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One coil crane instead of two

Innokran and STAHL CraneSystems supply customised 20 t crane

In one of Kienle+Spiess' buildings in Sachsenheim near Stuttgart, sheet steel coils are unloaded from goods waggons and lorries, stored, processed and loaded onto lorries again. The coils, weighing up to 10 tonnes, were previously transported with the aid of three cranes. Two of these cranes dating from 1966 now had to be replaced: regular repairs, expensive maintenance, and mounting downtimes ran up annual costs of between 20,000 and 30,000 € in recent years and spoke in favour of investing in a new crane system.

However a number of questions had to be clarified beforehand: does the company actually need a crane, or could the coils also be transported by a heavy load forklift? Not only the increased space requirement on the ground and loss of time entailed in manoeuvring the forklifts argued against this. Kienle+Spiess' management was unwilling to accept the increased safety hazards caused in particular from added movement underneath the third crane, which is still required for loading and unloading the lorries.

Kienle+Spiess thus decided on a new crane. Their idea: a new, faster crane system with 20 t S.W.L. was to replace the repair-intensive 13 t cranes and provide additional scope for future increases in capacity. The design engineers of Pleidelsheim crane builders Innokran embraced the challenge and developed the appropriate solution using crane components from STAHL CraneSystems.

Kienle+Spiess: "Don't react, act"

Kienle+Spiess was founded in Sachsenheim in 1935. The company soon became the most significant supplier of stampings and diecastings for manufacturing electric motors and generators. Kienle+Spiess has been able to maintain this strong market position up to the present day. In line with its motto "Don't react, act", the company seized the initiative and

placed the order with Innokran for building this exceptional crane solution. Exceptional in more than one regard: the existing crane runway, a relatively low ceiling and a 5.30 m high stamping press standing in the middle of the building did not give the designers much scope to fit the big double girder overhead crane with double rail crab and operator's cabin into the building. Only 10 cm clearance to the cabin remain when the crane travels over the stamping press, too little to meet safety regulations. For this reason Innokran planned a detour around this area in normal operation. Only for maintenance work or changing tools on the stamping press can the crane operator temporarily bridge this detour with a key switch.

The existing crane runway was only designed for the wheel loads of the 13 t cranes. In order to be able to operate the new 20 t crane on the existing runway, the higher load had to be distributed over more wheels. Innokran's solution: the crane runs on four STAHL CraneSystems crane endcarriages with a total of 8 wheels. Thus the load on the individual wheel is lower, in addition the outside wheels are farther apart distributing the forces on the crane runway over a longer distance.

Sensitive control from a bird's eye view

The crane is controlled either from the operator's cabin or by radio remote control. For Kienle+Spiess the decision to include for an operator's cabin was obvious: the crane operators would have to walk long distances in the 65 m long building. Also taking up and positioning the heavy coils is easier with a bird's eye view. Frequency inverters on the travel motors and the hoist permit smooth acceleration and sensitive hoisting processes, facilitating fast, accurate work and offering increased convenience for the crane operator in the cabin.

Mature technology for high standards

Segment laminations for wind generators, lamination packs for traction motors and armatures for universal motors: Kienle+Spiess' product range covers all areas of application for electric motors and generators. The products are in greater demand today than ever and the Swabian company's order situation is healthy. The stampings are produced in two shift operation, thus making correspondingly high demands on the new crane. High-load periods are in particular mornings and early afternoons when the lorries are loaded and unloaded and the coils have to be moved inside the building. The high FEM classification of the hoist M7/4m (for 20 t) and M8/5m (for 16 t maximum working load) meets this sustained demand. Innokran mounted two robust AS 7 wire rope hoists from STAHL CraneSystems on the crab as lifting equipment. The so-called twin AS 7 ZW was able to bring many of its advantages to bear here: its compact construction pays off in view of the low ceiling height, the high hoisting speed met Kienle+Spiess' requirement of replacing the two scrapped cranes with a single crane. The counter-rotating ropes prevent horizontal hook movement and permit even heavy loads to be set down extremely precisely. This makes handling the coils faster and safer.

In addition to the twin hoist, the whole crane control including frequency inverters is mounted on the crab – an off-standard design from STAHL CraneSystems, enabling

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Innokran to test the hoist and crane electrics before they were mounted on the crane bridge. STAHL CraneSystems' multicontroller SMC is another piece of off-standard equipment. This component guarantees continuous load measurement by means of an analog load sensor and disconnects the hoisting motion at overload. The SMC calculates the load spectrum, the number of operating hours and full load operating hours, it documents motor switching operations and other operating data. The main criteria such as displaying when a general overhaul is due can be seen from dials, all other data can be read out with a notebook. A further function is the integrated motor management to reduce wear on the system: this includes preventing of inching operating at fast speed, starting and braking via slow hoisting speed, and monitoring the hoist motors' ptc thermistors.

Modified by experts

Innokran scheduled three weeks from dismantling the old cranes up to commissioning the new system. Apart from Innokran's experts' experience, the third crane operating at a higher level was of assistance, loading the bisected old crane bridges onto lorries. As the new crane has a span of 34.8 metres, the tricky job of installing the two new box girders was precision work, but everything proceeded according to schedule. The system has been in continual use since the beginning of 2013, achieves the projected efficiency in material handling, and Kienle+Spiess' crane operators are enthusiastic too.

Keystrokes:

Photo material:



The new 20 t crane is used for lifting heavy coils. The load is distributed over four crane endcarriages and 8 wheels.

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The crane operator has an ideal view from the cabin. Kienle+Spiess deliberately decided against a motor-driven rotating hook as the crane operators are accustomed to turning the beam by touching the coils.



The cabinets for crane control and frequency inverters were designed to fit onto the crab. Both crab and crane bridge are accessible via maintenance catwalks.



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Compact hoist for maximum working loads to over 100 tonnes: the twin-version AS 7 ZW.



A tight fit: the clearance between stamping press and operator's cabin is only 10 centimetres. For this reason the crane must detour the central area of the building during normal operation.