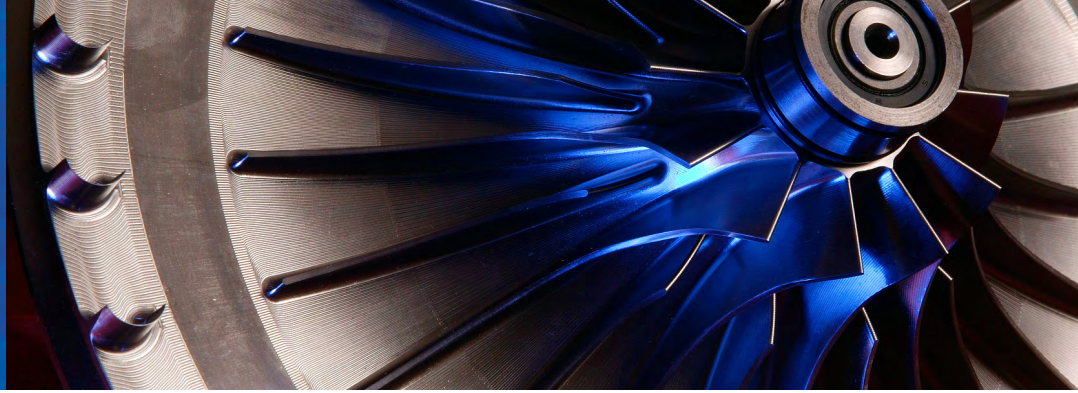




SOUTHWEST RESEARCH INSTITUTE



# Pulsations & Vibrations: Analysis and Testing

## 3-Day Short Course    April 17 – 19, 2019

Southwest Research Institute  
Building 263, First Floor Training Room  
6220 Culebra Road • San Antonio, TX

Day 1:            7:45 AM – 5:15 PM  
Days 2 – 3:      8:15 AM – 5:00 PM

### Course Overview

SwRI's introductory course covers applied pulsation and vibration problem solving, field examples, troubleshooting, and failure mitigation. The course is intended for engineers, operators, and technicians working with gas compression or liquid pumping piping systems. Instruction will be provided by experienced SwRI staff. The class includes practical hands-on exercises, case studies, and machinery demonstrations, along with a roundtable discussion with pulsation/vibration experts.

### Cost

The short course cost is \$985 USD per registrant. [Registration](#) includes three days of course instruction, training materials on flash drive, class exercises, and three lunches.

### Course Topics

- Pulsation Fundamentals & Mode Shapes Working Example
- Pulsation Control
  - Control Concepts for Compressor and Pump Piping Systems
  - Key Acoustic Responses
  - 3D Acoustic Modal Analysis – Screw & High Speed Reciprocating Compressors
  - Meter Station Design Concerns
  - Case Studies – Compressors & Pumps
- Instrumentation & Data Acquisition Systems
  - Data Measurement & Processing
  - Key Instrument Technologies
  - Acquisition Systems in General
- Mechanical and Thermal Design/Analysis – Part I.
  - Basic Vibration Theory
  - Pipe Restraints
  - Compressor Manifold Simulation (FEA)

- Resonance Avoidance/Management
- Typical Vibration Issue and Support Guidelines
- Mechanical and Thermal Design/Analysis – Part II.
  - Forced Response
  - Case Study (Manifold Analysis)
  - Internal Baffles and Choke Tubes
  - Fundamentals of Thermal Analysis
- Forced Response – Operating Speed Sweeps
  - Pulsation & Vibration Field Testing Considerations
  - Torsional Field Testing
  - Field Balancing
- Balancing with Demonstration
- Torsional Analysis: Reciprocating Compressor Trains
- Torsional/Vibration Testing Demo
- Resonance & ODS Testing with Impact Testing Demo
  - Testing Theory and Concepts
  - Proper Test Setup
  - Differences Between Resonance and ODS Testing with Example
  - Hands-On Demonstration of Impact Testing
- Acoustic and Flow-Induced Vibration + Noise Testing
  - Flow-Induced Pulsations in Piping
  - Flow-Induced Vortex Shedding Case Studies
  - Acoustic-Induced Vibration
  - Turbulence-Induced Pipe Vibration

For more information, please contact:  
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