

# What's new in PSS®E

## Version 33

### At a glance

PSS®E high-performance transmission planning software has supported the power community with meticulous and comprehensive modeling capabilities for more than 40 years.

Built on proven technology, Siemens PTI launched PSS®E Version 33 with new features and enhancements to:

- Improve your work flow
- Analyze effects of a Geo-Magnetic Disturbance (GMD) on the network
- Utilize all available processors during basic contingency analysis
- Support grid code compliance
- Provide preventative security capabilities.

The results of the analysis are displayed in extensive reporting capabilities as well as included for display and contouring on diagrams.

### New features

Version 33 introduced several new forms of analysis that includes Preventive Security Constrained OPF and N-1-1 contingency analysis. A number of new analytical models have been added along with the standardization of the Dynamic CONEC and CONET type models, improvements to data entry and connection codes in Short Circuit, an updated fully integrated Scenario Manager as well as improvements to basic power flow and dynamic simulation activities.

### Multi-processor support

New APIs have been developed to support the use of multiple-processors during basic contingency analysis. On a typical four-core system, performance enhancements can be three-fold while utilizing all available processors.

The APIs are available for:

- Tripping Simulation contingency calculation
- Multi-level contingency calculation
- N-1-1 calculation
- ACCC calculation

### Native Induction Machine Model

As requested by the user community, a native induction machine model has been added that can be used for an accurate representation of induction motor type modes throughout the PSS®E engine.

### Dynamic model standardization

Provision has been made to call every dynamic model from within PSS®E without an explicit call statement in the connection routines (CONEC and CONET.) As a result, no model in the PSS®E supplied library requires any compilation or linking of the connection routines. CCT models, a new family of models, have been introduced to replace the old CONEC and CONET type models.

### Preventive Security Constrained OPF

System security is the ability of a system to withstand contingencies, in other words, to remain intact even after equipment outages or failures. The Security Constrained Optimal Power Flow (SCOPF) can be used to perform a secure control to ensure the system security. SCOPF is a special class of OPF problems that considers the system constraints of predefined contingencies. This preventive method enables the system to be prepared for certain contingencies before an outage or failure.

### Sensitivity Analysis

A method to systematically study the impacts of changes in system operation conditions such as MW and MVar power injections on changes in branch flows and bus voltages. The function can calculate sensitivity factors with either a DC linear network or full AC network and can be used in the following applications:

- Mitigate System Operating Limit (SOL) violations
- Determine loading contribution
- Increase transfer capability
- Develop cost allocation

### N-1-1 Contingency Solution

The N-1-1 contingency solution performs an AC power flow to solve the primary contingency, applies the appropriate system adjustments in accordance with one of three adjustment modes, and then runs another AC power flow to solve the secondary contingency. The three adjustment modes are local control, corrective action and Preventive Security Constrained Optimal Power Flow (PSCOPF). Under each mode, several types of controls are available to adjust the system to meet the specified goals.

### Product enhancements

As with every version, we strive to increase the performance of PSS®E for our user community. Many product enhancements are included with each re-release. The following are just a sample of the performance enhancements introduced in Versions 33.0-33.4.

- Incremental Save Case Restoration – allows the user to reproduce the exact state of the network for each evaluated system state during contingency, PV and QV analysis
- Support for Multiple Python Versions –due to compatibility issues with the GUI, a rebuilt copy of the interpreter has been installed with PSS®E. Run the GUI, you are using the rebuilt interpreter. Run the external interpreter, you are running the native installed version.
- Enhanced OPF – improvements result in a more robust Optimal Power Flow solver that can solve cases previously not solved, and attain better solutions with a fewer number of iterations than previous versions
- OPF Results – several OPF sensitivity results can now be displayed on diagrams.
- New Bus Voltage/Angle Correction –for small groups of buses added to a solved case with default voltage values (1.0 magnitude, 0.0 phase angle), voltages are set to values to match those the point(s) at which they are connected to the original system
- Interactive Data Checking – data warnings/error can be visualized directly on the spreadsheets and model edit dialogs
- Short Circuit Modeling – modeling of MOV protected series capacitors has been added to Short Circuit calculations performed using activities SCMU, ASCC and IECS

- Auto-Draw Algorithms – new Diagram layout techniques allows for a better automatically generated diagram layout

### How to get started

For further information or to purchase PSS®E, please contact Siemens PTI software sales at [pti-software-sales.ptd@siemens.com](mailto:pti-software-sales.ptd@siemens.com) or +1 518 395 5000.

[siemens.com/power-technologies](http://siemens.com/power-technologies)

Siemens AG  
Power Technologies International  
Freyeslebenstrasse 1  
91058 Erlangen  
Germany

Siemens Industry, Inc.  
Power Technologies International  
400 State Street  
P.O. Box 1058  
Schenectady, NY 12301-1058 USA

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