

Generator Excitation Systems

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 and Combine Cycle Power Plant
- 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)
- Digital Voltage Regulator for Generators
- Functions and Construction of the Governors
- Permanent Magnets Generators
- Over Fluxing and Types of Excitation Systems
- Self-excitation vs. Brushless
- Effects of Over & 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 & Under Excitation
- Importance of The Capability Curve and P Q diagrams
- Interpreting The Capability Curve
- Capability Curve Software

- Generator Stator Thermal Effects
- Generator Rotor Thermal Effects
- Improvements of Generators Excitation Systems

DAY 4

The Generator Circuit Breaker ARC Extinction, Operation of Generator Step Up Transformer and Power Monitoring

- Generators Circuit Breaker Construction
- Vacuum and Gas Filled Generator Circuit Breakers Characteristics and Arc Extinction
- 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 Functionalities Related to Generator Protection
- Generator Earth Fault Relays
- Causes of Phase Imbalance
- Synchronisation Generator Conditions and Merits
- Common Generator Problems
- Cooling of Generators
- Online Monitoring of Generators
- Wrap-up Session