

## Industrial Hydraulics

This five-day course primarily focuses on hydraulic system troubleshooting. A comprehensive study of hydraulic system components and their major causes of failure will be examined in detail. Plant maintenance personnel will be asked to bring plant-specific prints for review and study during the print reading section of the course. In addition, a detailed study of hydraulic system contamination control is included, with an emphasis on component and system design changes that should be incorporated into all existing and future systems.

### I. Hydraulic Components

- System Familiarization
- Introduction to Hydraulic Systems
- Hydraulic Fluids
- Filtration Systems
- Hydraulic Pumps
- Pressure Control Devices
- Manual Directional Control Valves
- Check Valves
- Needle Valves
- Hydraulic Cylinders
- Hydraulic Flow Control Valves

### II. Hydraulic Laboratories

- Paired Cylinders in a Circuit
- Hydraulic Press Application
- Hydraulic Jack Application
- Hydraulic Positioner
- Hydraulic Symbols and Schematics

### III. Physical Properties

- Flow Rate in Hydraulic Systems
- Force in Hydraulic Systems
- Hydraulic Force Transformers
- Work Done with Hydraulic Systems
- Power in Hydraulic Systems
- Energy in Hydraulic Systems
- Pressure Drop

### IV. Hydraulic Pump Design

- Standards
- Applications
- Pump Classifications
- Basic Pump Types
- Dynamic (Kinetic)
- Centrifugal Pump Classes
- Terminology