UpLoad

The magazine for customers and friends of mobile and crawler cranes

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LIEBHERR

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We use male pronouns simply to make our articles easier to read.
However, the content of the articles applies to all genders.

Dear Readers,

First of all, I would like to thank you very much. We delivered nearly 2,000 new mobile and crawler cranes from Ehingen to you, our customers and partners around the world, in 2022. We were only able to achieve this under the current circumstances, which we are all aware of and are not easy to deal with, through a lot of trust, long-standing partnerships and a great deal of mutual understanding. At this point I would also like to express our appreciation to our employees in Ehingen and at the many sites worldwide – it is only thanks to their great commitment and flexibility that such a number of deliveries was possible at all.

This year we have already experienced a great deal – an exciting Conexpo in Las Vegas, the most important construction trade fair in North America. Like at Bauma, we were pleased to hear that you can still report high demand and good order books. Then there was the delivery of two large cranes – an LR 13000 to the USA and the first LR 12500-1.0, which Sarens is currently using in Rostock in Northern Germany. Read more about the first job for this giant crane on page 48. We were also able to launch a new crane: the LR 1700-1.0W, a 700 tonne crawler crane on a narrow track undercarriage, which is often required in wind farms. Read about this new development on page 22.

In this issue we look a little more closely at the topic of telescopic crawler cranes. You can find out how the LTR series came about in the first place on page 68. Today, these special, highly manoeuvrable machines are used for many different tasks: from housing construction (page 36), to major work on HS2, the high-speed rail project in the UK (page 28). Telescopic crawlers are also used in high stress situations with precast concrete elements on the hook (page 40). Talking about high stress – I can recommend a new roller coaster for adrenaline junkies, built with a Liebherr LTM 1090-4.1 at Europa-Park in Rust – enjoy the ride on page 60.

Digitalisation and climate protection – two enormous issues that concern us all: We explain how our customers in the USA are using digitalisation profitably on a daily basis with our MyLiebherr portal in “Totally **digital**” on page 64.

Our cranes are not just environmentally friendly during use (with reference to ECOmode, ECOdrive, HVO or the LTC 1050-3.1E), in fact we also produce these machines in the eco-friendliest way possible at our site in Ehingen. Find out more on page 72 in our “Sustain**able**” section.

But for us, being green also means that Liebherr cranes have a long service life. And that is why we want to ensure that these cranes remain available to you as much as possible by means of the significant investments we have made in the past and those over the next few years in our global service network – to ensure we always have the expertise available locally to our customers. And not just by having the appropriate service and repair capacity to ensure high operational availability, but also with a functioning market in second-hand machines, which often offer additional opportunities. So you can rest assured that we will continue to work every day to manufacture products that protect resources and keep them available to you so that you and future generations can continue to use them all over the world economically and safely.

Best wishes from Ehingen

Christoph Kleiner
Managing Director Sales, Liebherr Werk Ehingen GmbH

The subjects of our articles.

Mobile and crawler cranes

Also online:
UpLoad is also available at liebherr.com to read, look at and download.

www.liebherr.com/upload

In focus

The world with Liebherr

Moments

110 tonnes on a short boom
An LR 1750/2 is used to lower the drill head of a tunnel boring machine into the depths. This attachment tool being hoisted by the Bok Seng Group in Singapore weighs 110 tonnes on its own.


BOK SEN

Bridge building in Australia

MAX Services is using its LTM 1230-5.1 to dismantle a temporary bridge in Port Augusta, South Australia. The site here is about 300 kilometres north-west of Adelaide at the end of the Spencer Gulf.

Heavy load in Mexico

Large crane job at the OLMECA refinery in Dos Bocas, Tabasco, Mexico. Mexican crane operator ESEASA has two giant cranes in action there – an LR 13000 (front) and an LR 11350 (right). The new refinery was recently commissioned and is mainly designed to enhance safety in energy supplies. OLMECA is the largest refinery in the country.


ICA FLUOR

The mushrooms of Seville

Las Setas (English: the mushrooms) is a landmark in Seville in southern Spain, around 150 metres long, 70 metres wide and 26 metres high, which grew between 2005 and 2011. When it was completed, it was the largest wooden structure in the world – created with a mobile crane from Ehingen.

Hamburg landmark

Completed in autumn 2016 with a height of 110 metres, it has become the new landmark of the Port of Hamburg – The Elbphilharmonie in HafenCity was opened at the beginning of 2017 after ten years of construction. By then, Liebherr mobile cranes already had a successful appearance behind them.

Records high above the water

The Mike O'Callaghan-Pat Tillman Memorial Bridge in Nevada, USA, is one of the highest bridges in the world. It carries Highway 93 some 270 metres above the Colorado River and towers over the famous Hoover Dam. Involved in the construction: a Liebherr LTM 1400-7.1.

Made with Liebherr

Buildings that impress us all, over and over again. Technical masterpieces and experiences simply bubbling over with emotion. There are fascinating places like this all over the world. And for many we can proudly state: Made with Liebherr.

LTM 1750-9.1 dismantles last construction crane at Hamburg's Elbphilharmonie
Since its completion in autumn 2016, the Elbphilharmonie, now affectionately known as the "Elphi" by the people of Hamburg, has become a world famous concert hall and an architectural icon in the Port of Hamburg. Hamburg-based crane and heavy haulage contractor Thömen used a Liebherr LTM 1750-9.1 mobile crane to dismantle the last of the four large top-slewing cranes which for years have dominated the skyline at the former quay warehouse.

A demanding job completed in front of an imposing harbour backdrop. The crane erected on the south-west façade of the building had to be dismantled from the River Elbe. Seven years previously this construction crane had been erected from a pontoon despite the fact that the river in the Port of Hamburg is tidal. At that time, an LTM 1500-8.1 from Thömen was used. However, the dismantling work had to be completed by a more powerful mobile crane from a fixed jack-up platform since the crane was directly attached to the building at a final height of around 120 metres. This was lowered as far as possible while still allowing the boom to be slewed over the edge of the building.

Another advantage of a larger mobile crane was that several tower sections of the construction crane could be placed on the hook with each hoisting cycle so that the work could be completed faster. For this purpose, the nine-axle mobile crane was set up and equipped for use on a 75 metre long jack-up platform and equipped for the operation – with 114 tonnes of ballast, a 19 metre telescopic boom extension and a 66 metre luffing jib. This enabled it to reach the required hook height of 127 metres. The concept worked – the tower crane was dismantled and the Elphi opened its doors – both with great success.

Over two states
The US states of Nevada and Arizona are separated by the Colorado River – and since 2010 officially by the Mike O'Callaghan-Pat Tillman Memorial Bridge. On completion, the bridge was one of the longest and highest concrete arch bridges in the world. With a total length of 580 metres and a width of 26.8 metres, the dimensions of the bridge are impressive – as are those of its support piers, with the highest one measuring just under 88 metres. The arch itself has a span of 323 metres. The bridge, which opened in 2010 after a construction period of around seven years, was named after former football star Pat Tillman and former Nevada Governor Mike O'Callaghan – both of whom died while it was under construction. Las Vegas-based crane contractor Dielco used Liebherr cranes on multiple occasions. In our picture, you can see one dismantling a support pier. These piers were specially erected as a temporary structure to enable the large concrete arch to be completed piece by piece. An LTM 1400-7.1 can be seen here dismantling the individual concrete parts high above the river.

But the location is almost as much of a highlight as the Liebherr crane – many visitors and admirers of the Hoover Dam can now take the opportunity to get a bird's eye view of the huge dam on a walkway over the large bridge.

Metropol Parasol – taking inspiration from nature
The Metropol Parasol spans parts of the old town of Seville in Spain. Because of its shape, the locals like to call it "Las Setas", or "The Mushrooms". These mushrooms are a hybrid construction made of wood, concrete and steel, built between 2005 and 2011 in the Plaza de la Encarnación on the site of a former market hall dating back to 1842. The structure consists of six parasol-like structures with a mushroom-like shape that are connected in places to form a sunshade. The building was inspired by the columns of Seville Cathedral and by the weeping fig trees in the nearby Plaza del Cristo de Burgos.

Under the Metropol Parasol there are a market, shops, bars, restaurants and an archaeological museum where ruins from Roman and Moorish times can be visited. Another highlight among the large mushrooms is that many public events can now take place outdoors on the elevated plaza. On the roof of the large umbrellas there are function rooms and a series of walkways that offer impressive views over the Andalusian city.

Around 3,500 cubic metres of laminated veneer timber and 700 tonnes of steel were used in the construction work. They consist of 3,400 different components – some of which were hoisted by an LTM 1250-6.1 from Spanish crane rental contractor Eurogruas during the construction period, which lasted around five years.

Mobile and crawler cranes

Full onshore power for offshore installations
In Scotland, BMS is using an LR 11350 for parts assembly and loading offshore wind turbine components. A new wind farm is being built off the coast of Scotland in the North Sea.

Big impact on narrow track

Hitting the heights on a narrow track

Improved for use in wind farms, narrow track crawler cranes travel from one turbine to the next and are quickly ready to work. As early as 20 years ago, we developed the first crane of its kind, the LR 1400/2-W. This made us the inventors of the narrow track lattice boom crawler crane. And because these cranes are specially designed for wind farms, we even added a "W" – for wind – to their name.

We successfully sold and built our narrow track 400 tonne crane for many years... until it became too small. Wind turbine towers were getting taller and their components heavier. In response, we launched the significantly more powerful LR 1600/2-W back in 2010, of which around 50 are still in action around the world. But history repeats itself! "Assembly of the latest generation of wind turbines now requires cranes with an even greater lifting capacity. Which is why we've now developed a narrow track version of our LR 1700-1.0," explains Martin Frankenhauser. As a product and market specialist in our technical sales department for crawler cranes, he looks after the new crane, whose name also ends with a "W" – the LR 1700-1.0W.

The most powerful and highest on the market

Just as the LR 1700-1.0 replaced the LR 1600/2 in our line-up almost two years ago, the narrow track version of the 600 tonne crane is now also being replaced by the new 700 tonne LR 1700-1.0W. "The biggest differences compared to the predecessor model, the LR 1600/2-W, are the new crane's significantly higher lifting capacities and hoisting heights. This is mainly due to the significantly more powerful basic machine as well as the 3.5 metre wide H-lattice sections at the lower end of the main boom, which increase the lateral stability of the entire system," explains Frankenhauser. "The increase in performance is enormous. For example, if we compare the longest wind turbine boom with the derrick system on the previous model (156 metre main boom plus twelve metre lattice type fixed jib) with the new one, which has the same boom length, the latest model delivers a 64 per cent increase in lifting capacity. That's an increase from 73 to over 120 tonnes! In addition, the new LR 1700-1.0W can be set up with longer boom systems, gaining 15 metres with a derrick system and six metres without one. Our 700 tonne crane is the most powerful and highest narrow track crane on the market."

Our new crane thus meets the more challenging requirements of working on modern wind turbines with hub heights of up to 170 metres. The highest demand for the new narrow track 700 tonne cranes comes from the Iberian Peninsula and Latin America, where the previous crane was particularly popular. "There are large wind farms where our customers want to move the cranes, whilst they are at least partially assembled, on roads that are about six metres wide, to avoid heavy transports of crane components wherever possible," explains Martin Frankenhauser.

Crawler crane experts in front of the new LR 1700-1.0W:
(from left to right) Martin Frankenhauser, Steffen Schwertle, Markus Zeiler.

The chassis of the LR 1700-1.0W is just 5.9 metres wide.

Heavy-duty travel gear
Since crawler cranes, and particularly narrow track models, must be able to cope with long distances and inclines at wind farms, our designers placed a special focus on maximising the performance of the new LR 1700-1.0W's drivetrain. Markus Zeiler is Head of Crawler Undercarriage Design at Liebherr in Ehingen: "Our customers want to travel even longer distances with maximum equipment. So wear and tear is a major issue."

For this reason, we've given the LR 1700 narrow track crawler carrier some proven components from our next larger crane class. We use these as a modular system on all our larger vehicles from the LR 1800-1.0 to the LR 11350. "This means that the larger components are less heavily loaded and, in addition, we can distribute the crane weight over more track rollers – all of which helps to reduce wear. A lot of power is needed to steer the crawler chassis, which is only 5.9 metres wide, because the lever ratios are much less favourable than with the wide crawler travel gear. Here, too, the stronger "heavy-duty travel gear" helps. It provides about 40 per cent more drive power than the standard variant. As a result, the new narrow 700 tonne crane runs almost at idle speed when driving straight ahead."

Technical data

700 t

max. 9,650

102 + 96 m

165 m

400 kW

5.9 m

Extensive static calculations
It is in the nature of things that the overall centre of gravity of crawler cranes with long lattice booms is several metres above the ground. When moving these giants, especially with narrow travel gear, safety is the top priority. “We have worked out travel tables for each of the LR 1700-1.0W’s operating modes. There are a lot of variables: with or without a derrick, different boom systems and lengths and a wide variety of ballast variants. But this is the only way to ensure safe procedures. Our customers need to know which gradients are possible with which equipment,” explains Steffen Schwertle, who is responsible for narrow track cranes in our structural engineering department and was tasked with calculating the limits for the new crane.

On the narrow track crane, the lateral inclination is limited to two degrees, while the longitudinal inclination can be up to ten degrees, depending on the configuration. “That corresponds to gradients up to about 18 per cent, a massive value! With these big gradients, of course, you can no longer drive with very long systems. Our customers can conveniently view the required retrofit variant in the work planner and configure it directly in the LICCON control system. The corresponding ground pressures are also displayed there,” says Schwertle.

The work planner shows the required jib angle to adjust the overall centre of gravity of the crane to the slope of the ground. “To keep the centre of gravity as low as possible when driving the new narrow track crane, part of the slewing platform ballast is placed on a turntable extension and we work with central ballast on the side of the undercarriage. For this ballast variant, which is optimised for the crane’s centre of gravity, we have also calculated load charts for the crane’s operation,” explains Steffen Schwertle.

“By the way, the narrow track crane has the advantage that the ground in the crane set-up area doesn’t need to be levelled as carefully, because it works on supports and can thus optimally level itself,” says Martin Frankenhauser. “And it even offers greater load-bearing capacity than the wide crawler crane, since any lateral inclinations don’t need to be taken into account statically,” adds Steffen Schwertle.

Maximum flexibility
We now also offer the heavy-duty travel gear for the wide chassis of the LR 1700-1.0. Markus Zeiler explains why: “If a customer drives a lot, the reinforced undercarriage reduces wear and the crane can even be equipped with 2.4 metre base plates on the wide version, 40 centimentres more than on both the standard version and the narrow track crane. Of course, this reduces the ground pressures significantly.”

“Some customers buy the HD travel gear in preparation for retrofitting the crane later as a narrow track version,” says Martin Frankenhauser. “The new narrow track 700 tonner can also work with luffing jibs, which was not possible with its predecessor. Thus, all boom systems for the standard crane are now also available for the narrow track version, which also makes the LR 1700-1.0 flexible for industrial applications – in line with its slogan: Big impact on narrow track!”

The narrow track version also uses the hydraulically adjustable V-Frame® ballast guide.

The heavy-duty travel gear on the new narrow track crane is intensively tested on gradients of up to 18 per cent.

Very busy

A crane for (nearly) all cases – LTR cranes are working continuously on major British projects

We have been manufacturing crawler cranes with telescopic booms here in Ehingen since 2005. In its early years, this crane type was overshadowed by our traditional mobile and crawler cranes. But since then, the popularity of these highly flexible and compact LTR cranes has increased enormously. This is underlined by a current look at the British capital. On numerous and extensive construction sites – our cover picture shows construction machinery in the centre of London's "Canary Wharf" business district – Liebherr cranes, which are mobile even with a load, are increasingly common sights.

Liebherr's telescopic crawler cranes are not just rolling over the rubble on the huge Canary Wharf construction site in London's Docklands, where a fashionable shopping and residential area is being built on more than three hectares next to gigantic skyscrapers. The machines are also in great demand on the construction sites for "HS2", currently the largest railway infrastructure project in Great Britain. Our compact lifting units are performing numerous important tasks there, especially when it's not just about lifting, but also about transporting materials on the construction sites.

HS2 – a succinct acronym which stands for "High Speed 2" and is the name given to the ambitious British endeavour to cut rail journey times from London to Birmingham by almost half by the end of the decade, and later further north to Leeds and Manchester. Trains that can reach speed of 225 miles per hour (around 360 kilometres per hour) are required for this, as are new, efficient routes, junctions and stations in the metropolis' underground. We visited three interesting HS2 construction sites and saw a number of telescopic crawler cranes in use there.

At the west portal of the future Copthall Tunnel, an LTR 1040 delivers material to the construction site. Two crawler cranes from Liebherr's production site in Nenzing (Austria) accompany the emerging structure.

Making itself thin
To navigate a narrow passage, Select's LTR 1100 has set its crawler travel gear to narrow track – a valuable skill when navigating construction sites.

250,000 passengers daily
So let's get one thing straight right from the start – the dimensions here are enormous. The gigantic construction sites for this project demand great respect and even greater walking distances from visitors. In future, the largest railway station ever built in Great Britain will be called "Old Oak Common". For the past six years, it has been carved and built both into and on the ground in the west of the city. The construction site stretches for well over a kilometre. Fourteen above-ground and underground platforms will one day handle 250,000 passengers per day in the 850 metre station concourse. A considerable number of construction machines are at work at this giant hub for the HS2 project. It is also where we meet Amy Jacobs, a crane driver from Select Plant Hire Ltd. The young woman sits in the cab of her LTR 1100 and actually has very little time to chat.

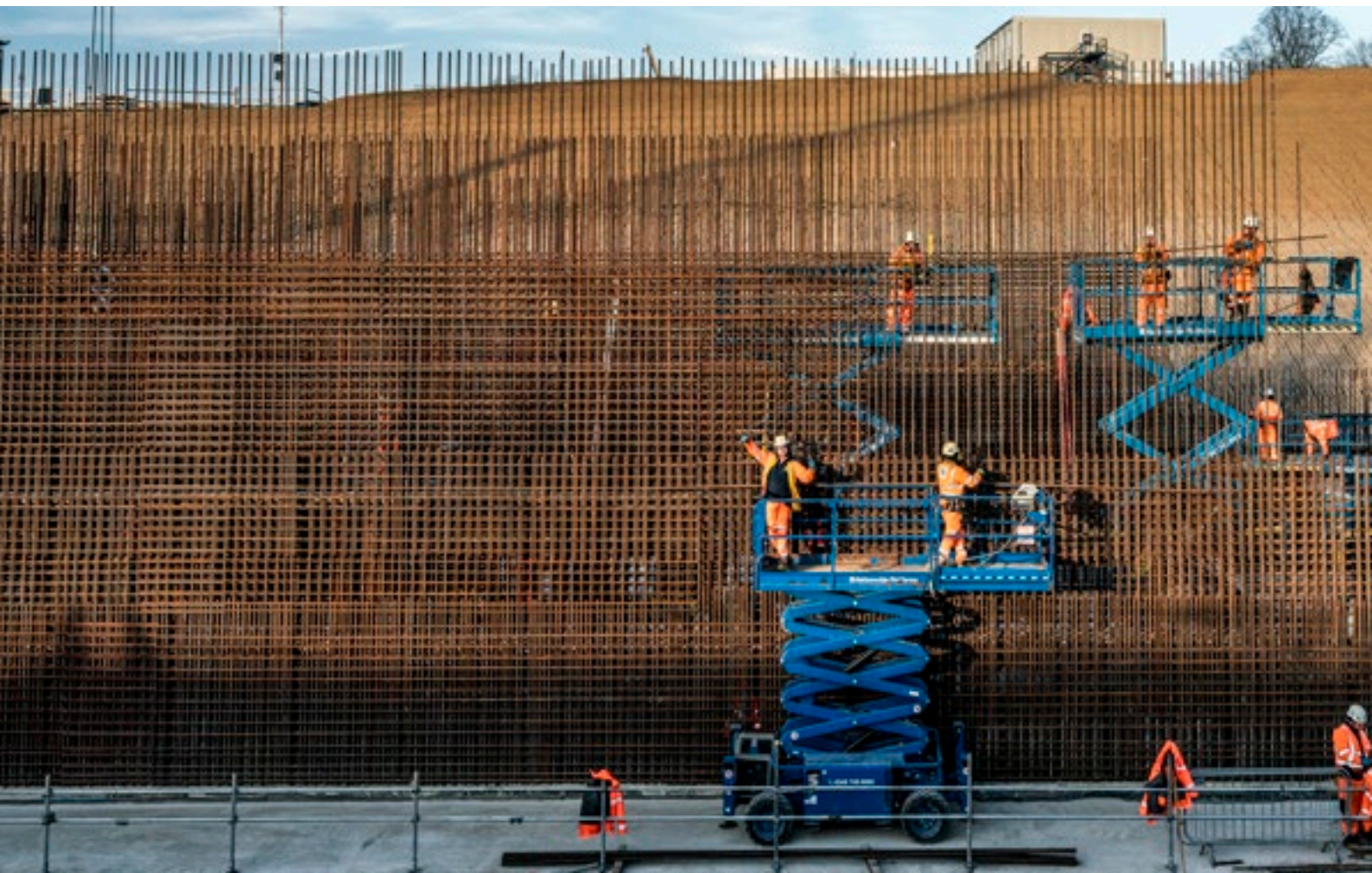
"At the moment we have to move a lot of material and equipment to the lower level," she explains, lowering the large concrete bucket on the hook block of her machine. "Other LTR cranes are being used for formwork or concrete work here," Amy says. Huge quantities of equipment and building materials need to be moved underground to where, at a depth of 14 metres, the platforms for the high-speed trains are currently being cast. They will be just under half a kilometre long. "Especially on this expansive construction site, my crawler crane has to cover a lot of distance. Either to transport material or if there is a job waiting for me elsewhere," Amy explains. "But it works really well – the machine is easy to control and very easy to drive." No sooner said than done – her LTR 1100 is immediately requested on the opposite side. Because she has to pass through a narrow passage on the way there, Amy sets the crawler travel gear to a narrow position, reducing the crane's width to just 3.5 metres. Now 155 centimetres "slimmer" than before, it rolls away towards the next job.

A construction site of extremes
Less than two kilometres away, another LTR 1100 also has a load on its hook, which it lowers into a huge shaft. At a depth of 20 metres, a team of orange-clad workers need a compressor. It only takes minutes for the mobile tele-crawler to drive up to the concrete edge with the tool and lower it down to the waiting men. This black-painted crawler crane belongs to Hawks Crane Hire Ltd and is also hard at work for High Speed 2. Different construction site, same massive proportions. Or at least that's what Elliot Hawkins, company boss and the crane's owner, assumes: "The Victoria Road Crossover Box, where we are now standing, is, as far as I know, the largest HS2 construction site as far as manhole work is concerned," Hawkins tells us. "Five really huge holes have been excavated in the ground here. Several tunnel boring machines are drilling through the London underground and will arrive here."

"I get exactly what I want from my crane..."
...is how Amy Jacobs describes the handling of her telescopic boom crawler crane. "Sensitive response, pleasant to operate and better to drive than any of my previous cranes."

Material handling
Unloading incoming deliveries and feeding the site with material below ground – these are the main tasks of Hawks Crane Hire Ltd's LTR 1100 during construction of the Victoria Road Crossover Box.

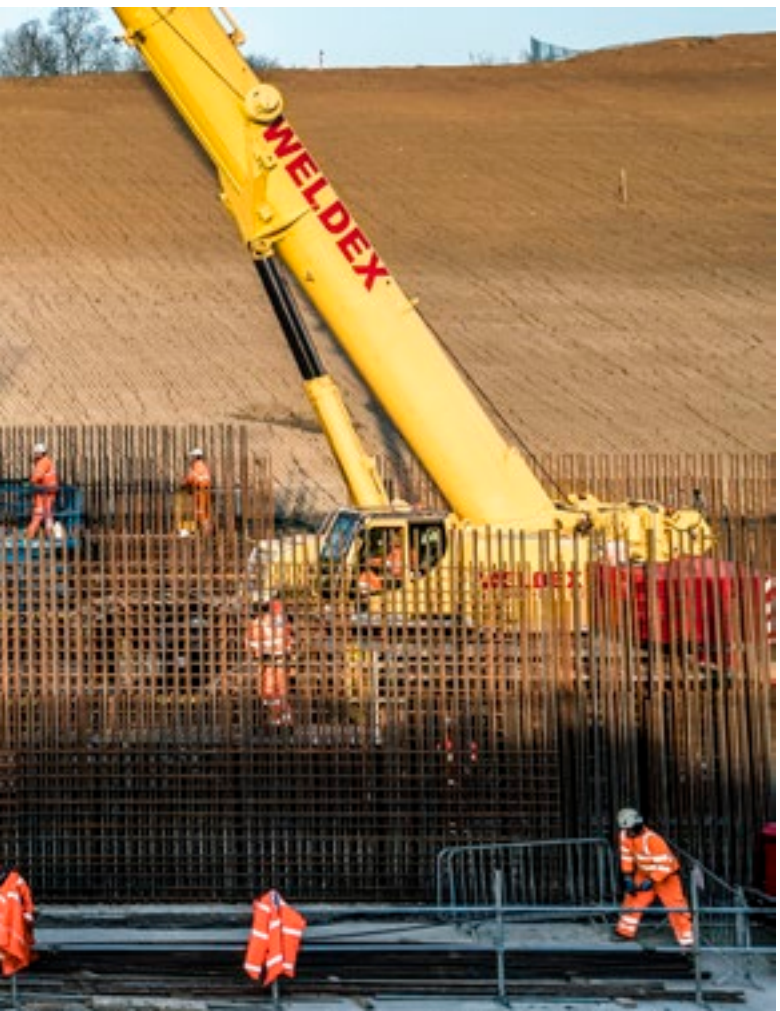
The underground box structure, which will later be 130 metres long, will house a complex switch system, among other things. It allows incoming and outgoing trains from the station mentioned above to switch between tracks. Hawkins is using an LR 1300 SX lattice boom crawler crane to provide sufficient lifting power, as well as an LTR 1100 to ensure a high degree of flexibility while working around the enormous hole. "The LTR, with its 52 metre telescopic boom, can quickly serve all locations on the construction site to a sufficient depth from the edge. It is being used, among other things, for concrete construction and to transport formwork or reinforcement bars. The crane's extremely short set-up times, as well as its ability to travel with a load attached, ensure speed and efficiency on large infrastructure construction sites like this," explains Hawkins. (Interview on page 34)



Storage yard logistics specialist
An LTR 1060 from Weldex ensures efficiency and order among the stacks of rebar.

Valuable feature: Pick & Carry

Mark Hollet, Operations Director at Weldex, Britain's largest, global crawler crane contractor, has a similar view of another hotspot for the high-speed rail project. "Due to the flexibility of their telescopic booms and their ability to transport material, we're using three LTR machines on the Copthall Tunnel site." Here near Uxbridge, on the western edge of the London metropolitan region, the Scottish crane experts have a total of five Liebherr machines in action. To manage the heavy loads, there are also two lattice boom crawler cranes from our sister plant in Nenzing, Austria, at the mobile construction site. An 880 metre long tunnel structure is being built here using the cut-and-cover method. After completion, the whole thing will be filled in again and covered with greenery.



The three telescopic crawler cranes are spread over the hilly area. One LTR 1060 exclusively handles the incoming construction material in the huge storage yard at the tunnel construction site and busily rolls back and forth between seemingly endless stacks of iron reinforcing rods. Two other units, an LTR 1040 and an LTR 1220, are directly involved in the construction of the tunnel. The large tele-crawler is almost invisible between all the walls of rebar. It handles the supplies for the numerous steel fixers who must weave the metal rods into reinforcements for the nascent structure's walls. Again and again, the machine's crawler carriers start moving. Hoisting a lifting platform out or letting steel in – all the while being driven to wherever it is needed. The slats of its caterpillar tracks are covered by thick plastic plates. This protects the surface.

The reinforcement work here is scheduled to be finished in two years. Until then, the Liebherr crawler cranes from Weldex will remain in service. It is estimated that it will be another ten years before the first trains rush through the Copthall Tunnel and enter Old Oak Common Railway Station through the Victoria Road Crossover Box. In the 2040s, links to cities in the north of England will be built and Great Britain's "High-Speed 2" railway line will finally be a reality.

Behind the iron carpet...
...the LTR 1220 telescopic crawler crane from Scottish crane contractor Weldex shimmers through the rust-coloured ironwork. The mobile powerhouse is supporting the reinforcement work during the construction of the Copthall Tunnel. One of the steel fixers takes the opportunity to pose for our camera.

… follow-up!

There is a lot happening in the British capital and Greater London in terms of mega infrastructure projects. Particularly noteworthy is the fact that our crawler cranes with telescopic booms are being used more and more frequently on these large construction sites. Why are Liebherr's LTR machines so suitable for working on construction sites of this kind? This is explained to us by two people who ought to know: Mark Hollett (right), 20 years in the business and Operations Director at Scottish crawler crane contractor Weldex, and Elliot Hawkins (left), CEO and founder of Hawks Crane Hire Ltd. Both men are currently sending their Liebherr machines to construction sites that are pushing ahead at full speed with the UK's High Speed 2 (HS2) rail project. And both companies specialise in a niche sector of the crane market, namely crawler cranes.

What equipment from your fleet do you have in use here on the extensive Copthall Tunnel construction site?

Mark Hollett: Since low-emission construction vehicles which meet the requirements of exhaust emission level 4 or 5 are specified for all HS2 construction sites, we naturally use our newer cranes for these jobs. There are currently five on site – all from Liebherr. We use the LR 1300 SX lattice boom crawler cranes and an LR 1250 here because of the required radii and lifting capacities. Three crawler cranes with telescopic booms are also in use across the site – an LTR 1220 and an LTR 1040 directly at the tunnel construction site, as well as an LTR 1060, which is used in the storage yard to handle the gigantic quantities of reinforcing steel that accumulate prior to loading. This machine is very compact and simply delivers good lifting performance.

Why are LTR cranes so popular on these large construction sites?

Mark Hollett: The popularity of this type of crane has grown immensely in recent years. It has been well received in the market, partly because our end customers have now become familiar with the advantages of these units. For this kind of tunnel construction, speed and versatility thanks to the telescopic boom were clearly the decisive factors for the choice of these machines. And of course, they make it possible to transport material on the construction site. Generally speaking, I can say that our LTR cranes are among the busiest in our fleet. The ability of these cranes to roll off the low-loader at the construction site, set themselves up without an auxiliary crane and simply be ready to work quickly is hugely advantageous. Especially in London, where there is often not enough space to mount a lattice boom.

Which LTR units can be found in the Weldex crane fleet?

Mark Hollett: We have them in all available load classes. The LTR 1040 was actually the result of our own initiative. Some of our customers wanted a smaller and lighter crane than the LTR 1060 and we asked Liebherr about it. Today, the 60 tonner is offered as the LTR 1040 without central ballast and without a ballasting device. The machine therefore has just 5.6 tonnes of ballast, but in many boom positions it actually offers significantly higher lifting capacities than a 40 tonne mobile crane. Our four LTR 1040s are really busy machines.

Elliot Hawkins, eight years ago you founded Hawks Crane Hire Ltd. You therefore have many years of practical experience with Liebherr's LTR machines. What's your verdict on our cranes?

Elliot Hawkins: Very good! We are delighted with your products. In addition to our eight large lattice boom crawler cranes, we operate seven Liebherr telescopic cranes with crawler travel gear. The LTR series is so practical simply because of the telescopic boom. The set-up times are extremely short and on huge construction sites like the ones we have here in London at the moment, the ability to move equipment or building materials quickly and efficiently is a huge advantage. The crane can move to another work location in only a short time. Compared to a mobile crane, which takes almost half an hour each time, we can save a lot of time. Here on the Victoria Road Crossover Box site, our LTR 1100's mobility and speed as well as the telescopic 52 metre boom are indispensable.

The fact that Liebherr always has an open ear for us has really paid off. We can see from the upgrades or from the new machines, which often contain the improvements we requested previously, that the people at Liebherr not only listen to our suggestions, but also implement them where possible. I think this partnership is something special.

Which lifting capacity classes does your fleet of tele-crawlers cover?

Elliot Hawkins: Our most powerful telescopic crawler cranes are the 100 tonne LTRs. But we want to increase both the number of cranes and their capacities. Specifically, we would like to have the LTR 1220 in our fleet in the future. In projects like "High Speed 2", this performance class is often needed. And I have to say, we are impressed with the LTR units we use.

Mark Hollett: They are simply quality machines. With the LTRs, we rarely see a unit failure. And Weldex also appreciates the really good working relationship with Liebherr. The support from the manufacturer is fantastic. After all, if we didn't really like their machines, we wouldn't have bought 41 LTR crawler cranes from Ehingen.

What's missing from the picture?

Two LTR 1060s on an unusual mission

If you cannot answer the question on the previous double page – perhaps you'd like to turn back and take another look? What's missing from the photo showing a future housing development in Greater London? Exactly! Not a construction crane in sight. Or at least not a construction crane in the classical sense. Instead, two of our smaller telescopic crawler cranes are at work there. The two Liebherr LTR 1060s are helping to construct a multi-storey residential building. And we were on site taking a closer look at this unusual job.

Granted, now and again we retouch a photograph to remove a distracting construction crane. In this case, I promise, we did not. In fact, the two Liebherr telescopic boom crawler cranes are constructing the entire building shell in Leatherhead, south west of the British capital, all by themselves. Our business partner, crane contractor Q Crane & Plant Hire Ltd, based in Oldham near Manchester, assigned two of its LTR 1060s to the project for a few months. They have taken on all the jobs usually performed by standard construction cranes. And even more besides – the crawler cranes are also being used at the material storage yard, which is located outside the actual construction site. Truckloads of building materials are delivered and stored there, before being hooked up and driven to where they are needed.

From concrete work to material transport – a crane for all cases

"It's precisely these pick-and-carry tasks that make our LTR cranes so practical and versatile in addition to their hoisting work," says Eduard Mincu, a crane driver at Q Crane who operates one of the two LTR 1060s. Eduard has been in the crane business for ten years. On this construction site in Leatherhead, he had to travel long distances with his vehicle, especially at the start of the job. "In the beginning, we sometimes had to cover stretches of over a hundred metres with a load on the hook. With the current work in the yard, we often only have to move ten or twenty metres." Today, Eduard is busy lifting formwork material and precast concrete parts with his machine, while the second tele-crawler on the opposite side provides reliable supplies for concreting. Throughout the day, truck mixers arrive to fill the concrete bucket on the crane's hook block near the remaining opening that leads to the new building's atrium. The LTR 1060 then travels almost to the other end of the inner yard and delivers the material to the steel fixers up top, who are currently building the ceiling of the third floor.

For Julius Lewis, the Deputy Site Manager, the mobility and the wide range of potential applications are the key attributes of the LTR cranes, which are ensuring rapid progress on his construction project.

Top right: Top right: While one LTR 1060 is concreting a floor slab, the second crawler crane has scaffolding elements on its hook. In the background you can see the storage area from which the two cranes transport material to the construction site.

Julius Lewis surveys his fast-growing concrete building with satisfaction. He works for Watkin Jones plc, a large UK construction company that also specialises in residential lettings. Lewis is the deputy site manager for the project in Leatherhead. “We’re making pretty good progress with these universal cranes. The dimensions of the area are enormous: we are building 214 flats on four storeys here. Normally, we would have needed two or three tower cranes to reach every part of the entire area without any problems,” he explains. “However, we would have had to erect the construction cranes at a very early stage and wouldn’t have been able to dismantle them until after the project was completed. The small, mobile crawler cranes offer us greater flexibility, also because they can travel to any location on the site. All the material has to be transported from the storage yard to the construction site. They are absolutely the perfect machines for this job.”

“I love the LTR”

His boss and project manager Ian Kelly takes a similar view. “First and foremost, the LTR 1060s are used due to their high mobility, but also to keep the costs of the crane work under control. The tower cranes that would normally be used would have stood idle for a very long time for logistical reasons. We only need the crawler cranes until the concrete structure is in place. After that, they’re gone again.” Kelly plans to continue using this type of crane in the future. “It’s the first time I’ve worked with crawler cranes in this way. However, based on our experience here and their advantages over tower cranes, I would definitely use them again on similar projects.”

Finally, let’s give Eduard Mincu, our crane driver, his say: “I’ve worked with many cranes from other manufacturers as well. But the LTR is my clear favourite. The wide range of options via the control programs makes the crane very convenient to operate. Whether for hoisting or transporting materials, this small machine offers superb performance in terms of reach and load capacity. And even on slopes of up to four degrees. That’s really extraordinary, but it’s also extraordinarily practical,” says Eduard and adds: “I love the LTR.” He laughs heartily at this spontaneous declaration of love.

Pretty happy
Crane driver Eduard Mincu

Under high voltage

An LTR 1220 enables an industrial building to be constructed directly below power lines

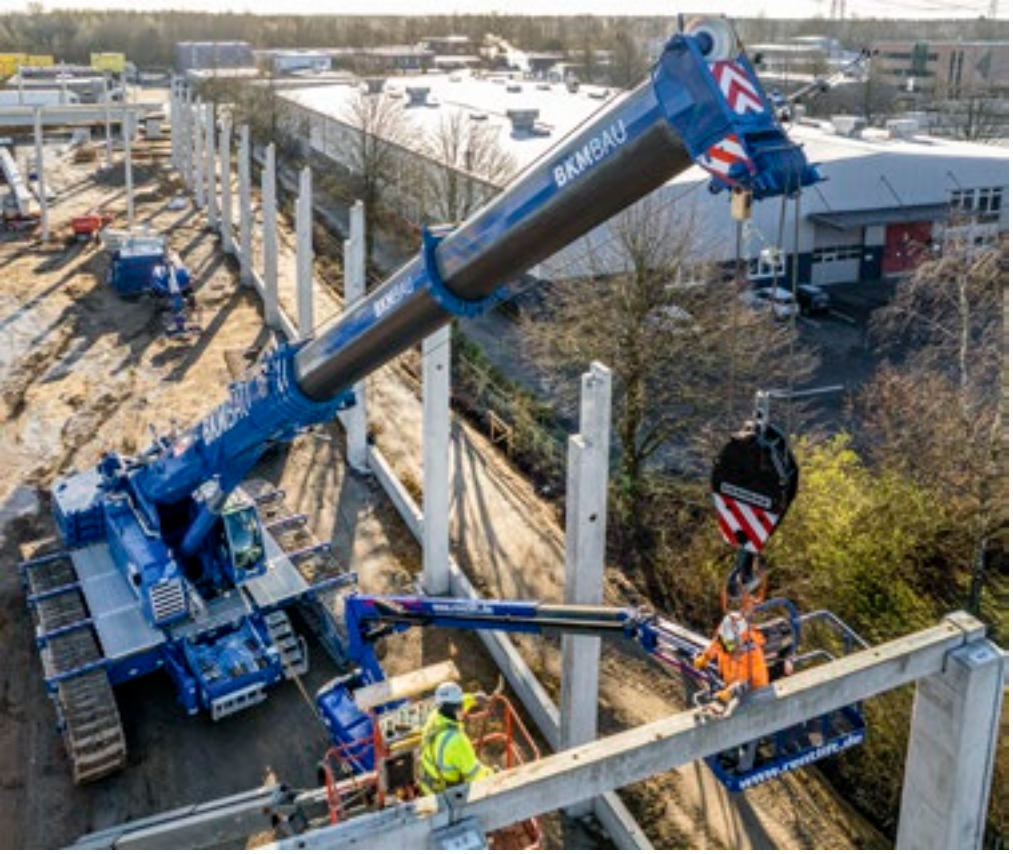
Building a warehouse almost ten metres high from prefabricated concrete elements is nothing unusual in itself. However, this routine job becomes a daring undertaking if the project must be carried out directly under several live high voltage lines with a ground clearance of less than 19 metres. In Norderstedt near Hamburg, BKM Bau Beteiligungs-GmbH KG (BKM), which specialises in industrial and commercial construction, has managed to do just that. 900 precast concrete elements were produced at BKM in Nienburg, delivered and installed in just nine weeks. The star of the show was a Liebherr LTR 1220 telescopic crawler crane, which delivered an electrifying performance.

"To put it bluntly, we wouldn't have been able to realise this construction project just a few metres under the high voltage line without the LTR 1220." Boris Cordes, assembly manager at BKM and the person responsible for the project, is visibly satisfied with the rapid progress of the construction work. And with his new crane. The graduate engineer is delighted that his plan, which he came up with more than a year ago, has worked. He convinced his boss and company owner Sebastian Tinzman that it would be better to buy the most powerful Liebherr telescopic crawler crane instead of the planned LTM 1230-5.1. However, they had previously always managed with mobile cranes and Cordes certainly had to do some convincing. "But now, after completing five construction projects with our LTR 1220, I can report consistently positive results," says Tinzman.

Only six metres of usable height above the building

Back to the construction site and Boris Cordes. Shortly before the planned completion of his customer's 11,000 square metre warehouse, everything is going according to plan on site in Norderstedt. The project is also on schedule, a comparative rarity in this industry. The crane and the men in its assembly team have already mastered the trickiest spots with the lowest hanging power lines. "The pulley head height for the crane was limited to a maximum of 15.7 metres here. We had to maintain the required safety distance from the power lines," says Cordes, "so in some places we only had a usable height of six metres above the building."

Manoeuvres with a bulky load
Underneath the power lines, the 36 metre long component is threaded through the gap between the cranes. The working range limiter, which is integrated as standard in the LICCON control system, can prevent too much luffing upwards or telescoping by automatically deactivating the working movement. An LTM 1130-5.1 mobile crane from the heavy haulage and crane logistics contractor Ulferts & Wittrock lends a hand.



Perfect!
Installing trusses at a height of ten metres: child's play for the LTR 1220. At the time, the 60 tonne girder was the heaviest element ever moved on the hook of BKM's telescopic crawler crane.

The most difficult problem, but one that was cleverly solved, was the assembly of the mighty, 40 tonne trusses. Together with a Liebherr mobile crane, the LTR 1220 lifted the 36 metre long concrete elements from the heavy transporter. Due to the limited space available, however, the long floor trusses could only be delivered at right angles to the direction of installation. The telescopic crawler crane had the task of picking them up at the far end and, after threading and swivelling the bulky components between the two machines, driving with its load to the installation site under the high-voltage lines. After that, positioning the beams on the pillars was fairly routine.

"Since all the supports for the warehouse had already been erected, it was already quite tight when handling the long prefabricated parts," explains Matthias Bachmann. He sits at the wheel of the blue-painted LTR 1220. Somehow, the Prenzlau native and professional crane driver seems almost at one with his equipment. He wouldn't add a thing to his new machine. "Control, camera system, mobility, precision – everything is really top notch," he enthuses. Since he took delivery of the tele-crawler eight months ago, there has not been a single period of downtime caused by difficulties with his crane. "990 operating hours and no problems, that's already massive. And in any case, there's nothing better for concrete construction sites than a crawler crane with a telescopic boom."

"For concrete construction sites, there's nothing better."
Matthias Bachmann in his telescopic crawler crane

"At least 20 per cent faster"
"Precision, flexible manoeuvring, even with a load, is of course the major advantage of this crane," explains Cordes. "The crane can simply drive a short distance to a newly arrived heavy transport vehicle to unload it. And my crane team has significantly less stress due to the fast load handling and simple procedures on the site. If the crane is in the way, it simply moves aside. There is also no need for time-consuming relocations as with a mobile crane. This, in turn, shortens the waiting time for our fitters. With the LTR, we are much faster than we were before with mobile cranes. At least by 20 per cent," he estimates. But Boris Cordes is quite sure of one thing: "Buying the LTR 1220 was the best decision we could have made. The crane is simply outstanding."


FOR LEASE
Hard Rock
CAFE

Borger pulls some very big strings

The LTM 1060-3.1 lifts the Les Paul guitar from the roof of the Hard Rock Café...

... while the Franna MAC25-4SL helps load it onto the transporter.

Rocking the hub in Surfers Paradise

The brand is a household name. Its locations are pilgrimage sites for fans of rock-tastic guitar riffs and prototypical American burgers: in 1971, the first Hard Rock Café opened in London and sent a wave of hype around the world. Since then, more than 200 Hard Rock locations have opened their doors around the globe and more than 170 of the iconic brand's cafés, resorts and casinos remain open for business today. One branch in Queensland, Australia, was recently closed – accompanied by a Liebherr all-terrain crane.

Joe Cocker, Alice Cooper, Sting, Pink and the Beach Boys are just a few of the musical greats who have performed at the Hard Rock Café Surfers Paradise in the city of Gold Coast since it opened in 1996. For 27 years, a unique landmark – a giant orange and red Les Paul guitar – was emblazoned over the building and attracted thousands of fans to the venue. However, the café's closure meant that the giant guitar had to find a new home. This resulted in a lifting operation that brought Gold Coast to a standstill.

The contract for this "heavy metal" crane job went to Borger Cranes and Precision Rigging & Logistics. According to Logan Alexander, operations manager at Borger Cranes, the lift was not without risks, including the site's close proximity to large retailers. In addition, a number of unforeseen factors cropped up during the preparations for the job. With no drawings of the guitar's structure available, the industrial service provider Field Engineers was brought in to assess it. To further complicate matters, a large supermarket and tram lines are located only a few metres from the café. "Because of the many risks involved, we were using smaller cranes in our fleet with our Liebherr LTM 1060-3.1 and Franna MAC25-4SL," says Alexander.

Let the show begin

In preparation for the lift, the tram line's rails were isolated and two residential blocks in Surfers Paradise were cordoned off. This enabled Borger Cranes to position the cranes perfectly and carry out the lift smoothly. "This lift really took some planning – something that Luke Williams, Director of Precision Rigging & Logistics and myself are used to," says Alexander with satisfaction after the five-hour job.

14.6 metres long, weighing 3.6 tonnes and installed at a height of approx. six metres: based on this key data, Borger Cranes used the LTM 1060-3.1 with its main boom and 12.8 tonnes of counterweight. "We picked the guitar at a radius of nine metres and landed it at 16 metres," explains Alexander. To bring the load from the vertical to the horizontal, the Franna crane was also hooked onto the lower end of the guitar. During a tandem lift, it supported the LTM 1060-3.1 while the oversized instrument was loaded onto the transporter.

Rock'n'roll never dies...

... and the inhabitants of Gold Coast will no doubt remember the musical landmark of Surfers Paradise for a long time to come. The guitar's future remains unclear yet – for now, however, it is in temporary storage and will perhaps experience a revival at another location.


CAVILL AVE
SURFERS PARADIS

Big pipe


LIEBHERR

Début for the LR 12500-1.0

To drive forward the energy transition, huge wind turbines are needed at sea to harvest powerful sea winds and supply green electricity for the mainland. The dimensions of modern offshore wind turbines are now enormous. So are the challenges for handling their gigantic components. A Liebherr LR 12500-1.0 crawler crane has recently been doing a job in the port of Rostock that makes this very clear. In its first deployment, the crane with a completely new design lifts foundation pillars measuring almost 90 metres into the water. It is supported in handling these 1,360 tonne monopiles by a Liebherr LR 1800-1.0 crawler crane.

Around 30 kilometres north-east of Rügen, a German island in the Baltic Sea, Dutch company Van Oord is currently building the foundations for the “Baltic Eagle” offshore wind farm. Van Oord is a specialist in constructing offshore wind farms. 50 wind turbines with a total capacity of 476 megawatts are to supply electricity for 475,000 households from the end of 2024, according to the operator Iberdrola, a Spanish energy provider. But there’s still a lot of hard work to do before that can happen. At sea and on land. Two of our state-of-the-art crawler cranes are operating at full power during port handling on the Baltic coast. This large-scale deployment is also the première of our brand new LR 12500-1.0.

If you travel to the industrial port of the coastal city of Rostock, it is easy to locate the area with the two large crawler cranes. The coloured lattice booms of the two machines rise steeply into the sky and point the way. Orientation becomes much more difficult when in the actual port area. The view is obscured by steel pipes as high as houses, stacked close together. You have to bend your knees a bit to spot the bright yellow crawler carriers of the LR 12500-1.0 underneath the jacked-up cylinders and determine your way forward. When you stand in front of the towering machine, your gaze inevitably wanders to the impressively wide lattice boom. This 7.5 metre wide HighPerformanceBoom and its unusual mounting on the slewing platform immediately catch the eye.

Relaxed, the Sarens team waits for the next monopile to be put into the water. From right to left:
Willem Ditmer, who is in charge of the crane deployment in Rostock, Fred Kloek, Thierry de Cree, and Rachid Al Houss.

Less than 500 metres from the cranes, in the direct vicinity of the “Rostock Port”, is where the piles are being manufactured. These will be driven into the seabed at sea and will later support the offshore turbines. The monopiles float on their way to the construction site in the sea. They will be towed by a tug over a distance of 85 nautical miles to the “Baltic Eagle” construction site. Our cranes are ready at the port basin to place the pipes in the water beforehand.

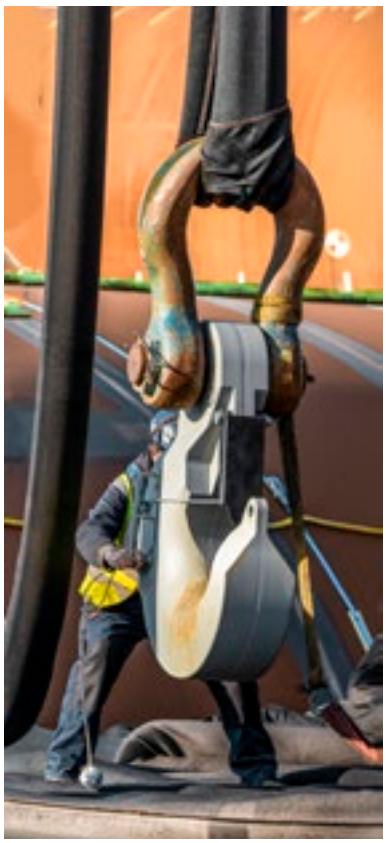
The crawler crane had to be set up in the middle of many steel pipes in Rostock port.

The innovative slewing platform design of the LR 12500-1.0 with its 7.5 metre wide HighPerformanceBoom.

This job is being executed by the Belgian heavy lifting giant Sarens group. The Belgians, active in over 70 countries, specialise in crane rental, heavy lifting and engineered transport of some of the heaviest loads worldwide. Sarens had the first LR 12500-1.0 delivered directly to Rostock from the factory in Ehingen. “With the support of Liebherr’s fitters, we finished assembling our new crawler crane here after three weeks,” says Willem Dittmer, project manager for Sarens, who is spearheading the challenging operation. “And this despite the fact that we had to set up the crane quite awkwardly between the pipes stored here.” A lot of effort was made to protect the subsoil. A plateau over one metre high supports the 2,500 tonne crane. On a thick layer of sand, Bongossi timbers and load distribution plates form the base for the massive crawler carriers.

“Giant strength with less dead weight”

The completely redesigned structure of the crawler crane with its wide lattice boom, which transfers the forces into the slewing platform with considerable stability, impresses the knowledgeable project manager after the first smoothly completed lifts. The transport and set-up time also received a positive response. “The completely new transport solutions of the LR 12500-1.0 with the folding mechanism of the lattice type sections and the split slewing platform are simply fantastic. We have fewer transport units and are faster in setting up the crane,” Dittmer says. “And it has giant strength with less dead weight. Unbelievable.”



Impressing dimensions

These huge forces are then called upon when the nine metre thick monopiles are lifted into the port basin. Together with an LR 1800-1.0 from the crane rental company MAXIKraft, a gross load of almost 1,600 tonnes has to be moved. At a distance of about 50 metres, the two innovative models from the Ehingen-based crawler crane production stand next to each other, ready to lift. This direct comparison underlines the dimensions of the LR 12500-1.0 with its massive boom and the hook block with the double hook for holding the hoists. On a side note, this specimen alone – which was probably the most photographed specimen at the last Bauma trade fair in Munich – has an impressive dead weight of 70 tonnes. These two hooks carry the lion's share of the load during the hoists of the monopiles. The LR 12500-1.0 has to handle a gross weight of 1,245 tonnes. 350 tonnes remain for the smaller crawler crane, which acts as a kind of support leg in the tandem lift. Only the LR 1800-1.0 can also perform swivel movements, should such movements be necessary.

"I'm happy with the crane."
In his huge cabin on the LR 12500-1.0, Robert Pawlowski waits and checks the displays on the numerous monitors again. He and his powerful machine are ready to go. At a height of seven metres, the crane driver has the best possible view of the action. "Working with this modern crawler crane makes me really happy," he remarks enthusiastically. "The perfect lighting and the many cameras do of course provide valuable support for us crane drivers. The numerous ladders and platforms enable us to work and set up easily and safely. I think the ergonomics of the crane are very well thought out. One truly impressive aspect is the completely new transport and assembly solution for the lattice boom sections. As is the incredible rigidity and stability of the boom."

Suddenly the man in the cabin chair pauses. He concentrates on what is happening on the ground. The next monopile is being moved directly in front of the two cranes on 30 double axle lines with SPMT modules. A team of six specialists is already waiting with gigantic-looking slings. Thick, sheathed steel cables. Man-sized shackles. Everything's a bit more powerful than usual. Pawlowski lowers the huge hook block so that the team can start their work. After a little more than an hour, everything is in place and the load is securely attached. Robert Pawlowski and his colleague in the crane next door receive the lift command via the radio.

Robert Pawlowski looks out of his cabin at the floating monopile after his work is done.

So here we go. A tug tows the floating monopile into the Baltic Sea.
The 85 nautical mile journey to the offshore construction site takes 15 hours.

After the load is picked up, things move unexpectedly quickly. The heavy-duty modules under the monopile are steered out of the danger zone and the cranes begin to tilt their lattice booms – barely visible. This process of increasing the radius and then setting the huge pipe into the deep port basin is a matter of just a few minutes. The crawler cranes increase their distance from their common load by twelve metres before the steel pile, which is closed at its ends, is lowered and placed in the water. A waiting tug takes over from there and gently pulls the floating pile into driving position. The sea voyage to the “Baltic Eagle” offshore wind farm can begin.

The Heavy Lift Vessel “Svanen” places the giant pile in a vertical position and piles it into the seabed.

Working on the dock of the bay


POL
LEMAN

Highly fragile load for the ultimate machine on eight axles

Dawn is breaking over the island's sleepy capital. It's still quiet in Palma de Mallorca – only in the harbour are great things on the horizon. The metal loading flap of the ferry jetty rests against the quay walls with a creaking, clattering sound. The beeping and flashing of forklifts shatter the early morning calm. And then the moment arrives – a blue LTM 1650-8.1 rolls off the deck.

The Liebherr mobile crane was brought from the Spanish mainland to the Mediterranean island last September for a special job. In the harbour of Palma de Mallorca, it was tasked with lifting out the 72 metre long, 24 tonne aluminium rigging of a super yacht. The lift was coordinated by the traditional Mallorcan company Grúas Pol in collaboration with Grúas Leman and the rigging company RSB Rigging Solutions. No easy undertaking, because the enormous rig not only includes the boom but also wiring looms, a multitude of ropes and "standing rigging", i.e. large diameter, solid stainless-steel rods that hold the mast upright and in position.

"During regular maintenance and inspection periods, we lift the mast out of the vessel, put it down, dismantle everything and carry out the maintenance and service work. We then reassemble all the components, so the yacht is ready for use again," explains Steven Branagh, owner of RSB Rigging Solutions.

Sure instincts and low wind

The fact that this maintenance work is such a delicate affair is not only due to the fact that a mast of this size costs between five and six million euros but multiple factors that can affect the task at hand: "When we lift the mast out of the vessel it becomes quite unstable and moves a lot from side to side, so we have to pay additional attention to the wind conditions during the whole process," Branagh continues. "Since the mast is delicate, you also need a lot of finesse," adds crane driver Pedro García Salas.

Many hours of planning and preparation go into a job of this kind. Accordingly, six riggers spent about ten days preparing the rigging for the lift for this project to help ensure a flawless unstepping of the rig. In addition, each professional involved in the project, from the riggers to the operational team, come together to create the conditions for the most seamless rig movement possible:

Just no jerky movements
Crane operator Pedro carefully lifts the rig from the sailing yacht with the LTM 1650-8.1.

A sure touch is needed here
Steve Branagh (right) and Russ Brown (left) support crane operator Pedro as he lifts the rigging out of its moorings.

“The last thing we need here is a crane that is rusty or looks poorly maintained. So, I was very happy when I saw a brand new Liebherr crane from Grúas Leman on the quay and knew it would make our work much easier,” Branagh adds. The 700 tonner was shipped specially from the mainland to the Balearic Island for operational reasons. The yacht client wanted to have his yacht serviced by RSB Rigging Solutions but the largest crane available on Mallorca did not have sufficient lifting capacity for this job. Therefore, Grúas Pol arranged for the Liebherr LTM 1650-8.1 at Grúas Leman to be shipped from the Spanish mainland.

Fragile mobile
Carefully and in tandem, the two Liebherr cranes lay down the rigging on the transport trestles.

From the vertical to the horizontal
How does this unstable mast get from the crane hook to lying horizontally in the support towers in the shipyard? This equally delicate process requires a second crane whose hook is attached to the lower end of the aluminium mast after being lifted from the yacht and stabilised. For this project, the local transport service provider used an LTM 1200-5.1 from its own fleet: “In tandem, the two cranes bring the rigging into a horizontal position,” explains Ed Juárez, the project manager at Grúas Pol. “The crane drivers then carefully manoeuvre the mast onto transport trestles allowing the rigging team and other contractors to work on it easily.”

A sailing rig of this size usually spends twelve to 18 weeks in the yard while undergoing maintenance. This includes, among other things, cleaning the mast, servicing, and checking the fittings and painting works if required. Once the riggers have completed all maintenance, they reassemble the rigging and – just as carefully – reinstall it back onboard the yacht.

Teamwork
The crane hook of the LTM 1650-8.1 is attached to the upper end of the ship’s mast.

Looping the loop for Europe

Liebherr mobile cranes construct roller coaster at amusement park

Our mobile cranes are on the move all over the world. They reliably carry out a wide variety of tasks with all kinds of loads hanging from their crane hooks. Among Europe's numerous crane companies, however, there are certain firms that specialise in niche markets. Ride Construction Service Worldwide GmbH (RCS) is one of them. Its five Liebherr mobile and truck-mounted telescopic cranes are highly specialised machines that are used to assemble roller coasters in theme parks. Or to put it more nostalgically: big dippers! And all over Europe and sometimes even further afield. In recent months, one such exciting and adrenaline-pumping construction project was completed near the Franco-German border.

Located right on the border with France, Europa-Park, the large adventure and leisure complex in Rust, southern Germany, recently built its first new roller coaster in many years. The park's new themed area, "Croatia", is under construction at the edge of the huge site. The main attraction there will be a new roller coaster that will wind its way through this area via numerous curves and loops. For four months, two mobile cranes owned by our customer RCS have been on site to assemble the steel superstructure and rails of this 1,385 metre long attraction. The components of the roller coaster were manufactured by "MACK Rides GmbH & Co KG" in nearby Waldkirch. For over 100 years, the remarkable 240-year-old Mack family business, which also operates Europa-Park, has been constructing roller coasters and amusement rides for fairs and theme parks all over the world.

“That’s only available from Liebherr”
The RCS company near Hamburg can also look back on a long family dynasty. Company boss Max Eberhard, an eighth-generation showman, started building roller coasters and rides in 1999. For this purpose, his assembly team regularly travels throughout Europe with Liebherr cranes. The company operates five telescopic cranes, including three LTF truck-mounted cranes. An almost 30-year-old LTM 1070/1 mobile crane has been in service with the company for a long time. The old machine, which doesn’t look its age, also helped build the roller coaster at Europa-Park. “We will certainly continue to use this crane on future projects. It’s very reliable and, if necessary, I can get spare parts for it after one or two days – not bad for a crane built in 1996,” says Eberhard. “This is where Liebherr differs from all the other manufacturers, you can’t beat that kind of service. That’s only available from Liebherr. That’s why I only have Liebherr machines.”

RCS recently upgraded its fleet and purchased a new LTM 1090-4.2. “It’s by far the best crane in this league,” enthuses Eberhard. “A 60 metre boom on the most compact machine in this load class.” Thanks to various technical innovations, such as VarioBallast® and the VarioBase® variable support program, the crane is ideal for assembly work on sites with limited space. Space at the project site in Rust was also often in short supply – the buildings for the future theme area were already being built at the same time as the growing roller coaster, and in its immediate vicinity. As a result, it was often necessary to work using the individual crane outriggers on the 90 tonne machine.

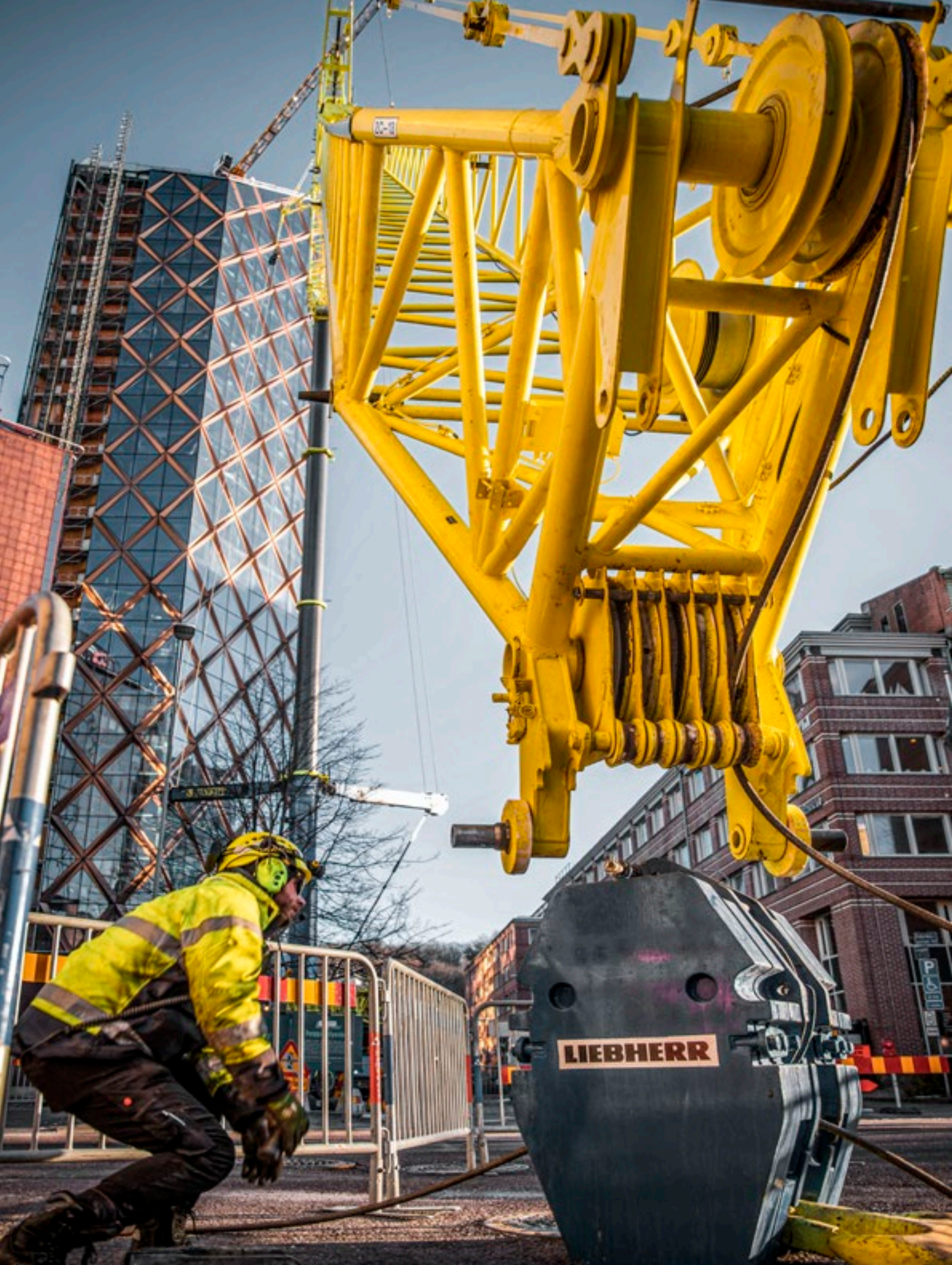
Four months of construction and more than 1,000 hoists were needed to build the adrenaline-pumping ride. The heaviest components, which were assembled at a height of over 30 metres, had a unit weight of around five tonnes.

However, it will be a while before the first visitors get to scream their way along the roller coaster’s curves and loops at top speed: the ride is scheduled to open next year. By then, however, the two Liebherr cranes will have long been in another part of Europe, continuing to build the winding world of roller coasters.

Parts of the future roller coaster lie above a small stream. Here, arches are attached to the sides of the rail track, between which close-meshed nets are stretched. They prevent bats in search of food from colliding with the speeding wagons.

In focus

Set-up time in Stockholm
Sven Jinert AB is setting up its LTM 1750-9.1 to dismantle a Liebherr 250 EC-B 12 tower crane in Stockholm. The top-slewing crane helped build the 110 metre high Kineum, which contains 28 flats, among other things.


LIEBHERR

One small step for man, a giant leap for the crane industry

The MyLiebherr team of Liebherr USA Co. checking the status of the daily spare part supply.

Totally **digital**

A digital journey in the United States – for cranes only

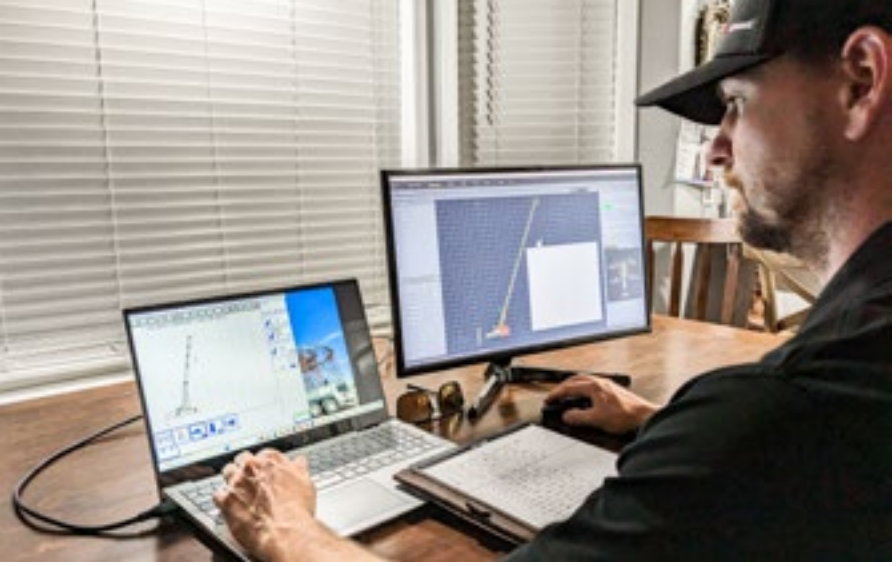
Throwback to 1969 – a well known date for all of us, as it was the year of the first moon landing (and, by the way, the founding of the Liebherr-Werk in Ehingen – but we don't want to blow our own trumpet). The first steps on the moon were impressive to say the least and the recording was transmitted to earth as a digital signal. 1971 – a date maybe not known that much, but still highly important: It was the year Ray Tomlinson sent the first email. And 1990 marks the official start of the world wide web as we all know it today. But let's jump into 2023 and find out where we are today on our path of digitalization around mobile and crawler cranes, and let's hear how our customers in the United States are using digital tools to support their daily business.

The extent to which our customers can benefit from using the MyLiebherr portal goes way beyond just ordering parts. Moving forward to today, MyLiebherr provides a plethora of information for its users all around the globe. From Machine Documentation, License and Services, Data Exchange, Crane Finder, Lubricants portal, Crane Planner 2.0 and, as described already, the Parts Catalog and cart. "The MyLiebherr portal is one more addition to the many services already offered by Liebherr, showing dedication and passion towards customer service. With digital and online tools becoming more and more accessible and attractive to its users, our customer base in the United States took to MyLiebherr at an unpredicted rate," reports Trina Baughman, Product Manager Digital Services at Liebherr USA Co., "and with this, our digital department in the US was formed." Liebherr introduced online digital services for all customers in 2017, by means of a parts ordering system called Parts24. The first parts order made through the portal was placed by Sterett Crane July 6th, 2017.

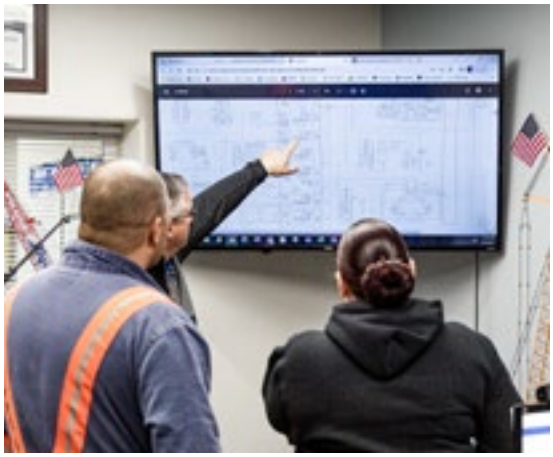
Digital services make life easier

"Since then, the portal has gone through tremendous transformation and growth. 2017–2018 the portal produced roughly 470 online orders, 2019–2020 around 3,330 parts orders and 2021–2022 we ended with roughly 8,500 parts orders," explains Baughman. Nearly 300 cranes were registered in MyLiebherr during 2022, giving a significant number of machines tracking in the portal – and that's only United States. Today we count in the United States roughly 500 customers in the portal. These numbers could not be obtained without the staff's efforts and support of the portal overall. Not to mention our customers comfort and confidence in the portal and its capabilities. What does comfort in this case mean? Well, "having access to the MyLiebherr portal while in the field has been a game changer when I need a diagram or when I have to look up parts while at the crane. This makes life quite easy," explains Jose Tinoco, Senior Service Technician at Smiley Lifting Solutions, based in Phoenix, Arizona.

Trina Baughmann, Product Manager Digital Services, is pleased that MyLiebherr has been well received by our customers in the USA.



The Liebherr Crane Planner 2.0 is also an extensively used digital tool at Smiley Lifting Solutions.



Bigge Crane and Rigging Co. uses the wide range of services in MyLiebherr.

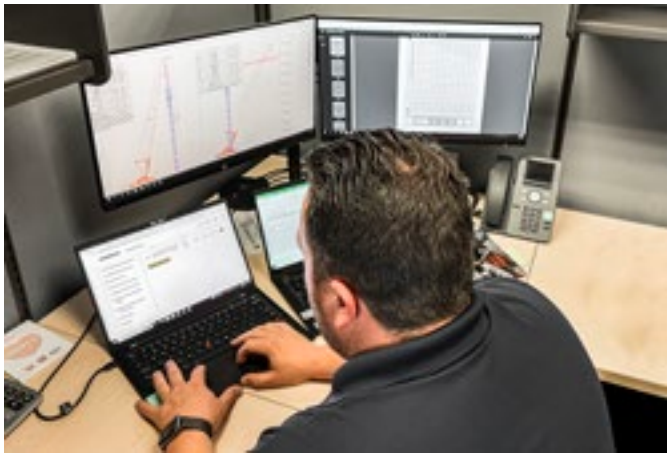
“At the beginning, our users were only seeing a fraction of what the portal had to offer. This sparked the necessary travel to our customers’ facilities to expand their knowledge about MyLiebherr. Whether in a conference room, parts/service department offices, even on the tailgate of a pick-up truck parked next to a crane, I met with and made sure our customers were able to access and acquaint themselves with everything the portal has to offer them so far. Many have been utilizing the portal for a few years now, ordering parts and pulling up their schematics, but had no idea we have a Lubricants Portal or an app called Crane Finder to help choose the right machine for their potential client in an expediated and efficient manner. Followed up with our Crane Planner 2.0 which can plan jobsites in 3D,” explains Baughman.
2022 brought with it thousands of miles driving for Trina Baughman, through small, exquisite country towns as well as bobbing and weaving through the bustling airports to meet with as many customers as possible. The 70 plus customer visits created an open path for communication and feedback. Meeting with customers and having them maneuver through their account familiarizing themselves with the different applications and functions created a more collaborative environment which brought even more interest to the portal.

“Taking additional time to make sure profiles, colleagues, products and any questions or suggestions were addressed has proven to be successful, not only for our customers but for us at Liebherr as well. We are all working towards the same end state; a seamless customer journey through the portal which provides necessary information and high value output required in a timely and expedited manner to make everyone’s daily work easier,” continues Baughman.

“Our team at Bigge Crane & Rigging use MyLiebherr to better serve the service and parts departments. The portal helps our team with the ease of referencing service, parts and technical manuals. We use it also for service information on our Perfect Fleet. Thanks to Liebherr for making our experience in owning Liebherr a pleasure,” states Scott Delay, Regional Service Manager at Bigge Crane and Rigging Co. based in San Leandro, California.

Simple, uncomplicated and fast
“MyLiebherr has evolved over the years to simplify the process of searching for parts and product-related documents. Diagrams and 3D images of parts breakdowns are a crucial factor when trying to figure out the correct parts that are needed. The use of the site is simpler, more descriptive and user friendly, making ordering parts very easy which helps with our time management. We don’t have to waste man hours on a website looking for parts and diagrams that are very vague and possibly do not match the serial number of our machine. The way the website is set up to store all our company equipment info is top notch and stands out above the rest. We cannot thank Trina Baughman and all the support staff over the years enough for their support and commitment to making our experience with Liebherr successful. We look forward to continuing that relationship for years to come,” reports Lou Viola, Fleet Manager at Sautter Crane Rental in Philadelphia.

John Schlessman (top left) and Lou Viola from Sautter Crane navigating through the Parts Catalog and Product Document sections on MyLiebherr.

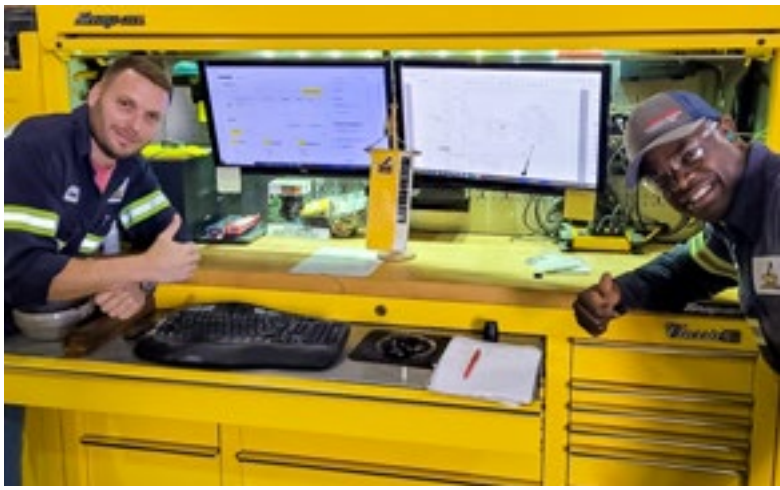


Dustin Morgan from Allegiance Crane & Equipment preparing the next crane job.

"The most recent updates to the My Liebherr Portal have allowed us to have better visibility of our fleet across all branches. The portal has allowed us to share information across multiple branches in real time. As we are a heavy petrochemical-based support company, the planning for lifts using Liebherr's work planner is critical to our success. It allows us to be very precise with our crane placement and lift planning. It is used by all team members in various planning stages, as well as our engineering group. We have integrated our new team members into MyLiebherr to achieve more in their day-to-day operations. This has given our team a vision of transparency and openness," explains Dustin Morgan, Operational Support Manager at Allegiance Crane & Equipment. Allegiance has several branches throughout the Southeastern United States, as Louisiana and Florida, as well as in Texas.

Direct cooperation – globally

Working directly with the MyLiebherr team at Ehingen, the team in the United States has been able to update, install and fine tune many items within the portal making it more advantageous for our customers. "And this is our way of working with the teams from all over the world, from Italy to Australia and South Africa to Canada," explains Stephan Schrade, head of digital products and services at Liebherr in Ehingen. "The internal customers – our spare parts, sales and service teams around the world – have also supplied vital feedback and teamwork allowing for the extensive growth of MyLiebherr around the world. And our colleagues in the field, like Trina, will continue to travel, meet with and provide an evolving portal to all our customers within and for sure also outside of the US. Culminating in one portal with all services to improve daily operations at our customers, making their life a bit easier."

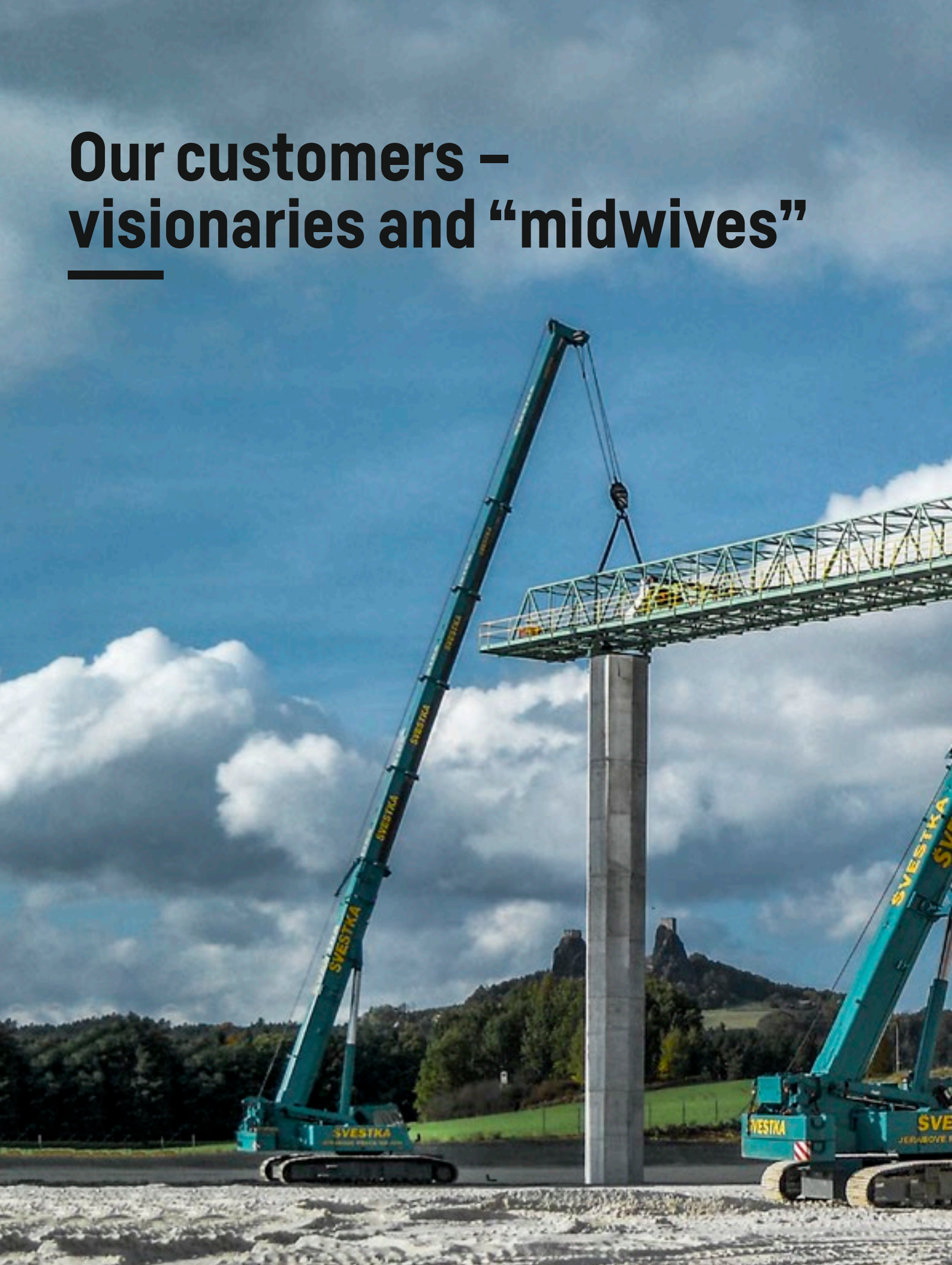


"My Liebherr is used to download electrical schematics and order parts. This is a very efficient tool for crane rental companies." Brian McCarrick (left) and Charles Chukwuemeka from TNT Crane & Rigging based in Houston, Texas.

Stephan Schrade,
Head of Digital Products
and Services in Ehingen

Find out more about MyLiebherr here:
www.myliebherr.com

Our customers – visionaries and “midwives”




SVESTKA

How a customer request changed the crane world – the birth of the LTR series

At the end of 2004 we had a visitor from the Czech Republic at the Liebherr factory in Ehingen: Pavel Švestka, an industrious entrepreneur, with a pretty big wish in tow. Our engineers were asked to develop a new type of crane for his company – not the smallest request they'd ever received! The animated conversation between Pavel Švestka and Hans-Dieter Willim, Head of Design at the time, can be described as the birth of the Liebherr telescopic boom crane on crawler travel gear. Here is a brief glimpse into this unusual crane story, one which ended up writing itself.

By the way, it's not unusual for our customers and partner companies to be actively involved in writing such stories. After all, it is their employees who bring new things to life with Liebherr cranes on construction sites all over the world, day in, day out. They gain such valuable experience there. This means they're acutely aware of the strengths and weaknesses of the machines and can see how they could be even more functional, powerful and economical. This "sharing of innovations," which we can admit unreservedly and proudly to our customers, is especially true of the Liebherr telescopic crawler crane. Without Pavel Švestka, there wouldn't be an LTR like there is now. At least not for as long as there has been!

A little flashback: in 1989, the "Velvet Revolution" in Czechoslovakia ushered in political change. A short time later, Pavel Švestka founded a small demolition, earth-moving and transport company just outside Prague. Thanks to the economic revival, the demand for construction machinery increased significantly. Švestka recognised the growing need for equipment to handle heavy components such as steel elements or precast concrete parts and ordered his first four mobile cranes from Klimex, our Czech sales and service partner.

Requirements from personal experience

But that didn't suffice. With regard to the flexibility required, he had the "crane of his dreams" clearly in mind: flexible and capable of transporting heavy parts from the road to the construction site on rough terrain – with telescopic boom and crawler travel gear. "However, the market for construction machinery at the time didn't have that on offer," Švestka recalls. "That's why I went to Ehingen with Karel Kladiva from Klimex. There, Liebherr's chief designer was fascinated by the idea and placed the superstructure of the 100 tonne mobile crane on a crawler chassis. Of course only "in his mind!" remarks Švestka, describing the scene in Hans-Dieter Willim's office. The protagonists agreed that the telescopic crane on crawler carriers could also be used for short-term operations in industrial plants and halls as well as for assembly work.

Market analysis and specifications

Despite all the good prospects and visionary power, there were also some initial reservations about spontaneously setting off on such new paths: "Considering the effort involved, a single-unit order was of course not an option," recalls Dr Ulrich Hamme, who was managing director of design at the time (and still is). But did the market have the demand for a small series? This was the reason for a market and competition analysis. "To be honest, this was going on while we were conducting the initial design studies and kicking off the process for successful crane development," Hamme says somewhat mischievously.

Everything else went quickly as well: the technical specifications were ready in January 2005 after analysis and costing had been completed. In April, the Management Board decided to base the newcomer "LTR 1100" largely on the superstructure of the LTM 1100-4.1 and the crawler travel gear of the HS 855 hydraulic rope excavator from from our sister company in Nenzing. Just six months after production release, we handed over crane number 1 to Švestka. Incidentally, this was the first of the 1,000 LTR cranes that would be produced.

Visionary
Pavel Švestka recognised the advantages of telescopic cranes on crawler chassis early on.

Mobile with large load
"Telescopic crawler cranes play an indispensable role in our company during demolition work, in assembly, on difficult terrain and in confined spaces," Pavel Švestka tells us. Here, his LTR 1220 is lifting the huge component of a new railway bridge. Together with an LTR 1100, the 105 tonne, 64 metre long steel structure was transported in tandem from the assembly site to its destination and placed on bridge pillars.

Background

Vision leads to success
This beautiful story set amidst our everyday lives shows more impressively than any glossy brochure that guys like Pavel Švestka are able to assess trends and develop visions – and what we can do with them. The LTR 1100 was ultimately only the first of a whole series. As its successors, we developed the smaller telescopic crawler crane with a lifting capacity of 60 tonnes, the powerful LTR 1220 and finally the LTR 1040. All four still feature in our portfolio, and we're not finished with this type of crane just yet. Whether for assembly work, for pick-and-carry jobs on large construction sites, as assistant cranes in wind farms or for setting up large crawler cranes: the nimble, manoeuvrable and powerful LTR machines are now indispensable.

The same is true for Pavel Švestka's company. His crane fleet now comprises ten machines from Ehingen, including four LTR cranes. Pavel Jr., son of the company's founder, recently took delivery of their latest machine at the Bauma trade fair in Munich. The machine in question was an LTR 1060.

XXL available too
We have also transformed the principle of the telescopic crane on crawler travel gear in the upper class of our lifting equipment. The LTR 11200 was launched in 2009 and was produced for a few years. This equipment is mainly found in large wind farms, like the crane of our customer McNally here in Australia. The LTR 11200's ability to move quickly to the next job site with retracted telescopic boom is one of its enormous advantages.

Into the future with green concepts

The energy transition is moving forward, climate protection is on everyone's lips. And we are helping to shape the change: whether through our products, in plant traffic or in building management – there are many small and large examples of environmental protection at Liebherr in Ehingen.

By 2050, renewable energy sources such as hydroelectric, solar power, geothermal energy and wind energy as well as renewable raw materials should account for around 60 per cent of gross final energy consumption and 80 per cent of gross electricity consumption in Germany. In order for the energy transition to be successful, the Federal Ministry of Education and Research also aims to oversee a significant increase in energy efficiency. Among other things, this involves energy-efficient building renovations and energy-saving industrial processes.

"We are seeing a constant stream of new proposals and ideas from the legislator and new regulations are being issued. However, we have been developing our own environmental protection measures for many years and have already made significant progress in terms of protecting the environment, saving energy and, of course, costs," says Jürgen Abele, Division Manager for Industrial Services and Construction. One area of focus is heat supply, which is not only about ensuring pleasant

Areas in which savings are being made:

- 43,000 metres of geothermal energy installed since 2006
- Approx. 160,000 m² of lighting converted to dimmable LED technology
- 30% reduction in the power consumption of the LED technology due to proprietary daylight-dependent control systems
- 70% heat recovery in the paint shop and exhaust air systems
- 67% heat recovery from extraction systems and compressed air systems

temperatures in office buildings and production halls: "We are developing concepts that optimise the way we generate and use heat, among other things," he explains. Abele and his department are therefore in charge of a versatile heating system: the heat is generated using geothermal and solar thermal energy, for example, or recovered by heat pumps and heat recovery equipment installed in the compressed air and exhaust air systems. The conventional natural-gas-fuelled radiant heaters and burners are operated via temperature or cascade controls, which can limit their consumption and thus lower the demand on the natural gas grid. "The key factor is reducing heat demand," adds Energy Engineer Sophie Gantert: "The production buildings have therefore been continuously renovated over the years and the roofs and façades have been insulated." This improvement of the building shell is not only noticeable in the heating season due to reduced energy consumption. The temperatures are also lower in the summer, making the working environment in the renovated halls more pleasant. Heat loss and draughts are counteracted through simultaneous operation of interlocking door groups and the existing airlock systems.

Green electricity for every new machine, an energy concept for every new building

Since January 2022, we have been drawing all the electricity for our machines and systems, but also for our lighting, office equipment, etc. from European wind power. This green electricity is certified with the "EKOenergy 100% Wind" label and is therefore CO_2-free. "The electricity from the grid is supplemented by 2.7 megawatts from photovoltaic systems – installed on four buildings at the plant so far," says Purchasing Manager Stefan Dambacher.

"As a matter of principle, we construct new buildings to at least the KfW 55 standard, including our southern repair branch in Ehingen/Berg," explains Abele. In addition, one third of the 12,000 square metre roof area on the building there has been greened. Another third, which is reserved for photovoltaics, is already occupied by a 142 kilowatt peak system. And the last third consists of skylights to deliver natural light into the building to reduce artificial lighting.

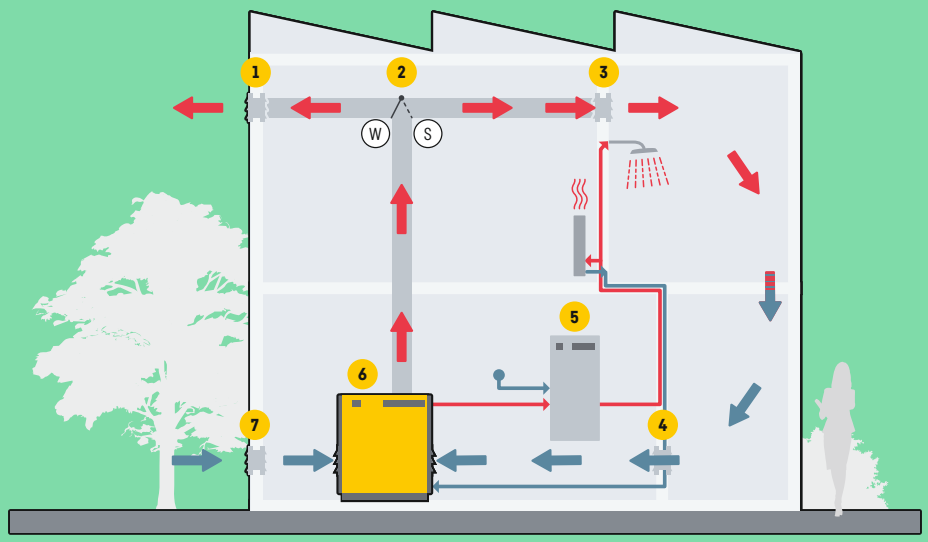
The role of the building control system

"We can use it to control every building in our plant," explains Christian Wölfle from the Industrial Service Electrics department as he shows us an overview of flashing bars and numbers on his computer. "Via a central program, we can control, for example, lighting, heating, skylights, compressors, compressed-air or exhaust systems, and even the medical refrigerators used by our medical service. We can track the energy consumption of the buildings down to the individual machines with a connected load of more than 20 kilowatts. To work out how much energy we can save, we need to know our actual consumption." More than 20 years ago, his supervisor Jürgen Abele began working on the building control system in the final assembly area. Among other things, it enables all compressed air consumption to be

Three men with a green concept:
Stefan Dambacher, Jürgen Abele and Berthold Ströbele

How heat storage and compressed air releases work:

Compressed air is created when air is compressed by a high-pressure compressor. This produces heat that is fed into the buffer storage tank to heat buildings and halls.



1 Summer (S) – exhaust air
2 Ventilation flap
3 Winter (W) – heating
4 Winter – recirculating air
5 Buffer tank
6 Air compressor (including heat exchanger)
7 Summer – air supply

switched off centrally outside working hours to reduce losses. Once identified, potential for improvement is exploited using the latest technology and control systems, which were developed in-house. More than half of the lighting has already been converted to dimmable LED technology – and the trend is rising. “We can reduce our energy consumption by a further 30 per cent with the LED lighting by using a daylight-dependent control system, which we also developed in-house. Our team creates every control system, be it for lighting, heating, skylights and other applications, to suit the needs of the site and their colleagues,” Wölfle tells us proudly.

“We design new buildings to at least the KfW 55 standard as a matter of principle.”

Jürgen Abele
Division Manager for Industrial Services and Construction

Increasing mobility
Another aspect of the energy transition that we are tackling at our Liebherr plant is mobility management. One of the challenges is to accommodate the increasing number of employees within a limited parking area. “But commuter traffic also plays a role, especially at rush hour. In order to make the transport situation more environmentally friendly, socially acceptable and efficient, we are working on a mobility concept for our employees,” explains Fleet Manager Berthold Ströbele. A working group was also set up for this purpose, consisting of representatives from the HR department, works council, IT, production, plant planning and marketing.

Besides promoting electric mobility for cars and two-wheelers, other potential measures include support for car-pooling, appropriate fleet and parking management, and improvements in the area of business travel. “We have already electrified nine vehicles in our fleet and ordered nine more. In addition, we are working on a concept for a bus shuttle service directly to the factory and are thinking about an employee app for carpooling,” reports Ströbele.

Embracing the future with an open approach to technology

"When we talk about the energy transition, we think of it holistically," says Dr Ulrich Hamme, Managing Director Design and Development. "Logically, this also includes our products." For almost two years now, we have been fuelling our cranes in Ehingen exclusively with pure HVO – a synthetic fuel that is largely carbon neutral and consists mainly of vegetable oil waste – for acceptance, test runs and for delivery. With regard to our products, HVO has the further advantage that there is no need to develop new machines or replace or upgrade the existing ones. You can continue working with HVO immediately.

"At Liebherr, our approach is to remain open to all types of technology. For our drive technologies, this means that they are adapted to the machine and the general conditions at the place of use," says Dr Hamme. Therefore, besides HVO, there are still diesel vehicles as well as battery drives and e-fuels on the market. Being open to technology also means accepting that electrification does not always make sense and is not always possible. For example, construction sites in remote, inaccessible locations do not always have a reliable charging infrastructure. "When erecting wind turbines, the supporting infrastructure and power supply are first created using mobile and crawler cranes. Nevertheless, these energy-intensive machines must work reliably. In addition, in terms of the power source you need a different basic vehicle for electricity than for HVO, which means converting the vehicles for every job is not technically possible."

> ***"Reducing our heat demand is crucial."***
>
> **Sophie Gantert**
> Energy Engineer

A green future – in Ehingen and the rest of the world

"As you can see, we are doing a lot in terms of environmental protection here at our plant in Ehingen. And our products, in turn, are used all over the world to preserve our environment for future generations," sums up Dr Hamme. For example, Liebherr cranes are used to erect wind turbines and power lines, and to build and expand photovoltaic plants and power storage facilities all over the world.

Christian Wölfle and Sophie Gantert check the heat flow meters on the canteen's heating manifold.

Catch Bar Plus – enhanced safety

As early as the development phase, we take care to ensure that operating errors are eliminated as far as possible during assembly operations on our cranes, or that their effects are kept to a minimum. Jan Walter is Head of Lattice Jibs and Equipment in our Design Department. He explains how our new Catch Bar Plus delivers even greater safety for installing folding jibs.

Intensively tested
We put the new system through its paces on a special test stand.

If, when mounting the folding jib, its attachment to the telescopic boom is loosened and the jib is swung out before it is bolted to the boom head, there is a risk that the jib will fall down. This is why our telescopic cranes have had a catch bar near the front transport brackets for many years. If the jib collapses, the operator sees and, above all, hears very clearly that he has not completed the assembly sequence correctly and that he must now take appropriate action. If he continues the assembly in this state, the folding jib may even fall off in the worst case.

Better safe than sorry – Catch Bar Plus
We have improved our system to prevent this and we call the result Catch Bar Plus. First we have modified the front catch bar so that the jib is held more securely by the fastenings. We have also designed another catch bar near the rear transport bracket, which also secures the folding jib. It consists of a hook on the folding jib and a bar on the folding jib support.

We have built a special test stand to ensure the function and safety of the new catch bar on all our current crane models. Various operator errors were simulated and we improved our designs on the basis of the test results. We have been delivering cranes with the new system for about a year. In the meantime, we have converted our entire range of telescopic cranes to Catch Bar Plus. This also means that we are already compliant with the latest

Accident prevented
The jib the suspended on the hook and rod.

Simply **explained**

“Our new Catch Bar Plus system makes accidents almost impossible when assembling folding jibs.”

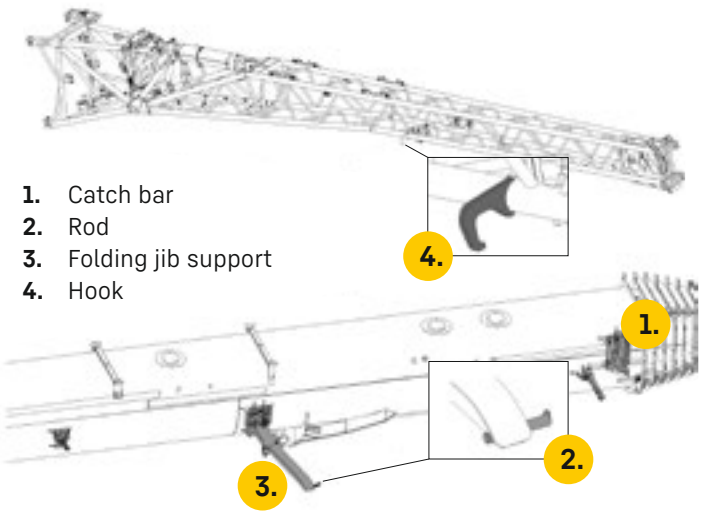
Jan Walter
Design and Development Superstructure,
Head of Lattice Jibs and Equipment

revision of the EN 13000 standard, which will soon come into force. Among other things, it calls for additional safety when assembling folding jibs.

However, a word of caution – if old type folding jibs are installed on cranes with Catch Bar Plus technology, then the “plus” in safety no longer applies. We suggest that you only install these folding jibs with an auxiliary crane. This also saves having to adjust the transport brackets to the folding jib, a job which requires a great deal of effort.

Short designations facilitate logistics
As the new “Catch Bar Plus” jibs look very similar to the previous ones, we have clearly labelled them with abbreviated names on adhesive labels. This also makes it clear which different jibs may be carried on which cranes. We have also introduced the new abbreviated designations on adhesive labels for other equipment such as lattice extensions. This ensures that you always have exactly the right parts for the job. You will find further information in the operating instructions.

Sophisticated
Just a few mechanical parts secure the folding jib to prevent it falling.



Unmistakable
Unique short designations make equipment components easy to use.

Clever combination of simple tools

1 **Measuring device**
Measure distances easily and quickly

What is the right and thus most cost-effective crane size for a particular lifting task? And which configuration will allow the crane to be used economically? Answering these questions is the daily challenge of dispatchers in the mobile and crawler crane industry. But the crane drivers on site also need tools that provide quick and reliable answers. Jürgen Maier, head of our mobile crane acceptance team and himself a long-time crane operator, provides today's tip.

Three values are sufficient to find the right crane for a particular lift: load, radius and lift height. In the past, this involved time-consuming work poring through dozens of load charts and lifting height diagrams to find the right crane type and configuration.

The LICCON work planner has been available for many years. It can be used to plan, simulate and document crane deployments very efficiently on an office PC or a laptop, as well as the LICCON screen in the crane. There is now an even more modern solution in the form of the Liebherr Crane Planner 2.0.

My Tip

“Use simple tools to enjoy success – quickly.”

Jürgen Maier
Mobile Crane Acceptance Manager

Find out more:
www.myliebherr.com

Three steps to quick success
You often don’t need a job planning tool if it’s simply a matter of finding the best crane with the appropriate configuration quickly and reliably. Hence my tip: use the Liebherr Crane Finder. This tool is very intuitive to use and delivers results in seconds. And it becomes even more convenient when combined with another simple tool, a laser rangefinder. These measuring devices are available for a few euros at any good DIY store, for example, and easily fit in your pocket.

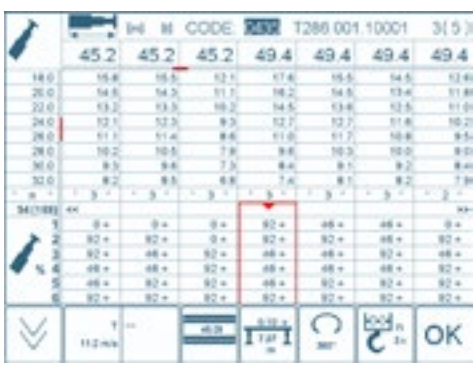
- Measure the distances, such as the lifting height and radius.
- Enter these values together with the load to be lifted into the Crane Finder.
- Then sit back, and let the system do everything else – a list of crane types with the appropriate equipment for the job will appear.

Advantages for the crane operator on site – in addition to PCs or laptops, the Crane Finder is also optimised for use on smartphones and tablets. Another convenient feature for the crane operator is that the Crane Finder even displays the set-up code. This can be entered directly into the LICCON control system – it couldn’t be easier. The crane operator will find the Crane Finder especially useful if the crane’s load capacities are tight on the construction site. Another plus point – in addition to telescopic boom and accessory length, the Crane Finder also indicates the optimum telescoping path.

As an aside, once the customer has registered their company and machines on MyLiebherr, the Crane Finder will prioritise this fleet in its search results.

We provide the Crane Finder free of charge in our MyLiebherr portal – your gateway to the world of Liebherr service. Not only our crane customers, but also planning and engineering offices are welcome to sign up.

2 **Crane Finder**
Find the best crane and configuration with set-up code



3 **LICCON control system**
Simply enter the set-up code in the crane control system

The world with Liebherr

Finding the big picture in the details
The big picture often emerges from many small parts. Like here at Conexpo in Las Vegas. We create the world with Liebherr out of over 30 exhibits and many digital products at our most important trade fair in North America.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Interview with the family shareholders

A conversation with **Dr. h.c. Isolde Liebherr** (2nd from left), vice president of the administrative board of Liebherr-International AG until 31 March 2023, **Dr. h.c. Willi Liebherr** (right), president of the administrative board of Liebherr-International AG until 31 March 2023, **Patricia Rüf** (2nd from right), member of the administrative board of Liebherr-International AG, and **Jan Liebherr** (left), president of the administrative board of Liebherr-International AG since 1st April 2023.

Isolde and Willi Liebherr, you have resigned from your positions as vice president and president of the administrative board of Liebherr-International AG, effective end of March 2023. Does this mean that you're now leaving the Liebherr Group and entering retirement?

Willi Liebherr: My sister and I will continue to be members of the administrative board, so we won't be leaving the company. Nevertheless, with our replacement by my son Jan and my niece Stéfanie on the presiding committee, we have taken another step towards a generational change in the company's management.

Isolde Liebherr: As long-standing members of the administrative board, all representatives of the third generation have a great deal of experience in managing our Group. We transferred shares in Liebherr-International AG to them back in 2012. Since then, they have managed various areas of the Group alongside us. The presiding committee of the administrative board is elected every three years. We thought that this year's election was the right time to make a new appointment to the presiding committee.

Mr Liebherr, what does this change mean for the Liebherr Group and for its customers and partners?

Jan Liebherr: We've simply taken another step towards the gradual transfer of responsibility from the second to the third generation of this family-run company. This process has been underway for several years. With my cousin and me as the presiding committee of the administrative board as well as the other representatives of the third generation, we guarantee continuity in the management of the company. We will continue to manage our Group as an independent family-run company

based on longstanding values. Long-term orientation, responsible conduct, sound management, pronounced customer focus and immense technological expertise continue to be key factors in our success, and that's not going to change in the future.

Let's take a look back at 2022. How did the 2022 business year measure up?

Willi Liebherr: We've come through a very eventful year, shaped both by the effects of the coronavirus pandemic and the war in Ukraine. We remain deeply saddened by the situation there. Unfortunately, our initial hopes for an immediate end to the hostilities and Russia withdrawing from Ukraine were dashed. Our deepest sympathy goes out to the people of Ukraine and the many refugees who had to leave their homes. This crisis has not only claimed countless lives and created the need for massive humanitarian aid, but has also left a deep mark on the global economy. The existing bottlenecks and uncertainties surrounding global supply chains and the procurement of materials were exacerbated by the war. Added to this were sharp increases in raw material and energy prices, high inflation rates and further increases in material and transport costs.

Patricia Rüf: Nevertheless, looking back, we can also report on some positive developments. We experienced very high demand for our products, and turnover reached a new record level by the end of the year. Following the many restrictions due to the pandemic, we were finally able to travel and hold face-to-face meetings with our customers again. In 2022, we made tremendous progress with our technologies and solutions, and invested heavily in them once again.

How did the individual product segments fare in the 2022 business year?

Isolde Liebherr: We achieved an increase in turnover in almost all product segments. This growth would certainly have been even greater with a stable supply chain. Order intake was at a very high level. It is very gratifying to note that the aerospace sector has recovered faster than originally forecast.

Were there any specific developments in individual sales markets?

Patricia Rüf: We've seen exceptional growth in the regions of North America, Central and South America, and Africa, Near and Middle East. Individual markets that performed particularly well were Italy, the Netherlands, Switzerland, Turkey and the United Kingdom. Of course, the situation in Russia was an exception to all that.

The operating result has declined. What's the reason for this?

Jan Liebherr: One underlying reason was the scarcity of materials over the course of the year, which made it difficult to complete our products. On top of that, procurement costs have risen significantly. Both had an impact on our operating result. This was already apparent at the beginning of 2022, which is why we were not surprised by the decline.

How are you counteracting the increase in costs?

Isolde Liebherr: The extreme turbulence over the past two to three years has unsettled the markets and market players. This has thrown the market off-balance. The extreme price fluctuations of recent years should be seen in that light. Together with our long-standing partners – including customers and suppliers – we will endeavour to restore things to a certain degree of normality. This also means that material costs, which have risen far out of proportion in some cases, will have to be brought back to a reasonable level.

With all the challenges, let us not forget the pleasant things. Can you tell us some of your personal highlights from the past year?

Jan Liebherr: The major highlight was, of course, the Bauma exhibition going ahead and proving to be a massive success. We were the largest exhibitor there, with a great many innovations and future-oriented developments, so we were able to make a big statement. Once again, we were able to demonstrate our technological leadership in many different areas.

Patricia Rüf: It was a very special experience, with an atmosphere of noticeably positive energy from day one. And, of course, it was nice to meet up with so many employees and customers in person again after such a long time.

Willi Liebherr: A special highlight for me was our new crawler excavator R 9XX H2, which is equipped with a prototype hydrogen combustion engine and which won the Bauma Innovation Award in the climate protection category. Or the presentation of our T 274 mining truck with trolley system, which saves fuel and also CO_2.

Jan Liebherr: To remain with the topic of mining, in the middle of the year we entered into a partnership with Fortescue Metals Group Ltd for the development and supply of mining trucks with zero-emission drive systems. These enable our customers to take one more step towards decarbonisation. That was also a special milestone for me.

Isolde Liebherr: For me, one of the top highlights was a world premiere for our refrigerators and freezers. Our new BluRoX technology makes us the only manufacturer to use an insulation vacuum in conjunction with perlite, a finely ground lava rock with very low thermal conductivity.

Willi Liebherr: And we achieved yet another milestone in the aerospace sector, with an order for the first complex component to be manufactured using 3D printing technology: the lower cargo door valve for the Airbus A350 fleet.

Patricia Rüf: I was particularly impressed when I saw the Heavy Lift Crane 295000, the largest crane that Liebherr has ever built, in operation for the first time. Here we have demonstrated what happens when people work closely together with an overarching goal in mind. Right away, our team went to extraordinary efforts to successfully install this heavy-duty crane on the installation vessel Orion. The nice thing is that this crane is also making a significant contribution towards the energy transition, because it's primarily used for setting up wind turbines and dismantling oil platforms.

You've already mentioned some new products and technological developments. Has there been any progress in terms of digitalisation?

Jan Liebherr: We have expanded our digital product portfolio and consolidated our central development expertise. We want to offer our customers digital services that are precisely tailored to them. One example is our new product configurator for earthmoving and material handling machines, which opens the way for digitalised sales processes in these product segments.

Patricia Rüf: At the same time, we rolled out some assistance systems in mining, including the Trolley Guidance and Crusher Guidance solutions. These systems enable semi-autonomous steering of mining trucks, improve driver efficiency, increase operational safety and reduce fuel consumption and the risk of machine damage.

Meanwhile, the LICCON3 control system created a milestone for a new, digitised generation of mobile cranes. This optimised control system can handle all future requirements, so LICCON3 cranes are equipped for telematics and fleet management technology as standard.

The MyLiebherr customer portal has been given a fresh new design and several new features. Our team have focused on constantly enhancing ease of use and user-specific features like the fleet overview functions.

What were your investment priorities in 2022, and what was the strategy behind them?

Patricia Rüf: Shaping technological progress remains an ongoing objective for us. We have demonstrated that again this year, if you look at what we have achieved in research and development – especially when it comes to alternative drive systems and digitalisation. Again, this required enormous investments.

Isolde Liebherr: We've also invested in modernising our plants and in ensuring our proximity to our markets. We need to have a local presence if we are to offer our customers the very best service. That's why we've invested in our sales and service companies in France and Austria. At the moment, we're also expanding our capacity at certain sites. Construction work has begun on a new hydraulic cylinder plant in Oberopfingen (Germany) and we're planning to enlarge our sites in Toulouse (France) and Pune (India). Last but not least, we decided to carry out extensive construction work on the Löwen Hotel Montafon in Schruns (Austria) which now offers guests even more space and comfort.

Jan Liebherr: Optimising our production processes was also a very important topic during the last year. At our Ehingen site in Germany, we pushed ahead with the development of the logistics plant and invested in restructuring our material flows. The new repair centre has already enhanced our range of services and provided new capacity. Further measures are planned for Ehingen up until 2024.

We were glad to see construction get underway for the new logistics centre at the Liebherr site in Telfs (Austria). Once it's completed in mid-2023, we'll store most of our production materials there, which will make logistics much easier.

Finally, let's take a look at the current business year. What are your predictions for 2023?

Jan Liebherr: The general conditions that we mentioned are still causing uncertainty and putting a strain on the global economy. It's difficult to make accurate predictions at this point in time, as things very much depend on global political development over the course of the year. Nevertheless, we began 2023 with a high order backlog and expect further growth in turnover.

Patricia Rüf: Generally speaking, there are plenty of opportunities for us this year. Just think of the energy transition and all the new opportunities and areas of business it is generating. This business year, we're once again engaging with this topic through our ongoing research into alternative drive systems and the advancement of existing technologies. We've taken the right path for the sake of future generations, and we're already making good progress. We're sure that we'll reach many more milestones this year. We're feeling optimistic about the rest of the year and are already looking forward to the Group's upcoming anniversary in 2024.


284
LIEBH

Dream big. Work hard. Make it happen.

I had to go the extra mile

About three stories high and capable of loading the equivalent of 26 school buses – no, this isn't a riddle but rather a Liebherr T 284 truck, the workplace of Panamanian miner Nancy Lazo. The young woman standing before us at the site of Cobre Panamá has an impressive record: she was one of the first women in Panama to sit in the driver's seat of a Liebherr T 284. Today, she also teaches her mostly male colleagues how to operate the colossal mining trucks.

"I am very proud to be the first female heavy equipment operator here in Panama. It is one of my greatest successes."

Nancy Lazo
Heavy equipment instructor

For some, becoming a woman in mining, a field still dominated by men, as well as an instructor, might seem an unusual career choice. For Nancy Lazo, it is where her passions have taken her. "It all started when I saw the machinery being taken to the mine," she explains. After attending courses at INADEH, the National Institute of Professional Training for Human Development, the now 30-year-old was hired by First Quantum Minerals (FQML), proprietor of Cobre Panamá. Starting as an operator, she soon began to drive bigger machines and finally became the operator of the biggest mining truck in Panama. In 2018 she was given the opportunity to extend her field to become an instructor. "It was obvious from the start that Nancy had a lot of determination. She was very clear about what she wanted to do, which was operating the biggest trucks in the world," says Edwin Salazar, Mining Production Manager at Cobre Panamá. "But we could see early on that she had great talent for passing on what she had learned. That's a rare gift because you may be a very good operator, but that does not mean you're a good teacher," he adds. For Lazo, joining the instructors meant fulfilling another dream: "Both my parents are teachers and I had always wanted to become one too," she says.

Working in a male-dominated industry

The fact that she would have to instruct mostly male colleagues was not a daunting task to Lazo. "My colleagues always treated me with respect," she says, "that did not change when I started training them. Sure, our interactions might be less relaxed when I'm teaching but that is because I sometimes make sure they're paying attention, it's not because they are challenging me." Something similar happened to one of Nancy's female colleagues, Ladyn Correa, the only female electrical technician working on the trucks. "There is a lot of respect in the team. They respect my position and my work. I work shoulder to shoulder with them," explained Correa. Still, with gender roles as they are, both of their paths were not without challenges. "Sometimes it was difficult to really become part of a group that used to think heavy equipment is only for men. There were situations where I felt I had to give more and keep trying and trying to

be accepted and also to do well," Lazo explains. Today, however, she feels most of her colleagues are proud of her progress and are happy to be taught by her. And this is well-deserved. "She's one of our top instructors for the Ultra Class Liebherr trucks T 284," confirms Salazar.

Mastering control of the giants

For Nancy the fascination of driving and training in a fully loaded 600 tonne truck hasn't worn off. "I love it!" she exclaims. Most of her time is spent teaching the theoretical background, "but whenever I'm in one of the DTU (Detachable Towing Unit) trucks with one of my students or when I operate them myself, I still feel just as excited as I did the first time," Lazo adds. Little wonder, as every day may pose a new challenge. "The coolest part is that you can never be certain what is going to happen. Here in Panama the weather is very volatile, and we often have to handle the equipment in extreme conditions," she explains, "and that's not easy at all and takes a lot of concentration. But to me it is the most beautiful part, because there is always something new, something different in these trucks on a daily basis."

Family matters

Mother to a teenage son, Nancy Lazo is glad that the equipment she works with is becoming more sustainable. Family, in general, and in particular the strong women surrounding her play an important role in her life. "My mom is my motivation, my pillar. She is the person who always pushes me forward and does not let me fall. And my grandmother, who sadly is no longer with us, always took care of me. Her memory is also what drives me because she was one of the people who believed that I could achieve this dream." Her mother also was the one who taught her how to drive a car when she was only 16 years old. "My dad just didn't have the patience," Lazo laughs. Being away from her family over extended periods of time is the only downside of her job – a situation that has been exacerbated due to the COVID-19 pandemic. "For the past five years I have had to leave home many times which is difficult because my son is still growing up. Luckily, my parents are there to support us," she adds. "Sometimes I feel a bit torn between home and the mine where I'm able to do such fascinating work."

"The memory of my grandmother is also what drives me because she believed that I could achieve this dream."

Nancy Lazo
Heavy equipment instructor

Dream team of the future
Since Liebherr Mining offers a range of future-ready solutions, it was the first choice for First Quantum Minerals. “We are a company at the forefront of technology and that’s why we chose Liebherr technology,” explains Salazar. FQML is convinced there is no better match for Cobre Panamá in terms of productivity, efficiency, and sustainability. The support offered by Liebherr is a further selling point: “We had to make a number of adaptations when we received the trucks in order to integrate them. All those challenges were overcome and the fleet is running perfectly today,” he explains. To date, the collaboration has been so successful that a further eight T 284 trucks have been ordered for the mine. “We are a world leader in copper exports. And in order to be a world leader, we have to work with state of the art technology,” says Salazar. “That’s why we wanted to work with Liebherr, because we know that they also work with state of the art technology.”

Contributing to zero emission mining
The innovative Liebherr solution enables customers to fulfil their goals in reducing CO_2 emissions. Enrique Fals, who works in product support for Liebherr, has been monitoring the Cobre Panamá fleet in order to provide feedback and ensure maintenance work is done according to the manual. As he works on site, he has direct insight into the effectiveness of the system. “The data we have gathered here shows two important things have been achieved. Firstly, that we are able to significantly reduce pollution given that we can save about 91 per cent of fuel. Secondly, the truck can go faster when connected to the Trolley System. Normally a loaded truck has a speed of 13 kilometres per hour but with the Trolley System the speed of a loaded truck uphill can be up to 22 kilometres per hour.” Both factors improve the duty cycle of the trucks, enabling mining companies to maximise their return on investment and to meet production targets with fewer trucks, or in shorter timeframes.

Digging deeper in Panama
Women represent an estimated eight to 17 per cent of the global mining workforce. Local statistics are hard to come by but in recent years, mining in Panama has experienced a strong push. Currently, Panama’s economy is primarily based on the services sector which accounts for about 80 per cent of the gross domestic product (GDP). While the Panama Canal is the largest economic contributor, mining is also a key economic driver. Reports claim that by 2023, mining activity is expected to contribute to about ten per cent of GDP. “Today, Cobre Panamá exports represent four per cent of the Panamanian GDP,” says Salazar. The growing industry will also provide opportunities for female miners. Cobre Panamá, which started commercial production in 2019, will produce more than 300,000 tonnes of copper per year along with gold, silver and molybdenum once it runs at full capacity.

An important metal

Lazo is not alone in this. Overall, there are more than 700 women miners working at Cobre Panamá. The mine is the largest employer in the region: “We provide work for more than 4,500 Panamanians as well as over 1,850 suppliers,” explains Edwin Salazar. Copper is needed for numerous applications in the industrial, technology, and automotive sectors. The metal and its alloys especially play a significant role in energy transition. Both electric vehicles (EVs) and battery storage technology heavily rely on the metal. According to the IEA, copper will remain the most widely used metal in renewable energy technologies.

About Cobre Panamá

Cobre Panamá is a copper mine owned by First Quantum Minerals (FQML), a world leader in mining. Minera Panamá S. A. is the legal entity of the group in this country. It is the largest private investment project in the history of Panama at $6.7 billion. It celebrated its first ore on February 18, 2019 and its first shipment on June 14, 2019. It consists of four components: international port, power plant, ore processing plant, and the mine. Its benefits are tangible since, even before the start of the production stage, the company contributed $118 million in worker-employer contributions to the Panamanian Social Security Fund, $66.5 million to the sustainable development of the communities of Donoso, Omar Torrijos and La Pintada, $53 million to the country's environmental conservation, as well as payments to more than 1,850 Panamanian companies, and more than $17 million in training for Panamanian personnel. According to a report prepared by INDESA, more than 39,000 jobs in the country depend, directly or indirectly, on Cobre Panamá's operations.

Diversity in mining

While women like Nancy Lazo may still be a rarity in mining, digitalisation and automation might just be the drivers for change. Early on, women had been extensively involved in mining in different parts of the world. However, by the end of the 18th century during industrialisation, women were gradually excluded from mining. By 1934 a report to the International Labour Conference stated that "the employment of women underground in mines no longer exists, or is dying out, within the metropolitan territories of the States Members of the International Labour Organization". Today we see a paradigm shift as the benefits of greater inclusion of women and diversity in mining are increasingly recognised. This is fueled in part by evidence that gender-inclusive workplaces produce more balanced group dynamics and reduce wear and tear on equipment. As mining becomes more automated, arguments for a male-dominated sector become even more obsolete.

According to UNESCO, 35 per cent of students pursuing science, technology, engineering and mathematics are female. And while still woefully underrepresented, that is more women in the field than ever before.

World's largest 360 tonne trolley truck fleet

If one is as in love with operating heavy machinery as Lazo, Cobre Panamá is the place to be. With 38 Liebherr T 284s and a further eight already ordered, First Quantum operates the largest ultra-class truck trolley fleet in the world. The T 284 is one of the largest haul trucks in the world. It is eight metres high which means that if you stand in front of it your head might just reach the bumper. The smart design of the T 284 allows it to load an impressive 363 tonnes, effectively maximising payload while minimising cycle times. All T 284s at Cobre Panamá are further equipped with the Trolley Assist System which uses onboard pantographs to connect the trucks' drive system to overhead power lines on uphill haulage routes. When connected to the overhead power lines in trolley mode, the full power capacity of the electric wheel motors can be translated into uphill speed while the diesel engine idles, improving productivity while reducing emissions, fuel consumption, and operating costs. With growing political, as well as societal pressures towards more sustainable production, mining customers around the world are showing a greater urgency to reduce CO_2 emissions. Solutions such as Trolley Assist Systems present a step towards mine site electrification, paving the road for reducing emissions from mines in the future.

Available worldwide

Liebherr LR 13000
The Liebherr LR 13000 crawler crane in 1:50 scale is the largest LEGO® Technic model ever made. It was developed in cooperation with Liebherr and can be operated by remote control. With a height of 99 cm, a width of 28 cm and a length of 110 cm, the new model is the ultimate construction site experience.