



Anti-collision system with redundantly designed distance measurement

The challenge

Salzgitter Flachstahl GmbH, the largest steel subsidiary in the Salzgitter Group, produces about 4.6 million tonnes of steel each year. With its extensive investments in new plant technology, Salzgitter Flachstahl guarantees compliance with all quality standards into the future. The company also sets the highest standards of safety for its workers while simultaneously maintaining high workflow efficiency. For this reason, potential crane collisions must be recognised and avoided without exception.

The solution

An automatic anti-collision system is to guarantee complete protection from collisions. The redundantly designed system should deliver constant position data in the close-up range, including data monitoring at any distance between the individual cranes in the input stock area of the hot strip mill. GIPA mbH, the company commissioned to implement the project, has been utilizing Symeo LPR® sensor technology to ensure absolutely fail-safe operation.

The project's success

LPR® sensors attached to gantry and overhead travelling cranes provide paired measurements of their relative distance and speed to one another at rates of up to thirty times a second. Two sensor pairs enable redundant measurements, ensuring maximum data quality and fail-safe collision avoidance. The project's success up to now and the fail-safe anti-collision system were convincing: Symeo sensor technology will be used to upgrade additional cranes.

Highest standards of safety

“Both of the manually controlled gantry and overhead cranes move on different levels, so it is possible that their paths could cross. There is a danger that the leg of crane 55 could collide with the operator’s cabin on crane 43,” explains Sandro Wicher, project manager for Salzgitter Flachstahl. Since such situations can lead not only to material losses and downtimes, but also to personal injuries, an anti-collision solution has to satisfy very demanding safety standards.

Sensor technology for fail-safe analysis

Herbert Behr, the managing director of GIPA mbH, describes the high standards for sensor technology: “It is crucial that the sensor technology is suited for use with industrial-grade components in outdoor locations. In addition to offering IP65 protection, the sensors have to be able to constantly deliver exact data, without long service or calibration times, under any conditions that might exist in Salzgitter Flachstahl’s outdoor areas.”

Constantly exact measurements

Salzgitter Flachstahl and GIPA decided to implement the LPR® system from the Munich-based firm Symeo GmbH. Mr. Behr says, “Symeo’s distance measuring system is the only solution on the market that fulfils the high standards of this safety-oriented application. With

LPR®, you don’t have to wait until an object is close by or visual contact is made before measurement can begin. LPR® enables measurement over large distances of several hundred meters. This is the only way to enable continuous and exact distance measurement, which allows the entire system to be monitored for constant, accurate and consistent functionality.”

Proven standard application

The entire system is designed to meet the standards for worker protection. Once Salzgitter Flachstahl formally accepted the fail-safe solution for both cranes, they made the decision to deploy the solution throughout their entire line. “We are very satisfied with the technology and with how well the project has run. We will continue to use Symeo in future projects,” says Mr. Wicher, project manager for Salzgitter Flachstahl. There are plans to equip more crane runways with Symeo sensor technology. “The implementation of our standard LPR®-1D product in Salzgitter’s specific system solution demonstrates the wide field of application for our technology,” says Christoph Rommel, Symeo’s managing director. Drawing on the positive results obtained at Salzgitter, Symeo is currently planning, in cooperation with the German employers’ liability insurance association, to bring an LPR® system into series production by 2009 that meets EN norm 954-1 certification standards.

Salzgitter AG

With 10 billion Euros in external sales, production of over 7 million tonnes of crude steel and almost 24,000 employees, Salzgitter AG is one of Europe’s leading steel technology companies. Salzgitter AG is among the top five European companies in the high-quality profile and flat steel product sector, is Europe’s number one in the standard conduit and precision tubing sector, and is the world leader in the large diameter pipe market. With its holdings in Klöckner-Werke AG, Salzgitter AG is a leading provider of filling and packaging technology. The company, which encompasses over 100 national and international subsidiaries and associated companies, is divided into business units for steel, business, tubes, services and technology.
www.salzgitter-ag.de/en/

GIPA mbH

GIPA sees itself as an engineering office and software provider for all industrial electrotechnology and automation sectors. GIPA offers services that include consulting, functional design specifications, hardware planning and implementation, software development, control cabinet construction and installation, system commissioning and training, as well as service and maintenance. In the specific field of automation, the firm offers software development services and the supply of functional units for the step-wise automation of cranes.
www.gipa-online.de

Symeo GmbH

Symeo GmbH develops and markets systems for precise and contact-free distance measurement, position detection and collision avoidance. Symeo products are suitable for cranes, industrial vehicles as well as for other transport methods. Furthermore, the company develops customer-specific telemetry and smart metering solutions, which fulfill relevant standards (e.g. EN 50463). Symeo products are robustly designed and well-suited for applications in harsh industrial environments indoors and outdoors.

Symeo’s patented LPR® offers a wireless and real-time system for precise positioning and distance measurement that is ideally suited for industrial applications. Symeo also provides industrial GNSS receivers that can be combined with LPR® and other motion and inertial sensor systems, enabling highly available and precise positioning even under the most adverse conditions and in areas with limited satellite availability.

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- Redundant sensor technology based on the Symeo LPR®-1D system
- Constant position and movement determination
- Typical measurement accuracy of ± 5 cm
- Measuring range between objects up to 1,800 m apart
- Complete fail-safe solution