Training Program:

Gas Turbine Principles & Applications

Introduction:

The gas turbine is a versatile source of shaft or propulsion power in a growing number of applications. The course reviews methods for evaluating the performance of gas turbines, leading to the criteria for selection and application of the engine.

Attendees will be instructed in identifying functions of the several components of the gas turbine. A thorough introduction into quantitative analysis of engine performance based on component characteristics will be provided. The successful operation of gas turbines will be analyzed, including the necessary characteristics of materials and fuels, the control of combustion emissions, and elements of condition monitoring and maintenance. Specific examples of component and gas turbine engine designs are shown to illustrate the application of the analysis principles.

Who Should Attend?

Electrical Engineers, Power Generation Engineers, Power System Protection Engineers, Gas turbine newcomers and more experienced persons who desire an overview of the many available gas turbine technologies, Process Control Engineers & Personnel, Electrical and Instrumentation Technicians & Design Engineers, Maintenance Technicians & Supervisors, Plant Operators & Technicians, Oil & Gas Industry Personnel

Course Objectives:

By the end of this course delegates will be able to:

- Explain the methods for evaluating the performance of gas turbines, leading to the criteria for selection and application of the engine
- Identify functions of the several components of the gas turbine

- Conduct a basic quantitative analysis of engine performance based on component characteristics
- Analyze the successful operation of gas turbines, including the necessary characteristics of materials and fuels, the control of combustion emissions, and elements of condition monitoring and maintenance

Course Outline

Gas Turbine Performance and Process Thermodynamics

- Principals and applications
- Performance
- Size and weight

Gas Turbine Cycles

- Brayton cycle
- Design and cycle variations

Component and Accessory Design Fundamentals

- Turbines
- Combustors
- Inlets
- Practical design features and limits

Characteristics, Advantages and Problems of Specific Applications

Open Cycle

Electrical Power Generation

Mechanical Drive

- Compressors
- Pumps
- Marine Propellers
- Shafts for Vehicular Drives

Hot Gas Generators

Closed Cycle

Gas-cooled Nuclear Reactors

Fossil Fuel Fired air Heaters

Materials: Alloys and Ceramics

- High temperature materials
- Requirements and considerations for gas turbine engines
- Coatings

Combustion and Emissions

- NOX
- CO
- UHC
- Smoke and particulate

- Odor

Alternate Fuels

- Distillate fuel oils
- Residuals
- Methanol
- Manufactured gas
- Coal
- Solar and nuclear
- Additives

Reliability and Maintenance

- Individual machine differences
- Inlet conditions
- Operating cycle
- Fuel
- Monitoring

Gas Turbine Future Potential and Developments

- Higher turbine inlet temperatures
- Better use of Reject Heat
- New fuels
- Component performance improvements
- New applications

Accreditation:

BTS attendance certificate will be issued to all attendees completing a minimum of 80% of the total course duration.