



## Start-up, Commissioning & Testing of Electrical Systems

Date	Venues	(\$)Fees	Book your seat
02 Jun -06 Jun 2024	Salalah	2900	<a href="#">Register Now</a>

### 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 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 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

### Training Methodology

Participants to this seminar will receive a thorough training on the subjects covered by the seminar outline with the Tutor utilising a variety of proven adult learning teaching and facilitation techniques. Seminar methodology will include audio and video PowerPoint presentation. The 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.

## **Organizational 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

## **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

## **Who Should Attend?**

This 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

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