

# Reciprocating Machinery Dynamics

April 17 – April 20, 2023

Location: Embassy Suites San Antonio Airport Hotel

Cypress Lecture Hall Meeting Room

10110 US Hwy 281 San Antonio, TX

## Syllabus

### Monday 04/17

Instructor Name

8:00 – 8:45	Basic Vibration Theory	Troy Feese
8:45 – 10:00	Piping Vibration Analysis-Natural Frequencies	Kyle Kuecker
10:00 – 10:15	<b>Break</b>	
10:15 – 12:00	Mode Shapes, Piping Vibration & Stress, Fatigue Strength/Codes, Allowable Vibration Amplitudes	Kyle Kuecker
12:00 – 1:00	<b>Lunch Break</b>	
1:00 – 2:45	Thermal Pipe Stress Considerations, Piping Sample Problems	Charles Hill
2:45 – 3:00	<b>Break</b>	
3:00 – 4:30	Reciprocating Machinery Kinematics, Shaking Forces & Bearing Loads, Anchor & Support Problems	Charles Hill
4:30 – 5:00	Compressor Manifold Vibration	Charles Hill

### Tuesday 04/18

8:00 – 10:00	Basics of Acoustics, Acoustic Velocity, Wavelength, Acoustic Resonances, Pulsation Generation Mechanisms in Reciprocating Equipment	Kile Watson
10:00 – 10:15	<b>Break</b>	
10:15 – 12:00	Basics of Acoustics (cont'd): Acoustic Spectral Response to Excitation; Effects of Pulsation, Forces, Performance. Cavitation; Pulsation Control: Techniques, Volumes, Filters, Pressure Drop; Comparison of Pulsation Control Devices; Acoustic Filters; Mechanical Analogies & Concepts of Surge Volumes & Filters	Kile Watson
12:00 – 1:00	<b>Lunch Break</b>	
1:00 – 3:00	Piping Acoustics Modeling: Acoustical Simulation Examples, Resonance in Compressor & Pump Systems	Charles Hill
3:00 – 3:15	<b>Break</b>	
3:15 – 5:00	API 618 and API 688	Kile Watson

### Wednesday 04/19

8:00 – 9:00	Operating Deflection Shape (ODS) and Motion Amplification (MA)	Stephen Price
9:00 – 10:00	Diagnostic Procedures & Test Methods	Stephen Price
10:00 – 10:15	<b>Break</b>	
10:15 – 12:00	Diagnostic Procedures & Test Methods (cont'd)	Stephen Price
12:00 – 1:00	<b>Lunch Break</b>	
1:00 – 3:00	Introduction to Torsional Vibration: Variable Frequency Drive, Transient Torsional Analysis	Troy Feese

### Thursday 04/20

8:00 – 10:00	Torsional Vibration (cont'd): Reciprocating Machinery Considerations, Field Testing Measurement Techniques	Troy Feese
10:00 – 10:15	<b>Break</b>	
10:15 – 12:00	Case Histories	Troy Feese
12:00 – 1:00	<b>Lunch Break</b>	Kyle Kuecker
1:00 – 3:00	Case Histories (cont'd)	Stephen Price