Systems for Excitiation Generators

Techniques for Excitation, Synchronous Machine Construction and Operation, Online Monitoring and Troubleshooting for Turbo Generators

Introduction

This training course on Systems for Excitation Generators has been designed to help participants increase their knowledge by acquiring new skills related to Generator systems and refreshing their prior knowledge and training.

In the end, the effectiveness of the inspection, testing, maintenance, and troubleshooting processes determines how well any generating system operates. Over time, well-thought-out protocols and planning will lead to lower expenses, equipment downtime, component requirements, and troubleshooting complexity.

The following will be covered in this training on generator excitation systems:

- Modes and Features of Excitation in Power Generator Systems
- Techniques for Synchronisation with Voltage Control and Governors in Generator Transformers
- Circuit breakers for generators
- Common Generator Problems Maintenance and Online Alternator Monitoring

Objectives

After completing this Course N Carry training course, you will have the ability to:

- Explain the various forms of power system generating.
- Talk about how the gas and steam turbines work.
- Analyse various excitation system types.
- Examine the many switch gear types connected to generating systems.
- Recognise governors and automatic voltage-regulating methods.
- Describe online monitoring and troubleshooting methods.

Training Methodology

An electronic copy of the comprehensive training course notes will be provided to each participant in this Generator Excitation Systems training session. Using computer screens and movies, the lecturer will provide an overview and discussion of the

subjects. The interactive nature of this Course N Carry Electrical Engineering training course is intended to maximise delegate engagement. It is encouraged to ask questions throughout and throughout the daily sessions.

Workshop sessions on problem solving will include case studies and examples for discussion. This allows attendees to talk about their own issues and suitable solutions with other delegates and the presenter. To guarantee maximum delegate attention during this Course N Carry training course, note-taking should be limited to the bare minimum.

Organizational impacts

Following completion of the training programme on Systems for Generator Excitation, the following organisational effects would occur:

- It is possible to review and modify current procedures on site to update the working environment to modern requirements.
- If their jobs don't require them to be entirely "hands on," engineers and technicians can still learn things that they can use in their specific responsibilities to better grasp the procedures and practices that are in place.
- Updating technical knowledge and standards from earlier education
- Managers, engineers, and technicians will be able to use modern work procedures to ensure legal compliance.
- All candidates will receive advance notice of impending legal and procedural changes so they can take the initiative in their work positions and swiftly and effectively execute the adjustments.
- Applicants can continue with additional Power-related training.

Personal Imapct

Following their successful completion of this training programme in systems for generator excitation, delegates will be qualified to:

- Provide a methodical approach to the setup and functioning of a turbo generator system.
- Continue to learn about the test apparatus used for electrical inspection and maintenance.
- Gain a deeper comprehension of the automatic voltage regulator, governors, and excitation systems' designs and functions.
- Recognise the functions of the various parts that make up a generator transformer.
- Use schematics and single-line graphics to troubleshoot
- Improve your knowledge of conventional work procedures and create project plans to help with inspection and troubleshooting.
- Recognise the significance of upkeep and security

Who should attend?

A wide range of professionals can profit from this Systems for Generator Excitation training course, however the following are the main advantages:

- Electrical Supervisors and Electrical Engineers
- Technicians in electrical systems
- Engineers for Electrical Projects
- Engineers in Electrical Power

Course Outline

Day 1

Definitions, Protocols for Communications, how to read and use drawings, how to plan maintenance, and how to use test equipment for generator systems that include both AC and DC components

- Generator System Upkeep and Operation
- Generation of Thermal Power and Combine Cycle Power Plant
- Synchronous Machine Stator Architecture and Features
- Single line diagrams for synchronous machines, their rotor construction and characteristics, and the equipment connected to generator systems
- GOOSE and IEC 61850

Day 2

How Generators Are Excited, the Value of Reactive Power Features, and How Automatic Voltage Regulator (AVR) Digital Voltage Regulator for Generators Are Built

- Governors' Roles and Structure: Permanent Magnets, Generators, Over-Fluxing, and Types of Excitation Systems
- Reactive Power Relationship to Excitation: Self-excitation vs. Brushless Effects of Over and Under Excitation

Day 3

The influence of over and under excitation on control systems for excitation can be attributed to both mechanical and economic factors.

- The Value of The Ability P Q and curve diagrams

- Understanding The Capability Software for Curve Capability Curve Generator Effects of Stator Heat
- Enhancements to Generator Excitation Systems Due to the Impact of Generator Rotor Heat

Day 4

The Generator Step-Up Transformer Operation, Generator Circuit Breaker ARC Extinction

- Generator Power Monitoring Construction of Circuit Breakers Features of Gas
- Vacuum Filled Generator Circuit Breakers and Arc Extinction
- Building Power Transformers
- Transformer for Generator Step-Up (GSU)
- GSU Requirements for Selection
- Load frequency control, power monitoring, and generator output optimisation in relation to speed, frequency, and excitation

Day 5

Typical Generator Failures, the Functions of Numerical Protection Relays, and Synchronisation

- Relays with Numerical Features for Protecting Generators and Earth Fault Relays
- Reasons for Phase Misalignment
- Harmonisation Conditions and Advantages of the Generator
- Typical Generator Issues
- Generator cooling
- Online Generator Monitoring
- Final Meeting