

# Valero Energy Corporation Improves Batch Control and Reduces Maintenance Costs with Rosemount™ 3051S Thermal Range Expander

## RESULTS

- 53 percent decrease in process level variation/noise
- Performed at  $-26^{\circ}\text{F}$  ( $-32^{\circ}\text{C}$ )
- No maintenance to date on both applications



## APPLICATION

Level measurement in a stripper column with a steam injection near the bottom

### Application #1: Mechanical displacer system

- Stripper column
- Light gasoil (LGO)
- $>300^{\circ}\text{C}$  process temperature,  $-40^{\circ}\text{C}$  ambient temperature
- 30 psi process pressure
- Device output used to operate feed pump to control level
- Agitation caused by steam injection at the bottom of the vessel

### Application #2: Previous transmitter installation

- Stripper column
- Heavy gasoil
- $>300^{\circ}\text{C}$  process temperature,  $-40^{\circ}\text{C}$  ambient temperature
- 30 psi process pressure
- Agitation caused by steam injection

## CUSTOMER

Valero Energy Corporation

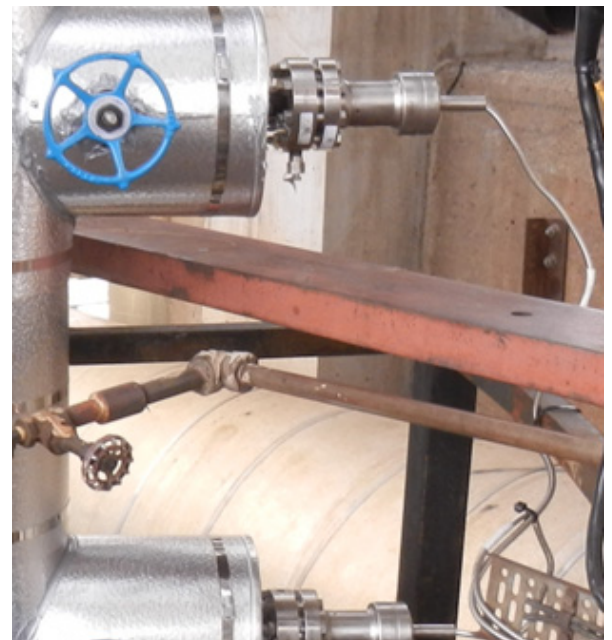
## CHALLENGE

Valero had two unique applications with frequent device failures and regular maintenance which drove them to search for new solutions. Their processes used heat tracing and impulse piping to keep oil at a high enough temperature to keep liquids from gelling. Previous installation also used a pressure transmitter connected to impulse piping filled with glycol since the transmitter could not handle the heat from the process.

No proven solution was available to meet their high process temperature and cold ambient temperature.

*“The main reason we like the Thermal Range Expander is because it eliminates maintenance and is compatible with the extreme process and ambient temperatures existing in our application.”*

*Instrumentation Supervisor - Group Technique  
Valero Energy Corporation*



*Rosemount 3051S Thermal Range Expander installed in application #2*

### Application #1: Mechanical displacer system

With the originally installed mechanical displacer system, there were extensive maintenance issues and variation in measurements. The system's internal mechanical components were frequently failing and a crane was required to remove the device for maintenance. This takes an estimated 28 man-hours to complete. The original mechanical displacement system also had a high standard deviation caused by process agitation from the injection of steam to the stripper column. This resulted in an unnecessary increase in level-controlling valve actuation.

### Application #2: Previous transmitter installation

The original competitive unit design did not meet the application requirements which resulted in device drift and both frequent scheduled and unscheduled maintenance. A vertical glycol intermediary system was installed to eliminate device drift but the fluid vaporized and required maintenance every three months. However, emergency instances did occur where maintenance was required and took two to four man-hours to perform during the week, plus paperwork. In addition, weekly conference calls were required for status and maintenance schedule updates.

## SOLUTION

### Application #1 Solution

A Rosemount 3051S Thermal Range Expander system was installed in January 2014 with a customer-specified threaded remote seal instrument connection. The primary and secondary fill fluids were Silicone 705 (370 °C) and Silicone 200 (-45 °C), respectively. The Emerson™ solution provided easy installation without a crane and reliable operation year-round with no maintenance. The Rosemount 3051S Thermal Range Expander also showed a 53 percent decrease in process level variation/noise which resulted in lower actuation of process level valve. In addition, Rosemount's solution performed as designed at a near record low ambient temperature of -26 °F (-32 °C) on January 22, 2014 which has provided peace-of-mind operation in worst-case conditions.

### Application #2 Solution

The Rosemount 3051S Thermal Range Expander was installed next to the competitive unit for comparison and operation began in May of 2014. Rosemount's solution had no glycol column and was fully insulated with heat-traced wet-legs (not required, system could have been direct mounted). Additionally, the Thermal Range Expander met the extreme hot process and extreme cold ambient temperature requirements. To date, the Thermal Range Expander system has not required any maintenance, provides no long-term drift, and provides peace-of-mind for reliable operation through the winter.

## SUMMARY

Valero's refinery was having issues with two installations with hot process and cold ambient conditions.

- Application #1: Old device needed replacement due to mechanical failures and frequent repairs.
- Application #2: Frequent maintenance required; device did not meet customer's specification

The Rosemount 3051S Thermal Range Expander devices were installed in both applications resulting in improved performance, no maintenance, and less valve actuations.

Valero gained peace-of-mind knowing that device will work in worst-case conditions, keeping process media hot.



*Rosemount 3051S Thermal Range Expander installation in application #1*

RESOURCES

Emerson Oil and Gas Industry

[Emerson.com/Industries/Oil-Gas](http://Emerson.com/Industries/Oil-Gas)






Rosemount 3051S Series of Instrumentation

[Emerson.com/Rosemount/Pressure-Transmitters/3051S](http://Emerson.com/Rosemount/Pressure-Transmitters/3051S)

**“We need a device that will be stable, consistent, and require no maintenance.”**

*Instrumentation Supervisor -  
Group Technique  
Valero Energy Corporation*




Standard Terms and Conditions of Sale can be found on the [Terms and Conditions of Sale page](#).  
The Emerson logo is a trademark and service mark of Emerson Electric Co.  
Rosemount and Rosemount logotype are trademarks of Emerson.  
All other marks are the property of their respective owners.  
© 2017 Emerson. All rights reserved.

-  [Linkedin.com/company/Emerson-Automation-Solutions](https://www.linkedin.com/company/Emerson-Automation-Solutions)
-  [Twitter.com/Rosemount\\_News](https://twitter.com/Rosemount_News)
-  [Facebook.com/Rosemount](https://www.facebook.com/Rosemount)
-  [Youtube.com/user/RosemountMeasurement](https://www.youtube.com/user/RosemountMeasurement)
-  [Google.com/+RosemountMeasurement](https://plus.google.com/+RosemountMeasurement)

**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](mailto: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](mailto: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](mailto:RFQ.RMTMEA@Emerson.com)

**Asia Pacific Region**

**Emerson Automation Solutions**

1 Pandan Crescent  
Singapore 128461

-  +65 6777 8211
-  +65 6777 0947
-  [Enquiries@AP.Emerson.com](mailto:Enquiries@AP.Emerson.com)

00830-4700-4801, Rev AB