AC Shovel Electrical Systems Training

**Course Duration**
4 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 AC 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**
Milwaukee Training Facility

**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**
- AC Drive Line up overview
- Drives Windows overview
- AC800M (Advant Controller 800) Hardware overview
- Control Builder overview
- Auxiliary Systems Operation
- System Maintenance and Troubleshooting
### Day 1

**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

### Day 2

**Drive Control Unit (RDCU)**
- Theory of operation
- Hardware overview
- Software chains
- Group 19 data transfer

**Drive PC Tool Software**
- Drives Windows overview
- ID RUN overview
- Student Lab Activities

**Advant Controller 800 and Remote I/O**
- Advant Controller Components
- Remote I/O Components
- Control builder overview
- Monitoring I/O Status
- Student Lab Activities

### Day 3/4

**Rear House Blower System**
- Theory of operation
- Hardware overview

**Auto Crowd Belt Tensioning System (4100XPC)**
- Theory of operation
- Hardware overview
- Troubleshooting

**Student Lab Activities**
- AC800 Procedures
- Drive Procedures
- Install I/O stations
- Verify connectivity
- Test Inputs
- Test outputs
- I/O system troubleshooting

### Shop Tour

**Course Evaluation and Wrap**
- Post-assessment
- Course evaluation