

# Bearing Monitoring Prevents Costly Refinery Shutdowns

## RESULTS

- Prevented costly unscheduled shutdowns
- Reduced installation costs by up to 70%
- Increased data reliability
- Improved diagnostic capabilities



## APPLICATION

Bearing temperature monitoring on recycling gas compressor

**Application Characteristics:** 16 thermocouples, 200 meters (656 feet) to control room, electromagnetic interference, Modbus® control system

## CUSTOMER

Refining company in South Asia

## CHALLENGE

A South Asian refining company needed to monitor bearing temperature to prevent costly shutdowns of their hydrocracker. They had local temperature monitoring, but they did not have a way to monitor and record temperature data at or near their Modbus control system.

The bearings were located in the recycling gas compressor, 200 meters away from the control room. If the refinery could get the highly important diagnostic data into the control room along with their existing vibration monitoring system, they could effectively monitor and maintain their compressor.

## SOLUTION

The refinery engineer decided that given the long cabling distance and likelihood of RFI, transmitters would be a better solution than the previously considered direct Modbus wiring. Emerson provided two Rosemount 848T multi-point temperature transmitters to locally collect the bearing temperature. The transmitters were then connected to a Rosemount 3420 Fieldbus Interface Module. The interface allowed the FOUNDATION™ fieldbus protocol transmitters to easily communicate with the Modbus control system. It also provided the additional benefits of a digital signal.

*The control system, now with improved diagnostic capabilities, identified a damaged bearing. This helped prevent an unscheduled shutdown.*



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The combination of Rosemount devices allowed the refinery to send the data back to the control room using an existing 2-conductor cable. The flexibility in protocols and the reliable temperature monitoring capability significantly reduced the number of unplanned shutdowns and saved over 70% in wiring costs at the same time. In this case, due to additional trenching, the savings amounted to \$20,000.

The bearing temperature measurement system has already proven its worth. At 2:30 pm one afternoon, not long after the monitoring system had been put into operation, an operator switched the recycled gas compressor to manual. To increase production, he reset the operating speed from its normal 10% to 95%. He was unaware, however, of the damaged condition of one of the compressor's bearings. The increased speed could lead to the bearing's failure which would shut down the compressor and, as a result, the complete process.

The control system, now with improved diagnostic capabilities, identified a damaged bearing. The operator quickly switched the unit back to normal operation, saving the bearing and preventing a costly and unnecessary shutdown. By preventing an emergency shutdown, the refinery was able to replace the bearing during scheduled maintenance. The advanced warning minimized both the materials and the repair time necessary for equipment failures.

## RESOURCES

### Rosemount 848T

<http://www.emersonprocess.com/rosemount/products/temperature/m848t.html>

### Rosemount 3420

<http://www.emersonprocess.com/rosemount/products/accessories/m3420.html>

### Emerson Process Management's Refining Industry Web Page

<http://www.emersonprocess.com/solutions/refining/>



Modbus Control System

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#### Emerson Process Management

Rosemount Division  
8200 Market Boulevard  
Chanhausen, MN 55317 USA  
T (U.S.) 1-800-999-9307  
T (International) (952) 906-8888  
F (952) 949-7001  
[www.rosemount.com](http://www.rosemount.com)

#### Emerson Process Management

Heath Place  
Bognor Regis  
West Sussex PO22 9SH,  
England  
T 44 1243 863121  
F 44 1243 867554

#### Emerson Process Management

Emerson Process Management Asia Pacific  
Private Limited  
1 Pandan Crescent  
Singapore 128461  
T (65) 6777 8211  
F (65) 6777 0947  
Enquiries@AP.EmersonProcess.com

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For more information:  
[www.rosemount.com](http://www.rosemount.com)

  
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