

Learn About:

- Basic pump principles
- How to properly select the right pump & motor for the job
- Installation, start-up and commission a pump
- Correctly aligning a pump and motor
- Properly maintaining pumps and pump systems
- Properly operating a pump system
- Reading pump gauges and what those readings mean
- Reading and applying pump curve charts
- Distinguishing a “pump” problem from a “system” problem
- Identifying, correcting and avoiding cavitation problems
- Preventing mechanical seal failure
- Conducting pump failure analysis so as not to repeat errors

Pumps & Pump Systems

Specification, Installation & Operation



“The class was just what I needed... Thank you!”

Laura H. - Sales

A 2-Day Course for Pump Design, Selection, Installation, & Monitoring Techniques

- Reserve your space now! **CALL 1-877-978-7246**
- Check us out online at live.tpctraining.com for a complete listing of all seminars coming to your area
- This seminar is also available as an **Online Simulcast** or can be brought **On-Site** to your facility

SEMINAR OVERVIEW

This two-day Pumps and Pump Systems course emphasizes centrifugal pumps and the systems that run them. The course is geared toward maintenance technicians with responsibility for pump specification, installation, and operating efficiency at their facility. This course begins with basic pump functions and features so that students can learn how to properly specify a pump for a given system, followed by pump selection, proper system design, pump installation. Students move on to how to select the right pump, then proper system design, and pump installation, maintenance, failure analysis, and condition monitoring.

WHAT YOU WILL TAKE HOME

- Comprehensive classroom materials
- A Personalized Training Certificate with 0.8 TPC Training Continuing Education Units for each day attended, 1.6 for both days.
- All the information you need from asking our instructors specific questions about your own unique equipment or facility.

CONTINUING EDUCATION

Upon completion of this seminar, the student will receive a Certification of Completion and .8 TPC Training CEUs per day attended. Most employers and many government agencies accept TPC Training CEUs to fulfill their continuing education requirements. If the student needs CEUs to renew a state license, please contact us at 303-867-5039 to ensure the state licensing board has approved the seminar. If we are currently not approved by your state licensing board, we are happy to begin the process as long as we receive your request at least one month before the training date.

TRAINING PHILOSOPHY

TPC Training's curriculum is designed to provide complete coverage of essential industrial maintenance skills, across a full range of electrical training, HVAC, plant management, and mechanical & industrial topics. Our "see, touch, do" instructional approach allows us to impart practical skills in an intensive format.

The most vital part of our seminar format is the coverage that goes beyond the course outline. Our small class sizes allow each instructor to tailor the course to address students' individual needs, concerns, and experience levels. Our instructors deliver content with hands-on exercises, demonstrations role-playing, visuals, and case study discussions.

 **"Top notch! ...clear and concise."**
Stefanie V. - Marketing

DISCUSSION TOPICS

- Pump Classification
 - Positive Displacement and Dynamic Pumps
- Basic Hydraulic & Pump Concepts & Definitions
 - Specific Gravity
 - Why Head Instead of Pressure?
- How Centrifugal Pumps Work
 - How Centrifugal Pumps Induce Flow
- Net Positive Suction Head (NPSH)
 - NPSHR vs. NPSHA
 - Pump Cavitation
 - NPSH Margin
- Horsepower & Efficiency
 - Calculating Efficiency and Losses
 - Effects of Viscosity
- Reading Pump Curves
 - Single Line Curves
 - Multiple Trim and Speed Curves
 - Affinity Laws
- Pump System Curves
 - Calculating System Heads
 - Series and Parallel Pumping Systems
 - Changes in the System Curve
 - Determining a Pump's Operating Point
- Effect of Pump Operation on Mechanical Reliability
 - Axial and Radial Loads
 - Shaft Deflection
 - Seal & Bearing Life
 - Start Up and Commissioning Procedures
 - Minimum Flow Restrictions
- Specifying the Right Pump
 - Matching the Right Pump for the Job
- Bearings
 - Lubrication Methods
 - Failure Modes
 - Proper Maintenance and Lubricant Care
- Seals & Packing for Pumps
 - Types of Packing and Proper Installation
 - Correctly Adjusting Packing
 - Mechanical and Dry Gas Seals
 - Pusher & Non Pusher Designs
 - Single Seals, Double, and Tandem Seals
- Good System Design and Installation Practices
 - Building Reliability From the Foundation Up
 - Types of Misalignment
 - Alignment Methods
- Optimizing Your Pump Operation
 - Energy Efficiency and Improved Reliability
 - Better Process Control
 - Effect of Pump Speed on Pump Life
- Pump Troubleshooting
 - Common Problems and Solutions
 - Root Cause Analysis
- Condition Monitoring of Pumps
 - Vibration and Lubricant Analysis

SEMINAR FEE & AGENDA

This 2-day course is just \$1195 (Earn 1.6 CEUs)

7:30 am	Registration
8:00 am	Class Begins
12:00 -1:00 pm	Lunch (on your own)
4:30 pm	Class Ends

NO RISK REGISTRATION & MONEY-BACK GUARANTEE

You can reserve your space in the class at any time and cancel without penalty. Cancellations made more than 14 days prior to the seminar may be refunded or rescheduled. Cancellations made within 14 days may be rescheduled for any future topic and/or date. If you're not satisfied with the course, we'll promptly refund your payment.

JOIN OUR CLASSROOM SEMINARS FROM VIRTUALLY ANYWHERE

live.tpctraining.com/simulcast

Our simulcast option allows students to connect to a live classroom seminar via a web link, with the ability to participate fully in the classroom dialogue, exercises, and Q&A. Online participants get all the benefits of the full classroom experience, plus the convenience of remote access.

Features include

- Two full days of live, interactive instruction from a TPC Training instructor
- All classroom materials in PDF format
- Certificate of completion for 16 hours of live training
- Full technical support to ensure your online experience is a rewarding one

BRING THE TRAINING ON-SITE TO YOUR FACILITY

live.tpctraining.com/on-site

Every public seminar class in our Course Catalog can be conducted on-site, with the same expert instructors. To arrange an on-site training, call or email us at onsite@tpctraining.com.

Some Advantages of On-Site Training

- Cost Savings — Save time and travel costs by keeping workers on-site
- Customized Content — Tailor the seminar to your facility and equipment
- Flexibility — Accommodate multiple shifts and different start and end times

