



Eaton clutches are engaged to help restart Arizona copper mine

Location:

Arizona

Segment:

Copper mining

Challenge:

Develop a highly reliable clutch solution entirely around a competitive, tightly enclosed framework and have it up and running in 16 weeks.

Solution:

Eaton® Airflex® clutches

Results:

Retrofit drop-in replacement clutch packages were delivered on time and on budget.

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"Eaton's Airflex engineering team designed and produced drop-in clutch replacements and delivered the complete retrofit packages in a very timely manner, which was of paramount importance to our operations."

Mine Superintendent

Background

Eaton's Airflex clutches are ready to support full-swing production when an Arizona copper mine is reopened at the end of 2012. Closed since 2009 due to the global economic downturn, the mine will produce copper concentrate to serve the global economy.

Eaton Airflex Ventilated Constricting (VC) clutches transmit the rotary torque from 4,000-horsepower low-speed synchronous motors, which operate six ball mills that grind the ore in preparation for copper extraction.

The Airflex clutches were supplied to the mine by Palmer Johnson Power Systems, an Eaton distributor in Phoenix, Arizona.

Challenge

Prior to being purchased by the current owner, the mine had been closed for several years, which caused idled concentrator systems to require restoration and repairs. Reconditioning competitive clutches on the grinding mills did not seem necessary until a clutch failure turned into a very lengthy and costly downtime event. After spending four days trying to repair the existing clutch, the mine called in Eaton and Palmer Johnson for a much-needed solution.

"Every member of the maintenance crew had previous experience with Eaton's Airflex clutches and recommended them wholeheartedly for the job," said Eaton's Don Keck, global market development manager.



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Keck and Palmer Johnson representatives soon learned that the project was not a run-of-the-mill clutch installation.

"Because the installation was a retrofit, we needed to develop a highly reliable solution entirely around a competitive, tightly enclosed framework," Keck said. "Therefore, creating a customized layout for the clutch would entail cutting seven inches off the length of the motor shaft in order to make a gap between the motor and the pinion shaft. This gap would allow the clutch to easily slip in and out for maintenance requirements.

"In addition to the modified layout, the project required creating detailed reference drawings, manufacturing the clutch to custom specifications, performing any onsite rework needed and getting the clutch up and running in 16 weeks."

Solution

While addressing overall clutch dimensions, horsepower and motor shaft locations in his project proposal, Keck highlighted how the mine would directly



An Eaton Airflex clutch transmits rotary torque to each of the mine's six ball mills.

benefit from Eaton's Airflex VC clutches.

He explained that the Airflex Dual 52VC1200 clutch would achieve full engagement at a slower speed upon startup than the previously used disc-style clutches, resulting in reduced power consumption and the elimination of heavy shock load that causes stress on multi-million-dollar motors and drive components.

Keck also reinforced the fact that Eaton's Airflex engineering team would work very quickly to design the new clutch retrofit units and provide a detailed project timeline.

Results

Impressed with Eaton's aggressive technical and design assistance within the delivery time frame, mine officials decided it was best to replace the worn-out disc clutch with an Airflex VC clutch—as well as the clutches on the other five ball mills before more untimely failures (causing downtime) occurred.

The first of the mills was restarted in four days after the Airflex clutch was delivered, and the remaining clutch conversions were also completed on time and within budget.

"Eaton's Airflex engineering team designed and produced drop-in clutch replacements and delivered the complete retrofit packages in a very timely manner, which was of paramount importance to our operations," said a mine superintendent.

"Eaton also provided qualified field service support to oversee and manage the installation of the first clutch, as well as startup assistance when the installation was complete."

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