XCELERATE TRAINING INSTITUTE

your learning & development partner

MECHANICAL ENGINEERING

Steam Turbine & Centrifugal Compressor Design, Operation and Maintenance Training Course

DURATION	LANGUAGE	FORMAT
5 days	English	Classroom / Online

Upcoming dates

Dates	Venue	Format	Fee
4 – 8 Jan 2027	Cairo	Classroom	€4,800
28 Jun – 2 Jul 2027	Live online	Online (live)	€1,200
6 – 10 Dec 2027	Live online	Online (live)	€1,200

Register or ask a question

Online: x8ti.com/course/steam-turbine-centrifugal-compressor-design-operatio…

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Steam Turbine & Centrifugal Compressor Design, Operation and Maintenance Training Course

Introduction

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A steam turbine permits steam to expand and attain high velocity, which in turn is converted to mechanical energy for significant use in industries. Steam turbines are important parts of plant utility systems, and most operations cannot proceed without them.

A centrifugal compressor is a sub-class of turbo machinery that achieves a rise in pressure by adding kinetic energy to a continuous flow of fluids through the roller or impeller.

Operation of centrifugal compressors considerably depend on speed, horsepower and driver type. They form an important part of essential turbo machinery and hence should be maintained and repaired if needed.

This Xcelerate Training Institute course will empower you with complete information and understanding of steam turbines and centrifugal compressors. Through this course, you will acquire the required knowledge, experience and skill to work with steam turbines and centrifugal compressors and would be able to contribute to your organization by ensuring their optimal operation and conducting regular maintenance and repair to prevent huge losses for the organization.

Learning Objectives

- comprehensive understanding of steam turbines and centrifugal compressors, including aspects related to their design, operation and maintenance
- the required awareness and understanding to choose the appropriate steam turbine and centrifugal compressor for your equipment
- adequate understanding and experience to deal with practical challenges encountered while working with steam turbines and centrifugal compressors
- awareness of international standards and guidelines for maintenance and operation of steam turbines and centrifugal compressors
- enhanced strategic and analytical skills to assess possible risks and make provisions to mitigate these to prevent losses
- adequate understanding and experience to conduct regular audits of turbines and compressors, thereby ensuring equipment longevity
- confidence and knowledge to train other professionals on working with steam turbines and centrifugal compressors
- the overall skill and capabilities to work in any industry, thereby increasing opportunities for progression

Training Methodology

Courses at Xcelerate Training Institute are created with scope for customization as per the intended audience. Lectures are delivered by experienced professionals using detailed audio-visual presentations. Two-way participation is encouraged through group activities and projects, including role-plays and case study discussions. Experiential learning is considered an important part of training.

Benefits for your Organization

- Trained and experienced professionals to manage operations and maintenance of steam turbines and centrifugal compressors
- Regular inspections for checking repair requirements to ensure equipment longevity, thereby reducing costs and contributing to organizational development
- Regular training of other employees to effectively work with steam turbines and centrifugal compressors
- Adherence to international standards and benchmarks of operation, quality and employee safety, thereby increasing organizational credibility
- Increased investments because of greater credibility and safer, more efficient operations
- Mitigation of risks by regular maintenance and repair activities

Benefits for You

- Comprehensive information and understanding of steam turbines and centrifugal compressors
- Increased confidence to train other professionals on working with steam turbines and centrifugal compressors
- Enhanced perspective and analytical skills to review operations, predict risks and take steps to mitigate these to prevent occupational hazards, contributing to employee safety
- Greater knowledge and experience to conduct regular audits to check for scope of maintenance or repair activities
- Increased knowledge and experience to choose the correct material and type of steam turbines and centrifugal compressors, as per the intended operation
- Increased knowledge of international standards and guidelines for operation and maintenance of steam turbines and centrifugal compressors
- Enhanced skill set and capabilities to undertake higher roles and responsibilities related to overseeing operations of steam turbine- and centrifugal compressor-related equipment in any industry, thereby increasing opportunities for career progression

Target Audience

- Top management of an organization responsible for making critical decisions related to purchasing and maintenance of equipment
- Plant engineers involved in running and handling equipment with steam turbines and centrifugal compressors
- Managers and supervisors as well as operations managers overseeing operations involving steam turbines and centrifugal compressors
- Quality auditors and compliance officials responsible for ensuring adherence to required standards and benchmarks
- Suppliers involved in material and equipment purchase and sale

- Any other professional who would like to know more about steam turbines and centrifugal compressors

Course Outline

Steam Turbine Components

- Feed water pump
- Boiler
- Turbine stages, including nozzle stator and rotor blade rows
- Condenser

General Applications of Steam Turbines

- Power generation
- Petrochemical refineries
- Pharmaceuticals
- Food processing
- Petroleum/gas processing
- Paper mills
- Sugar industry
- Waste-to-energy

Operating Modes of Steam Turbines

- Back pressure steam turbines
- Condensing steam turbines
- Extraction condensing turbines
- Induction turbines

Compounding of Steam Turbines

- Pressure compounding
- Velocity compounding
- Pressure-cum-velocity compounding

Steam Turbine Losses

- Profile loss
- Secondary loss
- Tip leakage loss
- Disc wind age loss
- Lacing wire loss
- Annulus loss
- Leaving loss
- Partial admission loss

Factors Influencing Steam Turbine Design

- Aerodynamic parameters
- Incidence angle

- Stator–rotor interaction
- Degree of reaction
- Whirl distribution
- Geometric parameters
- Blade profile
- Blade solidity
- Blade aspect ratio
- Blade stacking

Centrifugal Compressor Components

- Inlet
- Centrifugal impeller
- Diff-user
- Collector

Applications of Centrifugal Compressors

- Gas turbines and auxiliary power units
- Automotive engine and diesel engine turbochargers and superchargers
- Natural gas pipeline compressors
- Oil refineries and natural gas, petrochemical and chemical plants
- Air-conditioning and refrigeration

Centrifugal Compressor Performance

- Performance maps
- Surge
- Maximum flow line versus choke
- Other operating limits

Operating Parameters

- Vibration
- Motor amps
- Inlet and blow-off valve percent open
- Cooling water temperatures
- Discharge pressure
- Inter-stage pressure
- Inter-stage temperature
- Lube oil pressure
- Lube oil temperature
- Lube oil cooling water temperature
- Seal air pressure
- Inlet air filter
- Drive motor winding temperature

Mechanical Failures in Centrifugal Compressors

- Inappropriately calibrated controls
- Fouled inlet filter
- High inlet air temperatures
- Fouled inter coolers on-air or waterside
- Worn impellers and/or diff-users
- Deposits on impellers, diff-users, moisture separators
- Momentary loss of electrical power
- Water carryover from condensate or cooling water leak
- Inappropriately adjusted impeller to diff-user thrust clearance
- Low or high cooling water flow

Advantages of Preventative Centrifugal Compressor Maintenance

- More economical
- Prevention of catastrophic failure
- Reduced overall costs
- Reduced unplanned downtime

Aspects of Centrifugal Compressors and Their Maintenance

- Inlet air filter
- Lube oil filters
- Controls
- Performance
- Cooling system
- Instrument air system
- Drive motor/switch gear

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Registration Form

Steam Turbine & Centrifugal Compressor Design, Operation and Maintenance Training Course

Preferred dates: ..... Venue or online: .....

Duration: 5 days Language: .....

Please complete and email this form to us, or register online. We confirm your place and send the invoice within one working day.

Delegate information

Full name (Mr / Ms / Dr / Eng): .....

Position: ..... Telephone / mobile: .....

Official email: ..... Personal email: .....

Company information

Company name: .....

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Person responsible for training & development

Full name (Mr / Ms / Dr / Eng): .....

Position: ..... Telephone / mobile: .....

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