

CUSTOMER CASE STUDY

Newcrest Mining crushes its goals with AVEVA™ PI System™

Newcrest - www.newcrest.com

Industry - Mining

Challenges

- 80+ hours of mine downtime due to crushed ore bin sensor failure
- No ability to run models continuously

Solutions

- Real-time data made available 24/7, thanks to AVEVA PI System architecture that enabled the use of virtual sensors running machine learning (ML) models to overcome sensor failure

Benefits

- Increased throughput by 650,000 tons in the first six months
- Decreased crushing-circuit downtime by 50%

Newcrest Mining is one of the world's largest gold producers, with mines across three countries. Newcrest produced 2.49 million ounces of gold just last year, with growth and exploratory projects in AVEVA pipeline solutions. But producing more gold isn't just a matter of working harder – the company must delve deeper underground and explore increasingly remote parts of the world to meet its goals. According to Nevena Andric, IT solutions lead at Newcrest Mining, the solution the company needed was, “a scalable modern platform for collection and mobilization of data to produce digital outcomes for our company, as well as advanced analytics, such as AI and data science.”

Big data means big results

To succeed, Newcrest needed reliable, accessible data. Newcrest had models built primarily to inform operator decisions and predict what might happen in various parts of the system. “To improve,” Andric said, “we needed real-time data, which we didn’t have in our existing platform. And we also needed to scale our platform in terms of how many models we can run.”

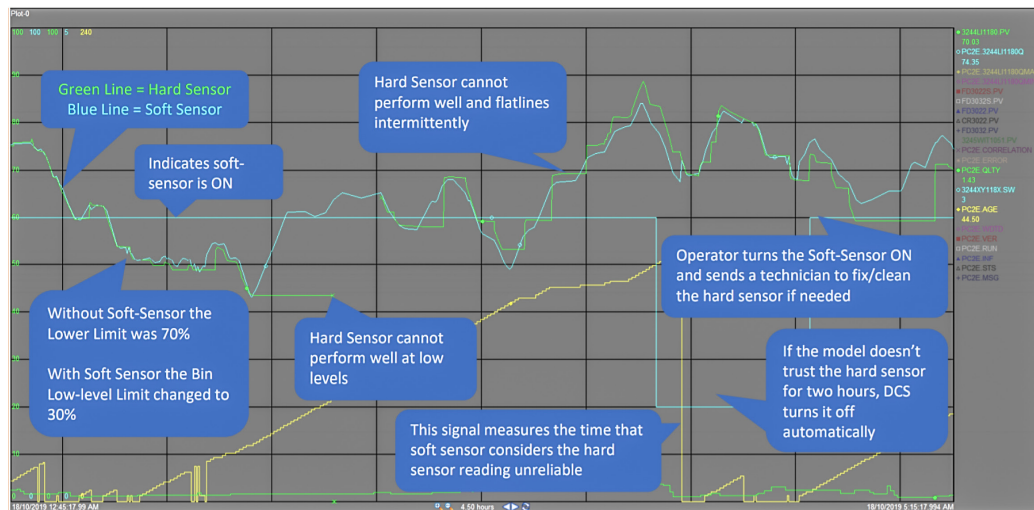
To meet these needs, Newcrest built a more modular, maintainable, and easy-to-troubleshoot data architecture. When the company started to develop this architecture, it had a single AVEVA™ PI Server on each site. “We had to often take that down for Windows patching,” Andric said, “which meant our models were down for that time as well.”

Now, the company has two servers running side by side, which creates a fully redundant AVEVA PI System architecture at each of its sites and allows its models to run all the time. “We picked this method because of its scalability and its cross-platform utilization,” Andric said. “We also roll up all our data nightly and send it to the cloud, and this is the data we use for retraining our models when we need to do so.”

The crushed-ore bin use case

Nowhere is the benefit of this restructuring clearer than the crushed-ore bin at Newcrest’s mine in Cadia, New South Wales, Australia. Machinery feeds newly crushed ore into the crushed-ore bin, which then feeds that ore onward for further processing. A microwave sensor located near the bottom of the bin monitors the levels of this crushed ore. Over the years, Newcrest saw that one of the major causes of downtime in the crushing circuit is due to the unreliability of these sensors.

Because of its location at the bottom of the bin, falling rocks frequently hit the sensor or cover it in dust, damaging it. When the sensor malfunctions, it either causes the bin to overfill, requiring maintenance crews to go in and empty it out (causing 7-8 hours of downtime), or under-fill, halting the crushing process completely until operators recalibrate the sensor. Cadia’s mine is completely underground, meaning it’s difficult to get technicians safely in and out to maintain this sensor, which meant Newcrest was dealing with over 80 hours of downtime in its crushing cycle.



A few hours of sensor data show that Newcrest’s soft sensors, which run on AVEVA PI System, are a significant change.

Soft sensor supports physical monitoring

Newcrest developed a model that would function as a soft, or virtual, sensor to predict the bin level without relying solely on the physical sensor. In Newcrest's new AVEVA PI System architecture, this soft sensor lowered the lower operating limit from 70% to 30%. This solution allows the crushing cycle to run uninterrupted until maintenance teams replace the microwave in a normal maintenance cycle. When Newcrest adopted AVEVA PI System, it also automated alerts to support when the virtual sensor's confidence in the readings becomes too low and informs operators when it is ready to run again.

With AVEVA PI System as a framework, this data also helps Newcrest decide when to retrain and recalibrate the models so they can constantly improve. Newcrest increased throughput by 650,000 tons in the first six months of use (a record). Thanks to this responsive and reliable process, it also decreased crushing-circuit downtime by 50% and enabled faster delivery by fostering trust between the site and IT teams.

“We can now continuously operate the COB, run of mine (ROM), and loaders, even in the event of a COB-level sensor failure. This helps ensure the conveyors are at full capacity and don't stop operating unnecessarily, leading to increased production.”

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Pascal Dubois

General Manager at Cadia

For more information about AVEVA PI System please [click here](#).