

INTERNATIONAL

SEPTEMBER 2015
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A KHL Group publication

cranes

AND SPECIALIZED TRANSPORT

Middle East

Ropes and
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OFFICIAL MAGAZINE

SPECIALIZED TRANSPORT, TOWER CRANE SITE REPORT, THE KNOWLEDGE



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◦ Tower cranes (4-100 ton)



◦ Crawler cranes (55-3600 ton)



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Well, how many people could genuinely say that they saw that coming – a merger between Terex and Konecranes? See the Konecranes Terex news story on page 6. Ron DeFeo, Terex Corporation chairman and CEO, told me, “The combined companies will be stronger together. In today’s world of global competition, stagnant markets and technology challenges – scale is important.

We are building a focused lifting and material handling company with global scale and innovation capabilities.”

On the subject of expected benefits and changes from the merger, DeFeo said, “Konecranes Terex will have several different products that are lifting related. The current Terex Cranes segment will remain virtually unchanged by this merger. We have a different customer base. However, I do expect us to improve our service product offering across the board.”

This month is a special issue on tower cranes and a highlight is the IC Tower Index ranking of the world’s largest tower crane-owning companies. A few surprises this year have changed things more than usual. See the story on page 29. Also on the tower crane theme, product and industry expert Heinz Kessel has written another of his highly detailed reports on this ubiquitous crane type, this time focusing on safety in relation to cranes installed on confined inner city and high rise sites. See page 19.

An exciting visit for me last month was to see Enerpac in the Netherlands. It was the Integrated Solutions division, formerly Hydrospeex. The amount of new product development work going on there was very impressive. There are several major new products in what used to be known as the alternative lifting sector. All of them use hydraulics, many in the form of reciprocating telescopic cylinders, as the core of the motion for lifting and shifting.

Largest, or at least with the highest capacity, of all of the new Enerpac products is the 4,800 tonne capacity offshore overhead travelling crane, the largest of its type in the world, Enerpac said. Initial testing is complete and it is now on its journey towards starting work in the Indian Ocean next year. See the full story on this on page 13. News of the other new products will follow in the coming weeks. Make sure you keep up to date with the latest news at: www.khl.com/cranes

ALEX DAHM

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Specialized Transport, Tower Crane Site Report, The Knowledge

Enerpac's 4,800 tonne capacity offshore gantry crane at its Hengelo manufacturing facility in the Netherlands. See the news special on page 13.

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International Cranes and Specialized Transport is a monthly publication with a worldwide circulation. The annual airmail subscription rate is £205, US\$330, €245. This issue of *International Cranes and Specialized Transport* is mailed on the 14th August 2015.

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International Cranes and Specialized Transport (USPS 017 158) is published monthly by KHL Group and distributed in the US by DSW, 75 Aberdeen Road, Emigsville, PA 17318-0437. Periodicals postage paid at Emigsville, PA. Postmaster: Send address changes to *International Cranes and Specialized Transport*, c/o PO Box 437, Emigsville, PA 17318-0437.



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Published by



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KHL Group 2015
ISSN: 1747-700X

Printed by: Warners Midlands PLC, UK

FEATURES

NEWS SPECIAL

Enerpac has completed initial testing on its 4,800 tonne capacity offshore gantry crane for work in the Indian Ocean. *Alex Dahm* reports

TOWER CRANES 19

Safe application of tower cranes on often cramped inner city sites presents particular challenges to those responsible for the installation. *Heinz-Gert Kessel* reports



SITE REPORT

Two Linden Comansa tower cranes are employed to help construction of the MahaNakhon Development in Thailand. *IC* reports



IC TOWER INDEX

The results of the 2015 *IC* Tower Crane Index indicates a strong and stable tower crane market. *IC* reports

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Alex Dahm talked to *Dan Main* and *Harry Fry* about the challenges surrounding financing tower cranes and the reticence of lenders to consider them a viable proposition

ROPE AND WINCHES

With increased usage of ropes made from synthetics, replacement criteria for ropes are a key topic of concern in the lifting industry.



TOPLIFT PREVIEW

This year's entries for the *IC* Top Lift 2015 competition include a selection of complicated and impressive lifts completed in the last 12 months

REGION FOCUS

To help meet customer requests, manufacturers are offering models designed with Middle Eastern markets in mind. *Laura Hatton* reports



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SC&RA COMMENT

Comment from *Joel Dandrea*, SC&RA executive vice president

SC&RA NEWS

The SC&RA awards programme is an opportunity for members worldwide to have their contributions to safety and ingenuity honoured. *Mike Chalmers* reports

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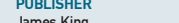
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Terex and Konecranes to merge

The boards of US-based construction equipment manufacturer Terex and Finnish industrial cranes maker Konecranes have agreed to an all-share “merger of equals”. The new entity, to be called Konecranes Terex, will have revenues of some US\$ 10 billion and earnings before interest, tax, depreciation and amortisation (EBITDA) of US\$ 845 million.

HIGHLIGHTS

■ Hydraulic loader crane manufacturer Cormach has signed MS Equipment as its distributor for seven Asian countries. The agreement, initially for three years, is between Italian manufacturer Cormach, and MS Holdings, parent company of MS Equipment. It includes all of Cormach’s lorry loaders, rescue cranes, straight boom loaders, heavy duty and marine models. Countries covered are: Brunei, Cambodia, Laos, Malaysia, Myanmar, Singapore and Vietnam. MS Equipment will be marketing, selling and providing after-sales service.

■ Great Pacific Equipment has developed a zero emission carrydeck crane. The new model ECrane 4500 has a 4.5 ton (4 tonne) capacity with a modern, all-electric operating system and an environmentally friendly footprint, the manufacturer said. It is designed with a self-aligning hexagonal boom using externally adjustable wear pads for proper boom section alignment and easy maintenance. The ECrane 4500 has a sheave height of 8.4 metres on the main boom and 10.7 m with the jib attached. The operator’s station is ergonomically designed with operator comfort in mind and plenty of legroom, easy to reach functions and a highly visible control panel.

Following the deal, current Terex shareholders will own about 60 % of the new company, while Konecranes’ owners will have 40 %. The Board will be composed of nine directors – five Terex nominees and four Konecranes representatives. Although in this sense Terex could be said to be the senior partner, the new company will be incorporated in Finland. It said it would maintain “significant headquarters” at both companies’ present head offices - Westport, Connecticut, USA and Hyvinkää in Finland. Shares are to be listed on the NASDAQ exchanges in Helsinki, Finland and New York, USA.

The CEO will be the Terex CEO, currently Ron DeFeo, who is also the company’s

chairman. However, his employment contract with Terex expires at the end of the year. The chair of the new entity will be the current chairman of Konecranes, Stig Gustavson.

In other Terex Corporation news, Tim Ford, Terex Cranes president, is leaving the company and will be replaced by Ken Lousberg who is Terex China president. Lousberg will also take over responsibility for Latin America, for which Ford was also responsible. A country leader for China, reporting to Lousberg, will be appointed.

George Ellis gets the new role of senior vice president, operations planning and president, Terex Construction. Scott Hensel, now vice president, Terex Services North America, will be vice president

and managing director, Terex Utilities and Services, reporting to Ken Lousberg. Kieran Hegarty, president, Terex Materials Processing, adds management responsibility for Terex Fuchs which joins the Terex Materials Processing segment.

On the broader implications for the corporation, DeFeo said, “While we expect to achieve substantial synergies with the announced merger with Konecranes, as we think ahead and help position the company for the merger we must continue to organise the company and operate Terex in a way that is best for the business.”

The merger is subject to regulatory and shareholder approval and is expected to close in the first half of 2016.

Sales still up at Tadano

Crane manufacturer Tadano reported a 2.5 % increase in sales for the three months to 30 June 2015 (the first quarter of the 2015 to 2016 financial year). Sales in the period for the Japan-headquartered company were US\$ 376.5 million against \$367.4 million in the same quarter a year earlier. The sales increase a year earlier, at the end of June 2014, was up 15.7 % on the same period of 2013. Operating income, at \$56.9 million for the quarter to 30 June 2015, was up 17.3 % on the \$48.5 million the year before and net income was up to \$39.5 million from \$30.8 million.

The manufacturer reported a gentle market recovery in Japan, continued growth in the USA and signs of recovery in Europe. A slowdown in emerging markets, especially China, debt issues in Europe and oil price trends dented confidence in the market. In terms of crane sales this translated as little change in

demand overall where it grew in Europe, Asia and the Middle East but fell in the Americas. In outlook for the full year

ended 31 March 2016 Tadano forecast a 1 % increase in sales, operating income up 1.8 % and net income up 2.6 %.

A new Mercedes-Benz heavy haulage tractor and Nootboom trailer have joined the fleet of Quinto Crane & Plant in the UK. The Norfolk-based company has new owners who recently spent £1.1 million (US\$ 1.7 million) on a new Grove all terrain crane. The new truck, which is a 155 tonne Arocs 3363 S and the trailer, a six axle low loader, will be used to move counterweight slabs for the new 300 tonne capacity crane. The combination will also be put to work moving demolition equipment and other heavy loads. Husband and wife Oliver and Hannah Arnold bought Quinto in 2014. Norwich dealer Orwell Truck & Van supplied the 460 kW (625 hp) Arocs. It has a Voith Turbo Retarder Clutch as does the new Manitowoc Grove GMK5250L all terrain crane. It works with the 16-speed Mercedes PowerShift 3 automated transmission for pulling away with heavy loads and to help brake the vehicle which can have a gross combination weight of 250 tonnes.



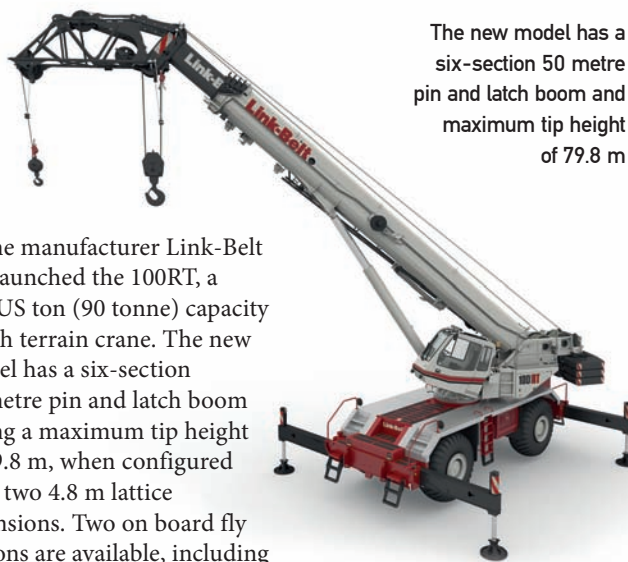
BOOM LOGISTICS HALVES LOSS

Australian crane rental company Boom Logistics posted a net loss after tax of AUS\$ 36.9 million (US\$ 25.8 million) for its financial year ended 30 June 2015. It is approximately half the net loss from 2014 which was AUS\$ 79.5 million (US\$ 55.7 million). Impairment charges of AUS\$ 6.3 million (US\$ 4.4 million) or assets up for sale, AUS\$ 14.5 million (US\$ 10.1 million) on assets in the fleet, restructuring costs of AUS\$ 5.9 million (US\$ 4.1 million) and AUS\$ 200,000 (US\$ 140,000) for legal costs were included in the results. Without them, Boom's earnings before interest and tax was a loss of AUS\$ 6.3 million (US\$ 4.4 million), compared with a profit of AUS\$ 13.9 million (US\$ 9.7 million) in 2014.

Brenden Mitchell, Boom CEO, said "Our key initiatives for profit recovery in FY16 reflect the strategies we have developed and executed over the past two years. Whilst we expect market conditions to continue to be challenging, we will remain focused on the profit recovery programme in FY16."

For the first half of the 2015 financial year, to 31 December 2014, Boom said that revenue and profitability were negatively impacted by lower levels of contract maintenance business in Western Australia, Central Queensland and New South Wales; price pressure in highly competitive markets; and project delays in the telecommunications and energy sectors. Next came temporary closures of mines due to falling commodity prices, cancellation of maintenance contracts and reduced activity in markets for the heavy lift division. In response to the falling market Boom shed 19 % of the workforce. It forecasts the challenging trading conditions to continue for the next 12 to 18 months.

New 100 RT from Link-Belt



The new model has a six-section 50 metre pin and latch boom and maximum tip height of 79.8 m

Crane manufacturer Link-Belt has launched the 100RT, a 100 US ton (90 tonne) capacity rough terrain crane. The new model has a six-section 50 metre pin and latch boom giving a maximum tip height of 79.8 m, when configured with two 4.8 m lattice extensions. Two on board fly options are available, including both two- and three-piece lattice bi-fold jibs. A 3 m heavy-lift fly jib with more than 24 tons (21.7 tonnes) of capacity is also available. Fly extensions on the 100RT are interchangeable with

several existing Link-Belt RTC and HTC models, the manufacturer said.

The cab tilts 20 degrees, has a large viewing window and is fitted with the Link-Belt Pulse

crane operating system. It has a camera package and LED lights on all four outrigger beams. For travel, the 100RT will transport with its base unit fully equipped minus modular counterweights at 42.4 tonnes, the manufacturer said. It has an overall height of 3.91 m. Arctic weather packages are also available.

HIGHLIGHT

■ India-based Talib & Shamsi Constructions has added two MCT 85 Potain tower cranes to its fleet. The MCT 85 has a 5 tonne capacity, a 52 metre maximum jib length and can lift 1.1 tonnes at the jib end. The two new units have been put to work on the DSK Dream City development in Pune, India. The development will have apartment blocks, leisure facilities and a five-star hotel.

■ Germany-based rental company Walsemann & Sommer has taken delivery of a 400 tonne capacity six-axle Grove GMK6400 all terrain crane. The model has a 60 metre main boom and 79 m luffing jib. It is powered by a single engine and has the MegaDrive hydrostatic drive. Björn Sommer, Walsemann & Sommer general manager, said, "We are extremely impressed with the GMK6400 and its short rigging time and strong lifting capacity."

Emerson crowns fleet with Liebherr 300 tonne AT crane

UK-based Emerson Crane Hire has taken delivery of a new 300 tonne capacity Liebherr LTM 1300-6.2. The new model is the largest in Emerson's fleet. It has a lifting capacity of 300 tonnes at 3 metres radius, 78 m main boom and a folding fly jib that is hydraulically adjustable under load.

Power comes from a Single Euro 4 engine. It has the Liebherr ECO mode function to improve fuel consumption. Also fitted is the Variobase outrigger system which allows the outriggers to be individually deployed according to the space available and the capacity is then calculated automatically.

Liam Clancy, Emerson Crane Hire managing director, said, "When looking to expand our heavy crane fleet we were extremely excited to purchase

a new LTM 1300-6.2 from Liebherr. This addition to our range of cranes will help us further meet demand from our customers for heavy lifting across the UK."

Emerson Crane Hire's new 300 tonne capacity Liebherr LTM 1300-6.2



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**EN 13000 CRANE
ACCIDENT REDUCTION**

Leading organisations in the European crane industry believe that a whole category of crane accidents in Europe have been reduced since the revised *EN 13000* European standard for mobile cranes came into force in May 2010. The *EN 13000:2010* standard (since updated to *EN 13000:2010+A1:2014*) included the requirement that the override switch be located outside the operator's cab to discourage the use of the override function by the operator. Initially, this was opposed both by manufacturers and crane owners who argued that it reduces the ability of the operator to have full control of the crane in an emergency.

European experts have now said that the amended standard appears to have resulted in significant improvements in safety on jobsites. Evidence of the impact on safety has come from ESTA (European association of abnormal road transport and mobile cranes) and FEM, (Fédération Européenne de la Manutention - the European materials handling federation).

"The new regulation has been in operation for five years and a large number of cranes have been delivered with the new set up of the rated capacity limiters," Klaus Meissner, president of FEM's Mobile Crane Product Group and director, product strategy, at Terex Cranes, explained.

"In Europe there have been no accidents reported on cranes delivered after May 2010 related to operating outside of the permitted capacities," Meissner added. "Moreover, we have had zero complaints from operators and no reports of situations where the new position of the override switch caused an issue."

■ The full story is at <http://bit.ly/1LA0EOM>

Terex city crane for Treffler

Mobile crane service provider Treffler Autokran and Schwertransport has taken delivery of a newly refurbished Terex AC 40 City Crane.

The newly refurbished AC 40 City crane was picked up at the Terex Bierbach plant in Germany in July.

Petra Treffler-Tomaschko, Treffler owner, said, "Together with our fleet managers Christoph Kleinert and Jürgen Kleinert, we went through a number of options that would allow us to continue to use the crane, and ultimately decided to go for full refurbishment."

Dirk Koslowski, Treffler Ingolstadt branch office manager, said, "For the last 15 years, our AC 40 City crane has always come through for us when doing overhead crane installation and machine setup work. Its compact design and powerful telescoping system



Dirk Koslowski, manager of the Treffler branch office in Ingolstadt, took over the refurbished AC 40 City from Alexander Schneble, Manager Repair Shop in Bierbach

make it unbeatable when it comes to indoor projects, which is why we decided to arrange for Terex to fully refurbish it.

"We're more than happy with the work that Alexander Schneble and his workshop team in Bierbach did,"

Koslowski said. "From the advice we got in advance, to the way they carried out the work, to the final handover – everything was perfect."

The refurbished crane has a twelve-month manufacturer's warranty on all replaced components.

Billion dollar highway project for Lunda Construction

Lunda Construction in the USA used a new Manitowoc MLC300 crawler crane with Variable Position Counterweight (VPC) for a highway project in Milwaukee.

The new crawler is being used on a US\$1.7 billion reconstruction of a highway at the Zoo Interchange. It is being used to lift and set large tub girders that will support a ramp from Highway 45/I-894 northbound to I-94 westbound. The heaviest girders weigh 62 tonnes.

The MLC300 has the VPC system and was configured with 47.8 metres of main boom and 172 tonnes of counterweight. The counterweight system automatically positions the crane's counterweight to maintain a centre of gravity closer to the centre of rotation, the manufacturer said. The system reduces ground bearing pressure and means the crane

needs less counterweight to complete a lift. The crawler was rented from Wisconsin-based Dawes Rigging & Crane rental, a member of the All Family of Companies. Joe Ruddell, Dawes Milwaukee rental sales manager, said, "As with any job for the Department of Transportation, there are going to be restrictions, specific time

frames in which we can work and guidelines that have to be followed. One big challenge is the limited space we have to situate the crane in, along with having to move the crane from one location to another in a limited amount of time over uneven ground conditions.

"The MLC300 offers a smaller footprint than other crawler cranes and its VPC system is perfect for this job. The reduced footprint and added stability really matter when the crane is sitting on limited real estate between eastbound and westbound lanes of the freeway with traffic whizzing by," Ruddell explained.

The project is scheduled for completion in 2018.

A Manitowoc MLC300 crawler crane at the US\$1.7 billion reconstruction at the Zoo Interchange



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Zugspitze peak for Bayerische

Bayerische Zugspitzbahn Bergbahn is using a Liebherr 150 EC-B 6 Litronic flat top tower crane at an elevation of 2,975 metres on the Zugspitze peak in Germany.

The 150 EC-B 6 is being used to help build the new Eibsee cable car which will be used to transport visitors from the Sonnalpin midway station to the summit of the Zugspitze.

It will have the highest steel support in the world, at 127 m, and will cover 3,207 m from the support to the summit station, a spokesperson said. The crane was dismantled into components weighing no more than 3.4 tonnes. The sections were transported to Sonnalpin midway station on the rack railway before being lifted to site by a helicopter from Swiss airline Heliswiss. Once at the

site, the crane was erected from the air with the help of Liebherr erection specialists, a spokesperson said.

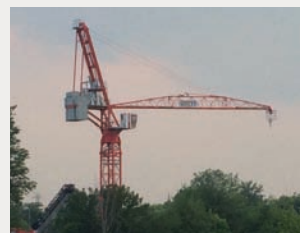
It was configured with a radius of 50 m and a hook height of 18.6 m. Challenges at the site include wind speeds of up to 280 km/h and low temperatures. The crane is designed to withstand temperatures down to minus

25 degrees Celsius. The planning work for the crane erection was carried out in close collaboration with Martin Hurm, project manager for the construction of the new Eibsee cable car, Bayerische Zugspitzbahn Bergbahn and Michael Weißschädel, project manager at the Tower Crane Solutions Department in Biberach, Germany.



The Liebherr 150 EC-B flat top crane on the Zugspitze

HIGHLIGHT



Empire Crane Company in the USA has taken delivery of a Wolffkran 355B model luffing jib tower crane. It is at Empire Crane Company's Bridgewater, New Jersey, yard in New York. The tower crane is NYC Cranes & Derricks approved and ANSI B30.3-2012 compliant, Empire said. It has a 60 metre luffing boom and a maximum line speed of 289 metres per minute. The Wolffkran crane system consists of a modular tower design and a full range of top slewing saddle jib and luffing jib tower cranes offering solutions for various construction jobs from small to large, Empire said.

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Overhead record

JEROEN NAALDEN, Enerpac Integrated Solutions director, and MART HINNEN, project manager, talked to ALEX DAHM about how they shaped the development of the world's largest offshore overhead travelling crane

Building an offshore highway involves lifting and accurately placing concrete foundation blocks on the seabed, positioning the supporting pillars and then assisting in the connections with the bridge deck. French consortium Bouygues Travaux Publics, VINCI Construction and Demathieu Bard Construction is constructing one for Réunion Island, east of Madagascar in the Indian Ocean. The 5.4 km Route du Littoral coastal highway will connect Saint

Enerpac has completed initial testing of the world's largest offshore gantry crane at its Hengelo manufacturing facility in the Netherlands. It was on one of the two pairs of beams and included lifting 1,100 tonne blocks, synchronised lifting of the block with a hook from each beam, and checking the crane's positioning, lifting and lowering accuracy to 1 mm



Jeroen Naalden,
Enerpac Integrated
Solutions director



Mart Hinnen, Enerpac
Integrated Solutions
project manager

Denis (the administrative capital of La Réunion) with La Possession. It replaces the existing coastal road which suffers from falling rocks and is hit by flooding and tropical storms.

To construct the highway a jack-up barge is being built at the Crist shipyard in Poland. On it will be an overhead travelling (OHT) crane with a width of 30 metres

and a lifting capacity of 4,800 tonnes. With the barge jacked up in position the OHT will lift, move and lower the segments. The crane is classified A5 for the structure and M5 for the mechanism. It is designed to operate in a tropical marine environment to IP66 protection.

Lifting system

The offshore highway will be a multi-span bridge structure in the open sea, between 100 and 200 m from the shore. Each bridge pier consists of several concrete components. The 48 bridge piers are between 85 and 120 m apart. The bridge deck segments spanning the piers will be fabricated onshore and placed using conventional bridge launching techniques.

There will be 288 heavy lifts in 144 cycles, each one as follows:

- at the quay take the load from the jetty fabrication area and transfer it to its travelling position on the barge and lower it down on the barge deck
- at the designated offshore location take the load from the barge deck and



The 4,800 tonne capacity crane will be used in the construction of an offshore highway on Réunion Island in the Indian Ocean by French consortium Bouygues Travaux Publics, VINCI Construction and Demathieu Bard Construction

transfer the load to its deployment position, lower the load and retrieve the unloaded hooks.

Key technical requirements for the gantry crane are the ability to lift, move and accurately place the loads in a tidal environment. Additional project and commercial considerations include: the weight of the crane; speed of handling, vessel time and cost; lifting systems costs; and cost of ownership.

Technology selection

The traditional choice for lifting operations of this type is strand jacks but there are alternatives. Another choice is winches to lift and lower and skidding or trolleys to move the blocks. The shape of the blocks is such that each requires four lifting points. Lifting would require either eight strand jacks or eight winches operating simultaneously.

Enerpac chose to use a reeved winch system, based on eight grooved drum winches, each with 500 kN line pull on the outer layer. Drum capacity is 800 m with a 52 mm rope. For proper spooling the winches have a drum with Lebus grooving.

A significant advantage of winches in this application is an ability to adjust the hoisting speed. The hydraulic circuit is a

Enerpac chose a winch and trolley solution. Eight 47 tonne capacity Zollern reeved winches are used (four on each trolley of two pairs of main beams). Slider pads on top of the main lifting beams are there for the transverse movement of the load hooks



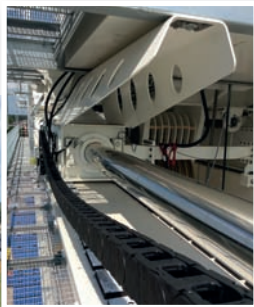
closed loop system with load-controlled flow. It means that when the hook is unloaded the speed of the winch can be doubled for a shorter load cycle.

Each block has to be moved into position after lifting it. Choices for the longitudinal travel of the gantry are either to use a skidding system or a trolley arrangement. Skidding involves a push-pull action from hydraulic cylinders. Movement is incremental so there is a risk of generating unnecessary fluctuating movements in the load. Wear and replacement of the PTFE slider pads needs to be factored into project scheduling and cost-of-ownership calculations.

In this application the trolley system offers advantages, Enerpac said. There is continuous movement of the block, the speed is variable and high speed is possible once the crane is unloaded. In addition, maintenance costs are lower.

There are two trolleys per lifting beam, giving a total of four for the two beams. Each trolley comprises four wheels, two of which are driven by hydraulic motors and planetary gearboxes.

The wheels run on two parallel rails bolted onto the runway beams of the barge. The runway length is 80 m and the speed is between 0 and 100 cm/minute when loaded and up to 200 cm/min unloaded.



LEFT: When the crane is set up on site in Réunion it will be subjected to an overload test of 5,200 tonnes. Enerpac will supervise the first four lifts and train the operators before handing it over to the consortium



Control room for the 4,800 tonne Enerpac crane

The winch and trolley arrangement allows smoother handling of the concrete elements and offers quicker lifting and lowering. Computer modelling of the operating sequence showed that with strand jacks and skidding it would take six hours for one complete block lift and placing cycle. With the winch and trolley arrangement it will take three hours.

Power requirements

There is a significant difference between the hydraulic power requirement for strand jacks and skidding versus winches and trolleys. Installed power is the main difference. To meet the required lifting speed a winch needs 55 kW while a strand jack operating at the same lifting speed will need 110 kW. The same applies on the hydraulic system for skidding versus trolleys. Here the push-pull system requires twice the volume of oil to achieve the same speed as the trolley system.

Although the installed power on the skidding and strand jack system is twice the amount, the cost difference is minimal. The main reason is that the hydraulic system's pumps and valves for the winches and trolleys are more expensive because of the closed loop system and proportional valves.

The combination of hydraulic trolleys, eight synchronised winches with four crane hooks, side shift cylinders on the beams and the size of the gantry crane make this a major engineering challenge. Together the eight winches give the 4,800 tonne total. Without a load on the hook they will operate at up to 100 cm/min. When lifting and lowering a load the speed ranges from zero to 40 cm/min.

Final commissioning of the vessel with the crane mounted on it will be in October or November 2015 before the voyage to the Indian Ocean. Early 2016 should see completion of the overload testing.

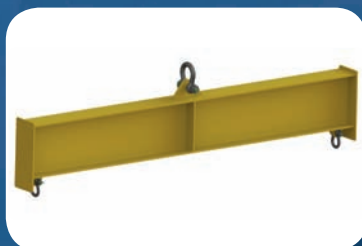
Wheel arrangement for the longitudinal trolley movement

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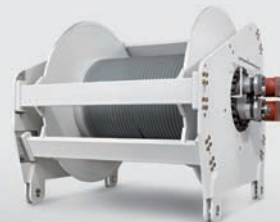
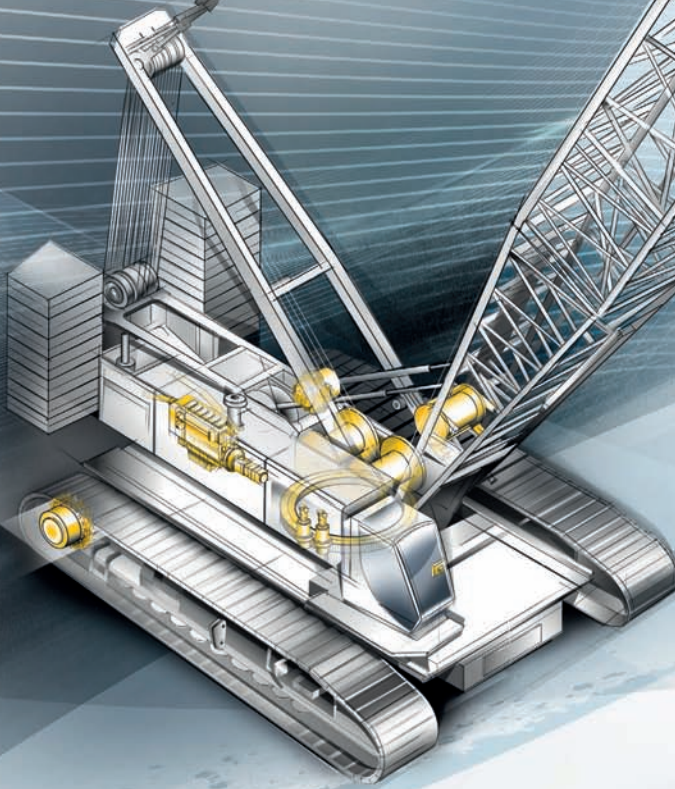
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Components

The collapse in Chinese share prices in late August reverberated in markets around the world.

CHRIS SLEIGHT
reports

Chinese impact

Share prices in China have been lurching lower for some months, but in late August there was a more significant collapse on the back of weak economic data. This prompted a sell-off in other markets around the world, with many key indexes dropping to their lowest in a year or more.

The Chinese collapse came in spite of significant government intervention in July and August to try to prevent a sell-off. These included various selling restrictions as well as measures designed to increase buying through state-controlled

entities such as banks and pension funds.

These failed, and arguably the government's unsuccessful attempt to push back the tide increased the panic. It is not what anyone has been used to in a country where the government actively manages and controls the state economy.

Market bubble

Up until the end of August, this was largely viewed as the inevitable bursting of a bubble which had built up in Chinese share prices. However, the latest sell-off was triggered by data suggesting a more

pronounced slowdown in the Chinese economy than had previously been anticipated. GDP growth this year looks likely to come in below 7 %, which is stellar by any other standards, but disappointing for China.

This has a much greater impact around the world than a domestic stock market bubble. It implies a slowdown in China's demand for a range of commodities and products, including cranes.

Between weeks 31 and 35, this pushed down key global market indicators like the FTSE, Dow and Nikkei by 6 % to 7 %, and IC's Share Index for the crane industry fell a similar amount. Although most crane manufacturers saw their share prices fall, there was a marked increase for XCMG, very much against the run of play. Terex and Konecranes were also up on the news of their merger.

Lower outlook

But despite these, the IC share index lost some 6.36 % of its value in the space of four weeks. At its worst in week 34, it hit an all-time low of 58.22 points, before rebounding to 60.86 points by the end of week 35.

The rebound illustrates that investors re-found their confidence following the sell-off, but it is likely that the lower outlook for China will keep share prices under pressure until there is a tangible economic recovery. ■

AUGUST IC SHARE INDEX

STOCK	CURRENCY	PRICE AT START	PRICE AT END	PRICE CHANGE	% CHANGE	PRICE 12 MTHS AGO	12 MTH % CHANGE
IC Share Index*		64.99	60.86	-4.13	-6.36	63.02	-3.43
Legacy IC Share Index**		315.59	296.41	-19.18	-6.08	393.74	-24.72
Dow Jones Industrial Average		17746	16655	-1091	-6.15	17080	-2.49
FTSE 100		6681	6201	-481	-7.19	6827	-9.18
Nikkei 225		20585	19136	-1449	-7.04	15425	24.06
Hitachi Construction Machinery	YEN	2065	1800	-265	-12.83	2044	-11.94
Konecranes	€	28.02	28.62	0.60	2.14	24.07	18.90
Kobe Steel	YEN	192	168	-24	-12.50	169	-0.59
Liugong	CNY	9.60	8.73	-0.87	-9.06	6.25	39.68
Manitowoc	US\$	16.97	16.49	-0.48	-2.83	28.51	-42.16
Palfinger	€	27.61	24.90	-2.71	-9.82	24.99	-0.36
Sany Heavy Industry	CNY	7.61	6.80	-0.81	-10.64	5.49	23.86
Tadano	YEN	2000	1693	-307	-15.35	1870	-9.47
Terex	US\$	22.42	22.91	0.49	2.19	37.24	-38.48
XCMG	CNY	11.02	13.20	2.18	19.78	7.84	68.37
Yongmao Holding	SGD	0.14	0.15	0.01	4.17	0.23	-33.33
Zoomlion	CNY	5.99	5.64	-0.35	-5.84	4.63	21.81

*IC Share Index, 1 Jan 2011 = 100

**Legacy IC Share Index, end April 2002 (week 17) = 100

EXCHANGE RATES – VALUE OF US\$

CURRENCY	VALUE AT START	VALUE AT END	VALUE CHANGE	% CHANGE	VALUE 12 MTHS AGO	12 MTH % CHANGE
CNY	6.210	6.391	0.1810	2.91	6.06	5.45
€	0.9150	0.8861	-0.0289	-3.16	0.7376	20.13
Yen	124.29	120.98	-3.31	-2.66	102.51	18.02
UK£	0.6426	0.6482	0.0056	0.87	0.6119	5.94

Period: Week 31 - 35



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City safety

Safe application of tower cranes on often cramped inner city sites presents particular challenges to those responsible for the installation.

HEINZ-GERT KESSEL reports

High rise construction work is concentrated in the inner city of metropolitan areas all over the world. Nearby buildings, busy streets, extremely cramped construction sites, existing essential subsurface installations, short construction times and, above all, safety aspects are major challenges for any crane installation work.

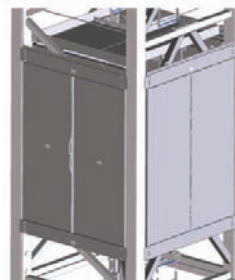
The general public is exposed to these inner city construction sites. Unauthorised people sometimes climb tower cranes as thrill-seekers. To combat this a good practice found on many construction sites in London, UK, is to use anti-climbing frames on exposed, free-standing tower cranes. To be functional, however, some design criteria should be respected. To prevent climbing, at least 3 metres of smooth external net type walling or panelling should be fitted around the crane's tower section. It can be done at the yard and can be transported in place on the mast. No installation work at height is then needed on site, for example, to install a fence like structure resembling an upside down umbrella. Inside the tower a horizontal barrier with trapdoor must be installed in a way that prevents access even

to very slim people. On large base tower systems with thick diagonals it is vital to have no space between outer vertical walls surrounding the tower system and the horizontal platform inside.

Airspace over large cities is extremely busy with helicopter flights bringing business people, police helicopters and flights to and from nearby hospitals. They are a permanent risk for tall tower cranes, particularly luffing jib types, where the boom can easily rise an additional 40 to 70 metres above the machinery deck at the top of the crane tower. In January 2013 there was a helicopter crash involving a luffing jib climbing crane enveloped in extreme fog at St Georges Wharf Tower in London. Since then the question of safety lighting on cranes has been discussed.

Investigations showed that solar-powered steady red warning lights on top of the crane structure were not switched on because

Liebherr developed an integrated anti-climbing clean wall system leaving no room for any hold at the surface



RIGHT: Common in London are climbing fans with grid walls all around the tower



LEFT: Traditional anti-climbing fan that slopes downwards



Terex Comedil luffing jib tower cranes on a narrow inner city site in London

the official requirement is to light them at night, meaning the period between half an hour after sunset and half an hour before sunrise. Such Obstruction lighting is required according to the British rules at least for cranes 150 m high or more. The question arises, however, whether it would improve safety if it should become good practice to switch on the aviation lightning

in the day time as well at night, to cope with all weather conditions and no matter how high the tower crane is standing on inner city sites.

When raising the boom even moderately tall luffers quickly become an obstacle far higher than the actual building line of a high rise construction site. Adding

aviation lighting to any tower crane, as is standard in Japan, could enhance safety. There are many different rules about how the aviation lighting must be arranged. In Japan, luffing jib cranes are mainly used, >



In Japan above 60m two red flashing lights at the top of A-frame and boom are requested. At a certain boom length in the middle additional red lighting is positioned.



Fixed restraining fan around the tower installed under the climbing frame of the crane at the Heron Tower project in London

generally above 60 m tall. Two intense red sparkling lights are used at the jib head and on the A-frame head. Also requested are seven-section alternating red and white painted booms to provide good visibility day and night.

As it becomes more common to operate the same tower crane with different jib length it could be sufficient to let the red and white colour scheme follow the assembly of the jib sections making up the boom in order to avoid expense of repainting of the boom each time when another boom length is requested. The number of tall free standing tower cranes on inner city projects with 70 to 100 m towers is increasing. It further raises the question about good practice and using additional steady red lights at the middle of the tower system, especially when heliports are nearby. It would help make the large construction cranes more visible during the early stages of the building project. No single standard defines a minimum mandatory requirement governing design and installation of aviation lighting. With respect to the tower crane rental business and to streamline safety standards there should be a unique European solution.

No climbing

On many projects in European cities the free standing capacity of modern tower cranes mean they can be set up without needing to climb. It means that the cranes can be set up in just one rigging period. If external climbing cranes are used, they follow the building as it rises during construction. These cranes have to climb several times in the life of the project. In this case the protection of people from falling objects must be not only assured

during assembly, rigging and dismantling but also each time that there is a climbing operation. Usually for this period appropriate exclusion zones, at least 20 m from the base of the tower crane, are defined.

It can be difficult the higher the crane is climbing and the closer it is to the edge of a construction site, especially next to a busy street. Here a protection fan surrounding the tower under the climbing frame could prevent tower connection material and climbing tools from falling to the ground. This arrangement, looking like an upside down umbrella, can have a folding mechanism so that it is more compact during the working period and interferes with the operator's view.

In this way the structure does not need to be dismantled and refitted to a higher tower section in a risky and time-consuming operation when the crane is jacked. Horizontal tower connection devices can be dropped during handling. It is less likely with vertical multiple bolt connections where the heavy bolts can be already inserted in the lugs before the more nuts are added. If these bolted connections are carried out completely inside the mast section, as is common on Japanese tower cranes, there is less risk of falling crane components dropped by riggers leaning out of the tower to reach.

In addition, there is no need to install work platforms outside the tower system when the tower is erected using an assist crane. On inner city sites most external climbing cranes are close to public areas. Falling objects during rigging, maintenance and climbing will not only be a hazard to workers on site but also to pedestrians. Risk zones on tower cranes are platforms where small hand tools and crane parts are temporarily stored.

Around the world one can witness the good practice of requesting the installation of safety nets around the handrails. If



Foldable restraining fan around a tower in Seoul, South Korea

a tower crane works for a longer time, however, nets break up. Instead durable perforated steel panels installed by the crane supplier are a much better solution than a classic multi-rail system which is enclosed temporarily by nets.

On the outside

An external climbing crane will generally reach heights where it has to be tied in to the building under construction. Generally for each tie-in support a massive collar surrounding the crane tower must be installed and then three anchorage struts must be connected to this collar. All the work is normally a risky operation in which riggers lean out of a man basket or balance over the steel collar to insert pins.

In the UK, HTC Wolffkran (formerly HTC Plant) designed an installation platform surrounding the tower under the steel collar to give a safe place of work and to reduce the risk of falling items. In Japan Yoshinaga Manufacturing developed collars of two u-shape units where an erection platform is already mounted. In two lifts it can be rigged at the tower and only two vertical pin connections have to be installed to form up the complete collar. Each tie-in support is done with its own work platform, so access does not have to be reinstalled. These are also safe points from which to inspect the anchorage struts.

The standardised tower dimensions of all the major Japanese climbing cranes means that this equipment can be used with different brands. Restricted site conditions and safety aspects may also lead to more floor climbing application. The main advantages are as follows:

- The crane can raise a high building without a massive tower or foundation and it generates much lower forces
- It can be climbed up to the standard in-service wind speed

The vertical bolt connections inside the IHI tower system minimise the risk of falling items

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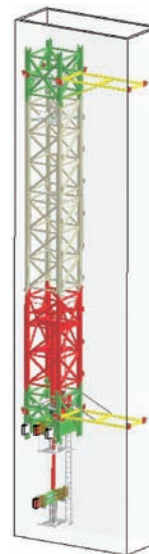
LEFT: Typical European-designed tie-in support with no access platforms



Fixing the tie-in beams using the work platform



The typical European internal climbing system requires a lot of manual rigging work to be carried out during the climbing process



RIGHT: Jaso's new lift shaft climbing system increases the safety of the climbing process

- The crane may be climbed safely at night as all work is carried out from the illuminated inside of the building
- The crane driver does not have to climb very high towers
- A working permit alongside railways is easier to get because of the reduced collapse radius

Jaso has developed an internal three-beam climbing system where jacking and support beams are inserted into six wall pockets of the concrete lift shafts carrying the crane. The three support beams are integrated with the hydraulic climbing system in the special base section of the tower crane. In working condition the crane is resting on all three parallel beams in the wall pockets.

When climbing the shoes of the outer beams are inserted hydraulically while the crane is still resting on the central beam. Then the complete crane is lifted by the central hydraulic ram of the base tower

section so that, at the next level of wall pockets, the two outer beams at the base tower section can be secured to base the crane. Then the central beam follows onto this level by retracting the central hydraulic ram. The maximum stroke of the Jaso climbing ram is 4 m so there must be a wall pocket every 4m in the concrete shaft cast ahead of the rest of the building.

Upper and lower tower guide systems can be added to adapt the system to different lift shaft dimensions. Jaso has developed the lift shaft system for two tower systems requiring openings of just 2.5 x 2.5 m, suitable for J380PA and J450PA models and 2.09 x 2.09 m for the J180PA / J208PA crane. The crane tower is guided

These two IHI external climbing cranes show up the Yoshinaga tie-in supports with integrated work platforms available for closed round tubular tower systems as well as for square mast systems

in the lift shaft by rollers fixed to the tower. In addition to its small size there are safety and time benefits. No work is needed outside the platforms integrated in the tower system. No crane components have to be added or removed by hand during the climbing process. City construction sites are often already surrounded by tall buildings so Jaso has developed special equipment for safe out of service positioning of rope-luffing jib cranes.

Taking a view

For the drivers of core-climbing cranes it will be hard to see the loading zones on the ground. In Japan tower cranes generally have a jib-top camera to give a "bird's eye view" of the load on a large monitor in the operator cabin. In other parts of the world cameras to assist the crane driver are still not standard, even though it could improve the safety of load handling procedures because the crane driver is no longer relying solely on radio communication. It lets the operator see hand signals and he can check if the load is safely slung before it leaves the ground.

There is the principle choice to add a camera at the trolley or luffing boom head of luffers or to use a hook block camera system. Recently three Terex luffing jib tower cranes serving the Berkeley Group's Corniche project at the River Thames in London had the HookCam wireless camera system fitted. It just requires an antenna at the jib end section and the camera directly fixed to the hook block.

HookCam cites university studies showing that the system not only improves safety but also reduces lift time by an average 26.7 % in open space and 38.9 % in blind space. The quality of hook camera

The two red guide sections allow adaptation to the lift shaft shape





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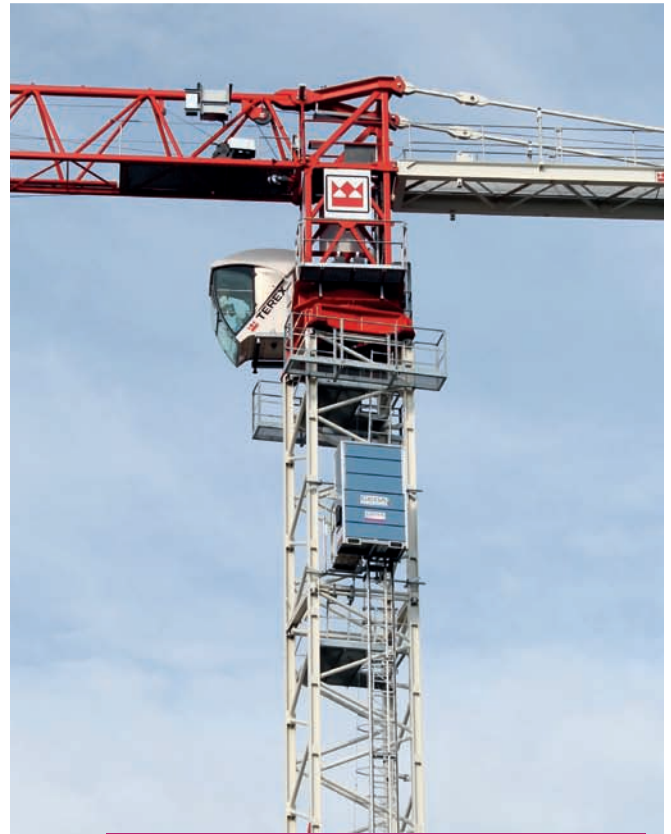
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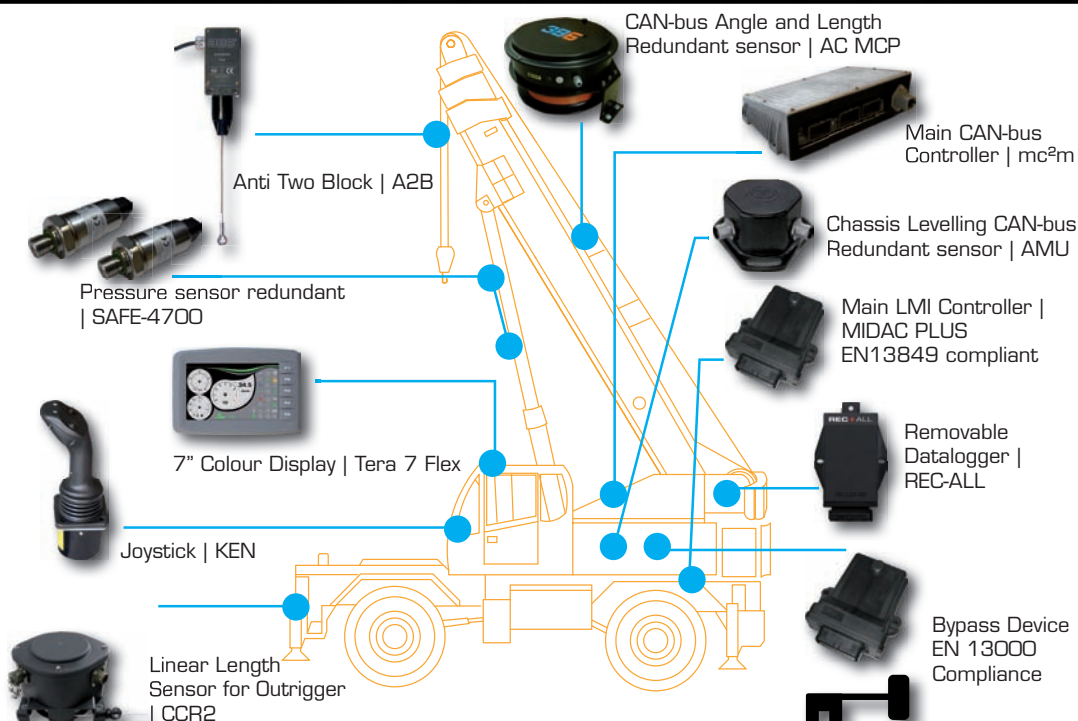
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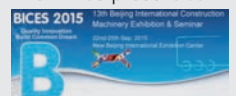
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Jaso J280 PA.2R rigged on the lift shaft climbing system on a cramped city site in Sydney, Australia

systems is mainly determined on battery capacity. The operator's view, however, is limited to the scene under the hook. In contrast, with a zoom camera installed at a trolley or, on luffers, at the end of the boom, the crane driver can zoom out to give a vertical view over the lifting area.

On cramped inner city sites with many cranes, often at the beginning a mix of mobiles and towers working together, this visibility to the rear of the machine becomes a safety factor. When lifting heavy loads a quick look at the winch spooling may help to avoid problems when another layer starts. For this purpose this Orlaco cameras and the load view monitor can be used with the rear view camera.

Tower power

Following major fatal incidents in recent years, especially in New York, it has been suggested that older diesel hydraulic cranes are less safe than newer cranes. Former New York City Mayor Bloomberg proposed a law that would ban all tower cranes from operating when they reach 25 years old and require all cranes, no matter how old they are, to have load-cycle counters.

In the last year a notable shift has taken place from diesel-hydraulic tower cranes towards electric tower cranes. While in 2011 still 68 % of New York's tower cranes were diesel-hydraulic, partly to cope with the poor energy supply at construction sites and to handle the high lifting loads on ultra-high rise sites in 2014, their share fell to 42 %.

Arguments against diesel-hydraulics focus on noise pollution and other environmental impact but a diesel-hydraulic drive with up to date technology is by no less safe than an electric crane. In addition, collision avoidance systems are not restricted to electric cranes.



Typical Japanese boom tip zoom camera

Using the Limatlas system, jointly developed in Australia by Atlas and Favelle Favco, specific work zones are programmable to stop hydraulically controlled diesel cranes operating outside set areas.

To improve safety several accident examinations indicate the importance of maintenance and skilled service above the pure age of a crane. The common multi-layer sub-contracting system for tower crane erection and dismantling work is an important risk because of the more complicated communication between the companies and riggers involved. Where main contractors rely on formal control by paperwork it doesn't reveal any inadequate training of the sub-contractor riggers.

Failure of tower crane components as a result of inadequate maintenance is one of the major causes of incidents, other than faults in the erection and assembly process. Crane driver elevators and remote controls should also be considered under the safety

RIGHT: Large modern European luffers with sophisticated fault control systems, high line pull capacity and speed like this Wolff 700B US-version working in New York add to the safety standards of ultra-high rise jobs



LEFT: Disk brake on the Yongmao STL1460C hoisting winch



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Early stage of the project with the 21LC290 18t (left) and the LCL310 24t. The MahaNakhon Cube is the glass building on the right (IMAGE: PACE DEVELOPMENT CORPORATION)

Towers in Thailand

Two Linden Comansa tower cranes are employed to help construction of the MahaNakhon Development in Thailand. IC reports

Construction company Bouygues-Thai is using two Linden Comansa tower cranes to help build the MahaNakhon tower in Bangkok, Thailand.

The MahaNakhon Development is by Pace Development Corporation. It will be 314 metres tall with 77 floors, including a hotel, a shopping area and luxury apartments. According to the company it is already the tallest building in Thailand.

The two tower cranes on site are an 18 tonne capacity 21LC290 and a 24 tonne capacity LCL310 luffing jib model. Both cranes were supplied to Bouygues-Thai by Smart, an official distributor of Linden Comansa in Thailand.

The LCL310 was erected at the base of the building and has been on site since 2012. It has a free standing height of 40.4 m, 60 m luffing jib and short counter jib. Work for the crane includes unloading construction materials for the first floors of the tower. Prior to this it was used to construct the MahaNakhon Cube, a seven floor luxury retail centre in the same area of the MahaNakhon tower.

The 21LC290 flat top is working on top of the MahaNakhon tower. It has been

configured with a 40 m jib. Initially, it was erected on fixing angles with a freestanding height of 60.7 m. It has an internal climbing system, meaning the crane only needs 11 mast sections to reach the height of 340 m, the manufacturer said. The 110 kW hoist motor on the 21LC290 offers a maximum speed of 228 m per minute.

The cranes are being used on site 16 hours a day, from 06.00 to 22.00 under the Bangkok Metropolitan Administration guidelines. Project completion is due for 2016.



Close view of the LCL310 24t luffer at the MahaNakhon project (IMAGE: PACE DEVELOPMENT CORPORATION)



Aerial view of the MahaNakhon tower



The 21LC290 flat top working on top of the MahaNakhon tower (IMAGE: PACE DEVELOPMENT CORPORATION)

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Staying strong

This year's *IC* Tower Crane Index indicates a stable tower crane market. *IC* reports

The results of the 2015 *IC* Tower Index are increasingly positive. Shanghai Panyuan Machinery Rental in China retained its top position with a Tower Index of 403,990. The company has kept its fleet size the same since 2014 and has added two more depots.

Morrow equipment has moved into third place from fourth with a Tower Index of 224,731. The company has reduced the number of depots it operates, however, it has increased tower crane numbers. The move has pushed Arcomet down from third to sixth place, with a Tower Index of 153,632.

Tat Hong Holdings in Singapore has also moved up the table this year, into fourth, with a Tower Index of 189,558. Following



the acquisition of HTC Plant in the UK, Wolffkran has jumped to fifth place from



Liebherr towers from Morrow Equipment at the Minnesota Vikings stadium project in the USA

seventh having increased its Tower Index by 48 % to 174,062. Wasel, originally in fifth place last year, remains just inside the top ten with a Tower Index of 68,500.

Outside the top 10, USA-based Maxim Crane Works has moved up to 11th place following its acquisition of Crane Rental Corporation. The company recorded a Tower Index of 58,078, a 57 % increase on last year's result. Bigge Crane and Rigging, also based in the USA, has also moved

IC TOWER INDEX

Companies are ranked by their Tower Crane Index, calculated as the total maximum load moment rating, in tonne-metres, of all tower cranes in a fleet. All companies in the list, plus other prospective ones, have the opportunity to supply fleet information and other data. Where companies supply the full data the figure used is calculated by them. In cases of insolvency, acquisition or lack of information, companies are withdrawn from the table.

While we make great effort to ensure the accuracy of information provided, it cannot be guaranteed and *IC* accepts no liability for inaccuracies or omissions. The *IC* Tower Crane Index will next be updated in the first half of 2016. If you think your company should be included please contact *IC* for an application form.

up the table and now ranks at 19 with a corrected Tower Index of 26,000. Sarens remains just in the top 20 with a Tower Index of 24,453.

New to the table this year is Dubai-based MMW Tower Cranes. The company enters the table in 22nd place, with a Tower Index of 14,918.

2015 Rank	2014 Rank	Company	Country	No. of depots	No. of employees	Scope of operation	No. of towers	Largest tower (make and model)	Largest tower (tonnes)	IC Tower Index 2015
1	1	Shanghai Panyuan Machinery Rental	China	32	3,950	Local	1,952	Zoomlion D2500-120	120	403,990
2	2	NFT	UAE	15	865	Worldwide	1,285	Potain MD 1100	64	390,290
3	4	Morrow Equipment	USA	25	371	Worldwide	639	Liebherr 1800 C 60	60	224,731
4	6	Tat Hong Holdings	Singapore	16	3,000	National	936	Sanyo M125	50	189,558
5	7	Wolffkran (including HTC)	Switzerland	11	900	Worldwide	739	Wolff 700B	50	174,062
6	3	Arcomet Group	Belgium	12	306	Worldwide	1,090	Terex Comedil CTT561-32	32	153,632
7	10	Van der Spek	Belgium	7	200	Continental	400	Liebherr 1000 EC-H20 Litronic		105,300
8	8	Select Tower Cranes	UK	6	1,200	Worldwide	450	Comedil CTL 630	32	96,100
9	9	Wilbert	Germany	2	180	Worldwide	200	Wilbert WT2405L e.tronic	128	74,300
10	5	Wasel	Germany	15	450	Continental	405	Liebherr 630 EC-H 50	50	68,500
11	15	Maxim Crane Works (includes Crane Rental Corp)	USA	31	1,450	National	111	Wolffkran 700B		58,078
12	12	Neremat	Belgium	3	50	Continental	250	Potain MD 1100	50	55,000
13	13	AmQuip	USA	13	500	National	99	Potain MR 615	32	51,640
14	14	BKL Baukran Logistics	Germany	4	200	Continental	353	Linden Comansa 21 LC 750	48	48,800
15	16	All Erection and Crane Rental	USA	37	1,500	Continental	86	Potain MR608	32	34,715
16	20	Locabens	Brazil	4	450	Worldwide	252	Potain MC475M25	25	31,500
17	17	Ramirent	Finland	8	55	National	155	Liebherr 550 EC-H	20	30,309
18	18	Tiong Woon	Singapore	1	50	Local	91	Yongmao STT 553	24	29,686
19	30	Bigge Crane and Rigging	USA	13	450	regional	80	Comedil CTT 721	40	26,000
20	19	Sarens	Belgium	90	4,275	Worldwide	67	Wilbert WT 2405 SL	130	24,453

Full complement

ALEX DAHM talked to DAN MAIN and HARRY FRY about the challenges surrounding financing tower cranes and the reticence of lenders to consider them a viable proposition

Even though the cyclical tower crane industry closely follows the global construction industry it is a different story when it comes to financing the equipment. More traditional construction machinery is relatively straightforward to finance but tower crane operators and rental companies often struggle to fund single unit or fleet purchases.

Asset finance is a method of raising money using the assets belonging to a company as collateral. The precise method takes various forms and can include finance or operating leases, hire purchase and various others, depending on the lender. While this can be an effective way of raising finance and is employed across a range of industries, there are some features of tower cranes that can cause issues as outlined below.

PROFILES

DAN MAIN

UK-based Dan Main works in the consultancy division of Liquidity Services, providing valuation and risk analysis for lenders and equipment operators across a range of industrial assets.



HARRY FRY

After attending college at C.W. Post College, Long Island University in the USA, Harry Fry began his career in finance. Fry developed and honed his knowledge in the corporate world of finance with GMAC and Mercedes-Benz Credit Corporation. In 1995 he started Harry Fry & Associates and decided to concentrate his finance and lease expertise efforts in the crane and lifting industry. In its 20 years the company has funded nearly \$1 billion in crane and lifting equipment acquisitions for many companies throughout North America.



Life versus loan term

Tower cranes have a long useful life of 25 years, or more in some cases, while the finance methods outlined above tend to have a loan term of around five to seven years. This relies either on a relatively predictable future value of the assets at five years or, alternatively, the user must pay a sizeable balloon payment to own the asset at this time. Given what we have already said about the cyclical nature of this industry, these future values can be hard to reliably forecast and place excessively high levels of risk either on the lessor or the lessee.

Mixing components

In addition, there is a requirement to be able to identify and track assets subject to these forms of finance. The “tool kit” or “Meccano set” nature of tower cranes in that they have a varying number of jib sections and tower sections for any given project can cause discomfort to a lender. This is especially an issue in tower crane fleets where the asset (i.e. a single crane in the eyes of the lender) is on site with tower sections and/or jib sections that effectively

are the property of someone else. This would be unacceptable for any other equipment type, and can be a major barrier to many lenders.

Exit process

In any finance agreement the bank or lender has to consider the worst case scenario, namely what would happen if the borrower were to go out of business. For tower cranes this means assets located at third party premises that are out of their control. The negative view of this is the exposure of the bank to an angry contractor who refuses to allow access to the crane whereas, in fact, this can be employed to the benefit of the lender who effectively has the upper hand. If an agreement is made to keep the crane in place for the remainder of a contract and the bank can secure the revenue stream, then with a sufficient contract length this can go some way to paying off the outstanding balance of the crane. We are aware of situations where the bank has actually received a greater amount back from this route than was originally owed.

The reality

Having said all this, the reality of obtaining finance can come down to the attitude of your lender, often to a specific decision-maker, based on their own individual experience. It is a fact that banks have had their fingers burned financing tower cranes in the past. They have not





anticipated the scale of a construction downturn and the impact on asset values or they have not had a clear picture of the exit process and struggled to gain access to their assets. There are individuals with memories of these experiences who will not lend money against tower cranes simply because they deem the industry to be too high risk, regardless of the specifics. Equally, however, there are lenders who take an open mind to this sector and those that we work with day to day will find a way to overcome the above issues or accept the risk associated with them.

The first step should be to approach your existing bank. Many banks are focused on relationships or, more appropriately, on control. If you already have your business banking, an overdraft and even some other asset backed finance

with a lender, they are given the extra comfort of knowing they have more influence than if it were simply a new asset finance agreement.

If you find that your bank is unreceptive, then the next steps are to take advice in your region about who to approach next. While the market is certainly more difficult than it used to be, we are aware of a range of lenders across the UK, Europe and the USA who will be open to financing existing tower crane fleets or new purchases. The successful finance of cranes still relies on working with the lender to help develop their understanding of the industry and get a realistic picture of the risks.

Although it seems an unlikely priority, it is in the interests of the person seeking the finance to make sure that the banks



are protecting themselves by following the right processes and collecting information on what is financed. A detailed schedule of assets of each crane should be contained in their documentation, including details of all the crane components. They should also explore the options to keep cranes on site and generating revenue wherever possible.

This not only helps to support a positive experience for banks financing tower cranes but, in the extreme event of the company becoming insolvent, it could help to ensure a positive resolution to the insolvency process.

The outlook

Tower crane finance is an area that is attracting more attention as manufacturers and operators alike recognise that barriers to obtaining finance can have a negative impact on the overall industry. The Committee for European Construction Equipment has published a brochure (<http://bit.ly/1UQmZcm>) covering the financing and insurance of tower cranes with the specific purposes of helping to develop understanding of the nature of tower cranes and how to overcome many of the issues surrounding their funding.

It is with the co-operation of all stakeholders in the industry with the major lenders that will help to improve the outlook for tower crane finance and the industry overall.





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A synthetic revolution

With increased usage of ropes made from synthetics, replacement criteria for ropes are a key topic of concern in the lifting industry. LAURA HATTON reports

In 2014 *EN 13001-3-2* was published by the European crane standards committee CEN/TC 147. A technical paper critiquing the *EN 13001-3-2* rope selection methodology, raising safety issues, has since been published by the Technical University at Dresden, in Germany raising concerns over the approach to rope selection. The paper recommends the use of *ISO 16625* (replaced *ISO 4308*) instead and has gained support from European Federation of Wire Rope Industries (EWRIS) and Drahtseilvereinigung (Association of German Steel Wire Rope Makers, DSV), members of which include Bridon, Casar, Diepa and Teufelberger.

For synthetic ropes there are general ISO standards. The crane industry, however, is still working on adapting current steel wire crane rope standards to the use of high performance synthetic ropes.

A spokesperson from synthetic fibre manufacturer DSM Dyneema, a supplier of the High Modulus Polyethylene (HMPE) fibre that is used to construct some synthetic fibre ropes, explains, "Within the EU region applications can be covered by the European Machinery Directive

– within this are guidelines for the safe usage of machinery and auxiliaries. Crane manufacturers have also initiated work on adapting *EN 13000* and relevant ISO standards. In the USA, for example, there is a draft ASME standard *B30.30* that, once approved, will specifically cover synthetic ropes."

As Michael Quinn, at synthetic fibre rope manufacturer Samson, director of new business development points out, the development of these standards is needed to support the use of this technology in the marketplace. Until such a regulation is in place, Samson, like many rope manufacturers of synthetic rope, has developed inspection and retirement criteria for its KZTM100 rope, which was developed in collaboration with crane manufacturer Manitowoc for hoist lines in mobile crane applications. It was the first synthetic rope designed specifically for mobile cranes (see *IC* March 2014, page 13).

Marcus Klink at Casar, originally a manufacturer of only steel ropes but now part of the WireCo World Group, adds, which includes manufacturers of synthetic rope, "For synthetic ropes, the whole development has just started and the lifting



The KZTM100 was the first synthetic rope designed specifically for mobile cranes

industry must adapt clear and easy-to-use standards for discarding. Steel cables have been used in many industries for more than a century and are recognised in the market for providing a higher breaking force compared to a same diameter synthetic rope at a two or three times lower price level. In addition, they provide a sense of security by clearly defined discard criteria according to *ISO 4309*.

"High quality steel wire ropes are designed in a way that the rope clearly shows its criteria for withdrawal from service (for example by a certain number of wire breaks on the surface). Compared to synthetic ropes, which is measured in millions of filaments, the counting of broken fibres is impractical. Furthermore, these very small filaments are vulnerable to damage and have a highly anisotropic nature. This means that the strength of the material acts axially down the length of the rope, but it also results in a material that is weaker off axis and resulting in more sensitive to harm from external contact than a steel wire. If the filaments of a synthetic rope indeed break, the frayed fibre will tend to stay attached to the rope body or even increase the volume between adjacent filaments. Consequently, a simple diameter measuring will not show the loss of material in the same way as in the case of an abraded steel rope."

Synthetic solutions

Compared to steel ropes, the material properties of synthetic rope provide some significant advantages, including weight reduction. Michael Quinn at Samson says, "With an 85 % reduction

The Soft Rope system comprises Lankhorst Ropes' LankoDeep rope, DSM Dyneema and an Active Heave Compensation (AHC) drum winch system



ROPES AND WINCHES

in weight, the hoist line below the boom tip is much lighter. This can allow OEMs to improve load charts, particularly on long boom applications. In addition, most high performance fibres are resistant to chemical degradation, which make synthetic ropes an excellent choice in corrosive environments.”

For the offshore industry, for example, synthetic ropes can handle heavy loads at increasing depths. Lankhorst Ropes, for example, has supplied two 3,100 metre long LankoDeep AHC ropes for a pair of 110 tonne Jebsen and Jessen knuckle boom crane systems. The Soft Rope system comprises Lankhorst Ropes’ LankoDeep rope, DSM Dyneema and an Active Heave Compensation (AHC) drum winch system from Deep Tek.

Sérgio Leite, Lankhorst Ropes sales director of heavy lift says, “The new rope has 12 stranded braids where each strand is a three-strand rope. This construction, combined with the DM20’s XBO coating, helps reduce the tension required to bed-in the rope, as well as reducing internal heating and abrasion. In addition, the rope can be inspected and is also repairable.”

Benefits from using synthetic fibre ropes have also be noted by the marine industry, as Andy Ash Vie, Harken



Industrial, CEO explains, “With fibre rope there is a reduction in maintenance, replacement costs and shipping costs. There are, however, some problems with using synthetic ropes, one of which is spooling. For example, with a low load the first layer of rope being wound onto the winch is in a pliable state. Then as the load is lifted up the fibre rope on the winch becomes stiffer and risks ‘sinking’ into the layer below it. The problem can be solved by either designing the rope and its weave

One solution to prevent issues from spooling synthetic rope has been raised by Harken. The idea comes from marine applications, where sailors use a sailing winch to pull rope in. The idea is to have a capstan winch to pull the load and then a storage reel for the remaining rope

to be compact, so when the load is off it remains stiff.

“The second approach is to separate the pulling function from the spooling function. The idea comes from marine applications, where sailors use a sailing winch to pull the rope in using only three, maybe four, wraps of the rope,” Ash-Vie explains. “The remaining rope is then left on deck. In the crane industry this is obviously not ideal, so the solution would be to have a capstan winch to pull the load and then have a separate storage reel for the remaining rope. By separating the two functions it could be possible to have a high load operating winch and a low load spooling winch.

“We are just seeing the first flickering flames of a synthetic revolution in cranes and we are seeing various different companies starting to pick it up,” Ash-Vie adds. “What we need to look at is how do you get the best out of using synthetic rope and how do you avoid its pitfalls?” ■









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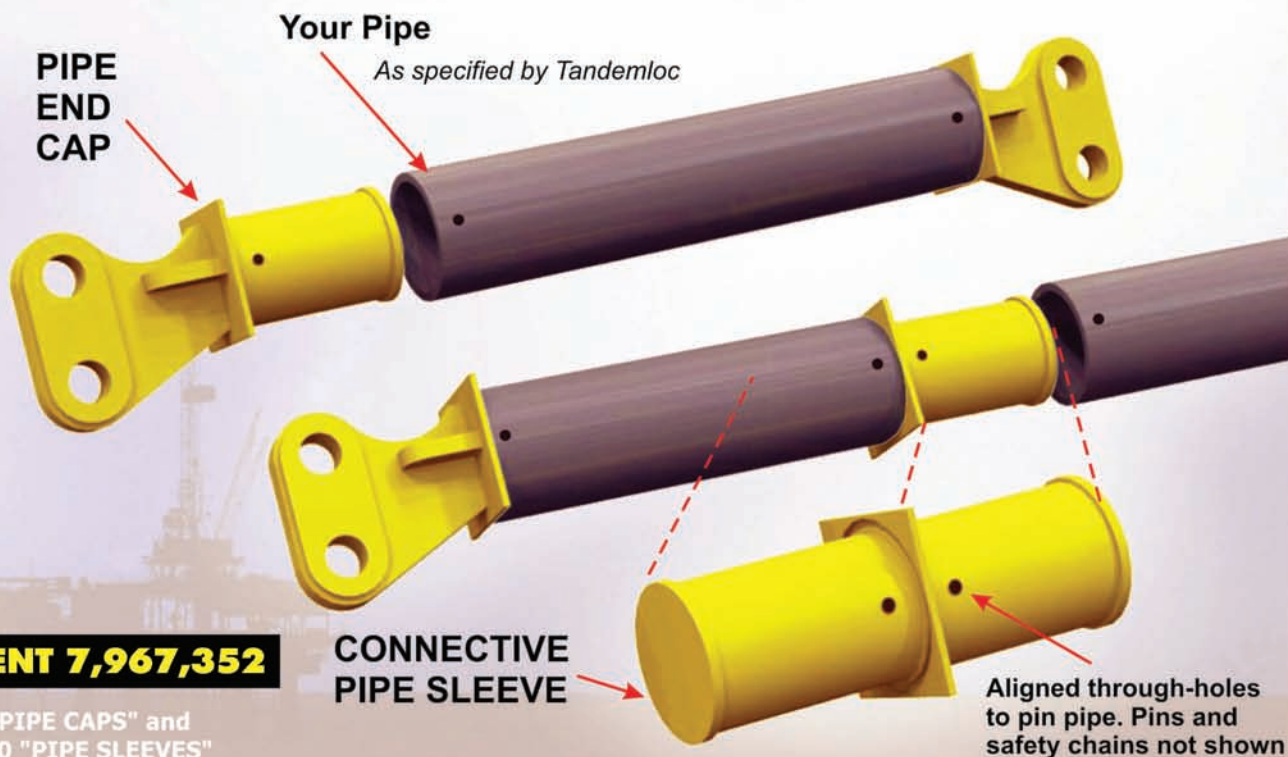


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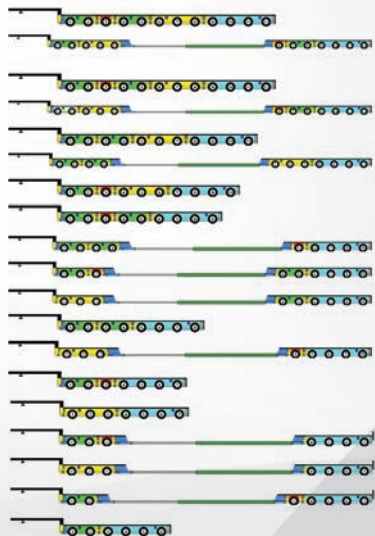
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Record Iraq transport for ALE

Specialized transport and heavy lift service provider ALE helped transport two liquefied petroleum gas (LPG) storage tanks 600 km through Iraq.

ALE was contracted by Samsung Engineering and Construction Limited (SECL) to carry out the transport. The LPG tanks were 50 metres long and weighed 250 tonnes. They were transported from Umm Qasr Port to Badra Oil Field. It is the largest cargo that has ever been transported this distance in Iraq, a company spokesperson said.

The route from Umm Qasr Port to Badra Oil Field presented a number of obstacles, including 11 bridges. The tanks were moved using 2 x 24 axle lines of conventional trailers.

Alberto Pittaluga, ALE country manager for Iraq, said, "The successful execution of these deliveries over such a long distance is the consequence of the early engagement with the final destination. ALE matured a complete mastery of the routing and its constraints allowing the team to pre-plan



The tanks were moved using 2 x 24 axle lines of conventional trailers

and propose a technically driven solution which enabled the awarding of this project and the successful consignments. The team worked hard to navigate this challenging route, removing obstacles, constructing bypasses and engineering a trailer configuration to negotiate the multiple bridges.

"The client was pleased with the execution and an additional eight units have to be transported within October 2015."

The transport time from port to site was 12 days.

STERETT'S HIGHWAY GIANT

Sterett Crane & Rigging based in Kentucky, USA, has taken delivery of a Scheuerle Highway Giant trailer. The Highway Giant trailer can be folded using its integrated folding mechanism. This allows the trailer to be transported on low-level platform semi-trailers. In addition, the trailer has a low tare weight, variable vehicle widths of 4.8, 5.4 and 6 m and can be adapted to meet various USA state regulations, the manufacturer said. The chassis is designed to be light weight and the trailer can have a gooseneck or drawbar. Spacers or a deck can also easily be fitted, the manufacturer added. It has pendulum axles and is available with a PowerBooster power pack.



Going the distance

Crane Rental Corporation, now owned by Maxim Crane Works (IC June 2015 News, page 6), completed an 8,000 mile (13,000 km) project to move three sections of a liquid natural gas (LNG) tank from Oklahoma to West Virginia, USA.

Several trips were made, each of which was different due to paving and construction work and other factors. Around 700,000 pounds (318 tonnes) of load was moved in total. The longest journey for any of the pieces was 1,724 miles (2,793 km) and the shortest was 1,436 miles (2,326 km).

"The biggest complexity of the project was the logistics," said Alan Ashlock, Crane Rental Corporation southeast



A Crane Rental Corp dual-lane trailer travelling over a suspension bridge on a journey from Oklahoma to West Virginia, USA

region president. "Our experienced team designed a method to carry the loads, co-ordinated permits and escorts through multiple states and municipalities, and planned staging areas to park the loads at night."

The end pieces of the LNG tank were 53 feet long, nearly 16 feet wide, almost 15 feet high (16 x 4.9 x 4.6 metres), and weighed nearly 270,000 pounds (122 tonnes). The centre section was 32 feet (9.75 m) long, approximately 15 feet (4.6 m) in diameter, and weighed about 145,000 pounds (66 tonnes).

Crane Rental Corp dual lane trailer making a 90 degree turn



The pieces travelled via suspension cable bridges on Crane Rental's dual-lane transport trailer. They were moved in 34 permitted days. Self propelled modular trailers (SPMT) were used to move the cargo the last 30 miles (50 km) on winding roads with gradients of 11 %. The tank was then assembled using 700 ton (635 tonne) capacity hydraulic telescopic gantries.

Frank Bardono, Maxim Crane sales and business development president, said, "Our heavy haul division enables the recently expanded Maxim team to provide a true one-stop shop for our customers throughout the nation. We are looking forward to expanding the heavy haul fleet to provide even more turnkey service coast to coast."

See a video of the move at <http://cranerental.com/long-distance-dual-lane/>

ENTRY 1

Traffic ties**EQUIPMENT USER:** Dawes**LIFTING EQUIPMENT USED:** Crawler crane**LOCATION:** Wisconsin, USA

Dawes Rigging & Crane Rental, part of the All Erection & Crane Rental company based in the USA, helped on a US\$61 million highway project in Wisconsin. The project included the construction of several new overpass bridges, traffic lane expansion, interchange reconstruction and 40 new roundabouts. Dawes used four Manitowoc 2250 crawler cranes configured with 100 metre main booms. Work included lifting loads across several traffic lanes and lifting road construction equipment.



ENTRY 2

Riverside project**EQUIPMENT USER:** Blüggel**LIFTING EQUIPMENT USED:** All terrain crane**LOCATION:** Eslohe, Germany

German crane service provider Blüggel used its Terex Explorer 5600 to relocate a footbridge across the River Ruhr in Olsberg. The 5600 was driven to the site fully equipped along a narrow and soft riverbank. Plastic load spreading plates were positioned alongside the river's walkway to allow the crane to travel to the site. The crane was configured with 33.4 metres of main boom and 46 tonnes of counterweight. The bridge was 29 m long and weighed 17 tonnes. It was loaded onto a trailer, moved to its new location further along the river and then lifted onto concrete piles.



Rising to the



This year's entries for the *IC Top Lift* 2015 competition include a selection of complicated and impressive lifts

completed in the last 12 months. Readers are asked to

ENTRY 3

Drum lifts**EQUIPMENT USER:** ALE**LIFTING EQUIPMENT USED:** Lattice boom crawler crane**LOCATION:** Buenos Aires, Argentina

ALE's Argentina branch used a 1,350 tonne capacity Liebherr LR 11350 to lift three coke drums at the YPF refinery in Buenos Aires. The drums weighed 435 tonnes each. To reduce the ground bearing pressure the crawler was set up on load spreading mats usually used for ALE's AL.SK crane. Challenges included working in a small working area filled with obstacles such as trees and buildings.



ENTRY 4

Space and time**EQUIPMENT USER:** Riga-Mainz**LIFTING EQUIPMENT USED:** Crawler crane**LOCATION:** Baden-Württemberg, Germany

Lifting and transport service provider Riga-Mainz used a 600 tonne capacity Liebherr LR 1600/2 to install a railway bridge in Germany. The bridge weighed 355 tonnes and was 40 metres long. Challenges included a small working area and a limited time schedule. To support the weight of the crane during the lift, two reinforced concrete ramps were used. Total weight of the lift was 402 tonnes.



ENTRY 5

Technical lift**EQUIPMENT USER:** Prangl**LIFTING EQUIPMENT USED:** Telescopic all terrains**LOCATION:** Hungary

Lifting and specialist transport service provider Prangl, based in Austria, lifted a 116 tonne dryer, a 61 tonne washing system, a 28 tonne chimney base and additional components into a 26 metre high steel structure at the Pétfürdő plant in Hungary. The lifting operations were performed outside the plant using a 500 tonne capacity Terex AC 500-2 and a 700 tonne capacity AC 700. The dryer was hoisted in tandem by the AC 500-2 and the AC 700.



challenge

pick their favourite from our selection of 10 outstanding lifting projects. To vote, please complete and return the form over the page. A form is also available online in the cranes and transport sector of www.khl.com

ENTRY 6

Space constraints

EQUIPMENT USER: Chunjo Construction

LIFTING EQUIPMENT USED: Crawler crane

LOCATION: Ulsan, South Korea

South Korean rental company Chunjo Construction used its 2,300 tonne capacity Manitowoc 31000 to place two reactors at a petrochemical plant Ulsan. Space at the site was limited and the crawler was required to work from a land filled river, with a road running adjacent to it. The first reactor weighed 800 tonnes and was lifted at a radius of 24 metres. The second reactor weighed 400 tonnes and was lifted at a radius of 34 m.



ENTRY 9



Ocean strength

EQUIPMENT USER: XCMG

LIFTING EQUIPMENT USED: Crawler crane

LOCATION: Shandong Province, China

A 2,000 tonne capacity XCMG XGC28000 was used to lift a drilling platform in Shandong Province, China. The 28,000 tonne-metre-rated crawler was rigged in SHW super-lift configuration with 102 metres of main boom and 54 m auxiliary jib. It lifted the oil platform at a working radius of 41 m to a height of 100 m. The lift was completed within 40 minutes, a company spokesperson said. The task was the first offshore industry project to be carried out by the XGC28000.

ENTRY 10



Shell installation

EQUIPMENT USER: Mammoet

LIFTING EQUIPMENT USED: Jacking system

LOCATION: West Philippine Sea

International heavy lifting and specialized transport company Mammoet completed the installation of an oil & gas industry platform for Shell in the Philippines. The platform was floated into place over its final location and the legs were lowered onto the prepared seabed. A pre-installed jacking system jacked the platform on 80 metre legs to lift it from the water. During the platform's construction, the strand jacks were also installed to prepare for the jack down of the DCP's legs and to raise the platform into place. To keep it level a new computer system to create tension and control platform movement on the water was used.

ENTRY 7

Boom booster

EQUIPMENT USER: Sarens

LIFTING EQUIPMENT USED: Lattice boom crawler crane

LOCATION: Netherlands

Sarens erected three large wind turbines, each with a tower height of 135 metres and a generating capacity of 7.5 MW, for the Enercon Wind Park in the Netherlands. The lift was carried out by a



1,650 tonne capacity Terex CC 8800-1 lattice boom crawler crane, equipped with the new Boom Booster, a boom system that increases lifting capacity.

ENTRY 8

Super extension

EQUIPMENT USER: Crane Hire Ltd

LIFTING EQUIPMENT USED: Wheeled mobile telescopic crane

LOCATION: Belfast

Crane Hire Ltd (CHL) in Ireland used a 500 tonne capacity Liebherr LTM 1500-8.1 to help with maintenance work on the Byford Dolphin offshore rig at the Harland & Wolff yard in Belfast. The crane was rigged in configuration TY3N with 84 metres of luffing fly jib. The crane lifted old parts weighing 6 tonnes up through the 109 metre high derrick. The parts were then loaded onto transport vehicles and sent for refurbishment.



TopLift 2015 voting form

ENTRY 1 ☒

Traffic ties

EQUIPMENT USER:
Dawes




Select your favourite lift from this year's entries by ticking *one* of the entry boxes and then e-mail, post

or fax your entry with your full name and address details as requested at the bottom of this page

ENTRY 2 ☒

Riverside project

EQUIPMENT USER:
Blüggel



ENTRY 5 ☒

Technical lift

EQUIPMENT USER:
Prangl



ENTRY 8 ☒

Super extension

EQUIPMENT USER:
Crane Hire Ltd



ENTRY 3 ☒

Drum lifts

EQUIPMENT USER:
ALE



ENTRY 6 ☒

Space constraints

EQUIPMENT USER:
Chunjo Construction



ENTRY 9 ☒

Ocean strength

EQUIPMENT USER:
XCMG



ENTRY 4 ☒

Space and time

EQUIPMENT USER:
Riga-Mainz



ENTRY 7 ☒

Boom booster

EQUIPMENT USER:
Sarens



ENTRY 10 ☒

Shell installation

EQUIPMENT USER:
Mammoet



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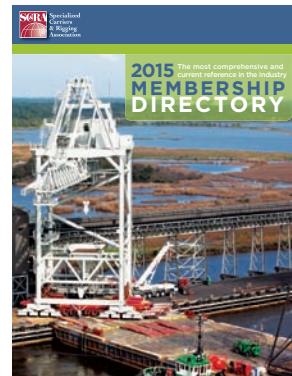
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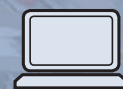
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Meeting market requirements

To help meet customer requests, manufacturers are offering models designed with Middle Eastern markets in mind. **LAURA HATTON** reports

The Middle East is seeing a number of major projects, from metro developments in Saudi Arabia and Qatar to the construction of the Kingdom Tower, in Jeddah, Saudi Arabia.

For the tower crane sector, the market is a busy one, as Hans-Martin Frech, Liebherr-Werk Biberach, marketing and market management, explains, "We have more than 30 units of 150 EC-B flat top cranes and a dozen 550 EC-H high top cranes in Qatar, and we recently supplied our 1000 EC-H 40 Litronic to the Riad Metro job site. In Makkah we had fourteen 540 HC-L on one site right next to the Kaba and another 11 luffing jib cranes on the clock tower, the world's second tallest building. In Abu Dhabi we had nearly 30 280 EC-H at the midfield airport terminal project and we have two 1250 HC tower cranes in the South at a nuclear power plant site. In addition, the upcoming Kuwait mall, The Avenue, is seeing a large number of our 280 EC-H on site.

"These jobsites are running at the same time with a lot of time-pressure and customers are demanding high performance and availability of the cranes with excellent service support. Our Tower

Crane Solutions department supports the customers to find the most suitable machines for the sites and to insure the highest performance level and most economic lifting solution."

Market designs

To help meet demands in petrochemical plants and refineries, Liebherr-Werk Ehingen offers the LTM 1500-8.1 wheeled mobile telescopic crane. Wolfgang Beringer, Liebherr-Werk Ehingen, says, "Customers in this region demand long telescopic booms, as often the space for mounting lattice jibs is restricted. This is the case especially in petrochemical plants and refineries for maintenance work."

Manufacturer Link-Belt has also experienced customer requests for longer main booms. The demand led the manufacturer to design bigger rough terrain and telescopic crawler cranes in the 80 to 135 tonne range, including the 127 tonne capacity TCC-1400 telescopic crawler crane.

The TCC-1400 has a six-section power, pin and latch boom that measures 59.5 m and Teflon (PTFE) wear pucks to eliminate the need for boom grease. It has on-board

a three-piece bi-fold lattice fly that allows a maximum tip height of 78.9 m.

Longer booms are also necessary for brick and block transport, which Palfinger incorporated into the design of the PK 27001 EL and PK 35001 EL. Both models offer a low maintenance extension boom system, hoses inside the column and a new type of top seat control with linear levers. The PK 35001 ELB has a lifting moment of 31.8 tonne-metres, hydraulic outreach with B-extension of 18.9 m, 400 degree slewing range, 7.4 m stabiliser spread and a dead weight of 4,210 kg. The PK 27001 ELA has a lifting moment 21.7 tonne-metres, hydraulic outreach with A-extension of 15.7 m, 400 degree slewing range, 6.6 m stabiliser spread and a dead weight of 3,350 kg.

At the higher end of the capacity scale from Terex are the CC 8800-1 with Boom Booster kit and the Superlift 3800 crawler cranes, both of which are suitable for petrochemical industries. Terex also offers the Explorer Series all terrains, from the



Al Majdouie transporting a vacuum tower for Samsung as part of the Lubref Yanbu refinery expansion project in Saudi Arabia





130 tonne capacity Explorer 5500 with 60 m main boom to the 220 tonne capacity Explorer 5800 with 70 m main boom. The cranes are fitted with the IC-1 Plus control system, which calculates lifting capacities for every position of the boom subject to the slewing angle of the superstructure, the manufacturer says. Terex also offers the Quadstar rough terrain crane family with three models in the 65 to 75 tonne capacity class. The Quadstar series offers compact dimensions, safe access, and easy maintenance and is suitable for the Middle Eastern markets, the manufacturer says.

Also developed with the Middle Eastern markets in mind is the new Liebherr duty cycle crawler crane HS 8130 HD. Manufactured by Liebherr-Werk Nenzing in Austria, the model was developed for material loading with grab or drag bucket, dynamic soil compaction and dredging applications. The new crawler

Liebherr 280EC-H and a 630EC-H tower cranes on site at the national museum in Doha, Qatar



Al Jaber Heavy Lift and Transport using its 3,200 tonne capacity Terex CC 8800-1 Twin to help complete a series of super-heavy lifts on a petrochemical development in Qatar

is successor to the HS 885 HD. It has an operating weight of 115 tonnes and can be transported with railings and walkways assembled on the upper carriage. It is fitted with two hydraulic free-fall winches offering 35 tonnes of line pull each and is powered by a V8 Liebherr diesel engine. Automatic engine stop control is an option. From Liebherr-Werk Biberach is the 1000 EC-H and 710 HC-L. Both models

are based on Middle East market requirements. "They are powerful and precise and despite their size very economical in operation and easy in erection," Hans-Martin Frech says. "The 1000 EC-H 50 Litronic has a maximum capacity of 50 tonnes and a lifting capacity of 11,500 kg at the tip, maximum radius of 80 m. The 710 HC-L 32/64 Litronic has a capacity of 64 tonnes, a jib length of 50 m and a 220 kw hoist gear."

From manufacturer Tadano is the GR-1450EX rough terrain crane. The model has a 145 tonne capacity and 61 metre boom. The first unit in the Middle East was delivered to Aertssen

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A Doll Panther semi low-loader S8H-S2

LEFT: Aertssen Machinery Services took delivery of a Tadano GR-1450EX rough terrain

Machinery Services in Abu Dhabi through Tadano dealer United Alsaqer Heavy Equipment.

Increased transport

The transport sector in the Middle East is just as busy and the growth is having a positive impact. Nadja Paulus at trailer manufacturer Doll, says, "Trailers that we normally design for European markets are more and more conquering the Middle Eastern markets due to the booming construction business. Trailers on offer include the Doll Panther series with single wheel suspension. The models feature a

loading height of 780 mm, a total stroke of 405 mm and a steering angle of 55 degrees covering payloads of up to 120 tonnes and an axle load of 12 to 15 tonnes. When it comes to optional extras, all Panther trailers have a modular design."

Optimism in the industry is also being felt by TII Group, which recently delivered Kamag K25 modular trailer units fitted with Powerbooster systems to transport company Al Majdouie, based in Saudi Arabia. Al Majdouie has carried out haulage and installation operations in Rabigh and has completed the transport of an evaporator in Yanbu, Saudi Arabia.

Manufacturer Faymonville also offers trailers for Middle Eastern markets, including the MultiMax semi-trailer series and the ModulMax modular range, a combinable road-going transport module with 2 to 6 axle lines and a total payload of up to 5,000 tonnes.

"ModulMax modular vehicles can be coupled lengthwise and crosswise, with spacers and low beds, etc," Marco Andres, Faymonville spokesperson, says. "It has a pivot-mounted bogie with 60 degree steering angle, axle loads of up to 45 tonnes per axle line and hydraulic axle compensation with a stroke of up to 650 mm." Also from Faymonville is the TeleMax 2 to 6-axle flatbed semi-trailer and the new CombiMax trailer.

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Advanced advantage

This month **MARCO VAN DAAL** goes deeper into the principle of mechanical advantage using different pulley systems

We begin this article by referring back to three figures from last month's article. These are Figures 1, 2 and 3.

Last month we saw that the red line that cut the parts of line was an indication for the mechanical advantage of the pulley arrangement.

ABOUT THE AUTHOR



Marco van Daal has been in the heavy lift and transport industry since 1993. He started at Mammoet Transport from the Netherlands and later with Fagioli PSC from Italy, both leading companies in the industry. His 20-year plus experience extends to five continents and more than 55 countries. It resulted in a book *The Art of Heavy Transport*, available at: www.khl-infostore.com/books Van Daal has a real passion for sharing knowledge and experience and holds seminars around the world.

We will now analyse each of these three arrangements and determine the load at the anchor point, the point on which the entire pulley system is suspended.

For this exercise we disregard the angle at which the hoist line departs from the top sheave.

FIGURE 1:

This pulley arrangement had a mechanical advantage (M.A.) of 1. The line pull (L.P.) in this case is equal to the load being lifted ($F_L = 100$ Newton).

The load in the anchor point (F_A) is therefore $F_A = L.P. + F_L = 100$ Newton + 100 Newton = 200 Newton.

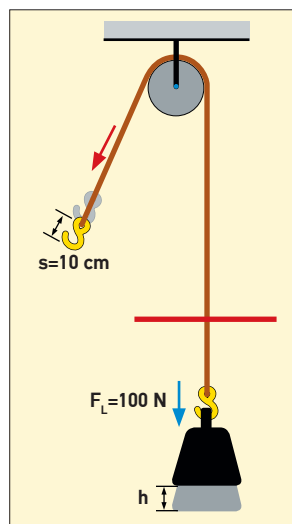


FIGURE 1

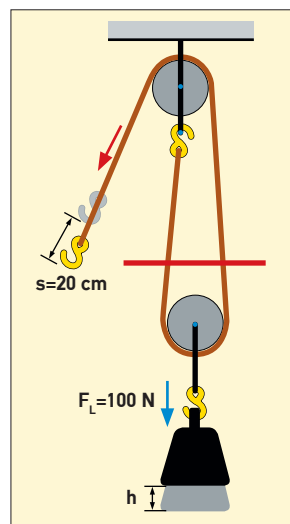


FIGURE 2

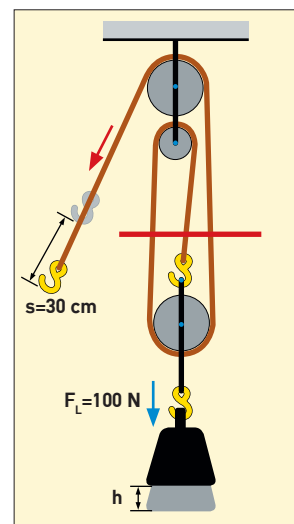


FIGURE 3

FIGURE 2:

This pulley arrangement had a mechanical advantage (M.A.) of 2. The line pull (L.P.) in this case is equal to the load being lifted ($F_L = 50$ Newton). The load in the anchor point (F_A) is therefore $F_A = L.P. + F_L = 50$ Newton + 100 Newton = 150 Newton.

FIGURE 3:

This pulley arrangement had a mechanical advantage (M.A.) of 3. The line pull (L.P.) in this case is equal to the load being lifted ($F_L = 33.3$ Newton).

The load in the anchor point (F_A) is therefore $F_A = L.P. + F_L = 33.3$ Newton + 100 Newton = 133.3 Newton.



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The conclusion we can draw from this is that the anchor point can be of a lesser capacity as the number of line parts increases. Why is this important in our heavy lift industry?

To answer this question, consider the following scenario:

A crane has a charted capacity of 10 ton at 12 metres (40 feet). The maximum line pull for this crane is 12 ton, the hoist rope is of the same capacity, as is the headache ball.

It is the intention to lift an 8 ton load (this includes the hook block and rigging) at a radius of 12 m (40 feet), this is well within the capacity of the crane. As a matter of fact the crane can perform this lift and still have a 20 % safety margin.

The crane chart shows a note stating: "for loads over 5 ton and over 6 m (20 feet) use at least a double sheave block with four parts of line".

Let's analyse the following scenarios:

A.) lifting the 8 ton load (F_L) with the headache ball on a single part of line.

B.) lifting the 8 ton load (F_L) with a single sheave block on two parts of line.

C.) lifting the 8 ton load (F_L) with a double sheave block on four parts of line.

Lifting the load with the headache ball

The mechanical advantage (M.A.) is 1. The required line pull equals the load to be lifted which is 8 ton. The load in the anchor (F_A), which in this case is the boom tip, is $F_A = L.P. + F_L = 8 \text{ ton} + 8 \text{ ton} = 16 \text{ ton}$.

The crane chart however states the crane is only suitable for 10 ton at this radius. By reeving the crane with only a headache ball an overload scenario has been created.

Lifting the load with a single sheave block

The mechanical advantage (M.A.) is 2. The required line pull equals the load to be lifted which is 4 ton. The load in the anchor (F_A), which in this case is the boom tip, is $F_A = L.P. + F_L = 4 \text{ ton} + 8 \text{ ton} = 12 \text{ ton}$.

The crane chart however states the crane is only suitable for 10 ton at this radius.

By reeving the crane with a single sheave block an overload scenario has been created.

Lifting the load with a double sheave block

The mechanical advantage (M.A.) is 4. The required line pull equals the load to be lifted which is 2 ton. The load in the anchor (F_A), which in this case is the boom tip, is $F_A = L.P. + F_L = 2 \text{ ton} + 8 \text{ ton} = 10 \text{ ton}$.

This is exactly the capacity shown in the chart. By reeving the crane with a double sheave block a safe lift scenario has been created.

IMPORTANT NOTES

The above example is to show how the forces in the anchor point, the boom tip, decrease as more parts of line are being used. In practice it is not necessary to perform this calculation, the charts for each crane are developed taking the line pull into account. The chart capacity is the real lift capacity.

It is just to clarify that charts are developed in

a way that produces the highest lifting capacity in each scenario.

In some cases this result in a requirement to reeve a hook block with more parts of line than what would seem necessary at first glance.

Simple, compound and complex pulley systems

The pulley arrangements in Figures 1, 2 and 3 are called simple pulley systems. To qualify for this title, it needs to satisfy the following two criteria.

1.) all moving pulleys need to move towards the anchor

2.) all moving pulleys need to move towards the anchor at the same speed.

Once this is confirmed, the mechanical advantage can be determined by counting the number of parts of line that supports the load. See the calculations or last month's article to confirm this statement. The

principle of counting parts of line can only be applied to a simple pulley system.

Compound pulley system

Review the five pulley system in Figure 4.

We need to determine if this is a simple pulley system. If it is we can count the number of parts of line to determine the mechanical advantage.

DEFINITION 1: "all moving pulleys need to move towards the anchor". This pulley system complies

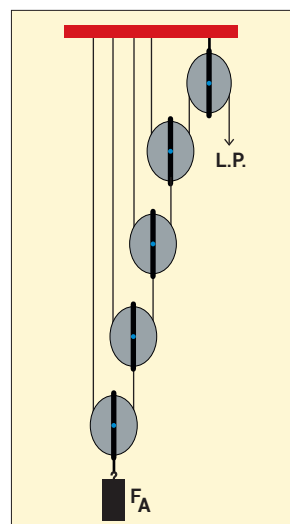


FIGURE 4




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with this first requirement, as we pull down on L.P. (Line Pull) the load will raise off the ground and all pulleys will move towards the anchor.

Note, we can disregard pulley 1 as this pulley does not contribute to any mechanical advantage, it merely changes the direction of the L.P. from a downward to an upward direction.

DEFINITION 2: “all moving pulleys need to move towards the anchor at the same speed”

We can determine this by using the T-method. T standing for tension. Review **Figure 5**. When pulling down on the L.P. we introduce a tension T in the rope, this tension will remain as the rope runs over pulley 1 and also remains as it approaches and departs from pulley 2 and terminates at the anchor (in red).

Pulley 2, however, experiences a load T on each side and consequently it can lift a weight equal to $2 \times T = 2T$. Therefore the mechanical advantage of pulley 2 is 2.

The tension ($2T$) in the rope attached to pulley 2 remains as it approaches and departs from pulley 3 and terminates at the anchor (in red). Pulley 3 experiences a load $2T$ on each side and consequently it can lift a weight equal to $4T$. The mechanical advantage of pulley 3 is 2.

At this point we can make a statement. Pulley 2, by itself a simple pulley system, will move up at half the distance that L.P. moves down. Pulley 3, by itself also a simple pulley system, will move up at half the distance that pulley 2 moves up. Therefore pulley 3 moves up at one quarter of the distance that L.P. moves down.

CONCLUSION 1: Pulley 2 and pulley 3 do not move up at the same speed. Therefore this arrangement is not a simple pulley system (see definition 2 of a simple pulley system) and the mechanical advantage (M.A.) may not be determined by counting parts of line.

CONCLUSION 2: Each of the pulleys (with the exception of pulley 1) are by themselves simple pulley systems so this arrangement is called a compound pulley system. The definition of a compound pulley system is that it is built up from multiple simple pulley systems attached to each other.

Back to Figure 5, continuing the T-method as applied to pulley 2 and 3 above, pulley 4 can lift a weight equal to $8T$

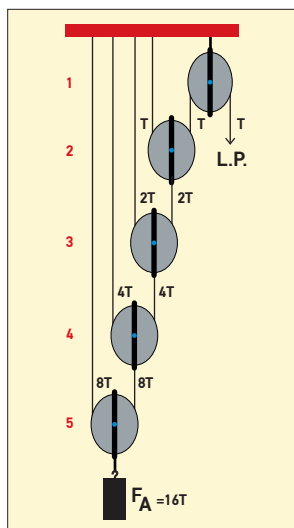


FIGURE 5

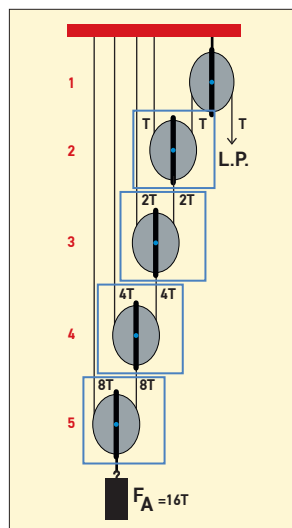


FIGURE 6

and pulley 5 can lift a weight equal to $16T$. With a line pull of $1T$ a load of $16T$ can be lifted. The mechanical advantage is 16. As you can see there are not 16 parts of line that could have been counted.

There is however an alternative and easier way to determine the mechanical advantage by isolating each of the simple pulley systems and determining the mechanical advantage per simple pulley system. See **Figure 6**. Each of the blue squares contains a simple pulley system and each of these has a mechanical advantage of 2. Check this for yourself. Note that the mechanical advantage of pulley 1 is 1 as it only changes the direction of the force.

The mechanical advantage of the compound pulley system is the multiplication of each of the simple pulley systems. $M.A.1. \times M.A.2. \times M.A.3. \times M.A.4. \times M.A.5 = 1 \times 2 \times 2 \times 2 \times 2 = 16$.

As seen last month, a mechanical advantage of 16 has to be at the cost of another property to “balance” the system due to the law of conservation of energy. You will need 16 times the amount of rope at L.P. to lift the load a foot (or a metre) off the ground.

Complex pulley system

A complex pulley system is any pulley system that is not a simple or compound pulley system. There is no one definition that characterises all complex pulley systems. With only four pulleys almost 100 different complex pulley systems can be made.

Due to their complexity, the complex pulley systems are not used frequently as they are also mostly impractical. It is not always easy and straightforward to determine if a pulley system is a compound pulley system or a complex pulley system.

The mechanical advantage of complex pulley systems can be determined in two ways. The most practical way is the T-method as outlined above.

For systems that become too complex to use the T-method, as pulleys may move in opposite directions, is to build the complex pulley system (field test) and pull a rope a known distance at the Line Pull end and measure the distance that the load was raised. The ratio is the mechanical advantage.

Review **Figure 7**. This is a complex pulley system, as the top pulley is connected to both the second and the third pulley. The mechanical advantage can no longer be determined by counting the parts of line nor by isolating each pulley and multiplying the individual mechanical advantages.

The mechanical advantage for this system can only be determined by the T-method or by field testing.

Figure 8 shows the results of the T-method, check this for yourself.

A quick method to check the correctness of the various loads. The total load in the anchor point (the red bar) should be equal to the load to be lifted (F_A) plus the line pull (L.P.), both are $5T$ which means that the forces are correct.

Food for thought: pulley 1 is stationary, pulley 2 moves downwards, pulley 3 moves upwards.

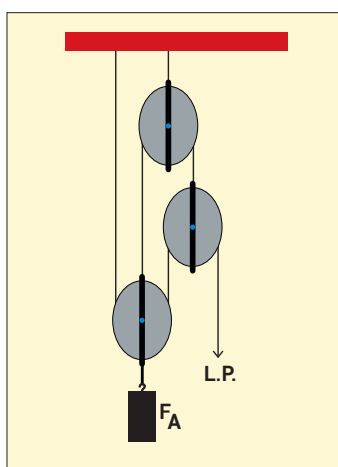


FIGURE 7

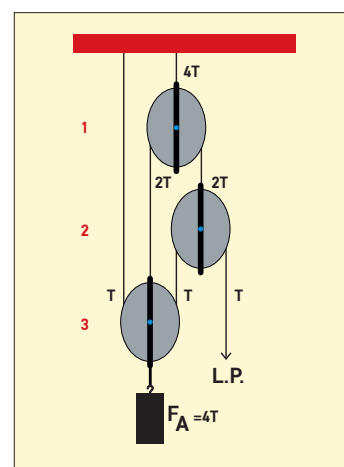


FIGURE 8

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COMMENT

Joel M Dandrea

Employer of choice



Our industry is undergoing a crucial period that will hopefully be reflected upon as a time when companies did their part(s) both individually and collectively to attract a new workforce, retain top talent and continue to move towards innovation and operational efficiency.

It seems that regardless of the company, country or continent, the specialized transportation, crane and rigging industry is facing a historical moment when what it does communally to attract workers, and how it decides to cultivate that talent, will be the distinction of the times.

Within this consideration is the notion of becoming an employer of choice. Yes your company might need workers but how are you positioning yourself to become the employer they choose? After all, it's one thing to simply hire some people that need or want a job; it's another thing to put in place a skilled labour force that enhances your brand, expands production and improves your standing in the marketplace.

Prospective employees

You find these types of people by becoming an employer of choice – a concept that Scott Marshall, vice president of global human resources at Jacobs (one of the world's largest providers of technical, professional and construction services) says is heavily reliant on how you recognise the “people side” of a project.

Marshall also says that companies who master this concept avoid an equally negative distinction – that of being an employer of “last resort.”

It's pretty simple: the “people side” of a project comprises all the details that make an environment a better place to work – a more attractive option for prospective employees. Things like picnic tables and grassy areas for breaks, available parking, well-equipped lunch facilities, well-functioning restroom facilities and, often, exercise facilities. In addition, this approach includes

the availability of training and career advancement opportunities. Considering the “people side” tells your current and potential employees that you're willing to invest in them, and they're likely to return the favour by investing in you with dedication and loyalty. Marshall emphasises that some of these considerations might seem like minor details but they actually could mean the difference between a company hiring the right people for the job one time, or having to steadily fill openings – and even struggle to rely on the employees that stick around.

Feeling valued

Marshall also points out that, too often, companies don't bake these details into a project plan, or a long-term strategy and that's also a major oversight. Many companies will only focus on how and where they're going to acquire employees – the objective component, if you will. Lost in the translation is the workforce development consideration side of it – the subjective component – where the company realises the importance of creating an environment, both long-term and project-specific, where workers feel valued, and opportunity exists.

Another facet of the “people side” approach is cultivation. Once a company can boast a reliable core of dedicated employees that feel valued and committed, it's important to offer them a glimpse at what opportunity there is with the company. Where do they want to be in ten years? What are the steps to get there? Can they go from working on a project site to managing the entire project? How can you both make this possible together?

If you can answer these types of questions, in addition to providing a work environment that values the needs of your employees, then you have the mindset of an employer of choice – and you'll likely look back on this crucial moment in our industry's history as a moment of true opportunity for your business. ■



WHO'S WHO

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The SC&RA awards programme is an opportunity for members worldwide to have their contributions to safety and ingenuity honoured. MIKE CHALMERS reports

Worldwide awards

As a testament to its ongoing pledge to advance the crane, rigging and specialized transportation industry by advocating for each of its member companies around the world, SC&RA takes pride in honouring its members' outstanding contributions in safety and ingenuity every year with the Awards Program.

The Awards Program represents the commitment and dedication of thousands of individuals and member companies by rewarding achievements in safely transporting, lifting and erecting oversize and-or overweight objects. It is important to remember that the opportunity to enter the competition(s) and even win one of these coveted awards is open to every Association member company – regardless of the country they call home. It is truly an international competition.

SC&RA awards boost morale for winners and provide inspiration to other members – with the impact of achieving an SC&RA award often reverberating throughout an entire company.

The 2016 SC&RA Awards Program will open on 5 October and run through to 15 March 2016. SC&RA members from around the world are strongly encouraged to participate. All information and applications are easily available and ready to complete using the SC&RA website www.scranet.org in the Awards section below the Membership tab.

International talk

Adriana Nunes at Transdata Movimentacao de Cargas Complexas in Sao Paulo, Brazil, enjoys the annual Job of the Year awards, as well as the value within each annual meeting. That excitement deepened when Transdata picked up a 2015 Rigging Job of the Year Award.

"SC&RA is a serious, reliable organisation," said Nunes. "The jobs presented during the contests are always impressive and the meetings allow us to keep our business at a high level through innovation and education."

Internationally Nunes knows that industry recognition is invaluable for Transdata. "The worldwide market exposure at SC&RA events reveals the potential of our business, as well as our country, to perform challenging projects."

Also benefiting from the exposure the SC&RA awards contests provide, NCSG Crane & Heavy Haul Services (Acheson, Alberta, Canada) was a participant in the 2012 SC&RA Job of the Year Contest, as well as a winner of the Crane & Rigging Safety Improvement Award. Ted Redmond, president and CEO, feels that the Job of the Year Contest allows companies to show the type of work they're capable of doing, which builds morale. "It lets our peers and industry participants know about our company and skills," Redmond explained. "And it's an opportunity to invite additional employees to SC&RA events so

they can experience the many benefits the association has to offer."

Redmond is quick to recommend the SC&RA Awards Program to other international members. "Yes – it's well worth the effort. SC&RA Safety and Job of the Year Awards are widely known and recognised as a high achievement."

Joery van Vlieden, managing director at Mammoet Canada Western, based in Edmonton, is a 2014 Job of the Year participant echoing Redmond. He said that, without a doubt, participating in the Association's Awards Program has helped his business. "It adds another medium in which to get our company's accomplishments out to a broader audience. We will continue to participate in the Awards Program as we feel it is important to share with the industry new advancements and new solutions being brought to the table."

As far as membership benefits go, van Vlieden sees unquestionable strategic value. "The networking is very beneficial and being a member allows us to gauge where the industry is and where it's headed."

AWARDS AVAILABLE FOR SC&RA MEMBERS IN 2016 ARE AS FOLLOWS:

Crane & Rigging

SAFETY AWARD Applicants must not exceed the maximum criteria established for Incident Rates and Workers' Compensation Modification.

SAFETY IMPROVEMENT Awarded to member companies who show improved incident and-or Workers' Compensation Modification rates compared to the previous year.

ZERO ACCIDENTS Awarded to SC&RA members having zero recordable accidents or incidents during the previous year.

CRANE OPERATOR SAFETY Presented to certified crane operators who exhibit exemplary work achievements, accumulating 10,000 consecutive man-hours while recording zero accidents and incidents.



One highly regarded crane and rigging award is the Zero Accidents Award for zero recordable accidents or incidents during the previous year

PROJECT SAFETY Projects with zero recordable injuries or illnesses are eligible for recognition. SC&RA members receive and present the award to their client.

CRANE RENTAL SERVICE SAFETY (in two categories):

- "Maintenance Work" – 1,500 hours of ongoing maintenance work in a single project location.
- "Single Project" – 1,500 hours of work during the length of one project for the same client.

For the Project Safety and Crane Rental Service Safety Awards members receive and present the award to their client, signifying the mutual commitment to safety between the client and the SC&RA member.

Transportation

MILLION MILER Recognising professional drivers who have accumulated a minimum of one million consecutive miles of safe driving in the industry.

DRIVER SAFETY AWARD This new award is given to drivers with five consecutive years of accident-free driving.

DRIVER OF THE YEAR Awarded to the driver who completes five consecutive accident-free years of driving along with demonstrating highway courtesy and providing outstanding contributions to the safety culture in their company.

FLEET SAFETY AWARD Applicants with the lowest accident frequency rate in seven mileage categories and all applicants whose rate is less than .45 are selected for this award.

FLEET SAFETY IMPROVEMENT Awarded to contestants who demonstrate a reduction in their accident frequency rate for miles travelled compared to their previous year.

Among the international winners of the 2015 Hauling Job of the Year Award were Tradelossa (Mexico City, Mexico) and Precision Specialized Division (Woodbridge, Ontario, Canada)



Among the international winners of the 2015 Rigging Job of the Year Award were: Fagioli (Opera, Milan, Italy) and Transdata Movimentacao de Cargas Complexas (São Paulo, Brazil)



A number of transportation safety awards recognise drivers with outstanding safety records

Job of the Year

HAULING JOB OF THE YEAR

Winning jobs epitomise how SC&RA members meet professional challenges encountered in hauling. Judges stress shipment routing, planning, physical elements, safety considerations and execution. Winners are selected in three job categories:

- Moving
- Trucking under 160,000 pounds net
- Trucking over 160,000 pounds.

Hauling Job of the Year 2015 international winners: Tradelossa, Mexico City, Mexico, and Precision Specialized Division, Woodbridge, Ontario, Canada.

RIGGING JOB OF THE YEAR

As one of the most prestigious awards in the industry, the Rigging Job of the Year focuses on ingenuity, hard work and adherence to standards, with an emphasis on safety, ingenuity, innovation, engineering and consideration of limitations. A winner is selected for each category, including:

- Under US\$150,000

- \$150,000 – \$750,000
- \$750,000 – \$2 million
- Over \$2 million.

Rigging Job of the Year 2015 international winners: Fagioli, Opera, Milan, Italy, and Transdata Movimentacao de Cargas Complexas, São Paulo, Brazil.

LONGEVITY AWARD Given to member companies at five-year intervals to recognise long-time support and dedication from five to 65 years.

Industry recognition

GOLDEN ACHIEVEMENT This award is a tribute to an individual who has made consistent and outstanding contributions to the specialized transportation, crane or rigging industry.

ENVIRONMENTAL Presented to a member company that demonstrates a consistent commitment to environmental protection.

PRESIDENT'S Awarded to a company whose employees have collectively recruited three or more companies to join SC&RA during the previous membership year.

Service awards

VOLUNTEER SERVICE Presented to individuals who have served a three-year elected term on the SC&RA Board of Directors, or as a Governing Committee member.

FOUNDATION CORNERSTONE Individuals who have served a two- or three-year elected term on the SC&R Foundation Board of Directors.

For more information see:
www.scranet.org/awards

SC&RA AWARDS 2016

This year's application process for the 2015 SC&RA Awards begins on 5 October 2015. It runs through until 15 March 2016. All member companies are encouraged to participate. The forms will be in the Awards section at www.scranet.org

For further information about a specific award contact SC&RA at:
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■ **Desmond Ong**
Founder & CEO, Galmon
Round-table session – aerial platform rental



■ **Jim Barr**
Vice President/General Manager Greater China Sales
and Service, Terex AWP
China's growing aerial platform sector



■ **Michel Petitjean**
Secretary General, European Rental Association,
Belgium
The Benefits of Cooperation in the Rental Business



■ **Jia Li Cai**
Managing Director, Machinery Management & Rental
Division of the China Construction Industry Association
(CCIA)
**China's rental market: historical roots and
conditions for growth**



■ **Bai Ri**
IPAF China Representative
Round-table session – aerial platform rental



■ **Tomie Chan**
General Manager, Haulotte Asia
Round-table session – aerial platform rental



■ **Vivek Soni**
co-CEO & CFO, Gemeni Equipment
and Rentals, India
**Strategies for Rental Companies in
Developing Markets**



■ **Gary Kucher**
Chief Executive Officer, Mongolia Holdings (Hertz
franchise), Mongolia
Mongolia as an Equipment Rental Opportunity



■ **Ni Xinli**
Chairman and founder, Jiangsu Tongyuan Machinery
Sales & Service Co Ltd
The future of earthmoving rental in China



■ **Enilson Moreira de Lima**
Chief Executive Officer, A Geradora, Brazil
Managing rental through growth and recession



■ **Chunyu Zhang**
General Manager, Shanghai Horizon Equipment &
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Views from a new rental company

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STRAIGHTPOINT
HEADROOM LINKS

Manufacturer of load cells and monitoring systems Straightpoint has introduced a new range of low headroom links. The headroom links are designed to provide accurate measurement of loads in applications where headroom restrictions are a major factor, the manufacturer said.

The links are manufactured from high strength alloy steel and are designed to work with industry standard shackles from manufacturers such as Crosby and Van Beest. Applications include weighing, lifting, force measurement and load monitoring of structures, for example, lighting trusses, hoist mountings and fly line tensioning.

■ For more information see: www.straightpoint.com

New conductor from LineWise

LineWise, part of Diversified Product, has launched the Phase Lifter, an insulated crane attachment for use in utility line applications.

The Phase Lifter can, according to the manufacturer, safely support up to three energised lines at once and allows workers to come in from underneath and hold the conductor, as opposed to over the top with rigging sticks hanging from a crane. It has a 680 kg total vertical load and 102 kg side load capacity per conductor. Maximum conductor spacing is 4.4 to 8.8 metres in increments of 150 mm, for a maximum width of 8.8 m.

The insulator is available in industry-standard Line Post Polymer or sealed fibreglass. The arms include a desiccant canister to absorb moisture, the manufacturer added.

"To attach the Phase Lifter to a crane, an adapter specific to the type of crane is fitted," the manufacturer explained.

The Phase Lifter insulated crane attachment



"For setup, folding arms are mechanically synced to open and close simultaneously. A pin automatically slides into a slot to lock the arms in a working or open position, while a cross

pin locks the pin in place. The Phase Lifter stows on the side of the crane for easy transport to and from a jobsite."

■ For more information see: www.diversifiedproduct.com

Rebel range fall protection

Fall protection specialist Capital Safety has launched new products in its Protecta Rebel range. The all-in-one web and self-retracting lifeline is designed for construction

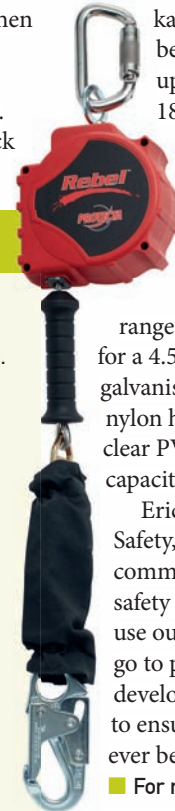
and general maintenance when working at height. The new range has CE EN360:2002 safety standard certification.

Products have a twist-lock zinc-plated top connector

karabiner with a load bearing capacity of up to 16 kN and an 18 mm opening, the manufacturer said. The high-strength polyester web version is available in 3.3 and 6 metre options. The new range includes an option for a 4.5 m cable with 5 mm galvanised cable. It has a nylon housing, heat-shrunk clear PVC coating, and a capacity of 140 kg.

Eric Dupont of Capital Safety, said, "We are committed to ensuring the safety of the people who use our products and will go to painstaking lengths to develop our product ranges to ensure they are safer than ever before."

■ For more information see: www.capitalsafety.com



KONGSBERG LAUNCHES ENTRY LEVEL SIMULATOR

Manufacturer of crane simulators Kongsberg GlobalSim has launched a new port crane simulator, the K-Sim Lift Essential.

The K-Sim Lift Essential has a single large display, a seat with real controls and an instructor station.

It includes port crane simulation software for ship-to-shore cranes, rubber-tyred gantry cranes, mobile harbour cranes, reachstackers and empty container handlers, a Kongsberg GlobalSim spokesperson said. Extra displays can also be added.

Clyde Stauffer, Kongsberg GlobalSim senior vice president, said, "Changing from STS controls to RTG controls takes only a matter of seconds. For years our full mission simulators have provided training with various functions such as single and twin-lift container operations, chain-lifts, man-cage operations and over-height frames. This high-end software also runs on the Essential platform."

■ For more information see: www.km.kongsberg.com

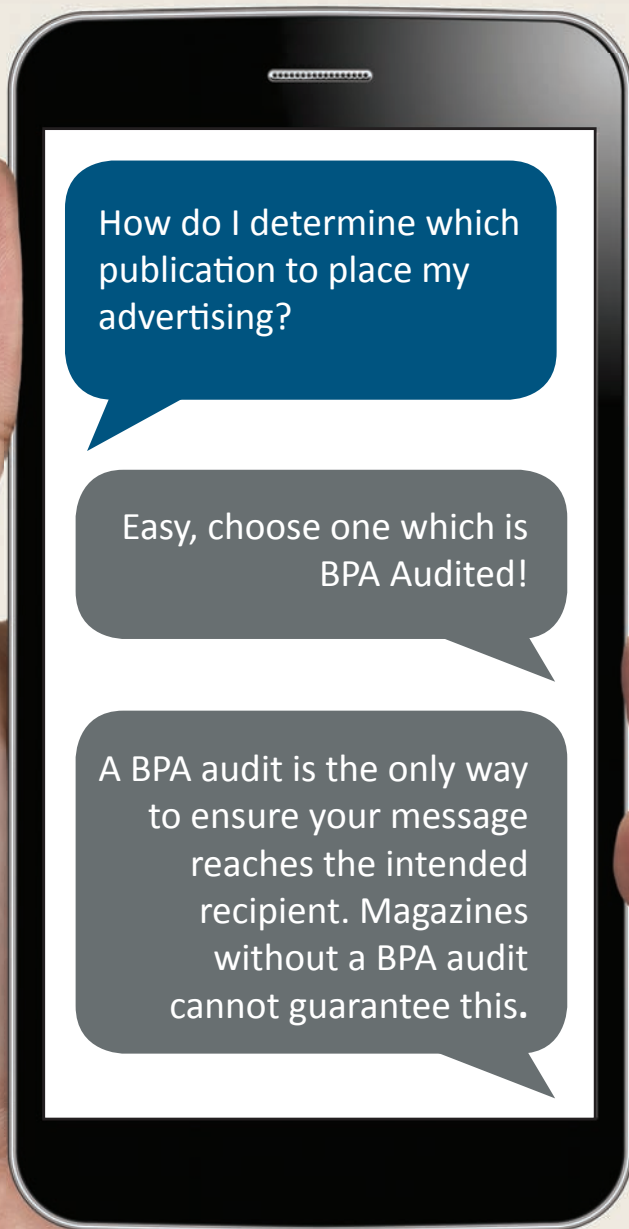


The K-Sim Lift Essential simulator for port crane operations

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www.bauma.de

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www.samoter.com

IN THE KNOW

Picture of the month

This issue's picture of month has been sent in by IC reader and contributor David Weston. The picture shows a Fowler Crane Engine called the *Duke of York* on display at the Lincoln Steam Rally in the UK. The *Duke of York* model was built in 1928 and has 10 nominal horse power (NHP). The crane has a 12 tonne capacity. The model was owned by Marstons Road Services Ltd based in Liverpool, which took over Edward Box and Co.



PEOPLE NEWS

■ The ALL

Family of Companies has appointed **RICH NOMANSON**



to general manager of ALL Carolina Crane & Equipment, based in North Carolina, USA. Nomanson has worked for ALL for 19 years, first as an operator and then at the Indiana-based Central Rent-a-Crane. Michael Liptak, ALL Family of Companies president, said, "Rich is a great fit to lead our growing operations in Raleigh. His many years of experience, his knowledge of our business and this industry will serve him very well." Commenting on his new role, Rich Nomanson said, "I've had a chance to work with some of the best people and equipment in the industry. I'm thankful for the chance to share the tradition and work ethic I've been taught, and will use my experience to maximize the potential of each team member."

■ JOSHUA

BACCI has been promoted to the position of crawler crane



fleet administrator at the All Family of Companies. Bacci will be responsible for preventive maintenance, inspections, relocating crawler parts and attachments and coordinating the departures of crawler cranes for job sites. Bacci has worked with ALL since 2006, with his most recent position as assistant operations manager. Rick Mikut, ALL manager of corporate crawler fleet division, said, "Josh has always demonstrated a willingness to learn and has never turned down a new opportunity. I can't think of a more deserving individual for this position." Bacci said, "I've learned from some of the best. In this new position, I'm able to appreciate from a different perspective what everyone does, and I look forward to learning more every day."

■ Chu Kai Public Company Limited, based in Thailand, has appointed **DOMINIC PATRICK PURDUE** to senior vice president

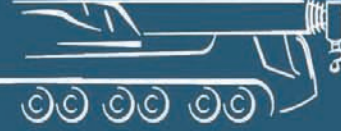


of operations and systems development for the company and its subsidiaries, including The Crane Laem Chabang, The Crane Rayong and The Crane Services. Purdue has experience in the crane and heavy transport industry. Previous roles include regional QEHS systems manager (Asia region) for Sarens Asia and QEHS systems manager for Mammoet Australia. He also has experience in the nuclear decommissioning and primary aluminium industries. In his new role Purdue will be responsible for the design and implementation of management systems based on ISO and OHSAS standards. Purdue will also reorganise work processes in the sales, rental and marketing departments for heavy cranes and allied business.

■ Send picture of the month entries and all other back page-related information to *International Cranes and Specialized Transport*, KHL Group, Southfields, Southview Road, Wadhurst, East Sussex TN5 6TP, UK or by e-mail to alex.dahm@khl.com. Picture caption entries should include: the month and year taken, the place, type of crane, owner and project, plus any other relevant information.

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70 t YOM 1998/1999



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Demag AC 300
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25 t Demag AC 25/75	1998	4x4x4	25,00m + 13,00m
30 t Tadano Faun ATF 30-2L	2006	4x4x4	28,50m + 12,20m
35 t Liebherr LTM 1030-2.1	2005	4x4x4	30,00m + 15,00m
35 t PPM ATT 400/2	2000	4x4x4	30,40m + 15,00m
50 t Terex Demag AC 50-1	2006	6x6x6	40,00m + 17,60m
50 t Terex Demag AC 50-1	2005	6x6x6	40,00m + 17,60m
55 t Liebherr LTC 1055-3.1	2005	6x6x6	36,00m + 7,80m
55 t Terex-PPM AC 55	2005	6x6x6	40,20m
55 t Terex-Demag AC 55 City	2006	6x6x6	40,00m + 13,80m + 1,20m
60 t Faun ATF 60-3	2005	6x6x6	40,00m + 16,00m
60 t Faun ATF 60-3	2003	6x6x6	40,00m
70 t Faun ATF 70-4	1998	8x6x8	40,50m + 16,00m
80 t Demag AC 80-1	1999	8x8x8	50,00m + 17,60m
100 t Grove GMK 5100	2005	10x6x10	51,00m + 18,00m
110 t Tadano Faun ATF 110G-5	2008	10x8x8	52,00m + 16,20m
130 t Grove GMK 5130-1	2005	10x8x10	60,00m + 18,00m
160 t Faun ATF 160G-5	2009	10x8x8	60,00m + 37,00m
180 t Demag AC 180	1998	12x8x8	60,00m + 32,50m + 1,50m
200 t Grove GMK 5200	2002	10x8x10	60,00m + 36,00m
300 t Liebherr LTM 1300	1999	14x8x10	60,00m + 42,00m + 70,00m

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35 t Faun HK 35	1998	8x4x4	25,30m
50 t Faun HK 50	1998	8x6x4	31,00m

LATTICE BOOM TRUCK CRANE

115 t Link-Belt HC 238	1982	10x6x6	48,00m/18,00m
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HARBOR MOBILE CRANES

40 t Sennebogen 640 M	2000	4x2x2	22,00m
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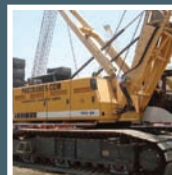
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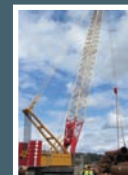
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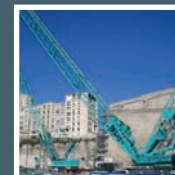
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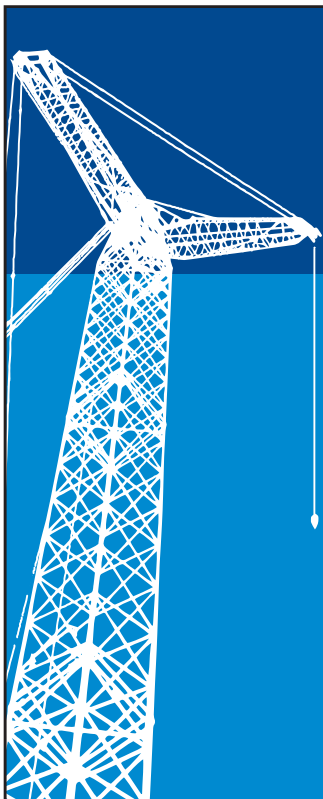


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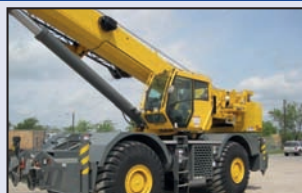
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Capacity	Manufacturer	Type	Year	Drive/Steering	Boom/jib (m)	Delivery
300 t	Liebherr	LTM 1300	1999	14 x 8 x 10	60 / 70 / 42	direct
200 t	Grove	GMK 5200	2002	10 x 8 x 10	60 / 38	direct
180 t	Demag	AC 180	1998	12 x 8 x 8	60 / 32.5 + 2.5	direct
160 t	Faun	ATF 160 G-5	2009	10 x 8 x 8	60 / 37	direct
160 t	Liebherr	LTM 1160/2	1999	10 x 8 x 10	60 / 36	direct
160 t	Liebherr	LTM 1160	1987	12 x 8 x 8	55 / 56	direct
130 t	Grove	GMK 5130-1	2005	10 x 8 x 10	60 / 18	direct
120 t	Demag	AC 120	2002	10 x 8 x 8	60 / 17+2+run.	direct
120 t	Luna	AT 120/47	1994	10 x 8 x 8	47 / 21	Spain
110 t	Faun	ATF 110 G-5	2008	10 x 6 x 8	52 / 16,2	direct
100 t	Grove	GMK 5100	2005	10 x 6 x 10	51/18/2,5/run.	direct
100 t	Liebherr	LTM 1100/2	2003	10 x 8 x 8	52 / 19	direct
80 t	Faun	ATF 80-4	2003	8 x 8 x 8	48,5 / 2+run.	direct
80 t	Liebherr	LTM 1080/1	2003	8 x 8 x 8	48 / 19+3+run.	direct
80 t	Demag	AC 80-1	1999	8 x 8 x 8	50 / 17	direct
70 t	Faun	ATF 70-4	1998	8 x 6 x 8	40,5 / 16	direct
70 t	Faun	ATF 70-4	1997	8 x 8 x 8	40,5 / 16	direct
70 t	Liebherr	LTM 1070	1992	8 x 8 x 8	42 / 18	direct
60 t	Faun	ATF 60-3	2005	6 x 6 x 6	40 / 16	direct
60 t	Faun	ATF 60-3	2003	6 x 6 x 6	40	direct
55 t	Terex-Demag	AC 55 City	2006	6 x 6 x 6	40 / 13,8	direct
55 t	Grove	GMK 3055	2004	6 x 6 x 6	43 / 15+runner	direct
50 t	Terex-Demag	AC 50-1	2006	6 x 6 x 6	40 / 17,6	direct
50 t	Grove	GMK 3050-1	2005	6 x 6 x 6	38 / 15	direct
50 t	Terex-Demag	AC 50-1	2005	6 x 6 x 6	40 / 17,6	direct
50 t	Terex-Demag	AC 50-1	2004	6 x 6 x 6	40 / 17,6+run.	direct
50 t	Demag	AC 50-1	2002	6 x 6 x 6	40 / 17,6	direct
35 t	Liebherr	LTM 1030-2.1	2005	4 x 4 x 4	30 / 15	direct
35 t	Terex	AC 35 L	2005	4 x 4 x 4	37,4	direct
35 t	PPM	ATT 400/2	2000	4 x 4 x 4	30,4 / 15	direct
30 t	Faun	ATF 30-2L	2002	4 x 4 x 4	28,5 / 12,2	direct
30 t	Luna	AT 30/27	1989	4 x 4 x 4	27 / 7	direct
30 t	Luna	AT 30/27	1989	4 x 4 x 4	27	direct
25 t	Demag	AC 25/75 City	1998	4 x 4 x 4	25 / 13+1,5	direct

LATTICE BOOM TRUCK CRANES						
Capacity	Manufacturer	Type	Year	Drive/Steering	Boom/jib (m)	Delivery
180 t	Demag	TC 650	1982	10 x 6 x 6	50 / 24	direct
130 t	Liebherr	LG 1130	1976	12 x 8 x 8	63 / 35	direct
125 t	Luna	GC 125	1986	10 x 6 x 6	56	direct
115 t	Linkbelt	HC 238	1981	10 x 6 x 4	42 / 19	direct

CRAWLER CRANES						
Capacity	Manufacturer	Type	Year	Drive/Steering	Boom/jib (m)	Delivery
120 t	Liebherr	HS 882 HD (2x)	1995	crawler	32	direct ex Dubai

MOBILE HARBOUR CRANES						
Capacity	Manufacturer	Type	Year	Drive/Steering	Boom/jib (m)	Delivery
40 t	Sennebogen	640 M	2000	4 x 2 x 2	22 m / -	direct

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30 t LIEBHERR LTF 1030-4, year 1999 26,0 + 8,0 m, Chassis DB 4143, 8x4	65 t TADANO FAUN ATF 65G-4, year 2006 44 m + 16 m, 8x6x8, 2x Mercedes engine
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Terex-Demag AC 100 (2005)



Liebherr LTM 1060-2 (2003)



Terex-Demag AC 80-2 (2006)



Grove GMK 7450 (2008)



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Sennebogenstraße 10
94315 Straubing, Germany

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Balancer
130-300 t

Material Handling
20-160 t

Duty Cycle Crane
30-300 t

Telescopic Crane
8-120 t

Crawler Crane
80-300 t

SENNEBOGEN