مركز الوقت للتدريب
Time Training Center

ADVANCED DYNAMIC SIMULATION FOR PSS®E COURSE

Introduction

This specialized course offers in-depth training on dynamic simulation techniques using PSS®E (Power System Simulator for Engineering), focusing on grid stability, renewable integration, and power electronics systems modeling. Designed for engineers and simulation specialists, the course covers synchronous machines, excitation systems, renewable energy modeling, and advanced troubleshooting techniques. Through intensive workshops and real-world case studies, participants will build dynamic models, perform fault analysis, and enhance their expertise in dynamic performance assessment of modern power systems.

Learning Objectives

- Understand dynamic simulation principles and applications
- Model synchronous machines, exciters, governors, and renewables in PSS®E
- Simulate system behavior under faults and disturbances
- Build and troubleshoot complex dynamic simulation cases
- Integrate HVDC and FACTS devices into stability studies
- Apply best practices for reliable dynamic simulations

Course Details

Mode of Training	Classroom or Online
Duration	5 Days

Who Should Attend

- Power system engineers and planners
- Grid stability and dynamic performance analysts
- Renewable integration specialists
- Transmission system operators and consultants working with PSS®E

Certificate(s)

Participants who complete a minimum of 80% of the total training hours will receive a **Certificate of Completion** issued by **Time Training Center**. This certificate reflects their active participation and commitment to professional development in the relevant field.

Course Outline

Module 1: Introduction to Dynamic Simulation Concepts

- Overview of Dynamic Simulation in Power Systems
- Applications and Importance in Grid Stability Studies
- Introduction to PSS®E Dynamic Simulation Modules

Module 2: Modeling of Synchronous Machines

- Dynamic Modeling Fundamentals
- Representation of Synchronous Generators in PSS®E
- Practical Exercises: Setting up Generator Dynamic Models

Module 3: Excitation Systems and Prime Movers

- Modeling of Exciters and Governors
- Understanding AVR, PSS, and Turbine Governor Dynamics
- Simulation of Generator Response to Disturbances

Module 4: Wind Turbine and Renewable Energy Integration

- Dynamic Modeling of Wind Turbine Generators
- Grid Impact Studies for Renewable Integration
- Simulation Exercises: Wind Farm Modeling

Module 5: Advanced Power Electronics Systems

- High Voltage Direct Current (HVDC) Systems Modeling
- Flexible AC Transmission Systems (FACTS) Devices
- Dynamic Behavior and Control Strategies

Module 6: Load Modeling and System Response Analysis

- Static vs Dynamic Load Models
- Composite Load Modeling
- Analysis of System Behavior Under Disturbances

Module 7: Hands-on Simulation Workshops

- Building Complete Dynamic Simulation Cases
- Fault Analysis and Stability Studies
- Practical Case Studies and Best Practices

Module 8: Advanced Troubleshooting and Best Practices

- Debugging Convergence Issues in Dynamic Simulations
- Tips for Reliable Dynamic Studies
- Review of Common Pitfalls and How to Avoid Them

Methodology

We employ a comprehensive and applied learning strategy, integrating theory with real-world implementation:

- **Conceptual Learning**: Expert-led sessions on catalytic theory and engineering principles
- **Interactive Workshops**: Group exercises, presentations, and technical discussion forums
- **Case-Based Learning**: Industry-specific examples and troubleshooting scenarios
- **Technology Integration**: Digital tools, simulations, and catalyst modeling applications
- **Assessment**: Pre-tests, post-tests, and Competence Validation Exams for Certified courses to ensure knowledge transfer and skills validation

Note: Instructors may adjust the training approach to fit technical requirements or participant engagement levels.

Instructors

Our instructors are seasoned Power Systems Simulation Engineers with extensive practical experience in dynamic modeling, stability studies, and renewable integration using PSS®E. They bring a deep understanding of grid behavior and dynamic system analysis, delivering training enriched with real-world projects and troubleshooting expertise. Detailed trainer profiles will be shared upon request.

About Time Training Center

Time Training Center is a leading professional training institute in Abu Dhabi that provides students and professionals with quality education and skill development programs. Time Training Center is accredited by the Abu Dhabi Center for Technical Vocational Education & Training (ACTVET) with a specialization in Computer and Management Training programs and certified by QA QC with ISO 9001:2015.

Operating in Abu Dhabi for over 3 decades, Time Training Center has established brand value as a high-quality Management & Technical Training Center in Abu Dhabi. We have also secured strong loyalty from corporate companies and associations with our holistic and practical teaching approach.

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