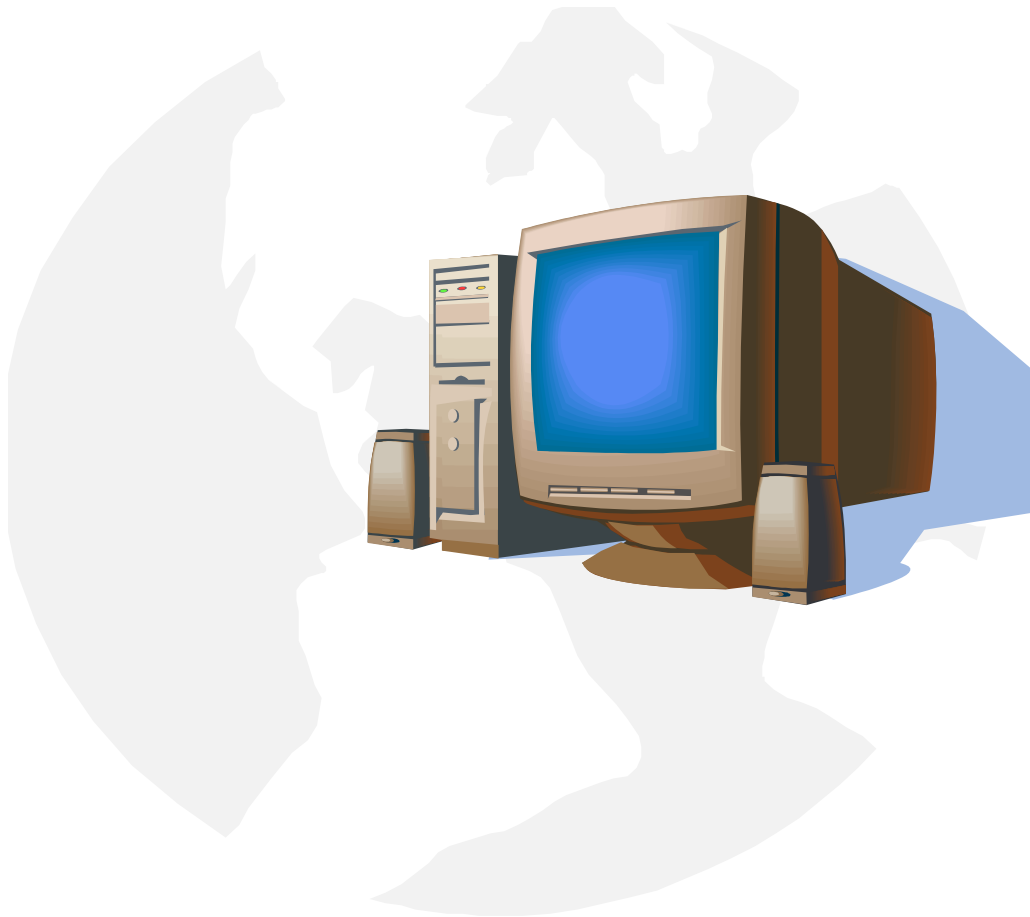# SES Software

Release Notes

Version 16.0

New Features in SES Software 16.0 Release

This document summarizes the most important features added to version 16.0 of SES Software. For more information on these new features and enhancements, please read the 2017 Users' Group Conference Proceedings (available on the SES web site and on the distribution media, under the **PDF\UsersGroup Documents** folder; the latest proceedings document is also installed by default).

Computation Modules	
Module	**What's New**
FCDIST	The following enhancements have been made to **FCDIST**: • Allow computations to be performed at zero frequency (DC). • The standard FCDIST report now displays the neutral current at the Central Site along each terminal. • The standard FCDIST and SPLITS reports now display the Current Split Factor at the Central Site. • The default terminal impedance in FCDIST and AutoGroundDesign is now 0.01 ohm.
FFTSES	The following enhancements have been made to **FFTSES**: • The default Sampling Exponent value has been changed to 11, to avoid aliasing issues by default with the following built-in generators: Single RLC, Double RLC switching and WaveTrain. • Introduced the possibility to specify window functions for signal analysis.
HIFREQ	The following enhancements have been made to **HIFREQ**: • Introduced unstructured meshing for plates. • Display of plate-related results in **Output Toolbox** and **GrServer**. • Can now take the thickness of the plates into account when computing the external impedance of plates. • Introduced an option to account for the actual positions of individual cables in pipe-type (multi-core) cables when computing the magnetic field. • Added support for multiple junctions between metallic plates.
MALT/MALZ	The following enhancements have been made to **MALT** and **MALZ**: • Introduced a multilayer hemispheroidal soil in MALZ (command mode only). • Account for the leakage current distribution in the system when performing the subdivision of finite volume faces into patches in MALT and MALZ soil models including Finite Volumes.

Computation Modules	
Module	**What's New**
HIFREQ/MALT/MALZ	Improved messages issued when no soil model is specified.
RESAP	The following enhancements have been made to **RESAP**: • Added a new option (**SIMULATED-ANNEALING**) to the **METHODOLOGY** feature (Command-mode only). • *High-Precision* filters are now used by default.
SPLITS	The following enhancements have been made to **SPLITS**: • Possibility to specify zero-sequence data for transformers in *Input Toolbox* for SPLITS.

CDEGS	
Module	**What's New**
CDEGS-Legacy	The old CDEGS program has changed its name from "CDEGS" to "CDEGS-Legacy", in order to ease the transition to the new CDEGS program.
CDEGS Examine Mode (SESResultsViewer and CDEGS-Legacy - Examine)	The following enhancements have been made: • New **Configuration** and **Conductor Data** plots of **Coating GPR** and **Coating Stress Voltage** for MALT. Also, new **Filter** on **Coating-Type** for **Configuration** plots. • New **Reference Direction** option to select the direction of arrows on **Configuration** plots in MALZ and HIFREQ. • Allow the simultaneous specification of a zoom area and of restrictions on observation profiles and points in SIRPS. • Allow plots and reports produced by **CDEGS-Legacy - Examine** to be saved in files whose path includes commas or other special characters.

SESTLC
The following enhancements have been made to **SESTLC**: • The behavior of the **Exposed Circuit** data table in **Fault Condition Interference** mode has been improved. • The diagram displayed for a steady-state interference analysis has been improved.

SESEnviroPlus
The following enhancements have been made to **SESEnviroPlus**: • Allow plots created by SESEnviroPlot (for SESEnviroPlus) and by SESTLC to be viewed in SESPlotViewer.

Right-of-Way Pro

The following enhancements have been made in **RightOfWay**:

- Improved handling of DUMMY paths specified in RowCAD.
- RowCAD project is now saved in the **Save As** operations.
- Filtering options are now available for *Steady-State Total Interference* plots.
- The program now accounts for the presence of a coating on conductors in the computation of the leakage impedance when the **Per Tower** option is used.
- The plot for two terminals/profiles system is now mirrored along the Y-axis to have a single curve, instead of two separate curves.
- Introduced the possibility to add an offset to the X axis of plots in RowExcelChart.
- Introduced the capability to produce plots of selected results as KML files that can be visualized in Google Earth™.
- A straight line representing the Design Objective value can now be added to selected plots.
- Allow the computation of shunt impedance of bare conductors in **Group-Type** paths when no group enclosure is specified.
- The *Arc Distance* calculations now take the system **X/R Ratio** into account.
- Update the **Touch-Voltage** and **Coating-Stress Voltage** percentage files when performing partial builds of a circuit.

AutoGroundDesign

The following enhancements have been made in **AutoGroundDesign**:

- The default terminal impedance in FCDIST and AutoGroundDesign is now 0.01 ohm.
- The name of the *Central Site* is now written in the FCDIST input files generated by AutoGroundDesign.

Tools and Utilities	
Module	**What's New**
Safety Module	The following enhancements have been made: • In the **Safety Module** (**Examine** modes of **CDEGS** and **CDEGS-Legacy**, **GrServer**, **AutoGrid Pro**, and **AutoGroundDesign**) and in **SESThreshold**, improved evaluation of fibrillation current from IEC curves.
SESCAD	The following enhancements have been made in **SESCAD**: • Introduced the possibility to define cylindrical soil volumes. • SESCAD is now available in French. • Introduced the notion of Unspecified soil and related user notifications. • Introduced the possibility to import *Keyhole Markup Language* files (Google Earth KML files). • Improved the display of labels on the drawing grid to show more decimal places. • The various *Advanced Options*, previously only available through the Input Toolbox, are now accessible from SESCAD. • Add a warning in SESCAD when loading or saving a file including data defined using very large coordinate values.
SESBatch	The following enhancements have been made to **SESBatch**: • Introduced commands to edit input files using AutoGroundDesign, SESFcdist, SESFFT, and SESResap. • Introduced the possibility to add all input files located in a folder (and optionally its sub-folders) to the batch list through drag & drop.
SESConverter	The following enhancements have been made to **SESConverter**: • Convert Invisible Entities in Block: the invisible entities in the insert will be converted and shown. • Convert all Contents of Inserts in Selected Layer: if an insert is selected, all contents of the Insert in Selected layer will be converted (shown) regardless of which layers the entities in the insert point to. • Export and View Invisible Layers: To view and export the content of invisible layers, allows user to see everything there is in the file, in case some of the hidden layers contain conductors that could be important in the SES model.

Tools and Utilities	
Module	**What's New**
AutoTransient	The following enhancements have been made to **AutoTransient**: • Automatic generation of the scalar potential, touch voltage, and step voltages databases whenever one of them is requested. • Restricted the production of plots to the case where this option is requested both in the FFTSES template file and in the **File Management** options. • Improved error diagnostics. • Allow the program to run at the same time as the **Examine** modes of **CDEGS** and **CDEGS-Legacy**.
ROWCAD	The following enhancements have been made to **ROWCAD**: • A **Copy Cross-Section** functionality has been added. • The program can now recognize that an invalid soil definition file is selected. • The uniform soil resistivity value is now disabled when a soil definition file has been selected to avoid confusion. • The KML import feature can now handle polylines and placemarks that are parts of multigeometries in Google Earth™. • A global visibility flag has been added which can make all polylines visible or invisible with a single click. • In automatic mode, the name of the path automatically created is that of its constituent polyline. • The cross-section name now appears in the Cross-Section window title bar. • The *Polar* and *Cartesian* notation options in the **Energization** screen have clearer labels to avoid confusion. Also, the default values have been change in order to have the Equivalent Source Impedances defined in Cartesian format, but the Phase-to-Neutral Voltages and Source Currents in polar notation. • The Alt+F4 key combination now closes the application and Ctrl+F4 closes the current project. • File import options have been clarified to avoid ambiguous import conditions. • The *Force Region Cuts at Tower Locations* and *Create Regions Cuts at Path Intersections* options are now active by default for new projects.
SEStralin	The following enhancements have been made in **SEStralin**: • The **Energization** panel now allows complex number format switch (allowed format are *Polar* and *Cartesian*).
SESFFT	The following enhancements have been made to **SESFFT**: • Database (.f80-84) generation: SIRPS computation errors are now caught by the WPF code and shown to the user through a message box. • Changed the **Results Zoom** grid columns in order to a more logical order; added super headers. • The **FFT Direction** switch box is disabled when the **Results** panel has the focus.

Tools and Utilities	
Module	**What's New**
	• Enables or disables available plots in the ribbon, according to the last FFT direction that was computed. • Improved the **Save As** command to copy and rename all output files, not only the .f05. This makes it possible to **Compute** immediately after **Save As**. • The copy/paste performance of the **Specified Surge** table was improved and lightning surges with negative amplitudes are now accepted.
SESThreshold	The following enhancements have been made in **SESThreshold** and **Zone Editor**: • Introduced the possibility to generate a report giving details about the computation of touch or step voltages safety thresholds.
SESImpedance	The following enhancements have been made to **SESImpedance**: • The close polygon mechanisms have been improved.
SESResap	Being able to do all that the existing RESAP in CDEGS can do, the new program additionally offers the following enhancements: • Clearer schematics with electrode labelling that follows popular conventions from instrument manufacturers. • Measurements data grid with optional columns that help verify the input data. • Possibility of adding comments for any data point. • Interactive plot of the data. • Clearer specification of analysis parameters. • Useful field data sheet that helps achieve quality measurements.

Licensing

- The logging of network license usage can now be activated via **SESLicenseManager**.
- Additional log files will be created, one for each license that has been activated for logging; they will contain a list of current users that are using the network licenses.

Language Support

- The interfaces of the following applications are now supported in Spanish but they are currently in beta phase: **CDEGS**, **SESResap**, **SESTralin**, **SESLibrary**, **SESResultsViewer**, **SESThreshold**, **SESFFT**, **SESeBundle**, and **F05TextEditor**.
- French is now largely supported in the main applications.

Preview of New Tools and Utilities	
Module	**Description**
New! **CDEGS**	A complete overhaul of the main CDEGS program offers the benefits of working with features that use the same user-interface standards of the new lineup of SES Software programs and provides rich, flexible, and intuitive functionalities to the existing features. At this early stage, the following are some of the enhancements: • Being able to quickly add jobs into the Job-ID list by dropping multiple files and folders, with sub-folders also being captured automatically. • Each program button has its dedicated session selection for those that are available for the selected job. • A convenient undo/redo on the operations made in the Job-ID list.
New! **SESFcdist**	**SESFCDIST** calculates extremely quickly the distribution of current flowing through the various metallic return paths, i.e. the shield or neutral wires or cable sheath/armor of the lines feeding the fault, and through the earth, which is the basis of a grounding study for a substation. Importantly, the calculation takes into account not only the longitudinal and shunt impedances of these metallic paths, but also their mutual coupling to the fault current carrying conductors.
New! **SESLibrary**	**SESLibrary** is a new program included in this version of the software. This program allows you to inspect the properties of a large number of *components* that can be part of models for many SES Software engineering programs. It currently includes a comprehensive database of conductors as well as several power cables; many other components will be added to the library in the near future.
New! **SESPlotViewer**	**SESPlotViewer** is a new program that can display data as plots of various types. The program also displays that same data in tabular format, and optionally allows editing it. The main use of this program is as a plotter for the computation results produced by some SES Software engineering programs, but it can also be used to create plots from scratch, using your own data. The program uses the centralized **SES Plotting Engine** component at its core; **SESFFT** is an example of another program using the same component. Eventually, all programs will fulfill their plotting requirements with this component.
New! **SESResultsViewer**	**SESResultsViewer** processes the computation data and results of the MALT, MALZ, and HIFREQ computation modules in CDEGS, offering a complete solution for displaying the plots and reports in an integrated viewer. It presents a light layout with intuitive organization of its settings that use sensible defaults that, in turn, allow for a fast configuration of the settings in order to achieve the desired output results.

Notable Bug-fixes	
Module	**Description**
AutoGroundDesign	The following bug-fixes have been made in **AutoGroundDesign**: • The number of sections (spans) along a terminal is now correctly defined. Previously, the calculation engine would use one less section than specified. • Fixed some incorrect data validations for cases involving very small grids in AutoGroundDesign.
AutoGridPro	The following bug-fixes have been made in **AutoGridPro**: • Fixed a problem that would prevent importing the soil model from SES Share Files (F11 files) in cultures using a comma as decimal separator.
GRSPLITS-3D	The following bug-fixes have been made in **GRSPLITS-3D**: • GRSPLITS3D added support for FCDIST multiple Bundles display. • In GrSPLITS-3D, opening a large SP file caused the application to be unresponsive. • In GRSPLITS-3D, for a FCDIST project, a bug fix has been made for a crash that would occur upon clicking on a shunt component of a circuit (e.g., on the Neutral Phase or at the Central Site).
MALT/MALZ	The following bug-fixes have been made to **MALT** and **MALZ**: • When using a vertical soil model in MALT or MALZ, the layer in which a conductor is located could be misidentified when the "Trace Point" specifying the position of a soil layer was set to the origin of the coordinate system (0, 0).
MALZ/HIFREQ	The following bug-fixes have been made in **MALZ and HIFREQ**: • Observation points located inside the outer surface of the coating of a conductor are now moved to the outer surface of the conductor coating when calculating electromagnetic fields. Previously, they would be moved to the outer surface of the metallic part of the conductor. • A conductor subdivision problem that could occur when the 'Node Detection Threshold' is very small.
ROWCAD	The following bug-fixes have been made in **RowCAD**: • Fixed an issue in ROWCAD where importing from the warehouse a cross-section containing a very large number of phases would take long time making the application feel like it was unresponsive. • Fixed a *Data Execution Prevention* (DEP) error that could occur on some platforms when executing the *Generate Regions* command in ROWCAD. • Added validation to add a task when a terminal's energization doesn't have any assigned grounding.

Notable Bug-fixes	
Module	**Description**
Right-of-Way	The following bug-fixes have been made in **Right-of-Way**: • Profiles generated in *Total Interference* could have redundant points. • In *Modify Circuit*, no operations would be loaded for cases with a terminal whose name includes a quote character ("). • The holiday resistance was not computed for a conductor in all regions following a region in which it was declared DUMMY. • The *Total Interference* file could be generated incorrectly in the presence of a Group path, or when the first section in a terminal is marked as DUMMY for an exported phase. • MALZ template files that include profiles are now handled correctly.
SESCAD	The following bug-fixes have been made in **SESCAD**: • Fixed a problem when re-loading a wire mesh PIPE object. This problem would cause the high-level description of the PIPE to be lost. • Fixed a problem that would prevent importing the soil model from SES Share Files (F11 files) in cultures using a comma as decimal separator.
SESShield	The following bug-fixes have been made in **SESShield**: • Fixed an incorrect calculation of the surge impedance of Class 2 towers in the Transmission Line module. Allows specification of tower diameters smaller than one centimeter in the Transmission Line module, to make it possible to model downlead conductors on wood poles.
SESThreshold	The following bug-fixes have been made in **SESThreshold**: • Opening a MALZ or HIFREQ F21 file would not read the units correctly and always returned metric.
SESResap	The following bug-fixes have been made in **SESResap**: • Fixed crash while editing a cell and unchecking the account for depth. • Corrected plot axis names for resistivity and resistance. • Opening a file immediately adds it to the recent file list.
SESCrossSection	The following bug-fixes have been made in **SESCrossSection**: • Fixed an issue where no errors would be displayed when opening a file that contained a component type with overlapping conductors.
SESPlot	The following bug-fixes have been made in **SESPlot**: • Plot not refreshing upon user action.

Notable Bug-fixes	
Module	**Description**
SESImpedance	The following bug-fixes have been made in **SESImpedance**: • Fixed an issue in SESImpedance where clicking on Compute while modifying the **Number of Segments** would use the previously entered value.
TRALIN	The following bug-fixes have been made in **TRALIN**: • Fixes a crash that could occur in SESEnviroPlus when requesting the calculation of space-charge effects without any DC energizations.
CDEGS	The drag-and-drop feature now supports files in network paths.

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