SAFE v20.3.0 Release Notes

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Notice Date: 01-July-2022

This document lists changes made to SAFE since v20.2.0, released 31-March-2022. Items marked with an asterisk (*) in the first column are more significant.

Analysis
Enhancements Implemented

*	Ticket	Description
*	8423	A change has been made to the reporting of joint reactions and base reactions for nonlinear static load cases. Previously joint-force loads and acceleration loads applied at restrained degrees of freedom were excluded from the reported joint reactions at these degrees of freedom, including their contribution to overall base reactions. This was intentional for matching the reactions to the force reported in the connected frame objects in nonlinear analysis. However, this is now changed to be consistent with the reactions reported for linear static load cases. This is a reporting issue only. No other results are affected, including the reactions at flexible supports (spring support and one-joint links). The only change in restraint reactions will be due to joint-force loads applied directly on the joint and apportioned acceleration loads from connected objects, including from mass directly assigned to the joint.

API
Enhancements Implemented

*	Ticket	Description
*	8531	The following enhancements have been made to the Application Programming Interface (API): (1.) The new function cHelper.GetObjectProcess() can be used to attach to any running instance of SAFE given its process ID. (2.) A new command "Set as active instance for API" has been added to the Tools menu. This command will make the current instance of SAFE the "active instance" so that it will then respond to subsequent calls to cHelper.GetObject() function. If the current instance is the active instance, then this command is disabled. In either case, the process ID of the current instance is displayed for use with the new function cHelper.GetObjectProcess(). (3.) A new interface cPluginContract has been added to simplify plugin development. (4.) Speed has been improved for external .NET clients that call the API by chaining properties and methods (e.g. mySapObject.SapModel.PointObj.GetElm) in deeply nested loops.

Data Files
Enhancements Implemented

*	Ticket	Description
	8331	A built-in material library has been added for Canada. The library contains steel materials per the CSA G40.20-13/G40.21-13 standard, concrete materials per the CSA A23.3 standard, and rebar materials per the CSA G30.18:21 standard.

Database Tables
Enhancements Implemented

*	Ticket	Description
	8345	An enhancement has been implemented to output the soil pressure in a tabular format on a joint-by-joint basis. Enveloped soil pressure on a slab-panel basis were already available.

Design – Concrete Frame
Enhancements Implemented

*	Ticket	Description
*	6889	An enhancement was made for all concrete frame design codes where the reported longitudinal rebars for detailing the beams were the top and bottom rebars required for flexural strength only. Now the reported top and bottom total longitudinal rebars for detailing are calculated from the flexural-, torsional-, and shear-strength requirements (for the applicable codes like "AS 3600-2018", "CSA A23.3-14","CSA A23.3-19", "Eurocode 2-2004", and "SP 63.13330.2012") . The display also shows "Torsional Longitudinal Reinforcing", "Shear Longitudinal Reinforcing", and "Flexural Longitudinal Reinforcing" for the codes where shear and torsion affect the longitudinal rebar design. The reported "Shear Plus Torsion Reinforcing" stirrup rebars are calculated from the shear and torsional strength requirements, and this is unchanged. Likewise, the reported "Shear Reinforcing" stirrup rebars in the beam are those for shear strength, as before. The previous design calculations were correct.

Design – Slab
Enhancements Implemented

*	Ticket	Description
	5679	Reinforced concrete slab and PT slab design have been updated for the NZS 3101-06 code to accommodate Amendments 1 to 3.
	8444	A new concrete slab design preference called "Overwrite Shear Lambdas to One for Mats and Footings?" is available for the "ACI 318-19" code. When set to "Yes", the depth-dependent shear-strength reduction factor, Lambda_s, will be set to 1.0 for mats and footings per ACI 318-19 13.2.6.2. The default value is "Yes". For older files, the value is taken as "No" so as to maintain the previous results, which were conservative. This can be changed, if desired, after opening the older model in the new version. The other slab types (Slab, Drop, Stiff, Ribbed, and Waffle) are unaffected by this design-preference toggle.
	8569	The "SAFE Reinforced Slab Design Manual" has been updated for the ACI 318-19 and IS 456:2000 codes to describe in more detail how the longitudinal rebar is increased to satisfy shear demand when the design preference "Increase Flexural Rebar for Enhanced Concrete Shear Capacity?" is set to "Yes". This change is only to the documentation and does not change any design calculations.
*	8624	The concrete code "CSA A23.3-19" has been added for reinforced concrete and post-tensioned slab design.

Documentation
Enhancements Implemented

*	Ticket	Description
	8339	An enhancement has been made to Concrete Slab Design Preferences Form for all design codes to add descriptions for the preference items. Previously, these descriptions were missing. This enhancement does not change any design calculations.

Graphics
Enhancements Implemented

*	Ticket	Description
	8583	An enhancement was made to handle the case where the user runs SAFE on different machines with differing graphics-card capabilities. The settings in the SAFE.INI file now keep track of the graphics mode (Standard Graphics or DirectX) selected for each machine where SAFE is run. Note that this mainly affects users with a Windows roaming profile or who copy the SAFE.INI file between machines. The SAFE.INI file can be found in the folder "%localappdata%\Computers and Structures\SAFE 20", and it also can be accessed by clicking the link "User Settings Folder" under command Help > About SAFE.

Installation and Licensing
Enhancements Implemented

*	Ticket	Description
*	8353	The version number has been changed to v20.3.0 for a new intermediate release.

Results Display and Output
Enhancements Implemented

*	Ticket	Description
	7806	An enhancement was made to add integrated wall reactions to tables and the on-screen display.
	8319	An enhancement has been implemented to always display the vertical offset distance of tendon control points from the bottom of the slab (or drop, if present) in the graphical user interface. Additionally, the display has been enhanced to show all control points within each span used for laying out the tendon. Previously, the display showed only the high and low point of the tendon within each span.

Analysis
Incidents Resolved

*	Ticket	Description
*	8424	An incident was resolved where linear load cases using the stiffness from the end of a nonlinear static load case that had cracked-section analysis enabled could incorrectly report the force-type response for those slab objects that had exhibited cracking. This was because the cracked-stiffness was not being used for determining the linear response. This affected force-type responses, such as base reactions and section cuts, as well as slab-design results. This issue did not affect the results of the nonlinear load case itself.
*	8662	An incident was resolved where response spectrum load cases were not considering additional eccentricity loads which were exported from ETABS. This only affected SAFE versions 20.0.0 to 20.2.0.

Data Files
Incidents Resolved

*	Ticket	Description
	8409	An incident was resolved where importing an .F2K text file (which had been exported from ETABS or SAP2000) into SAFE v20 was setting the default height of the story below to be 144 ft for US Customary units or 144 m for SI and MKS units. Now, the default height for the story below is computed based on the longest column or wall height below the floor level.

Database Tables
Incidents Resolved

*	Ticket	Description
	8363	An incident was resolved where the section type and the associated design property data for applicable concrete frame sections was not being reported in the table and as such, was also not being written to the file when the model was exported in any of the available formats. As a result, the section type and the design property data was reset to the program defaults when a model was exported and imported back into the program using tables. All missing data is now available in the frame section property tables. The fix now also allows interactive editing for the design property data which was not available before.
	8652	An incident was resolved where: (1.) The concrete beam design preferences for all design codes displayed in the database tables and reports were inconsistent with the input for the same in the graphical user interface. Concrete beam design preferences are now reported in the same table as the concrete slab design preferences, which is consistent with the user interface where the slab and beam design preferences are available on the same form. The report has also been updated to include the concrete slab and beam design preferences together. (2.) The concrete beam design overwrites displayed in the database tables and reports were inconsistent with the input for the same in the graphical user interface. Display items for beam design overwrites have been updated in the table and reports to be consistent with the input for the same on the beam design overwrites form. (3.) Some concrete slab/beam design preference items would get reset to default values when interactively editing or exporting and importing a model. This issue has now been addressed.

Design – Composite Beam
Incidents Resolved

*	Ticket	Description
	8581	An incident was resolved for composite beam design per the AISC 360-16 code where the design-overwrites section was missing from the generated design reports, even when it had been selected in the User Report form. Composite beam design reports were generated as expected for all other composite beam design codes. This issue affected all versions of SAFE capable of designing composite beams and was a reporting issue only.

Design – Concrete Frame
Incidents Resolved

*	Ticket	Description
*	8401	An incident was resolved where beam design results for multi-step load cases created by auto-pattern loading were being recovered as envelope max/min (enveloping results from individual load patterns) instead of envelope range max/min (enveloping results from any combination of one or more load patterns). Slab design was not affected by this error. The error affected SAFE v20.0.0 to v20.2.0. Any beam designed in these versions in models that used auto-pattern loading should be re-evaluated.
	8402	An incident was resolved for Concrete Beam design using the Chinese code where the design preference items "Importance Factor" and "Beam Negative Moment Reduction Factor" were not being updated when changed. Instead, the default values were being used.

Design – Slab
Incidents Resolved

*	Ticket	Description
	8461	An incident was resolved where verification design examples for reinforced concrete and PT slab were unable to show design results due to the slab not being at the datum. Reinforced concrete slab design verification example files have been updated to fix this issue.
	8551	An incident was resolved for the Eurocode 2-2004 and Italian NTC 2008 concrete slab design codes where the value of $f_{ywd,ef}$ used for computing shear rebar or shear studs was incorrect. The $f_{ywd,ef}$ calculation was using the value of d in m instead of mm units, and therefore the design was always conservative. A small change was also made to the calculation of the number of stud rails required which may have sometimes reported one extra rail required.
	8688	An incident was resolved for Chinese 2010 slab design where design preference "Crack Class" was inadvertently exposed. It was not being used. This parameter has now been removed form the design preferences and design preference table has been updated accordingly.

Detailing
Incidents Resolved

*	Ticket	Description
	8375	An incident was resolved were values set on the detailing preference form for mats and footings were not saved in the SAFE model file, and were instead reset to default values when the model was reopened.
	8381	An incident was resolved where steel-beam detailing preferences were not saved in the .FDB model file. They were reset to default values when the model was re-opened.
	8641	An incident was resolved where concrete detailing was unable to be performed when there were frame objects present in the model with NULL section properties assigned to them.
	8646	An incident was resolved for detailing where modifying the label of a beam or beam group did not properly update the labels displayed in the detailing Explorer tree, the window titles, or the view headings in the drawings. Note that only the labels can be changed, and these are what are shown in the drawings. The beam names and beam group names are internal and cannot be changed.
	8647	An incident was resolved for slab detailing where the Slabs/Mats/Footings Explorer tree was incorrectly showing the node "Bars-X" under Slab Rebar Details > ... > Supports for design strips that passed through drop panels. Now the drop-panel rebars will only be editable through the command Detailing > Bar Selection and Curtailment Rule > Slab/Mat/Footing Bar Selection and Curtailment Rule.

Drafting and Editing
Incidents Resolved

*	Ticket	Description
	8231	An incident was resolved where snaps to the architectural layer were not working after importing a DXF/DWG Architectural layer.
	8482	An incident was resolved where columns could not be drawn (or replicated) if the height specified for the column below or column above was more than the height of the story below or above, respectively. This was because of a restriction that did not allow columns to extend beyond story heights. This restriction has now been removed.
	8599	An incident was resolved where walls above the slab/mat level were not drawn correctly.

Graphics
Incidents Resolved

*	Ticket	Description
	8436	An incident was resolved where an abnormal termination could occur on certain machines when displaying 3D views using DirectX graphics mode. Affected machines could include those with Intel UHD Graphics or Intel Iris Xe Graphics cards, which are not adequate to support full DirectX Graphics in SAFE. Now the user interface will switch to Standard Graphics when this situation is detected.
	8494	An incident was resolved where certain objects that are not available in a specific license level would still be visible in the graphical user interface. This usually happened when a model created using a higher license level and containing objects available only for that level was opened or imported in a lower level. As an example, if a model was created in SAFE Post-Tensioning with tendons, and then was opened or imported in the Standard level, the tendon objects would still be visible in the user interface even though tendons are not available in the Standard level. The issue is now addressed so that all pertinent objects are deactivated and removed from the view when a model created in higher level is opened in a lower level of the product. Note the the objects are not actually removed from the model, and they will still be available with the higher license level, provided that any associated objects have not been deleted or modified in a way that invalidates the hidden object.

Results Display and Output
Incidents Resolved

*	Ticket	Description
	8324	An incident was resolved where printing when in DirectX mode was not working correctly with respect to the chosen scale. This has been corrected. Additionally, the user can now pan the view in the Print Preview form to make minor adjustments before printing. Panning is performed using the middle mouse button, while double-clicking will reset the view.
	8426	An incident was resolved where an abnormal termination could occur upon pressing the Enter key on the keyboard twice to display finite-element (FE) based slab design rebar contours after entering the maximum value for the contour range. The contours, however, could be displayed successfully without any issues by clicking on Apply button on the form instead of pressing the Enter key on the keyboard twice.
	8540	An incident was resolved where changing the load combination in the drop-down box on the beam design details form did not update the design information for the selected combination. The design information was always being displayed for overall envelope. Concrete beam design display has been enhanced to show the design summary for each load combination and each station of the concrete beam upon right-clicking on the member. The design details for a given load combination and station can be viewed by selecting the appropriate entry in the list and then clicking the Details button provided on the design summary form for that purpose.

Structural Model
Incidents Resolved

*	Ticket	Description
	8458	An incident was resolved when designating any slab area property as of type "Stiff" and running an analysis would make the property modifiers and the no-design flag for the property permanent. Changing such slab section to Slab, Drop, Mat or Footing was not resetting the stiffness modifiers back to unity. These retained the values for stiff areas, where m11, m22 and m12 were amplified by 100 times while the mass and weight modifiers were set as zeros. Furthermore, no design results were available for strips and such slab sections were not designed. Now these parameters are reset to default when Stiff area properties are changed to Slab, Drop, Mat or Footing.
	8541	An incident was resolved where the soil subgrade modulus was not using the the largest value where two or more slabs were overlapping and they were assigned different subgrade properties. This affected SAFE v20.0.0 to v20.2.0.
	8575	An incident was resolved where a drop panel that overlaps a slab object would prevent the temperature load that was assigned to the slab from being applied on the area which overlapped the drop panel. This behavior has been changed to be consistent with SAFE v16 where temperature loads on overlapping objects will be applied additively. This issue only affected SAFE v20.0.0 to v20.2.0.
	8586	An incident was resolved where drop panels or slabs drawn using the option to draw areas around a point would have their normals pointing downwards instead of upwards. This did not affect overall structural behavior or results, except that loads applied in the shell local 1 or 3 directions would be reversed, and bending-moment results would be of opposite sign. Loads applied in the gravity or global directions (X, Y, Z) were not affected.

User Interface
Incidents Resolved

*	Ticket	Description
	8391	An incident was resolved where the software would terminate abnormally when an attempt was made to use the Assign > Paste Assigns menu command to copy and paste joint, frame, or area assignments.
	8469	An incident was resolved where the option to add new stories and edit stories in the model explorer by right-clicking Model > Structure Layout > Stories was inadvertently left exposed. These options have now been disabled. In the current version of the program, only a maximum of two stories are allowed and the story data can be edited by right-clicking the coordinate system named GLOBAL in the model explorer under Model > Structure Layout > Grids.
	8473	An incident was resolved where the software would terminate abnormally when the menu command to select slab panels by labels was invoked. This did not affect selection by clicking on the slab-panel object itself.