



DC 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 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

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

- DC Power Systems 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*

DC Power Systems**SCR (101)**

- Theory of operation
- Basic Troubleshooting Techniques

Converter Operation

- Theory of operation
- Shovel Configuration
- Troubleshooting
- *Student lab activities*

Diverter Operation

- Theory of operation
- Shovel Configuration
- Troubleshooting
- *Student lab activities*

RPC Operation

- Theory of operation
- Program Configuration
- Troubleshooting
- *Student lab activities*

Day 2**Drive System Hardware Overview**

- DCS600 Circuit board operation
Or
- DCS800 Circuit Board Operation

Drive PC Tool Software

- Drives Windows 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*

Air System

- Theory of operation
- Hardware overview
- Troubleshooting
- *Student lab activities*

Brake System

- Theory of operation
- Hardware overview
- Troubleshooting

Automatic Lubrication System

- Theory of operation
- Hardware overview
- Troubleshooting
- *Student lab activities*

Day 3/4**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