

Codelco Optimizes Water Recovery Process with OneWireless Solution



“Honeywell’s OneWireless system has given us a comprehensive solution. It allows us to transmit the real-time data we needed to the Profit Controller as well as to measure such data from Honeywell’s wireless and conventional instrumentation. Now we can gauge and manage the thickeners’ levels and flows, and the efficiency of the whole process has greatly improved.”

Guillermo Cortés, Concentrators’ Automation Leader, Codelco

Benefits

Codelco, the world’s largest copper producer, needed to optimize the water recovery process of the thickener pools at its Norte mine in Chile. Water used in mineral processing is recovered for reuse and the thickeners need to gauge the levels with accuracy as well as communicate the information from the field to the central control room. Without that data, the multivariate predictive application based on Honeywell’s Profit® Controller could not optimize the water recovery process. Therefore, issues of gauging the level of several thickeners, the ability of communicating data and process optimization required a reliable and cost-effective solution.

Codelco implemented Honeywell’s OneWireless™ Network with Modbus communication support, connecting the remote programmable logic controllers (PLCs) used to manage equipment and instruments at each pool with Honeywell’s TPS control system.

The Honeywell OneWireless network is a rugged, industrial-grade network that extends the process control network into the field. This wireless network is composed of industrial wireless access points called multinodes that self-discover to create a redundant, self-healing mesh network.

Codelco applied the OneWireless solution to the final part of the concentration process, where water is recovered to reuse in the process. The efficiency of this process has improved greatly since the implementation. Codelco received many other benefits from the OneWireless implementation, including:

- Fast access to real-time data using ISA 100 standards
- Ability to retrieve timely and accurate water levels of the thickener pools

- Control room operators can call information remotely from PLCs
- Information fed into Honeywell Profit Controller provides more accurate decision-making
- Saved money by not using costly hard-wired alternatives
- Future plans to add Wi-Fi devices and industrial I/O devices



Codelco gains access to real-time data with Honeywell’s OneWireless solution. The picture shows a partial view of the huge thickeners used for the water recovery process at the mine site in the Atacama Desert.

Background

Codelco is the world’s largest copper producer, generating around 1.8Mt or 15 percent of the world’s total copper output per year. The Chilean state-owned copper mining company is headquartered in Santiago and owns the world’s largest known copper reserves and resources. The Norte division consists of three open pit mines producing approximately 896,000 tons of electro-refined and electro-wonned cathodes.

Codelco has a joint venture named Kairos Mining, which was created in strategic alliance with Honeywell. Through the Kairos Mining alliance, Codelco started a long-term comprehensive automation program for its mineral concentrator plants located at Codelco Norte, Andina and El Teniente sites.

Challenge

Codelco recognized the need for further optimization at its Norte plant. With a huge amount of precipitation in the thickener's pools to process recovered water and to send residuals to the tailing, it was unable to install wired instruments in the thickeners. Codelco could not retrieve accurate or timely water levels of both the dark (untreated) and recovered (clean treated) water of the pool. If clear water levels are too low, then not enough water is recovered. Plus, the pools were suddenly empty because there was no way to measure levels except manually. In addition, the topography of the region presented many obstacles including climate and distance challenges.

"The former inability of gauging online and the high cost of maintaining the wired traditional network (frequently broken by heavy trucks and machinery) caused very low availability of measurement," said Guillermo Cortés, Concentrators' Automation Leader, Codelco.

Solution

Codelco chose Honeywell's OneWireless Network to connect new field devices in the Codelco Norte mine to the existing Honeywell TPS control system. The OneWireless network is used to connect Siemens S7 300 PLCs to the Honeywell TPS system. The PLCs are then used to manage equipment and instruments installed at each tank and pool. Since installing the OneWireless solution, the use of water is much more efficient because Codelco can accurately gauge the level of water in the thickeners.

More Information

For more information on Honeywell's wireless solutions, visit www.honeywell.com/ps/wireless or contact your Honeywell account manager.

Automation & Control Solutions

Process Solutions

Honeywell

1860 W. Rose Garden Lane

Phoenix, AZ 85027

Tel: 800-822-7673

www.honeywell.com/ps

"We chose the OneWireless system from Honeywell because it offered the most dependable solution for both our complex operation and the advanced control application, since it provides a higher capacity to support real-time gauging and instrumentation," said Cortés. "Our desert zone has many challenges including topography, the long distance between the thickeners and control room, and the extreme environment conditions of radiation, wind and temperatures. We are very pleased with the reliability of the Honeywell solution."

There are seven OneWireless multinodes covering the site. One gateway is used to send the Modbus data collected from the PLC to the Honeywell TPS. With the installation of OneWireless, operators in the control room can call information from the PLCs under the Honeywell TPS control system. This information can be fed into the Profit Controller application to optimize process control of the facility.

After the successful implementation of the network to support PLCs, Codelco decided to install Honeywell XYR 6000 high level analog input transmitters to monitor the level of the clear and dark water using ultrasonic transmitters. The information is automatically transmitted to operators who can make sure water levels are accurate.

"Honeywell OneWireless has given us meaningful benefits in several issues, from gauging multiple variables and transmitting them in real-time with high availability until the consequent improvement in our water recovery process. We can now gauge and manage the thickeners' levels and flows and the efficiency of the whole process has greatly improved," said Cortés.

The Honeywell OneWireless solution provides a communications network and protects investments by integrating Honeywell and other third-party products. In addition, these solutions are guaranteed to migrate to emerging wireless standards. Much more than just avoiding the cost of wire, the breakthrough value lies in the ability to integrate valuable data into existing control systems and advanced applications, while also sharing that data with other networked applications.

Profit® is a registered trademark and OneWireless™ is a trademark of Honeywell International Inc.

