

Middle-Eastern petroleum refinery improves safety by installing integrated toxic gas detection system

RESULTS

- Solved long-standing toxic gas safety concern
- Integrated 13 measurement locations without costly wiring
- Wireless gas detectors interfaced with RTU for flawless communication
- Sensor network combines local alarms with integrated safety system



APPLICATION

Rosemount™ 928 Wireless Gas Monitor combined with Rosemount 628 Electrochemical Gas Sensor to detect toxic H₂S emissions at strategic locations in the facility.

CUSTOMER

Major Middle-Eastern oil & gas producer

CHALLENGE

A sprawling petroleum refinery was trying to deal with the changing chemical makeup of incoming gas, including higher levels of H₂S (hydrogen sulfide). The potential for release of this toxic gas was a growing concern within the facility, particularly in four strategic locations: the pump area, fence security gate, rack room, and maintenance engineering control center.

Facility engineers determined that toxic gas detectors placed at 13 specifically chosen locations throughout the facility would be capable of identifying a release quickly enough to warn any nearby operators and first responders of an incident. While Emerson gas detection technologies were available and even specified, integrating such a broadly deployed system using traditional methods would require installing an enormous amount of costly signal and power cabling with associated cable trays.

Each toxic gas sensor required the capability of triggering a local alarm station, including a strobe and siren, while also passing data to the integrated safety system to initiate additional alarms and send data to the control room. The anticipated costs and facility disruption associated with this implementation caused management to put the project aside again and again, in spite of its importance.

SOLUTION

Using Emerson's Wireless H₂S Gas Detectors on a new *WirelessHART*® network in this gas plant mitigates the identified risks. Combining Rosemount 928 Wireless Gas Monitors with Rosemount 628 Wireless Electrochemical Gas Sensors enabled 13 locations to be monitored without adding any signal or power cabling.

Combining Rosemount 928 Wireless Gas Monitors with Rosemount 628 Wireless Electrochemical Gas Sensors enabled four locations with 13 detectors to be monitored without adding any signal or power cabling.



Rosemount 928 Wireless Gas Monitor

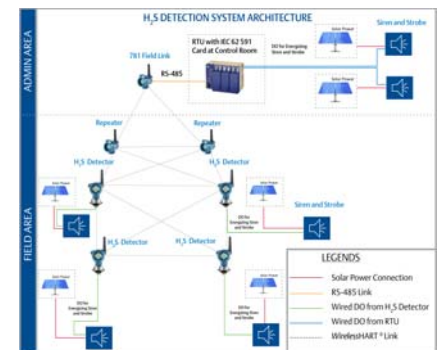
This solved one major concern, but there was still resistance from safety engineers unwilling to depend on wireless communication of any kind to support safety functions. This was remedied by using a direct wired digital output from the Rosemount 928 transmitter to trigger a local field alarm station with a siren and strobe combination in the event of a gas release. While this fulfilled the basic safety function requirement, it created another challenge – that of providing power to the alarm station, which had a higher power consumption requirement than could be supported by the Rosemount 928 transmitter. This issue was handled by adding a solar power collector able to keep the station battery charged.

All 13 gas monitors deployed around the facility are now outfitted with their own field alarm station along with a solar collector. The Rosemount 928 transmitters communicate with each other via the *WirelessHART* network so an alarm at one location can also trigger others based on location and typical gas diffusion patterns. In some areas where the network is thin, repeaters have been added to increase the available connection paths. All 13 transmitters connect via the mesh network to an Emerson Wireless 781 Field Link, which in turn connects to a RTU in the control room via an RS-485 link. The system provides alarm data to a historian and also informs operators in the control room as well as other people in administrative areas in the event of a toxic gas release. All the equipment used for this system is rated FM & CSA Class 1 Division 1 and ATEX Zone 0 Intrinsically Safe.

Deploying a system of this sophistication, without any cabling beyond the local solar collector and field alarm station, enabled the facility to carry out the installation with a far lower cost and much faster implementation than would be imaginable using conventional methods. Connecting the Rosemount 928 transmitter directly to the field alarm station fulfilled the critical alarming functionality with a minimum amount of cost and effort.



Rosemount 628 Wireless Electrochemical Gas Sensor



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RESOURCES

Rosemount 928

www.emerson.com/Rosemount928

Rosemount 628

www.emerson.com/Rosemount628

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