Liebherr crawler cranes with special equipment at the new Niederfinow boat lift

- Two Liebherr LR 1600/2 cranes operated by Sarens hoist a total of 10,000 tonnes of concrete weights
- Liebherr meets customer's request for a bespoke heavy duty runner with a payload of over 100 tonnes
- The new boat lift will transport boats and tug and barge combinations up to 110 m in length as from 2017

Ehingen / Donau (Germany), 18 January 2016 – One of the most impressive industrial monuments in Germany has been providing reliable service for more than 80 years: the boat lift in Niederfinow on the Oder-Havel Canal. On this waterway which connects Berlin to Szczecin in Poland, the boat lift helps traffic to overcome a 36-metre elevation. The vertical lift hoists barges up to 80 metres in length using a massive water trough which can be closed like a lock chamber.

But over the decades this imposing product of German engineering has become too small. Longer inland vessels and container ships with higher superstructures will not fit into the trough whilst tug and barge combinations must be lifted separately. So for the last seven years a more powerful lift for barges has been under construction a stone's throw away. Two Liebherr LR 1600/2 crawler cranes have been fitting concrete blocks weighing a total of around 10,000 tonnes to the new lift over the last few months. These will be used in the future as counterweights for the water trough and the vessels. The cranes needed particularly long runners with a large load capacity to install the counterweights into the structure.

The standard runner for this Liebherr crawler crane has a capacity of 36 tonnes and is two metres long. For this project, however, the customer, Belgian crane and transport specialist Sarens, asked Liebherr for a runner with a length of five metres and a capacity of 104 tonnes. And the engineers from the Ehingen crane plant delivered.

Only with this angled attachment was it possible for the cranes to swing their lattice mast below an interfering edge of the building and lowered the hook block from above

through the car slings for the counterweights. Each hoist raised two ballast blocks weighing a total of 89 tonnes to a height of around 40 metres into the pre-assembled frames and then attached to the lift's steel cables which are as thick as a person's arm. The car slings later surround the entire weights in the various gaps to act as safety devices. In the event of a cable tearing, the released concrete block would be held by the cables around the other weights.

The two crawler cranes and the installation teams always worked at the same level on both edges of the new boat lift. For static reasons the counterweights had to be installed almost synchronously. The boat trough on which large tensile forces act through the steel cables must not be exposed to one-sided loads for long periods of time. There are also thousands of sandbags in the belly of the 115 metre trough. The more counterweights were attached, the more of these big bags were required to keep the trough on the ground.

It was not an easy task for Sarens to plan two suitable, identical crawler cranes for this job. The company has eight LR 1600/2 cranes in its fleet "Four of them are in Canada, one each in Saudi Arabia and Kazakhstan and we only have two in Europe. So we had to have these two cranes at the same time on the site in Niederfinow", explained Hendrik Sanders, Equipment Engineer and crawler crane expert at Sarens. "That became a major headache for our schedulers."

The new Niederfinow boat lift is not due to go into service before 2017. By then 65,000 cubic metres of concrete and reinforced concrete will have been installed in this enormous lift which will cost 300 million euros.

From pile driving the first sheet pile walls using Liebherr hydraulic rope excavators at the start of the project in 2008 to the current installation of the counterweights by the two Liebherr crawler cranes, a large number of construction machines supplied by the group of companies has been used to build the new lift. In addition to machines from the division earth moving, four large Liebherr top-slewing cranes and several mobile cranes have also been used.

Caption

liebherr-lr-1600-2-sarens-niederfinow-1.jpg
A lift of superlatives: the new boat lift in Niederfinow, north east of Berlin.

liebherr-lr-1600-2-sarens-niederfinow-2.jpg
Real heavyweights: the counterweights are in the bottom storey and are lifted out in pairs.

liebherr-lr-1600-2-sarens-niederfinow-3.jpg
The mast tip swings under the floor of the cable pulley hall and pulls the concrete weights into the car sling from below.

liebherr-lr-1600-2-sarens-niederfinow-4.jpg
Like looking in a mirror: static reasons the counterweights have to be suspended on both sides of the new structure almost simultaneously.

liebherr-lr-1600-2-sarens-niederfinow-5.jpg
Gap between hook block and roller set: this runner designed at Liebherr's plant in Ehingen can be operated with a maximum of 6-way reeving – the fixed point of the rope is immediately above the roller set.

liebherr-lr-1600-2-sarens-niederfinow-6.jpg
The hoisting study shows the requirements for lifting the counterweights into the building.

liebherr-lr-1600-2-sarens-niederfinow-7.jpg
New lift – old principle: the trough and counterweights are connected with steel cables using massive return rollers just as in the existing boat lift.

liebherr-lr-1600-2-sarens-niederfinow-8.jpg
Millimetre precision: maximum concentration on the faces of the fitters and crane drivers threading the load into the car sling.

liebherr-lr-1600-2-sarens-niederfinow-9.jpg
A look into the lift's inner workings. 5,200 sandbags in the 115-metre trough simulate the weight to be hoisted when the lift is in operation.

liebherr-lr-1600-2-sarens-niederfinow-10.jpg
Liebherr dominance: In the foreground an LTM 1130-5.1 drawing in the steel cables. In the background an LTM 1160-5.1 and top-slewing cranes from Liebherr.

liebherr-lr-1600-2-sarens-niederfinow-11.jpg
Impressive: The steel cables run in giant pulleys on which the trough and over 200 weights for the lift will be suspended.

liebherr-lr-1600-2-sarens-niederfinow-12.jpg
Great engineering using 18,000 tonnes of steel: the old Niederfinow boat lift with a small pleasure craft in the trough (rear right).

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