SIEMENS

PSS®CAPE UGM Training Course Outlines

Classes listed in order of 2021 scheduled date

PSS®CAPE for New Users UPDATED in 2021!
Overview and Getting Started
Interface
OL & Data Entry
Short Circuit
Protection Data Entry

Coordination Graphics
Getting Started Exercises for Coordination Graphics
Special Displays, Commands and Macros in Coordination Graphics

- Fault Studies for Distance Protection
- Plot Resistive Faults
- Plot Maximum Reach of Sliding Fault
- Plot Reach
- Plot Dynamic characteristic
- Compute Zero-Sequence Compensation Factor
- Time-Distance Diagram
- Apparent Impedances from COMTRADE Files
- Dynamic TOC Displays
- Guide to Coordination Graphics Macros

System Simulator & Sensitivity and Coordination Macros UPDATED in 2021!
Overview of Stepped-Event Analysis and System Simulator
Local Zone of Protection (LZOP) Explanation
Suggested Contact Logic Codes
Wizards for Creating Teleprotection Schemes
An Automated Relay Coordination Study for General Use
Wide Area Coordination Study
Wide Area Sensitivity Study

NERC Compliance for PRC-019, 023, 024 & 025 UPDATED in 2020!
Data Preparation, Performing Compliance Study, Reporting and Analysis of Results

- NERC PRC-019 in the Compliance Module
- NERC PRC-023 in the Compliance Module
- NERC PRC-024 in the Compliance Module
- NERC PRC-025 in the Compliance Module

NERC PRC-026 Compliance and PSS®CAPE-TS Link™ UPDATED in 2020!
Basics of the PRC-026 Standard
Perform PRC-026 Study in Compliance Module
PSS®CAPE-TS Link Introduction
Fundamentals of Power Swing and Out-of-Step Protection
Practical Exercises using PSS®CAPE-TS Link

NERC PRC-027 and the Compliance Module **NEW in 2020!**
Basics of the PRC-027 standard
Compliance using the short-circuit level monitoring approach
Compliance using the protection coordination study approach
Performing wide-area coordination reviews
Reporting and analysis of results

Managing & Merging Data
The PSS®CAPE Database
- Sharing; Managing Accounts; Backup/Restore; Updating the Schema
Data Management Tools in DBE
- Library Import; Equipment Categories; DBE Tools
Merging Data
- Boundary Merge; Internal Merge; System Import; Comparisons

SQL Introduction
SQL Command Syntax
Using SQL with PSS®CAPE

Short-Circuit Modeling of Inverter-Based Resources **NEW in 2020!**
Purpose of Types I, II, III and IV wind and solar generators
Nine-bus test network from EPRI
CAPE Type III basic model: setting current limits
Type IV control model: generator data
Type IV initial power (P, Q)
Type IV controls: V, Q and fault-ride through
Type IV limits
Voltage-Controlled Current Source with table of currents
Convergent and non-convergent solutions
Effect of weak network source (high Thevenin equivalent; low short-circuit ratio)
Multiple generators
Controls for types III and IV sources

Relay Setting **UPDATED in 2021!**
Automatic relay setting in PSS®CAPE
Running the Relay Setting module
Testing Settings in Coordination Graphics
Other relay setting macros of interest
Relay Setting module organization for custom relay settings development
Custom relay setting macro

Modeling Detailed Bus Structures and Open-Ended Lines
Single, Double, Triple and Quadruple Bus Structures
Ring Bus Structures
Breaker-and-a-Half Bus Structures
Transfer Bus Structures
Double (or more) Bus with Transfer Bus

Macros – Beginner
Overview of PSS®CAPE User Programming Language (CUPL)
CUPL Help – the online quick reference document
Exercises writing simple macros
Exercise writing a more complex macro
Using the Multi-Question Form in Macros
Guide to Shortcuts and Ready-to-use CAPE Macros

Macros – Advanced NEW in 2021!
Multi-question form basics
Designing and coding a Multi-question form with different types of input
Topology searches using CUPL
Working with sets of objects (buses, branches, devices)
Putting it all together in a macro

Breaker Duty Analysis
Basic Concepts
Computing Breaker Margin
Performing Breaker Rating Studies in PSS®CAPE
Special Breaker Duty Macros

Line Constants for Modeling Transmission Lines and Calculating Line Parameters
Basic LC Data Concepts
Practical Exercise
- Library Data: soil resistivity, conductor constants, tower designs
- System data: rights of way, tower strings, line sections

Transformer Modeling and Neutral Nodes
Model examples that illustrate the following topics:
- Manufacturer's transformer test reports
- IEEE Standards for transformer measurements
- Library data: winding types, base kV; MVA for 3-phase and 1-phase transformers Percent leakage impedances and load loss
- Exciting current and percent impedance; no-load loss
- Phase angles for Y-D connection (reference angles) and angle taps
- One delta in 3-wdg YYD transformer closed or open for 0-seq tests
- Two-winding core-form transformer with phantom delta
- Short-circuit reports showing delta and auto-neutral currents
- Zigzag windings as zero-sequence shunts
- Base voltages and off-nominal tap voltages
- Autotransformer with shared neutral group
- Neutral shunts on transformers and generators
- Initializing prefault voltages
- Transformer Details report to test the model in PSS®CAPE Short Circuit
- Converting Tee-model transformers to N-Circuit models in PSS®CAPE database