INTERNATIONAL

CRANES

AND SPECIALIZED TRANSPORT

Volume 30 ■ Number 1 ■ OCTOBER 2021
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A KHL Group publication

- Crawler cranes
- Offshore lifting
- Cranes in demolition
- Operator assistance devices
- Russian market
- Life of a crane

On site in Dubai

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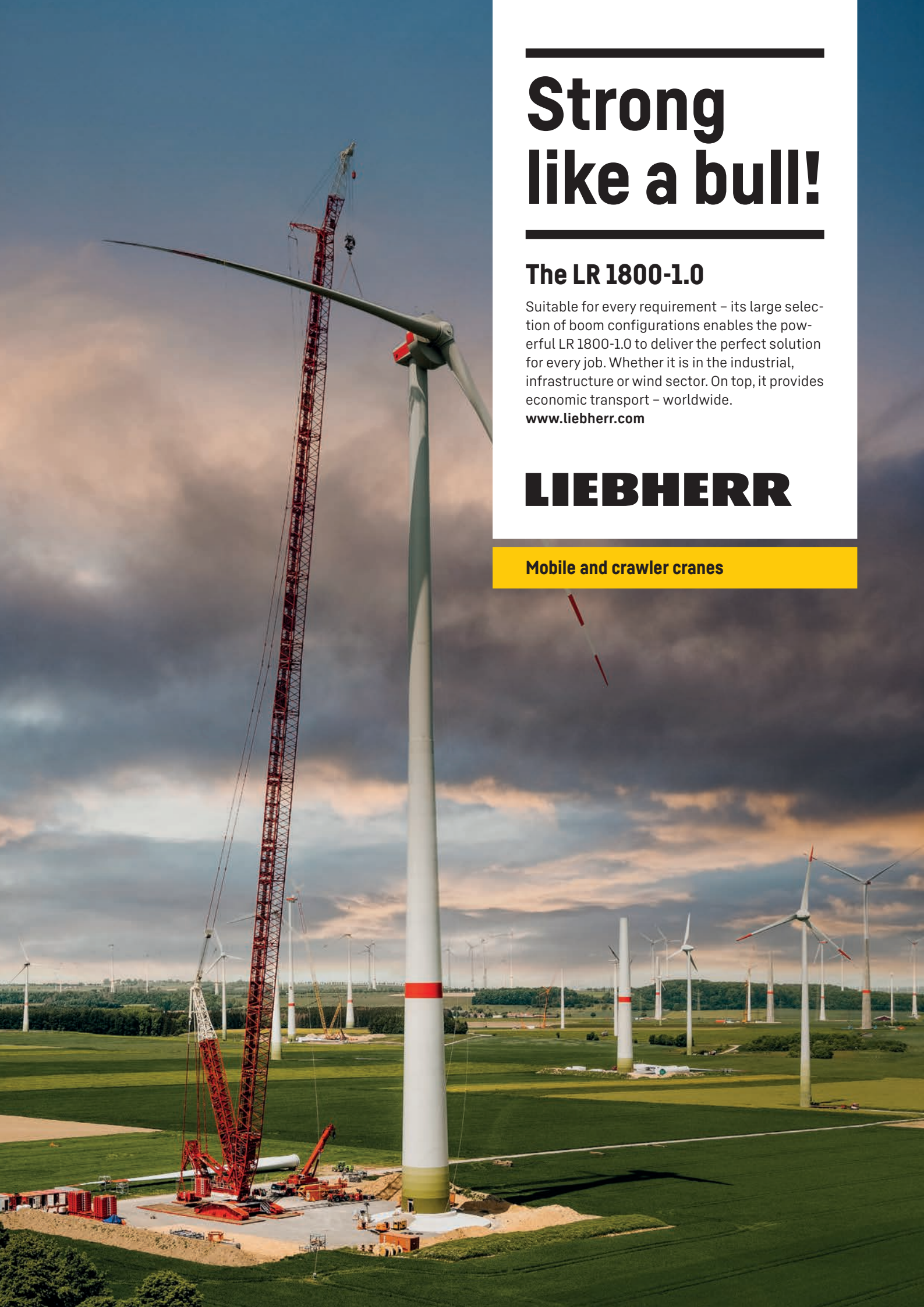

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VOLUME 30 ■ NUMBER 1 ■ OCTOBER 2021

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EDITOR'S VIEW

Offshore lifting, especially wind energy work, is a major driver of demand for new ever-larger turbine installation vessels. Expect this growth in the sector, also onshore, will continue for quite some time (feature on page 25).

In the UK, where not only are we suffering a hugely inflated price for natural gas (and I realise it is a similar situation in many other places), we don't seem to have enough of the other sort of gas (petrol and diesel) either, or at least there aren't enough people to deliver it to retail forecourts.

Drivers of electric cars can draw comfort (as well as electricity) from and for, their ability to still get around. Once again, I wonder how much it might further accelerate a shift away from fossil fuel at the point of use. Is increasing reliance on electricity instead of other sources of energy, and having all our energy eggs in one basket, a mistake?

I kind of expect we are past the point of no return in that respect. The way things are going in the UK it might make sense to keep a decent size multi-fuel generator and some chemistry books in the shed at home. Why? Well, in case the lights go out and you have to learn how to try and make fuel by mixing oil from your deep fat fryer with alcohol from some of those old bottles of Christmas liquers that have been at the back of the drinks cupboard since you inherited them from your grandparents (I know, but you get the idea).

Back to the magazine and the demolition lifting feature, on page 39. It is interesting that contractors in this sector – Keltbray in the UK and Priestly Demolition in Canada – both diversified by setting up lifting equipment divisions. I wonder how many other demolition companies have also moved into cranes.

Looking at the feature, tower cranes are increasingly being used for demolition, especially of high rise structures. I wonder how often might it be practical and realistic for those tower cranes on site for the demolition to then be able to remain in place, to help construct the new replacement for the old building. Always questions.

Finally, just a note to remember to cast your vote for your favourite project in our annual TopLift contest. The title of ICST TopLift 2021 will be determined from votes cast by readers. See page 46 of the September issue or vote online at internationalcranes.media under TopLift or on our social media channels.

ALEX DAHM
Editor

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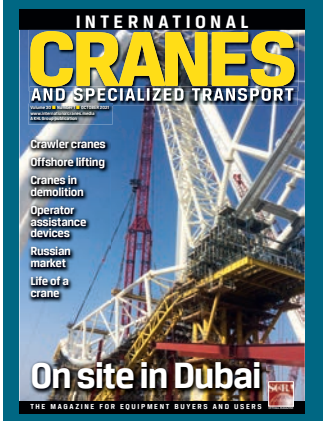

At the heart of Bluewaters island in Dubai, UAE, the Ain Dubai observation wheel stands more than 250 metres tall. Find out how it was constructed on page 30.

SUBSCRIPTIONS

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IN THIS ISSUE

FEATURES

REGULARS

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HIGHLIGHT

French crane rental house Mediaco Group has ordered three new cranes from Spierings. The wheeled mobile folding tower cranes will expand the fleet in France. Alexandre Vernazza, Mediaco president, "was convinced by the eLift concept," Spierings said. Once the crane has arrived on site it allows electric operation of its functions via a mains voltage power connection. Demand is rising for emission-free operation. Two units of the 7 tonne capacity SK597-AT4 eLift are scheduled for delivery in 2022 and the third in 2023.

NEW SCRA LEGAL RESOURCE

Understanding Tower Crane Bare Rental Agreements is a new tool to help tower crane companies protect themselves against unfair and biased agreements.

"Almost everything we do today is under a contract. This guide will educate the members of the association as to what certain terms mean, what to look for, and how they affect your business and insurance liability," said Billy Smith, NBIS, and chair of the Tower Crane Bare Rental Agreement Task Force.

Among many others, topics covered include: how to read a lessor agreement, agreement provisions to watch out for, sample agreement clause and-or language, contract checklist.

Michael Battaini of Sheedy Crane, who is a member of the task force responsible for the document said, "This document will give you language to use in your contracts to avoid those unnecessary exposures."

It is available to SCRA members as a free download.

For more information, contact Beth O'Quinn: boquinn@scranet.org

Massive module loaded out for Aibel

Mammoet loaded out a main support frame (MSF) module in Thailand, weighing more than 16,000 tonnes, using 604 axle lines of self propelled modular transporter (SPMT) at the Aibel Thailand yard in Leam Chabang.

It was the largest module ever fabricated by Aibel Thailand and the largest to be loaded-out in the country using SPMT. The module weighed 14,500 tones and totalled 16,258 tonnes with grillage.

Mammoet used a global network of engineers with specialists from Thailand and Mammoet's Global Offshore Services division, who were in charge of weighing the module. Mechanics and supervisors from Australia, Malaysia, Netherlands and Thailand covered the site move and load-out.

The 604 axle lines of SPMT and 21 power pack units (PPU) were sourced from multiple depots in Asia-Pacific, Africa and the Middle East. It was a logistical challenge for the team to bring in such a significant number of SPMT axle lines from different locations due to Covid-19 restrictions, which complicated shipping schedules.

The mega MSF module was the largest ever fabricated by Aibel Thailand

With the SPMT driven into position under the module and the hydraulic and electronic systems connected, the module was lifted up from its fabrication supports using the hydraulic suspension of the SPMT. The move was a distance of about 700 metres to the load out quay.

The following day it took a few hours before the module was rolled onto the vessel and accurately aligned with the grillage. Shimming and adjusting was done before the SPMT was removed.

The mega MSF module has since been shipped to Norway. ■

Top executives leave Maxim

Two top executives at Maxim CraneWorks, the largest crane-owning business in North America, have parted ways with the company, writes D.Ann Shiffler.

Frank Bardonaro, president and chief operating officer resigned on 20 September and two days later chief executive officer Bryan Carlisle sent a letter to employees outlining his departure from the company.

Bardonaro said his exit was amicable, that he remains an investor and shareholder in the company and is committed to seeing it succeed. In the letter to employees Carlisle said, "Maxim's future is bright, but it is also the right time to transition to the next generation of leaders."

Carlisle will leave over the next month, working with the Board of Directors to appoint a new CEO and transition his roles and responsibilities. He will continue to be a member of the Board and a shareholder in the company and support its long term value creation, he said in the letter.

At the time of writing Bardonaro and Carlisle had yet to reveal if they would continue their careers in the crane industry. ■

To avoid lane reduction during peak hours, a 240 metre bridge will be built above a roadway due to be resurfaced in Switzerland. Developed by the Swiss Federal Roads Office (ASTRA), this mobile bridge will allow resurfacing of the motorway without obstructing traffic or creating a traffic jam.

The traffic will therefore be diverted above the road, allowing

RITCHIE ACQUIRES SMARTEQUIP

Ritchie Bros. Auctioneers is to fully acquire parts e-procurement company SmartEquip for US$175 million.

SmartEquip provides an online portal for rental companies and other fleet owners to procure parts from 600 OEMs in Europe, North America and Asia. It supports $1 billion worth of transactions every year.

Ann Fandozzi, Ritchie Bros. chief executive officer, said, "This acquisition furthers our goal of providing the best experience for our customers as we continue our transition from a traditional auctioneer to a marketplace for insights, services, and solutions for commercial assets.

"SmartEquip will enable us to offer asset-specific, full-lifecycle parts and service support on behalf of our dealer and OEM partners to our buyers."

Ritchie said SmartEquip would continue to operate as a stand-alone business and maintain its office in Norwalk, Connecticut, for the foreseeable future.

Stafford acquires Soima

Tower crane specialist Stafford Crane Group (SCG) has acquired Portuguese tower crane manufacturer Soima for an undisclosed sum.

As part of family-owned SCG Soima will now have access to funding, new markets and new sales channels, the company said. Arizona, USA-based SCG will gradually replace its own tower crane fleet with cranes from Soima.

Patrick Stafford, SCG founder, said, "Soima is a perfect fit for us. Like SCG, Soima is a family-owned and operated company dedicated to providing high quality and efficiency in the global crane industry."

Manuel Morais, Soima founder, said he is looking forward to a continuation of the Soima legacy. "The Staffords are the right fit to take Soima to the next level," he said. "They have global experience and are highly focused on growth and customer satisfaction. We know they will help with the evolution of Soima."

Soima was founded in 1977 and said it has built more than 6,600 tower cranes and sold them around the world. As part of SCG Soima will continue to offer its range of tower cranes for sale. A new model is under development for the US market. The Soima 8041 will be a 32 tonne flat top with 80 metre maximum jib and should be out in early 2022.

"The new Soima 8041 is a tower crane designed by rental industry professionals," said Stafford. "It will be offered at a highly competitive price point compared to other cranes in its class. Between its value and SCG's post-purchase customer service, including our team of experienced technicians and stocked parts, I believe the 8041 will quickly gain significant market share in the US."

Stafford Crane Group founder Patrick Stafford and Soima Cranes founder Manuel Morais

SCG rents, sells and services tower cranes, wheeled mobile cranes and construction hoists. Look out for ICST's interview with Patrick Stafford on internationalcranes.media and in a future issue of the magazine. ■

Tadano upgrades 25 tonne RT

Manufacturer Tadano has an updated version of its 25 tonne capacity GR-250N rough terrain crane for the Japanese domestic market. The the GR-250N Crevo250 G5 is designed for urban construction projects where it can make the most of its mobility in narrow spaces and small turning radius.

The crane is designed for urban projects where space is limited

New features are aimed at improving operational efficiency and reducing emissions. During crane operation the engine speed is automatically adjusted according to the amount of crane lever operation. An automatic pump stop function stops the PTO pump when the crane is not being operated to reduce carbon dioxide emission and further improve fuel consumption.

Improvements have also been made to the Tadano View System to support safer driving. A new front left view camera and rear view camera on the slewing platform have been added as standard equipment.

Up to three patterns for the camera selections on the large-size display can be registered according to the road conditions, helping the driver to check safety while driving.

The human alert system, that detects and warns the driver when people are in the vicinity of the crane, has been improved. ■

HIGHLIGHTS

■ China's Zoomlion Heavy Industry Science & Technology Co exported a ZCC32000 crawler crane to Turkey on 16 September 2021, setting a new record for the largest new crane shipped from China. ICST announced this sale to Sarilar in March on internationalcranes.media

■ The 2,000 tonne capacity ZCC32000 lattice boom crawler has a maximum load moment rating of 32,000 tonne-metres and a max boom length of 168 metres. It will be used on a nuclear power plant project.

around 100 metres under the bridge for the actual construction work. Once the work is finished, the mobile bridge will be moved a further 100 metres by remote control for the next construction section.

The bridge itself consists of a drive-on/off ramps, 18 portals, 19 intermediate sections. Cometto will supply the project with 22 power packs, 8 SPMT bogies and other major accessories.

HIGHLIGHTS

■ The export of the ZCC32000 is the third time Zoomlion has broken the record for highest capacity crane exported from China. Previous records were set by the ZCC9800W and ZCC12500 crawler cranes exported to Turkey in September 2020 and June 2021, respectively.

■ Engineering and maintenance services specialist Sparrows Group has announced a global expansion with its move to six new purpose-built facilities in Abu Dhabi, Kazakhstan, Qatar, Saudi Arabia, Australia and the USA. Its expansion will create 200 new jobs. Stewart Mitchell, Sparrows CEO, said, "We see enormous potential in these locations to provide services to the energy and industrial sectors and will invest in people and equipment."

Link-Belt's new 85|RT rough terrain crane made its debut at the company's event in Kentucky, USA

Link-Belt launches 85|RT at CraneFest 2021

Having only first shown its new 85|RT rough terrain crane in September, manufacturer Link-Belt Cranes said it will be ready for deliveries to start in the fourth quarter.

The 85 US ton (77 tonne) capacity 85|RT has a full power, five-section 142 foot (43 metre) formed boom. A two-piece 35 to 58 foot (10.7 to 17.7 metre) SmartFly with manual offset adds flexibility and range.

Power for the 85|RT is from a 270 hp (201 kW) Cummins Tier 4F QSB 6.7 diesel engine driving through a six-speed transmission.

"General contractors and fleet owners will appreciate the competitive chart and value this crane delivers, not to mention it transports under 105,000 pounds with full counterweight and under 86,000 pounds with no counterweight," said Brian Elkins, Link-Belt product manager for rough terrain cranes.

Its V-CALC (Variable Confined Area Lifting Capacities) system allows virtually infinite outrigger configurations with real-time 360-degree charts, the manufacturer said. When the outriggers are set, the Pulse 2.0 system indicates what lifting capacity is available.

All electrical components coming into the cab are bulk headed for "plug and play" assembly. The cab can tilt upto 20 degrees for the operator to keep the load in line of sight. Link-Belt Site Vision includes a lights and cameras package built for extended workdays and cold weather conditions. Cameras on the 85|RT include heated rear-view, right side swing and winch cameras. ■

German crane specialist Schmidbauer used Tadano Demag cranes to lift and load onto self propelled modular transporter (SPMT), and then transport, a 700 tonne refinery column from the Port of Kelheim to the Bayernoil factory in Neustadt an der Donau. It was one of the heaviest loads to have ever been transported on roads in Germany.

To lift the load onto a 44 axle SPMT for transport to the refinery 25 kilometres away, a Demag CC 8800-1 crawler was assisted by ATF 220G-5 and AC 500-2 all terrains, both of which were also used as assist cranes to set up the crawler crane. The crawler crane was set up with a 54 metre boom and a 50 metre superlift mast, as well as 320 tonnes of superlift counterweight and 295 tonnes of central ballast. At the Bayernoil refinery, the CC-8800-1, assisted by a 600 tonne CC 2800-1, lifted the load up off the SPMT and into its final vertical position.

Check out the video of this lift: https://youtu.be/IzZKy732hUc and for more on crawler cranes see the feature on page 15.

Manitex Valla unveils V210R electric crane

Manitex Valla has launched a 21 tonne capacity battery-electric pick and carry industrial crane.

The Italian-made V210R can be operated via a radio remote control or from its cabin. It is aimed at indoor applications and is designed to be as compact as possible for its capacity.

"The V210R development is the response to the crane rental professionals asking for a higher capacity machine," said Carlo Forini, general manager, Manitex Valla. Forini said the idea was to satisfy demand for a larger unit in payload but was still compact.

Maximum lift height is 12.5 metres and horizontal reach is 8.2 metres with 6 tonnes of capacity. It is 1.98 metres wide, 2 metres tall and its turning radius is 4.1 metres. In addition to being able to pass through industrial doors and work in limited space, it can be transported in full working configuration on most low bed trailers. ■

Manitex Valla's new V210R can be controlled via radio remote control

TADANO

BENCHMARK ON 7 AXLES.

THE NEW AC 7.450-1

The new Tadano AC 7.450-1 is in a class of its own: With a carrier length of 15.99 m and an outrigger base of 8.45 m, it is as compact as a six-axle crane, and yet is as powerful as some eight-axle cranes. In fact, the AC 7.450-1 can reach lifting capacities of up to 23.7 tonnes when its 80 m main boom is fully extended, and that is without even using the SSL system. Bring in SSL, and the lifting capacity goes up to an unbeatable 37.3 tonnes. In addition, Tadano is using a new Sideways Superlift design for the first time ever in the AC 7.450-1 – one that makes handling and setup easier. The system can be extended with an 81 m luffing jib, and the sections of this jib can also be used to assemble fixed extensions.

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Lift and Shift India sets record for heaviest lift


The heaviest module was the LQ

Heavy lift operator Lift and Shift India set a new Indian record when handling a single module weighing 4,532 tonnes, for Mumbai High North Offshore Project. The module was the heaviest module fabricated in India to date.

The company was contracted by Larsen and Toubro Modular Fabrication division to handle seven modules weighing a total of 23,500 tonnes for the NWIS Mumbai High North project. The heaviest weighed 4,532 tonnes, five of them ranged from 3,000 tonnes to 4,400 tonnes in weight and the smallest one weighed 685 tonnes.

The load-out was completed in 20 days on barges of the 330 and 400 class. The operation involved preparing the axles in the desired format of 5 file/6 files, preparing the barge with pre-loadout ballast and then loading the modules onto the barge during the rising tide.

The first module, the East module, weighing 4,432 tonnes with a width of 52 metres, was the first to be shifted one kilometre on 10 files of axle lines totalling 188 axles, from MFF2 yard to MFF1 yard, and then rolled onto the barge.

The second module, the West deck, weighing 3,700 tonnes and a width of 52 metres, was loaded using 8 file axles totalling 160 axles.

The challenging aspect was to arrange the load-out of the third, fourth and fifth (named FFSDO, LSW, and TG) which required the axles to be reconfigured with only two days between the load out dates. This squeeze was due to ensuring suitable tides as FFSDO and LSW had to be loaded onto the same barge.

The final and heaviest module load out was the living quarter module (LQ), a "7-storey building" weighing 4,532 tonnes. The LQ module movement from fabrication yard to the jetty involved manoeuvring a hairpin turn and with limited space for the axles which were 60 metres long and 30.5 metres wide. The module was transported from yard to jetty in two and a half hours and rolled onto the barge within an hour.

KHL.COM

UltraWis CEO joins ITC conference line-up

INTERNATIONAL TOWER CRANES CONFERENCE & RECEPTION

Lior Avitan, CEO and co-founder of Israeli tower crane automation specialist UltraWis, has joined the speaker line-up for the International Tower Cranes (ITC) conference in Nice, France, on 2 December.

UltraWis is a technology spin-off from defence company Elbit Systems. It is transferring technology used in aviation into construction applications, including remote control, enhanced vision and automation technology. Solutions include a ground-based tower crane control booth.

At this year's ITC Avitan becomes the fourth and final member of the round-table panel on automation and remote control, as follows:

- **LIOR AVITAN**, CEO and co-founder, UltraWis
- **JEAN-CHARLES DELPLACE**, CEO, SMIE and CEO, Smart Jobsite
- **MARC LAMBERT**, founder and CEO, Lextan
- **MOR RAM-ON**, CEO, IntSite

The round-table will be preceded by a presentation from Marc Lambert on Lextan's work with French contractor Bouygues on the automation of construction equipment.

For details of the event see: www.khl-itc.com

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A flattening curve?

This month's share price changes seem less dramatic than in previous months of 2021, perhaps suggesting the market is starting to settle down post-pandemic. NIAMH MARRIOTT reports

Global vaccination rates continue to increase which could be a potential reason for the improving stability on the stock market after an extremely volatile time.

There is good news across the board and, looking at the last twelve months, the IC share index has changed dramatically – up 30.02 per cent from this time last year. Gains for mainstream indexes like the Dow, NASDAQ and FTSE100 were (still impressive) in the 20 to 30 per cent range.

Austrian crane manufacturer Palfinger's revenue was €405.9 million (US$469.9 million) in the first quarter of 2021, against €393.2 million ($455.2 million) for the same period in 2020. This is an increase of €12.7 million ($14.7 million), or 3.2 per cent. Its share price also rose by a whopping 64.32 per cent from last year and by 4.15 per cent in the last month. The company said despite full order books and the worldwide economic upswing, there are still substantial risk factors, such as supply chain limitations, higher raw material prices, production capacity bottlenecks and uncertainty concerning the Covid-19 pandemic.

Headquartered in North America, global manufacturer Manitowoc's share price also rose this month, from $23.26 to $23.78, a change of 2.24 per cent. There is certainly no doubt that demand for construction equipment around the world is strong right now and will continue to be for some time. The industry simply cannot meet the demand which is out there, and many producers are sold out well into 2022 as a result.

Chinese manufacturing is in particular demand. Zoomlion comments, "In the first half of the year, the construction machinery industry performed steadily, and the sales of major products continued to grow substantially. The export volume of the industry was growing with high demand for China's construction machinery from the international market." Zoomlion showed a small but definite increase in share price of 0.94 per cent from last month and said vaccine rates are helping the Chinese and global economy to recover.

The only company on our list this month to show a decrease in its share price is Sany Heavy Industry, with a change of -6.08 per cent from last month, and it seems unclear why. Sany reported a large growth in sales revenue in 50 major overseas markets in the first half of 2021 and implemented a range of anti-pandemic measures, vaccinating all its staff and adapting its international sales channels with more dealers.

Share prices in the industry are very high in historical terms. However, as an unprecedented high which was reached fairly quickly following the low of last year, it represents a boom and bust risk. ■

OCTOBER *IC* SHARE INDEX

STOCK	CURRENCY	PRICE AT START	PRICE AT END	PRICE CHANGE	% CHANGE	PRICE 12 MTHS AGO	12 MTH % CHANGE
IC* Share Index		**119.36**	**120.48**	**1.12**	**0.94**	**91.80**	**30.02**
Legacy *IC* Share Index**		**345.09**	**371.70**	**26.60**	**7.71**	**254.08**	**35.82**
Dow Jones Industrial Average		35,064	35,444	379.57	1.08	27,986	25.29
FTSE 100		7,109	7,180	70.93	1.00	5,789	22.81
Nikkei 225		27,820	29,128	1308.07	4.70	23,195	19.94
Hitachi Construction Machinery	YEN	3,050	3,355	305.00	10.00	3,665	-16.78
Konecranes	€	36.63	40.28	3.65	9.96	23.82	53.78
Kobe Steel	YEN	674	719	45.00	6.68	421	60.10
Liugong	CNY	7.98	8.64	0.66	8.27	7.41	7.69
Manitowoc	US$	23.26	23.78	0.52	2.24	9.63	141.54
Palfinger	€	36.15	37.65	1.50	4.15	22.00	64.32
Sany Heavy Industry	CNY	29.95	28.13	-1.82	-6.08	22.94	30.56
Tadano	YEN	1,161	1,233	72.00	6.20	823	41.07
Terex	US$	49.93	50.49	0.56	1.12	19.86	151.41
XCMG	CNY	6.50	7.22	0.72	11.08	6.01	8.15
Yongmao Holding	SGD	0.90	0.90	0.00	0.00	0.73	23.29
Zoomlion	CNY	8.55	8.63	0.08	0.94	8.51	0.47

**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	6.468	6.438	-0.03	0.47	6.85	-5.53
€	0.847	0.840	-0.01	0.74	0.85	-0.47
Yen	109.758	109.790	0.03	-0.03	106.13	3.41
UK£	0.718	0.722	0.00	-0.54	0.77	-7.16

Period: Weeks 32-36

Tadano's all-new 160 US ton (145 tonne) telescopic boom crawler crane, the GTC-1600, offers more than 60 metres of main boom length

Markets for lattice and telescopic boom variants of this crane type have strengthened in the last year but are hampered by supply chain pressures. GRAHAM ANDERSON reports

Market strong but pressure on

Sales and utilisation rates in global crawler crane markets appear to be bouncing back to pre-pandemic levels, driven by infrastructure and clean energy spending as governments try to boost their fragile economies and respond to growing concerns about climate change.

The pick-up has been so strong that some manufacturers and users are concerned supplies of raw materials and components will not keep up.

Harley Smith, global product and materials director at US manufacturer Manitowoc, describes the market as bullish with high demand but says everyone is facing supply chain struggles.

"Supply chain headwinds are abundant. Material shortages can lead to allocations and drive much higher lead times. The situation is stressful and the next major roadblock can pop up at any time.

Energy sector logistics

"Logistics has also been challenging. You work so hard to get the material shipped only to find vessel delays, container shortages, customs delays all coupled with escalating costs. It's a struggle we're all facing, so you roll with the punches."

He says the energy sector – and especially the wind industry – is a major driver of demand, a view that, Mammoet, the Netherlands-headquartered international heavy lift and transport specialist, agrees with Peter van Oostrom, Mammoet director of global projects and assets, told ICST, "The last year we definitely saw in Mammoet a shift in requests for wind cranes and add-on wind kits for existing cranes – more so than we have seen in the past.

"This is also what we hear from other contacts in the crane market, where more cranes are delivered in a wind configuration instead of the full heavy-duty specification. Clearly, over the next few years Mammoet will be involved in constructing large amounts of renewable energy infrastructure all over the world; the expertise we have built up elsewhere in heavy industry will be recycled to support this change."

The strength of the wind energy sector is also being seen by German mobile and crawler crane manufacturer Liebherr-Werk Ehingen. "The wind energy market is coming back rapidly," says Wolfgang Beringer, company spokesman. "More wind turbines have to be installed on- and offshore to reach the climate targets. More cranes are needed for the erection [of turbines] on land, but also for the handling of the large components in many ports."

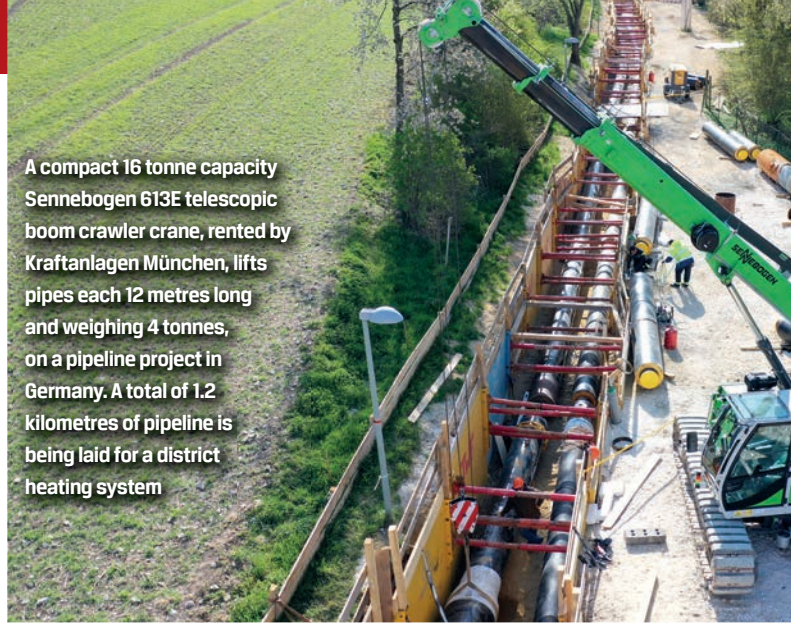
High capacity rises

In Ehingen, Liebherr manufactures crawler cranes over 350 tonnes lifting capacity and Beringer says the market is very strong. "We had a great first half year in 2021. Orders are high, especially in the crawler crane segment above 800 tonnes."

But the upturn appears to be taking root across the board, not just in the wind and heavy lift sectors. Beringer's colleague Wolfgang Pfister, head of strategic marketing at Austria-based sister company Liebherr-Werk Nenzing, is also upbeat. "Since the end of 2020 sales are on the rise with a promising outlook for 2022," he says. »

In the UK the SB3 joint venture is using four Kobelco CKE1350 crawler cranes to construct walls and associated structures of HS2's Old Oak Common train station

Unveiled in 2020, Manitowoc's MLC150-1 crawler crane improves on its predecessor, the MLC100-1, increasing the capacity to 150 tonnes and adding new features



A compact 16 tonne capacity Sennebogen 613E telescopic boom crawler crane, rented by Kraftanlagen München, lifts pipes each 12 metres long and weighing 4 tonnes, on a pipeline project in Germany. A total of 1.2 kilometres of pipeline is being laid for a district heating system

US manufacturer Link-Belt Cranes is equally positive but with a note of caution. Kelly Fiechter, Link-Belt product manager for lattice and telescopic crawler cranes, says demand is strong and looks likely to remain so going forward – as long as everyone can get the supplies and skills they need.

"It certainly appears that we are starting to get our arms around the pandemic and there is a lot of pent-up construction demand. Pre-pandemic the market looked good, and that pent-up work is now coming through. We have been doing well with our lattice products, although the supply of raw materials is an issue, steel especially."

He feels the market's concerns around both skills and supply shortages will be short-term as supply chains adjust to the changes and catch up with demand, but he expresses caution about government statements on infrastructure investment.

"We are taking the temperature of the market in light of the pandemic and the various government measures being taken to support the industry. There is a lot of optimism about recent government statements, but it is only talk.

"We are optimistic, though and we want to see it happen."

In the market

The picture painted by individual companies is backed up by Chris Sleight, managing director at specialist construction equipment industry analyst, Off-Highway Research.

Sleight explains, "As with anything else to do with the crane markets, you have to take China out of the picture, as it is by far the biggest geographical sector. Excluding China, the crawler crane market should be between 1,500 and 2,000 units in sales a year.

"In 2020 the sales figures were 3,760 in China and 1,260 in the rest of the world. So the market fell about 17 per cent last year – not as bad as we first feared and we expect it to bounce back this year and return to near normal levels."

But like Link-Belt's Kelly Fiechter, Sleight questions whether all promised post-pandemic government spending would in fact materialise, and if so when.

Kelly Fiechter, Link-Belt product manager for crawler cranes

Liebherr has two new cranes, the 700 tonne LR 1700-1.0, pictured, and the 40 tonne LTR 1040

"Infrastructure is the biggest driver outside residential and does drive crawler crane sales but we need to temper the optimism with a dose of reality. To state the obvious, plans are not the same as actual spending and work starting on site.

"Politicians make announcements but is the spending really extra? And even if it is, there can be a long time-gap between the announcement and work starting."

Sleight also says the huge Chinese market appears to be softening, although he expects the crane market to remain buoyant for some time yet.

He says three-quarters of the global crawler market are machines under 100 tonnes capacity, mostly sold in Asian markets where Chinese suppliers are very ambitious and have a price advantage.

Leading Chinese companies such as XCMG, Sany, Zoomlion and Liugong are trying to export globally but – as has long been the case – that strategy has been hampered by their lack of dealer networks.

Sleight adds, "If they want to be genuinely global, and seen in the same way as, say, Liebherr, they are going to have to acquire big. As for sales of crawler cranes within China, only the Chinese manufacturers are really active these days. Now that the Chinese producers are producing heavy cranes themselves, there is next to no market for international companies within China."

In outlook

Looking further forward, two developments have the potential to change the shape of international markets in future – the arrival of electric crawler cranes and the increasing popularity of telescopic boom crawler cranes.

Grove's telescoping crawler cranes product manager, JJ Grace, says, "We're seeing the popularity of this type of crane growing in our regions due to their manoeuvrability and versatility. With minimal transport requirements, impressive pick-and-carry

capability and a robust, full-power telescoping boom, these cranes are nimble in both getting to and navigating job sites.

"The telescoping boom paired with heavy-duty crawler tracks provide a solid option to other types of mobile hydraulic cranes for customers with application-specific work, such as alternative energy, bridge construction, and laydown yards."

Kelly Fiechter at Link-Belt is also a big fan of telescopic crawlers. "We are in on tele crawlers with both feet. They are so nimble and can do so many things. They are new to many firms, and we are still leading some contractors in their direction, but we see them as the future and a big part of our product line."

Liebherr manufactures telescopic crawler cranes in Ehingen and the company believes the market will grow further as they are often used as assist cranes for large cranes in the wind business.

Peter van Oostrom at Mammoet agrees, "Requests for these cranes are coming more often, and this has mainly to do with wind projects, where these cranes are a good match for assisting and assembly work."

As for electric crawler cranes, the picture is more varied. "This is still a developing subject, and some manufacturers have produced some already, but there are challenges that will need to be solved before they can be widely used," he says.

"Due to the power supply that is needed to operate the crane, for the moment only smaller models are in meaningful active service, both all terrain cranes and crawler cranes."

Electric futures

Kelly Fiechter is equally cautious and says it is not yet clear how the market will develop. "The danger is that you start down one path and then get regulated down another path. Electric cranes and battery power is a good thing, but hydrogen is also out there."

Liebherr, unsurprisingly, is more upbeat. At the end of last year, it launched a pair of new electric crawler cranes – the 220 tonne capacity LR 1200.1 unplugged and the 250 tonne capacity LR 1250.1 unplugged.

Wolfgang Pfister says, "This is a trend of the future. Since the launch of the world's-first battery driven crawler crane the response from the market has been very exciting."

Whatever the future looks like – and as we hopefully put the pandemic behind us – the short and medium-term prospects for the crawler crane market look good, driven by pent-up demand, government investment and green energy. Just as long as supply chains hold up. ■

Link-Belts' new 45 tonne-metre TCC-550 crawler crane has a full-power 11 to 35 metre four-section boom with two boom extend modes (EM1 and EM2). The entire boom is greaseless and includes Link-Belt's Teflon-impregnated wear pads for easy maintenance

Full story

Crawler cranes tend to last a long time, especially when properly looked after. This is the tale of a crane through its already long and still ongoing life. *ICST* reports

In 1992, before the merger with Mammoet, Van Seumeren purchased four Demag CC 4800 lattice boom crawler cranes. It was a bold move because the 800 tonner was one of the world's biggest cranes at that time.

The purchase proved to be a wise one for the company and the cranes went on to lift in many countries and industries over the next three decades.

This story follows one of those four – still in use today – throughout its entire history.

Dirk Knoester, senior advisor at Mammoet, remembers when the CC 4800 first arrived. "The purchase of the CC 4800 was a brave move for the business, as at the time we still mainly worked in the Netherlands and nearby European countries.

In those days a crane with an 800 tonne capacity was not as common as it is today; it was a special piece of equipment.

"Fortunately, we recognised that there was growing demand for bigger lifts to keep the crane busy, particularly in developing nations where the energy industry was expanding. In hindsight, the CC 4800 really helped to announce the company on a global scale."

In demand

This meant that the CC 4800 was soon working around the world, primarily on a range of oil and gas projects. A key appeal was that the crane required relatively little space in which to operate, could be relocated on its tracks and drive with its load.

Among its early projects was Exxon's Srirarcha Expansion Project in Thailand, where it lifted a range of large modules from a single position, helping to minimise the project's construction time. In the early 1990s it was used alongside another CC 4800 to perform the tandem lift of an 800 tonne reactor in Venezuela; at the time a record for South America.

Wherever the crane travelled, so did its specialist crew. "Because the capacity of the CC 4800 was so rare, there was demand for it all over the world. Today, there are cranes with the same capacity in many countries, so you can avoid the time and expense of shipping such a big piece of equipment. That was simply not the case in the 1990s," says Knoester.

"This meant that crews travelled across the world with the CC 4800, from Canada and South America to the Middle East and throughout Asia."

The 1,000 tonne barrier

As lifting bigger leads to more efficient project schedules, demand for the crane grew. So much so that by the mid-1990s even greater capacity was needed to accommodate the emerging trend for modularisation. This led Mammoet to look beyond the crawler crane format, into how the CC 4800 could be upgraded for use as a ring crane with a capacity of more than 1,440 tonnes. The crane could then be used in both crawler and ring configuration on a project to give greater lifting options without the need for two cranes on site. Although modularised construction is now widespread in the oil and gas industry, this was not always the case.

Foster Wheeler, at Exxon's Rotterdam facility in the Netherlands, used the ring configuration to lift seven items, including two columns weighing 606 tonnes and 759 tonnes, and then further smaller lifts in its standard crawler crane format.

Project managers who worked with the crane remember the advantages of working with this now traditional

During earlier times the Demag CC 4800 in Van Seumeren colours, set up in Twin Ring configuration

Still at work today, the Demag CC 4800 is now owned by Shepherd Offshore in the UK

piece of equipment, "We used to joke that all you really needed to make running repairs and fixes to the CC 4800 was a screwdriver and a hammer.

"This was a huge help when we were working out in remote locations such as Venezuela or Trinidad, where we would need to wait days if an engineer had to be flown in. Instead, we were able to deal with many problems ourselves, keeping the project on track.

"Although the CC 4800 was not easy to move – its crawlers weighed upwards of 90 tonnes each – it was a strong and reliable crane."

A varied career

While the majority of the CC 4800's work has been in the oil and gas sector, it has had an interesting working life beyond that industry. Knoester continues, "The CC 4800 helped move a steel mill from Germany to India, and a number of high-profile stadium builds. In 2006 it proved critical in building China's centerpiece Beijing National Stadium, the 'Bird's Nest', for the 2008 Olympic Games."

Shortly after this project, following more than 20 years of service with Van Seumeren and Mammoet, the CC4800 found a new home with Shepherd Offshore in the UK where it is located on the quayside of Shepherd's Newcastle upon Tyne facility.

Terry Hall, assistant general manager at Shepherd Offshore comments, "Between 2016 and 2017, the CC 4800 hit a Shepherd Offshore record in assisting 133 heavy reel transfers between Offshore Technology Park and Neptune Energy Park in Newcastle upon Tyne. Since 2018, Shepherd Offshore has had more than 70 vessels berthed at Neptune Energy Park where the CC 4800 is based.

"During this time, it has handled a wide variety of loading and discharging projects and has successfully handled over 50,000 combined tonnes to and from vessels. It follows that our CC 4800 crane has been an invaluable cog in the Shepherd Offshore machine and a lynchpin of our Neptune Energy Park operations.

"The CC 4800 operations have been so successful that we have recently constructed even more quay space, to allow increased movements. Further, we have transformed our dry dock into a maritime test tank. Here, the CC 4800 is crucial in providing heavy and moveable lifts.

Mammoet recently supplied Shepherd with parts to repair the crane and keep it running. "Equipment maintenance is key to how we operate, and we were delighted to help find the CC 4800 a new home when it had reached the end of its working life at Mammoet," comments Julian Alkemade at Mammoet Used Equipment. ■

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Each load was 52 metres long and weighed 213 tonnes

Tanks transported for UAE solar park

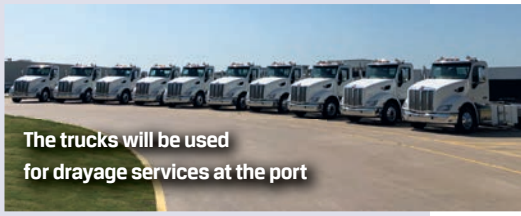
Al Faris in Dubai was contracted to transport and install 30 tanks for the Mohammed bin Rashid Al Maktoum Solar Park.

For the journey from Jebel Ali Port (UAE), the logistics and heavy haul company used Goldhofer THP/SL heavy duty modules. The transport of 52 metre long loads weighing 235 tonnes involved extensive logistical preparation and multiple permits. Every journey was made in a convoy of two files, each comprising 30 Goldhofer heavy-duty axle lines and a Mercedes Arocs tractor, in a bid to ensure punctual delivery of all tanks.

The tanks were used together with an expansion tank as part of an overflow storage system, in which the expanded thermal fluid from the solar park can be stored and reused.

With a final electrical generating capacity of 5,000 megawatts, the plant in Seih Al Dahal, UAE, which is partly operational already, will be the world's largest single-site solar farm. ■

PETERBILT DELIVERS ELECTRIC TRACTORS


The trucks will be used for drayage services at the port

Shippers Transport Express in the USA has taken delivery of 10 battery-electric Model 579EV tractor units from Peterbilt Motors. The electric trucks were put straight to work in the Port of Oakland, California. Five more units are scheduled for the port of Long Beach in November.

The trucks will be used for drayage operations requiring two to three trips a day, each up to 50 miles, before returning home at night to recharge. The lithium iron phosphate batteries have a capacity of 396 kW-h. They drive a Meritor Blue Horizon powertrain with electric motors and e-axles rated for 536 hp (400 kW) continuous output. On a DC fast charger, the battery packs recharge in three to four hours, the company said.

Oversized load moved to Iraq

Kamar Al-Ard Company and Fleetline Shipping (FLS-KAA) handled oversized non-stackable industrial equipment and accessories from Dubai in the UAE to Umm Qasir in Iraq. The in-house engineers at FLS surveyed the cargo and prepared the loading plan for the 1,300 cubic metre shipment which got loaded into 10 x 40 foot flat rack and 11 x 40 foot open top containers.

The ISO-, QHSE- and DP World-approved lashing team performed the loading and lashing in three days. ■

The cargo was made up of non-stackable industrial equipment and accessories

DEUTZ AND DLR TOGETHER ON HYDROGEN

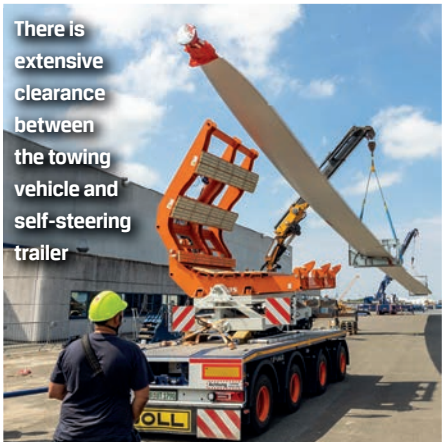
Engine manufacturer Deutz and The German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt (DLR)) are working together to develop new ideas and solutions for the operation of construction equipment and agricultural machinery using hydrogen.

The alliance is a product of the DLR. InnovationHub, which brings together representatives from the worlds of research and commerce, said Deutz.

The researchers from the DLR Institute of Vehicle Concepts will initially work with Deutz to scope out the necessary parameters – both technological and commercial – for making off-highway vehicles carbon-neutral.

New blade transport system

Following the success of a trial loading operation performed in Denmark in mid-July, the Doll wind blade transport system has been certified by Vestas. The system's list of approvals now extends to every major turbine manufacturer.


There is extensive clearance between the towing vehicle and self-steering trailer

The wind blade transport system offers mechanical or hydraulic lifting adapters with replaceable mounts for the root frame, a self-steering trailer with hydraulic steering and Doll Vario axle technology, plus special bolsters for accommodating the wing tips. The lifting adapters are mounted on the traction unit or an additional dolly, depending on the weight of the wind blade, and the swap bodies for the special bolsters can be adapted to various TIP frames.

Rolf Gerhardt, senior product manager at Doll Fahrzeugbau, said, "The biggest job in this case was designing a pendulum frame for accommodating a Vestas hydraulic friction clamp. The frame compensates for the forces and torsional moments during transport." ■

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Inspect and protect

Early 2021 saw a critical lift performed at the Fadhili gas plant in Saudi Arabia when a reboiler tube was removed for inspection. MUSTAFA AL ABDULMOHSIN reports

Saudi Aramco has an enormous fleet of mobile cranes

Saudi Aramco's Fadhili gas plant in the Eastern region of Saudi Arabia

The newly constructed Saudi Aramco Fadhili gas plant in the Eastern region of Saudi Arabia, is capable of processing up to 2.5 billion SCFD (standard cubic feet per day) of natural gas both from land and sea reservoirs.

The removal lift of the reboiler tube in March 2021 was performed by the Transportation & Equipment Services Department (T&ESD), the organisation responsible for lifting services at Saudi Aramco's hydrocarbon facilities.

This reboiler is designed to reheat the amine solution that is used in the gas treatment process. Each reboiler is capable of processing nearly 3,000 US gallons per minute of amine solution. Amine gas treatment, also known as amine scrubbing, gas sweetening and acid gas removal, uses aqueous solutions of alkylamines (amines) to remove hydrogen sulphide and carbon dioxide from gases.

The equipment needed to be removed so the internal components could be inspected for their integrity and assess any damage as it had been in operation for a year.

Crane configuration

The crane used for this lift was a 200 tonne capacity Terex Demag AC 200-1, with 34.4 tonnes of counterweight. It was positioned to lift at a 10 metre radius and was configured with a total boom length of 37.9 metres at a 72 degree angle. Capacity in this configuration was 47 tonnes.

The reboiler was at an elevation of 18 metres. Load net weight was estimated to be 22 tonnes. With the additional load of slings, hitching and other below the hook rigging tools, including the extraction machine, the total load weight was estimated to be 39.5 tonnes), around 84 per cent of the crane's capacity.

The first lift was to remove the outer shell attached to the main reboiler body, which processes the inlet and outlet product as well as protecting the internal tubes. After that, the tubes were removed using a special tube puller. Quite a complex task, this special lifting device extracts the tubes with a horizontal force and slowly pulls them through the main shell. The device itself is heavy, especially when compared to the load, making the lift a considerable challenge. Moreover, the vertical load on the crane gradually increases during the extraction, adding more weight on the pulling machine, meaning the centre of gravity is continuously changing during the process. Balancing of the load must be very precise and is controlled through a specialized chain system to minimise the vertical line movement.

Operation checklist

Safety is a top priority and this lift required a highly trained and specialized rigger to safely direct the operation. All lifts on site start with evaluating the environmental conditions and a critical lift plan is created, reviewed and approved.

Similar lifts are conducted on a daily basis across Saudi Aramco hydrocarbon facilities. The company has standardised its lift plans so there is a comprehensive check list to work through for each lift which analyses all requirements, including the load weight, crane configuration, additional below the hock loads, rigging type and information, other environmental and site checks such as ground and windspeed requirements as well as the total crane capacity in comparison with the load weight.

The reboiler was located at an elevation of 18 metres and the total load weight was estimated to be 84 per cent of the crane's capacity

ABOUT THE AUTHOR

MUSTAFA AL ABDULMOHSIN is a heavy lift engineer who has been working at Saudi Aramco for more than 10 years. His experience focuses on managing different equipment services, primarily mobile cranes which provide lifts for Saudi Aramco oil and gas plants.

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Heerema's Sleipnir set a new record for the heaviest jacket installation

A period of spectacular lifts, upgrades to existing equipment and plenty of wind farm investment suggest the offshore industry will continue to remain strong post-pandemic. NIAMH MARRIOTT reports

Winds of change

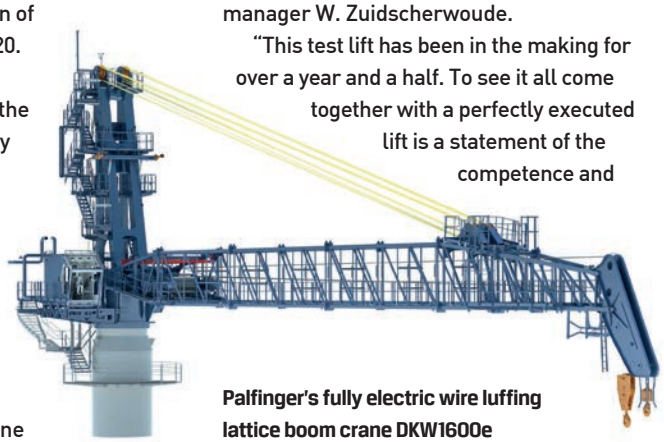
It is a busy time for offshore lifting contractors. At the top of the capacity scale, recent months have seen Heerema's semi-submersible crane vessel Sleipnir go from one job to the next. The Dutch contractor set a new record for the heaviest lift with Equinor's 12,050 tonne Johan Sverdrup processing platform (P2) jacket. This lift came after the inshore integration of the three P2 topside modules on behalf of client Aibel at the GMC yard in Gismarvik, Norway in May. Sleipnir also transported and installed the six-legged, 2,852 tonne, 50 metre long jacket for the Hollandse Kust (zuid) (HKZ) offshore transformer platform in the Netherlands. The project is Sleipnir's second on the HKZ project, with the installation of the HKZ alpha jacket in 2020.

After that, Sleipnir transported and installed the Hod B platform, a normally unmanned installation wellhead platform that is part of the Valhall complex in the Norwegian sector of the North Sea, on behalf of client Aker BP. In addition to the Hod B installation, Heerema performed a crane exchange on a platform within the complex.

Also gearing up for large offshore jobs, Allseas has updated the capabilities of its vessel Pioneering Spirit with a new jacket lift system. Part of it are two 170 metre hinged beams with integrated tail extensions, built to install and remove entire jackets up to 20,000 tonnes in a single lift and able to operate in bad weather.

Working in tandem, Scaldis completed a simultaneous and synchronised 5,000 tonne lift with its vessels Rambiz and Gulliver in the Netherlands. "For this lift we created a copy of the actual lifts to be performed, by placing a test load pontoon on the transport barge, combined with a unique and safe rigging design," says Scaldis project manager W. Zuidscherwoude.

"This test lift has been in the making for over a year and a half. To see it all come together with a perfectly executed lift is a statement of the competence and capabilities of Rambiz, Gulliver and their crews."



Palfinger's fully electric wire luffing lattice boom crane DKW1600e

At the other end of the capacity scale Austrian crane manufacturer Palfinger sees an increasing demand for smaller and more compact platforms, including normally unmanned platforms. Its latest development is the fully electric wire luffing lattice boom crane DKW1600e, which has a double luffing system for the boom. The company says it makes it one of the safest offshore cranes ever built. It can handle the full 60 tonne load even if one of the luffing wires or winches fails as the remaining rope can hold the boom in position while the load is being secured.

Wind investment

Offshore wind remains a fast-developing industry. Recognising this trend, a duo of upgrades for DEME Offshore have been arranged with Huisman as the company seeks to invest further in offshore wind.

Its DP2 jack-up installation vessel Sea Installer will get a major crane upgrade with an increased capacity from 900 tonnes to 1,600 tonnes. The upgraded vessel will be deployed for the first time at the 800 megawatt Vineyard Wind 1 project, one of the first large-scale wind farms in the USA, which will have 62 offshore turbines, each with a 220 metre rotor, 107 metre blades »

and will be a staggering 248 metres high.

Marro Vreys, business unit director at DEME Offshore, says, "We are willing to make the necessary investment in new technology to make sure our fleet is ready for the future."

The company has already installed wind turbines at 45 offshore wind farm projects across Europe and Asia. Sea installer is deployed at the Hornsea Two farm in the UK.

Offshore lifting equipment specialist Huisman will also deliver a 2,300 tonne metre lifting spreader and a set of adaptive damping tugger winches to be installed onboard DEME's offshore installation vessel Orion. The companies have worked together on optimising the spreader's design to increase the safety and efficiency of monopile installation, enabling hands-free sling handling of monopiles, controlled remotely, and powered by an exchangeable battery.

Carola de Vreede, communications officer at Huisman Equipment, says, "We have seen offshore wind catching up big time to the oil and gas industry. Ultimately, the offshore wind sector needs high reliability at an affordable price.

"Huisman has been delivering various kinds of key mission equipment for the installation of foundations. This includes the 5,000 tonne crane for Jan De Nul's Les Alizés vessel, as well as the 4,000 tonne offshore mast cranes for both DEME-CSBC and Boskalis."

Construction is progressing on the OHT Alfa Lift vessel for wind work worldwide. It will install the wind turbine foundations for the offshore wind farm Dogger Bank A & B, off the coast of Yorkshire in the UK. Due to be delivered in early 2022, it will be the world's first monohull vessel able to perform heavy lift crane operations when the main deck is submerged in offshore conditions and it boasts a 3,000 tonne heavy lift crane.

Already in operation in Europe, Spliethoff's vessel Lady Anne Beau delivered the first four monopiles for Fryslân wind farm in the Netherlands. Spliethoff Group will perform 26 more shipments for the project in the coming months, transporting a total of 89 monopiles and 89 concrete work platforms (CWPs).

Allseas has updated the capabilities of its vessel Pioneering Spirit with a new jacket lift system

GANTRY OVERCOMES OBSTACLES

Salt water, an explosive environment, and a low-clearance ceiling challenged Enaval, an environmental and energy consulting company, as it replaced process valves on a natural gas platform off the coast of Brazil. The ceiling height above the rig was so low that a mobile crane or similar lifting system wouldn't have had enough headroom to operate. Instead the company opted for Enerpac's super lift hydraulic gantry, as its compact size made it ideal for such a confined space. Each leg on the gantry had self-contained hydraulics to eliminate safety hazards presented by hoses and cables. The gantry comes standard with wireless controls, allowing the operator to move around to the best vantage point while controlling the load. A custom paint job on the gantry and a stainless-steel cabinet helped prevent seawater corrosion.

At the request of Petrobras and Enaval, an ATEX-certified explosion-proof motor was added as the equipment was operating in an explosive environment.

The ceiling height aboard the rig was so low a mobile crane wouldn't have been able to do it

Design above the waterline

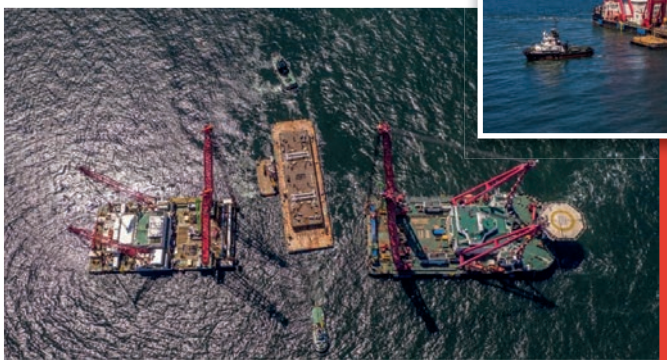
NOV will supply two GustoMSC NG-20000X self-propelled wind turbine installation jack-up vessel designs, known as the Cadeler X-Class, to Cosco Shipping Heavy Industry and Cadeler. It has 5,600 square metres of deck space capable of carrying more than 17,600 tonnes, making it one of the largest in the industry. This new hybrid, DNV-certified, cyber-secure jack-up vessel will transport and install seven complete 15 megawatt turbine sets or five sets of 20-plus megawatt turbines – a significant upgrade from prior designs. The expanded capacity will reduce the number of vessel trips required per development and accelerate installation speed, thereby improving project economics while reducing the total carbon footprint of the installation process.

In addition to the overall jack-up design, NOV will supply the system to lift the vessel and cargo above the waterline for turbine installation. Ready in 2024, the first NG-20000X jack-up vessel is contracted for one of the largest offshore wind farms, RWE's 1.4 gigawatt Sofia wind park in the UK.

Mikkel Gleerup, Cadeler CEO, says, "We need to ensure that the new vessels will be as cutting-edge as the turbines we will be installing."

In parallel, NOV is supplying new heavy-lift cranes for Cadeler's existing O-Class vessels, Wind Orca and Wind Osprey, to upgrade capabilities to handle the next-generation turbines.

Elsewhere in the world, Shimizu Corporation, one of the largest general »



Scaldis completed a simultaneous and synchronised 5,000 tonne lift with its vessels Rambiz and Gulliver

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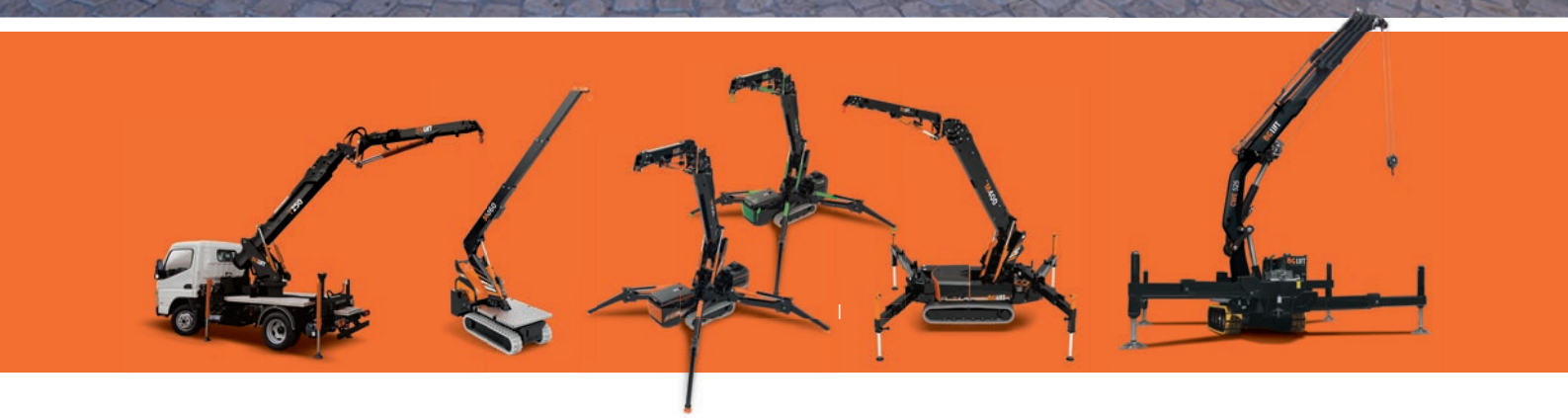

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Sea Installer will get a major crane upgrade raising capacity from 900 to 1,600 tonnes

contractors in Japan, and Heerema Marine Contractors, have entered into a co-operation agreement for the Japanese offshore wind market and will focus on installing turbine foundations. Shimizu was involved in the first offshore wind pilot project in Japan and intends to play a major role in the country's energy transition. Jeroen van Oosten, business unit director wind, at Heerema, says, "We are happy and honoured to be working with a general contractor with a strong ambition to support the growth of offshore wind in Japan."

Other movement in the sector includes heavy lift shipping and offshore transport contractor Jumbo, which is using heavy lift slings from Lankhorst Ropes to install offshore wind turbine transition pieces onto monopiles for the Yunlin Offshore Wind Farm in Taiwan. The slings are to help lift and position 80 transition pieces, each weighing 450 tonnes, from the vessel Jumbo Javelin, into what will be Taiwan's first large multi-megawatt offshore wind project. The heavy lift crane vessel has two rotating mast cranes with a combined capacity of 1,800 tonnes.

Oil and gas

Despite massive growth in renewables, the oil and gas industry remains strong, and cranes are still being used for the construction and maintenance of offshore sites. Carola de Vreede, communications officer at Huisman Equipment says, "Right now, the need for larger platforms has driven the need for larger cranes. The need for deeper depths in subsea operations, however, has come to a halt for where it is affecting new or upgraded equipment." This may change with a return of the offshore oil and gas industry to previous levels. Huisman foresees something may need to happen. "While there is a large drive for reducing the world's carbon footprint, we see that oil and gas may be needed for a long time as the primary focus should be on reducing the most carbon-inefficient sources like coal."

Favelle Favco Bhd's (FFB) latest contract wins are a further sign of recovery for the oil and gas sector, say analysts at MIDF Amanah Investment Bank. "Brent crude oil had been elevated in the first half of 2021 with the gradual curb of the pandemic and the increasing demand for the commodity, in addition to the recent OPEC+ decision to increase oil supply to 400,000 barrels per day in the next few months," MIDF notes.

MIDF added that the improved energy market situation would give FFB clients enough assurance to start offshore again. Business will grow in 2021 after FFB subsidiaries received eight purchase orders for offshore cranes, tower cranes, a compressor system, solar system and upgrade projects.

FFB's Exact Group holds more than 20 live maintenance contracts with most oil majors in Malaysia, and supplies hybrid solar and wind turbines for offshore facilities as well as automated analytical and maintenance systems, including pipeline monitoring and plant intelligence solutions.

Some companies are looking to combine their efforts both for renewables and the oil and gas industry. Specialist crane maker KenzFigee has opened a new UK office, workshop and storage facility in Brechin, Scotland, to accommodate the increasing demand it sees from the global offshore oil and gas, defence and renewables market.

Barry Stewart, KenzFigee vice president, says, "The continued growth of the KenzFigee service and design brand in the oil and gas, and offshore renewables markets, has created the need to expand our premises." There is a 650 square metre workshop and 2,000 square metre yard.

Future dredging

MacGregor, part of Cargotec, will deliver two 120 foot (36.6 metre) double telescopic service cranes and one 50 foot (15 metre) telescopic stores crane for a self-propelled hopper dredge, being built for USA-based Manson Construction. It will be the largest self-propelled trailing suction hopper dredge built in the USA.

The cranes are planned to be delivered to the yard by the end of 2021, prior to delivery of the dredge in the first quarter of 2023.

MacGregor worked with Manson and USA-based Hockema Group, during the earlier design stage of the project to provide crane models that fit their requirements. The cranes will be built at MacGregor's facility in Seattle, and the vessel will be built at Keppel AmFELS shipyard in Texas, USA. ■

Jumbo using heavy lift slings from Lankhorst to install offshore wind turbine transition pieces

Construction of the OHT Alfa Lift vessel has now seen installation of the Liebherr HLC 150000

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Wheel in motion

Constructing the world's largest and tallest observation wheel is no mean feat, especially when you factor in sandstorms, strong offshore winds and scorching temperatures. *ICST* reports

At the heart of Bluewaters, an island destination in Dubai, United Arab Emirates, the Ain Dubai observation wheel stands more than 250 metres tall. The wheel comprises a wheel rim, rotating hub and fixed spindles mounted on four support legs. The rim is 240 metres in diameter and was assembled from eight segments welded together on site and connected to the hub by cable spokes each longer than a full-size football pitch.

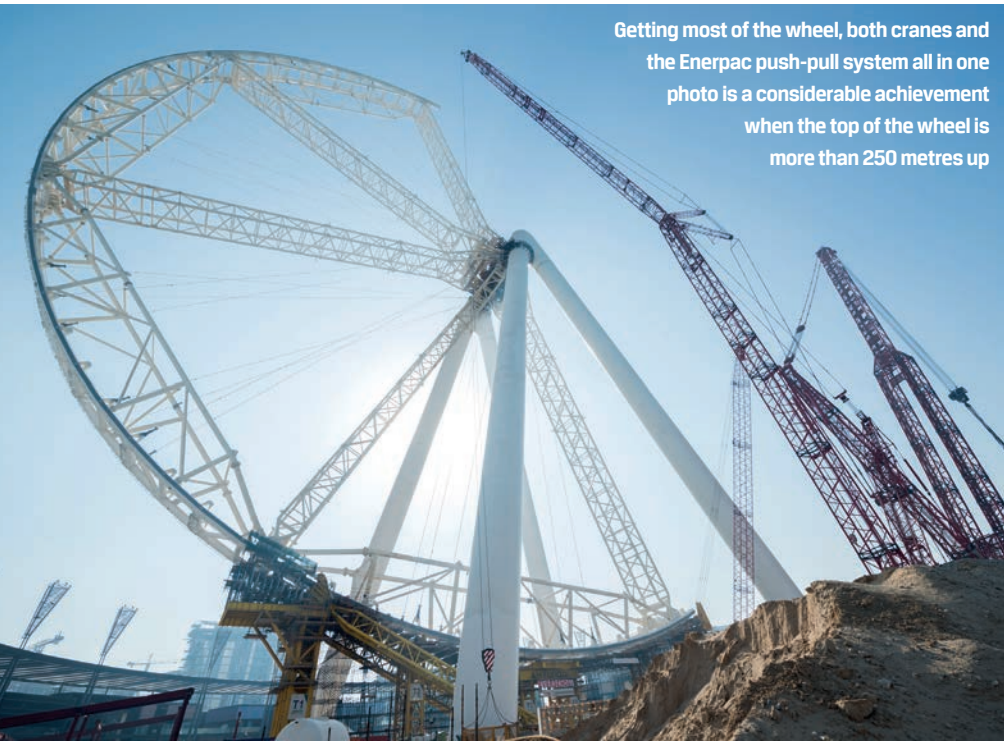
The 48 passenger cabins circling the enormous circumference of the wheel have capacity to carry more than 1,750 visitors at a time in total.

To begin this mammoth construction task, the legs and the spindle were prefabricated offsite before being transported by barge to the installation site.

Massive movement

Each 890 tonne leg was 126 metres long and 6.5 metres in diameter. They were rolled onto Mammoet's barge using 40 axle lines of SPMT at the fabrication yard in Abu-Dhabi. Once on the barge, the legs were securely floated to the site.

For the installation, Mammoet paired one of the world's biggest cranes – its PTC 200-DS – a 5,000 tonne ring crane, with a 3,000 tonne crawler crane. Together they ensured the stability and flexibility required to lift each leg and the spindle from the barge into position, while working 137 metres above the ground. Subsequently, Mammoet set a world record by lifting the 1,900 tonne spindle to sit on top of the four legs: it was the heaviest and highest tandem lift ever undertaken worldwide.



Getting most of the wheel, both cranes and the Enerpac push-pull system all in one photo is a considerable achievement when the top of the wheel is more than 250 metres up

Super sections

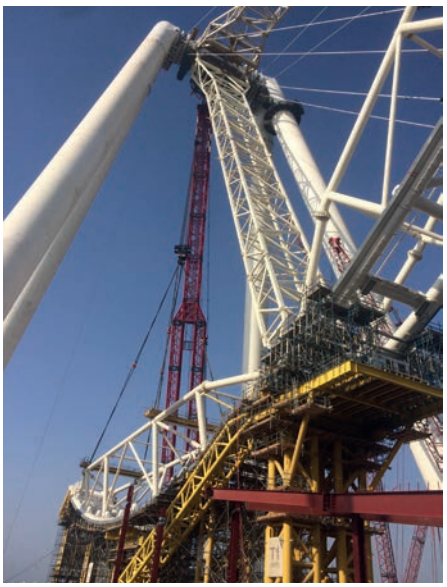
Following the positioning of the legs and the spindle, Mammoet lifted eight rim pieces and temporary spokes. The 3,000 tonne crawler crane was the only crane capable of carrying out these lifts. Its high capacity combined with its long lift radius could meet the distance between the barge and the installation point and lift each 700 tonne section in one motion, without the need to set them down or reconfigure the crane.

Enerpac proposed to use a push-pull system for the wheel construction. The idea was based on the erection of the ferris wheel they did in Las Vegas.

Positioned at the base of the wheel, a pair of hydraulic grippers pushed the wheel forward, effectively rotating it by 1,500 millimetres at a time. The push grippers were then released and pulled back into position using hydraulic cylinders. The push-pull operation was then repeated. This technology

Mammoet's Liebherr LR 13000 crawler crane lifting one of the eight wheel segments prior to its installation using the Enerpac push-pull system

The push-pull system in place at the base of the wheel. Each of the eight segments were loaded by crane onto a steel support cradle between the wheel's hub support legs



The next section lowered into its cradle prior to engaging the push-pull system to move it around

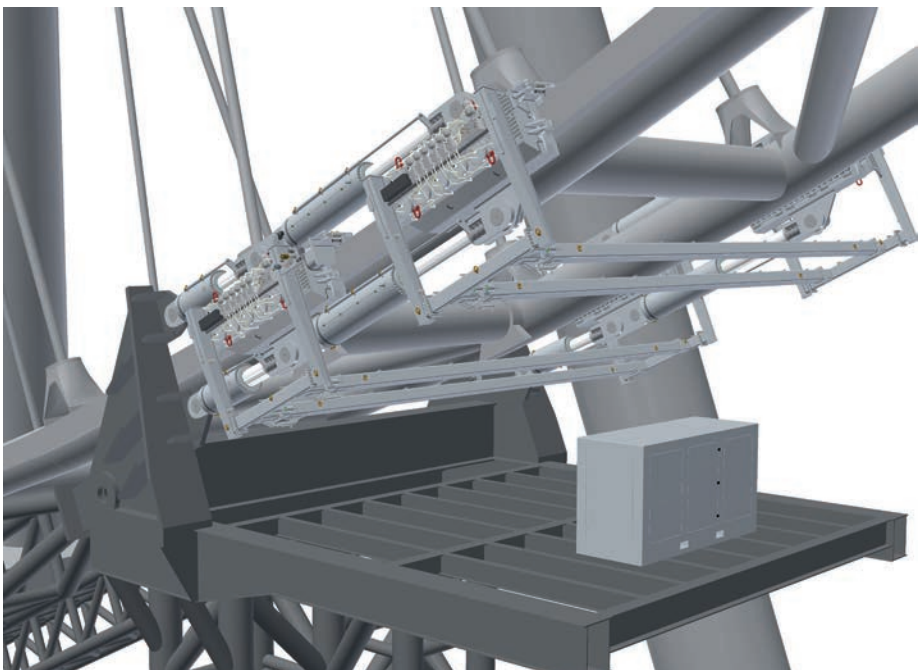
was based on the strand jack type Enerpac skidding systems.

The Push-Pull system was aligned to the wheel rim using steel wheels. The wheel rim is held and moved by the Push-Pull system's two gripper modules in a support frame positioned on either side of the wheel rim at the base of the wheel, similar to the arrangement for a bicycle wheel's brake blocks. Each module consists of four interconnected elements: dynamic gripper box, push-pull cylinders, a static gripper box and static balance cylinders attached to the push-pull tower.

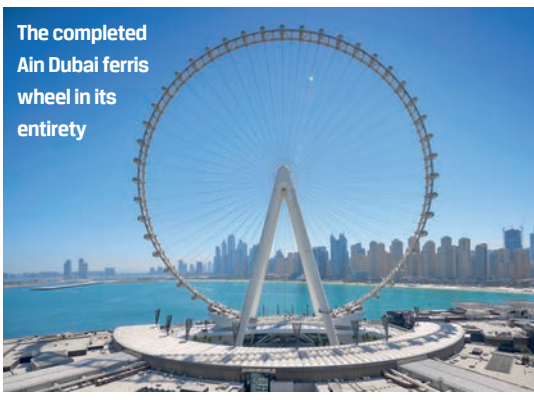
Push-pull

Given the high loads and limitations on the size of the push-pull unit, Enerpac decided to boost the gripping power of the gripper boxes. The force of the hydraulic cylinders on the wheel rim was supplemented with the addition of steel teeth pads and 12 spring energised clamp sets. "Enerpac's service engineers, mechanical engineer and software engineer did the erection of the wheel on site," said the spokesperson, who added that the work was done for the main contractor Hyundai Heavy Industries, who bought the system from Enerpac.

The assembly of the wheel is now complete and it is undergoing trials. A grand opening is scheduled for 21 October 2021. ■



Close up of the business end of the Enerpac push-pull system with its multiple extension and retraction cylinders



The completed Ain Dubai ferris wheel in its entirety

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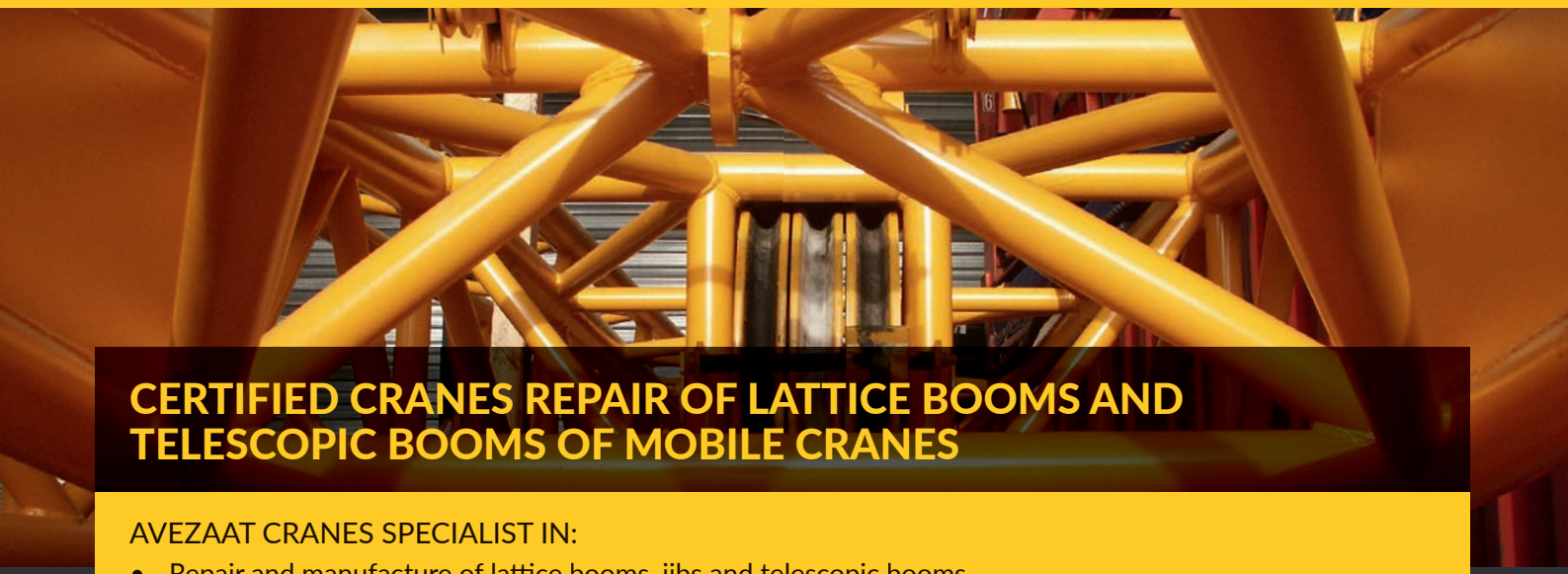

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Safety on site is paramount. A key element is the latest hardware and software, some already in use, and some still in development, assisting crane operators to safely do their job. NIAMH MARRIOTT reports

Epec offers 4G/LTE/GNSS/WLAN connectivity as part of its central unit controllers

First aid

Operational feats accomplished in the crane sector are spectacular yet the risks posed by using such heavy and large equipment can be frighteningly severe.

Following and adhering to safety standards helps minimise this risk and, of course, drivers are highly skilled and undergo extensive training to prepare for working on site. Specialist devices and systems, however, can be very useful. On the software side the Internet of Things has given rise to new technology that can provide an even wider safety net.

"Cranes and material handling have been one of the leading industry domains adopting the latest technology," says Kari Ahvenlampi, product portfolio manager at Epec Oy. Finland-based Epec, a manufacturer of machine control systems for crane OEMs, offers programmable Linux-based controllers for central master unit functions. Having only one programmable controller and several CANopen or Ethernet based input-output (I/O) modules placed close to sensors have significant advantages, the company says. "This kind of modular centralised intelligence architecture is coming as a trend especially in the bigger cranes and material handling machines," comments Ahvenlampi.

Epec offers 4G/LTE/GNSS/WLAN connectivity as part of its central unit controllers, which makes it easy for customers to implement IoT, edge computing, remote diagnostics or other digitalisation features.

Ahvenlampi continues, "No matter what is the machine architecture the functional safety is key with cranes. These machines typically operate on the areas where there are employees or other people around, making it important for the machine to be safe in operation."

AMCS Technologies' DCS 60 anticollision system is being used on a project in Norway

ABA's cloud-based platform captures and streams real time video and analytics

Prioritising safety

To help improve safety during tower crane lifting work, an operation support system is being developed jointly by Japanese companies Sumitomo Mitsui Construction and IHI Transport Machinery.

The system uses cloud-stored data to automatically generate the optimal lifting route, from the material pick up site to the installation position, and will guide the installation position to the sky, reducing the burden on the operator, and increasing the overall safety of the operation. Construction progress can be viewed in real-time on a web browser and the information can be shared with the head office.

Collision avoidance

A tower crane safety system already in operation is France-based AMCS Technologies' DCS 60 anticollision system, being used on a project in Norway where two new buildings are being constructed at Oslo University Hospital. Four Comansa cranes on »

ADVANCE WARNING

Safety should be a consideration before you even get on site. Transporting large construction equipment like cranes is no mean feat, and roads are not always built to withstand their weight or vast proportions. A proper plan is needed to move kit to the project site and there are new devices that can help along the route and detect potential obstacles.

Advance warning systems were brought into sharp focus in the UK earlier in 2021 when a large refrigeration lorry struck a bridge in Plymouth, damaging the stonework and raising the level of the bridge. The incident halted all trains in and out of Cornwall during a busy public holiday as the HGV became wedged under the bridge arch and took more than 24 hours to remove.

This is not an uncommon occurrence in the UK, where five bridges a day are hit by oversized vehicles, around 2,000 a year. Collisions cause delays on roads and railways, and in the worst cases injuries and fatalities, and it is certainly something to be considered when transporting large construction equipment.

The lorry struck the bridge in Plymouth damaging the stonework ad halting all trains

Manchester, UK-based VPS offers an over-height vehicle detection system which actively monitors traffic on routes where overhead obstructions pose a strike risk. It combines electronic sensors, variable message signs and alarm systems to warn over-height vehicles in advance of reaching a low bridge. The company said no bridge strikes have ever occurred with the system in operation.

the site have the technology to help ensure the safety of the machines, their surrounding environment and the people in it.

Key functions of the system include a zoning ability to restrict the crane from moving to forbidden zones of the jobsite as well as the anti-collision function which, as it suggests, is designed to stop the crane booms, counter jibs or hoist ropes and hooks from hitting one another. The system operates in real time and in three dimensions to calculate the distances between each crane component as well as the movement speed, to ensure complete immobilisation of the crane at a pre-set distance from a particular obstacle.

There is also a data-logger feature that continuously records and saves data related to events and movements, allowing direct viewing on the screen and-or downloading to a flash drive. Usefully, this universal device is suitable for all types and brands of cranes and will be used on the Oslo site until the completion of the construction of the buildings at the end of 2024.

Proximity warning

Another way to help ensure the safety of people working on site is to use tags attached both to workers and equipment. UK-based Brigade Electronics' ZoneSafe, a radio frequency identification (RFID) proximity warning system, creates detection zones around vehicles to reduce the risk of injury or damage from collisions and near miss occurrences to people and property.

Designed for use in challenging construction environments, ZoneSafe uses vehicle-mounted antennae to communicate with detection tags, worn by workers, set up in restricted areas or placed on objects. When a tag enters a detection zone, the vehicle operator will automatically receive a visual and audible alert via the in-cab control unit, which will enable them to take the necessary action. Tags worn by workers on foot will also vibrate to warn of an approaching vehicle.

The RFID technology does not require a line-of-sight so tags will be detected regardless of obstructions, blind spots, adverse weather or poor visibility. Each tag can be uniquely identified and linked to individual people.

Exact placement

Precision is key to ensuring the safety of a crane project and devices are being developed to use technology to this end. A new system, the Vita Load Pilot from Colorado, USA-based Vita Inclinata has been designed to precisely place crane loads. Even in high winds, the system is designed to automatically adjust and keep the load stable.

The first system was shipped earlier in 2021 to Holt Crane and Equipment, who have agreed to be the first distributor in Vita's national reseller network in the USA.

"Safety is where we see the biggest advantage – distancing someone from the load and allowing someone to set the load without the use of a tagline," says David Worsham, general manager at Holt. "Everyone in the construction industry is becoming more aware of safety in their organisation."

It is important to not be afraid of new tech but to embrace it, Worsham comments. "The industry generally has been slow to adopt technology, especially with the worry that it could take jobs. But having seen Vita's system in action, we're excited to help get it out there. We're confident that it will make jobs easier and safer instead of eliminating them," he says.

Challenging spaces

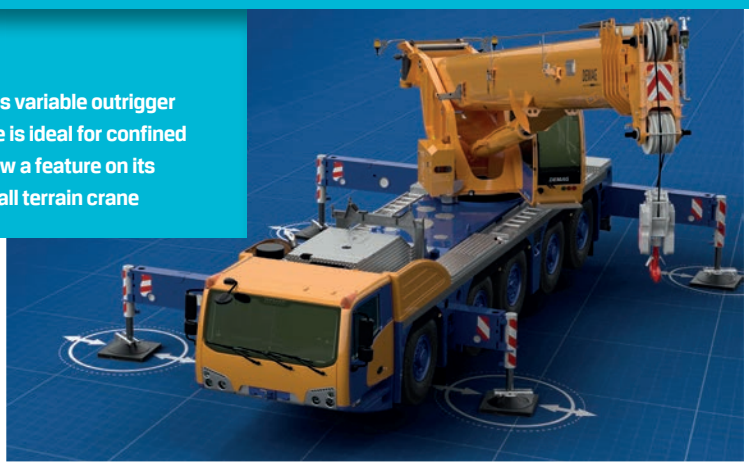
Confined spaces can cause difficulties when working with cranes. A solution is Japan-based Tadano's stepless variable outrigger system Flex Base, now a feature on its Demag »

Four Comansa cranes on the university hospital site in Norway are equipped with anti-collision systems with a zoning feature to help ensure the safety of the machines, their surrounding environment and the people in it

ideal for confined spaces such as construction sites or congested urban areas. It calculates crane capacity based on each outrigger's extension point, rather than a fixed position. The AC 130-5 is added to the growing list of Tadano all terrain cranes offering Flex Base, which include the AC 45 City, AC 55-3, AC 60-3 and the recently introduced AC 4.080-1 models.

Stepless outrigger positioning works in conjunction with Tadano's IC-1 Plus control system. Containing all the lift charts for every crane configuration of the AC 130-5, IC-1 Plus determines lift capacity in real-time, based on outrigger setup, counterweight, superstructure angle, main boom length and telescoping sequence. With Flex Base, crane capacities are no longer calculated from fixed outrigger positions and 360 degree load charts which means it can deliver the maximum possible lift capacities in any outrigger configuration, even asymmetrical.

Flex Base and IC-1 Plus allow cranes to carry out more lifts from positions that are otherwise unreachable, expanding the range of potential applications. To further increase on-site lifting efficiency and safety, the online IC-1 Lift Plan tool offers lift preplanning, so owners can determine the crane's exact position and configuration required to perform the lift.



Tadano's stepless variable outrigger system Flex Base is ideal for confined spaces and is now a feature on its Demag AC 130-5 all terrain crane

(Below) The Vita Load Pilot has been designed to precisely place crane loads

Cloud-based camera

UK-based ABA Crane Hire has installed Spillard Safety Systems' Spillard Live, a new cloud-based platform that captures and streams real time video and analytics simultaneously, to its Liebherr LTM 1110-5.1 and Demag AC 45 city crane.

To improve visibility for operators the tech provides four live cameras, additional 180 degree cameras fitted down the nearside and offside and DVR turn left and right alarms.

"As you can imagine, driving these large vehicles is a skill in itself but, traditionally the operator will have little additional technology to rely on to give it maximum visibility from the cab," says Adrian Baggott, operations manager at ABA Crane Hire.

The new system has been operational for just over four months and the real-time access to the data was particularly useful when some damage to the floor of a project was discovered. Though the company stresses its main concern is keeping workers safe, Baggott adds, "One benefit we didn't expect was being able to use the cameras to get a project update if a client wants a real-time progress report."

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Sophistication in destruction might sound like a contradiction in terms but precision and a light touch, delivered courtesy of cranes and lifting equipment, have their place in demolition. ALEX DAHM gives an update and reports some recent applications

A selection of equipment in the GK Crushmash fleet

Technical techniques

Before getting into details, it is great to be able to start with positive news about a buoyant sector.

Priestly Demolition (PDI) in Canada reports that an increased need for cranes in all areas of demolition is apparent as construction continues to boom in North America. And that applies whether it be civil, industrial, commercial, or residential, the company says. "Because of this demand, we need to constantly upgrade our fleet to support transport and assembly, disassembly and intricate demo work," comments Ryan Priestly, PDI president.

This has led to a new arm of the business, PDI National Cranes, which is equipped to rent rough terrain cranes, crawlers, all terrains, truck mounts and boom trucks.

"We work with our engineers and customers to determine weights, size, radius, heights and locations of what needs to be hoisted. The two pieces go well together – as PDI understands specialty cranes and equipment as well as the importance of partnerships and professional service," Priestly explains.

Russian dismantling

In Russia, demand for demolition services, especially the big cities, is stable, says Victor Kazakov, CEO at specialist contractor GK Crushmash. "At the same time demand is growing for professionalism and the ability to solve complex tasks, for which the contractor needs specialized equipment," Kazakov explains.

High altitude dismantling is one example and an increasingly important sector of the industry, in Russia and elsewhere – and cranes are a vital component. Kazakov continues, "We use a tower crane in cases where there is a need for high-altitude dismantling in cramped conditions: this can be both urban and industrial buildings. For example, in 2021, we used two tower cranes for the demolition of a 20-storey hotel in the centre of Moscow. The building was located in a dense development, surrounded by residential areas and therefore the use of tower cranes helped to quickly and safely lower the height of the building for further dismantling with the help of demolition excavators."

Priestly Demolition used tower cranes to remove mega columns as part of a demolition project at 1 Bloor Street in Toronto, Canada

Kazakov notes, however, that "dismantling with tower cranes has a number of limitations and, therefore, in many cases we make a choice in favour of lowering the height of the building with smaller powered plant.

"In Russia to use cranes it is necessary to develop a separate work performance project and the work itself is more expensive »

Victor Kazakov, CEO at Russian demolition contractor GK Crushmash. "When choosing a crane for dismantling works, such characteristics as weight, mobility, dimensions in the transport position, ease of re-deployment, and the ability to manoeuvre with a load on a hook in a limited space, are important for us," Kazakov says

Priestly brought in a 500 tonne Liebherr wheeled mobile crane operating at long radius to remove a bridge from the SickKids Hospital in Toronto

It is not just lifting equipment that takes glory in demolition as there is also a place for transport equipment. Krebs Korrosionsschutz in Germany used its Cometto SPMT to remove, move and deposit an expired 1,000 tonne bridge

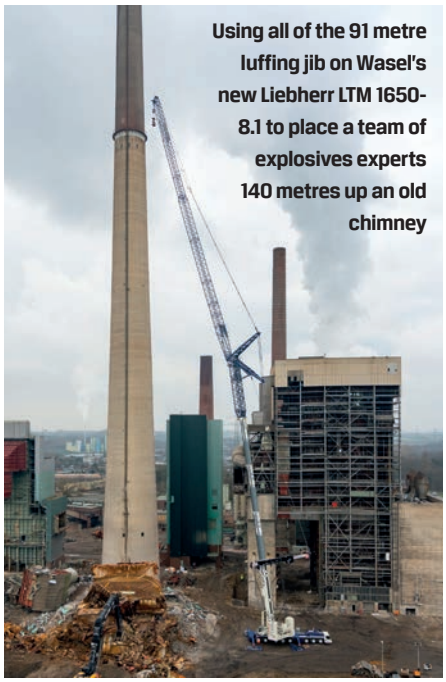
for the customer, despite the fact that there is no significant timesaving. Therefore, for us, dismantling with the help of tower cranes remains one of the options but not the main method of work."

Tower cranes are a crucial part of a high altitude demolition solution called TopDownWay, developed by Italy-headquartered specialist Despe. TDW is a modular self-descending machine adaptable to suit any type of structure, the company says. A key feature is that all the demolished material, including dust and water, is retained within the structure. Operators can work simultaneously on three floors. As work progresses, the platform makes a controlled descent down to ground level.

Parts of the TDW are assembled on the ground before being lifted to the top of the building using a tower crane which can then be climbed down with the building as its height reduces.

Tower cranes were chosen for a job in Canada, by Priestly Demolition. The company says it is always looking for new, and innovative ways to be faster, safer and more efficient in demolition. "Although there are many pieces to this puzzle, one way is to utilise the equipment we have available – to its full potential," Priestly says.

"Over the years, we have come to rely on cranes to help remove large concrete and steel beams, bridge girders, pedestrian bridges, satellite dishes from high rise buildings, digester roofs and more. When our high reach excavators can't handle the height, size or weight of a piece of structure, a crane is the next best option."



Using all of the 91 metre luffing jib on Wasel's new Liebherr LTM 1650-8.1 to place a team of explosives experts 140 metres up an old chimney

The tower job in question was 1 Bloor Street in Toronto where PDI demolished a temporary construction bridge structure to make way for a high-rise building with five floors below street level. Part of this demolition was the removal of numerous 60 foot deep solid concrete mega columns, all located below grade and encased in steel sleeves. The columns were 30 inches in diameter and weighed more than 60,000 pounds. "Our engineering team devised a plan to drill core holes into the columns and rigged using specially designed rigging beams to a tower crane. The columns were then saw cut at the base and safely remove from this busy downtown intersection."

Mobile versatility

Wheeled mobile cranes also have their place in the demolition sector, as demonstrated by PDI. The company said it was a more complicated procedure to remove of a pedestrian bridge at SickKids Hospital in Toronto.

As part of an ongoing expansion at the hospital, the bridge needed to be removed very carefully, in one piece, over both road and water without vibration so as not to disturb the surrounding patient care facilities or anything below. "With pedestrians on the move in yet another busy downtown location, safety was our primary concern," a spokesperson said, "For this project we used a 500 ton crane to lift the 70,000 pound bridge at nearly a 100 foot radius without any breakage."

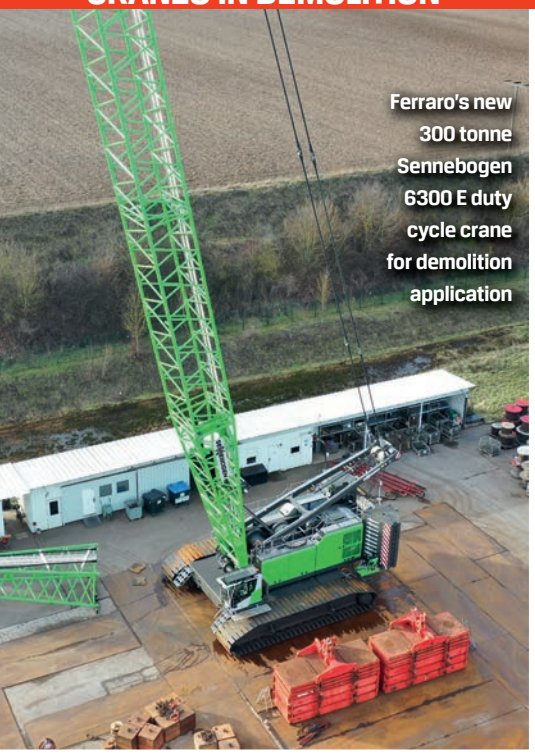
As there was no clean up needed with this type of crane removal, traffic could resume as soon as the bridge had been removed and downtime was minimal.

Another demolition job using a wheeled mobile crane was completed by Wasel in Germany. The specialist in wheeled, crawler and tower cranes, chose a 700 tonne capacity crane to complete two jobs from the same location while under time pressure.

On one hand Wasel's new Liebherr LTM 1650-8.1 wheeled mobile telescopic crane helped hoist explosive experts up a chimney to a height of 140 metres while it also helped remove façade components from another part of the building at a long radius of 80 metres.

The eight axle crane was fitted with a 91 metre luffing lattice jib to help demolish the coal fired power station in Lünen, North Rhine-Westphalia.

Crane operator Michael Müllers had his work cut out having two sites to concentrate on. From its position at the base of the 250 metre chimney the crane hoisted the explosives crew, with their drilling gear and explosives, up to a work platform on the flue at a height of around 140 metres. They placed »



Ferraro's new 300 tonne Sennebogen 6300 E duty cycle crane for demolition application

around 30 kilogrammes of explosives in 140 boreholes. Its great height meant the chimney had to be brought down using a single-folding method.

For the façade removal part of the job a large platform holding a team of workers and the salvaged material was hoisted in full over the neighbouring 70 metre high building. On the other side of the building the same platform was used at radii up to 80 metres. All up, including the safety cage, personnel and the demolition material, gave a gross load of around eight tonnes.

To cope with the long radius, Müllers set the radius of the crane's slewing platform ballast to its maximum value of 8.4 metres. Working on the chimney where the radius was 'only' around 45 metres, the ballast distance was reduced to 6.4 metres using the hydraulic slewing mechanism.

Big tradition

While heavy duty crawler cranes with a wrecking ball are traditional for demolition, it is getting less common to see them in this application. Bucking the trend, however, is Ferraro Group which has taken delivery of a new 300 tonne capacity duty cycle crane from Sennebogen.

The Bavarian manufacturer says its 6300 E is the world's largest duty cycle crane. With a working height of 118 metres, it is one-of-a-kind in demolition worldwide and the only one capable of working at this height with a wrecking ball, the company says.

"And the best thing is the duty cycle crane has a crane function that can lift weights of up to 300 tonnes. A 15 tonne concrete wrecking ball and a steel cutter that can cut 20 tonnes in use are already part of the overall package. Thanks to a winch, a special 60 square metre work platform can also be installed at any time and operated up to a height of 118 metres.

"As the Ferrraro Group, we deal with the topics of demolition, industrial dismantling and project development, and with the 300 tonner, there are practically no limits," states Nicolas Riqué, Ferraro Group marketing.

Alternative lifting

Other types of lifting equipment used in demolition further demonstrate the increasing level of sophistication in the industry. A few years ago ICST covered the massive ALE ALSK crane used in an urban setting for the dismantling the old Earl's Court exhibition centre in the UK. A more low key but also very impressive part of that project was the removal of a large access bridge and the main roof of the exhibition centre.

The bridge spanning a railway line was cut into full length pieces, lifted and then slid out using lifting and transport equipment from ALE. The roof, weighing 1,300 tonnes, was lowered 28 metres to the ground in one piece. Challenges included site conditions, lack of space, logistical constraints, environmental factors and more.

UK specialist Keltbray was principal contractor on the £51 million (US$75 million) project to demolish both Earls Court 1 and 2 exhibition centres. Design for temporary works was valued around £1 million and included propping below the main deck to allow access for a 500 tonne mobile crane. There were more than 150 designs and documents just for the temporary works.

Collaboration on the roof removal project was between Keltbray Lifting Services (lifting division), Wentworth House Partnership (Keltbray's in-house design and engineering company) and Keltbray Demolition with Fagioli providing the strand jacks.

The roof of the main exhibition hall was a 76 metre clear span by 126 metres long. It comprised seven steel girder trusses at 15 metre centres. First thoughts about how to remove it included controlled demolition at height or a birdcage scaffold to the underside of the roof trusses.

Five potential methods were considered, including using large mobile cranes lifting together. Risks included the need for extensive back-propping to support the mobile cranes, lifting operations above London Underground tunnels and logistical issues just to get cranes into the site.

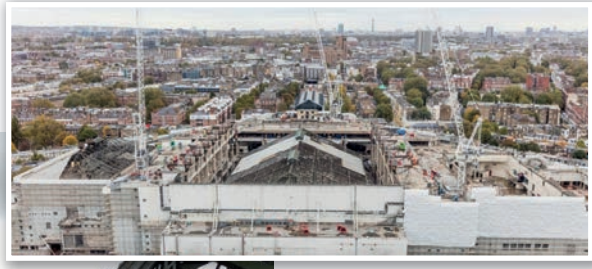
It was decided to lower the roof first because that way there would be little work at height, limited risk of dropping material, other activities could continue while the roof was being prepared and the roof would be dismantled inside the building.

Specialist strand jacking knowledge was needed and the roof had to be kept stable, horizontally and vertically, throughout the process. Fagioli from Italy supplied the strand jacks for this project. The ends of the trusses had to be re-framed so the strand jacks carried the weight but put the load back into the support columns and the roof. Bracing and preloaded ties were connected to the structure to control horizontal movement in the roof.

The strand jacks were installed above the supports at both ends of the main trusses. Cantilevered frames were designed and built on the existing columns. With the strand jack on one side, it was balanced on the other by a vertical down tie to the existing concrete structure below.

Removing the cladding prior to lowering reduced the weight of the roof from 1,700 to 1,300 tonnes. The lowering process, completed in conjunction with Fagioli and its computerised control of the jacks, was a single-shift, 11-hour operation.

With the roof lowered to ground level it was then cut up using conventional demolition methods. ■



(Above) The Earls Court 1 roof after lowering

Cantilevered supports and strand jacks to hold the main roof

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Growing more

Import replacement on the Russian market has stalled, and an unstable demand has given some of the major Russian crane producers financial challenges. Some segments of the domestic market, however, still have bright prospects. VLAD VOROTNIKOV reports exclusively for *ICST*.

Since beginning to exchange sanctions with Western countries in 2014, the Russian government has been calling domestic construction equipment companies to replace imported equipment on the national market, indicating that a strong dependence in this field one day could be deadly for the domestic industry.

This import replacement, however, is not likely to happen any time soon. In 2018 the Rzhevskij Crane Plant, one of the pillars of the Russian crane industry, went bankrupt. Its product range was primarily tower cranes but the company experienced severe financial problems for years, reportedly delaying payments to its suppliers and salaries to its employees. As explained by Vasily Shevchenko, Rzhevskij plant's bankruptcy supervisor, at the time of bankruptcy, the company accumulated a debt of RUB 303 million (US$4 million). Shevchenko cited lack of orders and consequently a poor capacity utilisation factor as the main reasons for the financial troubles. Hopes for an early revival of the company with a new investor failed to be realised. To date, the plant remains out of operation.

Moscow remains Russia's biggest market for construction tower cranes

The government is pushing for domestic products, for example, these Giraffe tower cranes, to replace foreign imports

For nearly a decade, Rzhevskij Crane Plant was one of the three biggest Russian crane producers, alongside Nyazepetrovsk Crane Plant and Strommashina. These three plants together produced around 200 cranes a year. They were the last splinters of the powerful Soviet industry, which consisted of several dozen plants at peak supplying customers across the Socialist block with roughly 4,000 cranes a year.

A few years before the bankruptcy, Roman Radivilov, deputy general director at the Rzhevskij plant, laid out plans to boost the production performance fourfold to 100 cranes a year. At that time, the Rzhevskij seemed to operate better than its local competitors. Nyazepetrovsk Crane Plant, for instance, had to fight for survival as, at some point, its production slumped to a miserable eight cranes a year.

Industrial security

Around that time, the Russian Industry and Trade Ministry listed some cranes among the industrial products, on which import-replacement must be pushed forward. Speaking during a government meeting a few years ago, former Russian Prime Minister Dmitry Medvedev estimated that up to 80 per cent of machines and equipment in the Russian construction industry was imported, which jeopardised the country's "industrial security" in the context of the geopolitical tension with Western countries.

Against this background, the authorities rolled out plans to achieve import replacement on the domestic market, beginning with the segment of tower cranes with lifting capacity between 12 and 16 tonnes. Russian construction companies, however, questioned the very idea of switching to domestic equipment.

Russia's crane market was oversupplied for several years

"The foreign equipment is more convenient, as foreign cranes have a larger boom, they are assembled faster. In addition, Russian equipment is very heavy," commented Petr Kapralov, general director at the Russian construction company, Citystroy. He added that at the time of the Rzhevskij plant's bankruptcy, Russia was overstocked with cranes.

"They [customers] imported so many cranes to Russia so that only half of them actually were operating," Kapralov said.

Crane oversupply

The oversupply problem has been hampering sales on the Russian crane market for several years. In 2020, 45 tower cranes were sold in Russia, almost twice the previous year's level, the Russian state statistical service Rosstat estimated. This is significantly lower compared to the level seen in the early 2010s.

The call for import replacement has become a warning sign for the Russian construction companies, who feared the government would decide to beat this goal by restricting imports of foreign cranes.

sophisticated

While the overall sales of cranes in Russia have been weak during recent years, some segments experienced higher demand than others. As explained by Alexander Kharisov, director of the Russian architecture company ASK Unit, the demand in the Russian market has been swinging towards all terrain and truck cranes.

"The use of such machines paves the way to mount structures in large blocks weighing 1,300 to 1,500 tonnes, which increases labour productivity tremendously," Kharisov explained, adding that quite a few new players emerged in this segment in the past few years.

"A number of Russian and foreign companies are currently engaged in the production of truck cranes. Key foreign suppliers are Tadano, Link-Belt, Kato, Liebherr, Grove, Terex, Zoomlion, and XCMG."

Cranes of Russian origin dominate in the small and medium capacity segment, while the heavyweight segment is controlled primarily by foreign suppliers. Currently, the leaders are Liebherr and the Chinese companies XCMG, Zoomlion and Sany.

"Among Russian companies, truck cranes with a lifting capacity of 60 and 80 tonnes are produced only by JSC Avtokran from Ivanovo and GAKZ. Truck cranes with a lifting capacity of 70 tonnes are produced only by GAKZ," Kharisov said.

A strong inflow of Chinese cranes has been seen on the Russian market in the last few years. Unlike many other industry segments, however, Russian companies producing truck cranes have managed to hold their ground.

"In recent years, the Russian truck crane industry has made a significant leap forward in its technological development due to the changed requirements and construction trend. The development of multi-axle chassis has enabled our manufacturers to supply competitive products that satisfy their consumers," Kharisov added.

Another type of lifting construction equipment in high demand in Russia these days is all terrain cranes, which is believed to be associated with expanding construction works in Siberia and the Far East.

China's ZPMC is the biggest market player in the port crane segment

Many port cranes in Russia are sufficiently outdated to require replacement

"The record holder in this segment belongs to the Liebherr LTM 11200-9 crane with a 100 metre boom, the lifting capacity of which reaches 1,200 tonnes. Among the models of Russian origin, the first place belongs to GAKZ, and its KS-74713 machine capable of handling an 80 tonne cargo," Kharisov said.

The Covid-19 pandemic has not brought any negative impact on the Russian crane market, market participants said. Even during the lockdown period introduced in the first half of 2020, most machine-building companies in Russia were granted a status of essential businesses, which allowed them to continue their operation as usual.

"The quarantine restrictions implemented by the Russian government to slow down the spread of the coronavirus appeared to be rather soft. In fact, the pandemic has even spurred the demand for real estate in Russia as a safe harbour for investments," commented an anonymous source at a Russian crane manufacturer.

Port cranes need modernisation

In the coming years, Russian companies also anticipate strong demand for port cranes, where most of the existing equipment is sufficiently outdated and needs replacement.

Not only existing ports will need new cranes in Russia. The government has embarked on the Northern Sea Route project – an ambitious plan to establish a new sea route through the Arctic ice, which is likely to become an alternative to the Suez Canal. To make this route operational, Russia will need to build several new seaports in the Arctic. ■

Cyber security: the more you know, the better

Cyber attacks continue to remain a serious threat to the construction industry. In the last year, attacks against critical targets in Europe have doubled, according to the European Union Agency for Cybersecurity. Obviously a global problem, company leaders in all industries are increasingly concerned about system breaches, compromised email and ransomware attacks. But hackers are increasingly going after construction companies, which are often underprepared for an attack.

In fact, hackers are "spoofing" their way into construction firms' systems more commonly, posing as subcontractors, and message company accountants, claiming to have a new routing number. Other times, a hacker will pretend to be an executive and email an employee asking for vital information at 4 pm on a Friday, in hopes the spoof will go unnoticed.

To that end, around 80 per cent of data breaches involve password compromises. An increase in remote working during Covid has also helped increase opportunities for breaches. In addition, remote access isn't being revoked. It's become the post-pandemic norm. In turn, a lot of hackers have moved from malware to credential stealing to get their foothold.

Early and often

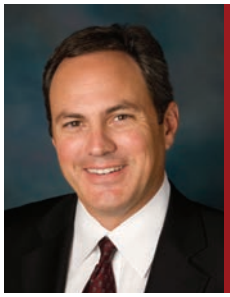
Unfortunately, hacker tactics pretty much run the gamut at this point – all of them worth recognising and understanding. Email fraud, for example, gets seemingly more sophisticated by the day – with fraudsters hacking into familiar email addresses and sending contact-list recipients emails with clickable links that then give them access to data.

Closely related, attackers will often purchase a domain name similar in appearance to that of a company or vendor. Changing a letter "l" to a numeral "1" can fool recipients into trusting emailers. It's also not uncommon for a hacker to create a fake email address that appears to be a CEO's personal address, and then ask an employee all types of things that would deliver access to the system.

Ultimately, a data breach could mean losing customers, destruction of your reputation and even financial ruin. No industry is immune to cyber attacks. In 2020, the average cost of a data breach, according to BigCommerce, was nearly US$150 million. Some additional stats that will give you pause: there's a 27 per cent chance your company will face a data breach; 84 per cent of companies lack IT security; there's a cyber security attack every 39 seconds.

Unauthorised access is another technique where hackers gain entry to a company or vendor email and use the compromised legitimate mailbox to send email. Password guessing is still a very lucrative hacking technique and hackers know and try common passwords by the millions. But the good news is protective measures are still effective when used proactively and across teams – preferably company-wide.

Enable multi-factor authentication on as many accounts as possible. Harden your email spam filter. Create a strong password policy. Train your end users. Keep good backups, isolated from your network. Consider cyber insurance. Evaluate security controls of third parties. Schedule IT maintenance and reviews early and often. With proper training, your staff will know how to spot scams and secure settings on devices to keep things safe. In the tech era, especially as it applies to cybersecurity, the more you know, the better. ■



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The Specialized Carriers & Rigging Foundation continues to evolve and expand. MIKE CHALMERS reports

Hard at work

Formed more than three decades ago as a private foundation to support SC&RA members and the industry at large, the Specialized Carriers & Rigging Foundation (SC&RF) is a non-profit organization comprising a board of directors and committees consisting of SC&RA member volunteers.

Association members are always encouraged to join the Foundation's leaders in helping to shape the future of SC&RF as well as the overall industry.

Two of those leaders are recently elected president Geoff Davis, Prodos Capital Operating Partner at Unified Logistics Operating Group, and vice president Jennifer Gabel, founder of Construct Your Health – a health and wellness programme targeting the specialized construction industry.

Davis plugged into SC&RF nearly a decade ago when someone described to him its unique mission. "I started volunteering, ended up on a couple of committees, spent some time as treasurer, VP, and now president for the next two years," he explained. "I like the structure – with multiple standing committees – and the way that knowledge is passed on, through the waves of volunteers that come through."

Gabel's path began several years ago while on the SC&RF Scholarship Committee, which led to her further involvement on the Board of Directors. "I served there for a few years, and then was nominated as treasurer, which led to this vice president role," she said. "And now I'm really excited to be a go-between for the treasurer and the president, and also just a representative of what I think is one of the most underrated but important parts of the whole Association."

She added, "Whether it's through scholarships, money for training for folks that need it or even reaching more potential workers via Lift & Move USA, we're looking to support the Association – often behind the scenes. That said, when folks realise what we're doing behind the scenes – and see what an adaptive mix of veterans and rookies, different ages and genders – they also realise that supporting us is an investment in the future of SC&RA as well as the industry."

Similarly, Davis has always been inspired by the Foundation's overall mission encompassing workforce development, research and support of SC&RA advocacy. "The research includes anything from permits to enforcement practices in the industry. From workforce to environment to legal, regulatory and even innovation, we've done apps and glossaries and built tools to support SC&RA members."

One of those tools particularly useful to the Association's international members is the Crane, Rigging and Hauling/Transport Terms app, which is free to members and

Jennifer Gabel, founder of Construct Your Health

SC&RF is now reconfiguring how to best run a Lift & Move USA event, which involves distilling specific parts of the mission and determining how it's best deployed in different areas

their employees, and allows users to learn specific industry terms in either English, Spanish or German.

Shaping initiatives

One substantial research project that SC&RF has been working on, indicated Davis, is the 2011 Transporting a Global Economy update. "Chris Smith [SC&RA VP, Transportation] talked to us late last year about the need to get this document updated and refreshed – so we got our heads together and decided on what it needed to be," he said.

"We knew that it had to be an update on what has changed in the industry. Now, the one thing that hasn't changed is the nature of our assets but I think what people will see significant updates in is the data sets – economics – growth, workforce, concept and a set of clearly defined deliverables that SC&RA feels it wants to work on in partnership with us. We want to support SC&RA in areas with government agencies – harmonisation, standardisation – and create the type of report that serves as a benchmark for the future while also helping to shape workforce initiatives and other programmes."

According to Davis, an additional wealth of SC&RF research is being dedicated to the workforce development side with a workforce survey that went out to SC&RA members this past summer to collect data. "We're heavily focused here – and not just recruiting best practices, but demographics, retirement," he stated. "These are things that we think the government agencies – state, regional, local, even federal – need to understand. The impact of our employees getting older. The nature of the work our people do."

The survey, titled, Industry Workforce Survey to Determine the State of Industry, is designed to establish a workforce development benchmark unlike any other data collection industry-wide.

This data was collected anonymously this summer and will be analysed and published to support SC&RA advocacy efforts, member recruiting programmes and to enhance and grow the SC&RF's ongoing workforce development initiatives.

Guiding attention

Gabel pointed out that the Lift & Move piece is also under examination. "We're currently looking into how to revamp it," she said. "Part of that research involves Foundation members examining what we're looking to do with Lift & Move."

Added Davis, "We're now reconfiguring how to best run a Lift & Move event. We need to get ready for A, B and C markets. This involves distilling specific parts of the mission – determining how it's best deployed in different areas."

Even as Davis and Gabel oversee the Foundation's substantial research efforts and the Lift & Move USA reconfiguration, they'll still also be guiding attention to the third branch of SC&RF – educational assistance – which provides scholarships as well as free or reduced training through tuition donation from Partners in Education: CICB, ITI, NCCCO (CCO) Foundation and Morrow Equipment Company.

In addition to financial donations at any point during the year, said Gabel, one popular way for Association members to contribute is to participate in the BBQ Fundraiser at this month's SC&RA Annual Conference in San Antonio, Texas, from 25 to 29 October.

"People should know that the money raised here [over fifty percent of ticket prices will go directly to SC&RF] isn't just going into an abyss. It flows back into the Association in very real ways. Obviously, it allows us to continue to elevate the scholarship opportunities for so many people, which ultimately makes the industry and the Association stronger, but it supports the research we do, and it gives us the flexibility to address the larger issues on our radar, like reimagining Lift & Move."

Getting involved

To date, through the support of Association members, SC&RF has been able to complete 31 reports, studies and research projects at an investment of US$685,000. An additional $60,000 has been invested in workforce development. In addition, 382 scholarships have been awarded, comprising $800,000

Geoff Davis, Prodos Capital Operating Partner at Unified Logistics Operating Group

and reaching 7,725 students and educators. To that end, six college and university students preparing for or furthering careers related to the crane, rigging and specialized transportation industries received scholarships – totalling $10,000.

They included: Grace Erlinger, at Link-Belt Cranes, who received a Jay Shiffler Memorial Scholarship; Robert Fleming, with Scott-Woods Transport, who received the George Young Memorial Scholarship; Elise Frueh, with Terex, who received a Continuing Education Scholarship; James McLean, with Beyel Brothers who received a George Bragg Memorial Scholarship; Kenneth Meuler, an intern with Doral Equipment Rental, who received a Collegiate Scholarship; and Denise Wilson, with Thackray Crane Rental, who received an IUOE Continuing Education Scholarship.

In addition, five recipients have been selected to receive vocational and-or technical or Partner in Education scholarships this year. They included: Robert Waltman (100 per cent tuition CICB-CCO course), Javier Cruz (50 per cent tuition CICB MCOT course), Lee Mobley, Emilio Garcia (50 per cent tuition CICB MCOT course) and Richard McGraw (100 per cent tuition CICB CCO course).

Ultimately, Gabel emphasised, "It's so important that SC&RA members donate, get involved and stay involved. I think people have begun to understand the value of supporting SC&RF and what it means to the Association in the long run. It makes me feel extremely optimistic about the Foundation's current goals and its efforts in the future." ■

■ For more information, see: www.scr-foundation.org

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Marc Lambert - Founder & CEO, Lextan
Dave Holder - European Operations Director, Wolffkran AG
Cristian Badin - Commercial director, Raimondi Cranes
Carmine Puca - Application and QHSE manager, Raimondi Cranes
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2 DECEMBER 2021

- Full-day conference
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CABLE-FREE SENSORS FOR TESTS

The products are designed to cope with harsh conditions

New load sensors from Strainsert, based on 2.4 GHz telemetry with a working range up to 800 metres, can facilitate installation for single- or multi-sensor use over long distances, problematic installations and otherwise challenging load measurement tasks.

There is no traditional wired system. The wireless load sensors and load cell telemetry systems include wireless load pins with integrated wireless transmitters and can be custom-designed.

With IP67-rated enclosures, the products are designed to cope with harsh conditions for weighing and load monitoring and are supported with software tools. Strainsert's T24 wireless transmitter modules are available in two module sizes with a choice of batteries – a compact AA-cell version or, for longer battery life, a larger D-cell module.

The modular system offers a choice of four USB-powered base stations.

For more information see: www.strainsert.com

Winch changeout extends crane's working life

Maritime Developments Limited (MDL) completed the change out of a boom hoist winch for a North Sea Operator's fixed platform crane after the client identified the winch replacement as the most efficient approach to safely extending the crane's working life.

The project was a result of a prior inspection and complete interface and dimensional survey by MDL's in-house engineering team in which they modelled different scenarios to ensure continued safe operations on the client's platform.

The replacement was the safest way to extend life

For more information see: www.maritimedevelopments.com

Shackles and hooks offer better control

Netherlands-based Green Pin's new ROV (remotely operated underwater vehicle) range now features two types of hook designed for better precision and control with subsea lifting – the eye hook and the shank hook.

Attached to the body and latch of the hook is a wire rope which can be grabbed by an ROV arm. This enables the ROV operator to easily manipulate the latch and open and close the hook. The white coating improves visibility underwater.

Two hooks and four shackles are available

The company also offers four types of ROV release shackles and two types of combined release and retrieve shackles. The release shackles are available with spring pins, locking clamps or spring loading.

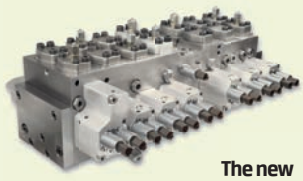
For more information see: www.greenpin.com

CUSTOM MODULAR CONTROL VALVES

Linde Hydraulics' new valve block VW 22/18 M5-03 has a modular system - five sections plus a pressure relief section. Customers can opt for three additional sections to be added on each side of the block.

Various functions can be selected for the additional sections, which are designed for specific requirements in a wheeled excavator. In addition to boom or lift regeneration, the company offers rod-to-head-regeneration, which can be used for cylinder functions in an excavator's stick.

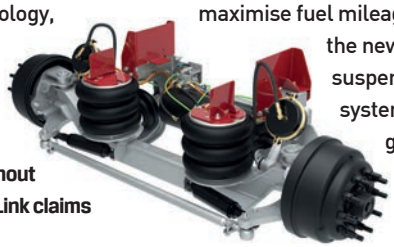
For more information see: www.linde-hydraulics.com



The new valve block has five sections plus a pressure relief section

Maximum traction with minimum pressure

Link's new, smart load-balancing suspensions, which uses its proprietary road optimised innovation technology, is designed to sense and maintain optimal tyre-to-ground pressure, reduce tyre wear and maximise fuel mileage. With the new auxiliary suspension systems, the guesswork of when to lift or lower is removed, so even inexperienced drivers can maintain maximum traction without overloading the axles, Link said.



Even novice drivers can maintain traction without overloading, Link claims

In challenging weather conditions, the system, working with the vehicle's ABS, will sense the absence of surface friction and reduce pressure as needed to shift the requisite tractive force to the driven axles. The suspension is suitable for heavy duty trucks and tractors, including dump bodies, cement trucks and roll-off trucks. Link said it is designing a Bodybuilder Package that has the control system integrated into the suspension.

For more information see: www.linkmfg.com

EVENTS DIARY

2021

WORLD DEMOLITION SUMMIT
20 and 21 October 2021
Chicago, USA
www.demolitionsummit.com

DIESEL PROGRESS SUMMIT
25 and 26 October 2021
Chicago, USA
www.dieselprogresssummit.com

SC&RA ANNUAL CONFERENCE
25 to 29 October 2021
San Antonio, Texas, USA
www.scranet.org

SMOPYC
17 to 21 November 2021
Zaragoza, Spain
www.feriazaragoza.com/smopyc-2021

INTERNATIONAL TOWER CRANES
1 and 2 December 2021
Nice, France
www.khl-itc.com

2022

SC&RA BOARD AND COMMITTEE MEETINGS
9 to 12 January 2022
Sun Valley Resort, Idaho, USA
www.scranet.org

SC&RA SPECIALIZED TRANSPORTATION SYMPOSIUM
22 to 24 February 2022
Glendale, Arizona, USA
www.scranet.org

LIFTEX BAHRAIN
21 and 22 March 2022
Bahrain, UAE
www.liftex.org

SC&RA ANNUAL CONFERENCE
25 to 29 April 2022
Washington, DC, USA
www.scranet.org

INTERMAT INDIA 2022
27 to 29 April 2022
Mumbai, India
www.india.intermatconstruction.com

HILLHEAD 2022
21 to 23 June 2022
Buxton, UK
www.hillhead.com

BAUMA 2022
24 to 30 October 2022
Munich, Germany
www.bauma.de

SAMOTER
March 2023 (Postponed from March 2021)
Verona, Italy
www.samoter.com

PICTURE OF THE MONTH

Two Bronzeshield all terrain cranes, on the left a 70 tonne capacity Liebherr LTM 1070-4.2 and on the right an 80 tonne capacity Terex Demag AC80-2, lift a commercial diver and their standby in a man-riding cage from ground level up and over into a water well outfall to inspect and survey the structure and help decide whether to build upon or demolish. The site in Dartford, UK, was transformed into an Amazon distribution centre in 2020.
PHOTO TAKEN BY COMMERCIAL DIVER OLIVER GRIX.

EVENTS REVIEW

Vertikal Days was held in Peterborough, UK, on 22 and 23 September 2021. The crane industry clearly welcomed the return of live events in the UK and there was a good mix of dealers, distributors and other industry professionals in attendance, as well as an impressive display of cranes and the latest accessories, technologies and equipment. Discussions at the expo and the evening networking party centered around delivery times, rental rates and fuel choices as everyone basked in the glorious weather and delighted in seeing familiar faces in real life once again.

In the USA, the Specialized Carriers & Rigging Association (SC&RA) 2021 Crane and Rigging Workshop was held 14 to 16 September at the Hyatt Regency Chicago, in Chicago, Illinois. Editor of American Cranes and Transport D.Ann Shiffler, who attended the workshop, found the event thought provoking and said it offered meaningful face-to-face networking. It was also highly safety conscious, given the ongoing pandemic, she said.

"The SC&RA staff and its volunteer leadership team pulled off a compelling event amid a complicated set of circumstances. Gathering in person is how SC&RA members like to do business, and the Association performed a monumental task to assure this could happen." Close to 400 people attended the workshop and more than 60 exhibitors showcased their products and services at the Exhibit Center. Shiffler also moderated a Q&A session which followed the first all-women panel assembled at a SC&RA event, where discussions surrounded how women navigate leadership roles in the crane and rigging industry.

PEOPLE NEWS

■ **JIM KESSLER**, chief operating officer at Ritchie Bros., has been named to the additional role of president. Canada-headquartered Ritchie Bros. is known for its construction equipment auctions.

"The president role will align our global revenue, services, operations, and critical support functions under Jim's leadership. His holistic approach to sales and operations makes him the ideal leader, " said Ritchie Bros. CEO Ann Fandozzi. Kessler has more than 20 years of experience in senior leadership positions, including those of president, chief operating officer, and chief financial officer.

OBITUARY

WAYNE KOKTA 1952 - 2021

With regret we report that **WAYNE KOKTA** died on 28 August 2021 in Cedarburg, Wisconsin, USA. Kokta retired in 2018 after a long career as transportation manager at Dawes Rigging and Crane Rental/DST Inc. He was also a long-time member of the Specialized Carriers & Rigging Association.

Wayne is survived by his wife of 47 years, Cynthia, sons: Paul (Emilie), Mark (Heidi) and Michael (Kathryn), and grandchildren: Kaia, Gabriel, Sayner, Emre, Nicholas and Marc Anthony. He is also survived by his mother as well as many family and friends.

■ Please 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, United Kingdom, or by e-mail to alex.dahm@khl.com. Entries for Picture of the month should include: the month and year taken, the place, type of crane, owner and project, plus any other relevant information.

MARKETPLACE

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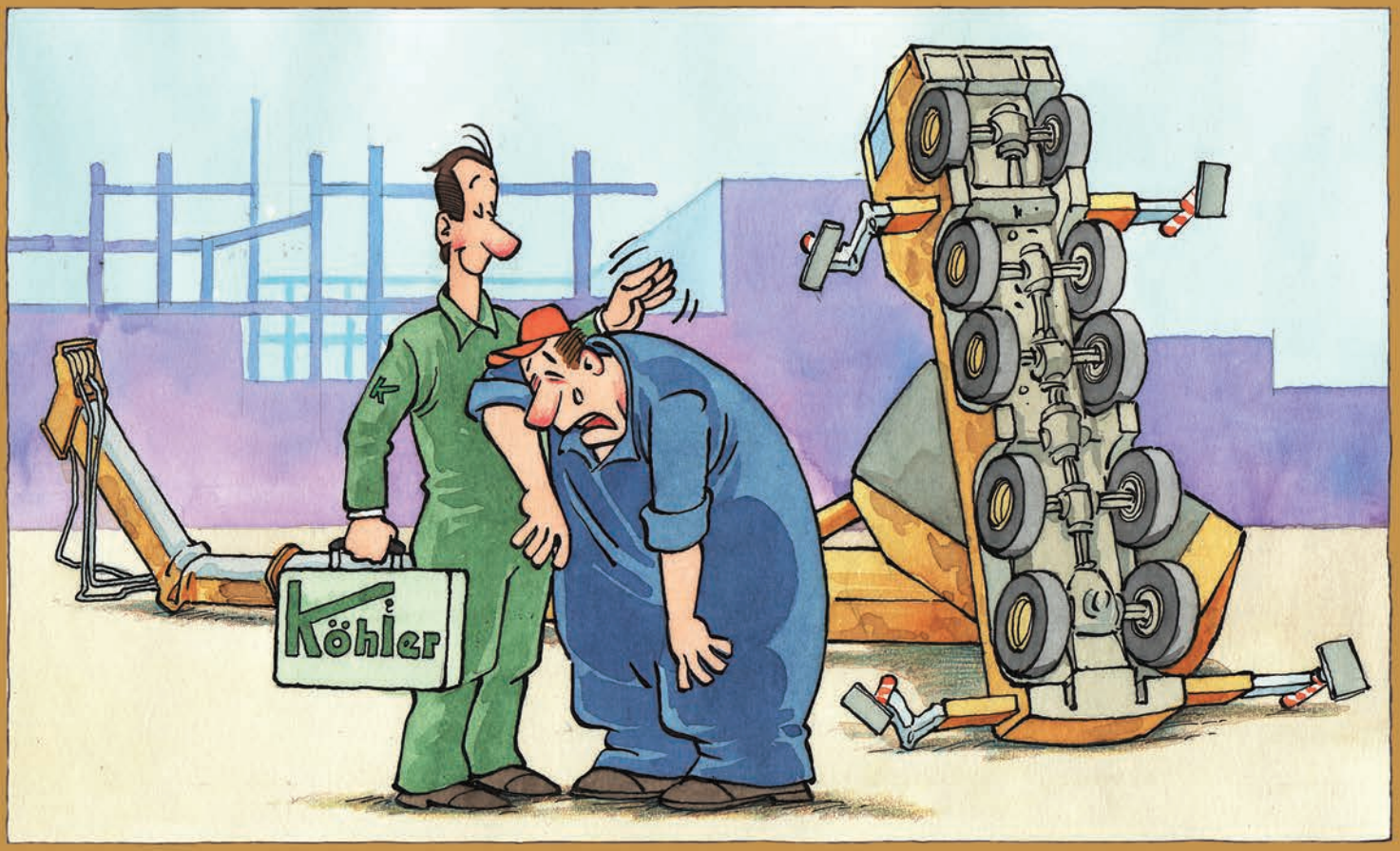
Our spare parts list



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