DC Shovel Electrical Systems Training

Course Duration
3 days

Target Audience
Electricians, Technicians and Engineers who service and maintain P&H Mining shovels.

Description
The student is introduced to the operation and maintenance of the P&H Electrical mining shovel. Furthermore the course focuses on critical knowledge and skills required in supporting present day P&H Electrical mining shovels. Topics included are the Centurion DC Shovel Control System. The concepts that are covered in the classroom are reinforced in a laboratory environment that allows the students to load, install and configure application software.

Prerequisites
Students should have knowledge of power electronics and computers. It is suggested that students complete Power, Drive and Control System elearning training modules.

Course Location
Field

Course Objectives
Upon completion of this course the student will be able to:

- Identify and explain the purpose of all the major components utilized.
- Use application software and programs as required.
- Remove and replace faulty components including a failure analysis.
- Explain the inter-relationship of the shovel systems.
- Analyze schematics and control diagrams utilized for troubleshooting and repair.

Main Concepts

- DC Power System overview
- Drives Windows overview
- AC800M (Advant Controller 800) Hardware overview
- Control Builder overview
- Auxiliary Systems Operation
- System Maintenance and Troubleshooting
Course Introduction
- Pre-assessment
- General safety
- ESD

Electrical System Diagrams
- Systems diagram overview
- Shovel schematics
- Use of the index
- Use of location codes
- Reading P&H Schematics
- Schematic Exercises

Touch Panel & GUI Systems
- Touch panel navigation
- Touch panel software tools and calibration
- Touch Panel Navigation Lab

DC Power Systems
SCR (101)
- Basic theory of operation
- Basics troubleshooting techniques

P&H Converter Configuration
- Theory of operation
- Hardware overview
- SCR Troubleshooting 101

Diverter Circuit
- Theory of operation
- Hardware Overview
- Basic troubleshooting
- Student worksheets

RPC
- Theory of operation
- Hardware overview
- Student worksheets

Drive System (DCS800 or DCS600)
- Theory of operation
- Hardware overview
- Student worksheets
- DriveWindows procedures

Advant Controller 800 and Remote I/O
- Advant Controller Components
- Remote I/O Components
- Control builder overview
- Monitoring I/O Status
- Student worksheets
- Controller loading procedures
- I/O System troubleshooting

Air System
- Theory of operation
- Hardware overview
- Troubleshooting
- Student worksheets

Brake System
- Theory of operation
- Hardware overview
- Troubleshooting

Automatic Lubrication System
- Theory of operation
- Hardware overview
- Troubleshooting
- Student worksheets

DC Motors
- Theory of operation
- P&H Motor Types
- Maintenance inspections/procedures

Course Evaluation and Wrap
- Post-assessment
- Course evaluation