

CASE STUDY:

Rotor Bar Fault

Maintenance Issue: Vibration Sensor Alert



A 398 KW MV motor that runs a blower fan in a cement plant was showing strange behavior. The vibration equipment indicated vibration amplitudes that became chronic with the passage of time. The maintenance team not knowing what the issue was, ran the motor until the bearings had to be replaced. This happened several times with no remedy or cause for the bearing failures. On a few occasions the motor tripped on start up. Other than the symptoms, there was no known explanation for the repeated failures of this motor. The motor was utilized daily in between repeated bearing changes.



The plant's condition monitoring cell called Prescon for condition assessment of the motor. Prescon utilized ESA (electrical signature analysis) to assess the condition of the motor. Within minutes the test showed that the motor had cracked rotor bars/end ring problems.



Electrical Signature Analysis (ESA) is an energized test method where voltage and current waveforms are captured while the motor system is running, to assess the health of the motor system. Energized testing provides valuable information for AC induction and DC motors, generators, wound rotor motors, synchronous motors, machine tool motors, and more.

The motor was then shut down and opened. A crack was found in one of the end rings as shown below.

ESA technology enables users to test the motors while under load. ALL-TEST Pro's ESA technology is two instruments in one. It's a complete Motor Analyzer (ESA) and a Power Quality Analyzer (PQ). Energized testing (ESA mode) provides valuable motor health information for AC induction and DC motors, generators, wound rotor motors, synchronous motors, machine tool motors, and more. When in PQ mode it can be used for energy data logging, harmonic analysis, voltage and current charting, viewing waveforms, waveform capture of sags and swells, transient capture and event capture.



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