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Power System Electro-Magnetic Transients (EMT) Simulation

Course details: https://www.electricityforum.com/electrical-training/power-system-emt-simulation

Power System Electro-Magnetic Transients (EMT) Simulation Training - Our 12-hour live online instructor-led course covers the fundamentals and applications of EMT simulation. EMT simulation is an essential tool for electric power engineers in the fields of protection, operation, system planning and/or designing.

This comprehensive two-day training course will provide invaluable information to anyone who wishes to understand the basic algorithms and applications of EMT simulation. It will clarify the similarity and differences with other approaches, including steady state analysis, fault analysis, harmonic analysis, load flow, transient stability. This course will explain the factors that would influence the effectiveness and accuracy of the simulation results, it would also provide insights on how to best use the tool.

Furthermore, while illustrating how simulation works, it will also analyze and examine common phenomena in power systems, such as switching overvoltage, transformer saturation, inrush, ferroresonance, travelling wave and Ferronti effects associated with power transmission lines.

This Power System Electro-Magnetic Transients Simulation Training Course is designed to be an interactive, hands-on, and problem-based forum. It offers an excellent opportunity for students of all disciplines to ask specific questions and exchange ideas regarding their own applications, and to be well-informed of the most commonly used software and hardware available in EMT simulation.

The course will be led by an instructor who has over 20 years of experience in EMT simulation with a world-leading company in the field. Free simulation tools will be available to all students.

WHO SHOULD ATTEND

The course requires background knowledge of basic circuit theory and calculus, preferably a B.Sc. in electrical engineering.

The target audience for this course are those electrical engineers who have an interest in the following subjects:

- Power System Modeling and Simulation
- Power System Analysis
- Power System Protection and Coordination

STUDENTS RECEIVE

- This Course Includes Our Latest Electrical Transformer Digital Handbook!! (Value $20)
- **$100 Coupon** Toward Any Future Electricity Forum Event (Restrictions Apply)
- 1.2 Continuing Education Unit (CEU) Credits (12 Professional Development Hours)
- **FREE** Magazine Subscription (Value $50.00)
- Course Materials In Paper Format

COURSE OUTLINE

Power Systems Electro-Magnetic Transients (EMT) Simulation

Day One

Session 1: Introduction

- What is Simulation
- Simulation platforms (Pen and paper, slide rule, TNA and computer algorithms)
- Differences between steady state, short circuit and transient analysis
- History and application of EMT simulations
- Widely used EMT simulation tools

Session 2: Basic Circuit Theory

- Lumped and distributed parameter circuits
- Reference directions
- KCL: Kirchhhoff's Current Law
- KVL: Kirchholff's Voltage Law
- Wavelength and dimension of the circuit
- Circuit elements, resistors, capacitors and inductors
- Independent sources
- Thevenin and Norton equivalent circuits
- Power and energy
- Physical component versus circuit elements

Session 3: Basics of Simulation Algorithms

- Nodal analysis of DC circuit
- Discretisation of R, L, C elements (EMT models of R, L, C)
- Network solution with nodal analysis

- Simulation time step, accuracy and numerical stability
- Simulation examples

Session 4: Modelling of Transformers

- Introduction
- Ideal transformer model
- Linear transformer model
- Saturation and hysteresis

Session 5: Analysis of Transformer In-rush Currents

- Mechanism of In-rush Currents
- Simulation examples

Session 6: Analysis of Transformer Ferroresonance

- Mechanism of ferroresonance
- Simulation examples

Day Two

Session 7: Simulation of Power Transmission Lines

- Introduction to transmission line theory
- Travelling wave transmission line model
- Simulation of travelling waves on long lines
- Ferranti effects in long transmission lines

- Frequency dependent transmission line models

Session 8: Control and Protection

- Introduction
- Transient Analysis of Control Systems(TACS)
- Modelling of transducers, CT, PT and CVT
- Modelling of protective devices

Session 9: Short Circuit Analysis

- Modelling of circuit breakers and faults
- Simulation examples: temporary overvoltages
- Modeling of faults in a power system
- Simulation examples: balanced and un-balanced faults

Session10: Rectifiers and Inverters

- Modelling of diodes and thyristor
- Modelling of single phase half wave and full wave rectifiers
- Modelling of three phase rectifiers and inverters

Session 11: Real Time Digital Simulation of Power Systems

- Real time and Non-real time simulation
- Real time simulation platforms
- Relay testing with real time simulators
- Control system testing with real time simulators
- Session 6: Practice, Questions and Answers

COURSE SCHEDULE:

Both days:

Start: 10 a.m. Eastern Time
Finish: 4:30 p.m. Eastern Time

Contact us Today for a FREE quotation to deliver this course at your company's location.

https://www.electricityforum.com/onsite-training-rfq