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Course Name

Pumps Operation and Maintenance

Sector Name

Mechanical Engineering

Document Type

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Pumps Operation and Maintenance

Course Introduction

Centrally positioned in industrial processes, pumps stand out as one of the most prevalent machines globally. Despite their widespread usage, pumps are frequently underestimated in their potential to enhance productivity or contribute to excessive costs when not operated correctly. Various factors and circumstances can lead to pump failure, necessitating swift removal from service. It is imperative for maintenance engineers, and particularly plant operators, to possess a thorough understanding of operational guidelines for the proper utilization of pumps in manufacturing and industrial settings, emphasizing adherence to best practices.

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Pumps Operation and Maintenance

Target Audience

- ✓ Operators & Technicians – Handling pump operations, troubleshooting, and maintenance.
- ✓ Engineers (Mechanical, Electrical, Civil, etc.) – Designing, optimizing, and troubleshooting pump systems.
- ✓ Maintenance & Reliability Personnel – Ensuring pump efficiency and longevity.
- ✓ Supervisors & Managers – Overseeing pump performance and maintenance strategies.
- ✓ Procurement & Supply Chain Professionals – Sourcing pumps, parts, and maintenance services.

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Learning Objectives

- ✓ Gain a comprehensive understanding of the different types of Pumps and the range of their applications.
- ✓ Understand the limits of the pump's operation.
- ✓ Identify the roles and responsibilities in the operation, maintenance, and troubleshooting of pumps.
- ✓ Gain additional knowledge on the Inspection and Maintenance of Centrifugal Pumps
- ✓ Read and interpret the performance curves of Pumps and provide an overview of testing standards/codes.
- ✓ Understand Operation, maintenance, & Troubleshooting aspects, including Start-up, priming, and shutdown.
- ✓ Conduct effective preventive and predictive maintenance of pumps.

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Pumps Operation and Maintenance

Course Outline

✓ **01 DAY ONE**

Basic Pump Principles

- ✓ How Pumps Work
- ✓ Head vs. Pressure
- ✓ Absolute and Gauge Pressures
- ✓ Work & Efficiency
- ✓ Flow & Head, Efficiency, Power

NPSH and Cavitation

- ✓ NPSH required
- ✓ NPSH available
- ✓ Vapor Pressure
- ✓ Types of Cavitation
- ✓ Effects & Prevention

Operation

- ✓ Start-Up, Priming, Shutdown
- ✓ Vibration Levels and their measurements
- ✓ Bearing Housing Temperatures
- ✓ Accessories (Shaft Seal, Bearing)

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✓ 02 DAY TWO

Troubleshooting

- ✓ Why duties change
- ✓ Identifying problem applications
- ✓ Where do your pumps operate
- ✓ Instrumentation (reading from gauges)
- ✓ Fault Finding and Failure Analysis
- ✓ Interpreting the Evidence
- ✓ Operator's Roles and Responsibilities

Bearings

- ✓ Types & Services
- ✓ Lubrication
- ✓ Maintenance & Seals

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Course Outline

✓ 03 DAY THREE

Pump Classification

- ✓ PD, Centrifugal types
- ✓ Impellers, Liquids
- ✓ ANSI / API
- ✓ Specific Speed

Pump Curves

- ✓ Head, Eff. & Power
- ✓ NPSHr
- ✓ Family Curves
- ✓ The Affinity Laws
- ✓ Speed & Diameter
- ✓ Practical Application

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Course Outline

✓ **04 DAY FOUR**

System Curves

- ✓ Total Dynamic Head
- ✓ Elevation, Pressure & Losses
- ✓ Static head, friction head curve
- ✓ Pumps in Series & Parallel

Pump Operation/Pump Reliability

- ✓ Definitions
- ✓ Operating away from BEP
- ✓ Energy savings, increased MTBF
- ✓ Bearing and Seal Life
- ✓ Shaft deflection
- ✓ Maintenance Operation & Design

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Course Outline

✓ 05 DAY FIVE

Pump- Motor Alignment

- ✓ Types of Misalignments
- ✓ Alignment Techniques

Pump Packing

- ✓ Packing Procedures
- ✓ Failure & Leakage
- ✓ Components

Mechanical Seals

- ✓ Components
- ✓ Single & Double
- ✓ Support Systems

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Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
April 26, 2027	April 30, 2027	5 days	4250.00 \$	UAE , Abu Dhabi
Jan. 11, 2027	Jan. 15, 2027	5 days	4950.00 \$	England , London
Aug. 9, 2027	Aug. 13, 2027	5 days	4250.00 \$	UAE , Dubai
Nov. 29, 2026	Dec. 3, 2026	5 days	4250.00 \$	KSA , Riyadh

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