

€ TRAINING

Gas Turbines Core Components





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Introduction:

This training program offers comprehensive instruction on the operation, technology, and maintenance of gas turbines. Through this training participants develop the skills needed to troubleshoot issues, optimize performance, and ensure reliable operation of gas turbine systems.

Program Objectives:

At the end of this program, participants will be able to:

- Describe the different stages involved in the operation of a gas turbine cycle.
- Operate and maintain the air inlet, the filtration system, the pulse cleaning system, and the evaporative cooler.
- Demonstrate an understanding of the compressor section to include the rotor, variable guide vanes, and compressor blading.
- Use the relevant turbine control terms to operate and control protection systems.
- Explain the construction and operation of the turbine section, including rotor, buckets, nozzles, and bearings.
- Outline the construction and operation of the liquid and gas fuel control systems, gas control valves, and the lube oil system, essential to the operation, maintenance, and troubleshooting of a gas turbine.
- Describe the construction and the theory behind the operation of a generator, including the starting system, the turning gear, the commutated inverter, and the cooling methods.

Targeted Audience:

- Engineers specializing in mechanical, electrical, or aerospace engineering.
- Technicians involved in gas turbine maintenance and troubleshooting.
- Professionals in the energy industry seeking to expand their knowledge of gas turbine technology and operation.

Program Outlines:

Unit 1:

Gas Turbine Theory and Air Inlet System:

- Gas turbine operation cycle.
- Air inlet system purpose and operation.
- Components of the compressor system.
- Operation and components of the combustion system.
- Gas path and its role in turbine operation.
- Components and function of the exhaust system.

Unit 2:

Compressor and Combustion System:

- Overview of the compressor and its function.
- Components of the compressor, including the rotor and blading.
- Variable input guide valves and their role in compressor operation.
- Purpose and operation of the combustion system.
- Components of the combustion system, including crossfire tubes, spark plugs, and flame detectors.

Unit 3:

Turbine Section and Support Systems:

- Construction and operation of the turbine.
- Importance and function of rotor cooling.
- Components and operation of turbine buckets.
- Role of nozzles and bearings in turbine operation.
- Overview of fuel control systems for both liquid and gas fuels.
- Functionality and operation of control valves.
- Explanation of speed ratio and stop valve.
- Importance and operation of lubrication systems.

Unit 4:

Air Filtration, Generator, and Plant Operations:

- Purpose and operation of the air inlet and filtration system.
- Overview of pulse cleaning operation and set points.
- Functionality and benefits of evaporative cooling.
- Theory and construction of generators.
- Procedures for starting and cooling a generator.
- Functionality of turning gear and commutated inverter.
- Components and operation of the generator.

Unit 5:

Controls and Monitoring:

- Overview of control panel and its functions
- Explanation of important terms related to plant operations
- Operator commands for various plant operations
- Controls to conduct trip oil, over speed, over-temperature, flame detection, and vibration detection.
- Importance and operation of combustion monitoring systems.