



N631: Introduction to Centrifugal, Reciprocating and Rotary Pumps - Design, Application and Operation

Instructor(s): John Henderson

2 Days

Competence Level:
Foundation



Classroom Course

Summary

This two day course provides an introduction to the design, application and operation of centrifugal, reciprocating and rotary pumps. It emphasizes practical understanding, design guidelines and "rules of thumb" with a minimum of mathematics. It covers application and sizing, system design, basic theory and operation, different types of pumps, pump components, pump auxiliaries, pump selection and specification.

Learning Outcomes

Participants will learn to:

- Understand all aspects of the pump industry. Introductory but technical level course with no required prerequisites.
- Develop an understanding of the different types of pumps used in Industrial applications.
- Learn the art of selecting the right pump for the right service
- Understand basic system design, cavitation, NPSH and pump theory
- Learn about Pump components and options and what to use where
- Understand pump curves and selection charts
- Explanation of different type of drive systems and how to select the optimum configuration
- Discuss Predictive Maintenance techniques
- Discuss major items to consider when purchasing pumps

Duration and Training Method

Two classroom days providing 1.6 CEU (Continuing Education Credits) or 16 PDH (Professional Development Hours)

Who Should Attend

This course is technical but introductory in nature and covers all aspects of the pump industry. It provides specific technical training for Engineers, Technologists, Millwrights, and Operations personnel involved in the design, operation, maintenance or purchase of pumps and pumping systems. It also provides an excellent overview/refresher/general technical training course suitable for Project Engineers, Managers, Procurement Specialists, Technical Sales staff and students.

Course Content

Course Agenda

Day One: Centrifugal

- Basic Pump Hydraulics
- How Pumps Work
- Selection and Sizing
- NPSH and Cavitation
- Suction Specific Speed



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- Pump Curve Selection Workshop
- Pump Components
- Mechanical Seal Design and Selection
- Bearing Types and when to use them
- Flushing and Cooling Plans
- Different Pump Types and when to use them
- Pump Materials and when to use

Day Two: Positive Displacement

- Reciprocating Pumps
 - Design and Components
 - Different types and when to use them
 - Reciprocating Pump Selection Workshop
 - NPSH and Cavitation
 - Material Options and when to use them
- Rotary Pumps
 - Design and Components
 - Different types and when to use them
 - Pump Selection
 - NPSH and Cavitation
- Gear Pumps
 - Different types and when to use them
 - Triple Screw
 - Double Screw
 - Progressive Cavity
 - Design and Components
 - Pump Selection
 - NPSH and Cavitation
- Pump Couplings & Drive Arrangements
- Pump Driver Sizing and Selection
- Installed Pumps Slide Show
- Predictive & Preventative Maintenance Techniques for Pumps
- How to Specify and Procure Large Industrial Pumps