BLACKBIRD FOR TRAINING

Reciprocating & screw compressors operating

Boston,Massachusetts (USA)

25 - 29 November 2024

UK Traininig

PARTNER

Reciprocating & screw compressors operating

Code: OG28 From: 25 - 29 November 2024 City: Boston,Massachusetts (USA) Fees: 6400 Pound

Introduction

The course will introduce delegates to the different types of pumps, motors and drives and their associated terminology. Centrifugal and positive-displacement pumps and compressors, packing, mechanical seals and sealing systems, bearings and couplings will all be discussed.

Course Objectives

- Have an understanding of the different types of compressors, Pumps, Motors, & Variable Speed Drives.
- Be able to operate Compressors, Pump, Motor, & Variable Speed Drives as close as possible to the design efficiency.
- Will be able to monitor Compressors, Pumps, Motors, & Variable Speed Drives' efficiency, availability and reliability.
- Have learnt about selection, operation and maintenance strategies.
- Be able to troubleshoot Compressors, Pumps, Motors, & Variable Speed Drives' problem.

Course Outlines

Day 1: Compressors:

- Compressor Types: positive displacement reciprocating and rotary. and dynamic centrifugal and rotary, compressor operating, gas laws.
- Compressor performance measurement, inlet conditions, compressor performance, energy available for recovery.
- Positive displacement compressors, reciprocating compressors, reciprocating compressors, diaphragm compressors.
- Rotary compressors, rotary screw compressor, lobe type air compressor, sliding vane compressor, liquid ring compressors.
- Dynamic compressors, centrifugal compressors, axial compressors.
- Air receivers, compressor control, compressor unloading system.
- Intercoolers and after-coolers, filters and air intake screens.

Centrifugal & Axial Compressors

- Principal of operation of centrifugal and axial flow compressors, characteristics of centrifugal and axial flow compressor.
- Surging choking, bleed, valves, variable stator vanes, inlet guide vanes.

Day 2: Compressors System Calculations

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- Affinity laws for centrifugal compressors.
- Calculation of air leaks from compressed-air-systems, annual cost of air leakage.
- Centrifugal compressor power requirement.
- Compressor selection, calculations of air system requirements.
- Characteristics of reciprocating compressors and blowers.
- Selection of air distribution system, water cooling requirement for compressors.
- Sizing of compressor system components, sizing of air receiver.
- Calculation of receiver pump-up-time.

Pump

- Pump definition, pump categories: dynamic and displacement reciprocating & Rotary.
- Centrifugal pumps: theory of operation of a centrifugal pump, casing and diffusers, radial thrust, hydrostatic pressure tests.
- Impeller, axial thrust in multistage pumps, hydraulic balancing devices, balancing drums, balancing disks.
- Centrifugal pumps general performance characteristics, cavitations, net positive suction head and requirements.

Day 3: Bearing & Lubrication

- Types of bearing, ball and roller bearing, stresses during rolling contacts.
- Statistical nature of bearing life, materials and finish, sizes of bearing, types of rolling bearings, thrust.

Bearings

- Used oil Analysis: proper lube oil sampling technique, test description and significance, visual and sensory inspections, chemical and physical tests, water content, viscosity, emission spectrographic analysis, infrared analysis, total base number TBN, total acid number TAN, particle count, summary.

Day 4: Positive Displacement Pumps

- Reciprocating pumps, piston pumps, plunger pump, rotary pumps, screw pumps, lobe pump.
- Cam pumps, vance pumps, metering pumps.

Pump Selection

- Engineering of system requirements, fluid type, system head curves, alternate modes of operation, margins, wear, future system changes.
- Selection of pump and driver, pump characteristics, code requirements, fluid characteristics, pump materials, driver type terms, special considerations, performance testing, pump drivers.
- Pump specifications, specification types, datasheet, codes and standards, bidding documents, technical specification, commercial terms, special considerations, performance testing, pump drivers.
- Special control requirements, drawing and data requirements form, quality assurance and quality control, bidding and negotiation.
- Public and private sector, bid list, evaluation of bids, cost, efficiency, economic life, spare, parts, guarantee/warranty, simple bid evaluation.

Day 5: Mechanical seals

- Basic components, temperature control, seal lubrication/leakage, typical single inside pusher seal.

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- Maintenance recommended on centrifugal pumps, recommended pump maintenance.

Vibration Analysis & Predictive Maintenance

- Vibration instrumentation, velocity transducer, acceleration transducer, transducer selection, time domain, frequency domain, machinery example, vibration analysis.
- Vibration causes, forcing frequency causes, unbalance, misalignment, mechanical looseness, bearing defects, gear defects, oil whirl, blade or vane problems electric motor defects, uneven loading, drive-shaft torsion.

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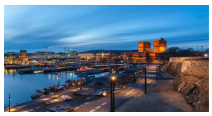
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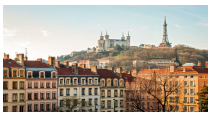
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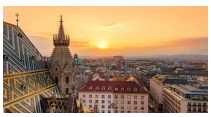
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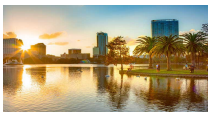
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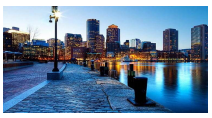
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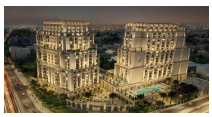
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International House 185 Tower Bridge Road London SE1 2UF United Kingdom

+44 7401 1773 35
+44 7480 775526

Sales@blackbird-training.com

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