

UPTIME'S **2010** PdM PROGRAM OF THE YEAR



Best
Overall
PdM
Mobile
Fleet

Arch Coal's Equipment List:

VIBRATION

- Analytical & Diagnostic Services (formerly Vibration Consultants, Inc.)
 - (5) GE-Tac Data Analyzers w/MAX software
 - (2) Rugged Tablet Analyzers w/MAX software
- COMMTEST
 - (6) Vb Online, 32 channel with Ascent Condition Monitoring Software
 - (3) Vb8 Data Analyzers with Ascent Condition Monitoring Software

(Note: We are in the 2nd year of a 3-year process standardizing to COMMTEST for a single source for online and offline, budgeting the phase-in of one type)

ULTRASOUND

- (10) UE Ultraprobe 3000 guns with UE Spectralyzer Software
- (2) UE Ultraprobe 100 guns with no software

UT

- (3) Krautkramer USN58L (now GE Inspection)
- (1) Krautkramer USN521
- (1) Krautkramer USN52

MCA

- (8) ALL-Test PRO IV 2000 Offline Analyzer with TREND 2005 and EMCAT 2005 software
- (8) ALL-TEST PRO Online II Analyzer with ATPOL II software

IR

- (6) FLIR P65HS
- (2) FLIR i5
- (1) FLIR P60
- (1) FLIR P625
- (1) FLIR P50

OIL/COOLANT/DIESEL ANALYSIS

- Caterpillar SOS (1 mine)
- Polaris Laboratory (10 mines)
- In-house Laboratory (1 mine)
 - (1) Fuel Sniffer by Spectro Inc.
 - (3) On-site Analysis II (OSAI)

BORESCOPES

- Multiple versions exist - Rigid SeeSnake, Snap-On, etc.

Arch Coal, Inc. Program Highlights

Arch Coal, Inc. - St. Louis based Arch Coal is the second largest U.S. coal producer. In total, we contribute about 16% of America's coal supply from our 11 mining complexes in Wyoming, Utah, Colorado, West Virginia, Kentucky, and Virginia.

With 126 million tons of coal sales in 2009, we provided U.S. utilities with the fuel for roughly 8% of the nation's electricity. We control a vast domestic reserve base totaling 4.7 billion tons. Of that total, 85% is low in sulfur and roughly 80% meets the most stringent requirements of the Clean Air Act without the application of expensive scrubbing technology.

We're proud stewards of safety and the environment, and have amassed dozens of national and state awards of excellence. Arch Coal is traded on the New York Stock Exchange under the ticker symbol ACI. Arch Coal's backbone for maintenance and reliability activities is our Arch Initiative in Maintenance or A.I.M. The A.I.M. model stipulates 70% planned work or 35% PM Inspections and 35% PdM inspections. A.I.M. Goal: A.I.M. is a strategic business solution that will create shareholder value by enhancing our planning efforts, resulting in a better understanding of today's business versus how we have managed in the past. A.I.M. Vision: Maximize asset availability



From Left:
Terry Taylor - Manager Equipment Reliability, Joe Swan - Manager Maintenance Technical Support, Bob McCreary - Director of Maintenance and Technical Services, Arne Rajala - Manager EAM Systems, Randy Fizer - Manager Equipment Reliability.

and reliability based on Production needs and at the same time reduce equipment costs through Reliability and Condition Based Asset Management.

Personnel - Maintenance Engineers and Predictive Services Engineers

- Employed at all locations
- Certified
- Continuing Education
- Annual and Monthly Team Meetings
- CMRPs on staff

Key Performance Indicators

- PdM maintenance labor hours/total maintenance labor hours available (lagging)
- Quarterly PdM Parts Cost Savings (lagging)
- Loss opportunity savings
- Component savings
- Trending
- Percent Planned Work (leading)

CMMS - Mincom Ellipse 5 upgraded to Mincom Ellipse 8 in 2011

Technologies deployed

Oil Analysis

- Comprehensive program with sampling taken at set intervals
- Severity 3 and 4 samples generate work orders and e-mails to the appropriate personnel
- Monthly dashboard meeting
- Executive report on trend statistics
- Transformers annually

Vibration Analysis

- Ventilation - Main and Section Fans
- Drives and Feeders

- Preparation Plants
- Draglines and Shovels
- Remote Data Points - Drives and Fans
- Online Continuous Monitoring - Drives and Fans

Thermography

- Electrical - Main Overhead HV, Power Centers, Trailing Cables, Motors and Substations
- Mechanical - Drives, Diesel Cooling Systems, Beltlines and Pumps
- Motor Circuit Analysis
- Offline - Pumps and LV Motors, Drives and Fans
- Ultrasonic Flaw Detection
- Draglines and Shovels - Structural, Propel, Boom and Suspension
- Mobile Equipment
- LW Shields & Feeder/Breakers

Ultrasound Analysis

- Mechanical - Engines, Gearboxes, Bearings and Boom Chord Leaks
- Electrical - Arcing, Tracking and Corona

Reliability Elements

- Certified Electric Motor Rebuild Shop Standards
- Certified Hydraulic Rebuild Shop Standards
- Certified Gearbox Rebuild and Acceptance Testing Standards
- Contamination Control and Oil Cleanliness Program
- Standardized Equipment/Component Specifications
- Standardized Preventive Maintenance Program
- Current Best Practice Self Assessments conducted annually

Arch Coal, Inc.