POWERSIDE®

Case Study

Cement manufacturer mired in costly outages finds stability and solid savings with DriveScan

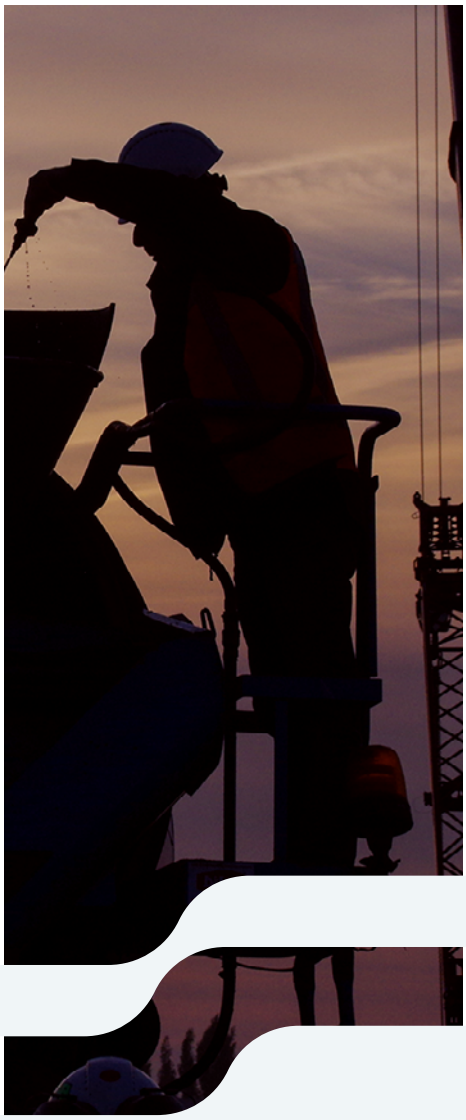
Problem:
An undetectable overcurrent on a medium voltage drive triggered frequent downtime events for a Utah cement plant.

Solution:
A DriveScan remote monitoring system was installed— providing a quick root-cause analysis and identification of the overcurrent issue and fast resolution.

Results:
DriveScan enabled the cement plant to return to up-time production levels, saving days of downtime and thousands of dollars of lost revenue.

DriveScan helps customers reduce downtime and emergency repair costs by as much as **50%.**

Real-world application



Background

With an annual production capacity of 800,000 metric tons, this cement production plant has to run 24/7. Operations are supported by a 400 HP, 4160V variable speed drive (VSD) with optional Across-The-Line Bypass. The VSD drives a medium voltage motor running a high CFM fan.

Problem

The drive would intermittently trip on an "Instantaneous Overcurrent" fault when starting up. At times it would restart and run without issue until it was eventually shut down. On other occasions, the drive would not restart, even after multiple attempts. When this happened, the operators would switch to bypass mode until the next outage, and then try again. The drive's inbuilt fault data did not identify issues on a specific phase, which initially lead to the assumption that the motor may be the problem. But was it?

> The inbuilt fault data produced by the variable speed drive did not identify issues relating to the intermittent outages. **The customer was stuck in an endless cycle.**

Solution

A DriveScan remote monitoring system was installed to quickly troubleshoot the ongoing drive problem.

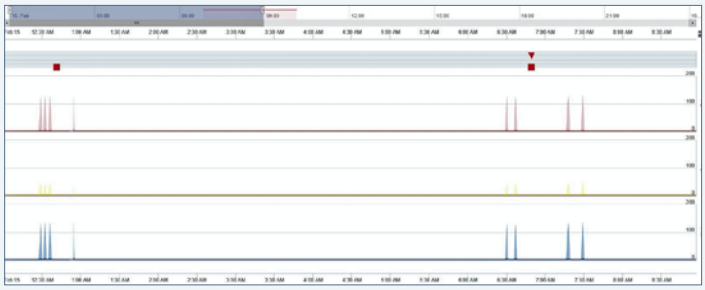


Figure A. Lower output current was recorded on V phase during startup.

Step 1:

The DriveScan system captured current draw trends on all phases during all stages of operation. The V phase current was significantly lower than the U and W phases during startup. This was consistent during four attempts to start the motor. The drive tripped in each case.

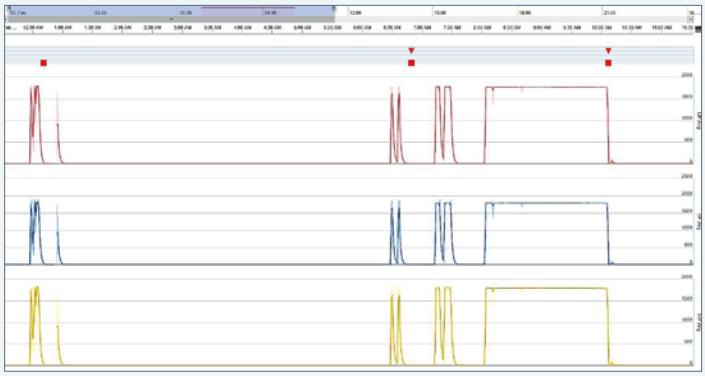


Figure B. DriveScan's patented DC cell capacitor monitoring showed no significant variation between phases on the DC bus. Keep in mind that after a fault, the drive's input contactor opens, removing power from all the cells.

Step 2:

DriveScan also provides cloud access to detailed DC cell voltage magnitude and ripple information. As part of the troubleshooting process this data was captured and studied, but as can be seen on the graph, the DC cell magnitudes appear consistent across all phases during the event.

Figure C. Consistent output current when motor was run across the line.

Step 3:

With DriveScan, it has been possible to trend the output current during a continuous period of operation. They confirmed that the output current was consistent across all three legs, which indicated that the motor and/or mechanical load was functioning properly. It became clear that the V phase cell was causing the issues.

Figure D. Swapping of V and W cells showed that the problem tracked the cell, not the phase.

Step 4:

The plant had a scheduled shutdown which allowed for swapping the questionable V phase cell with an apparently good W phase cell. They got the same fault message when they tried to run the drive, but based on DriveScan data, the current draw was significantly less on the W phase—confirming that the questionable V phase cell was the problem.

Results

DriveScan's remote real-time monitoring saved the Utah cement production plant precious time and money. Troubleshooting was significantly more efficient and data was collected in a much safer manner.

> Determining the suspected problem in advance allowed for repair during the scheduled offline period.

DriveScan continues to monitor the drive 24/7, provides an easy remote access while in the office or on the go, sends alert notifications and helps predict and avoid future operating problems.

The power of DriveScan

Reduced troubleshooting expenses

Safely and quickly identify drive problems via remote monitoring.

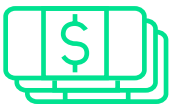
Avoid an extensive on-site system-wide troubleshooting process.

Reduced repair costs

Avoid sudden and potentially catastrophic drive cell failure. Such a failure can be a lengthy and expensive disruption leading to significant repair cost.

Relatively simple **on-site cell replacement** thanks to quick and efficient root cause identification of the failing component.

Reduced downtime



Downtime due to a medium voltage drive failure usually lasts **1-5 days and costs $5k-$75k** to repair.

Over its 20-year lifespan, one medium voltage drive has an **average cost of $2.2 million** in preventive maintenance, emergency services, and downtime.

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Learn more about how DriveScan remote monitoring can increase your uptime and decrease repair costs today.

Website

DriveScan Brochure

DriveScan Data Sheet

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