€TRAINING

Modern Electrical Power System

29 December 2024 -
2 January 2025
Online

Modern Electrical Power System

REF: L1305 DATE: 29 December 2024 - 2 January 2025 Venue: Online - Fee: 2500 Euro

Introduction:

A Modern Electrical Power System training program provides instruction on contemporary power systems, including renewable energy integration, smart grid technologies, and grid stability enhancement, to equip participants with the skills needed for today's electrical engineering challenges.

Program Objectives:

At the end of this program, the participants will be able to:

- Understand the operation and power flow characteristics of small-large networks and how the network can be arranged to deliver more real power over the transmission system to the load centers.
- Explore the form and use of a range of FACTS devices to improve system operation.
- Understand the fault level limiting devices.
- Learn about the New CT and VT optical transducers and protection relaying system using microprocessor configured relays.
- Deal with non-linear loads and the problem of Harmonics, at the PCC point of common coupling.
- Learn about Protection systems for thermal monitoring of cable networks.
- Explore alternative forms of generation and embedded generation with Carbon emission limiting.
- Learn about diagnostic monitoring of plant and in particular GIS substations and the high-speed fault limiters and real-time stability monitors.

Targeted Audience:

- Designers.
- Engineers.
- Technicians.
- Professionals involved with the planning, operation, and maintenance of small to large scale power networks, from around 11kV, upwards.
- Professionals from the Distribution Companies.
- Power Utilities, Engineering Professionals in the Electricity Supply Industry and Petrochemical Companies who have to deal with aspects of generation, transmission, and distribution.

Program Outlines:

Unit 1:

Fundamentals of Modern Electrical Power Systems:

- Overview of typical systems covering generation, transmission, and distribution.
- Determination of flow of real and reactive power.
- Control of fault level, reactive power, voltage, and active power.
- Requirements for reactive compensation voltage profiles.
- Ensuring quality of supply.

Unit 2:

Addressing Operational Challenges:

- Coping with rising demand for power transmission and distribution.
- Managing costs associated with increasing fault level.
- Adapting to increasing load on existing system ratings of plant.
- Monitoring plant conditioning and temperature.
- Reviewing analytical methods and optimizing system operation.

Unit 3:

Introduction to System Operation:

- Automation of active power and frequency control.
- Automation of voltage control and reactive power requirements.
- Understanding various generation methods including combined cycle and small embedded generators.
- Design considerations for transmission voltage levels, line and cable design, and power loading.

Unit 4:

Exploring Emerging Technologies:

- Assessing the role of energy and the environment, including solar and geothermal power.

- Managing demand side management through remote load control and optimization.
- Implementing Optical Current Transducers for Protection.
- Exploring High Voltage Applications such as surge protection and current limiters.

Unit 5:

Advancements in Control and Monitoring:

- Applying power electronics to power systems.
- Understanding flexibility in AC systems.
- Utilizing series controlled capacitors.
- Implementing advanced protection and control techniques.
- Employing diagnostics such as partial discharge techniques and optical cable temperature monitoring.