



One Machine Failure Can Impact the Revenue of Even the Largest Companies

When one of the world's largest global mining companies with locations in over 50 countries experienced a problem with a DC winder motor, significant losses mounted up over the days the machine was out of commission.

The mine operator contacted machinemonitor[®], the electrical reliability asset management company that it knew from previous experience would be able to rapidly identify the problem and return the machine to operation.

machinemonitor[®] is an independent electrical engineering consultancy that helps companies in the heavy industry sector gain a competitive advantage by increasing the efficiency and lifespan of capital assets. machinemonitor[®] has 15 years of experience in the asset management of electrical rotating machines and auxiliary equipment, and acts as a strategic partner by delivering design, troubleshooting, specialised field testing, repair management, condition monitoring and unique risk management services.

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The entire operation depended on a legacy machine

When a critical DC winder motor experienced armature failure, this mining company had no way to move materials and personnel. The operation had a forced shut down, costing the company more than **\$1 million per day**.

The DC winder was legacy equipment that had been in place since the mine opened. The company no longer had the knowledge in its workforce to repair the unit and had been performing only routine maintenance over the years. When the armature failed, the company overhauled the failed motor with an enhanced design. However, the machine continued to be unreliable and soon failed again.

A methodical diagnostic process was needed

The mine operator needed a partner with the depth of knowledge to identify the cause of failure and repair this winder motor quickly. Having worked with machinemonitor[®] in the past they trusted the company's ability to return the winder motor to service promptly.

Using historical knowledge of this particular machine a survey of the winder was conducted diagnosing the issue. When a high resistance connection was found, machinemonitor[®] applied a methodical, logical approach to determining the cause.

After conducting a number of tests to qualify the integrity of the motor, a thermography survey revealed that one set of brushes were colder than the others by approximately 20°C.

Current measurements taken with flexible CTs established that the cold arm had little current compared to the other brush arms. machinemonitor[®] then took resistance measurements between brush arms and used a digital video scope to visually inspect the area behind the brush arm carrier. A faulty connection was discovered.

The mine operator had a spare set of brush gear, which machinemonitor[®] also inspected before recommissioning the

When a Key Asset Failed, a Mining Company Required Assistance for a Fast, Accurate Repair

winder motor. The inspection showed that the brush arm connections on the spare had been modified at some point; the brazed connection had been replaced with a stud and nut joint. machinemonitor® found that the new stud was protruding into the armature raisers and there was not enough clearance for proper operation. The spare brush gear was modified on-site prior to installation, shortening the downtime while the winder motor was offline.

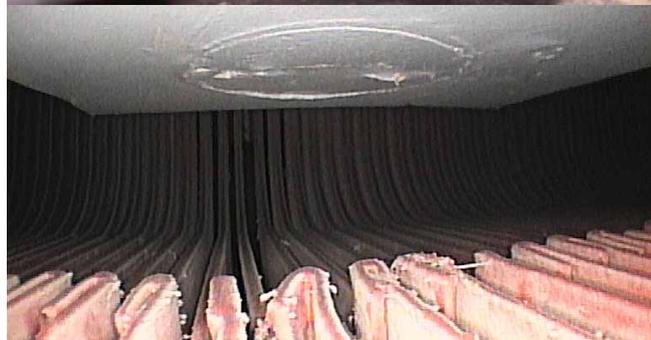
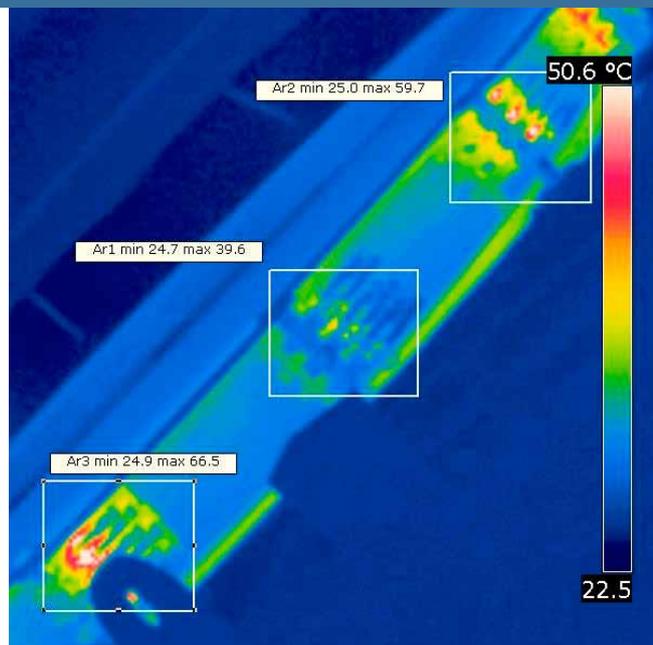
While on site, machinemonitor® also delivered technical support, working with the mine operator's maintenance staff to help them improve their work processes. machinemonitor® then developed a process for the maintenance staff to use to rectify the problem if it occurred again. When the engagement was completed, the mine operator had a working DC winder motor and staff that were better prepared to keep the critical machine running in the future.

Now the motor is reliable and the maintenance staff are better prepared to keep it running

The problem was pinpointed in a short window of time because of machinemonitor's logical approach to the problem, which incorporated on-site visual inspections and electrical testing. The winder motor was quickly restored to service, and the cost of the outage was minimised.

Since the motor's repair, it has continued to function reliably. The mine operator is confident that potential failures were prevented, saving the company from the significant production losses that would have been incurred if the repair had been less thorough. The company particularly noted the time saved by checking the spare set of brush gear; because of machinemonitor's diligence, modifications could be made before more time was wasted trying to install a piece that was not functional in its current state.

The mine operator benefited from a quick return to service, reduced risk, and elimination of a potential forced outage, as well as from the enhanced knowledge it gained from the knowledge transfer and process development that the machinemonitor® team delivered on site. A senior electrical engineer at the site said, "We now know what to do in the future if a similar problem occurs." ||



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 **machinemonitor®**
Electrical Asset Reliability Management