

# Design of substations



## OBJECTIVE

Discover the key theoretical and practical aspects in the design, operation and control of substations and transformer stations.



## AUDIENCE

Engineers and technicians involved in the design, utilisation and maintenance of transformer stations.



## CONTENT

### Substations: General concepts

- Types and siting of substations
- Electrical configurations according to liability, exploitation, maintenance and economics
- Standards and regulations

### Substation design: Basics

- Overvoltages in high voltage centres
- Insulation coordination and distance calculations
- Mechanical actions on busbars, switchgear and structures
- Civil engineering of a substation
- Earthing design
- Busbars design and calculations

### Primary systems

- Disconnectors and circuit breakers
- Transformers and MV switchgear
- GIS substations

### Secondary Systems

- Protection & control
  - Design of control systems
  - Basic structures in command and control
  - Single-line diagram
  - Wiring diagram
- SCADA and communications
  - Ethernet, OSI model and introduction to IEC 61850
- Ancillary services
  - Configuration and design criteria
  - Liability, automatic commutations, protection and protection coordination
  - Charge and dimensioning of batteries

**LIVE ONLINE TRAINING**

**Duration: 24 hours**

**More information and registration here:**

<https://bit.ly/HitachiGridAcademy>