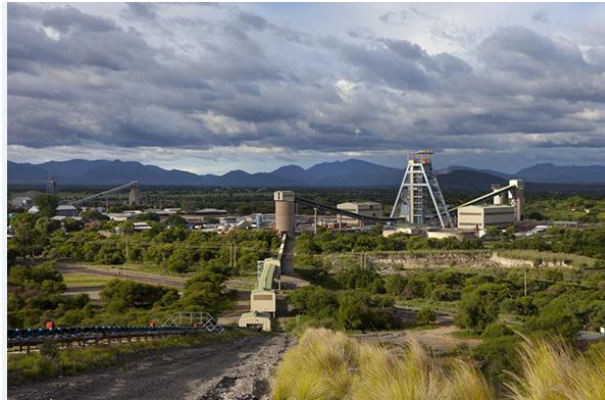


Wabtec's Digital Mine & GE Digital's Remote Monitoring Capabilities Improves Reliability of a Compressor at a Platinum Site in South Africa

Introduction:

Wabtec's Digital Mine & Asset Performance Management powered by GE Digital helped a platinum mining site change the future around the mine's powerful but problematic air compressor. Using Digital Twin software to predict failures before they occur, the platinum mine has achieved a Return on Investment (ROI) of 166% on this compressor.



This platinum mine produces about 7 million tons of platinum ore annually, extracted from rock up to 1.3 km (1,300 meters) below the earth's surface. The ore is processed onsite into a basket of products known as Platinum Group Metals or PGMs – a group of metals platinum, palladium, rhodium, iridium, osmium, and ruthenium. The mine has around 18,000 employees and contractors and draws about 155 megawatts of electricity from the national supply grid.

Challenge:

The mine site depends on a group of large air compressors that power some 3,500 pneumatic drills underground. Over the last few years, the team experienced many challenges with one of their largest onsite compressors that had reached the end of its useful life and required intervention to improve its reliability.

It wasn't long ago that when someone brought up this compressor, everyone would cringe and brace for the worst, thinking *Oh no. What's wrong with it this time?*

While the compressor invoked fear and many sleepless nights, it also inspired its share of awe. Manufactured in Liverpool, England in 1959, the compressor went through a major overhaul when it came to the mine site in 1998. Despite the refurbishments, it still had issues. Major issues. It wasn't uncommon for engineers to be called in the middle of the night to troubleshoot any number of reliability



incidents – from small instrumentation and oil-seal failures to circulating water supply and cooling tower failures.

“If that compressor stops, then all of our drilling stops underground. And effectively we lose an entire day’s production,” states the senior asset manager responsible for implementing the mine’s asset management framework, which tracks electrical and mechanical asset reliability and efficiency. The financial impacts are massive, as is the stress engineering teams face every time an issue arises.

“Obviously it’s an unacceptable condition that we lose massive amounts of production from one piece of equipment being unreliable,” said Senior Asset Manager. “Our entire team went about finding short-, medium- and long-term solutions.”

Solution:

The Asset Strategy and Reliability team began to evaluate the use of predictive analytic technology on critical mining equipment, where a failure on the equipment could impact overall production.

“We had not previously looked at the use of a predictive analytics tool to allow us to perform maintenance on a predictive basis,” said the Asset Manager. “It was something that everybody was very excited about.”

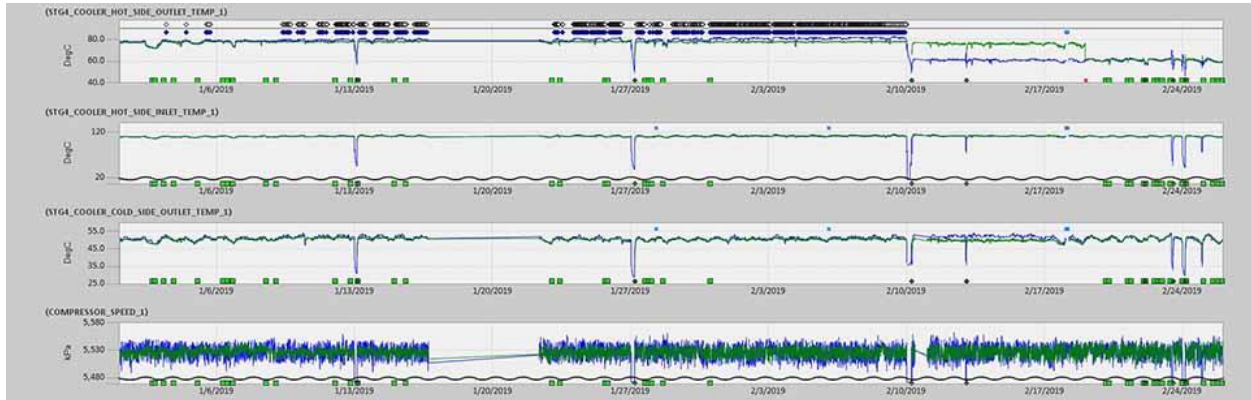
Working with Wabtec’s Digital Mine team & GE Digital’s Industrial Managed Services, the platinum mine began implementing Asset Performance Management and Digital Twin capabilities in late 2018. The combined solution uses online condition monitoring combined with predictive analytics to give the team information regarding possible future failures.



Results:

It quickly paid off. The mine’s air compressors compress large volumes of atmospheric air and distribute it across the mine, which includes 24 surface kilometers (15 miles) and hundreds of kilometers of underground pipeline. The compressed air powers 3,500 pneumatic drills used to prepare the rock face for blasting. The holes are charged with explosives that are set off at the end of the shift, liberating the ore from the rock. Inside the compressor are four interstage coolers, which maintain the air temperature for optimum efficiency.

In February 2019, the remote monitoring team detected a deviation using the digital twin on one of this compressor's interstage coolers. The Wabtec & GE Digital's Industrial Managed Services team alerted the mine's engineers who, upon inspection, discovered a failure on one of the cooling water circulation pumps. Temperatures had breached the early warning alarm of 80°C (176°F). When the pump was repaired, the discharge air temperature returned to the expected value of 60°C (140°F).



The catch, undetected by any other onsite alarms or toolsets, saved the mine site significant production loss, and would have required approximately four hours of unplanned downtime to repair otherwise. “We estimate savings by calculating what the impact would have been if we didn't pick up the fault, if we had a trip out on a compressor and had to conduct unplanned repairs mid-shift, and the impact it had on production.” said the Senior mechanical engineer at the site. He added that inadequate cooling water circulation can cause further equipment damage, so the catch could've saved more in damage prevention.

In addition to the cooling water circulating pump catch, the Senior Mechanical Engineer said the combined solution offering from Wabtec's Digital Mine has already pro-actively prevented about six large value issues thus far.

The company's purpose to “reimagine mining to improve people's lives” and employ innovative technological solutions that ensure the long-term stability of assets as a key part of that. The partnership with Wabtec's Digital Mine & GE Digital will help achieve that strategy.

While this compressor may not live forever, it is no longer the subject of angst and distress. In fact, the reliability improvements seen at this compressor, making use of solutions from Wabtec's Digital Mine & GE Digital solutions have delivered an ROI of 166% for the compressor and become a symbol for equipment reliability possibilities throughout the mine operations.

ABOUT WABTEC

Wabtec is a diversified, global leader in equipment, components, services, software and systems for the transportation and mining industries. Wabtec's successful heritage in the mining space spans electric drives for off-highway vehicles, Collision Awareness Solutions, and an innovative Digital Mine suite that combines advanced software, models, analytics and solutions to help miners foster safer mining practices and create a more efficient, productive and reliable mining ecosystem.



As an integrated solutions provider, Wabtec accelerates lifecycle solutions for the transportation and mining industries by improving interoperability, efficiency and competitiveness for customers. Wabtec has approximately 27,000 employees in facilities throughout the world. Visit the company's new website at: www.WabtecCorp.com.