

Peak Gold reaps the rewards of new process control and optimisation technology

Peak Gold called on Rockwell Automation® and mineral processing solution provider, Manta Controls® to increase productivity, cost savings and improve environmental outcomes.

Solutions

Upgrade to winder's drive and control system.

- Winder's drive and control system was upgraded using Rockwell Automation ControlLogix® and GuardLogix® to ensure reliability and meet current safety standards

Advanced process control and optimisation

- Existing control system of the processing plant was replaced with ControlLogix to provide advanced process control
- The Manta Cube was utilised in the SAG mill and cyanide leaching circuit for improved process optimisation
- The Manta Cube with a Smart Diver was integrated into the Tailings Thickener to help with settling rates, rake torque, and underflow density

Results

Increased production and reduced downtime.

- Throughput was increased by 2% which equates to 18,000 tonnes/year adding an extra 2000 ounces of gold/year
- The life of the mill lining system has been extended, reducing planned downtime
- Reduced cyanide and emissions
- Reduction in cyanide by approximately 10% Recovery from leach circuit increased by an extra 1800 ounces of gold
- Environmental benefits
- Increased density of tailings resulting in reduced cyanide consumption



Peak Gold Mine

Background

Mining companies around the world continue to face the challenge of increasing their productivity. Streamlining operations and optimising automation and control processes provides mining companies with a way to meet their production goals in the current global market.

New Gold's Peak Gold Mine is a gold and copper underground mining operation located in the Cobar Gold Field of Central West New South Wales, Australia. The mine produces gold dore for sale at the Perth mint and copper concentrate which is sold to markets in Asia.

The site comprises of five commercially active mines and a copper-gold processing plant. Peak Gold Mines are committed to investing in the latest technology with a key focus on safety, productivity and environmental protection.

To optimise the Peak Gold mine processing plant to improve throughput rates and process control, Peak Gold called on Rockwell Automation and mineral processing solution provider, Manta Controls to increase productivity and cost savings while also improving environmental outcomes.

LISTEN.
THINK.
SOLVE.®

Upgrade to winder's drive and control system

Prior to the work on the processing plant, the drive and control system of the winder at Peak Gold Mine was upgraded by the Rockwell Automation Systems and Solutions Business team.

The 814kW winder at Peak Gold is utilised to transport personnel and materials so it was important to ensure the safety and reliability of the winder.

According to Michael Graves, solutions consultant, Rockwell Automation, "We provided a tailored solution based on our proven mine winder safety, control and drive systems. All phases of the engineered solution were completed by our Local Drive Systems Engineering and Production facility based in Lane Cove in New South Wales in association with Peak Gold."

The winder upgrade ensures that the winder conforms to the latest safety standards and provides ease of maintenance by using common control and communication platforms. The next stage of the project was to optimise the Peak Gold processing plant to increase productivity of the mine."

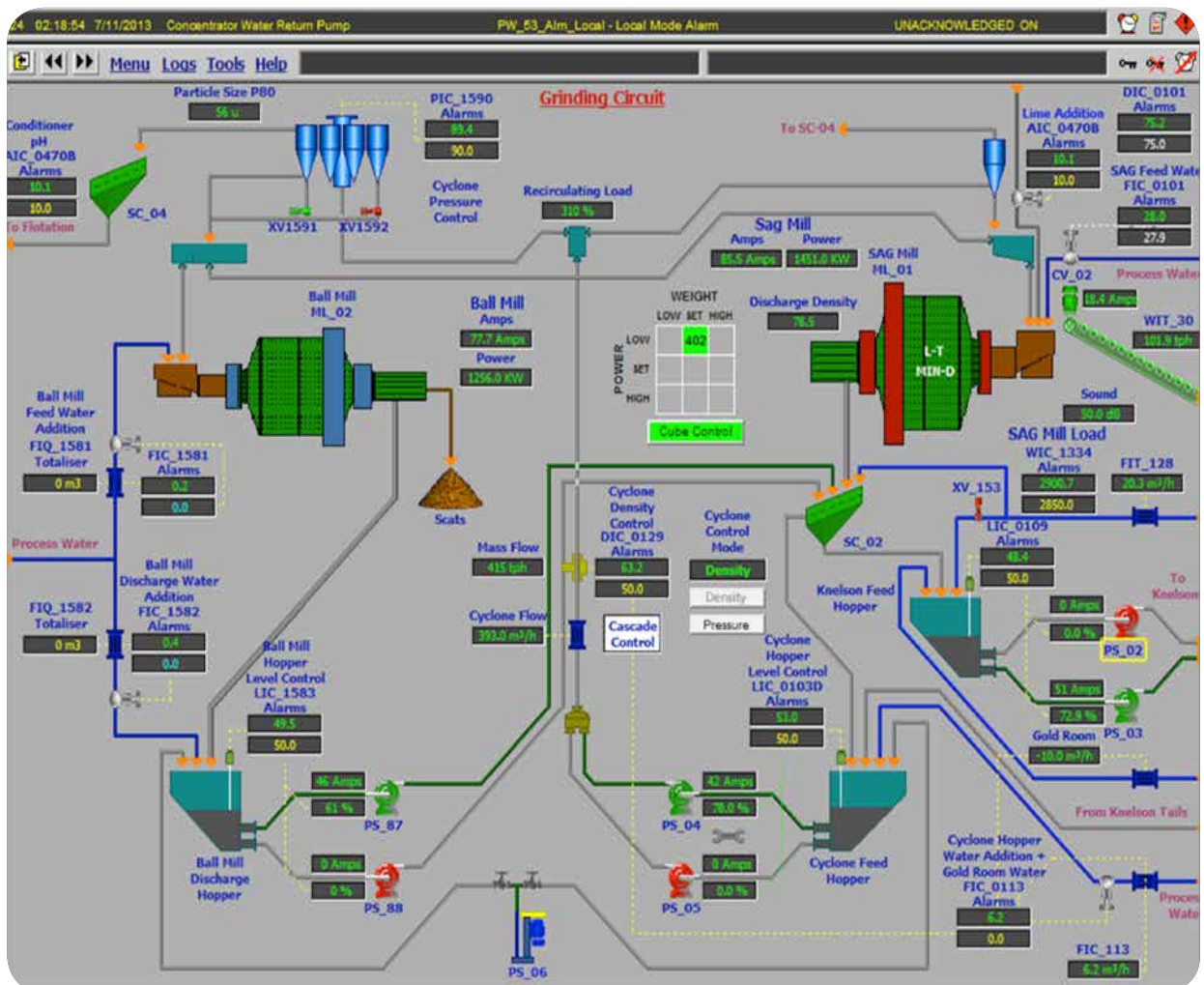
ControlLogix combined with 'Clever Cube' delivers advanced SAG mill control

SAG mills are a critical component in mineral processing operations; at the same time, they are a difficult process to control. There are a large number of variables involved in the process but the main objective is to maximise throughput. According to Vivian Beehan, Mill Manager at Peak Gold, "We set out to optimise the Peak Gold Mine processing plant to improve throughput rates and process control."

Ore from the Peak, Perseverance and New Occidental orebodies is crushed underground and hoisted to a surface stockpile and ultimately to the SAG mill feed conveyor. While ore from New Cobar and Chesney is hauled to Peak where it is fed into the SAG mill feed conveyor via a separate bin.

"A standard 'off the shelf' control system would not be enough to effectively improve throughput and control for this processing plant," said Sean Smith, NSW state sales manager, Rockwell Automation.

The solution provided utilised the advanced control and



The SAG Cube graphic at Peak Gold

programming capabilities of ControlLogix from Rockwell Automation integrated with the Manta Cube—the advanced control system from Manta Controls.

“The Manta Cube took more than 18 years to perfect but now provides a clever control system that can leverage the advanced process control functionality of the ControlLogix platform to take process control to the next level,” said John Karageorgos, managing director, Manta Controls.

As a result of the advanced control and process optimisation solution, Peak Gold was able to increase throughput by two percent which equates to an extra 18,000 tonnes per year, adding an extra 2000 ounces of gold per year.

“The life of our mill lining system has also been extended allowing us to push more tonnage through the mill. We’ve been able to push our relines out so we’re now doing three a year instead of four which is also providing a significant cost saving.”

Reducing cyanide consumption

Once the ore has been through the SAG-mill, gold and silver are recovered in a gravity circuit with Knelson concentrators, further concentrated in an intensive leach reactor, electrowon and sludge smelted in a gas-fired furnace to produce gold dore bars. A third method of gold and silver recovery is by cyanidation in a tank leach circuit. The resulting sludge is then smelted into gold dore bars.

To reduce costs and improve environmental outcomes the control around the cyanide system in the leaching circuit was optimised.

To reduce costs and improve environmental outcomes, the control around the cyanide system in the leaching circuit was optimised by incorporating Manta’s Cyanide Leach Cube into the ControlLogix control system. This allowed for advanced process control of the leaching circuit and the amount of cyanide used was significantly reduced.

“We went from using roughly around 1.8kg of cyanide per tonne to roughly 1.45kg per tonne in a period from the beginning of January 2013 to December 2013,” said Beehan.



The Smart Diver as installed on-site at Peak Gold on the Tails Thickener

“That’s a significant cost saving considering that each tonne of cyanide costs about \$4000. Additionally, as a result of cyanide reduction, recovery from the leach circuit has increased by an extra 1800 ounces of gold.”

Sustainable production

Gold, silver and copper from Peak Gold are also recovered as a copper concentrate in a conventional flotation circuit. The flotation concentrate is thickened, dewatered and stockpiled prior to being transported to the smelter. The Manta Thickener Cube with a Smart Diver was implemented on the Tailings Thickener to improve the settling rates, rake torque, the underflow density and ultimately increase the efficiency of the thickening process.

According to Beehan, “We’ve seen that our Tailings Thickener is better controlled and we are getting higher densities out of it. An additional bonus is that we used to spend a lot more time ‘babysitting’ or looking after the Tailings Thickener prior to installing the Thickener Cube with a Smart Diver but now we can dedicate that time to other tasks. We’ve also seen an increase in the density of our tailings system which helps us to meet our environmental commitment.”

“The project has been a huge success from a production, cost saving and environmental point of view and to top it off there was no significant downtime with very little interruption to processing,” concluded Beehan.

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