SES Software

New Features & Enhancements

Version 17.1 **2022**

sestech.com info@sestech.com 1 450 622-5000

Introduction

Version 17.1 of SES Software includes several new applications, and multiple new features and enhancements. Please see below for more details.

New Applications

Version 17.1 of SES Software includes the following new applications:

Application	Description
SESCPCalculator	SESCPCalculator is a new quick tool that performs calculations to estimate appropriate cathodic protection to specific target structures to be protected against corrosion.
SESCurvefitDigitizer	SESCurvefitDigitizer is a corrosion-analysis supporting tool that offers full digitizer functionalities and general scientific curve-fitting capabilities.
SESTrainSimulator	SESTrainSimulator is the most recent addition to the CDEGS family of electromagnetic simulation tools. It provides an intuitive and simple design environment to help creating a railway model efficiently, in order to assess average and maximum electromagnetic fields and electric quantities related to the electrified railway industry.

Enhancements

1. Computation Modules

The following enhancements were made:

Computation Module	What's New
All Modules	• For clients with network licenses for multiple users, the maximum number of concurrent computations that can be simultaneously run on a single machine having multiple cores has increased, to a maximum of twice the number of reserved network licenses.
FCDIST	• Concentric cables with multiple cable components are now supported.
MALT	• The new 'MiniMax' option was implemented to improve control over the patch sub-division process for Finite Volumes. • One face of a finite volume embedded in a multilayer soil can be positioned directly on the interface between two soil layers.
MALZ	• The new 'MiniMax' option was implemented to improve control over the patch sub-division process for Finite Volumes. • One face of a finite volume embedded in a multilayer soil can be positioned directly on the interface between two soil layers.
RESAP	• The computed apparent resistivity curve data are printed at the end of the .F09 output file not just for the specified measurement spacings, but also at all interpolated points such that data for the whole curve can be examined.

2. Main Software Packages

The following enhancements were made:

Package	What's New
CorrCAD	• In the Galvanic Series Definition screen, polarization curves can be selected directly via a dropdown menu in the Polarization Curves column. • In the Energization List, multiple rows or columns can be edited simultaneously. • The Number of Significant Figures defined in the Settings panel works properly throughout the program now. • Save Current 3D View can now capture the network or a result plot image (whichever is active). • Drag-and-Drop operations are available for the Cross-Sections, Soil Mapping, and Entity Models panels. • Computed results for OverPotential and Polarized Potential are available in the Results Plots module. • The program validates that the coating status, as indicated in the Cross-Section and in the Polarization Curve, is consistent. • SESTextEditor can be launched directly from the ribbon via the new View/Edit Input File button. • The computed Holiday Resistance is now printed and saved in the file \Results\WithPolarization\ComputedHoliday.txt for each soil definition, when the Computed method is selected in the Holiday Specification column of the Select Polarization Curve screen. • When system networks are displayed in SESCAD, the warning message regarding the absence of a soil model (which is not necessary to be diplayed in this context) will no longer appear, and SESCAD will be in read-only mode. • It is possible to connect two conductors or cable components together. The window defines a logical connection between two conductors: current flows from one of the conductors toward the other without passing through a physical connection between them. • Entity validation has been improved to consider cables and plates. • Further subdivision could occur occasionally in previous versions during the polarization iteration process, potentially leading to incorrect polarization results. This problem has been resolved in this new version. • In order to deemphasize their visualization in Spot-2D and Spot-3D plots, unpolarized objects are now plotted in a gray color. • The Min and Max values of the plot quantity are displayed on the Results Plots screen. • When no polarization curve is defined but Native Potential has been specified for a conductor, the Native Potential is now transferred to the MALZ and HIFREQ model files as the Working Potential for the computation. • Cables can now be defined in a cross-section. • SESCurvefitDigitizer, a new tool for digitizing data and obtaining polarization parameters based on user-specified polarization curves, is now available, and replaces SESCurveFit.

Package	What's New
CorrCAD	• A new polarization method, Anode & Cathodic Concentration Butler-Volmer, has been added. • Soil volume resistivity is transferred to the MALZ computation file. • Metal-to-Soil Potential is now a quantity that can be plotted in the Results Plots module.
Right-of-Way	• Right-of-Way now keeps all intermediate files related to the computation of the imped-ance of the ballast in a separate folder and copies this folder when saving a Scenario under a different name. • The maximum number of points in a single region for an individual path is now set automatically by the program when importing a RowCAD model. • In the Create Circuit module, the SELF commands for zero-impedance or DUMMY lines can now be omitted from the generated SPLITS circuit file, yielding much smaller files. • It is now possible to import custom tower definitions from a RowCAD model. These are used in the Create Circuit module by computing the tower resistances and in the Total Interference modules by importing the footings. • It is now possible to specify towers at the Central Site.
SESShield-3D	• Arrangement of items within the Construction Tree panel is now facilitated by automatic scrolling.

3. Applications

The following enhancements were made:

Application	What's New
GrSplits	• GRSplits opens the SPLITS or Fcdist F05 file (instead of the INP file) when started from within CDEGS.
RowCAD	• Changing the Minimum Cut Length now raises the modified file flag and clears the regions. • Maximum allowable number of phases increased to 200. • Connections allowed at Central Site and Terminal nodes. • Customized Tower Configuration definition and assignment interfaces. Customized tower labels on the viewer. • Transformers and Tower models can now be imported from the Import External Objects screen, which is accessed via the 'Import Scenario's linked objects' button. • The erroneous assignment of multiple entities at the Central Site node of the same path is now prevented. • Paths doubling back on themselves are now detected, and reported as an error.
SESCircuitSimulator	• Several SES applications (e.g. SESTextEditor, GRSplits-3D, SESScript, and others) can now be launched directly from the ribbon via the new Tools tab.
SESCombiner	• SESCombiner now combines the HIFREQ plate computation databases (X21 files) in addition to the regular computation databases (F21 files).
SESFcdist	• A new modeling and corresponding calculation method for power cables was added. It supports cable structures comprising multiple concentric components (core, sheath, armour, etc.), where the metallic part and insulating part of a component can each be made of multiple layers of different materials and thicknesses. There is no need to assume the outer components to be thin and non-magnetic, as was the case for the previous modeling methods. The same level of accuracy as that of the TRALIN and HIFREQ modules is attained by the calculation.
SESLibrary	• An “Annotations” view has been added to the Properties panel for the Fence Posts database. • The Conductors database was expanded significantly, with more than 1,800 new items.

Application	What's New
SESPlotViewer	• The application now features an Issues List Panel for displaying errors. • To move plot segments, it is no longer necessary to hold the Ctrl key while left-clicking on the segment to be moved; a left-click is now sufficient. • Added an 'Anchor Point' option to the Point context menu.
SESResap	• To help in the creation of limiting soil models, limiting traverses (upper and lower limits) can now be created not only from the strict maximum and minimum envelopes of the data, but also based on the statistical spread (standard deviation) of the data at each spacing. This is more statistically formal, more robust against outliers, and the desired tolerance level can be selected (e.g. 68%, 95% or 99.7% inclusion of the data). • A Depth column was added to the computed soil model table of the Computation Results panel. It is populated with values corresponding to the depth of the bottom of each layer with respect to the surface. • When the initial soil model is modified graphically (in user-defined mode), either the thickness of a single layer is modified (with the depths of all subsequent layers changing) or the thickness of the subsequent layer is also modified (with the depths of all subsequent layers remaining unchanged), depending on whether the Ctrl key is held while the vertical segment of the curve, corresponding to the layer boundary, is dragged left or right. • The table displaying the Initial estimate for the horizontal soil model parameters now explicitly exposes the values that will be generated by RESAP at run time in the absence of user input. Two options are available: Auto and User-Defined. Under the Auto option (default), the number of layers is automatically determined by the RESAP algorithm for a given data set and also their estimated resistivities and thicknesses. The table and corresponding plot will be in READ-only mode and the auto-generated estimate is not saved to the input file (it will be regenerated identically at run time). Under the User-Defined option, the table is initially pre-filled with the data determined by the Auto option. Now the table is editable, enabling the number of layers, their resistivities, thickesses, and corresponding lock options to be customized. Pre-filled data automatically appears where required to form a complete initial soil model, and is presented in a light gray font to indicate it is not user input data (which is displayed in normal font), and will not be saved to the file. The plot will also be in edit mode, meaning that layer resistivities and thicknesses can be modified interactively via the plot by click-and-dragging the corresponding segments of the dashed pink curve. • After the completion of a computation run, the RMS Error between the measured and computed apparent resistivities is displayed in the Computation Results panel for the Horizontal Layers soil type.

Application	What's New
SESResultsViewer	• For all modules, if an Enhanced Windows Metafile (EMF) has been produced, a plot can be displayed in the Results Display panel, even when there are messages related to minor errors.
SESSystemViewer	• Interactive rectangular zoom options have been introduced.
SESTextEditor	• Double- clicking an item in the Issues List moves the cursor to the corresponding line number. • The Find Results panel was redesigned. Results from searches on several files are regrouped in an uncluttered view under collapsible headings for each file. It is possible to filter out the results for the currently active file only, or to search the listed find results themselves. Other than the search matches, the display of additional columns of information can be toggled from a contextual menu for the filename, line number, column number and file path where the match occurred. Moreover, each node from the results tree can be copied, which is another way to easily port data to a spreadsheet or plotting application for further processing and analysis. On new searches, previous results can be chosen to be preserved or overwritten.
SESTralin	• Several SES applications (e.g. SESTextEditor, SESScript, SESBatch, and others) can now be launched directly from the ribbon via the new Tools tab.
SESTransient	• Addition of the Modified Transmission Line Model with Exponential Decay (MTLE) for indirect lightning strikes. • The plot generation process trace is now displayed in the Computation Trace panel.
SoilModelEditor	• Multi-Region capability for HIFREQ has been added. • The application now provides a default file name. • The Layers panel is now the default panel that will be open when SoilModelEditor is opened from SESCAD. • MiniMax can be applied to the criteria for finite volume subdivisions.

Documentation

1. Introduction

Version 17.1 includes new Quick Start Guides and Online Help documents, and a new How-to Manual. Also, multiple existing How-to Manuals and Quick Start Guides were updated.

2. Quick Start Guides

Quick Start Guides cover a broad range of topics at a level suitable for all users. Two new Quick Start Guides are included with Version 17.1. Both are available in English and Chinese:

Quick Start Guides (New) - English and Chinese
• SESCPCalculator • SESTrainSimulator

Also, the following Quick Start Guides were updated in all supported languages:

Quick Start Guides (Updated) - All Supported Languages
• CorrCAD (Onshore) • CorrCAD (Offshore)

3. How-to Manuals

Our How-to Manuals include instructions for completing a variety of studies from start to finish. A new How-to Manual is now available, in all supported languages:

How-to Manuals (New) - All Supported Languages
• SESCurvefitDigitizer - Understanding and Using SESCurvefitDigitizer

The English, French, and Spanish versions of the following How-to Manuals have been updated:

How-to Manuals (Updated) - English, French, and Spanish
• A Simple AC Total Interference Mitigation Study Using SES Software • A Simple Substation Grounding Grid Analysis • Computation of Capacitance and Inductance of Conductor Networks • Electromagnetic Fields Near a Transmission Line Tower Subjected to Unbalanced Currents and a Phase-to-Ground Fault • Electromagnetic Fields Under a Transmission Line and Induced Currents on a Fence • Large Suburban Substation Grounding System Analysis: Measurements & Computer Modeling • Lightning Transient Study of a Communication Tower • NCC-SES Gas Insulated Substation Grounding Analysis • The Computation of Transient Currents in RLC Circuits • Urban Area Substation Analysis

4. Online Help

The context-sensitive online help documents for many applications were updated. There are also two new online help documents, both available in all supported languages.

Online Help (New) - All Supported Languages
• SESCPCalculator • SESCurvefitDigitizer

SES & technologies, ltd.
3055 Blvd. Des Oiseaux, H7L 6E8, Laval, Québec, Canada
Tel.: 1 450 622-5000 - Fax: 1 450 622-5053
email: support@sestech.com
Website: www.sestech.com