

MULTI-STAGE PUMP OVERHAUL, PERFORMANCE & MAINTENANCE OPTIMIZATION

“Improving Reliability, Efficiency, and Lifecycle of Multi-Stage Pumping Systems through Precision Overhaul and Maintenance Strategies”

Schedule

Date	Venue	Fees
26 - 27 Feb 2026	Kuala Lumpur, Malaysia	USD 1995 per delegate

Introduction

Multi-stage pumps play a vital role in high-pressure fluid handling across critical industries such as oil & gas, power generation, water treatment, and petrochemicals. Failures or inefficiencies in these systems can result in costly downtime, reduced throughput, and safety concerns. This specialized training provides participants with the technical knowledge and practical techniques needed to overhaul, maintain, and optimize multi-stage pump systems for long-term operational excellence.

Through a combination of hands-on workshops, performance diagnostics, and maintenance planning, participants will gain the ability to troubleshoot, restore, and extend the life of multi-stage pumps while improving reliability and reducing maintenance costs.

Objectives

By the end of this course, participants will be able to:

- Understand the working principles and configurations of multi-stage pumps
- Perform proper disassembly, inspection, and reassembly during pump overhauls
- Identify root causes of failures and performance degradation
- Implement preventive and predictive maintenance programs
- Optimize pump operation for energy efficiency and mechanical reliability

Why Attend

- Improve asset reliability and avoid unexpected pump failures
- Learn precision overhaul and reassembly techniques for multi-stage pumps
- Identify performance issues early through vibration, pressure, and temperature trends
- Reduce operational and maintenance costs through optimization practices
- Extend equipment life through condition-based maintenance and alignment techniques

Target Audience

This program is designed for:

- Mechanical maintenance technicians and supervisors
- Rotating equipment engineers
- Maintenance planners and plant engineers
- Pump and reliability specialists
- Operations personnel responsible for pump systems

Individual Benefits

Key competencies that will be developed include:

- Technical understanding of multi-stage pump systems
- Overhaul procedures, including inspection and tolerance checks
- Use of condition monitoring to guide maintenance actions
- Troubleshooting common pump problems
- Best practices for alignment, sealing, and lubrication

Organizational Benefits

Upon completing the training course, participants will demonstrate:

- Reduced pump failures and unscheduled maintenance
- Improved overhaul planning and execution efficiency
- Increased mean time between failures (MTBF)
- Better spare parts control and predictive maintenance scheduling
- Enhanced pump energy performance and system reliability

Instructional Methodology

The course follows a blended learning approach combining theory with practice:

- Strategy Briefings - Core pump theory, design standards, and reliability fundamentals
- Case Studies - Real-world pump failures and overhaul success stories
- Workshops - Disassembly inspection planning, alignment exercises, and failure diagnosis
- Peer Exchange - Group troubleshooting and problem-solving activities
- Tools - Checklists for overhaul, alignment logs, performance tracking templates

Course Outline

Training Hours: 7:30 AM – 3:30 PM **Daily Format:** 3-4 Learning Modules | Coffee breaks: 09:30 & 11:15 | Lunch Buffet: 01:00 – 02:00

Day 1: Multi-Stage Pump Fundamentals and Overhaul Practices

- **Module 1: Pump Design, Operation, and Failure Mechanisms (07:30 – 09:30)** • Types and configurations of multi-stage pumps • Operating principles and performance curves • Common failure modes: wear, cavitation, misalignment
- **Module 2: Overhaul Planning and Preparation (09:45 – 11:15)** • Pre-overhaul inspections and documentation • Required tools, safety protocols, and rigging plans • Recording clearances and baseline readings
- **Module 3: Disassembly, Inspection, and Component Assessment (11:30 – 01:00)** • Step-by-step dismantling of casings, shafts, and impellers • Inspection criteria: bearings, wear rings, seals, shaft surfaces • Tolerance and concentricity checks
- **Module 4: Workshop – Overhaul Procedure Mapping (02:00 – 03:30)** • Participants map a complete overhaul process from a case example

Day 2: Reassembly, Troubleshooting, and Performance Optimization

- **Module 1: Precision Reassembly and Alignment (07:30 – 09:30)** • Techniques for shaft and coupling alignment • Seal and bearing installation best practices • Clearance setting and tightening sequences
- **Module 2: Condition Monitoring and Predictive Tools (09:45 – 11:15)** • Vibration analysis, thermography, pressure trends • Lubrication inspection and oil analysis • Real-time condition tracking systems
- **Module 3: Troubleshooting and Performance Restoration (11:30 – 01:00)** • Diagnosing vibration, noise, overheating, and flow reduction • Root cause correction and field repair methods • Performance recovery steps post-repair
- **Module 4: Workshop – Pump Performance Improvement Plan (02:00 – 03:30)** • Participants develop a 90-day plan to improve reliability of a critical pump • Group presentations and facilitator feedback

Certification

Participants will receive a Certificate of Completion in Multi-Stage Pump Overhaul, Performance & Maintenance Optimization, confirming their competence in safely overhauling, maintaining, and troubleshooting multi-stage pump systems for improved operational performance.

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