TRANSFORMATIONAL
PERFORMANCE SOLUTIONS

Pump Repair & Maintenance

This development course is available in both virtual and in-person, instructor-led formats, it is a two-day Pump Repair & Maintenance course designed to bring team members up to speed in their knowledge of pump repair, maintenance and servicing.

Description:

This course is suitable both for novice technicians seeking the fundamentals of pump repair as well as experienced technicians seeking skills improvement or a refresher. The course covers pump design, types, parts, common causes of pump failure, repair techniques, and predictive maintenance for pumps. The goal of the course is to ensure that team members understand the causes of pump failure, how to bring pumps back to life when they fail, what they should learn from those incidents, and how to reduce the risk of future failures.

Course Outline:

Day One – Topics

Centrifugal Pump Design

1. A Short History
2. Bernoulli's Principle & the Venturi Effect
3. Centrifugal Pump Design

Pump Parts and Identification – Hands-On Activities

1. Wetted End Parts
2. Dry End Part
3. Pump Tree
4. Drivers
5. How to Read a Cross-Sectional View

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Bearing Removal and Installation

1. Bearing Types and Identification
2. Expected Life Based on Bearing Loads and Speeds
3. Proper Installation of Pump Bearings
4. How to Use Micrometers – Hands-on Exercise
5. Press Fitting
6. Thermal Installation
7. Lubrication of Pump Bearings

Bearing Failure Analysis

1. Disassembling a Bearing for Inspection
2. Troubleshooting Bearing Failures

Simple Vibration Measurement

1. History of Vibration as a Condition Testing Tool
2. How to Read a Vibration Meter
3. Measurement of Vibration Velocity
4. Troubleshooting Using a Vibration Meter

Acoustical Measurement of Pump Bearing Condition

1. Introduction to Acoustical Measurements
2. Spalling and How to Determine When It Occurs
3. Pump Bearings Condition Guide

Split Case Pump Rebuilding Techniques

1. Techniques for Rebuilding a Spit Case Horizontal Pump
2. Techniques for Rebuilding an ANSI Frame Back Pull-Out Pump

Pump Foundations

1. Anchoring, Shimming & Grouting

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Pump Shafting Inspection and Repair

1. Shaft Condition & Drawings
2. Stub Shaft Techniques
3. Bowed Shafts
4. Diameter Corrections

Day Two - Topic

Suction and Discharge

1. Piping
2. "Dos and Don'ts" of Pump Piping Installation

Pump Coupling and Shaft Alignment

1. Soft Foot Inspection & Correction
2. Coupling Installation Techniques
3. Shaft Alignment Techniques
4. Laser Alignment

V-Belt Drives for Pumps

1. Types of Belts
2. Alignment of Belts
3. Sheave Groove Inspection
4. Belt Inspection
5. Force Deflection Method of Belt Tensioning

Wetted End Pump Troubleshooting

1. Cavitation
2. Unbalance of Impellers

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3. Volute Wear
4. Piping Strain
5. Air Entrainment
6. Seal Failure
7. Flange Leaks

Packing

1. Types of Shaft Packing
2. Tools for Repacking a Pump
3. How to Pack a Pump

Mechanical Seals

1. Types of Mechanical Seals – Hands-On Activity
2. Seal Installation
3. Seal Troubleshooting

Bolted Sealing Values for Wet End Assembly

1. Sequence Diagrams
2. Torque Chart

Developing a PM Program for Pumps

1. The Need to Identify Critical Equipment
2. Check Sheets
3. Predictive Maintenance Tools (Vibration Measurement, Oil Analysis, Infrared, and Ultrasound)
4. Pressure Testing
5. Dead Heading
6. Flow Testing
7. Pump Purchases & Acceptance
8. Advantages of Computer-Based Maintenance Management Software (CMMS)

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