industrial customers, Coeclerici therefore designed a solution customized for the Indian market. The solution was designed to overcome their respective logistical constraints.

In the year 2002, Coeclerici's Logistics Division delivered India's first Floating Transfer Station (FTS) *Bulk Challenger* to Mumbai for discharging the dry bulk cargo of Ispat Industries Limited (now JSW Steel). With the booming Indian economy in 2006, Coeclerici continued to expand its presence in India by partnering United Shippers Limited (USL), one of the largest stevedoring firms in India operating at various ports on the West Coast of India. Coeclerici invested in USL becoming its shareholder and the duo partnered in conceiving a new project capable of performing both loading and discharging operations mid-sea, a feature which made newly built FTS *Bulk Prosperity* uniquely different from standard transshippers.

Coeclerici designed the new FTS *Bulk Prosperity* which was capable of performing both type of operations i.e. discharging any kind of dry bulk cargo from vessels up to Capesize into the barges, as well as loading from barges into vessels up to Capesize. It also has capacity to store about 10,000 metric tonnes of cargo in its hold and its propulsion system helped in moving the FTS from one location to another on its own power and without assistance of tugs.

The duo delivered *Bulk Prosperity* in 2008. The unique flexibility offered by the unit led to its usage in different ports

for different operations and handling different cargoes. While it discharged iron ore/coal/coke from the Capesize vessels of Essar Steel at Hazira near Surat, it also loaded iron ore and bauxite for Fomento Group/Vedanta (Sesa Goa) and Ashapura Minechem at Goa and Bedi respectively. *Bulk Prosperity* was able to handle cargo at a net rate of up to 18,000 metric tonnes per day unloading, and up to 20,000 tonnes/day loading. The *Bulk Prosperity* was amongst the first FTS to operate during a monsoon at mooring dolphins installed by Mormugao Port Trust.

The Indian economy continued to grow and coal imports kept increasing. Spotting an opportunity to meet the additional handling requirements of coal importers, Coeclerici, along with its partner USL, decided to develop a custom-built facility that could meet coal importers' expectations and at the same time render valuable services to their supply chain. The duo decided to construct a floating crane in India to meet the above requirement.

The brand-new floating crane *Uniglory* started operations in Indian waters in the second half of 2012. *Uniglory* handles cargoes for various coal importers such as Essar Group, Vedanta (Hindustan Zinc), Jayprakash, Adani, Reliance, etc in the ports of Bedi and Navlakhi. The transshipment concept has started gaining interest amongst Indian coal importers. Sustained coal imports, coupled with congestion at deep water ports/ restricted availability of deep water ports, increased the use of transshipment facilities in India for coal discharging. This situation brought the partners to hire four floating cranes from the market. The combined usage of these floating cranes could result in achieving discharging rate up to 25,000 tonnes/day. Transshipment services have helped Indian coal importers to make savings, reducing ocean freight cost, resulting in lower

import bills and also streamlining their supply chain. India now has about 30 transshipment facilities which help in overcoming draught restrictions at ports and help Indian importers/exporters in loading/discharging vessels up to Capesize. Coeclerici's Logistics Division has, to date, handled more than 8mt (million metric tonnes) of cargo through its various transshipment facilities.

The acceptance of the transshipment concept in India has led Coeclerici, together with its partner USL, to proceed with the construction of another floating crane in India; this is expected to be operational by the second half of 2015. Additionally, Coeclerici has also made investments in a minor port operating company and is also actively involved in coal trading supplying thermal coal, coking coal and coke to Indian customers.

Coeclerici Group was founded in Genoa in 1895 and is celebrating its 120th anniversary this year. Coeclerici's business division include Logistics, Trading Mining and Shipping. Coeclerici – Logistics Division has transshipment facilities operating in Indonesia, Mozambique and India. It handles about 25mt a year of cargo mainly coal, iron ore, sulphur and bauxite.

Coeclerici's FTS Bulk Prosperity.



It also owns and operates high-speed boats in Venezuela. Coeclerici has an in-house project team looking after engineering, design, construction, supervision during construction and operations of custom built marine assets owned and operated by Logistics Division on long term contract with large industrial customers. The Coeclerici Group is headquartered in Milan with offices in Amsterdam, Beijing, Caracas, Jakarta, Lugano, Moscow, Mumbai, Novokuznetsk, Singapore and Sydney.

Krishnapatnam Port – India's dry bulk handling gateway

With India's coal imports trending upwards, Krishnapatnam Port expects to play a key role in handling surging coal imports. With its world-class infrastructure in place, the state-of-the-art Krishnapatnam Port is breaking all records. Not only did it become the first port to handle 100,000 cargo containers in less than one and half years after the opening of its Krishnapatnam Port Container Terminal, it is the first port to offer a deep draught of 18.5 metres on the East Coast enabling it to handle large Capesize vessels.

Commissioned in July 2008, the port has been seeing a surge in cargo handling, especially coal. While the port handled only 440,554 metric tonnes of coal between July 2008 and March 2009, it recorded a huge, several-fold jump in coal handling in these four years and handled a whopping 19,751,045 tonnes of coal in last financial year (FY13/14). With its efficiency and commitment to providing the best of services, the port has already beaten its half-yearly target for this year with a record breaking 14,367,133 tonnes of coal handled in just seven months (Apr–Oct 2014).

One of the major factors driving the growth is India's increasing dependence on coal imports. Of the country's projected coal imports of 240mt (million tonnes) by FY15/16, KPCL is aiming to have a bigger share and aims to import around 40–50mt of coal by FY16. For Krishnapatnam Port, the



imports will feed the surrounding industries, steel plants and power plants. Currently, seven power-generating companies are located surrounding the port area. Several power companies are currently building coal-fired electricity generating units in and around Krishnapatnam with a capacity that is likely to go up to 15,000MW. These companies cumulatively would be importing at least 70% of their coal requirement through Krishnapatnam port. Additionally, with Krishnapatnam being announced as one among the proposed 100 Industrial Smart Cities in India, the demand for coal will further go up to meet the industrial

requirements in the region.

With Krishnapatnam Port soon becoming the hub for industrialization in the region, coal imports are surging with an expectation to hit 100mt/annum in the next ten years. KPCL has always been a step ahead of demand by increasing its port capacity and operational efficiency. The port has recently inaugurated a mechanized coal handling system which facilitates the quick unloading of coal through the ship unloaders and



conveyed through a conveyor system that has a capacity of 3,000tph (tonnes per hour) and can directly transport cargo to its destination. It would enhance the berth productivity to 12mt per annum, eliminating all intermediary supply chain/logistics costs ensuring quality, zero handling loss and faster evacuation of cargo. This automation is slated to phase out all the existing multi-handling and manual operation system. Two TRF ship-unloaders, each with a capacity of 1,500tph, have been added into the port infrastructure.

Krishnapatnam Port is a new-age port with world-class facilities. It handles various types of coal from coking coal, met



coke, pet coke and thermal coal. It is the largest private port on the East Coast of India with 24x7 operations. It is an all-weather port with excellent connectivity to the MENA and APAC regions. With a deepest draught of 18.5 metres, the port is capable of handling Capesize vessels up to 200,000dwt, benefiting port users in terms of reducing ocean freight. The port is further increasing the draughts of its berths to enable more berths to accommodate larger-sized vessels and increasing volumes.

The port provides fast turnaround times for all types of cargo — it is equipped with 13 shore cranes each with a discharge rate of 1,000tph. KPCL is customer-focused, a one-stop-shop with centres of excellence such as single window clearance and



24x7x365 customer service with end-to-end port services. It has 6,500 acres and houses coal storage yards, dedicated plots, 13 warehouses which are spacious enough to store around 500,000 tonnes of cargo and connected with railway sidings exclusively for coal and other cargoes. This fosters quick and efficient cargo evacuation. The port has road and rail connectivity with 100mt/annum of evacuation capacity and is capable of going up to 200mt/annum. It currently handles 25 container rakes a day and aims to steadily reach 50 rakes in the next two to three years with the doubling of railway lines to be completed in the near future.

KPCL currently, is making huge investments to improve its



capacity and efficiencies. New berths have been added, new rail and roadways are being built. New equipment such as ship unloaders, post-Panamax quay cranes, mobile-harbour cranes, etc. are being added. Though still in its infancy, KPCL in a short span has already matched global standards in offering top-class port services and facilities.

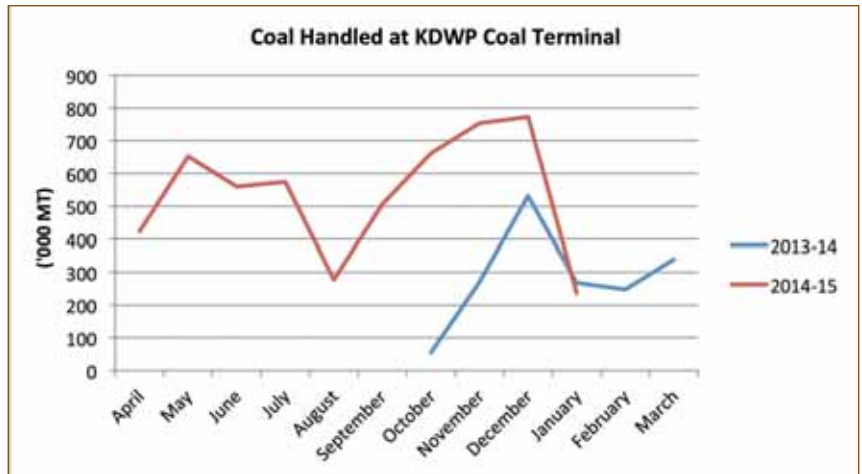
The port's ability to handle very large bulk carriers and the massive infrastructure created, including rail lines, have made a huge difference to the cargo business in the eastern India. In order to meet the expected coal import growth, the port has plans to ramp up the existing infrastructure. The plans include: the construction of new berths; mechanization of cargo handling systems — wagon loader (3,500 tonnes in two hours), stacker/reclaimer (3,000–5,000tph); wagon tippler (30 tips per hour); locomotives (four); and three in-motion; and 23 weighbridges, among others. It already has in place a dedicated four-lane road with capacity to handle 5,000 trucks/day.

KPCL was initially commissioned mainly to handle iron ore and coal. However, with the Supreme Court of India banning the export of iron ore in 2010, the port has concentrated more on coal and other cargo such as edible oil, fertilizers and containers. Krishnapatnam Port has just set sail and is already creating waves in the maritime world. Its vision is to handle 100mt by 2018. Its belief of constantly adapting to the needs of its customers has been its success mantra and it aims soon to become India's largest and best-in-class multipurpose port.

Bothra Group on the Indian east coast

Since its formation in 1977, Bothra Group has evolved from a conventional stevedoring, clearing and forwarding agency to a multidimensional shipping and port logistics group of companies. The group and associate companies have since gone global with operations in Singapore, China, the Far East, Indonesia, India, Middle East & African continent. Bothra Group enjoys a reputation beyond the shipping sector as a competent and reliable end-to-end logistics service provider with shipping and overland logistic solutions tailored to customer needs.

In recent times the group has focused on mechanization of its cargo handling activities at Kakinada. Bothra Group handles the majority of dry bulk cargo in Kakinada Deep Water Port



(KDWP). In October 2011, Bothra Group and Kakinada Seaports Limited together commenced construction of a state of the art 8mt (million metric tonnes) per year mechanized coal



handling terminal at the 5th Berth of KDWP. KDWP Coal Terminal was commissioned in October 2013 and within the first year of operations exceeded the projected traffic and handled over 6.9mt of coal till end of December 2014.

Bothra Group and Kakinada Seaports Limited are now close





to-end logistics services. Bothra Group has been providing this service to many of its esteemed clients including Andhra Pradesh Power Generation Corporation (APGENCO, a Govt of Andhra Pradesh undertaking) for the last many years. Under these services Bothra Group oversees the entire movement of coal cargo for APGENCO's thermal power plant in Vijayawada. For

to commissioning a 6mt per annum mechanized fertilizer handling terminal at the 6th Berth of KDWP. The KDWP Fertilizer Terminal features completely weather-protected railway sidings, a warehouse and an automated bagging system. The KDWP Fertilizer Terminal features a warehouse covering 72,450m² (18 acres) of floor space under a single roof, sufficient to store 400,000 tonnes of fertilizer cargo at any time. At 84 metres wide and 862.5 metres long, the warehouse is large enough to shelter 11 Airbus 380s. Discharge operations through this terminal were recently commenced in October 2014 and the bagging and dispatch system will be commissioned by April 2015.

KDWP Coal Terminal and KDWP Fertilizer Terminal have revamped the way dry bulk cargo is handled in the port of Kakinada. Bothra Group's focus on mechanized cargo handling and faster turnaround time of vessels has brought new clients to Kakinada Deep Water Port and strengthened relationships with existing clients.

As part of the group's efforts to provide innovative logistics solutions and services to its clients, the group also provides end-



APGENCO, Bothra Group co-ordinates and supervises activities from the loading of coal into railway wagons at Talcher, unloading from wagons at Paradip, loading into vessels, coastal movements from Paradip to Kakinada including chartering of vessels, unloading from vessels at Kakinada Port, loading dispatch in trucks or rakes up till delivery at APGENCO's power plant. Annually at least 3mt of APGENCO's coal is handled by Bothra Group through its end-to-end logistics model.

The group has emerged as a strong player in the logistics sector on the east coast of India and continues to evolve and move from strength to strength.

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