

Reciprocating Machinery Dynamics

April 4-7, 2022

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Monday 4/4		Instructor Name
8:00 – 8:45	Basic Vibration Theory	Ken Atkins
8:45 – 10:00	Piping Vibration Analysis - Natural Frequencies	Ken Atkins
10:00 – 10:15	Break	
10:15 – 12:00	-Mode Shapes -Piping Vibration & Stress -Fatigue Strength/Codes -Allowable Vibration Amplitudes	Ken Atkins
12:00 – 1:00	Lunch Break	
1:00 – 2:45	-Thermal Pipe Stress Considerations -Piping Sample Problems	Ken Atkins
2:45 – 3:00	Break	
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 4/5		
8:00 – 10:00	Basics of Acoustics -Acoustic Velocity, Wavelength -Acoustic Resonances -Pulsation Generation Mechanisms in Reciprocating Equipment	Ken Atkins
10:00 – 10:15	Break	
10:15 – 12:00	Basics of Acoustics (cont'd) -Acoustic Spectral Response to Excitation -Effects of Pulsation, Forces, Performance, Cavitation -Pulsation Control -Pulsation Control Techniques - Volumes, Filters, Pressure Drop -Comparison of Pulsation Control Devices -Acoustic Filters -Mechanical Analogies & Concepts of Surge Volumes & Filters	Ken Atkins
12:00 – 1:00	Lunch Break	
1:00 – 3:00	Piping Acoustics Modeling -Acoustical Simulation Examples -Resonance in Compressor & Pump Systems	Charles Hill
3:00 – 3:15	Break	
3:15 – 5:00	API 618 and API 688	Ken Atkins

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Wednesday 4/6

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	Break	
10:15 – 12:00	Diagnostic Procedures & Test Methods (cont'd)	Stephen Price
12:00 – 1:00	Lunch Break	
1:00 – 3:00	Introduction to Torsional Vibration -Variable Frequency Drives -Transient Torsional Analysis	Troy Feese

Thursday 4/7

8:00 – 10:00	Torsional Vibration (cont'd) -Reciprocating Machinery Considerations -Field Testing Measurement Techniques	Troy Feese
10:00 – 10:15	Break	
10:15 – 12:00	Case Histories	Ken Atkins Stephen Price Troy Feese
12:00 – 1:00	Lunch Break	
1:00 – 3:00	Case Histories (cont'd)	Ken Atkins Stephen Price Troy Feese