PSS®E

High-performance transmission system planning and analysis software

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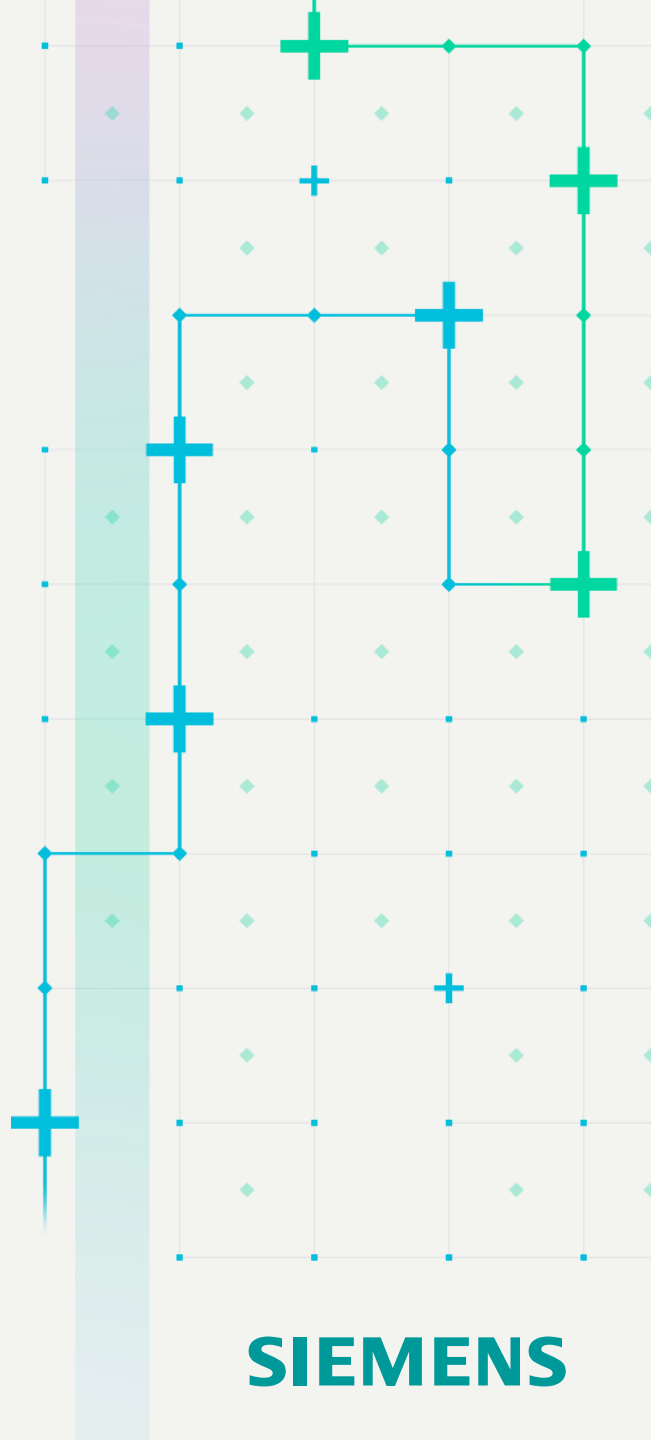
What is PSS®E?



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At a glance

PSS®E is the most widely used simulation software for transmission planning in the world.

Transmission Planning & Operations

Global Leader

Built-in Model Management

Dynamics

Optimum Powerflow

Dominant

#1

Trusted

Gold Standard

Advanced

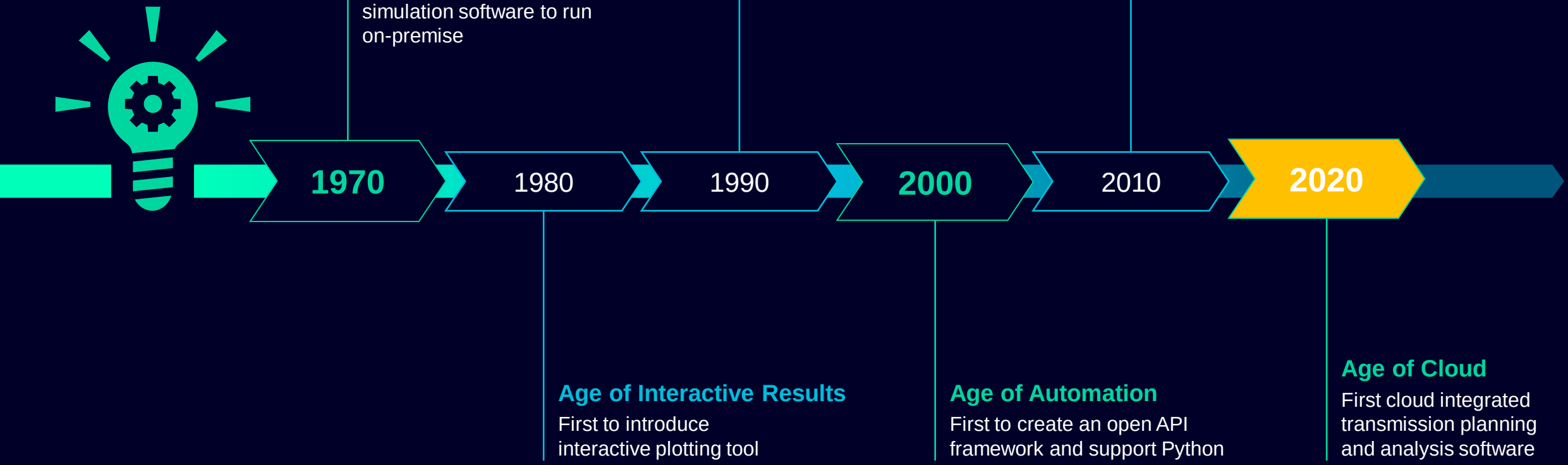
Contingency Analysis

Short Circuit

Powerflow

Industry Benchmark

Leading innovation in transmission system planning and analysis since 1970’s



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PSS®E for Transmission Operations and Planning

Challenges

- Expansion planning
- Operations planning
- System reliability and security
- Regulatory compliance
- System studies
- Automating workflow processes
- Integrated solutions for efficient data utilization

Our Solution

- Powerflow, contingency analysis, voltage stability (PV/QV), reliability assessment, Node-breaker model
- Dynamics/transient stability simulation
- Optimal powerflow
- Short circuit analysis
- GUI and API driven functionalities
- Integrated Model Management

Advantages

- 50 years of trusted results from “benchmark” tool in the industry
- Easy exchange of data and comparable results within your team and neighboring utilities
- Time savings from scripting and automation via 2,000+ APIs
- Industry-leading dynamics library saves model development effort
- Interoperability with other tools in the utility IT landscape

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PSS®E Capabilities

Standard features and included analysis, add-on modules, and companion extension tools

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PSS®E Base Package, Optional Add-on Modules, and Companion Extension Tools

Load Flow Analysis	Integrated Node-Breaker	Network Reduction	Linear Analysis	Contingency Analysis	Results & Reporting	Interactive Single-Line Diagrams	Steady-State Stability (PV/QV)
Scripting & Automation						PSS®E Cloud (U.S. and Canada)	Model Management Local Edition
Inductor Machine Parameter Modeling						Harmonics	Model Management Standard Edition
PSS®CAPE-TS Link[1]						Time Series Power Flow	Automated Grid Code (NERC TPL) Assessment
Graphical Model Builder[2]						Parallel Dynamics	Geomagnetically Induced Currents
PSS®E-PSCAD Data Conversion[3]	PSS®E-PSCAD Co-Simulation[3]	Optimal Power Flow	Dynamic Simulation	Short Circuit Analysis	Advanced Linear Analysis (formerly PSS®MUST)	Transmission Line Parameter Calculation	Remedial Action Schemes

Standard features | Add-on modules | Companion extension tools

1 PSS®CAPE license required | **2** Requires PSS®SINCAL | **3** PSCAD license required

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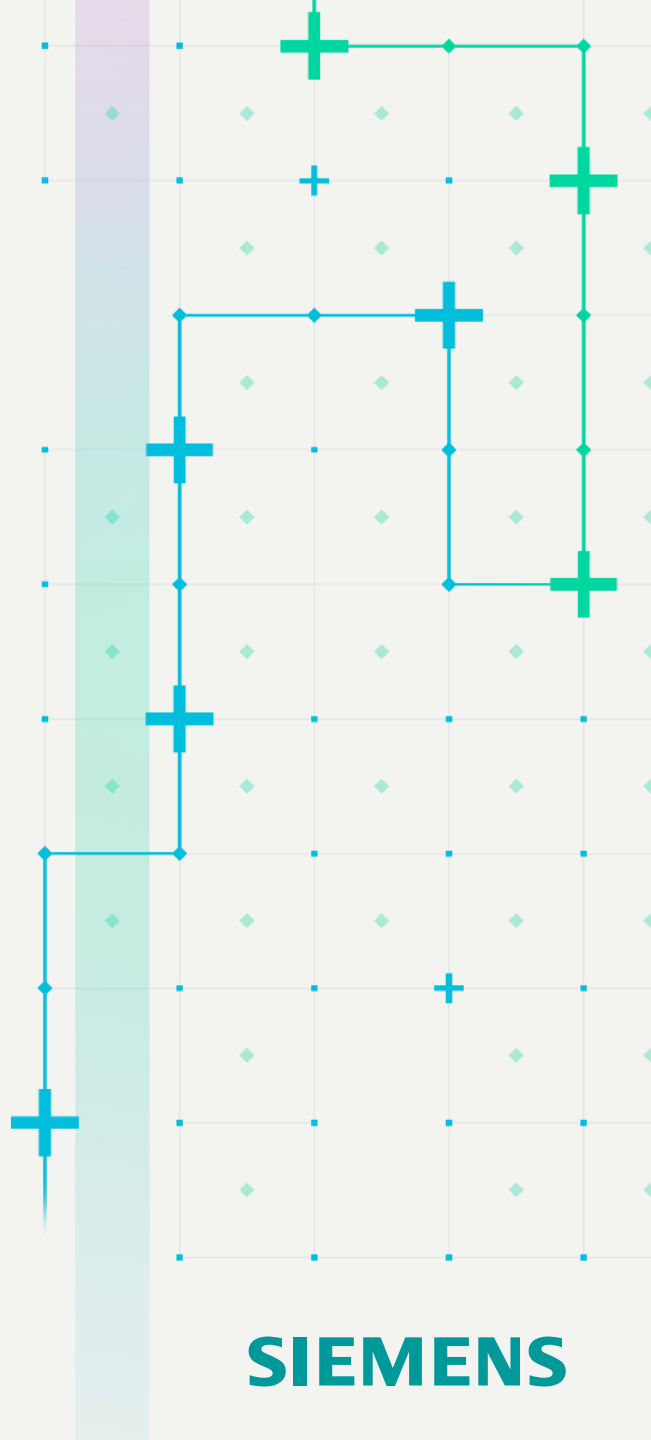
Standard Features



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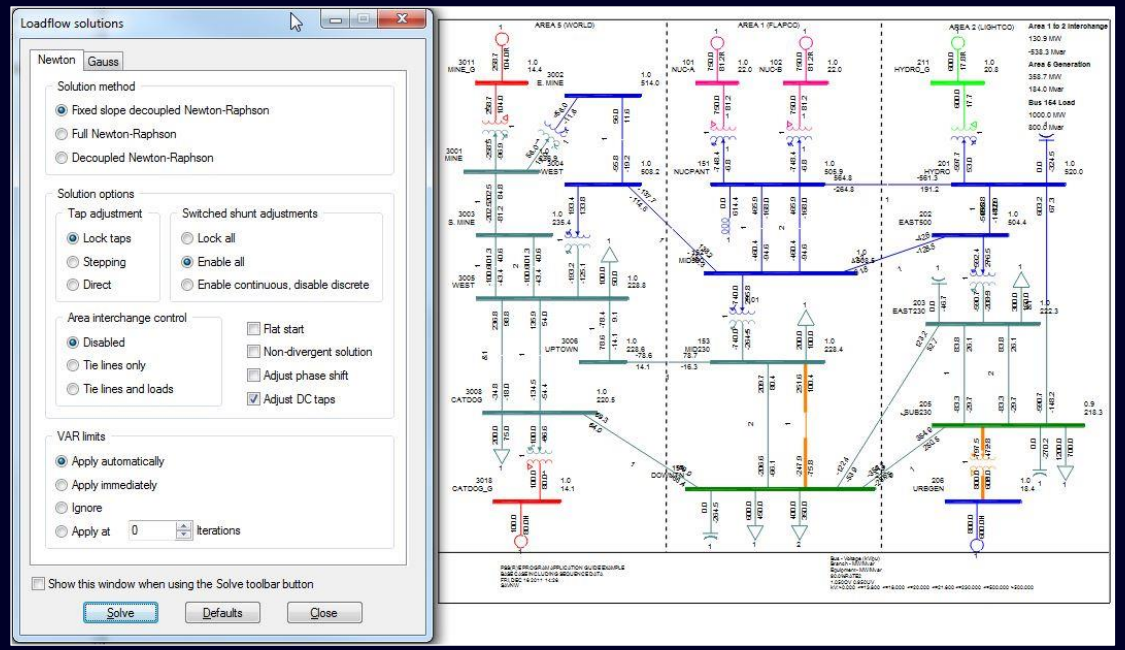
PSS®E Standard Features
Load Flow Analysis



- Robust load flow solutions for AC and DC equivalent networks
- Tap changer, phase shifter, switched shunt capacitor/reactor and SVC control
- Local and remote distributed voltage control
- DC tap adjustment
- Non-divergent solution option
- Switching device oscillation prevention
- Support for generator capability (D) curves
- Inertial load flow
- Area interchange control (local area slack)
- Advanced modeling of induction machines
- ZIP load models
- Multiple Gauss-Seidel and Newton options
- Corrective action solution for automatic adjustment of controls to mitigate violations
- Simple load and generation scaling

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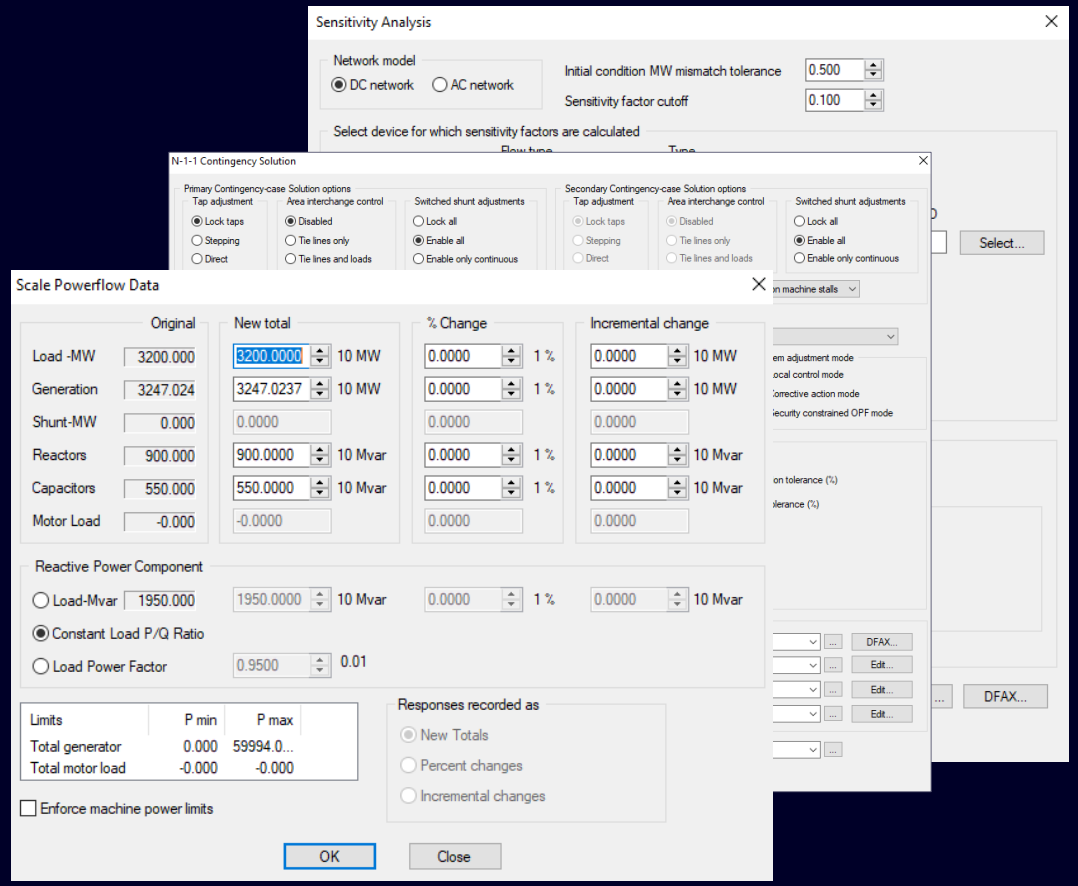
PSS®E Standard Features
Continued – Load Flow Analysis (extended steady-state analysis)



- Contingency analysis (N-1, N-2, N-1-1 etc)
- Preventive constrained security optimal power flow
- Probabilistic reliability assessment
- Sensitivity analysis
- Simple load and generation scaling
- Triangular Y-bus solution for switching and motor start studies
- Pre-solution node-breaker topology processing
- Powerful network data and solution result comparison tools
- Economic dispatch (generator heat-rate curves)

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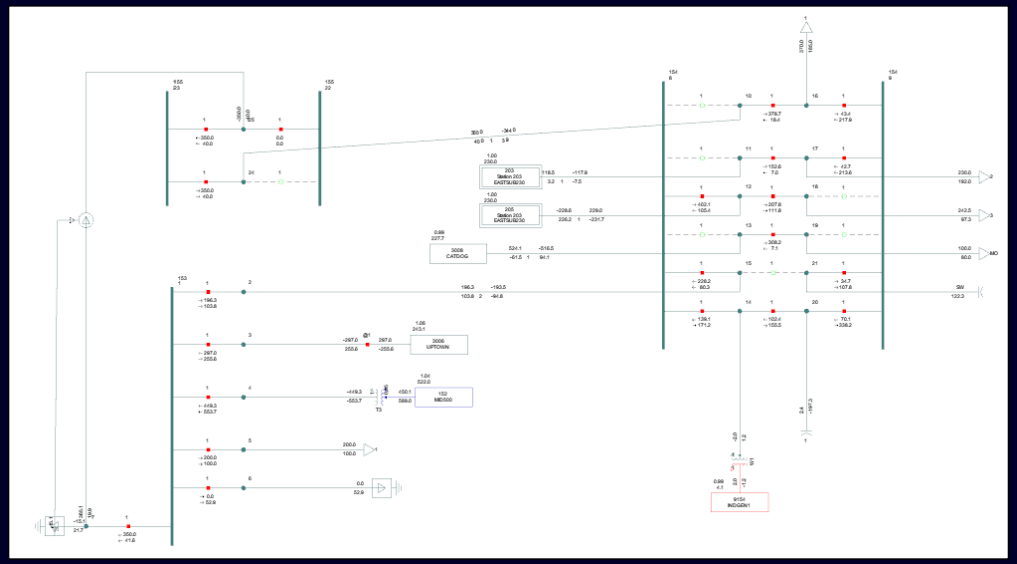
PSS®E Standard Features
Integrated Node-breaker Network



Network data | DOWNTN : 154 | STATION_153 : 153

	From Node Number	From Node Name	To Node Number	To Node Name	Id	Device Name	Close	Close (Normal)	Switching device type	Reactance (pu)
▶	1	STATION_153_153_1	3	STATION_153_153_3	1		☐	☑	Circuit breaker	0.0001
	1	STATION_153_153_1	4	STATION_153_153_4	1		☑	☑	Circuit breaker	0.0001
	1	STATION_153_153_1	5	STATION_153_153_5	1		☐	☑	Circuit breaker	0.0001
	1	STATION_153_153_1	6	STATION_153_153_6	1		☐	☑	Disconnect switch	0.0001
	1	STATION_153_153_1	7	STATION_153_153_7	1		☑	☑	Circuit breaker	0.0001
	1	STATION_153_153_1	8	STATION_153_153_8	1		☐	☑	Circuit breaker	0.0001
	2	STATION_153_153_2	3	STATION_153_153_3	1		☑	☑	Circuit breaker	0.0001
	2	STATION_153_153_2	4	STATION_153_153_4	1		☐	☑	Disconnect switch	0.0001
	2	STATION_153_153_2	5	STATION_153_153_5	1		☑	☑	Circuit breaker	0.0001

Substation | Node for Substation 153 [STATION_153] | Switching Device for Substation 153 [STATION_153]

Buses and Equipment | Branch | Node-Breaker | Other

- Automatic substation topology generation for common substation configurations such as breaker-and-a-half, ring bus, double bus double breaker, etc.
- Novel approach for linking bus-branch and node-breaker worlds
- Ability to reference elements and navigate the network via bus numbers/names
- Automated node-breaker contingency analysis for common node-breaker contingencies
- Full integration into SAV and RAW formats
- Bus-branch data can be used with node-breaker data extensions
- Creation and management of topology buses is fully automated
- Topology buses referenced and reported as bus sections

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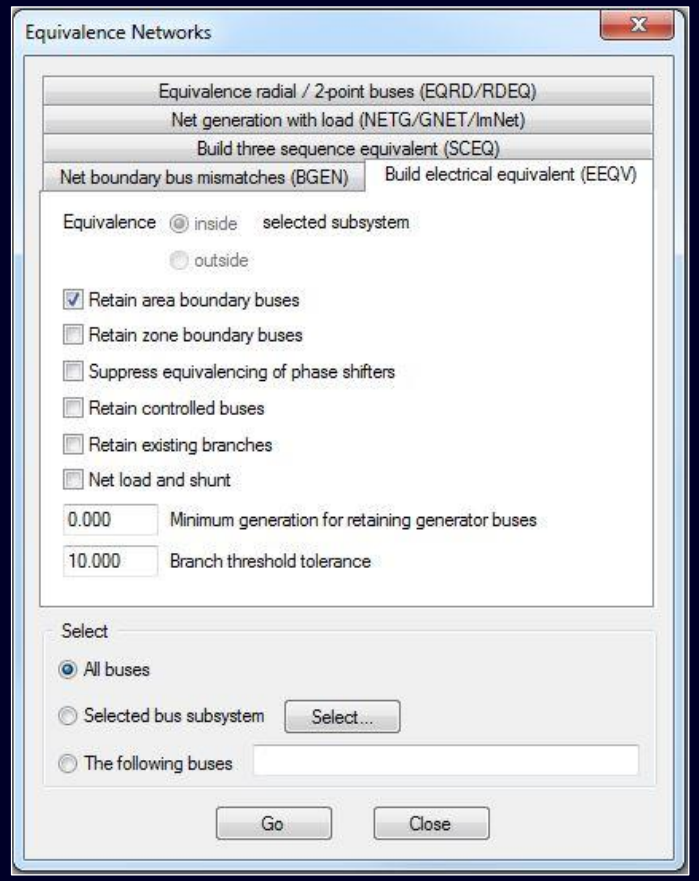
PSS®E Standard Features
Network Reduction



- Calculation of load flow and short circuit electrical equivalent
- Support for load, generation, and full Thevenin equivalents
- Full-topology retention of subsystems based on generator size, phase-shifting and voltage controls, etc.

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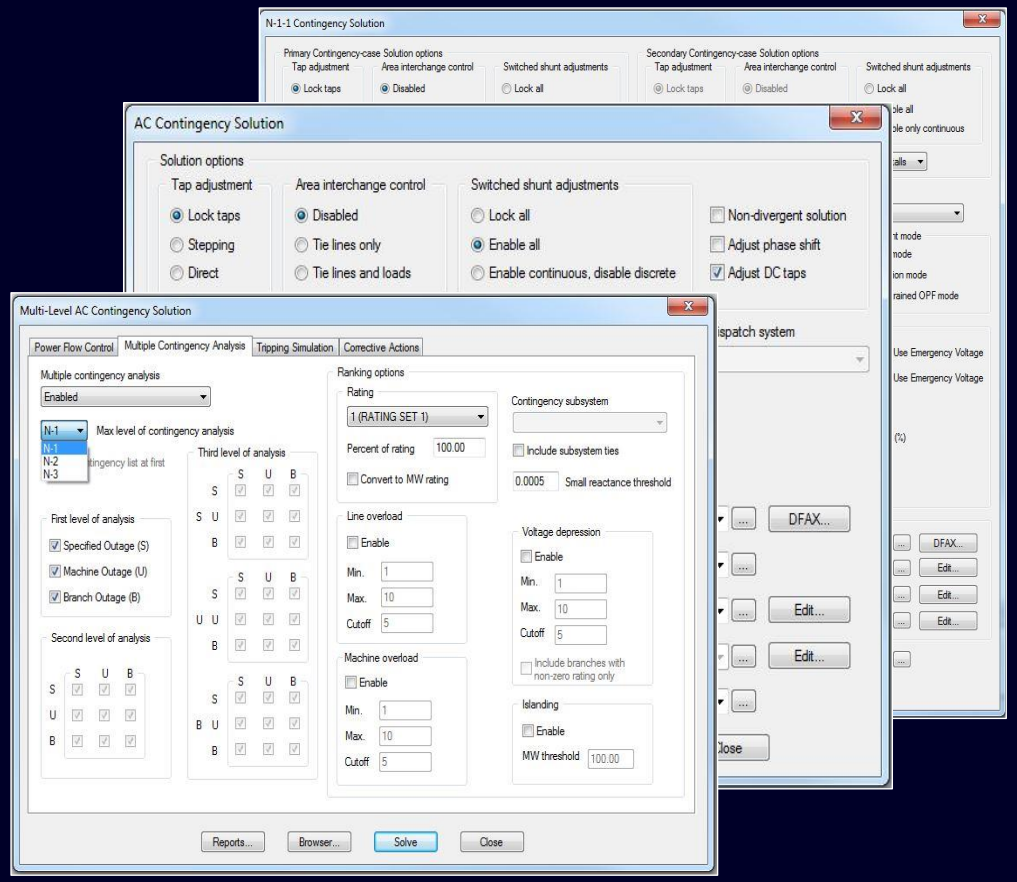
PSS®E Standard Features
Contingency Analysis



- AC or DC load flow automated contingency analysis
- Automated node-breaker contingency generation and simulation for breaker-to-breaker, stuck breaker and open terminal contingencies
- Tools for generation of contingencies, monitored element lists, and subsystem definitions
- Ability to save and recreate any contingency individually for detailed study
- Contingency result comparison reports for up to nine cases
- Built-in single-machine parallelization of contingency analysis for multi-processor hardware with up to 24 cores
- N-1-1 solution with automated corrective actions (generator dispatch, tap adjustments, etc.)
- Multi-level contingency analysis with contingency pruning using ranking wind chime algorithm for up to N-3 combinations

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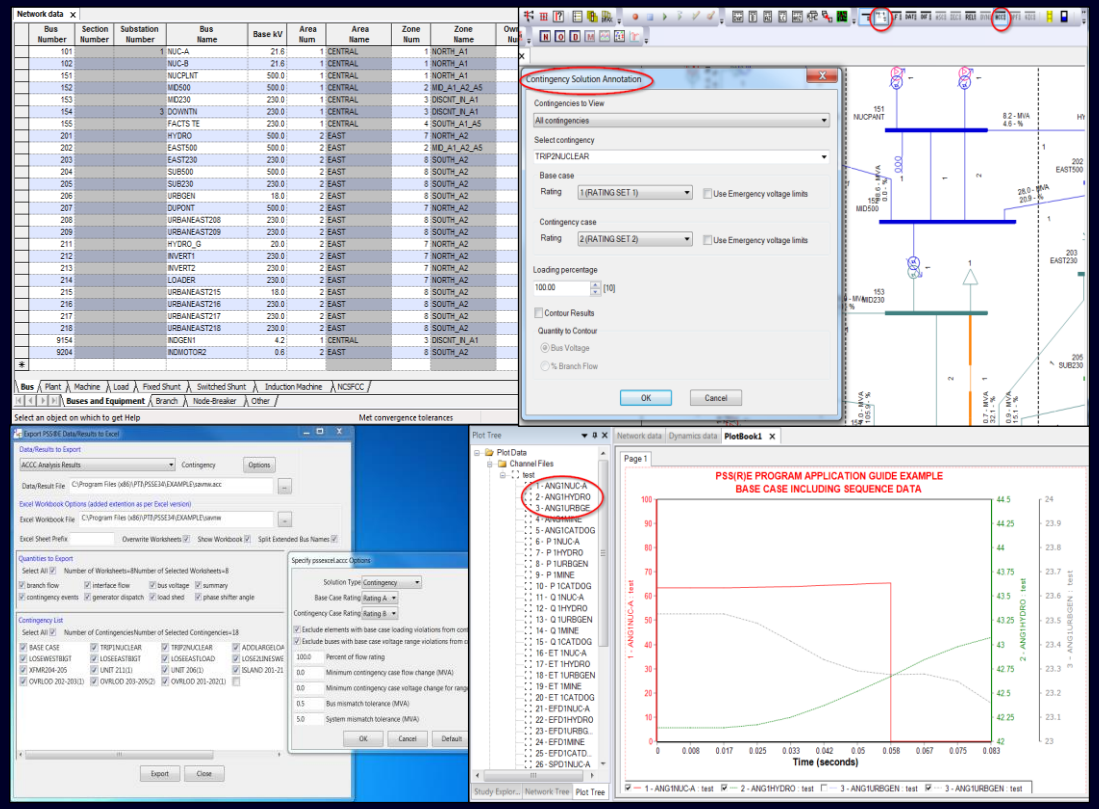
PSS®E Standard Features
Results and Reporting



- Interactive spreadsheet reports supporting filtering and sorting with export to Excel and CSV formats
- Network results spreadsheets for all load flow output quantities
- Comprehensive reporting as annotations in single-line diagrams for most analysis results (load flow, short circuit, dynamics, contingency analysis, GIC, etc.)
- Integrated dynamics plotter featuring drag-and-drop dynamics channel plotting
- Comprehensive results retrieval Python™ API for data intensive results from contingency and PV/QV results

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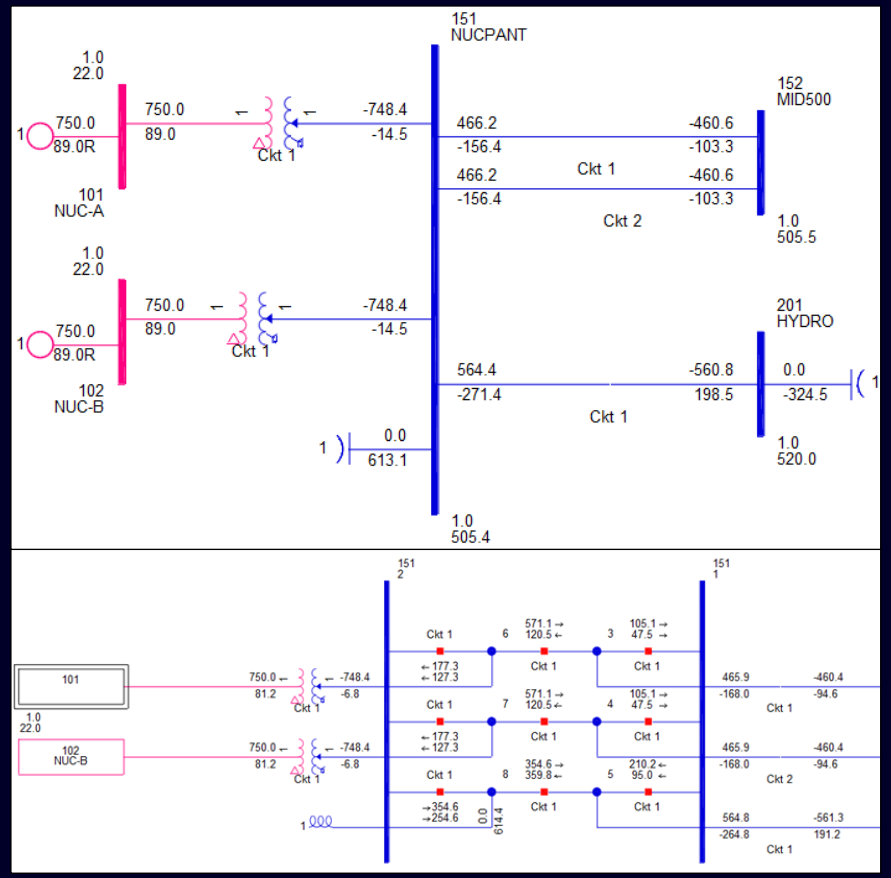
PSS®E Standard Features
Interactive Single-line Diagrams



- Interactive single-line diagrams for bus-branch and node-breaker substation views
- Automatic bus view diagrams for quick navigation of network
- Overlay diagrams on geographical map backgrounds by linking to various mapping sources
- Annotation layers and drawing tools (including shapes, texts, images, etc.)
- Automated, intelligent drawing of substation diagrams
- Robust auto-draw mode with intelligent layout algorithm
- Comprehensive reporting as annotations in single-line diagrams for most analysis results (load flow, short circuit, dynamics, contingency analysis, GIC, etc.)
- Heat-map contouring for several network quantities (bus voltage, line flows)
- Embedded single-line diagram mini-map for full diagram view and navigation
- High-resolution diagram export and printing functionality
- Python-powered report node for custom on-diagram text derived from network quantities
- Animated power flow indicators (arrows) and loading gauges

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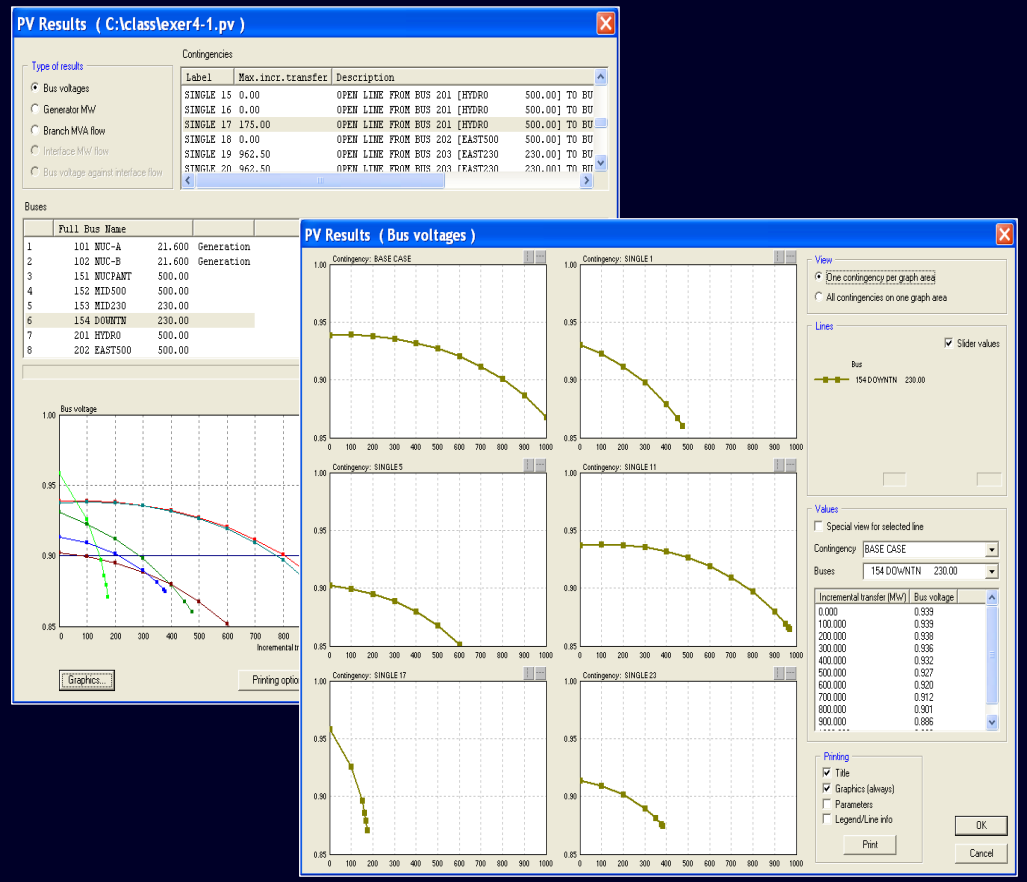
PSS®E Standard Features
Steady-State Stability (PV-QV)



- Fully automated PV curves calculation
- Determination of maximum power transfer capacity between two regions
- Various load and generation scaling options for exporting and importing region
- Thermal, voltage and contingency constraints options
- QV curves calculation
- Determination of critical point of voltage instability
- Detection of limiting contingency

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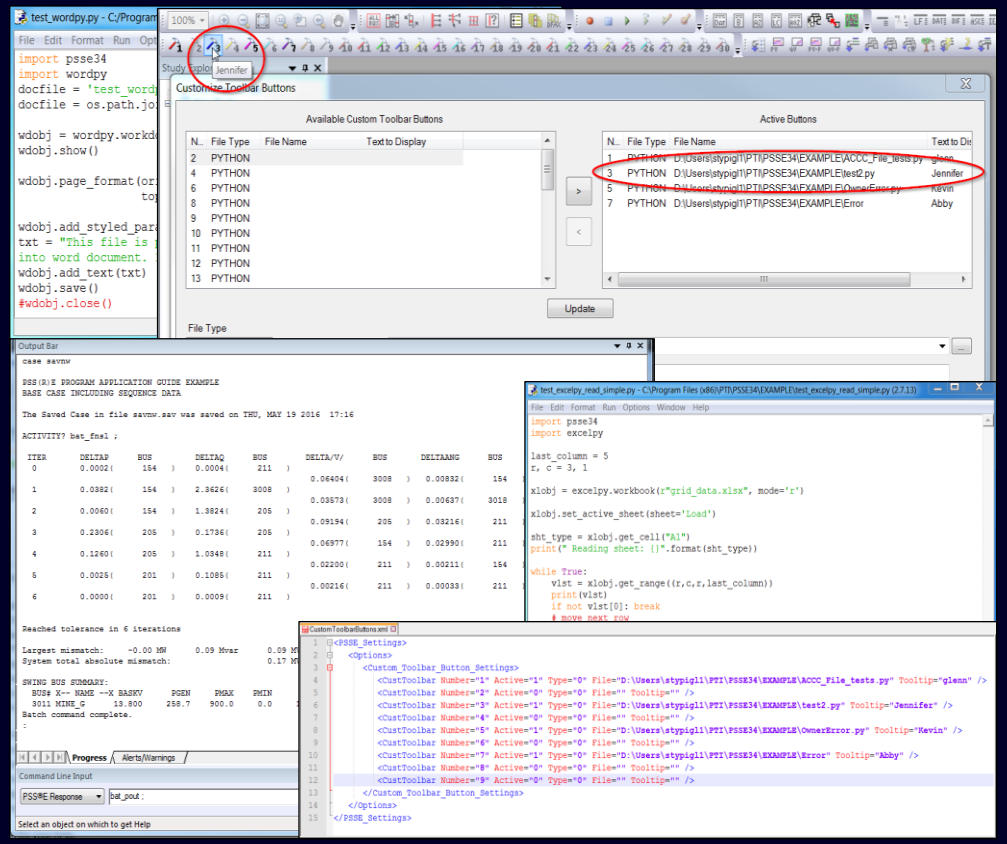
PSS®E Standard Features
Scripting and Automation



- Full Fortran, batch command, and Python API for all program functions and features
- Embedded Python interpreter
- PSS®E engine mode driven by any external interpreter
- Comprehensive results retrieval Python API for data intensive results (contingency, PV/QV results, etc.)
- Command line interface for legacy PSS®E response language, IDEV batch commands and Python API calls
- User-defined custom Python-powered GUI buttons
- High-level Python Excel and Word interface for simple reading/writing to/from Excel and Word

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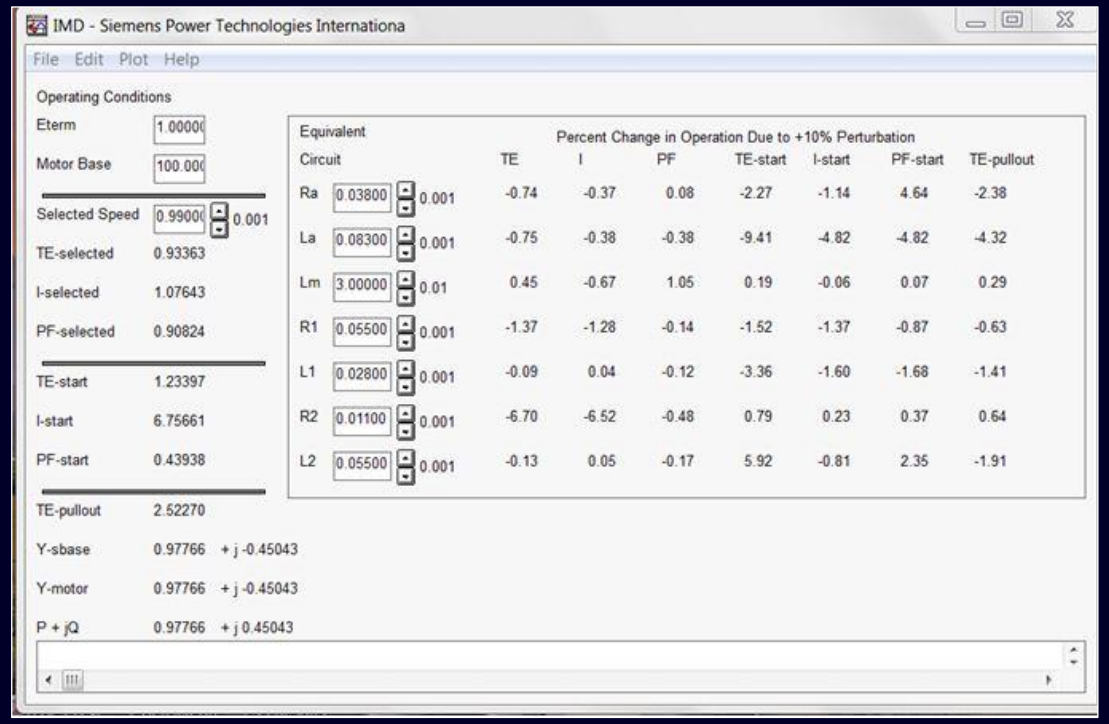
PSS®E Standard Features
Motor Parameters – Induction Motor Data (IMD)



- Calculate motor characteristics for given estimated machine impedances
- Graphical plotting of motor torque, current, and power factor curves using estimated parameters
- Generate DYRE record for use in PSS®E Dynamics Simulation

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PSS®E Standard Features
Linear Analysis: Basic (base package)

Basic

- **Calculate linear factors (LODF, PTDF, OTDF)** – Enabling basic DC equivalent load flow
- **Perform basic transfer limit analysis** – Calculate power exchange between two regions
- **Obtain simple reporting** – Basic text reports and numerical outputs

Advanced

- **Perform advanced transfer limit analysis** – Calculate the first contingency incremental transfer capability (FCITC) between any group of bus loads or generations efficiently and effectively via batch mode and automated subsystems
- **Perform impact and sensitivity analysis** – Determine the impact a change in an element has on the network or the sensitivity of an element to changes in the network
- **Take advantage of Security Constrained Economic Dispatch (SCED)** – Optimize the generation dispatch by considering generator costs
- **Perform advanced DC contingency analysis** – Identify both overloads and solution to fix overloads with an extremely fast and accurate algorithm to determine both corrective and preventive cases
- **Obtain advanced reporting** – Spreadsheet type report tables and interactive bubble diagrams

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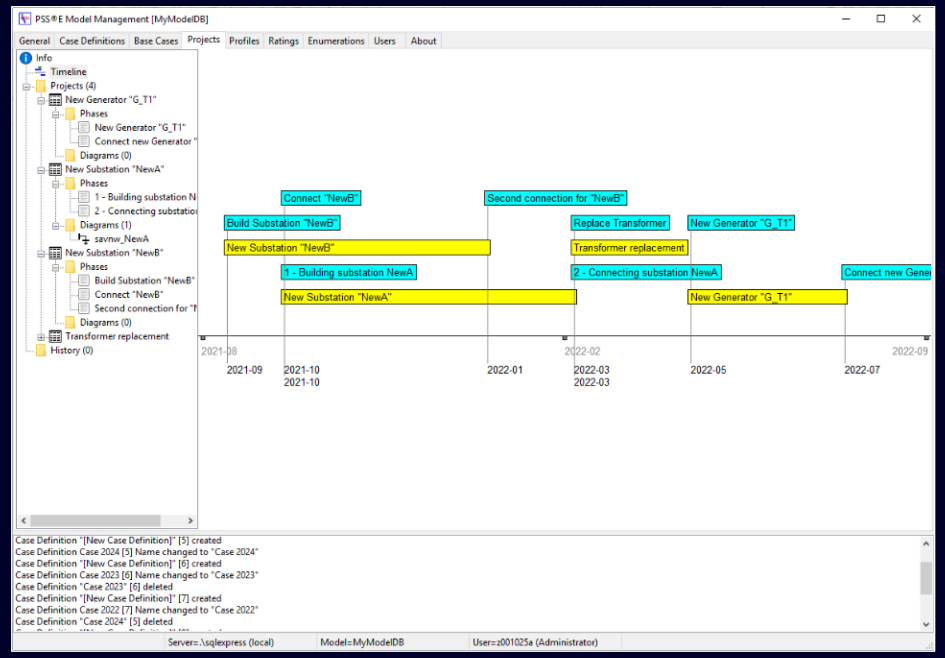
PSS®E Standard Features
Model Management: Local and Standard Edition



Local edition (built-in)

- Compatible with PSS®E 34.7 and above, and 35.1 and above
- Assemble and use a local, native PSS®E format network model database
- Organize and manage case definitions, base cases, projects, profiles and ratings
- Interactively record model changes in PSS®E
- Build and load customized study cases on-demand
- Import and export data in PSS®E format
- Visualize projects in an interactive timeline view

Standard edition (Add-on module)

- Maintain data in a central SQL Server database
- User management with 3 predefined roles
- Directly submit projects to PSS®MOD

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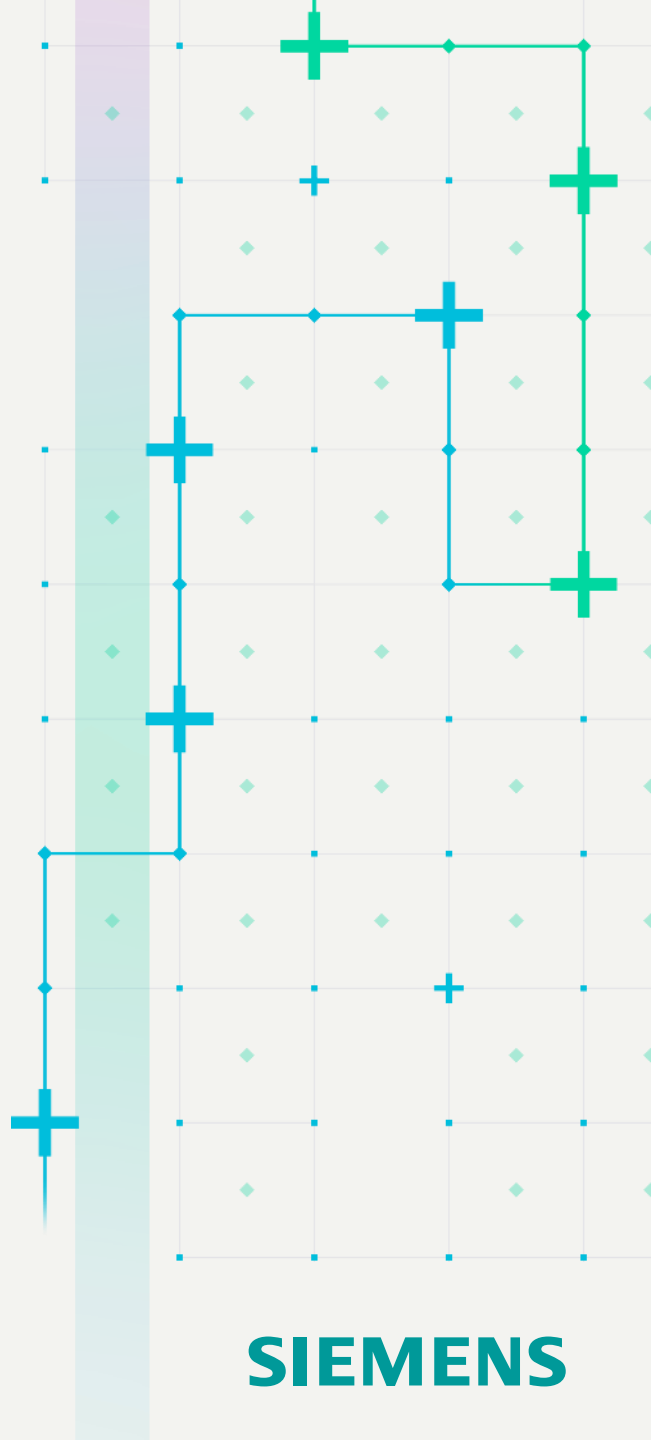
Add-on Modules



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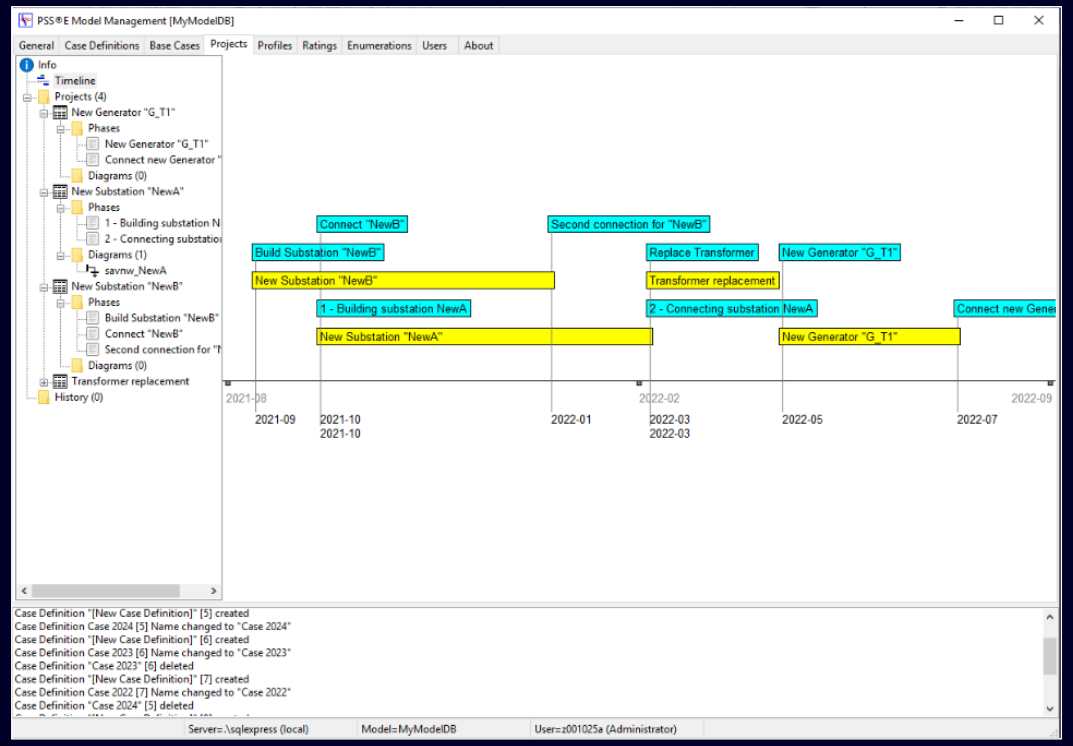
PSS®E Add-on Module
Model Management and Local and Standard Edition



Local edition (built-in)

- Compatible with PSS®E 34.7 and above, and 35.1 and above
- Assemble and use a local, native PSS®E format network model database
- Organize and manage case definitions, base cases, projects, profiles and ratings
- Interactively record model changes in PSS®E
- Build and load customized study cases on-demand
- Import and export data in PSS®E format
- Visualize projects in an interactive timeline view

Standard edition (Add-on module)

- Maintain data in a central SQL Server database
- User management with 3 predefined roles
- Directly submit projects to PSS®MOD

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PSS®E Standard Features
Advanced Linear Analysis

Basic

- **Calculate linear factors (LODF, PTDF, OTDF)** – Enabling basic DC equivalent load flow
- **Perform basic transfer limit analysis** – Calculate power exchange between two regions
- **Obtain simple reporting** – Basic text reports and numerical outputs

Advanced

- **Perform advanced transfer limit analysis** – Calculate the first contingency incremental transfer capability (FCITC) between any group of bus loads or generations efficiently and effectively via batch mode and automated subsystems
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- **Obtain advanced reporting** – Spreadsheet type report tables and interactive bubble diagrams

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Advanced Linear Analysis (Continued)
3-steps to unlock advanced use cases

01 | PSS®E

Network Case
(raw/sav)

Control Files
(sub/mon/con)

02 | Linearization

How
Calculate linear Distribution Factors (DF), e.g., LODF, PTDF, OTDF

Why
- Determine analytics about your network topologies
- Perform fast analysis
- Enable advanced use cases

03 | Key Benefits Unlocked

- **Transfer Limit Analysis**
  Calculate the First Contingency Incremental Transfer Capability (FCITC) between any group of bus loads or generations.
  In addition, leverage batch mode and automated subsystems – run multiple studies & scenarios at once
- **Security Constrained Economic Dispatch (SCED)**
  Optimize the generation dispatch by considering generator costs
- **Advanced Contingency Analysis for Operations**
  Determine in minutes the corrective and preventive case by identifying the overloads and the solution to fix the overloads while maintaining accuracy
- **Impact and Sensitivity Analysis**
  Determine 1-on-N or N-on-1:
  - Impact a change in an element has on the network
  - Sensitivity of an element to changes In the network

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Automated Grid Code Assessment
3-steps to unlock key benefits

01 | PSS®E

Network Case (raw/sav) with or without[1] Node-breaker information

02 | NERC TPL-001 Compliance Analysis

How

Provide only a set of cases and study parameters

Why

- Streamline compliance analysis and reporting process
- Increase efficiency and effectiveness
- Produce consistent reports at the click of a button

03 | Key Benefits Unlocked

- **Automatic Compliance Assessment**
  Obtain all information necessary to confirm compliance/non-compliance with NERC TPL-001 performance standards
- **Minimal Input Requirements**
  Individual contingency definitions are generated automatically without having to define SUB/MON/CON/DFX/ACC files
- **Support of Remedial Action Schemes (RAS)**
  Test your RAS schemes to verify that the proposed corrective actions are sufficient for NERC compliance
- **Intelligent Post-processing**
  Receive compliancy metrics without manual effort for NERC TPL violation count, type, severity and solution details, along with suggested mitigation strategies (alternate dispatches, etc.)
- **Turnkey Solution for Compliance Filing**
  Produce consistent and convenient report(s) sufficient for evidence of compliance

1 Absence of node-breaker data requires some manual entry such as stuck breaker contingencies

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Time Series Power Flow Add-on Module
3-steps to unlock key benefits

01 | PSS®E

Network Case
(rawx/sav)[1]
with profile data

02 | Time Series Power Flow (TSPF) Analysis

How
Adds the dimension of time to power flow analysis

Why
- Renewables performance analysis
- Economics and reliability
- Fast, accurate, and flexible

03 | Key Benefits Unlocked

- **Detailed Planning Model Profiles**
  Define load/generation profiles for any time interval with support for planned outages, multiple adjustment modes and aggregated curves, and import profile data from Excel file to rawx file and vice versa
- **Automated, Streamlined and Robust Solution**
  Automate the creation and solving of hundreds to thousands of power flow cases based on the profile definition with automatic generation dispatch to balance load demand and generation output
- **Intelligent Post-processing**
  Obtain summary results for all the runs and each time step (worse violations, number of violations, convergence, etc.) along with dense results that are provided for specified output channels in the spreadsheets
- **Flexible and Advanced Plotting**
  Identify revealing trends and outliers to pinpoint worse cases for further analysis. Plot any TSPF result and automatically plot just the most salient results such as maximum spread

1 Profile is stored directly within the rawx/sav file

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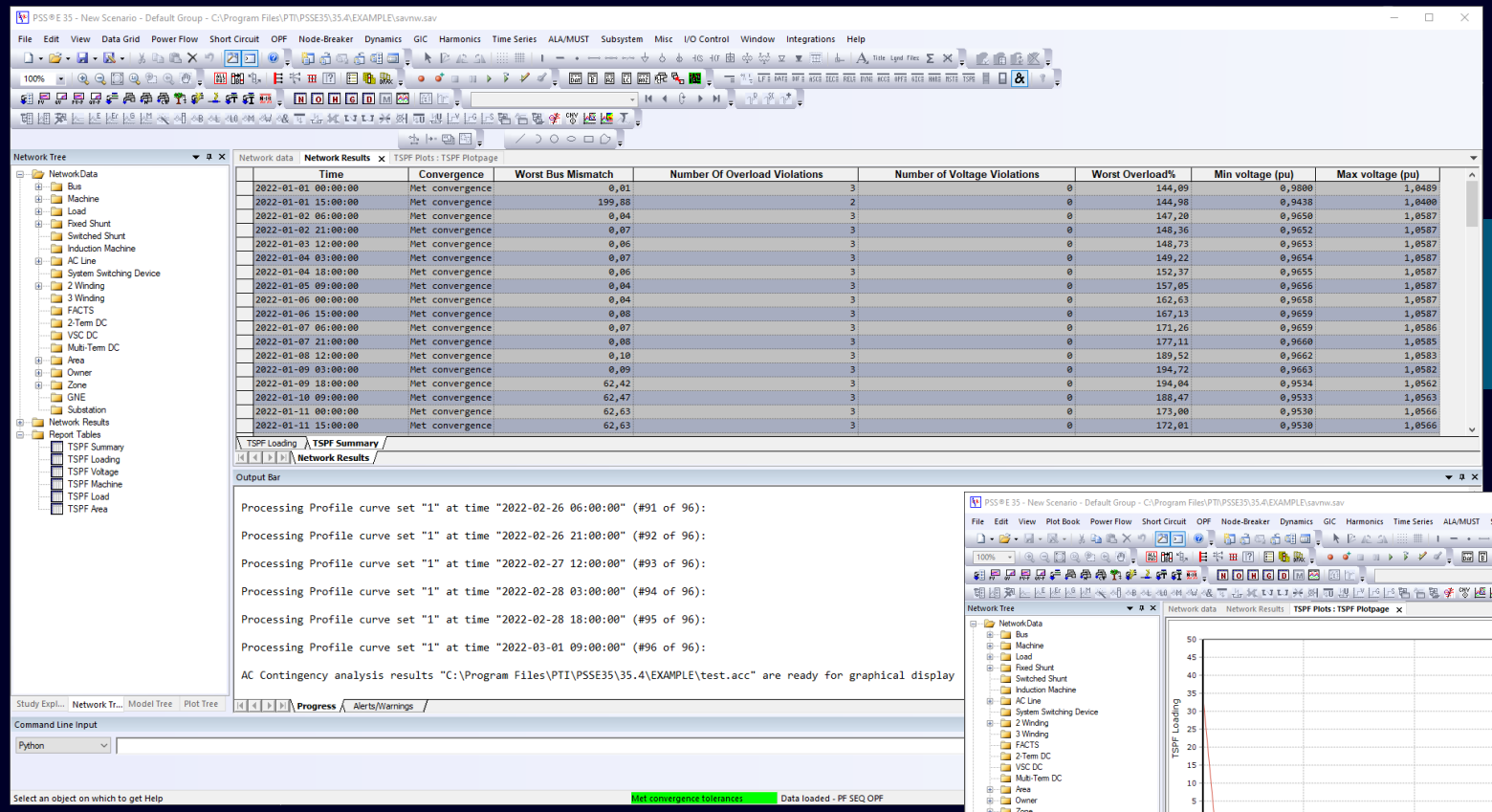
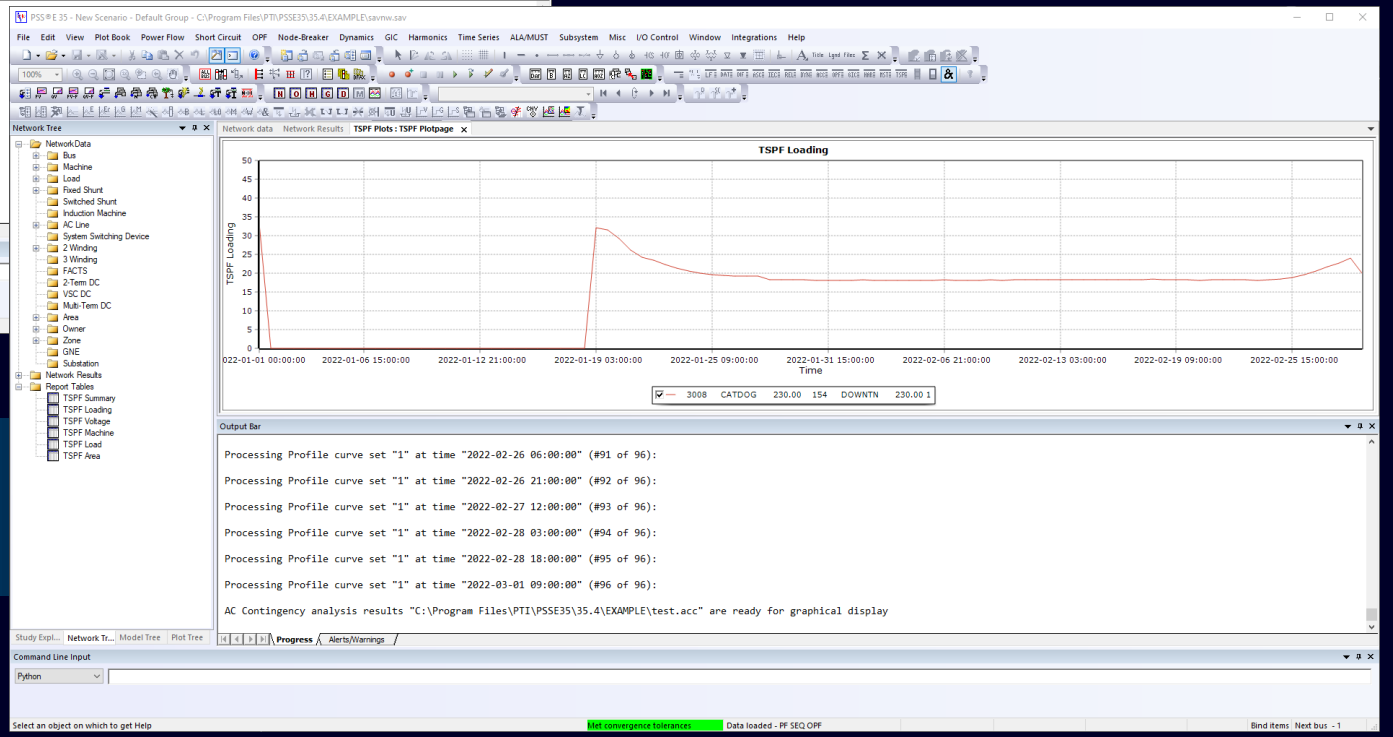
Network Results of Time-series Power Flow in Tabular View



% of Branch Loading Overtime



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Harmonics Add-on Module
3-steps to unlock key benefits

01 | PSS®E

Network Case
(rawx/sav)[1]
with harmonic
model data

02 | Harmonic Analysis

How

Harmonic Network Modeling based on CIGRE Technical Brochure 766 and IEEE Guidelines

Why

- Streamline renewable compliance analysis
- Model equipment according to field harmonic measurements
- Fast, accurate, and flexible

03 | Key Benefits Unlocked

- **Frequency Scan Analysis**
  Determine the frequency response of the network at the buses of interest at each harmonic order
- **Voltage and Current Distortion Analysis**
  Determine the total harmonic distortion (THD) factors and individual harmonic distortions
- **Review Potential Impact on Equipment**
  Obtain harmonic impedance magnitude, phase and locus curves, resonances to understand the frequency response. Obtain individual and total harmonic distortions to understand the harmonic impact.
- **Compare Potential Distortion Against Standards**
  Compare against IEEE and IEC distortion limits to determine any violations.
- **Analyze Results in Tabular or Results View**
  Plot harmonic analysis results using pssplot and process harmonic analysis results with Network Results spreadsheets

1 If specific harmonic network model data is not provided, default models are used for frequency scan. Harmonic current source data is required to perform distortion calculations

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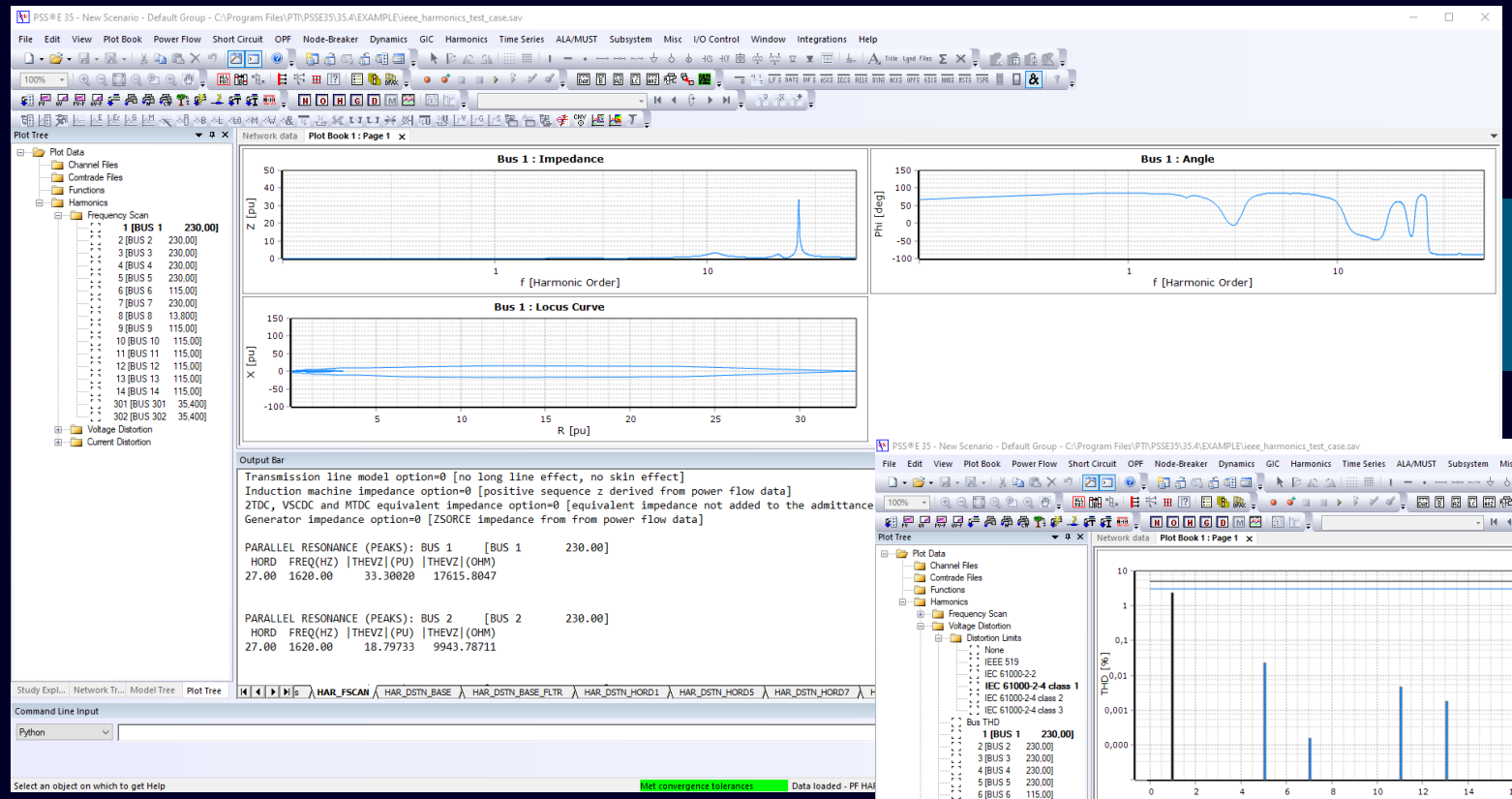
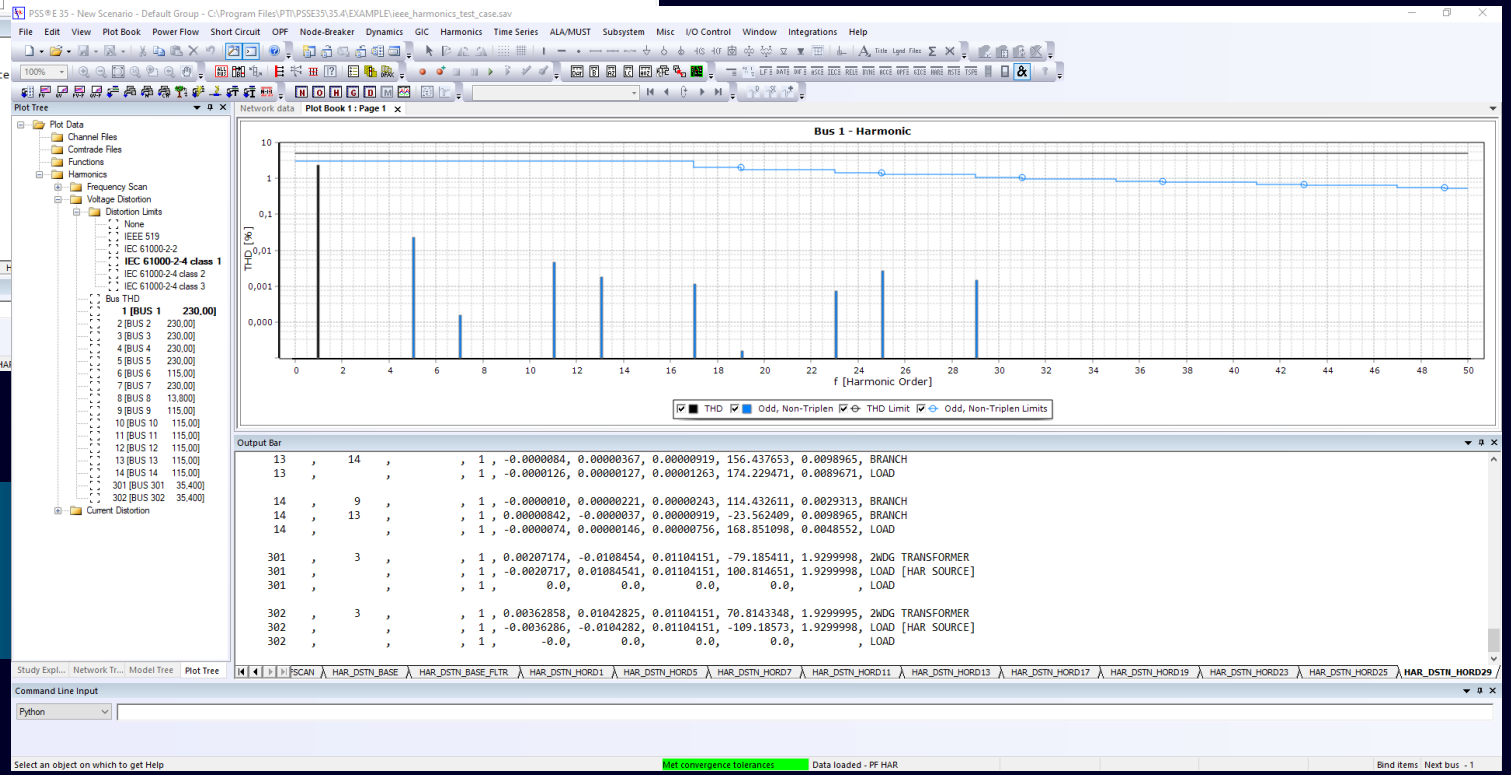


Harmonic Frequency Scan



Harmonic Distortion Calculations

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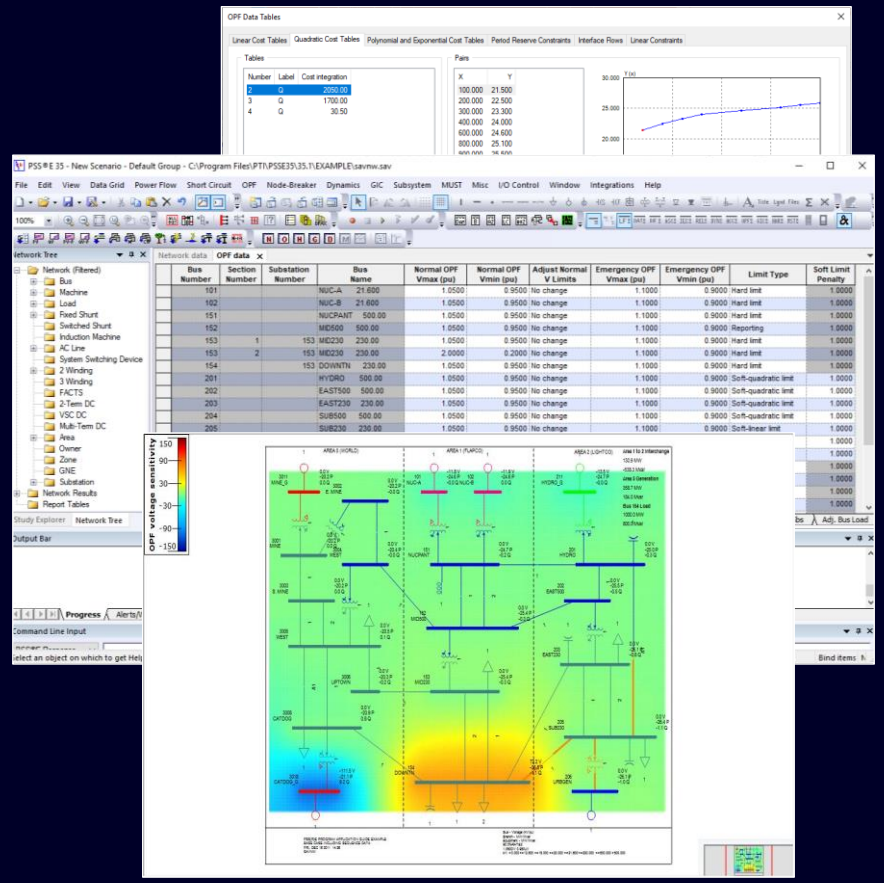
PSS®E Add-on Module
Optimal Power Flow (OPF)



- Goes beyond traditional load flow analysis to provide the ability to fully optimize and refine your transmission system plans
- Highly robust nonlinear AC OPF that seeks to find the optimal and most precise solution for a single network state
- Select from one or more objectives to minimize fuel costs, transmission losses, interface flows, series and shunt var compensation, and more
- Ideally suited for studies such as base case development, contingency mitigation, reactive power support sizing and placement, power transfer control and load adjustment
- Accurately models the many controls and constraints on the network
- Offers a variety of customizable linear constraint equations and penalties for even more comprehensive solutions

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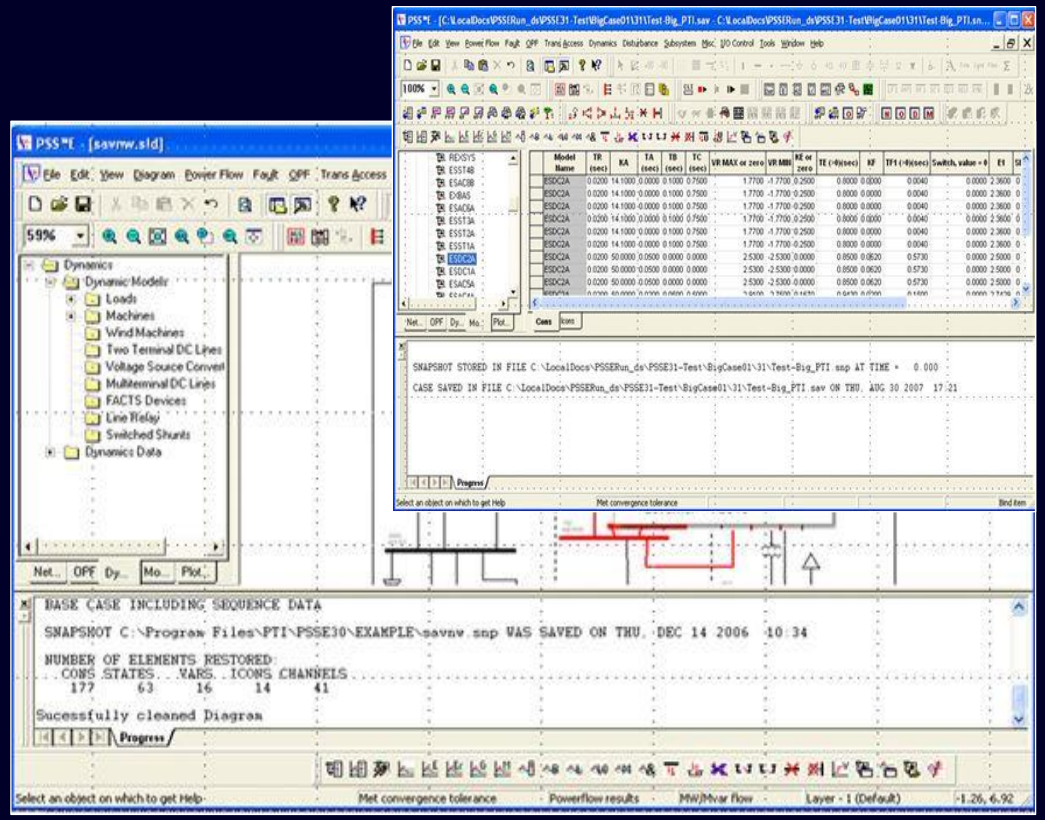
PSS®E Add-on Module
Dynamic Simulation



- Analyze the dynamic system response and stability of the grid to disturbances
- Includes a vast library of built-in dynamics models for modeling many types of equipment
- Users can define custom models of any complexity using the modeling interface
- An integrated dynamic simulation plotting package allows for quick generation and export of plots from the dynamic simulations

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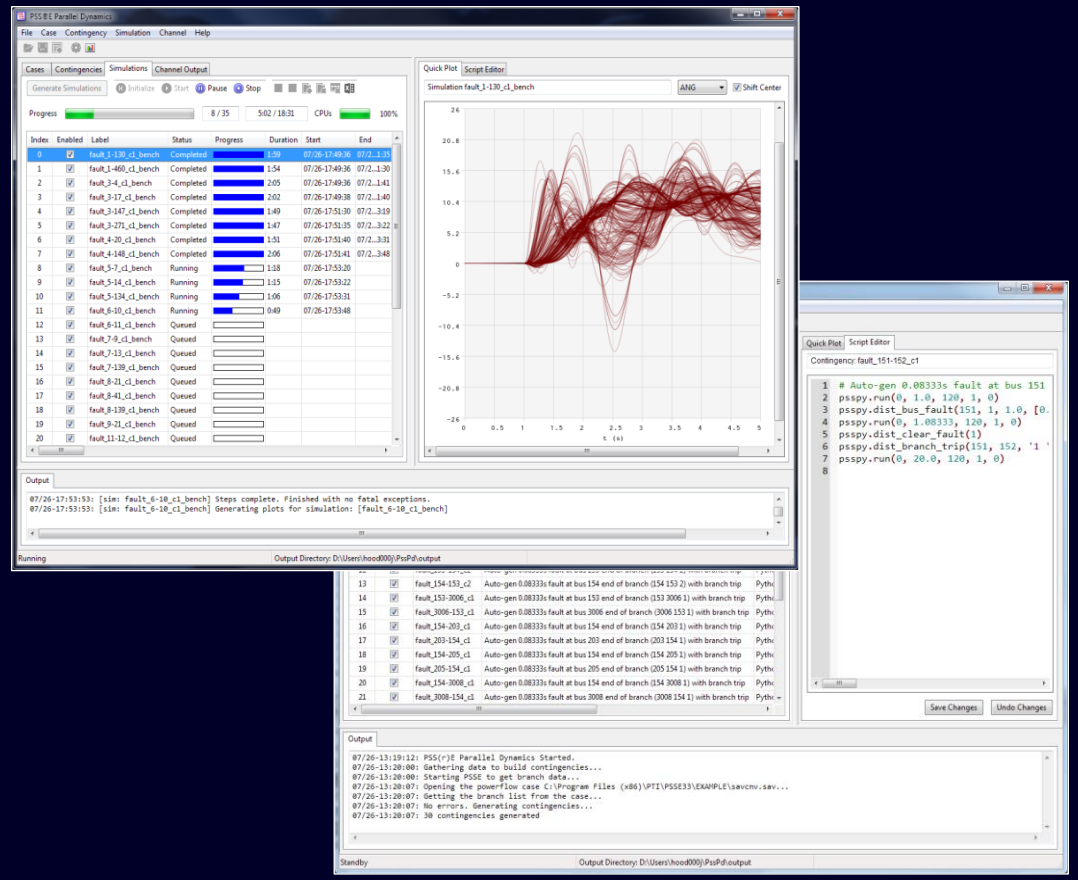
PSS®E Add-on Module
Parallel Dynamics



- Up to 24x speed-up of dynamics simulations
- Supports up to 24 CPU cores
- Near-linear speed-up
- Quick plotting of all output channels
- Built-in script editor
- Auto-generation of simple dynamic events for screening

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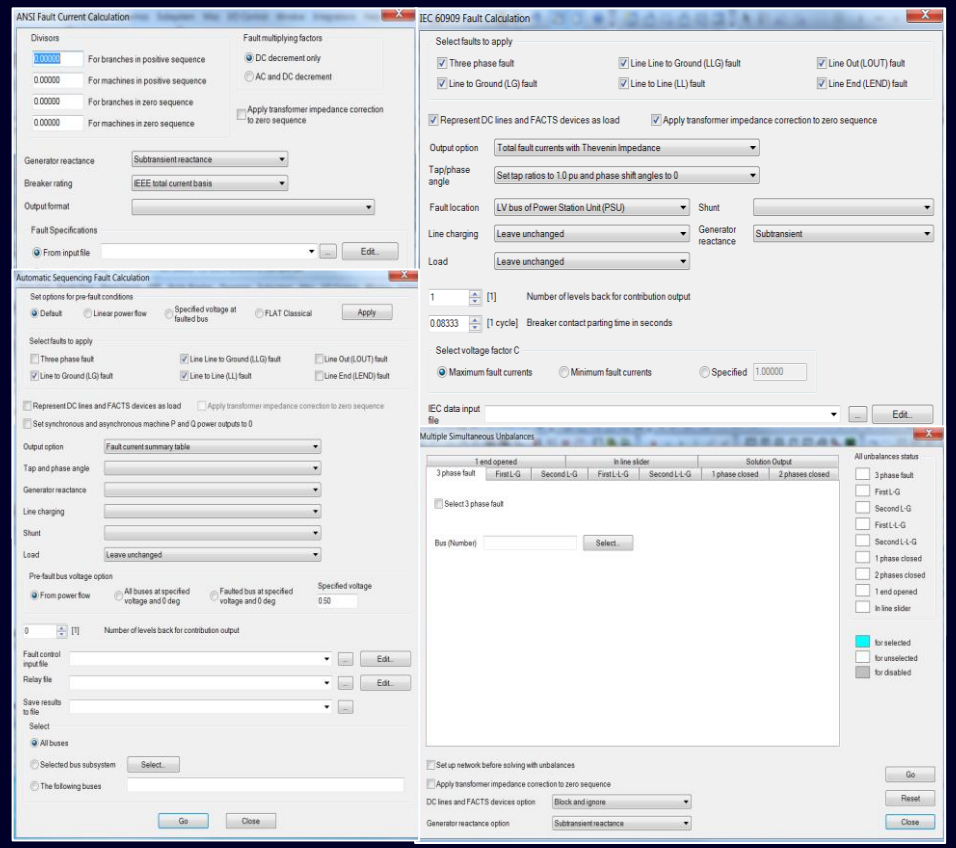
PSS®E Add-on Module
Short circuit Analysis



- Perform balanced and unbalanced short circuit analysis
- Perform fault calculations for multiple simultaneous faults
- Automatic sequencing of short circuit calculations for large models
- Circuit breaker duty calculations based on ANSI and/or IEC standards
- Circuit breaker detailed fault analysis

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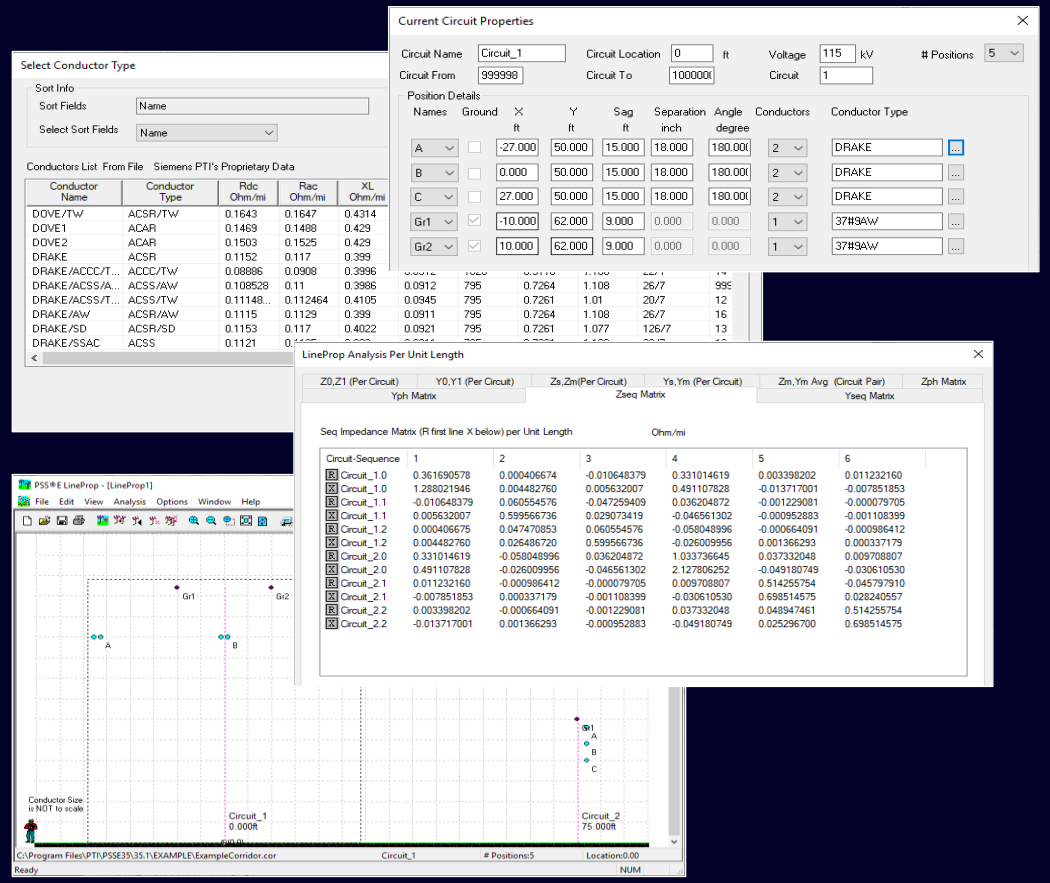
PSS®E Add-on Module
Transmission Line Parameter Calculation (LINEPROP)



- Graphically design corridor cross sections and calculate positive- and zero-sequence branch impedances from line geometry models
- Handles complex corridors with multiple lines, arbitrary conductor placement/bundling and mutual impedances
- Extensive conductor library that can easily be customized
- Calculate and automatically update branch properties from the PSS®E spreadsheet

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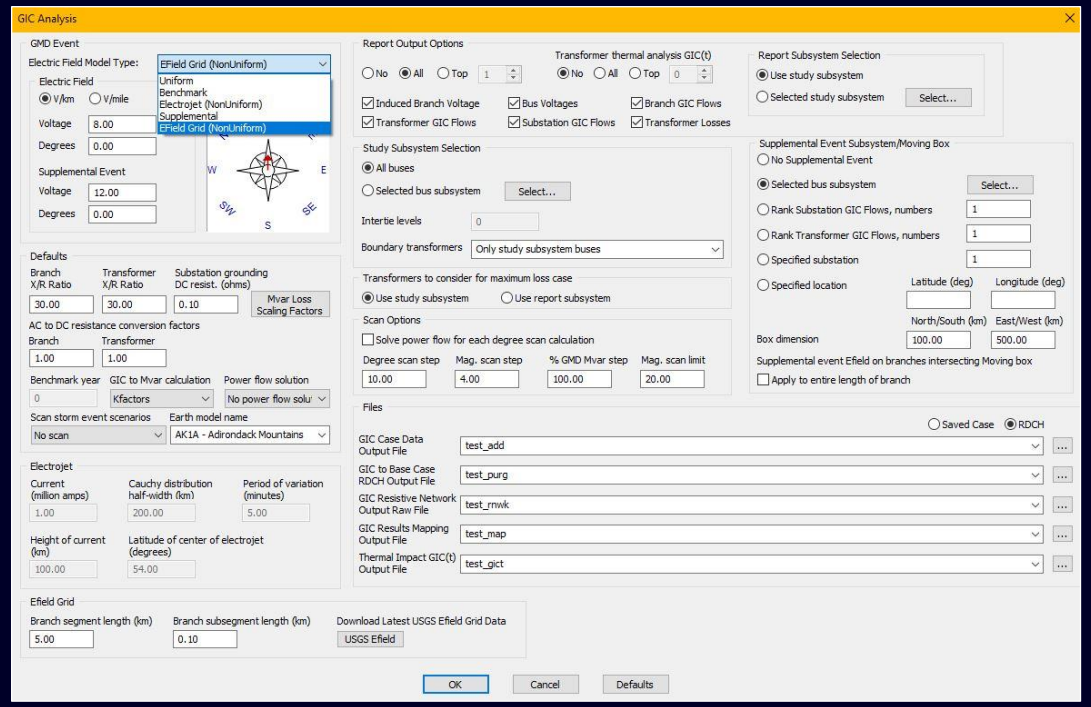
PSS®E Add-on Module
Geomagnetic Induced Currents (GIC)



- Accurately model the effects of a geomagnetic disturbance (GMD) on your system
- Uses the methods of calculation recommended by the latest research and NERC TPL standard 007
- Calculate GMD effects in grid with near real time Geoelectric Field Grid data provided by USGS/SWPC
- Includes tools for streamlining the process of gathering the required data
- Use the model with the effects of the GMD in other PSS®E analyses, such as dynamics or steady-state contingency analysis

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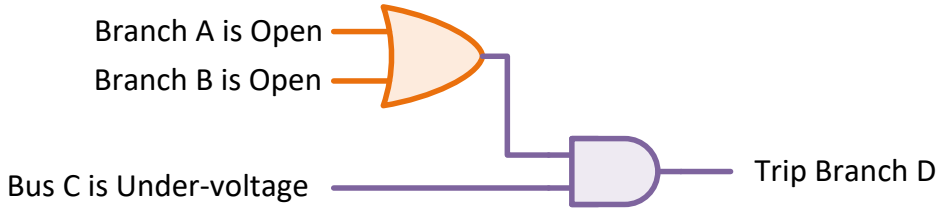
PSS®E Add-on Module
RAS and Advanced Contingency Module

```python
def condition():
    """Check if 151-152 lines open, 152-3004 is open or 151 is low voltage"""
    a = branch_is_open(151, 152, 1)
    b = branch_is_open(151, 152, 2)
    c = branch_is_open(152, 3004, 1)
    d = bus_voltage(151) < 0.96
    return (a and b) or c or d


def action():
    """Open line 152-202"""
    open_branch(152, 202, 1)


define_ras("RAS-1", condition, action)
```



- Power flow Customization Interface (PCI) and Remedial Action Scheme (RAS) APIs for writing custom RAS schemes
- New programmable functions available in several locations in ACCC analysis loop
- New RAS APIs for modifying network element in a contingency run

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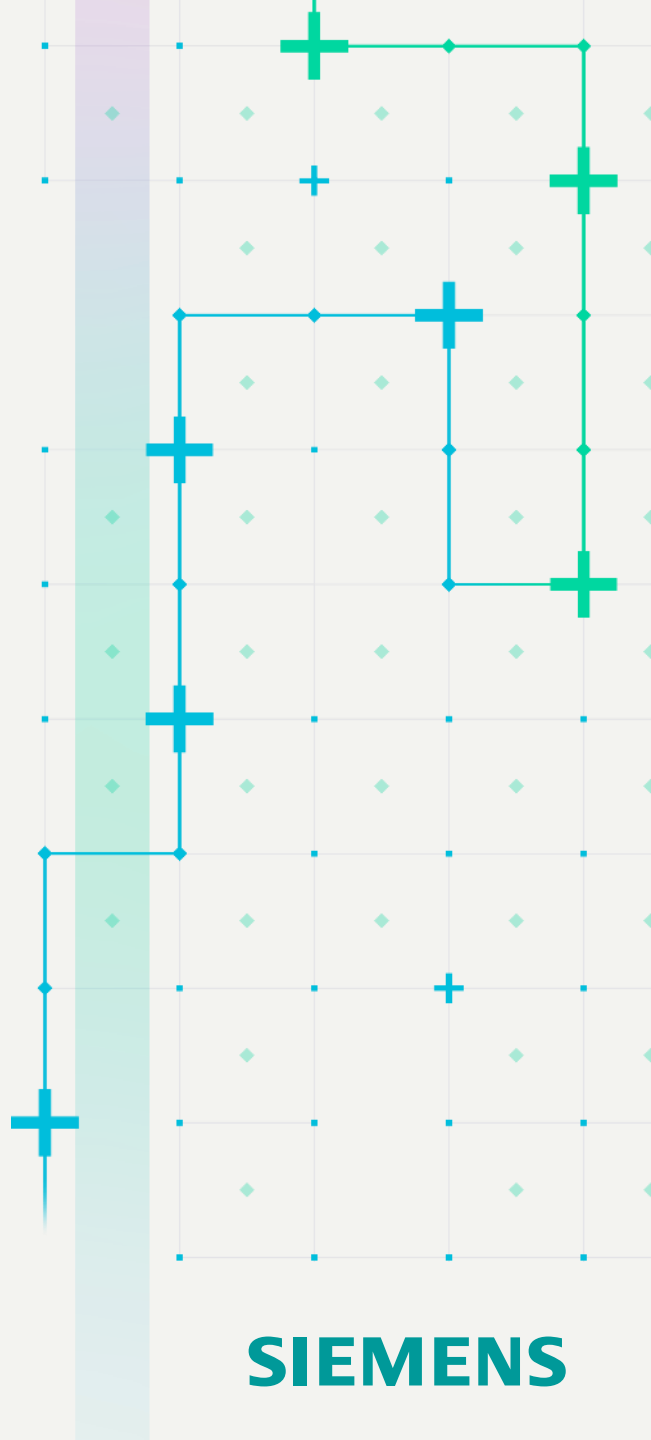
Companion Extension Tools



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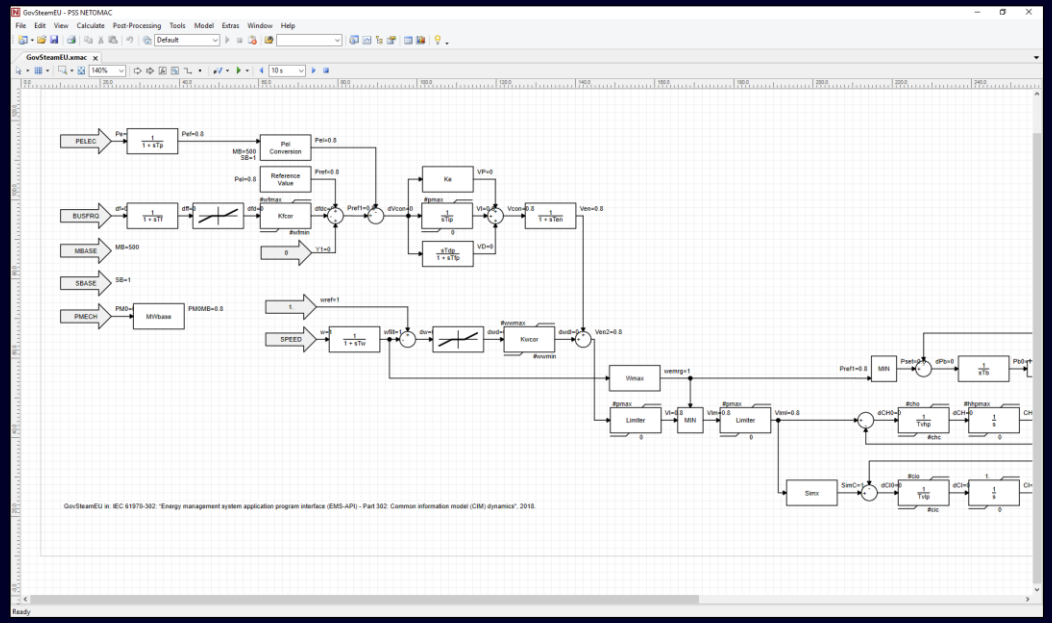
Companion Extension Tools
Graphic Model Builder (GMB)[1]



Provides the possibility of creating and testing user-defined models of machine controllers as well as generic network elements (GNE) in a user-friendly, block-oriented environment and of directly using the models without compilation or third-party software in PSS®E. It simplifies enormously the modeling process with regard to modeling itself, model initialization, debugging and documentation.

- Modeling of all machine controller types (excitation system and auxiliary devices, governor and turbine load controller) for dynamic simulation
- Using the modeling approach of generic network elements (GNE: variable power, admittance or current injection) for representation of any inverter-based technology (PV, Wind, Battery, HVDC, FACTS etc.) in load flow calculation or dynamic simulation
- Over 100 predefined function blocks (transfer functions, non-linearities, logical, mathematical etc.) and the possibility of implementing user-defined code in a FORTRAN-like syntax
- Possibility of model encryption for protecting intellectual property[2]

1 Requires PSS®SINCAL Platform installation

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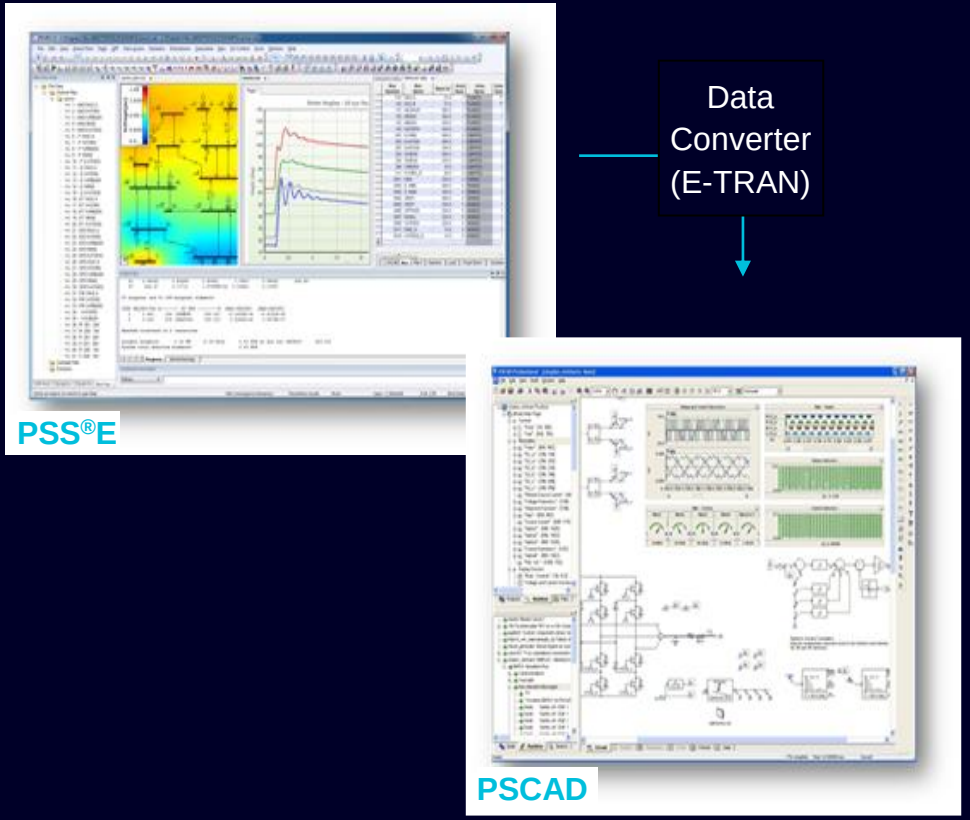
Companion Extension Tools
PSS®E-PSCAD Data Converter[1]



- Directly translate PSS®E network models into high-fidelity PSCAD electromagnetic transients models
- Complex PSCAD machine and HVDC models can be integrated into this network model for sophisticated analysis
- Builds complete multi-port network equivalents
- Supports full library of most standard PSS®E machine models (generators, exciters, governors, stabilizers, etc.), CLOD type load models and more
- Automatically initializes the PSCAD system (including HVDC links, generators and wind farms)
- Sanity check and Data verification of PSS/E .raw data
- Fault automation

1 Requires a PSCAD license

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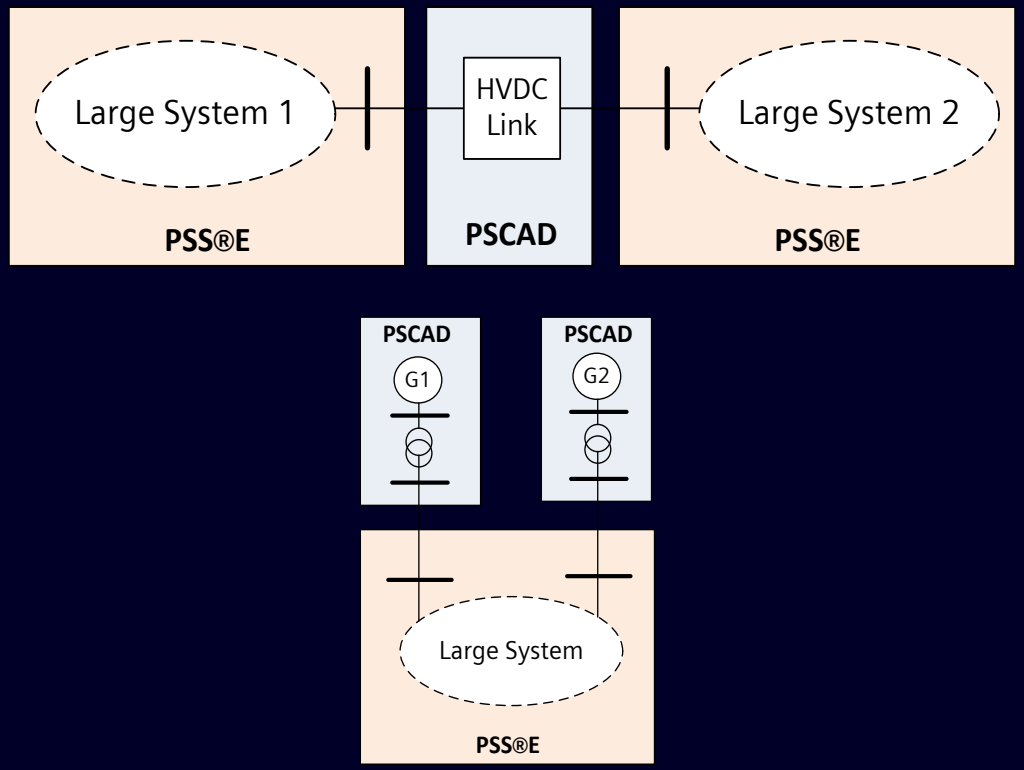
Companion Extension Tools
PSS®E-PSCAD Co-Simulation[1]



- Interface models on both sides, exchange information
- PSCAD models (to represent offshore VSC multi-terminal grid and wind turbine models etc.)
- PSS/E models (to represent the full AC system, including all modes of oscillation from nearby machines)
- E-TRAN Plus communication library (between CPUs or computers on a LAN)
- Plotting and control by a central PSCAD operator, auto-started via PSS®E automation

1 Requires a PSCAD license

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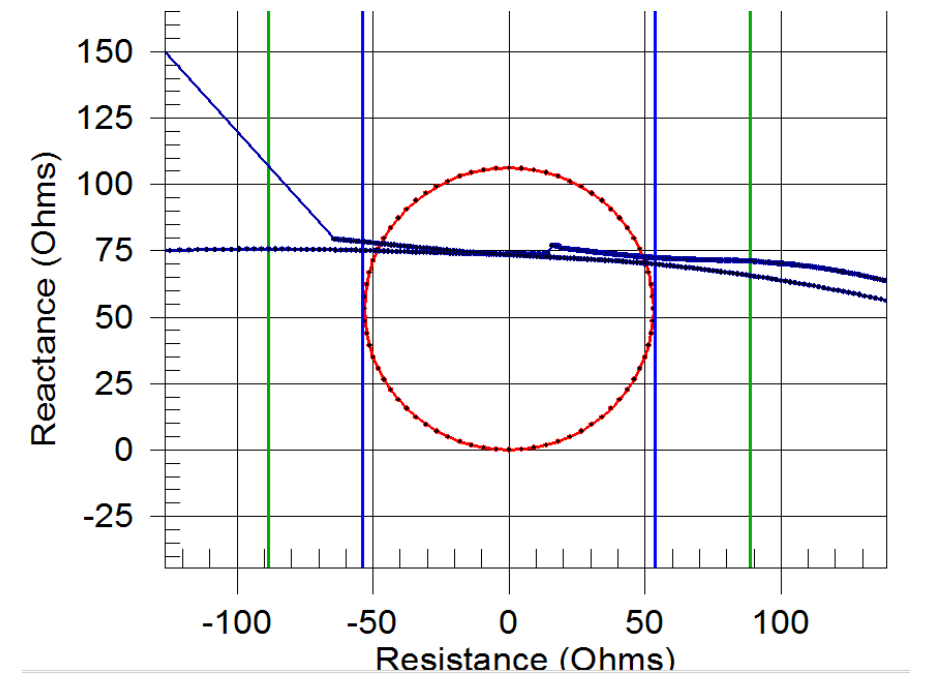
Companion Extension Tools
PSS®CAPE-TS Link™[1]



Relay trips on unstable swing on the 2nd slip
Example of out-of-step simulation using PSS®CAPE TS-Link

Combines PSS®E Transient Stability Capabilities with PSS®CAPE Highly Detailed Protection Model

- Uncover threats to network stability caused or amplified by protection system
- Relay behavior is simulated (not assumed)
- Study unbalanced conditions in transient stability environment
- Assure adequacy of protection for credible contingencies and planned outages
- Suggest setting changes for protective relays
- Develop and simulate special protection schemes

1 Requires a PSS®CAPE license

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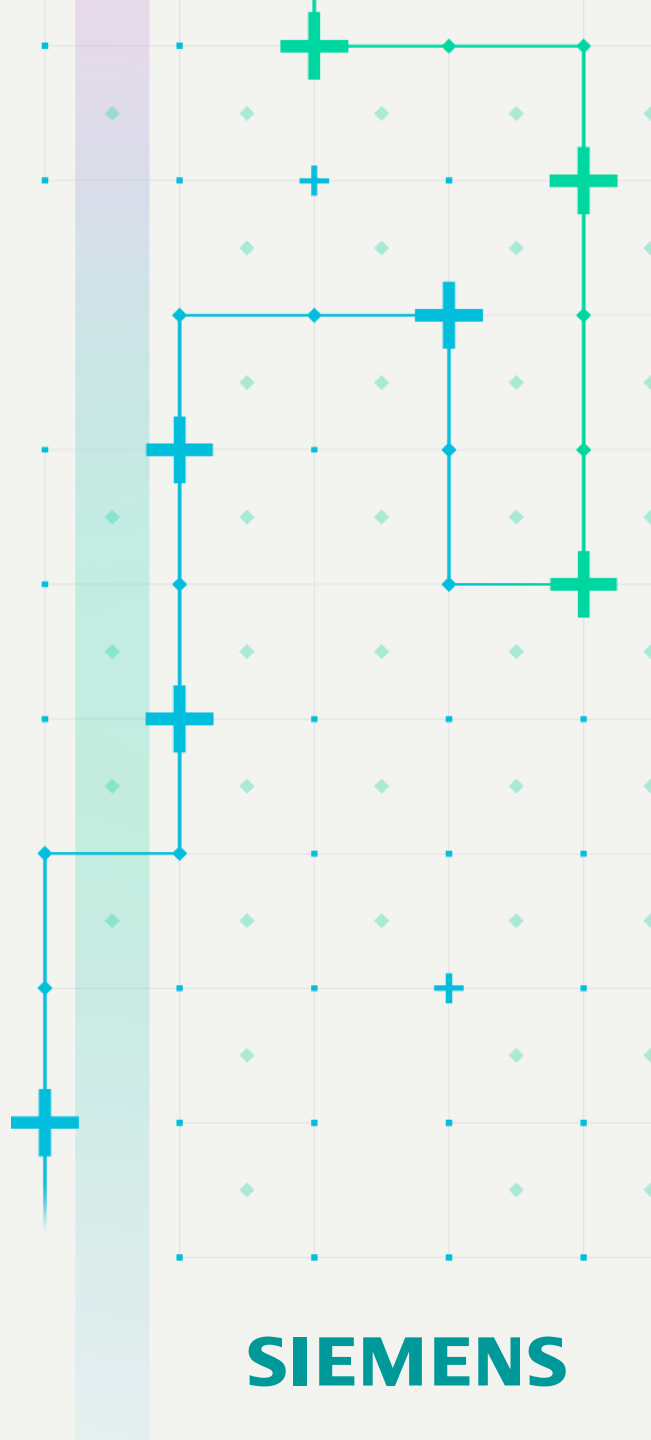
Why PSS®E?



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Why PSS®E?

Unique

- Industry benchmark
- Speed and accuracy
- Technical orientation → highly configurable and flexible; engineering depth
- PTI Team: Industry Legends
- Community
  - Massive user base and global ecosystem
  - Access to resources - Scripts, tutorials, models, libraries, and papers shared by other users
- PSS® Ideas portal: Nominate, vote, and comment on PSS®E enhancements → direct connection to product management team and other users
- Automation and customization through APIs, which are among the most comprehensive in the industry, and based on open Python™ technology

Valuable

- PTI invests millions of dollars every year in
  - Usability
  - Engineering improvements
  - Quality assurance
  - New functions
  - User communities
- Interoperability with other tools & systems in the utility IT landscape → Saves time & costs for system integration and data conversion
- Ease of automating PSS®E through its APIs → Improves workflow efficiency and reduces errors
- 2,000+ APIs are accessible from automation scripts

Proven

- In most regions around the world, PSS®E is the standard model/data format
- 40+ year history – longer than any other competitor
- Provides the industry benchmark for simulation results
- Any manufacturer who makes a new device, by default, creates a PSS®E dynamics model for it
- Most referenced tool in academic literature and textbooks

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Learn more about PSS®E
Available Resources

Resource	Location
PSS®E website	www.siemens.com/pss-e
Add-on Module Trial Request form	Request form
YouTube Tutorials, demonstration videos	www.siemens.com/pss-videos
LinkedIn	https://www.linkedin.com/groups/8513462
PSS® Ideas Portal	http://www.siemens.com/pss-ideas (for login, contact pti-software-sales.ptd@siemens.com)
Customer Portal Creating, managing, and tracking customer care tickets. Access knowledge libraries.	https://siemens-pss.freshdesk.com/en/support/login
Contact us!	pti-software-sales.ptd@siemens.com

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Thank you

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Take the next step!

Request a trial of PSS®E

Request a PSS®E module trial:
Harmonics & Time-Series Power Flow

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