Immediate Intervention Prevents Catastrophic Engine Failure

Mobile Equipment Monitor Saves Mine Over $200,000 With Real-Time Remote Diagnostics

Challenge

A fleet monitor at a large U.S. copper mine received an engine oil filter alarm from one of their fleet of Caterpillar 240 ton haulers. He had to quickly assess the significance of the alarm and decide whether to keep the haul truck in operation.

Solution

Using Mobile Equipment Monitor's real-time and historical data, the fleet monitor quickly investigated the truck's operating conditions. He called Maintenance immediately. They found metal shards in the oil filters and replaced the engine.

Advantage

- Mobile Equipment Monitor's comprehensive historical and real-time data allowed the fleet monitor to quickly make informed decisions about how to react
- Early intervention prevented catastrophic engine failure
- Saving the engine block avoided costs of over $200,000
- Downtime required to get truck back in operation was minimized

Mobile Equipment Monitor is Powered by Matrikon, which represents vendor neutrality. This product works with third-party control systems and applications.

Engine oil filter differential pressure alarm

At a large U.S. copper mine, an engine oil filter alarm from a high-hour Caterpillar 240 ton hauler appeared in the Mobile Equipment Monitor alarm viewer. The fleet monitor responded by using Mobile Equipment Monitor's data visualization capabilities to investigate the operating conditions of the truck.

The fleet monitor viewed a trend that displayed engine oil filter differential pressure (the trigger for the alarm), engine oil level and pressure, throttle position and engine speed. The trend showed that the same alarm was triggered 24 hours earlier. This earlier alarm was handled by a fleet monitor at a different mine site. By reviewing the annotations added to the earlier alarm message and saved in the mobile equipment monitoring system, the fleet monitor was able to determine that the first fleet monitor had contacted Maintenance and Dispatch departments, at which time a decision was made to keep the truck in service but to watch it. The trend showed that the engine oil filter differential pressure had recovered immediately after the first alarm. However, it had spiked erratically in the next 12 hours, leading to the second alarm. Further examination of the data revealed that this second alarm was due to a 14 PSI differential, which meant the filter was being bypassed and the engine's condition was beginning to seriously degrade.

Engine block saved

Based on the information displayed in the trend, the fleet monitor immediately instructed the operator to take the truck off the road. Maintenance was sent out to inspect the oil filters, where they found shards of metal. The haul truck's high-hour engine had already been scheduled for replacement, but the engine oil filter alarms and the metal found in the oil filters resulted in the decision to replace the engine immediately, rather than waiting for the scheduled engine swap. The truck was driven to the shop, and the engine was replaced.

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"With Mobile Equipment Monitor, the copper mine was able to intervene early enough to avoid catastrophic engine failure."

Through its alarm viewer and data visualization tools, Mobile Equipment Monitor helped the mine to avoid catastrophic engine failure. Having been alerted to a potential problem by an alarm, the fleet monitor was able to view and analyze the truck's behavior leading up to the alarm using Mobile Equipment Monitor's historical data and visualization tools. As a result, he was able to make an informed decision about how to intervene. Maintenance was able to replace the engine while the engine block was still intact, saving the site over $200,000. The mine also saved considerable downtime costs because the engine had not yet completely failed and the haul truck could be driven to the shop. When an engine fails, a complex procedure is required to override the truck's hydraulics. Another haul truck must be taken out of regular service to tow the failed truck to the shop.

Changing the face of equipment maintenance

Mobile Equipment Monitor's continuous collection and storage of operational data has changed the copper mine's approach to maintenance. The appearance of alarms in the Mobile Equipment Monitor alarm viewer in real time allows fleet monitors to react and investigate immediately, dramatically increasing the likelihood that they will be able to intervene before the equipment fails.

The ability to view and analyze historical data has provided enormous learning opportunities for fleet monitors. In addition to finding the evidence they need to make informed decisions, they can also become familiar with the warning signs if a similar situation develops in the future. These lessons learned may allow them to intervene even earlier. In this case, the fleet monitors increased the engine oil filter alarm's priority because past experience had shown them that the alarm had greater significance than what the manufacturer had originally assigned.

The copper mine has now shifted their maintenance approach from reactive to proactive. Staff can learn from past analyses and find ways to act as early as possible when equipment begins to develop problems, which means the mine can now put its resources toward keeping equipment running and intervening before catastrophic failure occurs.

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'Powered by Matrikon' symbolizes that this product/solution is system and application independent.

For more information:
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