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- Modernisation of three suspension cranes in a hangar  
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STAHL CraneSystems \_ Crane technology made to measure >>>



Automatic crane for organic substances heating and power station Pfaffenhofen

**Crane type** Automatic crane for handling bulk material \_ **S.W.L.** 5,000 kg \_ **Span** 24.1 m \_ **Hoisting speed** 12/2 m/min  
**Runway length** 65 m \_ **Control** Optional, either automatic with SPC, or manual with radio transmitter \_ **Scope of supply** Complete crane system including crane bridge, runway, bulk material grab, position encoding system and SPC control

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**STAHL**  
CraneSystems



Lifting technology | Drive technology | Control technology

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Wood chippings from forestry are delivered by lorry from neighbouring districts. During unloading the side flap of the lorry is opened, at the same time the lorry, safely lashed in position on a hydraulic platform, is tilted around its longitudinal axis to permit all the chippings to be unloaded into the bunker.



The organic substances heating and power station in Pfaffenhofen on the Ilm was commissioned in 2001. It processes approx. 80,000 t organic substances per year. The main products of the ultra-modern plant are district heating and power. In addition, a local foodstuffs manufacturer is supplied with process steam.



The crane with 24 m span is equipped with two load ropes which ensure that the bulk material grab is stable in operation and does not swing. The grab has a volume of 5 m<sup>3</sup> and was designed specifically for the requirements of the material to be handled.



In the area where the lorries move (to the left in the photo) the crane bridge was given a special offset design to permit the high lorry superstructures to be tilted.

**In an era when fossil fuels are becoming scarcer and more expensive, generating energy from organic substances continues to grow in importance. One of the most up-to-date organic substances combined heating and power station has been in service in Pfaffenhofen, 30 km north of Munich, since 2001. The fuelstuffs are wood chippings from sawmills and small gauge wood from forestry. The 28 MW combined heating and power station generates district heating for the town of Pfaffenhofen and process steam for the well-known baby food producer Hipp.**

**Starting situation** In the most up-to-date organic substances heating and power station in Germany, a 5 MW turbine generates electrical energy which is fed into the public mains system. In order to generate this amount of energy, the wood-burning furnace must be supplied with around 30 m<sup>3</sup> wood chippings per hour right around the clock. Side-tipping lorries deliver the fuelstuff and tip it from a platform installed along the long side of the building onto three tipping points, two of which are equipped with sliding trays to feed the wood-burning furnace. After delivery, the material is transported by the automatic crane to the storage area and from there to the sliding trays as required.

**Requirements** The reliable supply of wood chippings to the furnace is decisive for the long-term economic efficiency of an organic substances heating and power station – thus only high-performance technology and know-how can be considered. In addition to the requirement of a high turnover in loading and unloading the constant operation and the desire for automation were decisive criteria when designing the crane system. Both specialist knowledge regarding the mechanical design of the material handling and high engineering competence on electrical equipment are in demand in projects of this kind. The customer was convinced by the concepts presented by STAHL CraneSystems' project engineers.

**Realisation** Off-standard requirements demand particular engineering solutions. Thus it is no surprise that Kraftanlagen Anlagentechnik München GmbH commissioned the Munich branch of STAHL CraneSystems to supply the fully automatic grab crane. The double girder overhead travelling crane from STAHL CraneSystems has a span of 24 m and travels at a speed of up to 80 m/min on a 65 m long crane runway, also supplied by STAHL CraneSystems. The heart of the crane is a

special double rail crab equipped with a tried-and-tested wire rope hoist with two rope lead-offs. The wire rope hoist has an S.W.L. of 5 t which is practically fully utilised in every lifting cycle. The grab has a deadweight of 2.2 t and the weight of the wood chippings varies from 200 to 400 kg/m<sup>3</sup>. The crane, whose long and cross travel drives are equipped with frequency converters, is controlled from a control centre. For non-standard procedures, a radio remote control is provided with which all crane functions can be operated manually. The 65 m long and 14 m wide storage area is divided into five zones with twelve grab positions in each. These X and Y coordinates are permanently stored in the control of the automatic crane, a Siemens SPC S7. The filling heights of the storage area and the amount of fuel on the sliding trays are constantly registered by three Leuze laser scanners. This ensures a reliable supply of fuel and efficient storage and removal. A fourth laser scanner detects when lorries are tipping and prevents a possible collision with the grab when it is in automatic operation. The 24 m automatic crane was equipped by STAHL CraneSystems with the WCS2 contact-free positional measurement system both on the crane runway and on the crane bridge. This tried-and-tested system continuously transmits the position coordinates of

crane and crab to the Siemens SPC via an interface module with Profibus interface. The data are transmitted to the control via the SLB4 conductor line bus. This type of data transmission eliminates cables which are susceptible to faults. In addition, an SMC1 Multicontroller monitors the wire rope hoist and registers all operating data.

**Result** The crane has been functioning smoothly in three-shift operation since June 2001 and transports up to 50 m<sup>3</sup> wood chippings per hour. The structural steelwork of the crane system was manufactured in STAHL CraneSystems' Ettlingen crane factory and completed on site by fitters from the Munich branch office. This project came into being in close cooperation with Wildmoser Steuerungstechnik GmbH, Schweitenkirchen, together with whom STAHL CraneSystems has already successfully equipped automatic cranes in the past. The crane has been performing its duties reliably for five years now. According to the operator's statistics, the whole system was in operation for 8,446 of a total of 8,760 possible hours in 2004. The crane was reliably at the operator's disposal during the whole operating time.