

# Pump Systems Training & PSAP Preparation Course

## Energy EFFICIENCY and Bottom-Line Savings

### AGENDA

#### Day 1

- PSAP 13 Task and 34 Knowledge Requirement Review
- Achievable benefits of pump system assessment and optimization
- System Curves, Energy Consumption and System Controls
  - Exercise 1 – Developing the system curve
  - Exercise 2 – Calculating power consumption and control losses
- Pump curves, variable speed pumping, parallel & series pumping
- Pump design, NPSH, allowable and preferred option
  - Exercise 3 – Pump specific speed & attainable efficiency
  - Exercise 4 – Driver input power & annual operating costs
  - Exercise 5 – NPSHA for open systems
  - Exercise 6 – NPSHA for closed systems
  - Exercise 7 – Suction specific speed
- Common Operating Problems
- Pump System Components
  - Valves, drivers, variable speed drives, mechanical seals, bearings
  - Exercise 8 – Driver input power and pump input power

#### Day 2

- DOE Standards and Energy Rating Labels
- Pump selection, standards, specification and acceptance
- Basic pump maintenance practices
- System drawings, schematics and diagrams
- Pump system optimization for new and existing designs
- Hydraulic modeling to support optimization
  - Case study – Water Reclamation Project
  - Case study – Cooling Loop in Nuclear Power Plant
  - Case study – Reducing System Head in Water Distribution
- Life cycle cost, financial analysis and justification
- Pump system assessment methodology & reporting
  - Pump system assessment report case study

#### Day 3

- PSAP Certification Exam Preparation Review
  - Domain 1 work exercises 1, 2 & 3
  - Domain 2 work exercises 1, 2, 3 & 4
  - Domain 3 work exercise 1
  - Example test questions review – 32 review questions
- PSAP Certification Exam