SES Software

New Features & Enhancements

Version 20.0 **2025**

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Introducing SES Software Version 20!

We are thrilled to present SES Software version 20, packed with new features that create a smoother, more integrated user experience and elevate its powerful technical capabilities to new heights.

Key Enhancements

- **Real-Time Version Notifications:** Stay updated with real-time notifications and enjoy a streamlined automatic update process.
- **Performance Boost:** Experience a 30% increase in file reading speed and more fluid graphical interactions.
- **New File Launcher:** Open associated applications with a simple double-click on any F05 or F21 file.
- **Improved Organization:** Documents and resources are now easier to find following a comprehensive reorganization.
- **SESPlotViewer:** Preserve your preferred plot styles and attributes.
- **SESBatch:** Reaches maturity with continuous modernization efforts.

Advanced Technical Capabilities

- **Soil Structure Analysis:** Our expertise is further solidified with the Driven-Rod measurement method interpretation in SESResap and the inaugural version of vertical soil models in HIFREQ.
- **Enhanced Modeling Realism:** Include more realism in your models with new concentric cable and metallic plate models in MALZ. HIFREQ now supports magnetic shielding and frequency-dependent power transformers.
- **Refined Accuracy:** Improved cable models in HIFREQ and TRALIN incorporate proximity effects for calculations in pipe-type cables.
- **Optimized SESLibrary:** Now includes new permeability, curve-fitted permeability, transformers, and coatings databases.
- **SESShield-3D:** Now allows multi-zone shielding analysis with the Rolling Sphere method.

Evolving Integrated Programs

- **CorrCAD:** Features an improved, more accurate iteration approach for Working Potential polarization types.
- **SESTrainSimulator:** Boosts computational efficiency with automatic detection of previous computation files and parallel file creation.
- **ROWCAD:** Is now graduating to Right-of-Way (ROWCAD), becoming a standalone interface for the Right-of-Way computation engine.
- **SESAmpacity:** SESAmpacityBM is now SESAmpacity and is enhanced with the features of Ampacity.

All these changes allow Right-of-Way and Ampacity to be moved to the Legacy Applications folder and enable applications including CDEGS-Legacy, the legacy AutoGroundDesign, and SESCurveFit to be removed, streamlining the list of applications in CDEGS folders.

For a complete list of notable enhancements in version 20 of SES Software, please consult the following pages.

General Improvements

Updates on Application Availability

- **New Integrated Application:** The new SESBatch is no longer in beta, and it provides a robust solution for running multiple CDEGS programs consecutively or simultaneously.
- **Moved Applications:** Right-of-Way (superseded by Right-of-Way [ROWCAD]) and Ampacity (superseded by SESAmpacity) were moved to the Legacy Applications shortcut folder (to be completely removed in future years).
- **Removed Applications:** CDEGS-Legacy, Legacy AutoGroundDesign, SESCurveFit, and other legacy tools and applications have been removed.
- **Restructured Applications:** RowCAD is now Right-of-Way (ROWCAD), which indicates it has become a complete, standalone interface for the Right-of-Way core computation engine. SESAmpacityBM is now SESAmpacity, and it combines the old application features and bimetallic calculations.

Restructured Documentation

- Documents and resources are easier to find because program settings and reference material, such as how-to manuals and quick start guides (with their associated example files), now reside in the System and DocRef folders, respectively, in the public Documents location of SES Software.

Core Improvements

- We have introduced the ability to associate SES .F05 and .F21 files in Windows with the CDEGS File Launcher program. This feature automatically selects the appropriate program to open these files based on their two-letter prefix, streamlining the file-opening process and enhancing efficiency. Additionally, its intuitive user interface allows users to customize and modify default program associations for these file extensions, empowering them to easily adjust settings based on their preferences and providing greater flexibility and control over file management.
- Notifications now inform users whenever there is a new version available (either a hotfix or a major release).
- When a crash occurs due to an issue that has been solved in a newer version of SES Software, a feature now notifies the user to download the newer version. The user's files are automatically backed up, preventing frustration and ensuring data integrity.

- Updates can now be downloaded and installed directly from within the running application, eliminating the need for external downloads or authentication. After installation, the environment is restored to its original state, minimizing hassle and work downtime.

Enhancements

Main Software Packages (Programs)

Improvements made:

Package	What's New
CorrCAD	• SESPlotViewer has been integrated into CorrCAD, allowing users to access it directly from the CorrCAD interface. • The speed of breaking a polyline into multiple segments has been greatly improved, now taking less than 30 seconds for ~50,000 points. • The program can now detect whether Google Earth is installed correctly before launching a Google Earth plot. • The new integrated plot module is divided into two categories with enhanced rendering features: 2D and Interactive 3D. • The archive file format has been removed. • 'Automatic Subdivision' is turned off when additional subdivision occurs during polarization computation. • The Archive feature has been enhanced with a variety of archiving options.
Right-of-Way	• The potential coefficients, shunt admittances, and shunt impedances are now set to zero (or infinity) between cable components that cannot interact physically. • The interpolated fault current data can be plotted from the Monitor Fault screen. • In Total Interference, a ground rod can now be exported at the Central Site for a phase for which towers were not requested to be exported. • Coating corrections can be applied when using a Multi-Region soil in the Total Interference module. • The arc distance calculation equation has been improved for soil resistivities ranging from 100 ohm meters to 1000 ohm meters, that is, where Sunde's formulas need to be interpolated. • The JobID of the run that yielded the largest value is displayed as 'Point Name' in SESPlotViewer when creating envelope plots. • A 'Design Objective' can be added to a greater number of plots. • Design Objectives are now implemented in 2D SESPlotViewer files as Guidelines.

Package	What's New
	• A different color is now used in SESPlotViewer graphs for each data series representing a terminal.
Right-of-Way (ROWCAD)	• The application name has been updated from RowCAD to Right-of-Way (ROWCAD). • The file structure has been revised to no longer use an encapsulated .RowCAD file. Existing project files will be automatically converted to the new structure when opened in the application, and changes will be made permanent on the next Save action, whether explicitly requested or implicitly triggered by some other action, such as launching a computation. • Scenario files (*.RowCAD or RC_*.F05) can no longer be opened directly. In other words, only project files (*.rowx) that point to scenario files can be opened. • It is now possible to restrict the files being backed up to a much smaller subset of essential scenario specification files. This speeds up backup times significantly. • In the Monitor Fault screen, it is now possible to define a fault at the Central Site. • The 'Fault at' option in Total Interference is now available (as was the case in the legacy Right-of-Way). • Non-energized towers can now also be included in Total Interference MALZ files (as was the case in the legacy Right-of-Way). • Profiles or observation points defined in Entity files are now also transferred to the Total Interference files. • The Advanced screen of the legacy Total Interference module is replicated in Right-of-Way (ROWCAD). • Control over the embedding or not of electromotive force (EMF) terms in MALZ model conductors has been added to the Total Interference screen (as was previously the case in the legacy Right-of-Way). • The Plots and Reports module, re-implemented in Right-of-Way (ROWCAD), was modernized and reorganized to simplify the selection and generation of analysis results.
SESAutoGroundDesign	• A designed arbitrary shape can now be added using the mouse in the graphical area or defined in the data grid using coordinates. • The issues of the self-crossing grid or the duplicated vertices in the design stage can be inspected before doing computations.

Package	What's New
SESShield-2D	• The Substation Definition ribbon buttons' behavior has been synchronized with the Navigation panel when adding or removing phases, protection, and equipment.
SESShield-3D	• The new Multi-Zone shielding analysis capability allows for the analysis of a substation with multiple critical lightning currents using the Rolling Sphere Method in a single model. It displays a single accurate, easy-to-understand graphical rendering of results, along with individual reports for each zone. • Zone Definition, including the zone name, striking distance calculation method, and electrogeometric model, has been added to the Object Properties Panel. The fields are editable when a zone node in the Construction Tree is selected. When objects are selected, the characteristics of the zone they belong to are shown as read-only. • In Multi-Zone mode, the application provides independent reports for the analysis of all zones in a Multi-Zone mode project. The protection status is listed for each zone at the end of the relevant report. • Ground Interception Volume for Multi-Zone mode cases has been made visible. • Shielding Failure Analysis is not available in Multi-Zone mode, therefore the Shielding Failure Analysis definition screens have been disabled for multi-zone projects. • The commands lines to open a file if requested on launch of the application (CDEGSLauncher) have been added. • Ground volume can now be hidden in multi-zone cases when requested by the user. • A case with a pending change is now saved prior to running it. • The program can directly import CAD files (.dxf, .dwg) by automatically calling the SESConverter application to perform the necessary conversions.

Computation Modules

Improvements made:

Computation Module	What's New
FCDIST	• The output (F09) file now includes a table listing the Thevenin Equivalent of each terminal. It is now possible to omit the metallic return path (neutral) along a terminal. It is now possible to specify that the neutral in a block of sections is not grounded or that the mutual interactions between the phase and neutral wires in a block of sections are to be ignored.
FFTSES	• The calculation of the Fast Fourier Transforms is now much faster, leading to significant overall speed improvements in the program when computing several quantities in the same case.
HIFREQ	• A singularity removal technique was introduced to improve the accuracy of the integrals required to compute the electromagnetic fields due to metallic plates and finite volumes. • Support for proximity effects in enclosed cables has been added. • The ability to account for magnetic shunting effects in HIFREQ models including metallic plates has been introduced. • The ability to account for the frequency-dependence of the behavior of power-transformers (wideband transformers) has been introduced. • Multilayer Vertical soil model has been introduced. • The number of segments that can be generated through the Auto-Subdivision feature can now be controlled by the user. • In HIFREQ, a source impedance can be specified with the Energization command.
MALZ	• Support for cables has been introduced. • The ability to specify a source impedance on Voltage and Potential (GPR) energizations has been introduced. • Support for plates has been introduced. • MALT now allows simultaneous usage of plates and finite volumes. • MALT and MALZ account for the presence of plates in the patch subdivision process for finite volumes. • The number of segments that can be generated through the Auto-Subdivision feature can now be controlled by the user. • In MALZ, a source impedance can be specified with the Energization command.
RESAP	• Support for soil resistivity measurements carried out using the Driven Rod method has been introduced.

Computation Module	What's New
SIRPS	• Support for cable data and filters related to cables for MALZ in SESResultsViewer has been added. • In the SIRPS plotting engine, there is now greater flexibility in the selection of cable components for which results will be displayed. • Support for plots and reports for RESAP cases that use the Driven-Rod measurement method has been added.
TRALIN	• It is now possible to model asymmetrical currents to account for proximity effects between cables in pipe-type (multi-core) cables. • The potential coefficients, shunt admittances, and shunt impedances are now set to zero (or infinity) between cable components that cannot interact physically.

Applications

Improvements made:

Application	What's New
CDEGS	• SES .F05 and .F21 files in Windows can be associated with the CDEGS File Launcher program. This feature automatically selects the appropriate program to open these files based on their two-letter prefix, streamlining the file-opening process and enhancing efficiency. Its intuitive user interface allows users to customize and modify default program associations for .F05 and .F21 file extensions, empowering them to easily adjust settings based on their preferences and providing greater flexibility and control over file management.
SESAmpacity	• This program has completely replaced the legacy application and now combines the old application features and the bimetallic calculations.
SESBatch	• Macro runs are fully supported. These runs use the SES plotting and reporting engine (CSIRPS) to generate plots and reports based on data from engineering computation databases (*.F21). • The following run details are displayed on top of each computation trace tab: Working Directory, Program, JobID, run times, and RAM Consumption. • Total application runtime is displayed in the main UI. • Computation logs are saved for the full batch run as well as for each individual module run. • The checkbox Selected has been added to the batch runs table header, allowing users to quickly select or deselect all items.

Application	What's New
	• Batch log file is accessible from the main interface, and each individual run contextual menu contains a button to open the run log. • Using the run Context Menu, it is now possible to open any run location in Windows Explorer.
SESCAD	• Properties of various CP/mitigation wires for conductor types can now be imported from SESLibrary.
SESCAD	• Support has been added for vertically layered soils in HIFREQ. • Support has been added for plates and cables in MALZ and for the inclusion of proximity effects in cables. • A 'Not Applicable' category in the Display Filter (to identify elements for which a filter does not apply) has been introduced. In the Characteristics and Quick-Info screens, the outer radius of cables for conductors whose Cable-Type is not zero is displayed. • In the legacy version of SESCAD, support has been added for the specification of source impedances on Energizations.
SESCPCalculator	• The appearance and performance of the Project Info page have been improved. • Report format has been improved.
SESCircuitSimulator	• The computation results are displayed in the 3D View panel, and they can be customized through the settings of the 3D View. • A Go To button is now next to each section in the Navigation panel, clicking on which brings the focus of the 3D View to that specific section. • A large portion of the interface is dedicated to the 3D View so that the user can examine the circuit more easily, and the Properties panel does not occupy an extra space in the new interface; instead, the wide panel that is used for the 3D View has a Properties tab to display the properties of the system. • In FCDIST mode, when the Multi-Layered cable type is selected as block configuration, the addition and removal of cable components and layers is considerably improved. • The 3D View now supports display of FCDIST circuits and displays the computation results. • In FCDIST mode, it is now possible to omit the metallic return path (neutral) along a terminal by selecting the checkbox 'There is no metallic return current path along this terminal.'

Application	What's New
	• In FCDIST mode, it is now possible to specify that the mutual interactions between the phase and neutral wires in a block of sections are to be ignored by selecting the checkbox 'Ignore mutual induction on neutral wires.' • In FCDIST mode, it is now possible to specify that the neutral in a block of sections is not grounded by selecting the checkbox 'Neutrals are not grounded in this block.' • Navigating between the Specification and Examine Session panels no longer clears the results in the Examine Session.
SESConverter	• CADEditorX Version 15 has been integrated into the program. • The input file names can be reloaded using new refresh buttons. • Settings now has the option to disable displaying the loaded model in the Converter Viewer, thus avoiding excessive loading times for large CAD files.
SESCrossSection	• The panel to define concentric cables has been redesigned to conveniently show the properties of all layers. • The panel to define the enclosure of pipe type cables has been redesigned to conveniently show the properties of all layers. • Data in the selected cells in the data grid can be copied and pasted in the applications. • A new GCS-Manual Configuration Mode has been added. • The Area Resistance and Length Resistance have been added for insulation layers in cables.
SESCurvefitDigitizer	• F05 files can now be opened directly in SESTextEditor from the application via a hotkey or the button on the ribbon. • The data validation on the Digitized Data grid has been improved. • Fitting results obtained using the Manual Fit option can now be reset to their initial state. • The quality of image positioning has been improved. • The option to keep the sliders on the axes of the image after calibration has been added. • Undo actions can now be applied to 'Fit Process Parameters' and other controls. • Parameter changes in the Type of Polarization Curve Axes and Associated Units are now compound Undo actions.

Application	What's New
SESImpedance	• The program automatically determines the appropriate number of vertices to add to each edge of a given primitive shape (triangles, rectangles, or polygons). Therefore, there is no need to increase the number of vertices beyond their natural size.
SESLibrary	• A new Permeability database has been introduced. It contains typical and curve-fitted electrical permeabilities for various materials. • A new category filter (Phase) has been added to the GIS/GIL database. • The importation screen is now opened as a dialog to store the loaded databases in memory. • Electric Strength can be imported from SESLibrary to applications such as ROWCAD. • A new Coatings database has been introduced. It contains specific pipeline coating resistances for different quality condition ratings. • The user can generate SESImpedance models from geometrical structures and electrical characteristics stored in the database to compare resistivity and permeability values with the manufacturer-provided data for several types of conductors in SESLibrary. • A new Transformer database has been introduced. It contains the electrical characteristics of typical power transformers, which can be used in HIFREQ and SPLITS computation modules. • Curve-fitted permeability data for typical non-oriented and grain-oriented electrical steel has been added to the database.
SESLicenseManager	• An option has been provided to allow or disallow collection of software usage metrics and other data.
SESPlotViewer	• The SIRPS engine used by SESResultsViewer and SESBatch macro files can produce SESPlotViewer files for 2D plots, which present advantages in terms of presentation quality, interactive plot examination, data modification, and style customization. • The user can save selected elements of the graphical style of a plot as a template for reuse in other plots. • New example files have been added, including templates that are applicable when creating new files. • Background images can be rotated. • Data series can be exported to the SESPlotViewer (PL_.F05), Excel (.xslx), or comma-separated values (.csv) formats. • When exporting data from the Series ribbon or right-click menu in the Plot View panel, the contents included in the output file can be restricted through a series selector.

Application	What's New
	• The color of the legend background and frame can be customized. • The colors of major and minor ticks can be changed independently from the colors of the gridlines.
SESResap	• The Driven Rod measurement method is introduced. • The plot legend can be customized from the ribbon. • The options to add traverses, such as Average, Upper Limit, and Lower Limit, are available in the Home ribbon for quicker access. • Traverses can be saved to one or more new files using an array of new buttons in the Home ribbon. • Two new buttons in the Plot ribbon allow the plot to be exported as an image or saved as a SESPlot file.
SESResultsViewer	• The program can use SESPlotViewer directly for 2D plotting. • The program can now save a plot produced by SESPlotEngine. • In HIFREQ, a new option allows the specification of pipe-type and coaxial cable types and their selected components independently. In the case of pipe-type cables, components are specified by providing the index/name of the component in the list of available components for the selected enclosed coaxial cable; in the case of coaxial cables, components are specified by providing the index/name of the component in the list of components relevant to the selected coaxial cable. • The program now supports plotting plates in MALZ.
SESThreshold	• The calculation of step and touch voltage safety thresholds has been updated based on the latest IEC/CENELEC standards.
SESTrainSimulator	• Pipe enclosures are now supported. • The program detects previous computation files within the current computation time window and offers the option to include these files in the analysis to speed up computation (states corresponding to these files do not need to be recomputed). • Automated validation processes for train input data were improved. • Envelope plots are produced as part of the output. These plots can be visualized and analyzed in SESPlotViewer, offering a seamless way to interpret your results. • The program now gives direct access to individual state files, envelope results, and combined results. • DC corrosive current calculations can be executed. • A system can be edited with the new version of SESCAD or with its predecessor.

Application	What's New
SESTralin	• It is now possible to model asymmetrical currents to account for proximity effects between cables in pipe-type (multi-core) cables.
SESTransient	• Support for wide-frequency-band transformers is now included. • Conductor selections involving Filters are re-evaluated and updated each time the network is edited in SESCAD. • New plot types are available: PDF, JPG, PNG, and SESPlot. • Errors and warnings related to the HIFREQ template are now displayed in Issues List view. • A system can be edited with the new version of SESCAD or with its predecessor.
SESeBundle	• The program can be opened using a command line with a file path argument or by dropping an SESeBundle F05 file on the executable file.
SoilModelEditor	• The application now supports the Vertical soil model for HIFREQ. • The resistivity of air is (10^{12}) as the default value for all specifications.
TransformerDataEditor	• The name of the transformer is included in the Issues List items (such as error messages and tasks), which is helpful for models with multiple transformers. • Expanded high-frequency parameters have been introduced that allow the wideband modeling of power transformers in HIFREQ, which are suitable for harmonic and transient analysis. • The number of significant digits has been increased to a practically unlimited number of significant digits.

Documentation

Version 20 introduces a clean visual style, updated technical information, and newly translated documents. The key highlights are below.

Media	What's New
Interfaces	• All newly developed and updated program interfaces are available in English, French, Chinese, Spanish, and Portuguese. • More than 60 icons have been created or updated in the applications and online help.
Online help	• The context-sensitive online help for all applications has been updated to a clean, modern style.

Media	What's New
	• Context-sensitive online help for SESLibrary, SESConverter, SESTextEditor, and SESZoom has been updated with a user-friendly structured data format. Instructions are at the beginning. Fundamental user interface items are next, clearly marked. A dedicated section at the end contains detailed reference material and deep contextual information.
Support documents	• Support documents have been translated into German. They include activation instructions and installation documents.
Technical documents	• One new Quick Start Guide, for SESShield-2D, has been added, with translations to Chinese, French, and Portuguese. • All English How-to manuals (16) have been updated. All Chinese and Portuguese How-tos, one Spanish How-to, and two French How-tos have been translated based on the latest English documents. • The Legacy How-to manuals and Quick Start Guides have been removed, including their respective example files. • All Mini How-to manuals (4) and User's Guides (1) are now integrated into the Quick Start Guide collection. These guides were updated in English and Chinese. Six Quick Start Guides were translated into Portuguese for the first time, and one existing Portuguese guide was updated.
Video tutorials	• Twelve new, comprehensive video tutorials have been created for applications, including CDEGS (in English, French, Portuguese, and Chinese), SESShield-2D (English), MultiFields (two of four episodes complete, in English), and SESPlotViewer (in English and French). Whenever possible, videos were filmed with audio and UI in the target language.