

PSS®E Advanced Linear Analysis Add-on Module

Key analytics for your network topology.

At a Glance

Smart technologies and alternative energy resources are changing the face of the power grid as we know it. Power system operators are continuously challenged by carefully monitoring and planning of the grid to ensure resilience and system reliability. Moving power from one part of the grid to another is a key concern in the restructured electric utility environment.

The Challenge

To stay current, engineers need to determine the transmission transfer capability by simulating network conditions with equipment outages during changing network conditions and by simulating generation dispatch in an efficient manner. Power system planner and operators are typically using in-house, excel based, and non-integrated tools which can be error prone and time consuming to update. The Advanced Linear Analysis add-on module enables engineers to accomplish these tasks accurately and efficiently.

The Solution

With seamless PSS®E integration and full automation, the Advanced Linear

Analysis Add-on Module complements PSS®E's data handling and analysis functions with the most advanced and user-friendly linear analysis. Building on the basic linear analysis capabilities in PSS®E, the module enables power system planners and operators to unlock four specific advanced use cases through linearization.

Advanced Use Cases 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.

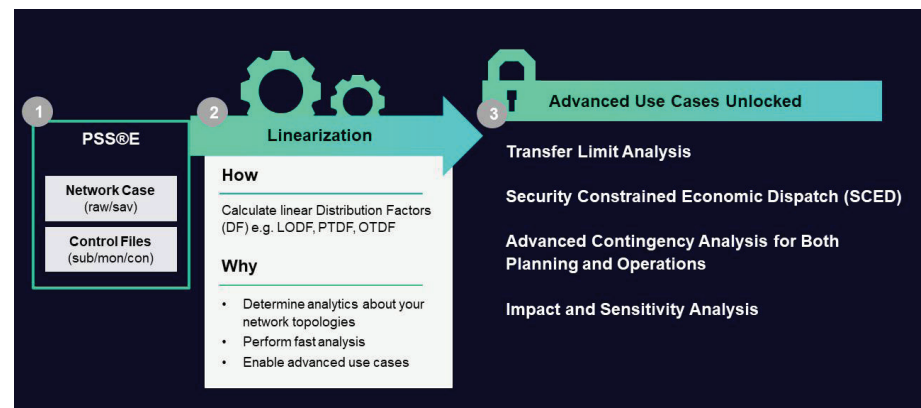
Advanced Contingency Analysis for Both Planning and Operations

Determine in minutes the corrective and preventative 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



PSS®E Advanced Linear Analysis Add-on Module unlocks benefits and advantages for advanced use case in three simple steps.

“Sophisticated approach to software tool-based modeling should be improved instead of relying mainly in operational experience.”

– PSS®E User

Did you know?

An important consideration for the development of this module was to ensure that PSS®E users had seamless access to the key benefits of the former PSS®MUST solution directly within the software. Integrating these capabilities into PSS®E seamlessly brings the best of both worlds under one tool to improve user friendliness and the ability to further strengthen the tool. Here are the additional features and benefits:

- *Integrated solution with seamless interaction and automation* – Directly invokes the module from the PSS®E GUI and make use of the network case in PSS®E memory.
- *Enhanced visualization* – Interactive bubble diagrams and spreadsheet reports directly in PSS®E
- *Improved robustness* – Moving away from an Excel-based GUI improves the robustness and usability of the tool
- *Consistent user experience* – Drive module using PSS®E menus and dialogs, which enables a common look and feel with modern interface mechanics and overall ease of use
- *Enhanced automation* – Ability to develop and run a single Python script that uses both the PSS®E API modules (such as psspy and pssarrays) as well as the MUST API module (mustpy)

- *Increased performance* – PSS®E supports x64 bit so you can have faster operation on even larger cases with improved memory management. The number of contingencies which it can handle has been significantly increased (a limit has not been detected yet).
- *Synchronized releases* – New versions are fully synchronized with inherent file and format compatibility.
- *Consistent inputs and outputs* – Harmonized file formats and consistent power flow results

Leverage PSS®E Core Capabilities

The Advanced Linear Analysis add-on module can seamlessly leverage the powerful functionalities of PSS®E:

- Interactive Bubble diagrams build directly into the PSS®E Slider Framework for improved UI
- Take advantage of PSS®E Report Tables which enables tabularized spreadsheet reports directly in PSS®E to easily process, sort and filter data and only export to Excel if needed for detailed analysis
- Take advantage of PSS®E Model Management Local Edition to facilitate case creation
- Make use of PSS®E Study Projects to work with Variants and analyze Base Case sensitives
- Once control files are fully harmonized, jointly take advantage of PSS®E activities such as Corrective Actions, PSC OPF, Probabilistic Reliability Assessment, PVI/QV analysis

“It seems like a powerful tool, especially for its speed and ability to customize the constraints.”

– PSS®E User

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