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New liquefied gas terminals in China Some more LNG wire rope hoists from STAHL CraneSystems in action

China is continuously expanding its energy production, but is also progressively reliant on energy imports to meet its rising demand for energy. The People's Republic is focussing increasingly on importing liquefied natural gas (LNG). Cooled down to -160°C , LNG is transported by tanker, for example from Australia or the Middle East, to LNG terminals on the coast of China, where it is stored temporarily. LNG is regasified by being heated in gasification plants and then pipelined to the interior. China has set up a total of 10 of these terminals in the past year, two more plants are to be commissioned in 2014. Explosion-protection technology is in demand wherever explosive gases are involved. As a specialist for explosion-protected crane technology, STAHL CraneSystems has been producing off-standard hoists specifically for LNG plants and gas tanks since 1997. The Künzelsau company has supplied a total of 15 Ex hoists for gas tanks in 12 plants in China. The final two hoists were mounted on two LNG tanks in the North of China in May 2014. The order was processed by STAHL CraneSystems' Chinese subsidiary, based in Shanghai.

Hoisting operations in Ex Zone 2

Most LNG tanks have a heavyweight pump on the base which pumps the cooled liquefied natural gas out of the tank. For maintenance, or during a breakdown, the pump must be lifted out of the tank – a manoeuvre which, due to the tremendous differences in temperature and the explosion hazard from evaporating gas, makes the utmost demands on the skill of the engineers and the reliability of the apparatus used. This is where STAHL CraneSystems' crane technology comes into the fore. In the current project in North China, off-standard wire rope hoists from the field-proven SH 60 ex series, certified for explosion protection Zone 2 in accordance with ATEX are used. The hoists are mounted on slewing cranes on the roofs of the liquefied gas tanks and have a safe working load of 3.5 tonnes and a lifting height of 58 metres.

Sophisticated off-standard equipment

The hoists were optimised for use on the Chinese LNG tanks by modifying their controls and fitting off-standard rope drums. The customer specified both the rope diameter and the ratio of rope diameter to rope drum diameter. Meeting these requirements was not possible with the standard SH 6 rope drum. STAHL CraneSystems thus manufactured a customised rope drum based on the standard SH6 drum (Ø 352 mm), however with a centre diameter of 457 mm. In this way the customer's specifications could be met - while maintaining the frame geometry of the hoist and continuing to use the field-proven rope drum brake from the series hoist.

An off-standard rope, permanently attached to the pump and remaining in the tank's maintenance shaft during normal operation, is used to lift the pump. When the shaft is opened this rope must be attached to the rope drum of the LNG hoist by three rope clamps. STAHL CraneSystems has equipped its wire rope hoists with additional key switches on hoist and control pendant to facilitate substituting the rope. The engineers can bridge the emergency hoist limit switch by pressing a button and thus unwind the final rope turns from the drum. The saline air and the harsh coastal climate made corrosion-resistant paint necessary. A housing protects the hoist from adverse weather conditions when it is not in use, as months, even years, may lie between maintenance operations.

Individual safety

The safety requirements for LNG hoists vary according to purchaser and country of destination. The highest standards are met by the wire rope hoists for Qatargas which STAHL CraneSystems supplied in 2009. They have fully redundant design and a rocking suspension, hoisting proceeds smoothly even in the (improbable) event that a rope should break. These are regarded as the safest hoists on the market.

Partner for international projects

STAHL CraneSystems has acquired the expertise to build off-standard hoists of this kind over the last 120 years: the company has been building hoists since 1893, and began developing explosion-protected products in 1926. STAHL CraneSystems has had perceptible influence on the advance of crane technology with its numerous innovations in this field. The experience and knowledge gained over many decades, our own basic research, approvals from the Federal Physico-Technical Institute (PTB) and other test institutes around the world make the crane technology experts from Künzelsau highly professional partners for major international projects. STAHL CraneSystems has nine subsidiaries and a close-meshed network of sales and trading partners in order to provide optimum service to customers all around the world. The above project was quoted in May 2013 by STAHL CraneSystems' subsidiary in Shanghai, and was fully supervised from China right up to commissioning in May 2014.

Photo material:



A maintenance crane for lifting the liquefied gas pump out of the tank is mounted on each of the 40 m high tanks. Pillar slewing cranes are always used on LNG tanks if other components within the radius of the jib need to be lifted.



The housing protects the hoist from wind and rain.



The slewing cranes are equipped with maintenance platforms on both sides to afford better access to the hoist when substituting the rope.



Appearances can be deceptive: saline air and the harsh coastal climate place great stress on materials. Robust technology and corrosion-resistant paint ensure that the maintenance crane is always ready for use.



STAHL CraneSystems' specialised LNG hoists are ATEX certified and thus approved for use in hazardous areas.

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STAHL CraneSystems designed a customised rope drum to meet the customer's specifications.



The standard wire rope is used for opening the maintenance shaft. When the pump is lifted, the standard rope is removed and the off-standard rope from the pump reeved onto the rope drum.