

Maximum Protection through Reliable Positioning of the Fall Protection System

Optimizing the Functional Safety
of an Existing Plant at
VOORTMANN GmbH & Co. KG

The Customer

VOORTMANN specializes in services for control, compressed air, loading, and spraying systems. The company from Issum am Niederrhein, Germany, offers a comprehensive range of services to keep plants running optimally.

VOORTMANN offers plant engineering, commercial, and spare parts services relating to pneumatic systems, compressed air, hydraulic systems, electrical engineering, and loading and spraying technology. In addition, the VOORTMANN Academy offers a comprehensive technical training program in the areas of hydraulic systems, pneumatic systems, and electrical engineering.

With a workforce of more than 120 people, the company handles the project management process and the scheduled maintenance of plants. Ensuring the highest quality is of great importance to VOORTMANN—the regular certifications awarded to the company attest to its focus on continuous development and quality assurance.



The Initial Situation

Around 40 percent of all chemical products transported are hazardous substances. Around 60 percent of these products are transported by truck and 12 percent by rail. However, filling road vehicles and tank wagons is not a standard procedure—the vehicles are not uniform and the products (gases, liquids, or granulates) can vary greatly.

Any manual activity required when filling hazardous substances increases the risk of people coming into contact with the medium or of environmental contamination. Work with hazardous substances that may cause an explosion is especially risky.

Workers fill the road vehicles or tank wagons from a platform positioned directly above the vehicles, which can be up to four meters high. VOORTMANN has already developed a wide range of fall protection systems for use in such scenarios. These are tailored to the specific loading requirements on-site, therefore optimally ensuring the safety of employees. However, manual activities must also be performed, requiring employees to make individual decisions that can have a major impact on process safety.

The Solution

The position of the lifting platform on the tank wagon is monitored by a photoelectric sensor. This detects and reports incorrect positioning to prevent collisions between the lifting platform and railings on the tank wagon, for example. Automatic verification protects personnel and plant. The filling process can be initiated without extensive control measures.

To enable this process, Pepperl+Fuchs developed a 2-D laser sensor in an explosion-protected housing. The R2000 2-D

LiDAR sensor has proven to be highly precise and reliable when used for positioning tasks in factory automation. The device maps its environment in real time using a very high frequency.

The sensor is mounted under the platform railing at the height of the filling device and is clamped into position facing its scanning field. Installing the sensor in the enclosure at a 15° angle prevents refraction from scattering and distorting signals. The scanner functions as follows: If, for example, the lifting platform is lowered too close to the tank carriage and interrupts the specified scanning field, the sensor triggers a dual warning—a flashing light and audible signal. In addition, the movement of the lifting platform is interrupted. The platform operator is therefore prompted to move the lifting platform to the right position.

The R2000 2-D LiDAR sensor has been equipped with a special housing for this type of application. An Ex d rated aluminum housing developed by Pepperl+Fuchs was used. An integrated viewing window gives the sensor a “clear view” without impairing the signal quality. With this housing, the device can be used in Zones 1, 2, 21, and 22. Due to its extensive certifications, the device can be used virtually anywhere in the world. It is mounted in the optimal position via a bracket and is directly connected to the signaling devices, with no need for a control system.

This enables VOORTMANN and its customers to install the system flexibly without modifying the existing infrastructure at the respective plant.

Reliable position assurance protects employees and plants, ensuring safe processes, accelerating the filling process, and preventing avoidable interruptions to operations.

For more information, visit: pepperl-fuchs.com/px-solutions

