XCELERATE TRAINING INSTITUTE

your learning & development partner

MECHANICAL ENGINEERING

Gas Turbine Operation, Performance, Maintenance and Repair Training Course

DURATION	LANGUAGE	FORMAT
5 days	**English**	**Classroom / Online**

Upcoming dates

Dates	Venue	Format	Fee
3 – 7 ???? 2027	Live online	Online (live)	**€1?200**
14 – 18 ????? 2027	Madrid	Classroom	**€4?800**
8 – 12 ?????? 2027	Live online	Online (live)	**€1?200**

Register or ask a question

Online: x8ti.com/course/gas-turbine-operation-performance-maintenance-and-re…

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Gas Turbine Operation, Performance, Maintenance and Repair Training Course

Introduction

Introduction

Gas turbines are internal combustion engines in which the burning of an air-fuel mixture produces hot gases that spin a turbine to generate power. It is the process of hot gas production during fuel combustion. Basic operation of gas turbines is called the Brayton cycle.

They are used to power aircraft, trains, ships, electric generators, pumps, etc. It is advantageous to use gas turbines for power generation because they have a high power-to-weight ratio, are smaller than most other engines, show smooth main shaft rotation, are more reliable, have lower peak combustion pressures, etc.

Their regular maintenance is extremely critical because it increases system efficiency, extends life-cycle of the turbine, reduces maintenance costs, etc.

This Xcelerate Training Institute course will empower you with detailed knowledge and understanding of gas turbines, including their operation, performance, maintenance and troubleshooting.

Through this course, you will build your skill set to cater to all aspects concerning gas turbines, a pre-requisite for senior roles in processes involving gas turbine operations. This course will prepare you to undertake higher roles and responsibilities not just in your organization but any other organization.

Learning Objectives

- detailed information and knowledge about gas turbines, including their operation, performance, maintenance and troubleshooting
- the required skills to successfully handle processes involving gas turbines
- the ability to make appropriate, timely decisions related to the choice of material and type of turbine as per the intended purpose
- the necessary confidence and knowledge to train other professionals to efficiently work with gas turbines
- the experience and exposure to review current systems and make enhancements to improve operational efficiency and demonstrate skill and talent
- the confidence to face all challenges when working with gas turbines and not let these impact the organization
- the ability to contribute to operational efficiency and reduction in operational and maintenance costs, thereby demonstrating potential to undertake higher roles and responsibilities
- the capabilities to ensure adherence to all standards set out for working with gas turbines
- a sense of pride contributing to organizational development through reduced costs and increased operational efficiency

Training Methodology

Courses at Xcelerate Training Institute are delivered with a focus to ensure complete relevance of the training content to the intended audience. For this reason, the course content is closely reviewed and checked for changes, if any, as per the intended audience.

A highly experienced professional deliver the training using audio-visual presentations. The trainer also assigns projects to the audience to engage them in the program. Role-plays and case study discussions also encourage interaction among trainees.

Benefits for Your Organization

- Experienced and trained professionals to oversee operations, performance, maintenance and troubleshooting of gas turbines
- Appropriate selection of gas turbines in processes across the organization
- Regular checks to ensure all turbines are performing at optimal efficiency
- In-time maintenance and repair of gas turbines to prevent serious damages and problems
- Reduced maintenance costs because of better management of gas turbines
- Free training of other employees on best practices when working with gas turbines
- Adherence to required regulations for working with gas turbines
- Organizational growth because of reduced costs and increased operational efficiency
- Greater credibility because of reduced risks of occupational hazards as a result of regular audits
- Employee safety in adherence with required regulations

Benefits for You

- Comprehensive understanding of gas turbines, including their operation, performance, maintenance and troubleshooting
- Increased understanding and experience to identify machinery requiring maintenance or repair through regular audits
- Greater confidence and knowledge to train other professionals on working with gas turbines
- Adequate knowledge and awareness to ensure that the correct type of gas turbines are used
- Increased awareness and knowledge of international standards and guidelines to ensure operation is within these limits
- Enhanced foresight to predict future challenges and make provisions to prevent organizational impact
- Greater potential and confidence to contribute to organizational development through operational excellence and reduced costs
- Enhanced skill set and capabilities to handle higher roles and responsibilities related to the functioning of gas turbines, within and outside one’s organization, thereby receiving greater opportunities for growth

Target Audience

- Engineers and staff working on processes and systems requiring gas turbines
- Managers and supervisors responsible for overseeing end-to-end operations
- Top management who need to understand the importance of gas turbines to understand utility in

industries
- Suppliers of part or whole machinery who need to understand what and how to sell appropriate machinery
- Compliance auditors and quality checkers responsible for seamless operations complying with required standards and guidelines
- Any other professional who would like to know more about gas turbines

Course Outline

Elements Common to All Gas Turbines

- Upstream rotating gas compressor
- Combustor
- Downstream turbine on the same shaft as the compressor

Types of Gas Turbines and their Operation

- Jet engines
- Turboprop engines
- Aero derivative gas turbines
- Amateur gas turbines
- Auxiliary power units
- Industrial gas turbines for power generation
- Industrial gas turbines for mechanical drive
- Turboshaft engines
- Radial gas turbines
- Scale jet engines
- Micro turbines
- Gas turbine engines

Advantages of Gas Turbine Engines

- High power-to-weight ratio
- Smaller than most engines
- Smooth main shaft rotation
- Fewer moving parts
- Greater reliability
- Waste heat dissipated almost entirely
- Lower peak combustion pressures
- High shaft speeds
- Low lubricating oil cost and consumption
- Low toxic emissions

Disadvantages of Gas Turbine Engines

- High core engine costs
- Less efficiency at idle speed

- Longer start-up
- Less responsive to changes in power demand
- Characteristic whine that is hard to suppress

Four Thermodynamic Processes in an Ideal Gas Turbine

- Isotropic compression
- Isobaric combustion
- Isotropic expansion
- Heat rejection

Gas Turbine Performance

- Site-dependent parameters
- Ambient temperature
- Ambient pressure
- Humidity
- Pressure ratio
- Turbine inlet temperature
- Components efficiency
- Stagnation or total properties
- Isentropic efficiency
- Polytrophic efficiency

Components of Gas Turbine Systems Requiring Special Attention

- Turbine
- Compressor
- Air intake
- Exhaust chimney
- Gearbox
- Combustor
- Electric generator

Refurbishment Methods to Deal with Mechanical Stress and High Operating Temperatures

- Removal of old coating
- Application of new coating
- Welding to rebuild geometry
- Heat treatment to rejuvenate the material condition
- Change in design and material

Benefits of Gas Turbine Maintenance

- Increased system efficiency
- Extended gas turbine life cycle
- Reduced maintenance costs
- Increased availability of gas turbine

- Increased reliability of equipment

Types of Maintenance Inspections

- Standby inspections
- Running inspections
- Rapid cool-down
- Combustion inspection
- Hot gas path inspection
- Major inspection

Gas Turbine Troubleshooting

- Abnormal conditions and operations
- Vibrations
- Axial turbine and compressor issues
- Combustor issues

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Registration Form

Gas Turbine Operation, Performance, Maintenance and Repair 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: .....

Address: .....

City / country: ..... VAT / tax number: .....

Person responsible for training & development

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

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

Email: .....

Payment

☐ Please invoice me ☐ Please invoice my company

Signature: ..... Date: .....

Call
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Email this form
info@x8ti.com

Register online
Open the course page