ASSET PERFORMANCE MANAGEMENT

BENTLY NEVADA™ RECIPROCATING COMPRESSOR CONDITION MONITORING & DIAGNOSTICS (CMD)

Participants learn about instrumentation used for protection and condition monitoring of a reciprocating compressor, interpret data plots, and identify signatures and patterns related to reciprocating compressor malfunctions. The course includes actual case histories and hands-on workshops.

Format

Duration: 28 hours **Schedule:** 4 Day(s) **Delivery:** Classroom

Who should attend

- Engineers who want to learn about reciprocating compressor components, mechanics and performance
- Interpret reciprocating compressor vibration and analyze malfunctions
- design and perform acceptance testing and maintain reciprocating machinery

Objectives

- Develop an understanding of the basic components and nomenclature of API-618 reciprocating compressors.
- Learn reciprocating compressor mechanics, performance theory, and recip-specific diagnostic techniques.
- Understand the need for monitoring of reciprocating compressors and typical monitoring strategy corresponding to API-618 and API-670 guidelines.
- Comprehend the importance of crank angle reference measurements in recip monitoring and diagnostics.
- Develop a diagnostic strategy (understand plots for PV, rod load, performance indicators, frame vibration, crosshead vibration, cylinder vibration and piston rod monitoring) required for comprehensive monitoring and analysis of reciprocating compressors.
- Practice the knowledge while diagnosing real-time data from machines. Several case studies will be presented throughout the course to visualize the typical malfunctions' signatures.
- Demonstration of Calibration, setup and maintaining Piston Rod Monitoring.

Recommended Prerequisites

Interest in the Reciprocating Compressor Monitoring and Maintenance

Fundamentals of vibration measurement

Program Outline

Day 1:

- Introduction to reciprocating compressors
- Components, typical failures and condition monitoring of reciprocating compressors
- Crankshaft timing – crank angle reference
- Dynamic cylinder pressure monitoring (PV and performance monitoring)

Day 2:

- Capacity control
- Workshop: case studies related to cylinder pressure monitoring
- Cylinder pressure installation issues
- Workshop: case study on instrumentation issues
- Monitoring efficacy of capacity control types and case studies
- Monitoring of multistage compression

Day 3:

- Rod Load forces, rod load reversal and vertical forces monitoring
- Workshop: case study on rod load forces and rod reversal
- Piston rod monitoring (rod drop and rod position)
- Probe calibration demonstration
- Workshop: case study on rod position data interpretation

Day 4:

- Compressor Vibration
- Workshop: case study on compressor vibration
- System 1™ recip plots
- Workshop: System 1™ recip plots navigation
- Knowledge check: case history
- Introduction to Decision Support Analytics