Detection Of Arcing Faults In Generator Winding Prevented $0.5 Million In Potential Losses

BACKGROUND

The company prides itself upon its environmental and safety track record of not having a single safety incident in the last 15 years. One of its mine sites in Alberta, Canada called Gennesse, supplies coal to the adjoining power plant, which is owned by Capital Power that supplies power to the entire province of Alberta.

THE CHALLENGE

Coal is uncovered using the two draglines (1 – M8750; 1 – M8200). The current annual production of the mine is 5 million tonnes.
2 weeks of unplanned shutdown can cause as much as $11.5 million in losses. Recently, dragline M8750 was down due to an unexpected bearing failure on the boom.
Thus, Westmoreland really needed an automated predictive maintenance solution to prevent these losses from keep happening.

THE SOLUTION

We proposed our RotationLF system under which we installed around 30 wireless sensors as a part of a pilot project: 17 on the M8750 & the rest on M8200 as shown in below images.

Westmoreland Coal Company is a 150 years old company that mines coal and has 14 sites across North America (USA & Canada).

Once installed, strong battery-powered wireless sensors started sensing and sending data to our SaaS-based platform through an encrypted & secured network using Edge and Cloud computing. We were successfully able to provide internet at up to 250 ft height and even deep inside the mine with the help of our mesh system. As data was received, the RotationLF platform worked on data analysis using highly sophisticated algorithms.
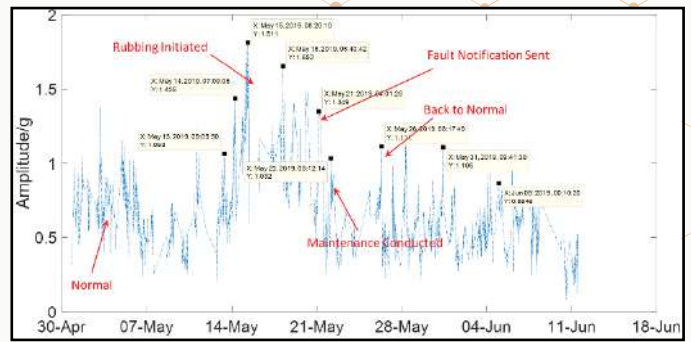
All these sensors were installed on April 30th. After 15 days only, the RMS trend plot generated from vibration data sent by sensors showed an upward trend indicating anomaly behavior as shown on the plot on the right. On May 21st, a fault notification was sent and corrective action was taken on May 22nd. By May 31st, the readings went back to normal.
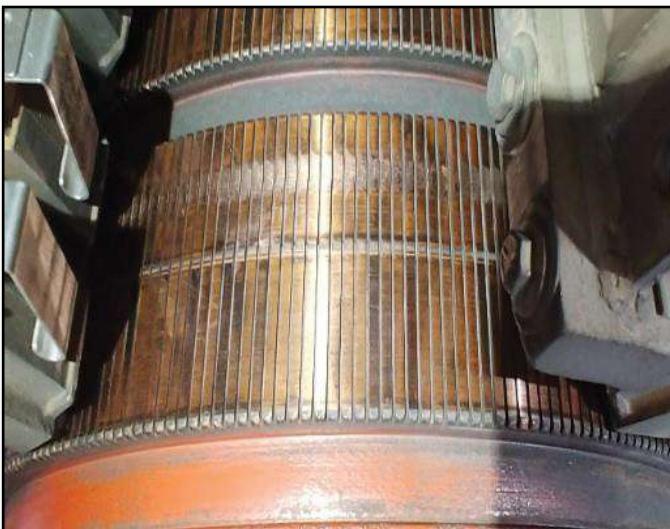
Rub marks generated due to carbon rod rubbing against the copper lining

THE RESULT

The RotationLF analytics sensed & detected the anomaly in the pattern and alerted Westmoreland staff about this unusual trend automatically through mobile text and email alerts. When the Westmoreland engineers opened the generator during one of the available down times, they found that the spring suspended underneath one of the carbon rods had snapped and as a result, the carbon rod started rubbing against the commutator (image on left). The plant engineers then undertook immediate repair action.

ABOUT NANOPRECISE

Nanoprecise specializes in the implementation of Artificial Intelligence and IoT technology for predictive asset maintenance and condition monitoring. Our timely and accurate diagnosis of machine faults provides our clients insights that allow them to make decisions that will save them considerable time and resources. Nanoprecise is headquartered in Edmonton, Canada with branches in Bangalore, India; San Diego, USA, and Newcastle, UK. We have managed to establish ourselves as a trusted solution provider in the asset management industry.

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