Generator Excitation Systems

Excitation Methods, Operations and Construction of Synchronous Machines, Troubleshooting and Online Monitoring of Turbo Generators

29 Jul - 02 Aug 2019, Kuala Lumpur
Introduction

This GLOMACS Generator Excitation Systems training seminar has been developed for the participants to learn new skills associated with Generator systems and refresh their previous skills and training, to further advancement of knowledge.

The successful operation of any Generating Systems ultimately depends on how well the inspection, testing, maintenance and troubleshooting functions are carried out. Well-developed procedures and planning will in the long run result in reduced costs, equipment down time, parts requirements and troubleshooting complexity.

This GLOMACS training seminar will highlight:

- Power Generator Systems
- Excitation Modes and Characteristics
- Voltage Control and Governors
- Generator Transformers
- Synchronization Techniques
- Generator Circuit Breakers
- Common Generator Faults
- Maintenance and Online Monitoring of Alternators

Delegates are encouraged to participate by active involvement in group discussions, practical exercises and sharing experiences.

Objectives

At the end of this GLOMACS training course, you will learn to:

- Elaborate on different types of power system generation
- Discuss operations of the steam and gas turbines
- Examine different types excitation systems
- Explore different types of switch gear associated with generator systems
- Identify automatic voltage regulating techniques and governors
- Describe troubleshooting techniques and online monitoring

Training Methodology

In this GLOMACS Generator Excitation Systems training course, each participant will receive an electronic copy of the comprehensive training seminar notes. The presenter will outline and discuss the topics using computer displays and videos. This GLOMACS Electrical Engineering training course is designed to have an interactive format to maximize delegate participation. Questions and answers are encouraged throughout and at the daily sessions.

Case studies and examples will be discussed in problem solving workshop sessions. This gives participants the opportunity to discuss with other delegates and the presenter their specific problems and appropriate solutions. Only minimum note taking is encouraged to ensure maximum delegate attention during this GLOMACS training course.

Organisational Impact

This GLOMACS Generator Excitation Systems training seminar will allow delegates to learn new skills to improve efficiency and technical competence of Engineering teams.

It will also allow delegates to do the following:

- Current practices onsite can be reviewed (and changed) to bring the workplace up to current standards
- Engineers and Technicians can gain knowledge to apply in their individual work roles so that they can understand current procedures and practices, should their work role not be a fully ‘hands-on’ role
- Updating of technical skills and Standards from previous learning
- Technicians, Engineers and Managers will be able to apply current work practices, for compliance with legislation
- All candidates will be made aware of upcoming changes to practices and legislation, so that they can be pro-active in their work roles and implement the changes quickly and efficiently
- Candidates can progress onto further Power related training seminars, which Glomacs can provide

Personal Impact

On successful completion of this GLOMACS training programme, delegates will be able to:

- Develop a systematic approach to the construction and operation of a turbo generator system
- Maintain a continuing understanding of test equipment used for electrical inspection and servicing
- Better understand the design, functionality of the excitation systems, automatic voltage regulator and governors
- Understand the operations and component functions of a generator transformer
- Utilize single-line diagrams and schematics for troubleshooting
- Better understand standard work practices plus develop job plans, which assist in successful inspection and troubleshooting
- Awareness the importance of maintenance and safety

Who Should Attend?

This GLOMACS training programme is suitable to a wide range of professionals but will greatly benefit:

- Electrical Engineers
- Electrical Supervisors
- Electrical Technicians
- Electrical Project Engineers
Day 1
Definitions, Communications Protocols, Interpretation and Use of Drawings, Maintenance Planning and The Use of Test Equipment

- Generator Systems AC and DC Components
- Operation and Maintenance of Generator Systems
- Thermal Power Generation
- Synchronous Machine Stator Construction and Characteristics
- Synchronous Machine Rotor Construction and Characteristics
- Instrumentation Associated with Generator Systems
- Single Line Diagrams
- IEC 61850 and GOOSE

Day 2
The Methods of Generator Excitations and Importance of Reactive Power

- Functions and Construction of the Automatic Voltage Regulator (AVR)
- Functions and Construction of the Governors
- Over-Fluxing
- Types of Excitation Systems
- Self-excitation vs. Brushless
- Effects of over Excitation
- Effects of under Excitation
- Reactive Power Relationship to Excitation

Day 3
Economical and Mechanical Impacts on Over and Under Excitation Control Systems

- Control Systems for Excitation
- Impact of Over Excitation
- Impact of Under Excitation
- Importance of The Capability Curve
- Interpreting The Capability Curve
- Generator Stator Thermal Effects
- Generator Rotor Thermal Effects
- Improvements of Generators Excitation Systems

Day 4
The Generator Circuit Breaker, Operation of Generator Step Up Transformer and Power Monitoring

- Generators Circuit Breaker Construction
- Vacuum and Gas Filled Generator Circuit Breakers Characteristics
- Construction of Power Transformers
- Generator Step Up Transformer (GSU)
- GSU Selection Criteria
- Power Monitoring
- Load Frequency Control
- Optimisation of Generator Output Related to Speed, Frequency and Excitation

Day 5
Common Generator Faults, Numerical Protection Relays Functionalities and Synchronisation

- Numerical Relay Generator Protection
- Generator Earth Fault Relays
- Phase Imbalance
- Synchronisation Generator Conditions and Merits
- Common Generator Problems
- Cooling of Generators
- Online Monitoring of Generators
- Wrap-up Session
EXCITATION METHODS, OPERATIONS AND CONSTRUCTION OF SYNCHRONOUS MACHINES, TROUBLESHOOTING AND ONLINE MONITORING OF TURBO GENERATORS

REGISTRATION DETAILS

LAST NAME: ____________________________________________
FIRST NAME: __________________________________________
DESIGNATION: __________________________________________
COMPANY: _____________________________________________
ADDRESS: ______________________________________________
________________________________________________________
CITY: __________________________________________________
COUNTRY: ______________________________________________
TELEPHONE: ____________________________________________
MOBILE: ________________________________________________
FAX: ____________________________________________________
EMAIL: _________________________________________________

AUTHORISATION DETAILS

AUTHORISED BY: _________________________________________
DESIGNATION: __________________________________________
COMPANY: ______________________________________________
ADDRESS: ______________________________________________
________________________________________________________
CITY: __________________________________________________
COUNTRY: ______________________________________________
TELEPHONE: ____________________________________________
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PAYMENT DETAILS

☐ Please invoice my company
☐ Cheque payable to GLOMACS
☐ Please invoice me

CERTIFICATION

Successful participants will receive GLOMACS’ Certificate of Completion

4 WAYS TO REGISTER

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TERMS AND CONDITIONS

• Fees – Each fee is inclusive of Documentation, Lunch and refreshments served during the entire seminar.
• Mode of Payment – The delegate has the option to pay the course fee directly or request to send an invoice to his/her company/sponsor. Credit card and cheque payments are both acceptable.
• Cancellation / Substitution – Request for seminar cancellation must be made in writing & received three (3) weeks prior to the seminar date. A US$ 250.00 processing fee will be charged per delegate for each cancellation. Thereafter, we regret that we are unable to refund any fees due, although in such cases we would be happy to welcome a colleague who would substitute for you.
• Hotel Accommodation – is not included in the course fee. A reduced corporate rate and a limited number of rooms may be available for attendees wishing to stay at the hotel venue. Requests for hotel reservations should be made at least three (3) weeks prior to the commencement of the seminar. All hotel accommodation is strictly subject to availability and terms and conditions imposed by the hotel will apply.
• Attendance Certificate – a certificate of attendance will only be awarded to those delegates who successfully completed/attended the entire seminar including the awarding of applicable Continuing Professional Education Units/Hours.
• Force Majeure – any circumstances beyond the control of the Company may necessitate postponement, change of seminar venue or substitution of assigned Instructor. The Company reserves the right to exercise this clause and implement such amendments.
• Fair Access / Equal Opportunities – In the provision of its services as a world-class Training Provider, the Company is committed to provide fair access / equal opportunities throughout the delivery of its courses and assessment leading to the completion of training seminars, or 3rd party qualifications/certifications.

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