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CASTROL CHEMICALS PLANT FOUNDATION FIELDBUS SYSTEM, ANTWERP, BELGIUM

In 2000, Castrol NV awarded Fisher-Rosemount (now Emerson Process Management) the contract to build the first FOUNDATION fieldbus in its Antwerp chemicals plant, Belgium. The plant automation contract was part of a project to modernise the tank farm at the chemicals plant. The system had to meet certain requirements, including the required standards in density adjustment, good standards in leak detection, simplicity of installation, simplicity of operation and advanced diagnostics. The integrated automation system included a process control system, asset management systems, level measurement instruments and other elements.

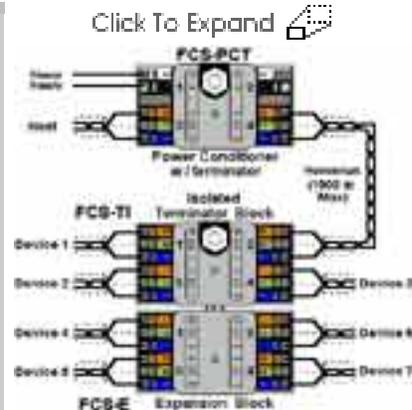
DENSITY ADJUSTMENT

Because of the variety of products and different densities of media to be stored in the system, the fieldbus system created parameters so as to eliminate the need for repeated readjustments of level measurements.

ADVANCED DIAGNOSTICS

The fieldbus system is able to predict and warn if any of the connected devices (for example a level transmitter) are no longer working optimally. This is in accordance with quality control of the linked instrumentation. Status and diagnostics must be accessible on-line. This assures the user that both leak detection and overfill protection are functioning properly.

REGULATORY PRESSURES AND LEAKAGE



The topology of FOUNDATION fieldbus uses a power source at the control room end of the fieldbus segment. By using a Power Conditioner with a fieldbus terminator built into it, the number of connector blocks is minimised.

DETECTION

Castrol NV must comply with certain statutory environmental regulations concerning leakage detection which the fieldbus system is designed to overcome. By identifying if no transaction has been performed in the vessel, the system should automatically determine whether a drop in level means that a leak has occurred, in which case it should trigger an alarm signal. The automation also protects by preventing the tanks from over-filling as an alarm will sound once the pre-set level has been exceeded.

THE DELTA V SYSTEM

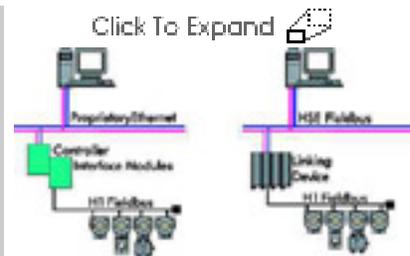
A Delta V system was attached to the existing AMS package (Asset Management Solutions). AMS uses bi-directional communication between the field devices and the process control system. This communication makes it possible to change on-line parameters, to configure transmitters and to archive documentation and diagnostic information. This is essential for ISO-certification. Thanks to the advanced diagnostics, the number of metering devices could be reduced to one at each measuring point.

WIRING COSTS

Providing such a tank farm with new cabling in the traditional way would be costly in both time and money. The FOUNDATION fieldbus technology is a better means of meeting the requirements. More than 65 hydrostatic level measurements are linked to the DeltaV "PlantWeb builder system," using only five FOUNDATION fieldbus segments. This greatly reduces the wiring and installation costs.

GREATER INSTRUMENT ACCURACY

In addition to low installation costs, the measurements are now more accurate as a result of the use of digital technology. This eliminates the typical analogue instrument accuracy loss of 0.2% -



One of the main advantages of a fieldbus system is that it no longer relies on proprietary devices or networks.



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1% when converting the measurement range. To facilitate a flawless start-up, a FAT (factory acceptance test) was first carried out at the company office in Diegem.

INSTRUMENTATION AND CABLING

The instrumentation and cabling were installed in collaboration with Castrol's technical service. The level transmitters are not polarity sensitive and, like the cable, were delivered complete with factory installed fieldbus connectors. This means that the actual transmitter connection time is minimal. The "auto-sensing" mode ensures that all the connected transmitters report automatically to the system without any manual intervention.

Each device has its own icon and tag so that it can be recognized in Navigator or Explorer software. Both device and cabling are diagnosed simultaneously. This is enabled by embedded DD technology.



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Castrol's lubricant plant is located in Antwerp, Belgium. This gives it excellent communication links through the port and the road and rail networks.

SPECIFICATION

FEATURED SUPPLIERS

[NEL Frequency Controls Inc - Hercules Encoders and Potentiometers \(Handling Systems and Components\)](#)

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