Training Course on Flexible AC Transmission Systems (FACTS): Best Practices For Engineers

11 – 15 October 2027
Abu Dhabi

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Ref: 36249_75838 **Date:** 11 – 15 October 2027 **Location:** Abu Dhabi **Fees:** 6500 Euro

Course Overview:

The course is a comprehensive program designed to equip engineers with in-depth knowledge and practical skills in FACTS of controllers and power transmission. This course delves into the essential concepts and applications of Flexible AC Transmission Systems FACTS, focusing on static shunt and series converters, and the Unified Power Flow Controller UPFC. Participants will gain insights into Voltage Sourced Converters, Current Sourced Converters, and the design of FACTS controllers. With a strong emphasis on Power Transmission Stability, Controllable VAR Generation, and Power Oscillation Damping Techniques, this course offers hands-on learning and real-world applications. Engineers will learn to enhance voltage regulation, improve transient stability, and compare SVC and STATCOM systems. By mastering Thyristor-Controlled Series Capacitors and Pulse Width Modulation PWM Converters, participants will be prepared to address complex challenges in power flow control and transmission.

Target Audience:

- Electrical Engineers
- Power Systems Engineers
- Transmission Engineers
- Control Systems Engineers
- Senior Technicians
- Engineers looking to specialize in Flexible AC Transmission Systems FACTS

Targeted Organizational Departments:

- Power Transmission Departments
- Electrical Engineering Divisions
- Control Systems Units
- R&D Departments in Power Systems

Targeted Industries:

- Power Generation and Transmission
- Electrical Engineering Services
- Renewable Energy Sector
- Utility Companies

Course Offerings:

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

- Understand and apply the principles of Flexible AC Transmission Systems FACTS
- Design and implement FACTS controllers in power transmission systems
- Enhance power transmission stability and efficiency using advanced techniques
- Compare and evaluate different types of static shunt and series compensators
- Implement Voltage Sourced and Current Sourced Converters effectively

Training Methodology:

This course employs a variety of training methodologies to ensure an engaging and effective learning experience. Participants will benefit from interactive lectures, case studies, group discussions, and hands-on workshops. Real-world examples and practical applications of FACTS controllers will be emphasized to bridge the gap between theory and practice. Collaborative group work and feedback sessions will encourage active participation and knowledge sharing.

Course Toolbox:

- Comprehensive workbooks and manuals
- Access to online resources and reading materials
- Checklists and templates for FACTS controller design

Course Agenda:

Day 1: Concepts of Flexible AC Transmission Systems

- **Topic 1:** Introduction to Flexible AC Transmission Systems FACTS
- **Topic 2:** Types and Applications of FACTS Controllers
- **Topic 3:** Shunt Controllers in Power Transmission
- **Topic 4:** Series Controllers and Their Benefits
- **Topic 5:** Combined Shunt and Series Controllers
- **Reflection & Review:** Key Learnings and Benefits of FACTS

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Day 2: Voltage And Current Sourced Converters

- **Topic 1:** Fundamentals of Voltage Sourced Converters
- **Topic 2:** Single Phase and Three Phase Full Wave Bridge Converters
- **Topic 3:** Transformer Connections for 12-Pulse Operation
- **Topic 4:** Current Sourced Converters with Turn Off Devices
- **Topic 5:** Comparison Between Voltage Sourced and Current Sourced Converters
- **Reflection & Review:** Practical Applications of Converters

Day 3: Static Shunt Compensators

- **Topic 1:** Objectives and Methods of Shunt Compensation
- **Topic 2:** Midpoint Voltage Regulation Techniques
- **Topic 3:** Enhancing Transient Stability and Power Oscillation Damping
- **Topic 4:** Variable Impedance and Switching Converter Type VAR Generators
- **Topic 5:** Comparison of SVC and STATCOM Systems
- **Reflection & Review:** Enhancing Stability with Shunt Compensators

Day 4: Static Series Compensators

- **Topic 1:** Objectives of Series Compensation
- **Topic 2:** Techniques for Voltage Stability Improvement
- **Topic 3:** Thyristor-Controlled Series Capacitor TCSC Systems
- **Topic 4:** Operating Control Schemes for Series Compensators
- **Topic 5:** Static Synchronous Series Capacitor SSSC
- **Reflection & Review:** Effective Use of Series Compensators

Day 5: Power Flow Controllers

- **Topic 1:** Basic Principles of Unified Power Flow Controller UPFC
- **Topic 2:** Real and Reactive Power Flow Control
- **Topic 3:** Dynamic Performance of Power Flow Controllers
- **Topic 4:** Interline Power Flow Controller IPFC Applications
- **Topic 5:** Multifunctional FACTS Controllers
- **Reflection & Review:** Advanced Power Flow Control Techniques

How This Course is Different from Other FACTS Maintenance Courses:

This course stands out by offering a hands-on, practical approach to learning about Flexible AC Transmission Systems FACTS. Unlike other courses, it integrates real-world applications and case studies, ensuring that participants can directly apply their learning to solve complex power transmission challenges. The course also covers a wide range of FACTS controllers, from static shunt and series compensators to advanced power flow controllers like UPFC and IPFC. With a strong emphasis on practical skills and industry best practices, participants will leave with the confidence and expertise needed to excel in the field of power transmission engineering.