



"Eaton's Hydrokraft™ motors give us twice the drive torque to the tracks, which results in better control. Tram pressures are lower, resulting in lower operating temperatures in the hydraulic system."

*Cecil Huber, PotashCorp General Maintenance Foreman
Underground*

Eaton Hydraulic Motor Helps Increase Production Efficiency in Canada Potash Mine

Location:

Canada

Segment:

Potash mining

Challenge:

Need for a compact, two-speed hydraulic motor that would increase tram speed of a miner and default to maximum displacement in the event of pilot pressure loss

Solution:

Eaton custom Hydrokraft motor

Results:

Eaton two-speed Hydrokraft motors speed up non-productive operations, such as relocating the miner, and increase cutting operation efficiency through more precise delivery of torque to the tracks during mining operations.

Contact Information:

Lyle Meyer
Eaton's Hydraulics Group
(952) 294-7936
LyleGMeyer@eaton.com

Background

Work output in a potash mine is dependent on machines with high mobility and production efficiency. As the world's demand increases for potash that is used primarily as an agriculture fertilizer, Canada's PotashCorp of Saskatchewan (PCS) has stepped up production at its Rocanville Saskatchewan mining facility with a continuous bore mining machine that extracts some 1,200 tons of potash ore per hour.

Propelling the massive four-rotor mining machine, weighing in at 250 tons, are two Eaton Hydrokraft 250-cc motors that are the heart of the hydraulic system on the X CEL 44 Series miner built by Prairie Machine & Parts Manufacturing, Ltd. of Saskatoon.

Challenges

PCS has relied on HyPOWER Systems Inc. of Regina, Saskatchewan, an Eaton distributor, to provide hydraulics muscle and hydraulics commonality for its mining machinery. When the need for an additional miner became evident, PCS asked HyPOWER to redesign hydraulic circuitry for the machine and to work with Prairie Machine on fit, functionality, and integration requirements.

Delving into the project, HyPOWER's Ken Pagan, technical sales representative, and Cal Ganshorn, mechanical engineering technologist, called on Eaton's Lyle Meyer, Hydrokraft product manager, for a two-speed hydraulic motor recommendation.

"We explained to Lyle that the motors would need to increase tram speed over PCS's current miners that move at a snail's pace through the mine," Ganshorn says, "plus fit into a tight envelope on the miner.

"In addition, the motors would need to default to maximum displacement, in the event that hydraulic system pilot pressure was lost."

Solution

Meyer proposed Eaton's compact Hydrokraft two-speed motor for the application, after confirming with Eaton's Wehrheim, Germany, manufacturing facility that a customized version would default to maximum displacement, not minimum displacement as does the standard version, when pilot pressure is lost. Ganshorn specified the custom Hydrokraft motors into his hydraulic system design proposal that also included Eaton DG4S4 valves, V Series vane pumps, and a Series 2 piston pump that would operate auxiliary functions.

PCS liked the design proposal and gave HyPOWER its endorsement to design the miner's hydraulic system around the custom Eaton Hydrokraft motor.



Powering Business Worldwide

Eaton Corporation is a diversified power management company ranked among the largest Fortune 500 companies. Eaton is a global leader in electrical components and systems for power quality, distribution and control; hydraulics components, systems and services for industrial and mobile equipment; aerospace fuel, hydraulics and pneumatic systems for commercial and military use; and truck and automotive drivetrain and powertrain systems for performance, fuel economy and safety. Eaton has approximately 73,000 employees and sells products to customers in more than 150 countries. www.eaton.com

Results

Following assembly and testing, the miner was completely disassembled in order to be transported down the mine shaft. Simultaneous with these projects was the task of carving out rock 3,200 feet below the Saskatchewan prairie in order to build a shop in which to reassemble the 38-foot-long by 22-foot-wide miner piece by piece. Overall, the multi-million-dollar investment is already paying off for PCS. The machine has been up and running since November 2009 and is significantly faster than the elder PCS miners.

"Our hydraulic system design with the Eaton Hydrokraft motors has enabled the new X CEL miner to increase tram speed by 40 percent," Ganshorn notes.

The increased tram speed saves two hours of tram time and more, says PCS's Cecil Huber, general maintenance foreman underground.

"The time savings frees up the operator to help with setup sooner and allows us to move the electrical set that much sooner as well," Huber says.

"Eaton's Hydrokraft motors give us twice the drive torque to the tracks, which results in better control. Tram pressures are lower, resulting in lower operating temperatures in the hydraulic system."

PCS plans to add five more X CEL miners equipped with Eaton products to its Rocanville machinery lineup.



An Eaton Hydrokraft motor is the heart of the hydraulic system on PCS's new X CEL miner that extracts some 1,200 tons of potash per 100 feet of advance per hour.

Eaton
Hydraulics Group USA
14615 Lone Oak Road
Eden Prairie, MN 55344
USA
Tel: 952-937-9800
Fax: 952-294-7722
www.eaton.com/hydraulics

Eaton
Hydraulics Group Europe
Route de la Longeraie 7
1110 Morges
Switzerland
Tel: +41 (0) 21 811 4600
Fax: +41 (0) 21 811 4601

Eaton
Hydraulics Group Asia Pacific
Eaton Building
4th Floor, No. 3 Lane 280 Linhong Rd.
Changning District
Shanghai 200335
China
China
Tel: (+86 21) 5200 0099
Fax: (+86 21) 5200 0400



Powering Business Worldwide

© 2010 Eaton Corporation
All Rights Reserved
Printed in USA
Document No. E-HYOV-MS042-E
March 2010