



## Advanced Generator Maintenance Training

### Description

#### Course Description

This course is designed for those who have a need to understand most aspects of power plant GENERATORS. This course addresses Theory of Generator Operation, Design Considerations, Construction, Relationships to the System, Excitation Systems, Auxiliaries, and Normal/Abnormal Operations, Protective Relaying associated with the Generator, Outage Planning, Disassembly, Inspection/Repair, and Reassembly. There are NO SMALL PROBLEMS when it comes to the GENERATOR!! The Design, Construction, Operations, Safety, Testing, Inspection/Repair as well as disassembly/reassembly shall be fully understood

#### Course Objectives

Register for this course today and get the answers to the all questions including:

- How does a generator function?
- Why is it designed as it is?
- What happens if the generator is synchronized out-of-phase?
- What happened in the control room such that one would make such a large error when synchronizing?
- How can we avoid such an error?
- Just how bad (and what is) negative phase sequence currents?
- Corona discharge what does that mean?
- How do you repair fused stator punchings?
- What components should be high-potential tested?
- How can we avoid accidental injury when testing the generator?
- What are the probable causes of grounded fields?
- Why have we (recently) heard of hydrogen explosions? How do we avoid?

#### Course Outlines

**Upon successful completion of this course the participant will be able to:**

- Describe how a generator functions. (Learn why and how the voltage drops with an application of a load and learn why and how the rotor speed and angle change as that load is applied).
- Describe active and reactive power. (Learn how active power is generated, how reactive power is generated, and how these loads are shared from one generator to another.)
- Describe the major components used in the construction of an AC generator.
- Learn how these components are at risk during mis- or abnormal operations.
- Explain operation and maintenance of the most common excitation systems.
- Explain how a speed governor alters generator output in response to a frequency deviation. (Learn why the speed changes when a load is applied. Learn what is the role of the governor in response to this speed/frequency change).
- Explain how the voltage regulator alters generator output in response to a voltage deviation. (Furthermore, learn why the voltage drops, how a voltage drop is detected, where it is detected, and how the voltage regulator responds as it does).
- Discuss the causes and effects of both voltage and frequency oscillations and the impact they each have on power system dynamics.
- Describe generator normal/safe startup and shutdown procedures.
- Describe why the generator synchronizing process is as it is. (Learn what are the results of not checking phase rotation, of mismatching voltages, of mismatching frequencies, and closing the circuit breaker out-of-phase.)
- Discuss abnormal generator operation and recommended actions for generator protection.
- Given an unfortunate abnormal condition, describe possible results to equipment and/or system.
- Describe the major activities associated with generator maintenance.
- Describe proper generator disassembly and reassembly sequences.
- Describe the procedures for cleaning generator components.
- Describe the procedures for inspection of generator components.
- Given any generator component, describe the types of damage that might be found, and what probable causes of that damage are.
- Describe the various repair methods for defective component condition.
- List all those electrical tests commonly performed on large AC generators.
- For each electrical test listed, describe the purpose of conducting that test; i.e., what are we looking for as a result of the test?
- Describe the procedures for the various generator tests.
- List and describe safety precautions for the conducting of these electrical tests.