

OXEA Reduces Maintenance and Unit Operating Costs with Improved Distillation Column Level Measurement

RESULTS

- Improved unit efficiency by 10 percent
- Higher throughput and longer production cycles
- Reduced maintenance time by 40 percent and replacement costs by 40 percent
- Reduced spares



“We have reduced our maintenance time on this unit by nearly 40 percent, and have longer production cycles with fewer shutdowns and startups due to maintenance issues. We have also been able to raise the upper limit of the level measurement, (which) has made our unit more efficient.”

Herr Andreas Busch-Ahlschläger
I&C Engineer

CUSTOMER

OXEA Produktions GmbH & Co. KG, Marl, Germany. OXEA is a world leader in Oxo chemicals, producing more than 70 Oxo intermediates and Oxo derivatives for customers in a wide range of industries and end market applications.

APPLICATION

DP level measurement and control in a distillation column with acetates

CHALLENGE

OXEA distills acetates in the production of various esters for a variety of end market applications. At the Marl plant, accurate level control was difficult due to the harsh process conditions of 200mbar static pressure, 120 °C temperature, and a differential pressure of 170 mbar. “We were having trouble with level measurement failures,” said Herr Andreas Busch-Ahlschläger, I&C Engineer. “The harsh process conditions caused frequent seal failures, which required us to shut down the column and completely replace the balanced system.”

In addition to seal failures, OXEA was having trouble with capillaries being damaged each time a new system was installed, causing further shutdowns and system replacements. “We typically refill and restart the column every two to three weeks based on demand,” said Busch-Ahlschläger. “And we were able to meet customer demand in spite of the unscheduled shutdowns. But startups and shutdowns are expensive, and our operating costs were higher than they should be.”

OXEA was also looking for a more accurate level measurement without the ambient temperature effects on long capillary runs, which were exacerbated by changes in seasons, to improve level control and reduce the cost of operation. The plant also wanted to reduce maintenance time and measurement system replacement costs.

SOLUTION

OXEA installed the Rosemount™ 3051S Electronic Remote Sensor (ERS)™ System with one diaphragm seal on the tank wall and one in-line sensor directly connected to the process. This solution eliminates all capillaries in the system, which significantly reduced maintenance costs, spares and measurement errors.

The upper seal was eliminated from the harsh process by the in-line sensor, reducing installation costs as well as eliminating seal failures at that measurement point. Capillary failures and measurement errors due to ambient temperature changes were completely eliminated with replacement of the upper seal and an electronic remote sensor placed on the lower measurement point. Mechanical improvements were made to the seal with a change in seal vendor (and therefore method of welding, material, etc.), and failures due to corrosion have been significantly reduced.

The Rosemount 3051S ERS System then relays the DP between the upper sensor and lower sensor to the DCS to determine the level within the tank. The Rosemount 3051S ERS System performed at a higher accuracy with much higher reliability than the traditional balanced-design system.

“This solution was much easier to install,” said Herr Busch-Ahlschläger. “It is much easier to maintain, and does not require a complete system replacement when one component, like the seal, needs to be replaced. And when the upper sensor needs to be replaced (due to the highly corrosive environment), we don’t have to shut down the column.”

Installation time is reduced, ongoing maintenance is significantly reduced, replacement costs are much lower (the whole system does not need to be replaced), spare parts are reduced, and distillation unit operating costs are significantly lower.

“We have reduced our maintenance time on this unit by nearly 40 percent,” said Herr Busch-Ahlschläger. “We now have longer production cycles with fewer shutdowns and startups due to maintenance issues. We have also been able to raise the upper limit of the level measurement, as we have improved the accuracy and reliability of the level measurement. This has made our unit more efficient and has reduced our overall cost to operate the column.”

RESOURCES

Emerson Automation Solution Chemical Industry

[Emerson.com/Industries/Chemical](https://www.emerson.com/industries/chemical)

Rosemount 3051S ERS System

[Emerson.com/Rosemount/Pressure/3051S-ERS](https://www.emerson.com/Rosemount/Pressure/3051S-ERS)

The Emerson™ solution completely eliminates capillaries and eliminates one seal from the process to reduce failures, measurement errors, and shutdowns.



The Rosemount 3051ERS System improves both accuracy and reliability of the level measurement on the distillation column, while cutting response time by 90 percent.

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Global Headquarters

Emerson Automation Solutions

6021 Innovation Blvd.
Shakopee, MN 55379, USA

 +1 800 999 9307 or +1 952 906 8888
 +1 952 949 7001
 RFQ.RMD-RCC@Emerson.com

Europe Region

Emerson Automation Solutions Europe GmbH

Neuhofstrasse 19a P.O. Box 1046
CH 6340 Baar, Switzerland

 +41 (0) 41 768 6111
 +41 (0) 41 768 6300
 RFQ.RMD-RCC@Emerson.com

Middle East and Africa Region

Emerson Automation Solutions

Emerson FZE P.O. Box 17033,
Jebel Ali Free Zone - South 2
Dubai, United Arab Emirates

 +971 4 8118100
 +971 4 8865465
 RFQ.RMTMEA@Emerson.com

Asia Pacific Region

Emerson Automation Solutions Asia Pacific Pte Ltd

1 Pandan Crescent
Singapore 128461

 +65 6777 8211
 +65 6777 0947
 Enquiries@AP.Emerson.com

00830-1400-4804, Rev AA

