

€ TRAINING

Power Plant Operations and Control





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Introduction:

This Power Plant Operations and Control training program provides participants with the expertise needed to manage power generation facilities efficiently and safely, covering operations, equipment control, safety protocols, and emergency response procedures. The program aims to ensure that operators are proficient in optimizing plant performance, maintaining reliability, and adhering to regulatory standards.

Program Objectives:

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

- Analyze process and control diagrams.
- Become familiar with maintenance, troubleshooting, and control of power plants.
- Comprehend the power plant parameters, disturbances, and control techniques.
- Understand the operation of power plants.
- Learn about power plant features, selection criteria, and optimization.

Targeted Audience:

- Electrical and mechanical engineers of different competency levels.
- Project engineers and project managers.
- Power station maintenance crew.
- Power station operators, technicians, engineers, and managers.
- University graduates, site engineers, and technical crew.

Program Outlines:

Unit 1:

Fundamentals of Mechanical & Electrical Engineering:

- Sensors, actuators.
- Pumps, compressors, turbines, fan, blowers.

- Pneumatics and hydraulics.
- Control valves and cylinders, electrical actuation.
- Theory of heat transfer.
- Electric generators, motors, and drives.

Unit 2:

Gas Power Station:

- Overview of gas power stations.
- Fundamentals and thermodynamics.
- Gas turbine components.
- Construction, lubrication system, fuel system, and auxiliary systems.
- Protection, control, and instrumentation.
- Installation, operation, and maintenance.

Unit 3:

Thermal Power Station:

- Overview of thermal power stations.
- Fuel combustion and steam generation process.
- Boiler auxiliary plant, operation, and controls.
- Boilers and power generation.
- Waste heat recovery.
- Boiler emission control, maintenance, and troubleshooting.

Unit 4:

Diesel Generator DG Power Station:

- Power plant types and components, engine types.
- Engine technology and classifications.
- DG types, protection, insulation, earthing and construction.

- DG set assemblies & components.
- DG plant layout.
- DG operation and maintenance.

Unit 5:

Process Instrumentation & Control:

- Process control fundamentals.
- Measurement and control of pressure, level, flow and heat.
- Electronic controllers.
- Process flow diagram PFD, P&ID, transfer function.
- Open & closed-loop controllers.
- Operational amplifiers, analog & digital controllers.