Increasing Reliability & Profits by Reducing Hose Failures and Leaks

Danny Petty
August 14, 2013
Overview

- Case Studies on Loss Due to Hose Failures
- Challenging the Underground Standard
- Caterpillar’s Focus on Fluid Lines
- Increasing Reliability & Profits Underground
Case Studies on Hose Failures and Leaks

• R&P section had 417 hydraulic downtimes in a 512 day period
  – 357 hrs of downtime averaging 51 minutes each

• A study of a R&P mine with 7 roof bolters recorded 185 hose failures over 479 days
  – Resulted in a MTBF of 18.1 days per roof bolter
  – 2.6 days for the roof bolter fleet
CM Case Studies on Hose Failures and Leaks

• Midwest mine reported 90% of downtime due to hose failures on fleet of 5 CMs
  – 500K tons loss in production due to these failures

• A PA longwall operation lost the equivalent of 93 full shifts on a fleet of 6 miner bolters
  – 92% availability across the fleet
  – Hose failures and leaks make up 26% of downtime
Challenging the Underground Standard

**Underground**
- JIC couplings
- Standard hose lengths
- No hard lines

**Surface**
- ORFS couplings
- Customized hose lengths
- Hard lines
ORFS can be a Direct Replacement for JIC

ORFS and JIC Comparison

SAE Split Flange
Study shows JIC leaks 20 times more than ORFS

ORFS at Caterpillar

- ORFS are the preferred connection at by CAT worldwide

- Large volumes at CAT have driven down cost

- ORFS have worldwide availability

- Many improvements have been made to ORFS
Caterpillar’s Focus on Fluid Lines

- Developed own software for hose routing called Fluid Lines
- Design guides and training classes for hose and tube designers
- Hose audit process to maximize reliability and durability
- Dealer network enabled to support fluid lines for all products
Hose Audit Process

Virtual Review

On-Machine Review
Cat has Success on Underground Equipment

All new hard rock vehicle development uses ORFS
Increasing Reliability on Roof Bolters

- Initiated fluid line audit process on roof bolter
- Using Fluid Lines to design hose and tube routings
- ORFS is preferred connector
- Using combination of hoses and hard lines
Summary

- Case studies show poor reliability of fluid lines in underground mines
- To increase fluid line reliability we must change the underground standard
- Using the proper line type and connector are critical to success
Wherever there’s mining, you’ll find Caterpillar. Cat products are hard at work around the world — drilling and digging, loading and hauling, grading and dozing. And our people are there, too — supporting our products, training operators, helping customers mine safely and more profitably, and actively participating in the global mining industry.

WHEREVER THERE’S MINING, WE’RE THERE.