Start-up, Commissioning & Testing of Electrical Systems

18 - 22 Nov 2018, Dubai - UAE
Introduction

The purpose of electric systems start-up, commissioning and testing is to increase the stability, integrity and reliability of electrical power systems after installation by identifying problems and providing a set of baseline values for comparison with subsequent routine tests.

Before commencing the pre-commission tests, it is necessary to visually inspect various parts, components and accessories of the electrical system and also to conduct operational checks for various equipment associated with the electrical system. Check lists may be followed for the visual inspection and the operational checks so that the pre-commission checks are conducted in a systematic manner.

Various types of testing, measuring and analyzing instruments are used to ensure that the various systems and sub systems equipment are functioning correctly. These instruments are performed on circuit breakers, transformers, protection relays, instrument transformers, batteries, UPS system and motors.

This training seminar will highlight:
- Reasons for Pre-commissioning Tests
- Commissioning Planning, Process and Procedures
- Testing Procedures
- Commissioning / Maintenance Tests
- Start-up or First Energisation
- Safety Aspect of Commissioning

Objectives

The training seminar covers all aspects of testing in electrical systems, performed during construction or maintenance. It considers practical understanding of variety of tests and prescribes how to carefully plan and perform them. The final stage is the start-up or first energisation when equipment is connected to the system under load conditions.

At the end of this course, participants will learn to:
- Understand the testing process
- Plan and prepare for testing
- Plan and carry out inspections
- Perform on load and off loads tests
- Plan the first energisation
- Perform phasing tests
- Consider safety aspects during testing

Personal Impact

- Learn the testing process
- Understand a step by step approach of the commissioning
- Have a comprehensive understanding of testing of HV and LV equipment
- Gain knowledge of the first energisation
- Understand the safety aspects of commissioning & testing

Training Methodology

Participants to this training seminar will receive a thorough training on the subjects covered by the seminar outline with the Instructor utilising a variety of proven adult learning teaching and facilitation techniques. Seminar methodology will include audio and video PowerPoint presentation. The training course is designed to have an interactive format to maximize delegate participation. Questions and answers sessions are encouraged throughout the course. The case studies are tailored to the attendees needs and various examples from practice will be discussed in problem solving workshop sessions.

Organisational Impact

- Train staff to be able to carry out testing and commissioning
- Make the participants aware of equipment testing either during a project construction or maintenance
- The course will allow delegates to interact and gain knowledge from shared experience
- The staff will understand the concept of the equipment testing and appreciate its importance in operation and maintenance of an electrical power system
- Awareness of safety during testing and commissioning

Who Should Attend?

This training course is suitable to a wide range of professionals involved in projects, planning, commissioning and maintenance of electrical power systems. The following profile will greatly benefit:
- Testing Engineers / Technicians
- Maintenance Engineers / Technicians
- Managers of Engineering Departments
- Consulting Engineers / Technicians
- Project Engineers
- Safety Professional
# Seminar Outline

## DAY 1

### Introduction to Start-up, Commissioning and Testing
- Definition of Start-up, Commissioning and Testing
- Pre-Commissioning Procedures
- Reasons for Start-up, Commissioning and Testing
- Substation Commissioning
- Managing Commissioning
- Earthing System including Clean Earth, Intrinsic Safe Earth and Plant Earth
- Gas Insulated Substations
- Start-up Procedures

## DAY 2

### Commissioning Test Equipment Circuit Breakers and Instrument Transformers
- Types of Tests and Equipment for Commissioning
- IR Test, Primary Injection Test, Secondary Injection Test
- HV Test, AC Hipot Test, DC Hipot Test
- Infrared and Partial Discharge Monitoring
- Circuit Breaker Functional Tests
- Tests for SF6 Circuit Breaker
- SF6 Management
- Construction and Test for Current Transformer and Voltage Transformers

## DAY 3

### Commissioning Test Equipment for Transformers
- Transformer Noise
- Commissioning Test and Test Equipment for Power Transformers
- Functional Tests for Power Transformer
- Vector Group of Transformer
- Transformer Oil Characteristics and Tests
- Sweep Response Frequency Test
- Tan Delta Test and Polarization Index
- Transformer Protection Tests

## DAY 4

### Commissioning Test for Motors, Earthing and Lightning Systems
- Importance of Earthing
- Network Earthing
- Neutral Earthing Resistors
- Restricted and Sensitive Earth Faults
- Sensitive Earth Fault
- Lightning Protection Systems
- Commissioning Testing for Motors
- Numerical Relays Functionalities

## DAY 5

### First Energisation and Commissioning Documentations
- Battery Charger Commissioning Tests
- Commissioning Switching Plans
- Managing First Energisation
- Switching Plans
- Soak Tests and Phasing Tests
- Commissioning Certificates
- Case Study
- Wrap-up Q & A session
Start-up, Commissioning & Testing of Electrical Systems

<table>
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<tr>
<th>Code</th>
<th>Date</th>
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<th>Fees</th>
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<td>EL033</td>
<td>18 - 22 Nov 2018</td>
<td>Dubai</td>
<td>$4,750</td>
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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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FAX: __________________________________________________
EMAIL: ________________________________________________

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.