



## Course Duration

The duration is 2 days

## TARGET AUDIENCE:

This training is targeted to Electricians, Technicians and Engineers who will 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. The topics include The ElectroTorque Plus B Digital Drive System, and the Centurion Shovel Control System. The concepts that are covered in the classroom are reinforced in a laboratory environment that allow the students to load install and configure application software.

## Prerequisites:

Students should have a basic knowledge of power electronics and computers. It is also suggested that students complete Power, Drive and Control System eLearning training modules.

## Course Location

TBD

## Course Plan

## 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 relationship to the rest of the shovel systems.
- Analyze schematics and control diagrams utilized for troubleshooting and repair.

## Main Concepts

- Electro-Torque Plus B Hardware Overview
- Drives Window Overview
- DW 2.1 Procedures
- Drive fault analysis
- AC800M (Advant Controller 800) Hardware Overview
- Remote I/O devices
- Control Builder Overview
- Control Builder Procedures
- System Maintenance and Troubleshooting



## Day 1

### **Course Introduction**

- Class Objectives
- General Safety
- ESD

### **Electrical System Block Diagrams**

- Systems Diagram Overview
- Shovel Schematics

### **Touch Panel & GUI Systems Review**

- Touch Panel Navigation
- Touch Panel Software Tools
- Touch Panel Navigation LAB

### **Advant Controller 800 & Remote I/O Hardware Review**

- AC800 Processor Unit
- Profibus DP-V1 Interface
- External Battery unit
- Interface Modules
- I/O Modules

### **AC800 Basic Software Overview**

- Control Builder Introduction

### **Student Lab Activities**

- Clearing & Loading AC800 Applications

### **Student Lab Activities**

- I/O Tracing

## Day 2

### **Electrotorque Plus B Hardware Review**

- Circuit Board Operation
- Detailed Comparison to Previous Drive Systems

### **Electrotorque Plus B Software Overview**

- Drives Windows Introduction

### **Student Lab Activities**

- Loading Back Up Packages

### **System Troubleshooting**

- Fault Finding Methods,

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