

# Rotor Pole Short Circuit & Gear Teeth Monitoring

VibroSystM's Zero Outage Online Monitoring system (ZOOM®) can perform local and remote monitoring of multiple machine condition parameters. It provides real-time and accurate results on the condition of a motor.

In an effort to establish pre-emptive instead of reactive measures, a copper production mine decided to install our ZOOM® system on two of their ball mills: A 15 MW gearless ball mill, with an internal stator core of 11.1m; and a gear ball mill, weighing approximately 54.000 kg and with a crown diameter of 6.7m.



## GEARLESS BALL MILL

The measuring chains installed on the gearless ball mill are for the monitoring of air gap, end-winding vibration, stator core vibration, oil film thickness (pads) and knife switch temperature.

In addition, as part of the monitoring system for the gearless ball mill, a magnetic flux sensor was installed next to the air gap sensor on the stator at 0°.

Analysis of the results obtained by the correlation of the magnetic flux and air gap measurements revealed a short circuit in rotor pole #14. (Figure 1)

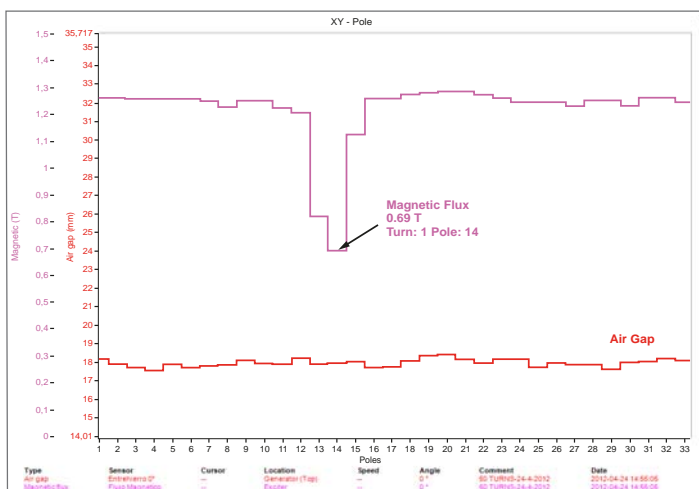


Figure 1.

## GEAR BALL MILL

The monitoring system installed on the gear-driven ball mill included measuring chains for gear frame absolute vibration, bearing absolute vibration, gear axial displacement and oil film thickness (pads).

In addition, as part of the gear monitoring measuring chain, teeth monitoring sensors were installed on the charge side of the mill. The ZOOM® system was able to show that bull gear tooth #18 was protruding when compared to the other adjacent teeth. A variation of up to 2.9 mm was recorded. In addition, the data showed that the protrusion was located only on the charge side. (Figure 2)

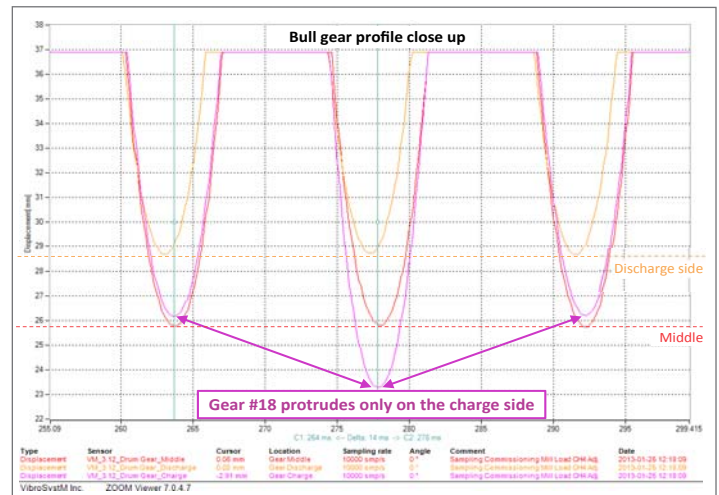


Figure 2.

## OUTCOME

The installation of VibroSystM's ZOOM® system has given the utility control over their maintenance schedule. They are now able to actively plan their machine shutdowns. The system is able to detect problematic situations, which enables the utility to plan ahead of time what corrective measures will be taken when the machine is shut down, significantly reducing unplanned outages.

