Pump System Optimization Overview

Introduction:

Pumping systems account for a significant portion of a facility's energy use in many industries. In the majority of pumping systems, energy added to the working fluid by the pump is much greater than required by the process. The excess energy generates heat, noise and vibration that increases system maintenance costs. It also results in over-sizing piping system components such as pumps, process components, and control valves that increase capital costs. Understanding how to assess pumps systems and identify and quantify pump system energy consumption is essential in reducing excess energy consumption while improving reliability. To help pump users run their systems more efficiently, a pump system assessment identifies problematic areas where the greatest opportunities for improvement exist.

The Pumping System Optimization course will provides attendees with the information needed to conduct basic assessments of their pumping systems. Case studies will be discussed throughout the course. Hands-on group exercises are an integral part of this course including: How to estimate the annual energy cost of a pumping system, how to match a system curve/pump curve and determine if the right pump is being used and how to improve a pumping system and the life cycle costs of each improvement.

By performing Pumping System Optimization, the candidates will acquire:

- Increased productivity
- Reduced production costs
- Reduced Maintenance costs
- Improved product quality
- Improved capacity utilization
- Improved reliability
- Improved worker safety
- Increased equipment uptime
- Understanding of pump system interaction
- Improved pump selection and application
- Improved mechanical seal life

Who Should Attend?

Electrical Consulting Engineers, Electrical Contractors, Electrical Maintenance Supervisors, Electrical Maintenance Technicians, Engineering and Design Personnel, Instrument and Control Engineers, Instrument Technicians, Maintenance Personnel, Mechanical Engineers, Operations Personnel, Plant Engineers, Process Control Engineers, Service Technicians.

Course Objectives:

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

- Improve pump systems efficiency and reduce energy and operating costs
- The benefits of improving the performance of pumping systems
- System optimization and basic pump system interaction
- How to screen pumping systems to find good systems improvement candidates
- How to identify and implement basic performance improvement opportunities
- Basic life-cycle cost analysis
- How to plan and propose an Action Plan to management and execute energy conservation initiatives

Course Outline:

- Introduction and overview
- Basic principles of rotating electric machines
- Efficiency, torque, inertia, horsepower/power factor
- Torque-speed curves
- Principles of operation and performance
- Energy Losses & Efficiency of Three Phase AC Induction Motors
- Pumping System Optimization
- Why efficient pumping systems are important
- Effect of energy consumption on total price
- Systems optimization and Improvement
- Basic pump system interaction
- Screening pumping systems
- Analysis tools for pumping systems
- Improving the performance of pumping systems
- Choosing the Best Efficiency Point
- Life cycle cost analysis
- Saving pump energy, how?
- Developing an Action Plan
- Resources and follow-up strategy
- Next Steps and Available Resources
- ASME Pump Systems Energy Assessment Standard
- ISO 50001 for Energy Management Systems
- Summary and Evaluation