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CDEGS

SES Software

New Features & Enhancements

Version 17.0

2021

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Introduction

Version 17.0 of SES Software includes a free license upgrade, a new software package and multiple new features and enhancements. Please see below for more details.

Automatic License Upgrade

With the release of SES Software Version 17.0, SES has updated its license policy to provide two concurrent uses of any computation modules free of charge. This does not require an additional purchase of a license. Those who previously purchased a license for concurrent computations will get a bonus concurrent license seat. This upgrade will enable you to achieve your results faster on multicore CPUs.

New Applications

Version 17.0 of SES Software includes the following new applications:

Application	Description
SESShield-2D	SESShield-2D is a new WPF application for the new SESShield-2D software package; the new application complements the existing SESShield tool (which will remain as a tool). It features a modern WPF user interface and is based on rigorous IEC 62305 methods, providing qualitative and quantitative assessments of risks associated with lightning flashes to and near structures and the services that are connected to them.
SESAutoGroundDesign	SESAutoGroundDesign is a new WPF application for the AutoGroundDesign package. The new application has a modern user interface and a new powerful capability for modeling multiblock terminals along the electric network.

Enhancements

1. Computation Modules

The following enhancements were made:

Module	What's New
HIFREQ	<ul style="list-style-type: none">• Conductors energized with a GPR energization can now be insulated with a "Perfect" coating.• Possibility to energize the conductor network by providing only the work potential (galvanic series) of conductors (wires) and plates for cathodic protection studies.
MALT	<ul style="list-style-type: none">• Finite soil volumes are automatically subdivided at soil layer interfaces in multilayer soil models.• Major stability and speed enhancements to the 'Discrete Complex Image Method' option offered as an alternative computational approach.
MALZ	<ul style="list-style-type: none">• Finite soil volumes are automatically subdivided at soil layer interfaces in multilayer soil models.
SPLITS	<ul style="list-style-type: none">• A new model for Scott-T transformers was added.

2. Main Software Packages (Programs)

The following enhancements were made:

Program	What's New
AutoGrid Pro	<ul style="list-style-type: none">• The limit on the number of observation points that can be automatically generated by the program was increased to one million.
AutoGroundDesign	<ul style="list-style-type: none">• A new powerful capability for modeling multi-block terminals along the electric network was implemented.

Program	What's New
CorrCAD	<ul style="list-style-type: none"> • Plates and cables are now fully supported in HIFREQ entity models. • The Plot Results module, especially 2D-spot, has been greatly improved. • A built-in 3D-plot engine has been integrated in the Plot Results module. • More plot data quantities are available in the Plot Results module. • A new tool is available to connect conductors on a path at a user-specified distance. • The color levels for the 3D plots are now customizable. • Imported entity models will be converted to match the unit system used in the CorrCAD project, if needed. • The program now remembers the user-defined UI layout from the previous session. • Fit to screen and reset rotation are now distinct tools instead of a combined one. • Soil data will be converted when a soil model specified in different units is imported. • It is now possible to remove galvanic series affected segments. • Entity panel has been improved and simplified. • The first component of successive cross-sections assigned to the same path will be electrically continuous, even if height or lateral offset are different. • SESTextEditor is now the default viewer for the output files (F09).

Right-of-Way

- The **Create Circuit** module can now use all physical processor cores to speed up the creation of the circuit if launched from RowCAD. By default, half of the available cores will be selected.
- The program can now automatically compute the equivalent ballast resistance considering soil variations along the right-of-way:
 - In the **Create Circuit** module, the equivalent shunt impedance per rail and rail-to-rail connection impedances are computed automatically along the rail tracks considering the interactions through the ballast and local soil variations;
 - In the **Total Interference** module, the equivalent coating resistance per rail is computed automatically along the rail tracks considering local soil variations, and is used when generating the **Total Interference** (MALZ) models.
- The **Plot & Report** module was reorganized. All plotting options now appear on a single screen. In particular, the **Advanced Plot** module is now completely integrated into this screen. Moreover, several new features were introduced, including:
 - **2D-Curve** plots can now be generated in the SESPlotViewer format.
 - **Record** and **Play** Macro commands are available for several plotting options.
- Introduced **No Interaction** line. A new flag of “No Mutual” is added in the **Phase Leakage...** status options in addition to “Real”, “Dummy” and “Zero-Impedance”. If a phase line is defined as “No Mutual” for a section/region, the line won't have any interactions with the rest of all lines, i.e., no MUTU command and only SELF command for this line will be in the SPLITS circuit SP_*_0.F05 file generated by **Create Circuit**.
- The maximum allowable number of phases was increased from 100 to 200.
- When calculating the holiday resistance of a pipeline, the program now uses the lowest soil resistivity amongst all soil layers occupied by the pipeline in order to get the highest holiday current density for AC corrosion status evaluation.
- For **Steady-State** cases in the **Total Interference** module, the methodology for computing the envelope of **Metal GPR** was improved to prevent overestimating the results.
- The program can now produce the **Percentage** files (**GPRTouchVoltage**, **GPRTouchingStress**) for Cable and Group paths.

Program

What's New

Right-of-Way

- The program can now import transformer data specified in the RowCAD file, i.e., *.rowx or *.rowcad.
- In **Steady-State** mode, the **Total Interference** module now generates **Total Interference** model (MALZ) files only for soil regions where the pipeline exists, leading to greater efficiency.
- The generation of **Total Interference** models has been improved, to reduce problems with:
 - The presence of conductors in a shifted path going in the reverse direction relative to those on the original path;
 - Regular pipeline and mitigation connections;
 - Pipeline and mitigation connections when more than one mitigation wire are present on the same side of the pipeline.
- It is now possible to compute only inductive interference effects only in the **Total Interference** module, i.e., exporting/including energized towers in **Total Interference** models is now optional.
- The Right-of-Way Scenario file for the **Active Scenario** can be reviewed and edited from the interface using the SESTextEditor tool.
- The Scenario folder can be quickly accessed by clicking the **Active Scenario** path displayed at the bottom of the main Right-of-Way screen.
- In the **Create Circuit** module, the presence of a negative coating thickness is now detected and replaced with a default coating thickness in the calculations.
- In the **Total Interference** module, the **Coating Correction** now fully accounts for the complex nature of the leakage impedance of the coating.
- The **Total Interference** module now uses the pipe **Coating Resistance** directly (if specified in the **Cross-Section** definition) instead of relying on the equivalent resistivity of the coating.
- The program handles errors better, reporting appropriate error messages rather than failing silently.
- When running a **Monitor Fault** operation, the program no longer produces an empty SPLITS input (.F05) file for the first fault location.
- In the **Total Interference** module, observation points (profiles) defined in the template file are now computed and reported in **ROWPlot**.
- In the **Monitor Fault** module, fault current interpolation can now be applied to any phase, including phases that are DUMMY in one or more terminals.

Program	What's New
Right-of-Way	<ul style="list-style-type: none"> • A plotting macro can now be recorded and replayed in the Advanced Plots screen. • The GPR to Touch Voltage and GPR to Coating Stress Voltage are now produced for Cable and Group paths. • Conductor grids and other such components that are part of the MALZ template file for Total Interference are now transferred as objects (as opposed to a simple group of conductors) in the Total Interference model file. • Several ranges of profile numbers can now be specified when generating Advanced Plots.
SESShield-3D	<ul style="list-style-type: none"> • Arrangement of items within the Construction Tree panel facilitated by automatic scrolling. • Supports 64-bit environment, significantly enhancing computation speed and overall performance.

3. Applications

The following enhancements were made:

Application	What's New
RowCAD	<ul style="list-style-type: none">• The Create Circuit module automatically uses all physical processor cores (by default) to speed up the creation of the circuit and compute different regions in parallel.• A new panel called "Devices" is introduced. Transformer devices can be defined in the RowCAD interface using the integrated TransformerDataEditor (TDE) module.• Possibility to specify a path as rail-track and define the ballast resistance so that Right-of-Way can automatically compute the equivalent ballast resistance considering soil variations along the right-of-way.• It is possible to update a circuit SPLITS .F05 file immediately when the Terminal Energization is updated without calling Create Circuit.• It is possible to update a circuit SPLITS .F05 file immediately when any Entity model is updated without calling Create Circuit.• Methods of displaying line interaction mapping, i.e., Generate Region results, are greatly improved.• The SESCAD models for entities are now opened in a "no soil" defined mode, since soil attributes will be automatically imported from the corresponding soil region where the entity is located.• Error message pertaining to short segments improved to display the value being used as a reference, and the cross-section it comes from.• Includes an implied high source impedance when energization set to Dummy.• RowCAD can detect short or long segments that will cause issues in the computation.• Generate Regions computation can be paused and resumed via corresponding buttons in the Computation Trace panel.• Possibility to use segment number to assign Cross-Sections and Soils.• Soil data will be converted when a soil model specified in different units is imported.• Remembers the user-defined UI layout from the previous session.• Capability to insert a polyline point at a specific location in the coordinates list.• Detects that a phase is not active on any path.

Application	What's New
SES3DEngine	<ul style="list-style-type: none"> • Selection of conductor segments can be done entirely graphically from a 3D view of the conductors network. Further refinement on the selection(s) is also possible through filtering, either by Depth, Radius, Coating Type, Conductor Type, Length, Segment Number, Conductor Number or Cable Type.
SESAmpacity	<ul style="list-style-type: none"> • There is a new module to calculate the Temperature Rise of HVDC land ground electrodes, and a corresponding .F05 file has been added to the Examples folder.
SESCDEGS	<ul style="list-style-type: none"> • The new SESShield-2D program can be launched from the Programs tab. • The new SESAutoGroundDesign program can be launched from the Programs tab. • Can use SESTextEditor to view computation output files. • New icons for multiple modules, programs and tools.

Application

What's New

SESCircuitSimulator

- The **System Busses** datagrid has been reordered to make it more efficient.
- Sections can be removed easily with a right-click option.
- **Import Data** button added to **Sections** panel.
- Section properties can be imported easily from a TRALIN F27 file via the **Import Data** button.
- Units and related terms are now consistent with those of the TRALIN F27 file. Span Length units are now in p.u. and have been renamed to **Span Length Ratio**, the Section Length has been renamed to **Reference Length** and the **Impedance** units are in Ohms only.
- A validation mechanism is implemented for Grounding Impedance points.
- A retro-compatibility mechanism is implemented to consider the Grounding Impedance points.
- Implemented a shortcut key (**CTRL+F5**) for reloading files.
- An interactive 3D Viewer with many display options has been added and is shown by default at application startup.
- Users can load/unload the 3D Viewer to reduce memory consumption or gain space.
- An interactive 3D rendering plot is now available in the **Examine Session** panel.
- Memory consumption is optimized to allow for even larger files to be opened.
- A tooltip has been added for the **Span Length Ratio** field in the **General Information** section of the **Terminal Properties** panel.
- The viewing of F09 files in SESTextEditor has been facilitated with the addition of a shortcut in the **Computation Trace** panel.
- The behavior of the read-only sections of the **Properties** panel has been improved, when **Transformer Definitions** has been selected in the **Navigation** panel.

Application	What's New
SESCConverter	<ul style="list-style-type: none"> • The SES Input Command Language (SICL) file specified in the application can be sent to SESTextEditor for detailed examination. • Anonymous block references in DXF/DWG files are handled in the same way as those of normal blocks. • When entities are requested to be converted to a <i>buried</i> electrode type (applicable to MALT-type conversions only), buried electrode structures are created based on the organization by layers of the CAD file. • The thickness of plates created by the conversion process can be better controlled and is taken as twice the radius specified for the entity type that will produce the plate, rather than being based on the global default conductor radius. • The application has been upgraded to a 64-bit platform, which implies that much larger files can be loaded and converted than was previously possible. In standalone mode, it runs the 32-bit or 64-bit version, according to the platform of the operating system. If it is called by a 32-bit program, such as SESCAD, it will run the 32-bit version. • Conversion of DXF entities of type "PolyfaceMesh" and "3DFace" to SES Plates has been enabled for the HIFREQ file type; it was previously only available for the MALT file type. • A computation frequency can be specified for the conversion to the MALZ or HIFREQ file. The Units and Frequency fields can also be inherited from the CDEGS template files storing the user's preferences for the selected file types, if they have been generated. • Conductors resulting from the conversion process can be automatically organized in groups that are based on the organization by layers of the DXF/DWG file. • An option to specify the starting depth of rods was added to the settings window so that they do not have to start at the soil's surface.
SESCrossSection	<ul style="list-style-type: none"> • The validation conditions for the Geometric Mean Radius (GMR) have been improved. • The Z=0 limitation has been removed for CorrCAD. • The maximum allowable number of phases was increased from 100 to 200 when ROW/ RowCAD is selected as the Configuration Mode.

Application	What's New
SESCurveFit	<ul style="list-style-type: none"> • The prefix for SESCureFit files, "CF", automatically appears in the File name field of the Save As dialog. • The horizontal and vertical scrollbars have been adjusted to improve the user experience.
SESeBundle	<ul style="list-style-type: none"> • SESTextEditor can now be invoked via the SHIFT+F5 shortcut. • A ribbon command button and shortcut key were added to view F09 reports.
SESFFT	<ul style="list-style-type: none"> • A new type of plot, 3D Interactive, is introduced, and is the new default Plot Type for Inverse FFT computations. • New option to force FFTSES to use all computation frequencies for the full spectrum instead of iteratively recommending new ones. • Non-contiguous segments or different ranges of segments can be displayed for any given quantity within the same 2D plot. • Optimized rendering of the 3D Plots.
SESImpedance	<ul style="list-style-type: none"> • Possibility to obtain the characteristics of a user-defined equivalent hollow conductor.

Application

What's New

SESLibrary

- Added **Enclosed Cables** to the database.
- Improved the consistency of the SESLibrary interface.
- Added **Structures** to the database.
- Add 3-Phases **GIS/GIL** to the database.
- Database refreshes faster after settings changed.
- **3D Viewer** shown in import mode.
- Added a new flag to show estimated values for the **Relative Resistivity** and **Relative Permeability** whenever these values are not computed from the other entered conductor parameters.
- Anode conductors from the **Conductors** database have been copied to the **CP/Mitigation** database to facilitate their retrieval.
- Added an **Annotations** view when creating **Cables**.
- The datagrid super headers (**Cables** , **GIS/GIL** and **CP/Mitigation** databases) were redesigned.
- Implemented the Search tool for the **CP/Mitigation**, **GIS/GIL**, **Fence Posts**, and **Cables** databases.
- Implemented the Search filters for the **CP/Mitigation**, **GIS/GIL**, **Fence Posts**, and **Cables** databases.
- Implemented a **Customize Display** button for the **CP/Mitigation**, **GIS/GIL**, and **Cables** database.
- Multiple items can now be deleted at the same time, making database maintenance more efficient.
- Implemented a **Scientific Notation** setting.
- Improved the interaction with the user when importing a *.scc file (Legacy SESConductorDatabase file).
- **SESImpedance** field added for **Fence Posts** and **CP/Mitigation** databases.
- Implemented the **Internal Impedance** computation for the **Fence Posts** database.
- Rail conductor name and data fields added to the **Calculate** dialog window in order to show the equivalent radius for the **Reference Values** and **Target Values**.
- Inner and outer radii of a conductor are automatically computed when the **Strand Radius** and **Number of Strands** are modified.
- New flags added to show estimated and computed values for the **Relative Resistivity** and **Relative Permeability**.

Application	What's New
SESLibrary	<ul style="list-style-type: none"> • Added an option in the Properties of the Conductors database to instruct the program as to whether current is applicable to conductor parameters. • Added an Annotations tab in order to enter conductor properties that cannot be entered from the Properties tab. • Behavior of the Customize Display tool improved in order to let the user select all the available fields at once. • Updated some databases icons. • Modification of SESImpedance files no longer restricted to Create/Edit window. • The aspect ratio of the 3D Viewer is consistent for any Display Unit. • Improved the specification for GIS/GIL and made it more efficient and intuitive.
SESPlotViewer	<ul style="list-style-type: none"> • Different types of series can be plotted together (Line, Scatter, and Stair Step). • An Add Point option has been introduced to the "Line Interaction" context menu. • Implemented a shortcut and a button in the ribbon for opening files directly in SESTextEditor. • Implemented a reload shortcut key (CTRL+F5). • Implemented a Stair Step plot type. • Implemented an option to view/change the pixel tolerance for a point selection. • Implemented an option to show/hide an axis. • Added a <i>Save</i> option to the Quick Access toolbar. • Added an option to synchronize the horizontal and vertical axes. • Actions on the plot control can be undone or redone. • Actions on the data grid can be undone or redone. • Improved grid in the Data panel and made it similar to those in other applications. • The online help was introduced.

Application

What's New

SESResap

- Warnings will be displayed if the measurement data exhibits unusual trends for a horizontally layered soil, such as an apparent resistance increasing with measurement spacing or an apparent resistivity curve with a slope greater than 45 degrees (on a Log-Log scale).
- The plot supports double axes, the primary axes is used to plot the electrode spacing versus **Data type** (apparent resistance or resistivity) whereas the secondary axes is used to plot the soil model depth versus the soil model resistivity.
- A new selection checkbox was added to the **Traverse** tabs. Unselected traverses are not plotted on the graph, as an indication that they are excluded from the analysis regardless of whether any individual point was selected under that traverse.
- The probe depth columns are disabled when **Apparent Resistivity** is selected as the **Data type**.
- Each traverse can be saved as a new file. There are two options for saving a file, with default or with current analysis options. Both options will retain the system of units of the original file. The second option will retain the **Project description** and **Module description**, the **Soil type** and all other **Computation** and **Optimization** options. When the file is saved, an SESResap session will be launched with the saved file loaded.
- Multiple files can now be imported; the traverses defined in each imported file will be added to the ones already defined in the current session. If the imported file has a different system of units, the user is presented the option of either converting the data before importation or importing data without conversion.
- The **Computation Results** panel tabulates the computed soil model after completion of a run. This table can be copied and pasted for inclusion in a report. A **Result Status** indicates whether the output data presented in the table is up-to-date with respect to the input data.
- The computed apparent resistivity curve for a fully specified initial estimate soil model can be plotted and compared to the measured data before optimizing computations are launched.

Application	What's New
SESEResultsViewer	<ul style="list-style-type: none"> • An interactive 3D rendering plot is now available. • The Ribbon features a Tools tab to access various software tools relevant to SESEResultsViewer. • The legacy zoom tool has been replaced with the new SESZoom tool, with an intuitive interface that can be used to draw arbitrary-shaped polygons, to edit polygon vertices graphically, to shift polygons in their coordinate plane, and to recall an active bounding polygon when SESZoom is reopened after closing.
SESSystemViewer	<ul style="list-style-type: none"> • The Multilanguage interface for SESSystemViewer is now available in Japanese. • Two new interactive mouse zoom modes were introduced to help users focus on specific regions of the 2D or 3D plot. • The existing Define 3D Zoom Region section of the 3D Settings and Navigation Parameters dialog screen has track bars that simplify and speed up the global zoom experience. The interactive mouse zoom functionality can be accessed from there as well. • A new 3D spot mode was introduced as an alternative to vector plots. This mode allows 3D plots for arbitrary profiles located on a planar surface but with different lengths, number of points and orientations (directions). • The classical 3D plots have been upgraded and support profiles located on a planar surface that have different lengths, number of points and orientations (directions) that are quasiparallel, and spaced similarly. Although equal profile spacing, profile point spacing and same direction are not required i.e., the spacing differences, length differences, number of point differences and direction differences must be reasonable. A number of parameters have been introduced to control the magnitude of the differences that can be tolerated. • The Preferences and Settings dialog screen has been expanded to control a number of important parameters. • Several additions and enhancements were already introduced but were not implemented in this first release. SES will post an upcoming update on its website that include the new features and will describe them.

Application	What's New
SESTextEditor	<ul style="list-style-type: none"> • The application now supports any text file, not just SES .F05 input files. In particular, it can be used to display .F09 output files. • For .F05 input files, the command help relevant for the line where the caret is currently located can be accessed by pressing the F1 key. • When other SES applications offer to view an .F09 output file, SESTextEditor is now invoked by default. The SHIFT+F9 shortcut key combination has also been implemented in these applications for quick access to this feature, which complements the SHIFT+F5 shortcut key combination to open the current .F05 input file in SESTextEditor.
SESTralin	<ul style="list-style-type: none"> • Icons in the Specification Mode group of the Home ribbon are now transparent, which facilitates discernment of the selected mode. • New button in the Home ribbon enables SESTextEditor to be launched directly from interface for viewing .F05 and F09 files. • Order of options under the Mode menu in the backstage is now consistent with their order in the tooltips.

Application	What's New
SESTransient	<ul style="list-style-type: none"> • Conductor segments can now be selected graphically from a 3D view of the conductor network. • Further refinement of selection(s) can be done by filtering according to criteria such as: Depth, Radius, Coating Type, Conductor Type, Length, Segment Number, Conductor Number or Cable Type. • Quantities selected in the Conductors and Profiles tabs of the System panel view are now cross-validated against the content of the HIFREQ template. Any inconsistency is reported as either a warning or error in the Issues List. • The Results section was adapted to take into account the 3D selection(s) of conductors as made in the new System view. • Implemented a shortcut key (CTRL+F5) for reloading files. • Non-contiguous segments or different ranges of segments can be displayed for any given quantity within the same 2D plot. • Optimized rendering of the 3D Plots. • A project can now be closed without opening or creating a new project. • A new button in the System view allows extracting a different set of results from the FFTSES databases for the same quantity, without computing new frequencies . • The Computation graphical user interface has been improved. The HIFREQ Computation Progress bar indicates the number of frequencies ran over the total number of frequencies, for the current computation cycle. The parallel computation settings are now saved per scenario. The application icon flashes in the taskbar when the computation is completed.
SoilModelEditor	<ul style="list-style-type: none"> • Maximum Depth column was added for horizontally layered soils. • The Name field (for specifying the soil model name) has been removed from the Soil Properties panel, except for HIFREQ multi-region soils. • <i>Save</i> and <i>Save As</i> buttons were added to the Quick Access Toolbar. • Soil data is correctly converted when a soil model specified in different unit is imported. • It is now possible to import Soil Structure file types (i.e., SS_*.F05).
TransformerDataEditor	<ul style="list-style-type: none"> • A new transformer type, Scott-T, is now available to use in both SPLITS and HIFREQ modules.

Documentation

1. Introduction

Several new Video Tutorials and Mini How-to Manuals are included with version 17.0, and multiple existing Quick Start Guides, How-to Manuals, and Help documents were updated in all supported languages.

2. Video Tutorials

Video Tutorials are available to help you become familiar with SES Software programs. Each video offers an overview of the software's capabilities and provides a basic idea of how you can get started with using the software. The following new video tutorials are now available in English:

Video Tutorials (New)

- SESScript & Macros - 1 of 4 - Introduction
- SESScript & Macros - 2 of 4 - HIFREQ Model
- SESScript & Macros - 3 of 4 - SESScript
- SESScript & Macros - 4 of 4 - Macros & Plotting
- SoilModelManager - Getting Started

3. Mini How-to Manuals

Mini How-to Manuals provide detailed information about the individual steps required to complete specific tasks. Two new Mini How-to Manuals are included with version 17.0. Both are available in all supported languages (English, Chinese, French, and Spanish):

Mini How-to Manuals (New) - All Supported Languages

- FFTSES - Transient Ground Potential Rise of a Metallic Pole
- SESTralin - Double Circuit 400kV

A Mini How-to Manual that was previously introduced in version 16.2 in English only is now available in all supported languages:

Mini How-to Manual (New Translations) - Chinese, French, & Spanish

- SESTransient - Transient Ground Potential Rise of a Metallic Pole

4. Quick Start Guides

Our Quick Start Guides cover a broad range of topics at a level suitable for all users. The English versions of the following Quick Start Guides, as well as all the corresponding Chinese, French, and Spanish translations, have been updated:

Quick Start Guides (Updated) - All Supported Languages

- Quick Start Guide - CorrCAD Offshore
- Quick Start Guide - CorrCAD Onshore
- Quick Start Guide - Right-of-Way
- Quick Start Guide - RowCAD
- Quick Start Guide - SESShield-3D

5. How-to Manuals

Our How-to Manuals are excellent detailed guides that introduce the software and include instructions for how to complete a variety of studies from start to finish. The English versions of the following How-to Manuals, as well as the corresponding Chinese, French, and Spanish translations, were updated:

How-to Manuals (Updated) - All Supported Languages

- A Simple AC Total Interference Mitigation Study Using SES Software
- A Simple Substation Ground Grid Analysis
- A Simple Substation Grounding Grid Analysis Using AutoGrid Pro
- Analysis of AC Interference Between Transmission Lines and Pipelines
- Automated Grounding System Design Using AutoGroundDesign
- Computation of Capacitance and Inductance of Conductor Networks
- Computation of Transient Currents in RLC Circuits
- Electromagnetic Fields Under a Transmission Line and Induced Currents on a Fence
- Electromagnetic Fields near a Transmission Line Tower Subjected to Unbalanced Currents and a Phase-to-Ground Fault
- Large Suburban Substation Grounding System Analysis: Measurements & Computer Modeling
- Lightning Transient Study of a Communication Tower
- NCC-SES Gas Insulated Substation Grounding Analysis
- SESEnviroPlus - Electromagnetic Environment Study
- SESShield3D: Direct Lightning Stroke Shielding of a Substation
- SESTLC - EM Field and AC Interference Study
- Urban Area Substation Analysis

6. Online Help

The context-sensitive online help documents for many applications were updated. The online help document for SESPlotViewer is now available in all supported languages (English, Chinese, French, and Spanish) and the online help document for SESSystemViewer, for which there is now a Japanese version, was extensively revised.

To access these help documents, select **Manuals & Help** from the **Help** tab of the application interface, or simply press the [F1](#) key.



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