# What's New in PowerWorld Simulator 17

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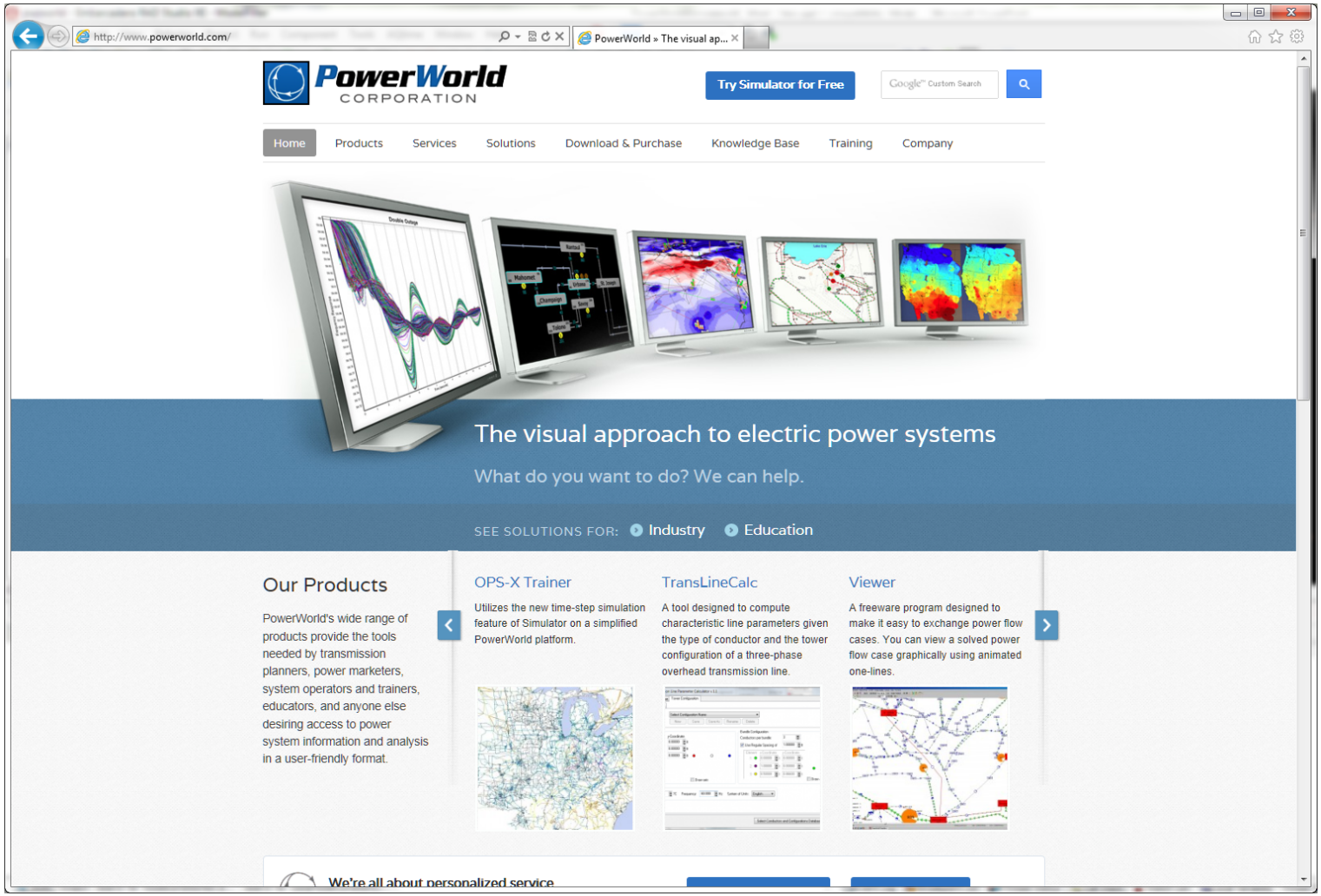
# New Website

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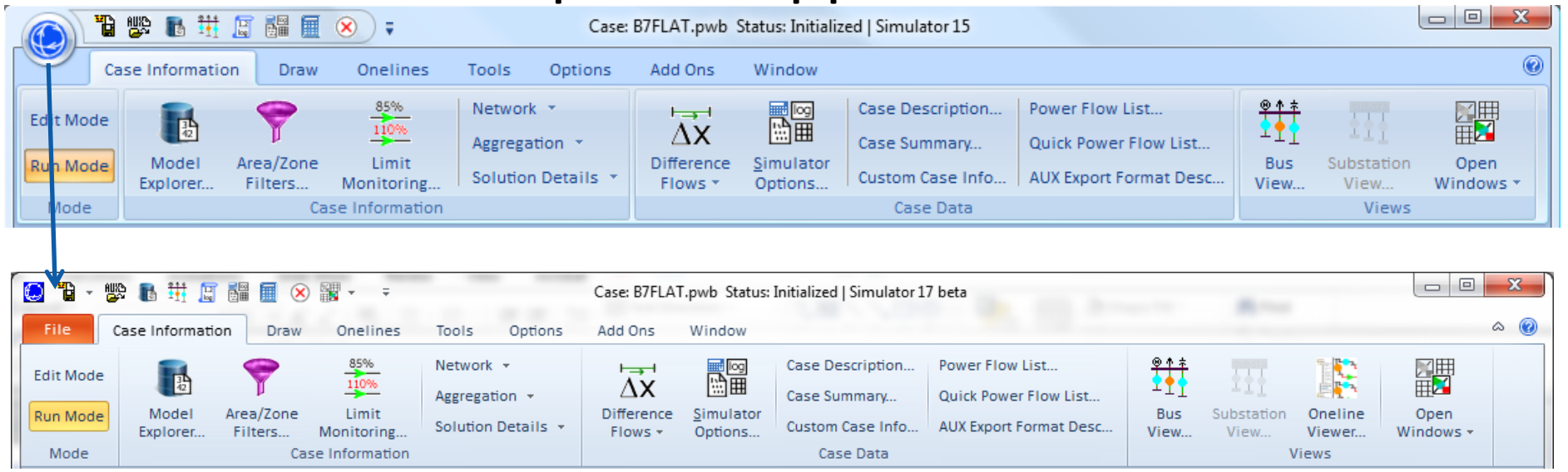
# User Interface

- File Menu replaces Application Button




- Some touchscreen support
- Add any dialog's System Menu for "Print" which will send an image of the dialog to the printer.

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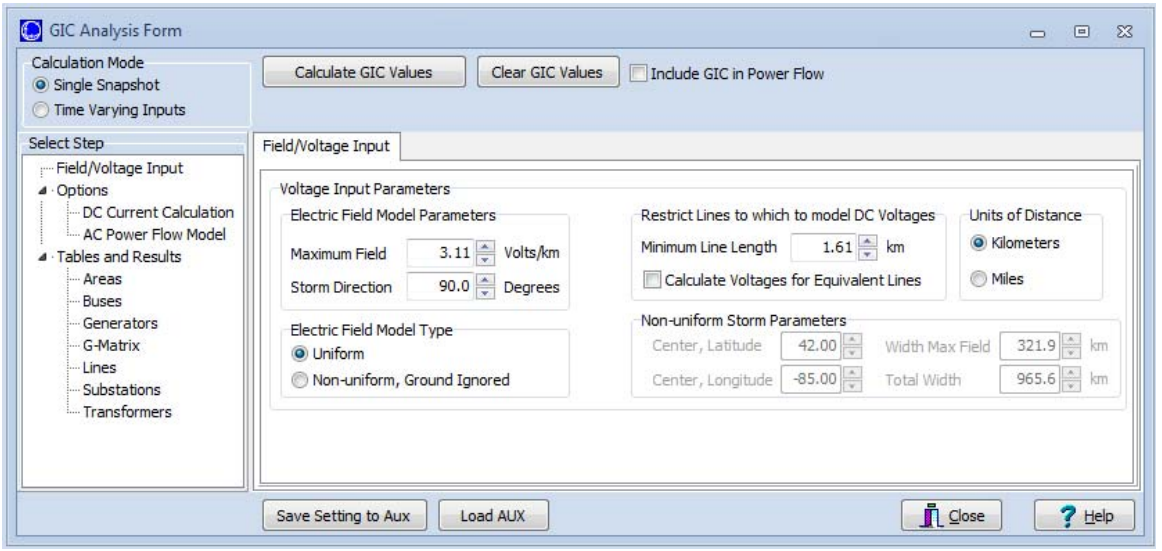
# GIC

- New add-on tool for calculating Geomagnetically Induced Current also known as Geomagnetic Disturbances (GMD)

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# Retriever

- PMU (IEEE C37.118-2005) data source
  - Can poll at intervals or read stream data, refreshing as quickly as possible
- Data Cache
  - Store data from past retrievals to hard disk
- Trend Chart
  - Oneline object showing change over time
  - Plots data from cache

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# Scheduled Outage Analysis

- Set up actions (“outages”) involving lines, generators, loads, or shunts
  - Open or close lines, generators, loads, or shunts
  - Change output of generators
- Play through time period and automatically implement the actions
- See the effects of planned “outages” on the system
- Gantt chart can show how “outages” interact with each other over time

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# Transient Stability

- User-Defined Models
- Composite load model (CMPLDW) now fully functional
  - Combine common data into Load Model Groups and Load Distribution Equivalent Types
- Static Var Compensators (SVCs)
  - SVSMO1, SVSMO2, and SVSMO3
- Pacific DC Intertie model
  - Creates MTDC_PDCI, CONV_CELILO, CONV_CELILO_N, and CONV_SYLMAR dyanmic models
  - Can be added automatically if appropriate multi-terminal DC line records exist in case

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# Transient Stability

- FACRI_SC and FACRI_SS models for series capacitors and switched shunts
- Implemented TLIN1 relay
- Added CSV file format for Play In structure so that data can be read and written to facilitate quickly getting data into Simulator for plotting comparison purposes.

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# Contingency Analysis

- TOPOLOGYCHECK status
- Contingency Element Action
  - *Evaluate in Reference State*
- Model Condition
  - *Disable if true in Contingency Reference State*
  - *Evaluate in Contingency Reference State*
- What Actually Occurred
  - Better explanations of what happened during contingency
  - New tab that only shows what occurred for a single contingency
- Accounting for overlapping generation drop
- Model Conditions, Model Filters, and Model Expressions
  - Memo field
- Model Expressions
  - Can reference Model Conditions and Model Filters
- Custom Monitors

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# Auxiliary Files

- Can now refer to custom expression by name rather than number location of the field. Instead of using "CustomExpression:location" can now use "CustomExpresion:name". Using this option for custom expressions requires that a name be specified for the custom expression
- When saving out an entire case as an auxiliary file, the field "AllLabels" is included for each object type that allows labels and has some labels defined.
- Improved speed of loading a large number of Model Expressions or Custom Expressions from an auxiliary file.

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# Auxiliary Files

- Allow the SaveCase script command to take special keywords as part of the filename. Simulator will replace these special strings as desired when creating the filename to save. @DATETIME will replace the keyword with the actual date an time in the format yyyymmdd_hhnnss-hhmm with the UTC offset included on the end of the time. The other special keywords @DATE, @TIME, @BUILDDATE,and @VERSION can also be used but are not as useful as the @DATETIME.
- The text field for script command WriteTextToFile and the Header_Value_List for script command SaveDataWithExtra will now allow special keywords to specify date, time, and version. @BUILDDATE, @DATETIME, @DATE, @TIME, and @VERSION will be replaced with the appropriate values.

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# Auxiliary Files

- New objecttype POWERWORLDSESSION is now available that will provide access to the Simulator executable currently being used. Use variablename VERSION to return just the executable version and VERSION:1 to return a string listing the add ons.
- New objecttype POWERWORLDSESSION provides access to a string containing the system slack buses. Use variablename BUSSLACK to return a string containing bus numbers and names of all system slack buses. Use variablename BUSSLACK:1 to return a string containing the system slack buses along with MW and Mvar ouptut values and minimum and maximum limits.

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# Auxiliary Files

- Can now refer to custom fields (integers, singles, and strings) and calculated fields by name rather than number location of the field. Instead of using variablename:location can now use variablename:name. "BGCalcField:My calculated field name" and "CustomInteger:My custom integer name" are examples. Using this option for custom fields requires that field names be specified using the Custom Field Descriptions.
- Added new DATA object, DefDrawOneline, that will allow changing the default font (name, size, color, and style), option to use the default font size for all new text fields, and the default background color for oneline diagrams via an auxiliary file.

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# Integrated Topology Processing (ITP)

- Better integration of labels throughout Simulator
  - Labels are needed to uniquely identify objects in full-topology case instead of using bus numbers that can change
- Refinement of Derived Status and Derived Online

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# Oneline Diagrams

- Greater support for substation topology diagrams
- Oneline Viewer
  - Fast way to browse a large number of diagrams
- Pie charts and gauges for Model Expressions
- Background Arc object
- Optional arrows with field objects to indicate positive value direction

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# OPF

- Bus voltage angle constraints can be enforced

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# Power Flow Solution

- D-FACTS Line Devices
  - Modify the impedance of a line to maintain current below a specified threshold

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# Switched Shunts

- Static Var Compensators (SVCs) control modes
  - Correspond to SVSMO1, SVSMO2, and SVSMO3
- Custom Control Mode
  - Set output of shunt to result of Model Expression
  - Intent is to set output of shunt based on the MW output of a generator

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# PV and QV Curve

- "New Plots"
  - Now support the plotting of base case values on the horizontal axis

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# ATC

- Model Conditions and Filters that are part of contingency model criteria used during ATC analysis now allow use of the Model Condition option to Disable if Condition is True in Contingency Reference State.
- The option to evaluate Model Expressions or fields that are part of contingency actions in the contingency reference state is now used when running ATC analysis.

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# Fault Analysis

- Can now optionally append sequence data when loaded from the Fault Analysis dialog. A prompt will be given to clear all sequence data first or append if opening an auxiliary file or a PTI *.seq file where the *.seq file contains a 0 indicator for new data. If the *.seq file contains a 1 indicating that data should be appended, no prompt is given and the data is just appended.

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