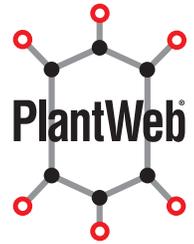


# ExxonMobil executes project faster with PlantWeb®



## RESULTS

- Completed project 6 weeks sooner than with an alternative solution
- 49% lower cost than direct sensor wiring
- 16 man-days saved each time catalyst regeneration is needed



## APPLICATION

Depleted catalyst from one of two reformer units at the Altona Refinery near Melbourne, Australia, must be regenerated in one of several platinum reformer reactors before reuse. Monitoring the temperature profile of each reactor is critical to the success of the regeneration process.

## CUSTOMER

Mobil Oil Australia Pty Ltd needed to automate some of the functions that were still being performed manually on the two existing reformer units in the Altona Refinery.

## CHALLENGE

It is very important to maintain a gradual and uniform temperature rise without runaway hot-spots throughout the reactor during regeneration. Temperature profile is measured in each reactor using three multi-point sensor arrays. Previously, an I/E technician had to

***“This is a very powerful solution for ExxonMobil.”***

**Tun Mra Gyaw, Team Leader, I/E/A Reliability Maintenance, Reliability & Engineering, Altona Refinery, Mobil Oil Australia Pty Ltd**

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manually connect more than 100 temperature sensors to chart recorders each time it was necessary to regenerate catalyst -- a time-consuming practice. Personnel safety also drove the need for changing the system, since the reactor temperature points are located in a Gas Group IIC hazardous area.

ExxonMobil officials wanted to reduce the time workers were exposed near the high temperature reactors by permanently integrating the measurement points with the refinery's DCS before the next regeneration run. An internal study found that a conventional temperature multiplexer would take too long to deploy, missing the project deadline. In that case, their commitment to reduce personnel exposure during regeneration activities for 2007 could not have been achieved. Furthermore, a temperature multiplexer would have had surge challenges because of the location of several temperature points. A temperature multiplexer would also constitute an unwanted single point of failure.

Other solutions studied included running thermocouple compensation wire back to temperature input cards in the DCS or equipment health monitoring system, but this would have been prohibitively expensive. The most promising solution appeared to be based on the FOUNDATION™ fieldbus technology, because it was both cost-effective and could be completed on schedule.

### SOLUTION

Emerson Process Management was selected to provide a PlantWeb® solution consisting of two Rosemount® 3420 Fieldbus Interface Modules with four fieldbus ports each acting as a gateway to ExxonMobil's existing DCS used for operator display and historical trending. Thirty-one Rosemount 848T eight-channel temperature transmitters were mounted near the sensors in junction boxes with each fieldbus segment connecting four transmitters. The eight-channel temperature transmitter is only possible with fieldbus. Emerson provided a complete solution with control panel, FISCO power supply to meet the hazardous area requirements, field junction boxes, etc. The whole solution was pre-engineered and tested by Emerson before shipment to the refinery, drastically reducing the on-site work.



***“The new system engineered, supplied, and delivered by Emerson Process Management is a great win for ExxonMobil.”***

**Nick Burchell, Operations Coordinator  
Refining & Supply, Altona Refinery, Mobil Oil  
Australia Pty Ltd**

As per best practice, the system was designed to avoid any single point of failure. Temperature points are interlaced and distributed across several transmitters in such a way that a single fault cannot cause all measurement points on a reactor to be lost. At least a partial reactor temperature profile will continue to be available. This would not be easy using temperature multiplexers.

The AMS® Suite: Intelligent Device Manager predictive maintenance software taps into the FOUNDATION Fieldbus High Speed Ethernet (HSE), giving plant personnel access to field-generated diagnostics. Burnout of any of the more than 220 thermocouples and problems with the transmitters

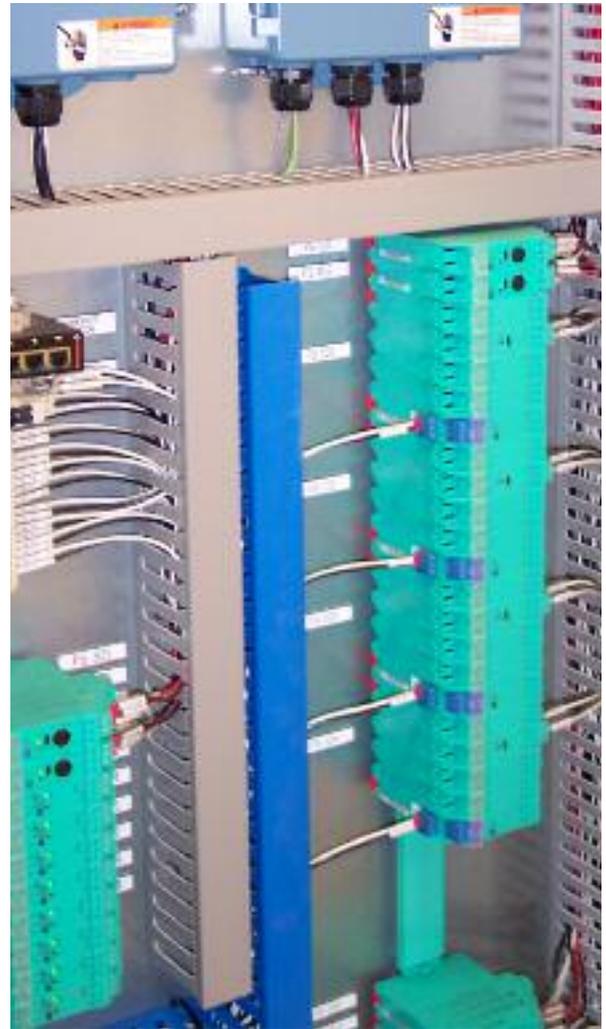
themselves are easily identified in this way so repairs can be made before the next regeneration period.

The project was completed in just eight weeks on a very tight schedule and just in time for the next regeneration. That project was six weeks faster than would have been possible with a multiplexer solution because PlantWeb requires fewer drawings and shorter sensor wire runs.

Considering material, labor, and documentation, the cost of the eight-channel fieldbus transmitter solution was 66 percent lower than with single-input 4-20 mA transmitters, and 49 percent less expensive than direct sensor wiring.

Measurements are now permanently available, and the process unit is ready to regenerate any time without advance notice. As a result, 16 man-days are saved with each regeneration procedure, reducing the overall cost of this operation. This also frees up operators for other tasks. Fewer persons are moving about the plant, meaning improved safety, particularly during regeneration periods.

The temperature profile is now more accurate and displayed on the DCS console, so operators can immediately see a temperature profile change. A gradual and uniform temperature increase is easier to achieve. Operators also have better knowledge of when a regeneration process is complete, so they can stop it before it runs too long. The results are more repeatable, and new operators will find it easier to learn how to operate the reactors.



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