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Compressor Technology

24 February - 7 March 2

Amsterdam (Netherlands)

Compressor Technology

course code: E6023 From: 24 February - 7 March 2025 Venue: Amsterdam (Netherlands) - course Fees: 6750 Euro

INTRODUCTION

This programme provides a comprehensive understanding of the various types of reciprocating, rotary, and dynamic compressors. This includes trunk piston, sliding crosshead piston, diaphragm, rotary screw, straight lobe, sliding vane, liquid ring, centrifugal, and axial compressors. Bearings are also covered thoroughly. The characteristics, selection criteria, sizing calculations, sealing arrangements, common problems, repair techniques, as well as the preventive and predictive maintenance of these compressors is covered in detail.

This programme is a MUST for those who use this equipment. It covers how compressors and bearings operate and provides the guidelines and rules that must be followed for their successful application. This programme provides the following for all types of compressors and bearings:

1. Basic Design
2. Specification
3. Selection Criteria
4. Sizing Calculations
5. Sealing Arrangements
6. Common Operational Problems
7. All Diagnostics, Troubleshooting, and Maintenance Required for this Equipment Including Vibration Analysis, and Used Oil Analysis

PROGRAMME OBJECTIVES

1. **Maximize** the efficiency, reliability, and longevity of all types of compressors and bearings
2. **Size** and select out of the various types of dynamic and positive displacement compressors using the performance characteristics and the selection criteria that you learn in the programme
3. **Carry out** diagnostic testing and inspection of critical components with the knowledge of common failure modes of compressors and bearings by applying advanced fault detection techniques
4. **Select** bearings and lubrication, compressor sealing arrangements, meet commissioning requirements, conduct vibration and used oil analyses, troubleshoot, provide predictive and preventive maintenance, enhance reliability, and reduce cost
5. **Determine** the maintenance required to minimize compressor downtime and operating cost and maximize its efficiency, reliability, and useful life
6. **Gain** a thorough understanding of compressor surge and surge prevention systems
7. **Understand** all the causes of failures in compressors
8. **Determine** all the design features that improve the efficiency and reliability of all compressors
9. **Design** different types of compressor systems
10. **Gain** a thorough understanding of the various types of sealing arrangements used in compressors

TRAINING METHODOLOGY

The instructor relies on a highly interactive training method to enhance

method ensures that all the delegates gain a complete understanding of all the topics covered. The training environment is highly stimulating, challenging, and effective. The participants will learn by case studies. They will be able to apply all the concepts to their own organization.

PROGRAMME SUMMARY

This programme provides indepth understanding of the operation, selection, sizing, applications, sealing arrangements, troubleshooting, and maintenance of all types of compressors and bearings. All the methods used to enhance the performance, reliability troubleshooting, and maintenance of this equipment are discussed in detail. This programme includes also detailed coverage of compressor surge, choking, surge prevention systems, and anti-choking systems. Dry seals and magnetic bearings are also covered in detail in this programme.

PROGRAMME OUTLINE

Gas Laws, Compressor Types and Applications

1. Perfect and Imperfect Gases
2. Compressor Polytropic Efficiency and Power Requirements
3. Compressor Volumetric Flow Rate and Volumetric Efficiency
4. Rotary and Reciprocating Compressors
5. Dynamic Compressors (Centrifugal and Axial)
6. Compressor Performance Measurement
7. Receivers, Compressor Control, and Compressor Unloading Systems
8. Preventive Maintenance and Housekeeping

Positive Displacement Compressors

1. Performance of Positive Displacement Compressors
2. Reciprocating Compressors
3. Reciprocating Compressors Troubleshooting and Maintenance
4. Diaphragm Compressors
5. Rotary Screw Compressors and Filter Separators
6. Straight Lobe Compressors
7. Recent Developments in Liquid/Gas Separation Technology

Dynamic Compressors

1. Dynamic Compressor Technology
2. Centrifugal and Axial Compressors
3. Simplifies Equations for Determining the Performance of Dynamic Compressors
4. Centrifugal Compressors – Components, Performance Characteristics, Balancing, Surge Prevention Systems and Testing
5. Choking, and Anti-Choking Systems
6. Compressor Auxiliaries, Off-Design Performance, Stall, and Surge

Dynamic Compressors Performance, Compressor Seals, and Compressor System Calculations

1. Dynamic Compressors Performance
2. Surge Limit, Stonewall, Prevention of Surge, Anti-Surge Control Systems
3. Compressor Seal Systems

4. Gas Seals, Liquid Seals, Liquid Bushing Seals, Contact Seals, Restricted Bushing Seals, Seal Liquid leakage System
5. Dry Seals, Advanced Sealing Mechanisms, and Magnetic Bearings
6. Compressor System Calculations
7. Sizing of Compressor System Components, Sizing of Gas Receiver
8. Workshop – Case Studies: Design and Selection of Different Compressor Systems for the Oil and Gas industry, and the Power Generation Industry

Bearings, Lubrication, Vibration Analysis and Predictive Maintenance

1. Bearings, Types of Bearings, Thrust Bearings
2. Lubrication, Viscosity of Lubricants, Non-Newtonian Fluids, and Greases
3. Used Oil Analysis
4. Vibration Analysis and Predictive Maintenance
5. Vibration Causes, Resonant Frequency, Vibration in Predictive Maintenance, Diagnostics
6. Intelligent (Smart Transmitters)
7. Advantages of Intelligent Instrumentation
8. Control Valve Selection, Cavitation, and Noise
9. Actuators, Positioners, and Accessories
10. Diagnostic Testing