CONNECTED DETECTION BRINGS NEW SAFETY LEVELS AT CALUMET SPECIALTY’S SHREVEPORT REFINING FACILITY

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U.S. Bureau of Labor Statistics (BLS)
The Solution: Connected plant-wide gas monitoring for 24/7 remote detection of hazards.

Refining Facility Turns to Wireless Detection to Increase Worker Safety

Calumet Specialty’s Shreveport Refining facility in Shreveport, Louisiana, produces specialty lubricating oils, waxes, and fuel products such as gasoline, diesel, and jet fuel. Production processes pose risks to personnel within the facility, as well as to those beyond the facility’s fence line. Calumet safety managers were determined to build a safety program that ensures personnel within the facility and the surrounding community are safe from exposure to harmful gases and substances.

The operation has high-pressure hydrogen compressors within its site, according to Michael Rhoades, Safety and Environmental Manager at Calumet’s Shreveport facility. “We also are potentially exposed to hydrogen sulfide (H₂S) and sulfur dioxide inside the plant and around some of our processing equipment that removes the H₂S,” explains Rhoades.

Calumet has improved its control and monitoring of these, as well as other harmful gases, by installing a RAE Systems by Honeywell connected system and fence line monitoring of the facility. Rhoades says the system is very easy to use and is quite user-friendly. He notes that the configuration and set-up is more technical. “We actually brought some system guys onboard to help with initial troubleshooting,” he elaborates. “But it’s been pretty successful after that.”

As the oil and gas industry continues to experience a global uptick in production, risk from exposure to dangerous gas is more prevalent. According to the U.S. Bureau of Labor Statistics (BLS), the number of fatalities from from exposures to hazardous substances in 2013 represented 12% of the 4,405 worker fatalities in the United States. Approximately 112 workers died from exposure to hazardous substances last year*. Gases such as carbon monoxide, hydrogen sulfide, ammonia, methane, fluorine, chlorine dioxide, and others are released during the exploration and manufacturing processes. All pose a potentially deadly threat.

In 2012, a 21-year old worker was found dead next to an open tank at a Bakken, North Dakota, Shale fracking site. Inhalation of a hazardous gas was the suspected cause of this fatality.

The scenario is common — particularly when workers lack proper gas detection monitors to protect them from exposure to gases, and are working remotely without a man-down alarm.
With this system, industrial hygienists, safety managers, production supervisors, and other professionals remotely monitor personnel deployed in hazardous areas. Internet access enables key data to be logged and recorded for historical purposes. Plus, a worker can be monitored, personnel alerted, and action taken immediately, if an incident occurs and they need help. Data is available to facility production and safety managers to share with other stakeholders such as emergency workers and remediation specialists for better safety planning and prevention.

Rhoades emphasizes the importance of gradual implementation of a connected detection system to meet all needed challenges and obstacles along the way. “One of the things that we’ve found is that it’s more effective to take baby steps.” He says for small and medium-sized customers, the idea of a full-scale wireless replacement of their existing protocol can be overwhelming. Starting with portable instruments where one can communicate with multiple instruments can be a precursor to a larger fixed system with a software installation. “That comes in time,” says Rhoades, “but some facilities need to ease into a wireless system, versus a one-time wholesale replacement.”

He says the connected system is easy to learn, and users quickly understand how it works, how to use it, and what the alarms mean.

“It’s really simple, simple stuff,” Rhoades emphasizes. “The alarms do not clear until the gas is gone. Indicators tell operators where the alarms are. We’ve got them on a map on a grid system, so we know exactly where the alarms and monitors are when a notification comes in.”

**Calumet Response Teams and Community Are Better Protected**

“When we get an alarm, we send our people in to first make sure that the area is safe and then shut down any release,” Rhoades says. “We’ve got protocol developed for an alarm and we send people in with understanding of how to test the system to validate. It’s been successful numerous times. We’ve saved equipment loss, and more important, prevented injury.”

Rhoades says that the granularity of the detection has helped to diagnose releases. “The instrumentation is very sensitive,” he says. “Some of these small-scale releases may have gone unnoticed for longer durations. We’re catching them a lot quicker now.”

RAE Systems fence-line monitoring greatly helps protect the community around Shreveport Refining. “We’ve put about 45 units around the perimeter of the facility,” says Rhoades. “And again, we’re looking at these fence perimeters regularly. Readings of key indications and levels feed into a centrally located panel, as well is the facility’s central control room. We have alarm set points. So, if we get an alarm on any one of those local units, it feeds into the control room and then the operator can acknowledge it and respond accordingly.”

**Connected Plant-Wide and Confined-Space Gas Detection Trend**

Steve Haise is the owner of All Safe Industries in Louisville, Kentucky, a well-established safety distributor in Kentucky and surrounding states. He says that many organizations today are receptive to, and are now installing, connected detection systems because they improve worker safety.

“Connected gas detection systems provide a way to communicate data more effectively, specifically data that represents the condition of atmospheres in work areas, including confined spaces. Now safety managers and attendants can monitor readings from multiple instruments with one handheld device. This real-time data may be used to analyze risk and coordinate quicker responses to hazards as soon as they occur,” says Haise.

Installing a wireless system requires set-up. Organizations can prepare for the deployment challenges by working with their distributor and monitor provider to create a site plan, to reduce any challenges that come with a system installation. “The site plan is critical”, Haise says. “Then, once the wireless gas detection system is up and running, customers absolutely love the system.”

According to Haise, “Real-time wireless gas-detection systems are reliable and convenient and reduce operational costs. They are an attractive replacement of legacy fixed and hard-wired systems. And in some plants, wireless systems include a hard-wired system in combination with stand-alone monitors and rapid deployment kits.”

Hazardous gas exposure, often a silent killer, can be fatal, as it was for the young man in Bakken, North Dakota. Causes for refinery incidents can include faulty repairs, leaking pipes and pumps, tank overfills and spills, or breakdowns
in safety procedures or adequately utilizing safety equipment. Undetected gas leaks and subsequent damage, if uncontrolled and unmonitored, pose a dangerous safety risk to industrial assets and facility workers, as well as to the communities around them.

Connected gas detection systems have proven to be reliable in many industries, including oil and gas, steel fabrication, construction, paper production, chemical processing, rendering, and others.

Real-time connected monitoring of threats helps organizations identify tank leaks and dangerous confined-space gas levels. Data that includes time, location, concentrations, lower explosive limits, and other variables can be archived and analyzed to identify dangerous situations and ultimately predict failure before it occurs.

Connected plant-wide and confined space gas detection systems help industrial sites operate safely and manage production and safety throughout the facility. This can more effectively protect workers, assets, and the community.

* http://www.bls.gov/iif/oshcfoi1.htm#2012

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