



*Training Course:
Power System Transmission and Control*

*20 April - 1 May 2025
Cairo (Egypt)
Holiday Inn & Suites Cairo Maadi, an IHG Hotel*

Training Course: Power System Transmission and Control

Training Course code: EN235128 From: 20 April - 1 May 2025 Venue: Cairo (Egypt) - Holiday Inn & Suites Cairo Maadi, an IHG Hotel Training Course Fees: 6600 € Euro

Introduction:

Welcome to the Power System Transmission and Control training program the Global Horizon Training Center offers. This comprehensive program is designed to provide participants with a deep understanding of power system transmission principles, control strategies, and technologies. Whether you are a professional in the energy sector or a student aiming to enhance your knowledge, this program will equip you with the necessary skills to navigate the complexities of power transmission and control.

Objectives:

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

- Understand the fundamentals of power system transmission and distribution.
- Explain the importance of efficient power transmission in modern energy networks.
- Analyze different types of power system controls and their applications.
- Evaluate the challenges and solutions in maintaining grid stability and reliability.
- Apply advanced technologies in power system monitoring, protection, and control.

Methodology:

The training program will employ a balanced approach of theoretical learning, practical case studies, group discussions, and hands-on exercises. Participants will have access to industry-standard simulation tools and software to gain practical experience in power system control scenarios.

Target Audience:

- Engineers and technicians working in the energy and power sectors.
- Electrical and power engineering students and graduates.
- Professionals seeking to expand their knowledge in power system control.

- Anyone interested in understanding the intricacies of power transmission and control systems.

Outlines:

Day 1:

Introduction to Power System Transmission

- Basics of electricity and power systems.
- Components of a power system: generation, transmission, distribution.
- Importance of efficient power transmission.
- Role of power grids in modern society.

Day 2:

Power Grid Structure and Components

- Overview of power grid hierarchy: generation, transmission, distribution.
- Substations, transformers, circuit breakers, and other key components.
- Transmission line types: overhead, underground, submarine.
- Challenges and considerations in designing power transmission systems.

Day 3:

Power System Stability and Control

- Understanding power system stability and its significance.
- Factors affecting stability: load variations, faults, disturbances.
- Voltage control: importance, methods, and devices.
- Frequency control: primary and secondary control, load shedding.

Day 4:

Generator Control and Excitation

- Role of generators in power generation.
- Generator excitation and its impact on system stability.
- Automatic Voltage Regulators AVRs and excitation control systems.
- Synchronous generators and their control characteristics.

Day 5:

Grid Monitoring Technologies

- Importance of real-time grid monitoring.
- SCADA Supervisory Control and Data Acquisition systems.
- Phasor Measurement Units PMUs and synchrophasors.
- Data analytics for grid monitoring and maintenance.

Day 6:

Power System Protection and Relaying

- Basics of power system protection.
- Types of faults: short-circuit, overcurrent, underfrequency.
- Protective relays and their operation.
- Coordination of protection devices for system reliability.

Day 7:

Introduction to FACTS

- Flexible AC Transmission Systems FACTS and their role.
- Voltage and phase angle control using FACTS devices.

- Types of FACTS devices: SVC, STATCOM, UPFC.
- Benefits of FACTS in enhancing grid stability.

Day 8:

HVDC Transmission Control

- Advantages of High Voltage Direct Current HVDC transmission.
- Control strategies in HVDC systems.
- Inverter and rectifier control in HVDC converters.
- HVDC applications in long-distance transmission and interconnecting grids.

Day 9:

Smart Grid Technologies

- Concept and significance of smart grids.
- Smart grid components: smart meters, communication networks.
- Demand response and load management.
- Integration of renewable energy sources in smart grids.

Day 10:

Practical Applications and Future Trends

- Hands-on simulation exercises using industry software e.g., PSCAD, MATLAB.
- Case studies of real-world power system control scenarios.
- Control challenges and opportunities with the integration of renewables.
- Emerging trends in power transmission and control technologies.

Registration form on the Training Course: Power System Transmission and Control

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Complete & Mail or fax to Global Horizon Training Center (GHTC) at the address given below

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- ☐ Please find enclosed a cheque made payable to Global Horizon
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