Training Program:

Control & Protection Systems Of Gas Turbine

Introduction:

This course presents the features of control and protection systems as used on gas turbine installations. It enables the participants to understand and be able to apply the following concepts:
the function of the control system, the control loop, sensing devices, actuators, controllers, mechanical, electronic, digital, reliability i.e. redundant (duplicate) equipment, operator interface, display of information, inputting commands, controlling turbine output - FSR (Fuel Stroke Reference), automatic start-up sequence, permissive, speed sensors, switches, relays, modes of control, startup, speed/load, temperature, pre-set FSR, limitations, speed/load control, governor characteristic, loading rate limitations, automatic shut-down sequence, spin cooling, fired shut-down, exhaust temperature control, monitoring thermocouples, spread, monitoring combustion conditions, alarms and trips, flameout protection, over speed protection, over temperature protection, vibration protection.

Who Should Attend?

Electrical Engineers, Power Generation Engineers, Power System Protection Engineers, 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:

- Describe the elements of the basic control loop and explain the parameters typically monitored in the operation of the control system
- Be able to describe common indications of faulty or uneven combustion conditions in a gas turbine
- Describe a typical gas turbine protection and alarm systems
- Describe the common conditions that will cause a gas turbine trip
- Know about the operator interface, and the indications and controls provided
- Be able to describe the operation of an automatic start-up system for a typical gas turbine
- Learn the automated operation and shutdown of a typical gas turbine
- Explain how the exhaust temperature of the gas turbine can be used in the control of its operation

Course Outline

- The function of the control system
- The control loop
- Sensing devices
- Actuators
- Controllers, mechanical, electronic, digital
- Reliability i.e. redundant (duplicate) equipment
- Operator interface

- Display of information
- Inputting commands
- Controlling turbine output - FSR (Fuel Stroke Reference)
- Atomatic start-up sequence
- Permissives
- Speed sensors
- Switches
- Relays
- Modes of control
- Start-up, speed/load
- Temperature
- Pre-set FSR
- Limitations
- Speed/load control
- Governor characteristic
- Loading rate limitations
- Automatic shut-down sequence
- Spin cooling
- Fired shut-down
- Exhaust temperature control
- Monitoring thermocouples, spread
- Monitoring combustion conditions
- Alarms and trips

- Flameout protection
- Over speed protection
- Over temperature protection
- Vibration protection

Accreditation:

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