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STAHL CraneSystems GmbH
Daimlerstraße 6
74653 Künzelsau

Your contact for questions on the content:

Heike Metzger
Tel. +49 7940 128-2388
Fax +49 7940 128-2300
heike.metzger@stahlcranes.com
www.stahlcranes.com

Author:

Dipl.-Ing. Jan Türk
VISUELL Studio für Kommunikation
Tel. +49 711 64868-0
jan.tuerk@visuell.de

Sophisticated control for Siemens

Upgrading from 16 to 32 tonnes safely in "Performance Level d"

SIEMENS produces large electric motors in the former Loher factory in Ruhstorf in Bavaria. Demand for these motors is increasing, their output and thus their weight too. The existing crane system comprising two 16 t cranes on a 16 t crane runway was no longer adequate for transporting the finished motors. SIEMENS was looking for an experienced crane builder to upgrade it, who would be able to reinforce the old concrete crane runway to a safe working load of 32 tonnes and replace the 16 t cranes by two 32 t cranes. STAHL CraneSystems' partner "Haslinger Metallbau+Krantchnik", led by project engineer Herbert Mirwald, developed a customised crane system which met all requirements and kept to the tight budget specified by SIEMENS. CraneKits comprising four 32 t wire rope hoists from STAHL CraneSystems and support from an experienced control manufacturer made it possible for Haslinger to produce this customised solution.

First of all, company director Karl Haslinger, in cooperation with the Schwitz structural engineering bureau, developed an underpinned steel structure to "upload" the crane runway. Two cranes with a safe working load of a maximum of 32 tonnes can thus move on different sections of the reinforced crane runway. The load capacity in the vicinity of the pillars is considerably higher even. However in practice, the cranes rarely work at full load. On the other hand, the two cranes must be able to work parallel to one another with as little space between them as possible in order to make optimum use of the production area. "This was a real challenge as regards control technology and system classification," says Herbert Mirwald and explains: "If for example a component such as the load control should fail and an overload come about, the crane runway could be fractured – we had to make sure this couldn't happen of course." Haslinger found expert support for this challenging problem from a well-known German control manufacturer. Working together,

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the crane specialists were able to upgrade both the control and the STAHL CraneSystems CraneKits to meet the required classification.

All four hoists were equipped with redundant load cells to monitor the hoisted load, in addition Haslinger installed a fail-safe position encoding system for the crane travel drives and a fail-safe system for data transmission between the cranes. The SIEMENS S7 control is the heart of the system which has been independently classified by the TÜV in Category 3 in compliance with DIN EN 954 and in Performance Level d in compliance with DIN ISO 13849-1. The control registers the positional data and the distance between the two cranes and the load currently suspended from each of the four STAHL CraneSystems AS 7 wire rope hoists. Hoist and travel motions are enabled or disabled subject to all measured data. Thus two cranes can work at close quarters in the same crane runway section as long as their total load does not exceed 32 tonnes. If the cranes are on the left and right near to one of the pillars, the control permits the full load to be taken up by both cranes. Each 32 t crane is itself equipped with two 32 t wire rope hoists, enabling the heavy SIEMENS motors to be lifted and rotated with two hooks. In addition, tandem operation of the two crabs is integrated into the S7 control. However tandem operation of the two cranes is not provided for.

In the end, Haslinger's in-depth customer-oriented consulting and their suggestion of having the whole situation classified by an independent test institute such as the TÜV were instrumental in gaining the order. "This project has demonstrated once again that we offer our customers one-stop shopping – from spare parts right up to this sort of challenging system," says Herbert Mirwald. The first construction stage was tested in July 2012 and has been in fault-free operation ever since. The cranes are mainly used to transport the ready assembled motors within the building, load them onto the paint-spraying line and from there onto lorries. A second construction stage in a second aisle of the building is under construction at present and will be commissioned in autumn 2013.

Photo material:



SIEMENS manufactures electric motors in its Ruhstorf plant. The crane system was upgraded from 2 x 16 to 2 x 32 tonnes S.W.L. in order to be able to transport the increasingly large and heavy motors.

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Two crane bridges, four wire rope hoists, one customised control: Haslinger's crane system is anything but standard. On the left of the photo: the paint shop.



Each of the wire rope hoists can lift 32 tonnes, each crane is designed for 32 tonnes and the crane runway between the pillars is also designed for 32 tonnes. Position detection and load measurement and evaluation in a Siemens S7 control guarantee safety.



Crane builder Haslinger uses STAHL CraneSystems' AS 7 wire rope hoists when high performance and reliability are required.

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The wall in the background can be swivelled back so that the cranes can move into the neighbouring aisle to load the motors onto lorries.



High-tech on the crane: position detection by means of drive belt (shown centre) and fail-safe data transmission.