

# TAMCO High Voltage Switchgears

## INTRODUCTION

- This TAMCO High Voltage Switchgears training course focuses mainly on the installation, operation and maintenance of high voltage switchgear and equipment, with reference to auxiliary equipment necessary for its operation. High voltage equipment plays an important role in the safe distribution of electrical power. The equipment needs to be operated in a safe manner securing continuity of supply to consumers. Technical aspects of switching devices as well as their maintenance requirements are briefly included in this training seminar in order to understand the risks associated with switchgear operation. Aspects of modern maintenance techniques in asset managements will be covered at the level appropriate for this training course.
- Protection systems are installed to prevent faults from damaging electrical plant and to initiate isolation of faulted sections in order to maintain continuity of supply elsewhere on the system.

This training course will highlight:

- The roles of MV and HV switchgears
- Compression principles of circuit breakers
- Application and installation of vacuum interrupters
- Importance of maintenance and testing
- Protective relays and characteristics

## OBJECTIVES

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

- Understand the operations and types of TAMCO high voltage switchgears
- Develop management and implementation of safe work systems
- Design coordination of maintenance activities and maintaining system safety
- Apply air and gas insulated switchgear operations and maintenance
- Explain the various types of protective relays
- Analyse troubleshooting and repair of high voltage switchgears

## **ORGANISATIONAL IMPACT**

Upon completion of the training course, the organisational impact would be:

- Technical training and up-skilling to improve and realise the full potential of a competent workforce
- Productivity increase through minimisation of project time acceptance/design and commissioning
- Identification for opportunities of improvements due to deep understanding of the presented state-of-the-art maintenance technologies
- Networking of personnel with technology leaders and other engineers and technicians with strong field experience
- Exposure of personnel to the standard international procedures
- Attitude change of workforce, as continuous follow up of new technologies

## **PERSONAL IMPACT**

On successful completion of this training course, delegate will be able to understand:

- The TAMCO high voltage switchgears types, installation, operations and maintenance
- The need for routine inspection, adequate maintenance of equipment and accurate record keeping
- Methods of maintenance management, using safe systems of work
- How to coordinate maintenance activities for best utilisation of time and resources, while ensuring safety is not compromised
- Switchgear maintenance requirements and techniques - properties of insulating oils and their analysis
- The use of non-intrusive condition monitoring methods

## **WHO SHOULD ATTEND?**

- The technicians and maintenance staff will be able to comprehend the types, construction, operations, function of transformers. This will enable them to carry out effective maintenance activities.

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

- Electrical engineers
- Maintenance technicians
- Electrical supervisors
- Engineering professionals
- Managers of the electrical engineering department

## Course Outline

### The Role and Importance of the Medium and High Voltage Air Insulated and Gas Insulated Switchgears in Power Systems

- Circuit breakers, ring mains unit and earth switches
- Importance of single line diagrams and switchgear symbols
- Substation switchgear layouts
- Substation arrangements
- Live tank and dead tank HV circuit breakers

### Sulphur Hexafluoride (SF<sub>6</sub>), Green Gas for Grid and Vacuum Circuit Breakers

- Circuit breakers compression principles
- SF<sub>6</sub> hazards and test equipment
- Hybrid dead and live tank HV circuit breakers
- Vacuum interrupters operation and maintenance
- Types of vacuum circuit breaker characteristics
- Other applications and installations of vacuum interrupters

### TAMCO High Voltage Switchgears Blueprint, Components, Operation and Maintenance

- Typical TAMCO gas insulated switchgear
- TAMCO switchgear special features
- Interpreting TAMCO switchgear blueprint
- Ring mains unit
- Container substation and package substation

### Maintenance and Testing of TAMCO High Voltage Switchgears Material List, Conditioned Based Maintenance and Incidents

- Importance of maintenance and testing
- Preventive and condition-based maintenance services including thermography
- TAMCO material lists and layout diagrams
- Maintenance post commissioning
- Flash over
- Typical switchgear temperature alarms

### Protection and Types of Relay of High Voltage Installation Incorporating TAMCO Switchgears

- Characteristics of switching devices
- Fault currents and short circuit current situation
- Protective relay types and characteristics