

Available training topics for customised training

Rotating Equipment Academy can customize training courses: topics, level and the duration can be specified by the customer in consultation with Rotating Equipment Academy. The following topics are available. If the requested topic is not in the list, please contact Rotating Equipment Academy to discuss the possibilities.

Process applications

Introduction to different compressor and pump applications:
Fluid Catalytic Cracking
Polyethylene Recycle Gas
Gas Injection
Gas Lift
Gas depletion
Gas transmission
FPSO
Etc.

Compressor types & selection

Introduction to compressor and pump types
High level selection criteria between types
Properties of compressor and pump types

Practical training with case study to select compressor and driver. Training will be supported by a compressor selection calculation sheet.

Mechanical design

Casing(s)
Rotor(s)
Impellers
Axial thrust compensation
Internal seals
External seals
Barrier seals
Bearings
Couplings
Shaft monitoring devices

Manufacturing

Impeller engineering
Impeller production
Assembly

Dry gas seals

Development
Gap controlling mechanism
Dry gas seal improvements
Gas seal / mechanical seal
Groove patterns
Pressure distributions
Maintenance aspects

Sealing Elements

Location of SE in the compressor
O-rings, Cup-rings
Labyrinth design and types
Dry gas seal design and types
Barrier seal design and types

P & I diagram

Instrumentation
Operational aspects
Diagram explanation
Protection system

Bearings

Radial/thrust bearings
Troubleshooting
Maintenance aspects
Active Magnetic Bearings

Active magnetic bearings

AMB vs. oil bearings
Magnetism
Materials/Saturation/Forces
Losses
Auxiliary bearings
Control system
Sensors
PID controller

Surge, stall and choke

General
Surge limit
Rotating stall
Choke limit
Cause and effects

Anti-Surge Control

Basic ASC
Control systems
Challenges
Piping lay-out

Compressor Control

Why compressor control
Performance control
Discharge throttle
Suction throttle
Recycle
Guide vanes
Speed variation
Anti-surge
Load Sharing
Load sharing
Limiting control
Override
Execution time

Performance

Compressor curve
Operating vs. Design point
Fixed speed vs. variable
Operating envelope
Limits of the curve (choke, surge)
Curves: m-p vs. Q-H
Influence of suction conditions

Revamping benefits and possibilities

Bundle
Aero
Seals
Control System

Start-up / shut down

Basic safety aspects
General starting preparations
Normal running
Logic drawings

Coupling

Misalignment
Types of flexible couplings
Principles
Advances / dis-advances
Guards & Windage

Maintenance

Basic aspects
Inspections
Maintenance schedules
Service intervals
Cleaning and preservation
Possible repairs
Balancing
Alignment
Spare parts requirements
Spare parts storage

Fault finding tools (2 hours)

Trending
Data logging
Error logging
Controller fault finding
Technical Documents

Troubleshooting

Cause and effect
Rectification

New developments

L TSA
Brush seals
Sleeves
Remote monitoring

Control System (UCP)

System architecture
Hardware overview
Software overview
Panel layout

HMI panels

Configuration
Control Mimics
Navigating
Control options
Settings
Alarming and trending

Case: Compressor Selection

Case introduction

Compressor selection considerations

Explanation calculation tool

Execution of case study in teams

Fill in sheets

Team presentation of results

Evaluation and discussion

Case: Optimal compressor station configuration

Practical training with case study to select compressor and match a driver. Training will be supported by a compressor selection calculation sheet and driver characteristics.

Case introduction

Selection considerations

Explanation calculation tool

Execution of case study in teams

Fill in sheets

Team presentation of results

Evaluation and discussion

Case: Basic Electricity

Case: E motor selection

Practical training supported by ICTP

Influences of suction conditions

Normal running with Interactive Compressor

Training Program. Influences of suction

parameters on the performance curves: head

vs volume flow and discharge pressure vs

mass flow.

Practical training supported by ICTP

Capacity Control

Normal running with Interactive Compressor

Training Program. Simulation of capacity

control with speed, suction throttle and

recycle.

Practical training supported by ICT

Alarms and troubleshooting

Normal running with Interactive Compressor

Training Program. Introduction of random

alarms and faults. To be solved and cured by

the trainee.

Practical training supported by ICTP

Start up and shut down.

Compressor train start up and shut down with

Interactive Compressor Training Program and

questionnaire.

Gas turbines

Fundamentals

Principals of a gas turbine

Turbine Ranges

Gas turbines

Core engine systems

Core engine

Compressor

Fuel system

Lube oil system

Starter system

Interactive session with the

turbine explorer

Gas turbines

Auxiliary systems

Filters

Exhaust

Ducting

Coolers

Demister

Fundamentals of electricity

Electromagnetism

AC current

Real, reactive and apparent power

3 phase ac current

Line, phase, star and delta voltage

and power

Sinus and 3 phase animations

Electrical motors

Working principle of a motor

Motors types and design and

compare

Enclosures and cooling

Torque curves

Construction and operation

animations

Electrical Starting methods

DOL

DOL with current limiter

Auto transformer

Softs starter

Static Frequency Convertor

Variable Frequency Drives

VSDS principle

VSDS parts

Steam turbine fundamentals

Principals of a steam turbine

Types of steam turbines

Design of steam turbines

Condensing, non-condensing