Greenfield Mining Operation Protects Assets with *Wireless*HART

It isn't easy to run a high-grade nickel and copper mining and milling operation in the harsh environment of Michigan's Upper Peninsula. Sub-zero temperatures, diverse terrain and long distances between facilities make it difficult to maintain plant assets in optimal working order.

Lundin Mining Corporation's Eagle Mine in Marquette County, Michigan, needed an easy and cost-effective way to measure process variables. Some mill assets are up to ¾ mile from the main facility at the mill site, and many locations are not staffed on a 24/7 basis—creating the need for a remote monitoring capability.

Lundin Mining chose to install a *Wireless*HART network to monitor and protect its essential equipment. The flexible, yet robust wireless system addressed critical applications ranging from freeze protection for fire systems, to monitoring the health and performance of sump pumps and crushing equipment. The use of wireless technology also helped the mill substantially reduce installation costs and avoid failures.

According to John Berglund, maintenance superintendent for Eagle Mine, the implementation of *Wireless*HART was driven by an exceptionally tight commissioning schedule for the Greenfield mill site. "We couldn't wait for the installation of traditional wiring and conduit for measurement devices, which would have caused us to miss our project schedule. This made *Wireless*HART a natural choice as a remote asset monitoring solution," Berglund said. "I had previous experience with wireless networks at two other facilities, so I knew the technology could minimize the effort involved in putting new devices in the field."

Eagle Mine's *Wireless*HART network initially consisted of 40 wireless temperature transmitters paired with an Emerson Asset Management System (AMS) Device Manager, which provides asset and calibration management with real-time monitoring and reporting. Four wireless gateways were deployed and networked to a Rockwell Logix programmable logic controller (PLC). Wireless instruments, in turn, connect to the gateways to create a mesh network. The gateways interface to the business network through a demilitarized zone (DMZ), and wireless variables are displayed and trended on the PI program.

The AMS Device Manager was networked with Emerson's Machinery Health Manager software to provide a comprehensive monitoring and management tool for smart devices, including wireless vibration transmitters used to monitor the condition of crushers and ball mills. This solution improves reliability and supports preventative maintenance programs. Vibration analysis data can be pulled from history each day, and alarms are generated from the vibration equipment.

A key challenge for mine personnel was dealing with the long distances between asset monitoring applications. Due to concerns about signal strength, the decision was made to install both short and long range wireless antennas on gateways and transmitters to ensure dependable communication across geographically dispersed areas. Additionally, thumbs used on third-party devices simplified network expansion and configuration of instruments from the AMS.

Identifying the proper mounting configurations for wireless devices was another important consideration on this project. The use of gateways at strategic locations was essential for achieving the full range of wireless coverage throughout the facility.

In Berglund's view, the easy deployment of *Wireless*HART devices gained the favor of Eagle Mine's operations department. Wireless instruments can be installed quickly for a fraction of the cost of a wired alternative, and the flexibility of the technology enables users to obtain the data they need in almost any location in the plant. The wireless solution equated to an $83k installation cost savings at Eagle Mine, and at the same time, enabled a cost avoidance of $3-$10K per freeze incident in remote applications.

Technicians can now take advantage of enhanced capabilities for real-time device monitoring, which enable them to check the status of assets directly from the AMS. The AMS Client functions like a HART field communicator, allowing all configurations to be done from the E&I shop. It also provides for efficiently managing instrument calibration routes and calibration recordkeeping.

Since its installation in late 2014, the *Wireless*HART network has provided for reduced start-up times along with the assurance that all is well in the mill's remote locations. The wireless solution also significantly improved asset reliability by minimizing the potential of unpredicted downtime.

Starting with temperature transmitters for remote freeze protection applications, Eagle Mine has expanded its asset monitoring capabilities to utilize wireless devices for pressure, pH, level, flow and other process variables. Future plans call for the installation of additional wireless equipment for system expansion. A flexible network infrastructure employing wireless gateways allows the mill to add measuring points for little more than the cost of a transmitter.

For more information, visit the WirelessHART Technology page.