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DEMAG
BY TEREX

Mega lifters

At the end of last year we charted the development of the new generation heavy lift cranes, including the launch of Sarens' 250,000 tonne/metre SGC-250. This third generation crane - which claimed to be the largest land based crane in the world - is capable of lifting 5,000 tonnes at 40 metres radius and 2,000 tonnes at 100 metres. However such is the progress of the heavy lift sector that this crane has now been well and truly superseded not by one but two new mega lifters that offer double and almost four times the lifting power!

But why the sudden increase in capacity? The latest heavy lifters from ALE, Sarens and Mammoet have been designed in a modular fashion that allows them to be increased in size to meet demand. Whether that demand is driven by the pressing requirement to lift larger and heavier modules or that the modules are getting heavier because larger capacity cranes are becoming available, it's a bit like which came first - the chicken or the egg' question? However, the end result is that modules and the mega lifter's capacities are both increasing dramatically.

Just like London buses you wait for ages and then three new mega lifters come along at the same time.

Sarens' SGC-250 was followed by the launch of the 10,000 tonne ALE SK10,000 at the Offshore Technology Conference in Texas last month, just 24 hours later Mammoet announced the MSG1000 which, it says, has the potential to be upgraded to lift 18,000 tonnes.

ALE SK10,000

ALE's 10,000 tonne SK10,000 uses the same basic design concept as its 5,000 tonne AL.SK350. It can lift with main boom and jib to a radius of up to 200 metres and offers a ground bearing pressure of around 22 tonnes a square metre. The design allows a partial slewing track to be laid purely to cover the slew arc required up to a full 360 degrees. The fixed ballast is



The 10,000 tonne MSG1000 will be scalable up to a maximum capacity of 18,000 tonnes



C&A

heavy lift

Mammoet MSG1000



The ALE SK10,000 can lift at a radius of 200 metres



ALE's SK10,000 can lift up to 10,000 tonnes and has a fixed ballast of 8,000 tonnes

made up of 8,000 tonnes of locally sourced material such as sand.

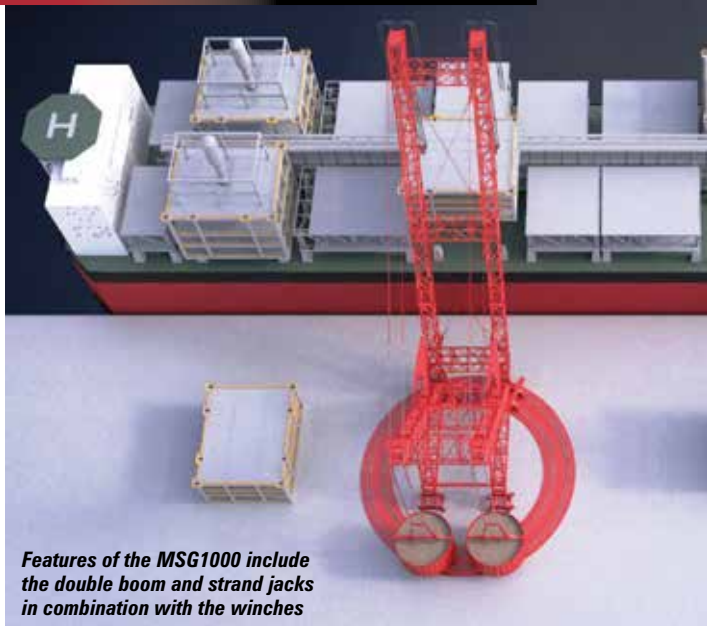
ALE says that the new crane is suited for loading modules weighing between 4,000 to 7,000 tonnes across the full width of a Floating Production Storage and Offloading barge.

ALE's group technical director Ronald Hoefmans said: "Demand for lifting larger and heavier modules is growing and the introduction of the SK10,000 means that individual lifts of up to 10,000 tonnes are now possible, allowing customers to build larger modules more efficiently in fabrication yards."

Mammoet MSG1000

Less than 24 hours after ALE

unveiled its SK10,000, Mammoet announced that it is also working on a new ultra high capacity crane - the MSG1000 - based on its current heavy lift crane models - the MSG80 and PTC range - which offer capacities up to 5,000 tonnes with boom and jib combinations to 256 metres through 360 degrees. The new 10,000 tonne Mammoet MSG 1000 will be much larger than its PTC range of which the company has 10 in its fleet, having a large double track ring, dual booms and back masts and two large counterweights, while using a combination of strand jacks and winches. Mammoet believes it will be able to scale the new concept up to a maximum capacity of



Features of the MSG1000 include the double boom and strand jacks in combination with the winches

18,000 tonnes if required and plans to discuss the concept with its main customers over the coming months to verify the concept and functionality and explore additional developments.

Global director of market development and innovation Jacques Stoof said: "The MSG80 and PTC cranes have revolutionised construction and maintenance efficiency in the past decade. However, we see from developments in modular construction that there is a growing need for cranes with significantly more capacity than the market has seen thus far. While we have left the basic concept of the PTC intact, we have enhanced its capacity, with

features such as the double boom and strand jacks in combination with winches."

Both ALE and Mammoet clearly agree that demand to lift heavier pre-constructed modules is increasing and that the only way to satisfy this is to develop their own new products, as they have already done in the 5,000 tonne area. Also it will come as no surprise if Sarens launches an increased capacity SGC crane in the not too distant future.

The Focus

Mammoet's design department has clearly been busy over the past year or two as it also announced it will progress the development of the Focus, a new type of heavy lifter for



Mammoet has tweaked the design of the Focus to further improve its performance and is now ready to launch the crane

use in confined spaces. The Focus is high capacity crane that can be erected vertically in a very small area making it an ideal heavy lift solution for restricted spaces in industrial plants and inner cities. Since the concept was announced last year Mammoet has tweaked the design to improve its performance and it is now said to be ready to launch.

more efficient, significantly reducing any downtime to assemble a crane'. The crane will also include a variable superlift system with a radius that can be adjusted under load from 16 to 30 metres. The new concept is scheduled to go into service in the second quarter of next year.

The latest design sees the crane's superstructure placed on a pedestal, which is said to enhance stability, while ground bearing pressures have been reduced to less than 10 tonnes per square metre. For assembly and operation the crane requires a minimum footprint of 22 metres square. The second major improvement is a new climbing frame that allows it to build itself vertically - like a tower crane - rather than the initial principal of an extension ladder. The change eliminates the need to clear large areas around the crane or to erect the crane over hazardous areas in industrial plants such as live pipe racks.

Mammoet says that the assembly process is 'less complex, safer and



The Mammoet Focus is a high capacity crane that can be erected vertically in a very small area.

Faster crawler crane relocation

In order to reduce the contract time for the installation of the 16 turbine Loma Blanca II wind farm project in Patagonia, Argentina, ALE used a SPMT - Self Propelled Modular Transporter - to move its fully rigged Manitowoc 18000 crawler crane between turbine sites. ALE designed a solution that allowed the crane to sit on steel beams laid across the SPMTs deck. Although the tracks protruded over the width of the transporter's deck, its wheels were narrow enough to fit onto the six metre wide dirt tracks.

A total of 36 axle lines of third generation SPMTs were used in a four file 18 configuration. As soon as a lift was finished the crane, complete with 120 metres of boom, was lashed down and jacked up into transport mode. Factors such as cambers in the road were all taken into consideration before the move got underway.

ALE engineering manager Andres Crespo said: "By avoiding the need to disassemble and reassemble for every lift, we provided the most cost-effective option possible which also reduced operational costs."



ALE adapted a Manitowoc 18000 crawler crane to significantly reduce the contract time for the installation of 16 wind turbines

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Demag CC 3800-1 reduces set-up space

Setting up the main boom of large capacity cranes can be a challenge on confined sites. German crane rental company Wiesbauer faced the problem with its Demag CC 3800-1 when replacing an old autobahn viaduct spanning the river Lahn near Dorlar, Germany. It solved it by setting up the 84 metre main boom without using the Superlift counterweight.

Working across the railway and the river that runs parallel to it, required a concrete foundation to support the crane. Once completed the CC 3800-1 was set up in LSL 1 configuration with an 84 metre main

boom, 36 metre Superlift/derrick boom, 50 tonnes of central ballast and 225 tonnes of counterweight. A Demag AC 160-5 was used as an assist crane.

"The job involved loads from 96 to 148 tonnes at radii of between 40 and 64 metres, so we had no option but to use a 650 tonne class crawler crane, despite the limited space," said Wiesbauer project manager Marco Wilhelm. "The large counterweight allowed us to set up the main boom without the additional Superlift



Wiesbauer used its Demag CC 3800-1 to replace the old viaduct on the A45 highway that spans the river Lahn near Dorlar, Germany

counterweight, which increased the crane's usable working area significantly."

The building of the bridge span sections was carried out in two steps, the first involved lifting the steel

beams that make up each span, over the river and then lifting them over the railway line.

The CC 3800-1 lifted the 54 metre steel beams, which weighed between 96 to 148 tonnes from the transporter without the Superlift counterweight. The crane then slewed to a pick up point where it was able to attach the waiting Superlift frame and its 325 tonnes of counterweight to lift the beams



The steel beams measured up to 54 metres long and weighing between 96 to 148 tonnes

to a height of around 22 metres and set them on the bridge points. The radii ranged from 40 to 64 metres and due to their length, 20 and 25 metre long spreader beams were used. Most of the lifts were carried out at night within defined time slots in order to keep disruption to a minimum. Despite the restrictions the whole contract - including the double set up and dismantling - was completed in five weeks.



The CC 3800-1 had an 84 metre main boom, 36 metre Superlift boom, 50 tonne of central ballast and 225 tonnes of counterweight

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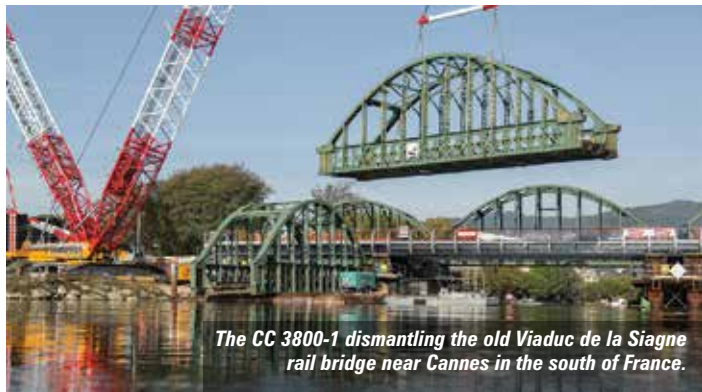
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The time factor

Time was the major factor when dismantling the old Viaduc de la Siagne rail bridge near Cannes in the south of France. Just 130 hours were available to dismantle the bridge over the river Siagne. Vernazza Autogru used its brand new 650 tonne Demag CC 3800-1 crawler crane, carrying out its maiden lift to remove the bridge components weighing up to 115 tonnes each.

The crane was set up in LSL configuration with 78 metres of main boom, Superlift system and split tray. The work space was restricted with the site bounded by the river Siagne on one side and a golf course on the other, making it difficult to put down the dismantled bridge components. The weather was a mixture of wind and rain adding to the challenge.

The team managed to set up the CC 3800-1 in four days as planned, completing it just as SNCF closed the line for 130 hours. During this time the eight 22 metre long, six metres wide and eight metres high components had to be lifted and removed, along with many smaller bridge components. The 75 tonne components were lifted at a radius of up to 68 metres, while the largest 115 tonne components were lifted at a radius of 43 metres. After each lift the CC 3800-1 had to track 18 metres with each component to set them down in the required position before returning for the next lift.



The CC 3800-1 dismantling the old Viaduc de la Siagne rail bridge near Cannes in the south of France.

C&A

heavy lift

Mammoet's milestone lift

Mammoet has used its MSG80 ringer crane to lift an 87 metre, 1,815 tonne quench tower into position at Shell's Pennsylvania Chemicals Plant in Potter Township. The facility is the first major US project of its kind to be built outside of the Gulf Coast region in 20 years. Once operational, the plant will boast an ethane cracker and three polyethylene units and is expected to employ up to 600.

The quench tower was the tallest and heaviest component to be lifted by the MSG80 and was erected according to plan within a 12 hour time slot. Due to the limited space available, the MSG80 was the only crane with a small enough footprint and large enough capacity to complete the lift. Mammoet's PTC200 DS is also on site and is scheduled to carry out a further 45 lifts during the project. The MSG80 has a maximum capacity of 3,073



The MSG80 lifting the quench tower into position

tonnes at a radius of 22 metres with a Superlift ballast of 2,000 tonnes and an outside ring diameter of 34 metres.

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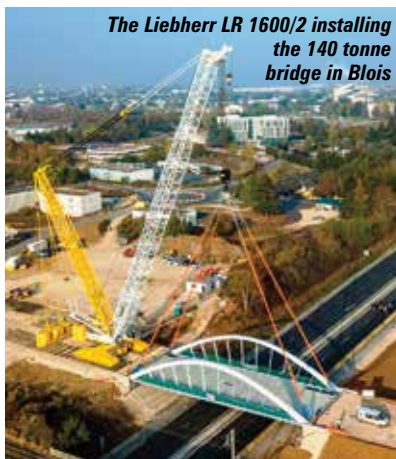
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Used Liebherrs for Mediaco

French crane rental company Mediaco has taken delivery of two refurbished Liebherr lattice boom cranes - a nine year old LG 1750 truck crane and an eight year old LR 1600/2 crawler. The LG 1750 went straight out on the 'Grand Paris' infrastructure project - the largest construction site in Europe, while the first job for the LR 1600/2 was the installation of a 140 tonne bridge in Blois.

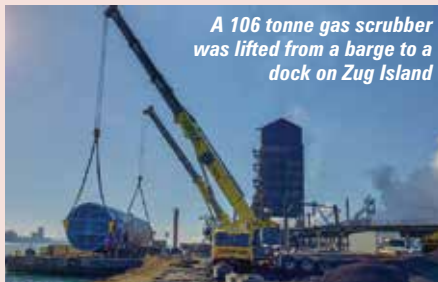


The Liebherr LR 1600/2 installing the 140 tonne bridge in Blois

Mediaco ordered both the cranes with retrofitted derrick ballast with VarioTray. The LG 1750 was also supplied with an additional winch and the ballast supports were modified to ensure that both the crane's 12.5 and 10 tonne slabs from other Liebherr cranes in the Mediaco fleet can be used.

Grove tandem lift at Detroit docks

Detroit-based JJ Curran was contracted to lift a 106 tonne, 33 metre long, six metre diameter gas scrubber from a barge in the Detroit River to a dock on Zug Island. The company used its 300 tonne Grove GMK6300L and 400 tonne GMK6400



A 106 tonne gas scrubber was lifted from a barge to a dock on Zug Island

All Terrain cranes working in tandem at a radius of 22.8 metres - the distance from the centre of the barge to the landing point.

Liebherr LR 11000 railway bridge lift

German crane company Wiesbauer has used its 1,000 tonne Liebherr LR 11000 crawler crane to remove a 100 year old railway bridge. As the bridge was situated in a nature conservation area the crane had to set up a considerable distance away and was erected with 96 metres of main boom, a 46 metre derrick boom and 405 tonnes of ballast to remove the 60 tonne 'fish-bellied bridge' out of the nature area at a radius of 60 metres.

Before placing the bridge on the ground, the two arched fish belly girders under the bridge support, had to be cut free. The crane then lifted a temporary bridge into place. A permanent steel structure weighing 150 tonnes will be installed in 2021.



The LR 11000 with 96 metre main boom removing the 60 tonne bridge



Two arched fish-bellied girders under the bridge support, had to be removed before being placed on the ground

Spanish refinery upgrade

Mammoet was contracted to install a new 400 tonne cracking column at CEPSA's La Rábida oil refinery in southern Spain, overcoming complex regulatory and logistical challenges to complete the project in four days.

The column was manufactured and transported from India to the port of Huelva, Spain by Prism Logistics with Mammoet assisting with the land move. The column was transported on a 24 axle single line SPMT and took just two hours from port to plant.



The 400 tonne cracking column during transportation

Mammoet Spain branch manager, Rafael Martinez said: "Timing was an important factor as every hour of outage was costing our client a small fortune. Using public roads for the transit required two months of intensive communication with three major Spanish transport ministries, agencies and police to ensure that there were no delays on the cracking column's escorted journey from port to refinery."

"The site was heavily congested, which made both the transport and installation challenging. Due to the lack of space, we were unable to use the standard crane for a lift of this size. The positioning of critical pipework within the lift site meant that it wasn't possible to employ a backmast or superlift, dramatically reducing the available lifting capacity. We overcame this by using a 1,350 tonne Liebherr LR 11350 crawler crane with 60 metres main boom and 340 tonnes of central counterweight."

The team tailed in the reactor by attaching the base of the column to the reconfigured SPMTs with an in-house tailing frame. This allowed the LR 11350 to successfully up end the column and assist the CEPSA mechanical team with its alignment and installation.



The LR 11350 lifting in the column tailed by the SPMTs using an in-house tailing frame

Enerpac Gantry in Morocco

North African logistics company, Marine Maroc used its new Enerpac SL400 gantry to install high pressure heaters weighing 130 tonnes at the 1,386MW capacity Safi coal-fired power plant near Safi, Southwest Morocco. The plant is the first coal fired plant in Africa to use ultra supercritical technology which increases efficiency by 10 percent compared to conventional plants, enabling significant reductions in CO2 and fuel consumption.

Marine Maroc was contracted to transport the heaters to the plant from Safi port. On arrival an Enerpac SL400 gantry lifted the heaters from the transporter. Equipped with three stage lift cylinders, the SL400 can lift to a height of 9.14 metres and handle up to 408 tonnes. IT features an Intelli-Lift wireless remote control system, with automatic lifting synchronisation with an accuracy of 24mm and automatic synchronisation of travel to 15mm.

Marine Maroc used its Enerpac SL400 gantry to install high pressure (HP) heaters weighing 130 tonnes at the Safi coal-fired power plant in Southwest Morocco





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