

## Auxiliary Generator Operations, Maintenance and Troubleshooting

This course covers fundamentals of electric generation, a practical understanding of electric switchgear and protective devices, and the basic operating theory behind electric synchronization and load sharing, the trainee will understand and be able to start, stop, synchronize, load share, and monitor the operation of an electric generator. The trainee will also understand electrical power generation and be able to operate, maintain, and troubleshoot auxiliary generators, related electrical switchgear controls and metering, and devices.

### I. Operate, Maintain and Troubleshoot Auxiliary Generators

- Understand the general functionality of a facility's electrical system.
- Understand the basic operation of an auxiliary generator.
- Understand the operating theory of the major components of the auxiliary generator set and electrical switchgear.
- Read and interpret 1-Line and 3-Line electrical schematics of generator systems.
- Define the major components of the auxiliary generator set and electrical switchgear.
- Understand the basic theory of power generation.
- Understand the impact of each generator control and metering device.
- Explain the electrical effects of controlling the governor and exciter voltage on a synchronous generator.
- Interpret the basic instrumentation on electric panels.
- Define the basic instrumentation and switches on the generator controlpanels.
- Define the basic instrumentation and controls on the synchronizing (swing)panel.
- Understand the function and operation of control breakers and resets.
- Explain the function, operation, and basic calibration of protective devices.
- Understand the concept of breaker selectivity.
- Define the purpose of synchronizing the generators.
- Explain the basic process of electrical synchronization.
- Define the purpose of electrical power load sharing.
- Identify and quantify unbalanced load sharing.
- Explain the basic process to adjust and correct load sharing between generators.
- Understand the load sharing concepts of droop and isochronous operation.
- Explain basic operating procedures to start the prime mover and establish electric power generation.

- Explain basic operating procedures to deenergize and shutdown a generator set.
- Determine need to add generators and perform operating procedures to start the prime mover and establish electric power generation.
- Understand and perform basic generator maintenance.
- Explain basic monitoring requirements during generator operation.