

CENTRIFUGAL PUMPS

MCE029

COURSE DESCRIPTION

This course provides an introduction to the fundamental concepts used to describe and understand centrifugal pumps and the systems into which they are installed. The course will then review pump characteristic curves, system curves, pump affinity laws, and discuss valve throttling versus variable speed control for pump operation. Finally, the student will learn about different styles of centrifugal pumps, basic packing and mechanical seal technology, and fundamentals of proper installation, testing and operation.

COURSE GOAL

To enhance the participants' knowledge, skills, and abilities necessary to understand the principles of centrifugal pumps, their operation and their characteristics.

COURSE OBJECTIVES

By the end of this course the participant will be able to:

- Understand the principles of centrifugal pumps.
- Understand the API - 610 Standard.
- Troubleshoot centrifugal pumps.

WHO CAN BENEFIT

Plant and or engineering personnel who design, operate, maintain or install centrifugal pumping systems.

COURSE DURATION

5 working Days

COURSE OUTLINE

1. Introduction
2. Pump classification
 - Centrifugal pumps.
 - Mixed flow pumps.
 - Axial flow pumps.
 - Type and Construction based on:

- Suction design.
- No. of stages.
- Guide vanes.
- Casing construction.
- Impeller shrouds.
- Shaft position.

3. Centrifugal Pump Basics

- Principle of operation.
- Pressure concepts.
- Hydraulics - a few basics.
- Vapor pressure.
- Pump Cavitation.
- Pump NPSH - Net positive suction head.
- Pump curves / Pump Performance curves / Pump characteristic curves.

4. API – 610 Types and features

- Overhung.
 - Flexibly Coupled.
 - Rigidly Coupled.
- Between Bearing.
 - 1st and 2nd Stage.
 - Multistage.
- Vertical Suspended.
 - Single Casing.
 - Double Casing.
- Wear ring running clearances.
- Mechanical seal types / arrangement / plans.
- Cooling water piping.
- Lube oil system.

5. Technical Glossary

6. Troubleshooting Guide

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