Screw Gas Compressors & Dry Gas Seals Application

Introduction:

This 5-day course offers delegates a comprehensive overview of the design, construction, control and operation of screw compressors of the type normally found in the oil, gas, and other process industries.

The course describes the principles of operation of the compressor and how, through a combination of the physical constraints both on the gas being processed and the materials of construction of the compressor, the design is adapted to a number of different configurations to meet numerous needs.

This course defines functions, operation and condition monitoring of all types of screw compressors. It also considers and discusses performance and maintenance requirements of screw compressors.

Dry Seals are becoming the Sealing Devices of choice for today's environmentally conscious consumers. This course is designed to educate you with the appropriate knowledge of these devices and how they accomplish their job. A thorough comprehension of dry Seal Principles is often required for you to effectively carry out your day to day business. If you design, specify, repair, maintain, operate or work with dry Seals in any way, this course will provide you with the information required to perform these tasks.

Course Objectives:

This course explores the construction and configuration of the screw gas compressor in some detail:

- Classification of compressor units (types)
- The effect of the process sys
- tem on compressor performance
- Screw compressor performance - the curve, concepts and relationships
- Screw compressor mechanical design - rotor, seals, …..etc.
- basic understanding of the application, sizing,
- Operation and maintenance of screw compressors.
- Describe the purpose of a dry Seal,
- Identify the parts of a dry Seal,
- Describe dry Seal classifications,
- Describe dry Seal materials of construction,
- Describe dry Seal operation, identify Seal environmental controls, describe Seal design history, and troubleshoot some basic Seal failures.

Who Should Attend?

Reliability Engineers, Maintenance Managers, Engineers & Planners, Reliability and Maintenance Engineers, Facilities and Utilities Managers, Design Engineers, Top Level Maintenance Technicians, OE Champions, Predictive and Preventive Maintenance, Technicians & Supervisors, Planners, Maintenance Supervisors, Crafts and Tradesmen, Operations Supervisors, Process Engineers, Inspectors and Inspection Supervisors, Equipment Engineers Team Leaders and Professionals in Maintenance, Engineering and Production, Maintenance managers, reliability and maintenance Engineers, Production Managers, Plant Engineers, Design Engineers, Reliability Engineers and Technicians, Operators, Safety Engineers, Risk Engineers, Safety Engineers and anyone who is involved in Reliability Engineering strategies or methodologies to include design engineers for capital projects engineers, Foreman and Technicians, Mechanical, Electrical and Operational Personnel, Personnel designated as Planners, Key leaders from each maintenance craft, Key operations personnel, Technical professionals responsible for maintenance and repair of equipment, Professionals involved in inspection and maintenance and repair, professionals involved in asset & maintenance management

auditing, Quality & Compliance Managers, Lead Auditors & Audit Team Members, Process Controllers, Maintenance Supervisors, Maintenance Planners, Predictive Maintenance Technicians & Supervisors, Materials Management Managers and Supervisors, Service Company Representatives, Asset owners & Asset Managers

Course Outline:

Mechanical Aspects of Screw Gas Compressors

These sessions will be covering the following Key Topics:

- Principles of operation
- Designs & Construction
- Configurations
- Lubrication
- Condition Monitoring
- Gas Cooling
- Piping Systems
- Compressor Installation
- Compressor Operations

Control & Operation of Screw Gas Compressors

Key topics to be covered may include

- Compressor performance and selection,
- Instrumentation and control,

Case studies will be used and participants will be encouraged to solve problems for themselves.

Natural Gas Compression Using Screw Compressors

The design and operation of oil-injected screw compressor units used in typical natural gas field booster compression and propane refrigeration applications. The sessions are designed for the selection, operation, and troubleshooting of screw compressors.

Topics to be covered

- Compressor Selection and Design Considerations
- Compressor Components
- Horsepower and Temperature Rise - Calculations and Monitoring
- Lube Systems Options - Oil Injected Versus Dry
- Screw Compressors in Refrigeration Service
- Project Applications
- Screw Compressors as Boosters
- Cooling Systems - Optimisation and Troubleshooting
- Capacity Control and Driver Selection

Compressor Operation In A Process System

- Compressor Characteristics
- Compressor Performance
- The performance curves
- Compressor Performance
- Effects of gas composition

Basic Compression Theory

- Compressor Selection and Design Consideration
- Screw Compressor Components
- Horsepower and Temperature Rise - Calculations and Monitoring
- Cooling Systems - Optimisation and Troubleshooting
- Capacity Control
- Compressor Packaging and Environmental Considerations

Operation & Design of Screw Compressors

Key Topics Covered:

- Compression Principles
- Process & Control Description
- Compressor Operations
- Mechanical Design – Screw Compressors
- Compressor Protection
- Compressor selection
- Principles of the Compression Process
- Theory of Operation

Frame Assemblies and Compressor Configurations

Cooling and Lubrication

Performance & design calculations

Case Studies and Compressor Applications

Control of Screw Compressors

These sessions gives a thorough introduction to the Control, Design and Operation of screw compressors. This type of compressor is used for both air and process gas applications

Key Topics Covered:

- History of Screw Compressors
- Compression Principles and Thermodynamics
- Oil Free Screw Compressors
- Control
- Operation
- Performance calculations
- Compressor Design
- Compressor liquid seals

- Compressor dry gas seal systems

Screw Compressors Operation And Maintenance

These sessions define functions, operation and condition monitoring of major types of screw compressors. It considers and discusses performance and maintenance requirements of compressor units installed on your sites.

Key Issues To be covered:

- Classification of compressor units
- Screw compressor component functions and operation
- Screw compressor component condition monitoring
- Types Screw Compressors
- Applications & Selection
- Component function
- Condition monitoring; vibration, pulsation and safety.

Dry Gas Seals

The Evolution of Dry Gas Seals

- Radial Seals
- Mechanical Contact Seals
- Dry Gas Seals
- Magnetic Bearings and Oil-Free Compressors

Introduction to Dry Gas Seals

- Principle of Operation
- Materials of Construction
- Manufacturing and Verification Testing

Dry Gas Seal Configurations

- Barrier Seals
- Dry Gas Seal Support Systems

- Dry Gas Seal Retrofits
- Dry Gas Seal Operations and Maintenance
- Dry Gas Seal Contamination