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# Are big crawlers too big?

Despite the hammering taken by the new crane market over the past two years, one area that has remained surprisingly buoyant is crawler cranes, in particular the larger end of the sector, as well as the growing number of 'big lift' alternatives.

The past few years have seen quite a change in the crane market with sales in some sectors going literally from boom to bust. Large crawler cranes have however performed well, with sales driven by the global demand from large infrastructure and power projects. For these massive contracts we are talking capacities from 500 to more than 3,000 tonnes. This size of crane was previously limited to the established global players such as Liebherr, Terex and Manitowoc and specialist producers such as Lampson. Kobelco has also been pushing further into this area and in the past couple of years a growing influx of big crawler cranes from Chinese manufacturers.

Manitowoc has the strongest or longest pedigree in this sector, having built-up a huge reputation in the 1960s and 1970s with its 150 ton 4000W VICON (Variable Independent Control) and then the legendary 300 tonne capacity 4100W VICON Series 2 or Series 3 with ringer attachments.

The 4100W ringer can out lift many of the modern day cranes by more than 100 percent at long radii, managing for example 35 tonnes on a 300ft boom at 210ft radius. It is no surprise therefore that these cranes were so popular and still have a certain following today.

By the early to mid 1980's as a major construction slump took

hold, the Manitowoc 4100 and 4600 series began to look dated against the heavy Demag crawler cranes such as the 300 tonne CC2000 series (launched 1979/80) and Liebherr's emerging big crawler crane line-up led by the LR1600.

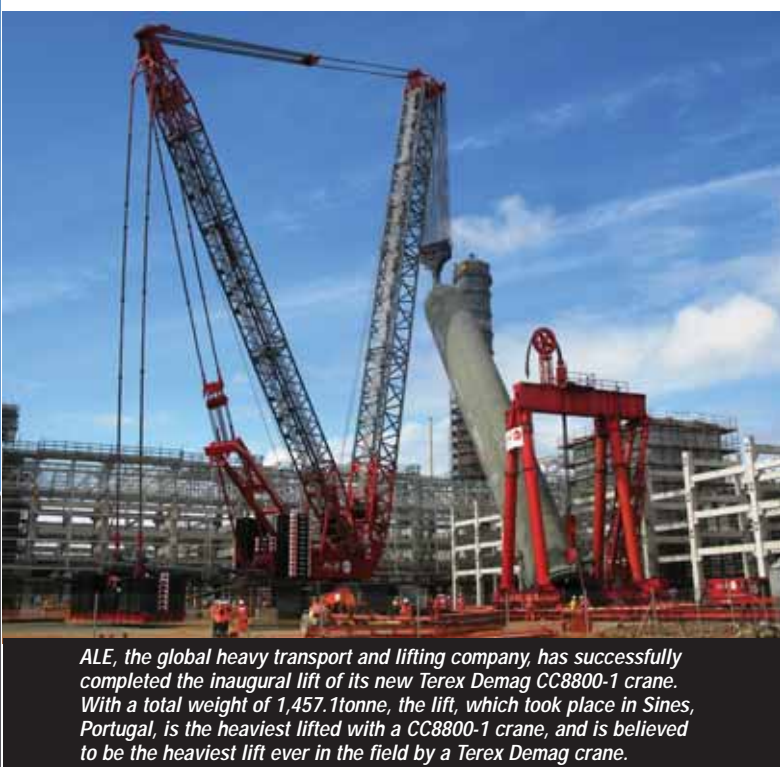
The CC2000 was the improved, larger capacity successor to the short-lived 250 tonne CC1200 and became the basis of the CC2400, CC2600 and the CC2800-1 of today. On top of this Link Belt had teamed up with Sumitomo and was pushing its all-hydraulic HyLab cranes at the smaller end of the market. The combination hit Manitowoc hard, and given that it also had its shipbuilding and ice making divisions to fall back on, the company almost quit crane-making for good, limiting production to more profitable build-to-order contracts, while supporting its existing population. While many of its dealers and competitors thought that this was the beginning of the end for Manitowoc cranes, it was working on a completely new, all hydraulic crane line, resulting in the launch of the Manitowoc M250, a new, easy to transport, quick to erect 250 ton crane in 1992. It was exceptionally well received and not only put Manitowoc back on the crane map, but made it strong enough after a few years to go shopping for acquisitions, adding Potain tower cranes and then Grove telescopic cranes in 2002, taking it from an 'also-ran' to one of the top three international crane producers.

When it comes to the big crawler crane market though, the company has not managed to recreate the position that the Manitowoc brand

had in Europe during the hay-day of the 4100's – or at least not yet. In the past few years Demag, (now Terex) has had its fellow countryman Liebherr breathing down its neck in the big crawler crane market to the point where Liebherr has arguably unseated it as the dominant player? Both though need to keep an eye on Kobelco which has been taking an increasingly larger share of the market in which it competes. Then there is the growing presence (threat?) from China with Sany, Fuwa and Zoomlion recently launching new cranes up to 1,250 tonnes.

C&a crawler cranes

Manitowoc  
31000 on test



ALE, the global heavy transport and lifting company, has successfully completed the inaugural lift of its new Terex Demag CC8800-1 crane. With a total weight of 1,457.1tonne, the lift, which took place in Sines, Portugal, is the heaviest lifted with a CC8800-1 crane, and is believed to be the heaviest lift ever in the field by a Terex Demag crane.

The new  
Sennebogen 7700  
with a 370 tonne  
test load





## crawler cranes C&a

### Oriental competition

Established in 1904 Fuwa is the oldest crane manufacturer in China. With increasing sales both at home and abroad, the company is continually expanding its manufacturing facilities, currently adding a new plant near Shenyang. A few months ago it announced the new 1,250 tonne QUY1250 which will be seen at Bauma China in Shanghai later this year.

Powered by a Cummins engine and Rexroth hydraulics it is rated at 1,250 tonnes at eight metres radius

with the main boom in super lift configuration. Maximum boom/jib configuration is 96 metres of boom plus a 108 metre luffing jib. Although not confirmed, it is thought that this crane will be joined by an 8-900 tonner later this year, filling in between its previous largest 500 tonner and the new QUY1250.

About a year ago Chinese crane manufacturer Sany, unveiled its 1,000 tonne crawler, the SCC 10000 which should now be in production. The new crane followed closely on

The 3,200 tonne Terex CC8800-1 Twin at its launch in 2007



Liebherr's new LR 1300 is currently being built.

the heels of a 900 tonner and offers a maximum main boom of 120 metres, with a total boom and jib combination of 192 metres.

But these are not the only Chinese manufacturers producing sizeable crawler cranes. XCMG, Foton Lovol and Zoomlion are all producing 500 tonne plus cranes and looking to increase capacities further although most, if not all large capacity Chinese crawler cranes remain in China working on the larger infrastructure and power contracts. The speed with which these companies have developed such big cranes is something close to frightening. Even with the massive computing power and design aids that today's crane engineers have at their fingertips, the development of

such big cranes takes the international manufacturers - who have years of experience in the sector - a very long time. This applies to Americans, Germans and the Japanese so it's not a question of old world or western inefficiency. The question that many are asking is what do these new entrants know? Is it the number of people they can throw at the task? Or is it that they don't know the depth of design work required? This uncertainty will surely curb sales to the major international lifting specialists. However if, as one assumes there is a substantial price advantage, they could appeal to contractors in the developing world and as such pose a challenge to the established producers.

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Sarens bought this 600 tonne Sany SCC6300

**The brilliant CC2000**

Terex/Demag owes a great deal of its success in the big crawler crane market to the brilliance of the original 1980s CC2000 design. Since its initial success it has taken the basic building blocks from that model and extended it in every way possible to the point where the current CC2800 probably takes the design as far as it can go. Expect a new 750 tonne model from Terex soon and if it has done its job, it will become the base for a new product range to build on the CC2000 pedigree. For Terex, this is essential if it is to keep up with the relentless march of Liebherr which already has a firm grasp on the 600 to 750 tonne class. Its LR1600-2 is a very strong crane while the LR1750 has been a strong competitor to the Terex CC2800. Current largest Liebherr is the 1,350 tonne LR 11350 although it will not be long before the 3,000 tonne LR13000 will be ready to go to work. Manitowoc is also in the final testing stages of its 2,300 tonne Model 31000, while Terex, which led the way in the 2,000 tonne plus market, has its 3,200

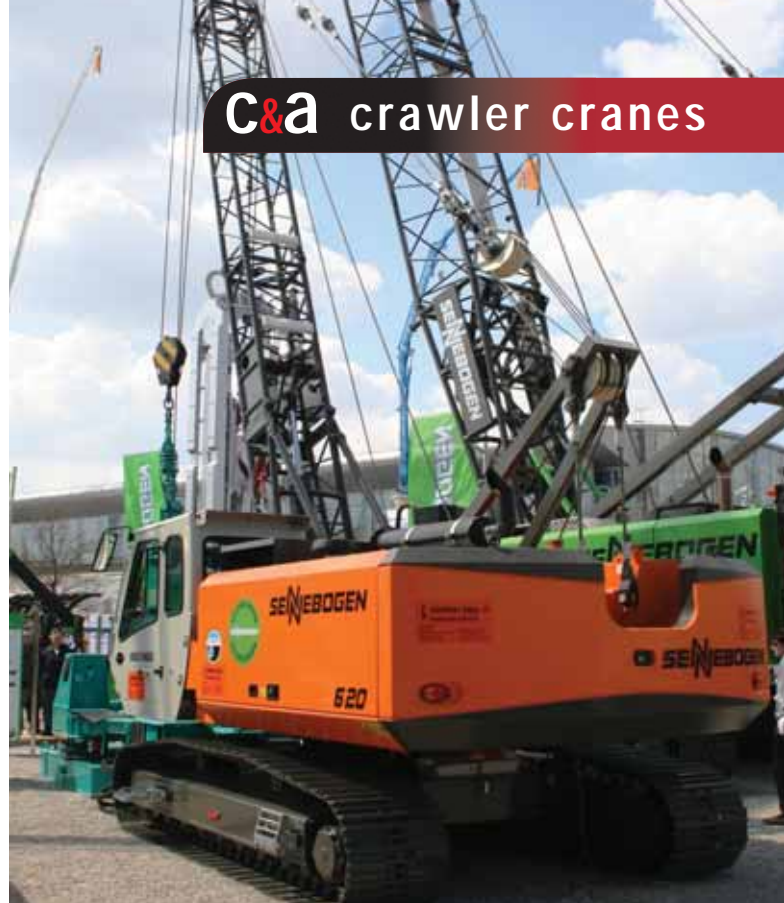
tonne twin boom CC8800-1 Twin launched almost three years ago. So all three major crane producers will soon have 'large' capacity crawlers between 2,300 and 3,200 tonnes, but how big is this market likely to be?

To date, Liebherr does not have an order for its unit. Manitowoc is preparing to ship its first 31000, fulfilling one of two initial orders announced at Conexpo 2008 but nothing since. Terex has done the best with three CC8800-1 Twin sales but has not announced any recent sales.

When Terex launched its CC8800-1 in 2007, it predicted a bright future for this 'mega' crawler crane sector as nuclear power station building programmes were launched across the world, not to mention the need for more refining capacity. This may well still come to pass, the only question is how soon? And will contractors go for traditional crawler cranes or work with the massive modular lifting machines built by the likes of ALE and Mammoet, soon to be joined by Sarens?

**Big crawlers or alternatives?**

One question many crane buyers and manufacturers have considered is the potential for even larger crawler cranes - perhaps 4,000 or even 5,000 tonnes capacity? A crawler crane has the benefit of being able to move with the load or at least with fully rigged boom and jib configurations. However when you move a loaded crawler of even 2,000 tonnes, it can be extremely precarious if the ground conditions are not perfectly prepared. Also given that the work for these machines tends to be single large lifts, such as large petro chemical columns and offshore



Sennebogen has two new crawler cranes including the compact 20 tonne 620HD duty cycle crawler crane. Based on a folding boom crane that Sennebogen last built around 20 years ago the crane's main feature is its ability to hydraulically fold the main boom (up to 12 metres long) backwards with the 10 metre (maximum) long fly jib over the A frame. the crawler undercarriage can extend from 2.75 metres to four metres, while transport height with the folded main boom is just 3.13 metres or 3.5 metres with the main boom and fly jib. The company also launched its largest crawler to date - the 280/300 tonne Star Lifter 7700.

fabrications, the need to travel is usually limited, which rather plays into the hands of the latest generation of modular lifting machines.

However there are certain applications, such as where a crane cannot be rigged close enough to the lift, when the ability to rig away from the job and then track in is of course attractive. There is also the potential for new work created once a lifting machine is available to handle it. However given the massive development costs of these units and the current sluggish demand for even the current products on the market, one wonders if the crawler crane may have finally reached its upper limits - for practical reasons rather than technology limitations. It is probably more likely that companies will develop and improve the safety and planning equipment for handling tandem or even multiple lifts rather than seeking larger and larger models. On the other hand if and when the global economy picks up and crane buyers have money to invest again you can

be sure that the subject of bigger cranes will be back on the table.

**Big load or big crane?**

One company leading the top-end alternative lifting solution is global heavy transport and lifting company ALE. Despite the current climate it has announced substantial additions to its global fleet, including a second AL.SK190, its 4,300 tonne capacity ultra-heavy lifting machine, which will be completed in the second half of 2011.



Zoomlions QUY400 was seen at Bauma



Kobelco SL4500 Light.





*Fuwa recently unveiled its 1,250 tonne QUY1250*

The AL.SK190 claims to be the world's largest land-based crane with a load moment of 190,000 tonne/metre, a 141 metre main boom and a 32.1 metre ballast radius. It also features a 600 tonne quick winch system for lifting smaller items quickly.

The drive behind the development of the AL.SK was the cost of large capacity crawler cranes from the major manufacturers and the need for more lifting power than a Terex CC8800 Twin. The original design brief for the AL.SK series was to lift a 130 metre long, 10 metre diameter column weighing 3,000 tonnes. The original SK90 - now called the SK190 - may also be joined by the SK350 with a load moment of 354,000 tonne/metre and 5,000 tonne maximum capacity. ALE is in negotiations for three possible contracts - in Europe, USA and Asia - that would use the AL.SK350 but until one is confirmed, it remains on the drawing board.



*A couple of Hitachi Sumitomo crawlers were seen at Bauma*

Belgian-based international lifting specialist Sarens is the most recent company launching its own heavy lift crane. The SGC120 is a 3,250 tonne capacity, 120,000 tonne/metre crane of its own design (following its acquisition of Rigging International) and is said to handle 600 tonnes at 100 metres radius. The crane is a classic ringer design slewing on a 38 metre double ring track which sits on a load bearing mat system.

The main boom is a twin boom design with a maximum length of 130 metres, with twin back masts. A 90 metre luffing jib can be added with a massive 68 metre jib pendant to ensure good fully luffed capacities.

The SGC120 uses up to six high power winches rather than strand jacks, with 61 tonnes of line pull and line speeds of up to 20 metres a minute making it more akin to a heavy lift crane than some other lifting machines of this size.

For applications requiring frequent movement the crane can be mounted on dual track rail system laid out to suit the job site.

### **Viable alternative**

Kobe Steel's crane business began in 1953 building US cranes under licence in Japan from P&H and then developing its own products when the license expired. In recent years the company has steadily moved up the capacity range its largest offering in Japan is the SL13000, an 800 tonne capacity crawler. Its policy of preferring 'to polish the quality and technology' of new products in its home market, means that the largest crane complying with EU legislation is the 550 tonne SL6000. As its cranes become more popular -

and to continue its global expansion - it has recently taken the decision to start manufacturing in India to overcome currency risks and tariff barriers.

The \$12.7 million investment in the Chennai plant in South Eastern India will be Kobelco's first overseas crawler crane production facility. Located adjacent to a new Kobelco excavator plant, the initial covered area will be 6,900 square metres with production scheduled to start in October 2011.

The company plans to establish a wholly owned Indian subsidiary - Kobelco Cranes India - later this year to operate the plant, which will produce cranes from 90 to 250 tonnes capacity. As well as the growing Indian market - expected to go from 200 to 700 cranes over the next five years -

Kobelco says that its medium to long term business vision includes increasing exports from the current 33 to around 50 percent.

Terex, looking to strengthen its crawler crane position in China, has acquired a 65 percent stake in Jinan-based crawler crane manufacturer Shandong Topower Heavy Machinery Company which currently manufactures lattice boom crawler cranes from 70 to 360 tonnes. Founded in 2007, Topower's Cranes are largely used in the energy industry.

So although the large crawler crane market has enjoyed a surprise period of success, it could be entering a very difficult period with increased competition from heavy lift alternatives. Then we will find out if the very big crawlers are too big!



*A ringer version of the Demag CC2000 RL-1*



*Liebherr LR 1600-2*



*An early 150 ton Maniowoc 4000W*



*The Ale AL SK190*



*The Demag CC2000*



# First Manitowoc 18000 for Australia

Leading engineering company Monadelphous Group has added one of the largest cranes in Australia to its fleet with the commissioning of a 750 tonne Manitowoc 18000. It has also added a 400 tonne Manitowoc 16000 crawler crane to its fleet of more than 100 cranes.

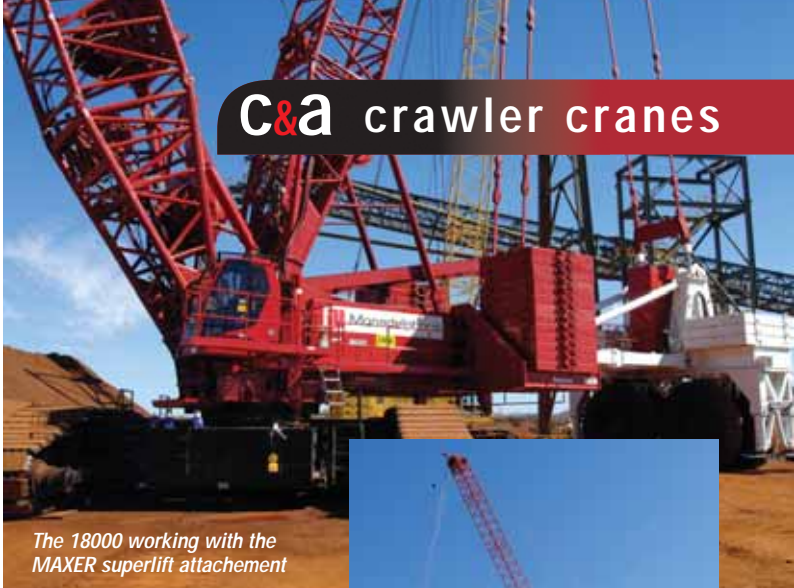
The new 18000 crane - the first in Australia - has gone to work in its Engineering Construction Division at a mining operation in the Pilbara region of Western Australia. The crane is fitted with a MAX-ER superlift arrangement and 92 metres of main boom. A luffing fly can add up to an additional 94 metres.

Monadelphous Engineering construction division executive general manager Dino Foti said:

"We've always had our own cranes, that's important because it gives us the flexibility to quickly allocate resources where and when required and provide strong project support for customers. The addition of the Manitowoc 18000 means we have another high-capacity, versatile and cost-effective piece of equipment of our own to handle a wide range of lifts and modular installations."

The Manitowoc 18000 will also be an important addition for SinoStruct - Monadelphous' wholly owned subsidiary in China - which specialises in heavy plate and large-scale structural fabrication, including pre-assembled modules for the mining, mineral processing and oil and gas industries.

**C&a** crawler cranes



*The 18000 working with the MAXER superlift attachment*

The new cranes will extend Monadelphous' capability to lift and assemble larger modules on-site in Australia, allowing SinoStruct to design and build larger individual components.

*Monadelphous's new Manitowoc 18000 lifts a steel sub assembly.*



## Beam me up



*The Manitowoc 18000 set up 120ft below the new bridge*

A total of 175 beams measuring between 102ft (31 metres) to 168ft (51.2 metres) and weighing up to 120 tons will be placed on the Lehigh River and Pohopoco Creek Bridge Replacement Project in Pennsylvania, USA.

ALL Erection and Crane Rental is using a Manitowoc 18000 to completely replace the Pohopoco Creek and Lehigh River Bridge structures on the Northeast Extension of I-476 in Carbon County, Pennsylvania.

Aaron Barnes, assistant resident engineer for the Lehigh River and

Pohopoco Creek Bridge Replacement Project said access and logistics made beam erection a real challenge on this project.

"We installed a construction causeway in the Pohopoco Creek valley where the majority of the lifts are made," he said. "Extremely steep slopes border the creek on both sides and there is limited space on the causeway which ruled out lifts using two cranes. Because of these factors, we needed a crane that could lift beams weighing more than 100 tons (90.7 tonnes) at a radius of 118ft (36 metres) and the Manitowoc 18000 fitted the bill perfectly."

The most difficult part of the job was the erection of beams for the longest spans on the Pohopoco Creek structures. With very limited site access lifting contractor Cornell and Co had to lift the beams from the right lane of the southbound mainline turnpike. Traffic lanes were closed while the 18000 set up on the construction causeway 120ft below the beam placement level.

The crane will have several different configurations during its time on the project, but for the most challenging lifts, the 18000 worked with 100ft of mast, 160ft of main boom and a 130ft luffing jib. It had 528,000 lbs (239.5 tonne) of crane upper counterweight and 320,000 lbs (145 tonnes) of carbody counterweight.

## Dismantling Angelique

When the Pfaendertunnel - a large motorway tunnel through the Pfaender mountain in Bregenz, Austria - was completed in December, crane and heavy transport specialist Felbermayr was called in to disassemble the tunnel boring machine Angelika. The company selected a 300 tonne Liebherr LR1300 crawler crane, rigged with 44 metres of main boom, derrick boom and a wheeled counterweight with powered drive wheels.

The 1,300 tonne boring machine was dismantled into 120 tonne segments for transport. The problem was the restricted space around the boring machine which prevented the transport trailers from getting up close.

The LR1300 lifted each segment at a 12 metre radius, it then had to turn around and carry the load to the transporter. The job was completed on schedule over a four week period, in spite of the atrocious weather.



*The Liebherr LR1300 removes one of the 120 tonne segments*



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