Advanced Solutions

Honeywell

Control Performance Optimizer Enhances Control and Improves Nickel Dryer Throughput

Challenge

An Australian nickel refiner had determined that the nickel ore dryer was creating a bottleneck for plant throughput. They needed to find a way to increase throughput while maintaining a constant drying rate and ore moisture content.

Solution

The refiner used Control Performance Optimizer to design, develop and simulate an improved control strategy for their ore drying process offline, then seamlessly implement it on their process.

Control Performance Optimizer is Powered by Matrikon, which represents vendor neutrality. This product works with third-party control systems and applications.

Advantage

- Performance at steady state
- Disturbance rejection
- Performance during start up and shut down
- Maintainability
- Simplicity

Poor Dryer Control Limits Throughput

A major Australian nickel refiner had determined that the nickel ore dryer was causing a bottleneck to plant throughput.

The production of nickel involves numerous stages of processing, beginning with the drying of the ore. The drying process is usually performed in a rotary dryer with high-temperature air passed co-currently to reduce the ore moisture content from between 30 - 40% to approximately 3%.

The refiner needed an improved control strategy for their ore drying process. They used Control Performance Optimizer to design, develop and simulate the best control strategy offline, then seamlessly implement it on their process.

Rotary dryers employ high temperature convective drying to achieve drying of large volumes of ore with a short residence time. Moisture content is inferred from the off-gas temperature. Variability of inlet moisture content and long process dead time makes off-gas temperature and moisture content difficult to control.

Additionally, implementing new control strategies online without prior testing can be dangerous and expensive in the form of lost production, poor quality or trips. Control Performance Optimizer allowed plant control engineers to design, develop and simulate different control strategies offline before implementing the most effective strategy on-line. By improving the dryer control, the throughput could be increased without sacrificing the outlet moisture content.

Enhanced Dryer Control Strategy

A reduction in variability of the outlet temperature ensures a consistent temperature differential across the dryer, resulting in a constant drying rate and ore moisture content at the outlet.

Using Control Performance Optimizer, a number of control strategies were developed, simulated and tested offline. The strategies developed were evaluated based on a number of criteria before final implementation, including:

- performance at steady state
- disturbance rejection
- performance during start up and shut down
- maintainability
- simplicity

POWERED BY MATRIKON

The Benefits of Improved Control

The control strategy developed and tested with Matrikon Control Performance Optimizer has helped stabilize the dryer operation through improved temperature control, allowing throughput to be increased without sacrificing control of the moisture content.

Implementation of enhanced control reduced the variability of the outlet temperature by 20°C and negated the impact of feed disturbances.

Key Benefits
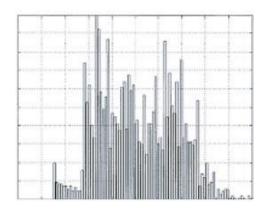
- Improved throughput
- More consistent operation

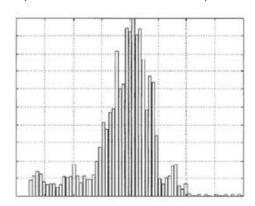Figure 1 - Temperature deviation before controller implementation

Figure 2 - Temperature deviation after controller implementation

POWERED BY MATRIKON

'Powered by Matrikon' symbolizes that this product/solution is system and application independent.

For more information:

For more information about Control Performance Optimizer, visit our website www.honeywell.com/ps or contact your Honeywell account manager.
www.matrikon.com
cpo@matrikon.com

Honeywell Process Solutions

1250 West Sam Houston Parkway South
Houston, TX 77042
Lovelace Road, Southern Industrial Estate
Bracknell, Berkshire, England RG12 8WD
Shanghai City Centre, 100 Junyi Road
Shanghai, China 20051
www.honeywell.com/ps

Honeywell