# SAP2000® Version 18.0.1
# Release Notes



## *Notice Date: 2015-11-12*

This file lists all changes made to SAP2000 since the previous version. **Most changes do not affect most users.** Incidents marked with an asterisk (*****) in the first column of the tables below are more significant.

Version 18.0.1 was released shortly after v18.0.0 to address several issues with the initial release of v18. For this reason the Release Notes for v18.0.0 are also included in this file.

## *Changes from v18.0.0 (Released 2015-10-30)*

### Miscellaneous
#### *Enhancements Implemented*

| * | Incident | Description |
|---|---|---|
| | 85445 | The version number has been changed to v18.0.1 for a new minor update. |

### User Interface and Display
#### *Incidents Resolved*

| * | Incident | Description |
|---|---|---|
| * | 85432 | An incident was resolved in which the 64-bit version of the program could take a minute or more to launch on certain machines. This is a result of Microsoft's JIT (just-in-time) compiler and not a bug in the software. Not all systems are equally affected, and newer versions of the Windows (8.1 and 10) tend to be less affected, especially if Windows Updates are current. A new tool, CSiNativeImageGen is available to 'precompile' the software after installation, prior to use. In most cases this should resolve the slow startup time, as well as speed up the displaying of forms. CSiNativeImageGen is available in the installation folder and must be Run As Administrator. Information on the use of this optional tool is provided within CSiNativeImageGen itself using the Help command, and by searching the CSI Knowledge Base at wiki.csiamerica.com for 'native image generation'. |

### Modeling
#### Incidents Resolved

| * | Incident | Description |
|---|---|---|
| | 85311 | An incident was resolved in which trying to access the Pipes and Plates templates when using the 64-bit version would generate a series of error messages. These templates are currently not supported in the 64-bit version and a message to reflect this has been added. Users who need these templates should use the 32-bit version. |

### Loading
#### Incidents Resolved

| * | Incident | Description |
|---|---|---|
| | 85364 | An incident was resolved for Chinese auto wind loading in which the mode shape period T1 was not accounted for while calculating the wind loading. |

| * | Incident | Description |
|---|---|---|
| * | 85382<br>85534 | An incident was resolved in which the assignment of area loads to frames was actually being assigned as area uniform loads instead of area loads to frames. The analysis results would reflect the area uniform loads, and usually no load was lost. |
| | 85607 | An incident was resolved where the diaphragm widths in X and Y directions were flipped when calculating the torsion due to specified additional eccentricity for response spectrum cases. |

## Frame Design

### *Incidents Resolved*

| * | Incident | Description |
|---|---|---|
| | 83457 | An incident was resolved for the Chinese Concrete frame design code for column design where the additional eccentricity moments were being added only on the positive side. Also the seismic moment modifiers, if overwritten, will now be applied even if the column compression ratio is below 0.15. |
| * | 85333<br>85386 | An incident was resolved in which the steel frame design results could be incorrect and/or the right-click design details were not able to be viewed when using the 64-bit version on certain machines. When results were available they could appear reasonable even if they were not correct. All steel frame design codes could be affected. This only affected v18.0.0, 64-bit. The 32-bit version was not affected. |
| * | 85387 | An incident was resolved in which the Eurocode 3-2005 steel frame design was incorrect for box sections. Models with box sections designed in v18.0.0 should be redesigned. No other version were affected. |
| * | 85520 | An incident was resolved for AISC 360-10 steel frame design in which the compression capacity of box, pipe, rectangle, circle, general, and section designer sections was being taken equal to the tension capacity, ignoring the compression capacity due to flexural buckling. This error could overestimate the compression capacity of these type of sections. This only affected models designed in v18.0.0. |

## Results Display and Output

### *Incidents Resolved*

| * | Incident | Description |
|---|---|---|
| | 85453 | An incident was resolved in which the graphical display of results on a limited selection of the model was taking extra time to display. This was a performance issue only and did not affect results. |
| | 85587 | An incident was resolved in which the date on the report cover page was not correct. |

## Database Tables

### *Incidents Resolved*

| * | Incident | Description |
|---|---|---|
| | 85481 | An incident was resolved where exporting a table from the interactive database to Excel while the decimal separator was a comma might result in some values losing the decimal separator in Excel. |

## Data Files

### *Incidents Resolved*

| * | Incident | Description |
|---|---|---|
| * | 85367 | An incident was resolved in which trying to import frame section properties from a *.pro library file would generate an abnormal termination when the *.pro file was located in a folder without write permissions, which is usually the case for the default installation location. |

## External Import/Export

### *Incidents Resolved*

| * | Incident | Description |
|---|---|---|
| | 85289<br>85506 | An incident was resolved where importing any DXF file into SAP2000 did not import anything - point objects, frame objects, nor shell objects. This affected version 18.0.0 only. |

## Miscellaneous

### *Incidents Resolved*

| * | Incident | Description |
|---|---|---|
| | 85353 | An incident was resolved in which a Microsoft Access message "Can't find Language DLL msain.dll" would appear on some machines when starting the program. |

# SAP2000® Version 18.0.0
# Release Notes



## *Notice Date: 2015-10-28*

This file lists all changes made to SAP2000 since the previous version. **Most changes do not affect most users.** Incidents marked with an asterisk (*****) in the first column of the tables below are more significant.

## *Changes from v17.3.0 (Released 2015-07-06)*

### User Interface
#### *Enhancements Implemented*

| * | Incident | Description |
|---|---|---|
| | 46985<br>81772 | An enhancement has been implemented to allow selection of null frame objects assigned the "None" section property via the Select > Select > Properties > Frame Sections command. |
| * | 62650<br>64942 | A full 64-bit version of SAP2000 is now available. The 32-bit version can be installed on either a 32-bit or 64-bit operating system, while the 64-bit version requires a 64-bit operating system. |
| * | 69107<br>72353 | An enhancement was implemented to add an Apply button to the Select and Assign command forms and allow them to remain open (floating) for continual use. |

### Graphics
#### *Enhancements Implemented*

| * | Incident | Description |
|---|---|---|
| * | 41385<br>69876 | The DirectX graphics performance has been enhanced, especially for larger models containing many points. |
| * | 81474 | DirectX graphics has been updated from DirectX 9 to DirectX 11. This may affect the graphics cards that are supported, particularly on older machines. |

### Modeling
#### *Enhancements Implemented*

| * | Incident | Description |
|---|---|---|
| * | 14367 | A new two-dimensional concrete model has been added to the nonlinear layered shell. This model is based on the Darwin-Pecknold model, with consideration of Vecchio-Collins behavior. This model represents the concrete compression, cracking, and shear behavior under both monotonic and cyclic loading. The direction of cracking can change during the loading history, and the shear strength is affected by the tension strain in the material. The given material stress-strain curve is simplified to account for initial stiffness, yielding, ultimate plateau, and strength loss due to crushing. Zero tensile strength is assumed. The layered shell allows this material to be used for membrane and/or flexural behavior and to be combined with steel reinforcement in arbitrary directions and locations. Transverse (out-of-plane) shear is assumed to be elastic. |
| * | 34675<br>40792 | An enhancement has been implemented to provide a semi-rigid option for diaphragm constraints. |
| * | 80135 | An enhancement has been implemented to add two new capabilities to the Modify Undeformed Geometry feature, namely, 1) It is now possible to specify a coordinate system and one or more directions (X, Y, Z) to limit the direction in which the target displacement modification is applied. 2) It is now possible to limit the modification, using either the target displacement or scaled mode-shape option, to a selection of joints. |

| * | Incident | Description |
|---|---|---|
| | 83286 | An enhancement has been implemented to update the Russian material library to modify the concrete ultimate strain values. |

## Loading

### *Enhancements Implemented*

| * | Incident | Description |
|---|---|---|
| * | 15578<br>18825 | An enhancement was implemented adding the ability to consider accidental eccentricity in response-spectrum load cases. |
| | 72234 | An enhancement has been made to exclude the mass at restrained joints from being considered when computing the total mass for automated equivalent static seismic loads. Stiff springs should be used instead of restraints if such mass is to be included. |
| | 80688<br>80935 | An enhancement was made so that the joint pattern assignment option using the Z Coordinate at Zero Pressure and Weight Per Unit Volume option calculates the resulting pressure value using the current units, not the specified values converted to database units. |
| | 81973 | An enhancement was made to the Eurocode 8-2004 response spectrum function to add more discretization points for periods larger than Td. |
| * | 82280 | Automated response-spectrum functions have been implemented for the following codes: Costa Rica Seismic code 2010, Ecuador (NEC-SE-DS 2015), Korea KBC 2009, Mexico (CFE-93 and CFE-2008), and Peru (NTE E.030 2014). |
| * | 82662 | An enhancement has been made to add automated static seismic lateral loads based on the Korean Building Code (KBC 2009) and the Dominican Republic code(R-001). |

## Analysis

### *Enhancements Implemented*

| * | Incident | Description |
|---|---|---|
| * | 68919<br>70348 | The handling of convergence tolerances for time-dependent behavior during staged-construction analysis has been improved to better enforce equilibrium after large load increments have been applied. Previously the convergence tolerance used to measure equilibrium during the time-dependent phase of a stage was relative to the magnitude of the load applied in that stage and previous stages. Now the convergence tolerance for the time-dependent phase is relative only to the internal creep and shrinkage effects themselves, and does not depend on the magnitude of any externally applied loads. This will have little effect on most models, but may improve the equilibrium for certain models without needing to tighten the convergence tolerance for the entire load case. It is always recommended that the effect of convergence tolerance upon results be examined when developing any nonlinear model. |
| * | 75659 | A new stability check has been added for nonlinear load static cases. For force-controlled load cases, including staged construction, the stiffness matrix will be formed, solved, and checked at the final converged state for negative eigenvalues. The number found will be reported in the analysis log file (.LOG), and a stability warning issued in the log file if the number is greater than zero. Displacement-controlled load cases are not checked as these typically are used to analyze unstable structures, whereas force-controlled load cases are intended to be stable. |

## Frame Design

### *Enhancements Implemented*

| * | Incident | Description |
|---|---|---|
| | 45985 | An enhancement was implemented for the BS 5950-2000 steel frame design right-click design details to present the elastic modulus as Z and the plastic modulus as S, instead of the inverse which is used for other codes. |
| * | 58956 | An enhancement has been implemented to provide torsion design of steel frame sections according to Eurocode 3-2005. The SCI Publication 385 "Design of Steel Beams in Torsion in Accordance with Eurocodes and UK National Annexes," by Hughes, A. F., Iles, D. C., and Malik, A. S. is taken as the guide for this implementation. Frame sections considered include open doubly-symmetric I- |

| * | Incident | Description |
|---|---|---|
| | | shapes and closed rectangular hollow sections and pipe sections. The current implementation considers the variation of the torsional moment along the length to be constant and/or linear; other variations will be approximated as constant plus linear. |
| | 60998<br>82325 | An enhancement was made to include roof live load in default design combinations for ACI-318-08, ACI 318-11, and ACI 318-14 codes. Also companion loads were added to default design combinations for CSA A23.3-04, CSA A23.3-14, CSA S16-09, and CSA S16-14 codes. |
| * | 65245 | An enhancement has been implemented to add steel frame design based on the Russian SP 16.13330.2011 (SNiP II-23-81:2011) code. |
| | 76864 | The handling of effective-length K-factors has been changed for steel frame design for the "AISC 360-10" and "AISC 360-05" codes when the Analysis Method is set to "Direct Analysis". Previously the bending factors K22 and K33 were always taken as 1.0, and the lateral-torsional buckling factor K_LTB was taken as an internally calculated value for K22, which was generally greater than 1.0 and usually over-conservative. Furthermore, these factors were always being used and could not be changed by the user. Now the default values for all three factors (K22, K33, and K_LTB) are taken as 1.0, but these can be changed by the user by assigning design overwrites to specific frame members. This change only affects the design using the Direct Analysis Method. |
| * | 81910 | A change has been made to remove older design codes which have been superseded. Models with older code assignments will now use the latest corresponding design codes. The following older codes have been removed: For steel frame design "AISC-ASD01", "AISC-LRFD99", "BS5950 90", "CAN/CSA-S16-01", "CISC 95", "EUROCODE 3-1993", "Indian IS:800-1998", "Italian UNI 10011", "Norsok N-004", "UBC97-ASD" and "UBC97-LRFD"; and for concrete frame design "ACI 318-99", "ACI 318-02", "ACI 318-05/IBC2003", "AS 3600-01", "BS8110 89", "CSA-A23.3-94", "EUROCODE 2-1992", "Hong Kong CP 2004", "Italian DM 14-2-92", "KCI 1999", "Mexican RCDF 2001", "NZS 3101-95" and "UBC97". |
| | 82657 | An enhancement was added for ACI 318-14, ACI 318-11, and ACI 318-08 concrete frame design codes where the Design System Rho (P) and Design System SDS factors can be specified in the concrete frame design preferences. Previously, System Rho and SDS were internally used as 1.0. Design results may change if default values for Rho and SDS are used. |
| * | 82660 | An enhancement has been implemented to add concrete frame design for the Korean Building Code (KBC 2009). |
| * | 82661 | An enhancement has been made to add steel frame design based on the Korean Building Code (KBC 2009). |

## Results Display & Output

### *Enhancements Implemented*

| * | Incident | Description |
|---|---|---|
| * | 34730<br>55210 | An enhancement has been made so that contour plots are now available for frame axial stresses. Contour values are plotted as colors on the line or the extruded shape of the frame objects based on the extrusion setting. Currently only the I-Shape, rectangle, circle, tube and pipe are extruded for this operation; other sections will show as lines. When plotted on the line the color represents the maximum axial stress in the cross section. The axial stresses are the S11 components due to axial force plus bi-axial bending moment, and are provided for all load cases except influence-based moving-load cases. Stresses are calculated for the base material, and do not account for modular ratio. Stresses are computed for the section property assigned to the frame object, and do not account for the possibility that the section has been changed during staged construction. |
| | 79371 | An enhancement was implemented to report the center of mass for each individual joint, as well as for the summation of mass accelerated in each of the three translational directions. This data is included in the Assembled Joint Masses database table. |
| * | 84141<br>84466 | An enhancement has been made so that contour plots are now available for frame deflections. Contour values are plotted as colors on the line or the extruded shape of the frame objects based on the extrusion setting. |

## Application Programming Interface
### *Enhancements Implemented*

| * | Incident | Description |
|---|---|---|
| | 71255 | An enhancement has been implemented, updating the API functions SapObject.SapModel.DesignSteel.Eurocode_3_2005.GetOverwrite and SetOverwrite to include additional overwrite items that were previously not accessible using these functions. |
| | 81247 | An enhancement has been made to the API functions GetPreference and SetPreference for the Chinese 2010 steel frame design to allow getting and setting the Seismic Design Grade preference. |
| * | 82060 | The SAP2000 API has been updated for v18 such that both v17 and v18 can coexist on the same machine. API tools and plugins written using the v17 API will need to be recompiled after changing the reference to SAP2000v18.dll. |

## External Import/Export
### *Enhancements Implemented*

| * | Incident | Description |
|---|---|---|
| | 81503 | The export to Revit Structure has been enhanced so that steel sections are now exported parametrically, i.e., their dimensions are written in the .EXR file in addition to the section name. When CSiXRevit 2016.1 imports an .EXRfile into Revit Structure from SAP2000 and encounters a steel section with a name it cannot match to a Revit family type in the user's Revit Structure template or family libraries, CSiXRevit 2016.1 will then create a new Revit family type based on the SAP2000 parametric section dimensions. Previous versions of CSiXRevit do not feature this functionality. |

## Documentation
### *Enhancements Implemented*

| * | Incident | Description |
|---|---|---|
| | 13044 | An enhancement has been implemented to define the list of documents shown via the Help > Documentation command using an XML file in place of the Microsoft Access database. This XML file can be modified by the user to add their own documents to the documentation tree within the software. |

## Installation and Licensing
### *Enhancements Implemented*

| * | Incident | Description |
|---|---|---|
| | 71757 | The license manager for network licenses has been updated to Sentinel RMS 8.6. |

## Miscellaneous
### *Enhancements Implemented*

| * | Incident | Description |
|---|---|---|
| | 81073 | The version number has been changed to v18.0.0 for a new major release. |

## User Interface and Display
### *Incidents Resolved*

| * | Incident | Description |
|---|---|---|
| | 81497 | An incident was resolved in which the modal case selected for defining additional frequencies for steady state or power spectral density (PSD) load cases was not always saved when multiple modal cases were defined in the model. The results agreed with the modal case shown when going back to review the steady state or PSD load case. |
| | 82317 | An incident was resolved where in some rare cases the Auto Load Combination for Design form would give an abnormal termination error. The auto combination parameters were corrupted in the file and have been trapped. |
| | 82543 | An incident was resolved to remove the **Assign > Frame > End Skews** command as it is not applicable to SAP2000. |
| | 82640 | An incident was resolved in which an abnormal termination could occur after deleting certain load patterns and then trying to display loads on the screen. This was a user interface error and did not affect results. |
| | 82655 | An incident was resolved in which values pasted into the quadrilateral cutting plane table on the Section Cut Data form were not retained after clicking OK. Directly typing in values would work as expected. This was a user interface issue. Results would agree with the defined cutting plane coordinates. |
| | 83429 | An incident was resolved in which an abnormal termination could occur when trying to delete a reference point on the Edit Reference Points form. This was a user interface issue only. |
| | 84055 | An incident was resolved where negative values were not being allowed for diaphragm eccentricity overwrites in the auto-seismic load pattern definition dialog. |

## Modeling
### Incidents Resolved

| * | Incident | Description |
|---|---|---|
| | 39529<br>41509<br>66071<br>66274 | An incident was resolved where, in certain rare cases, it was not possible to draw a long vertical cable. Drawing the cable as several shorter vertical segments would work. Other minor issues related to drawing cables were also resolved where the drawn shape would not appear symmetrical or could exhibit small oscillations at one end. This could result in unequal segment lengths if the cable was subdivided, or in the appearance of unexpected deflections. However, analysis results were always correct and consistent with the length of the drawn cable as shown in the Cable Geometry form and the Cable Shape Data database table. Results are not affected, except that the displayed deformed shape of the cable may appear different in certain cases. The actual deformed shape of the cable, its tension, and its action on the rest of the structure are unchanged. |
| | 82584 | An incident was resolved where incorrect values were displayed in the textboxes on the Tendon Response Form. This was a display issue on this form only and did not otherwise affect the results. |

## Analysis
### Incidents Resolved

| * | Incident | Description |
|---|---|---|
| | 79967 | An incident was resolved where the analysis would sometimes run very slowly when there was a large number of linear load cases applying restraint displacement loads, such as might occur in large models imported from ETABS. This was an efficiency issue only. No results were affected. |
| * | 80931 | An incident was resolved where the results of a moving load case could be incorrect for vehicles where the option "Vehicle Remains Fully in Path" was selected. This error, although not common, could occur in versions 17.2.0 and 17.3.0. Moving load cases containing such vehicles should be re-run with the new version to confirm the results. Multi-step linear static load cases for vehicle loads were not affected, only influence-based moving load cases. |
| | 81970 | An incident was resolved in which an abnormal termination could occur when running the analysis for a load case containing a seismic load pattern based on user loads if other constraints were specified before all the rigid diaphragm constraints were specified in the model. |

| * | Incident | Description |
|---|---|---|
| | 82986 | An incident was resolved where an eigen-type of modal analysis could fail to complete, and generate an error message in the .LOG file, when performing a stiffness shift in a model containing cable objects if the modal analysis was run at the same time as a moving load case that used the stiffness from the end of the same nonlinear static load case (or zero initial conditions). When this occurred, the results of the modal analysis were not available. Results for load cases that did complete were not affected. Running the modal analysis separately from the moving load case would allow the modal analysis to complete. Models without cable objects were not affected. Modal load cases that did not require an automatic stiffness shift were not affected. |

## Frame Design

### *Incidents Resolved*

| * | Incident | Description |
|---|---|---|
| | 77303 | An incident has been resolved in several steel frame design codes in which the design reported the maximum tension force in the braces in the database tables "Tables: Steel Design 8 – Brace Max Axial Load -*" with the wrong sign, especially when special seismic design was done and seismic load was present. The design computed a single maximum axial force irrespective of sign (tension and compression). Now the design computes the maximum axial forces envelopes for tension and compression separately. This was a reporting issue only. Actual member capacity checks were unaffected. Affected codes are AISC 360-05, AISC 360-10, CSA S16-09, CSA S16-14, Eurocode 3-2005, Italian NTC 2008, and Indian IS 800:2007. |
| | 77852<br>82626 | An incident was resolved in frame design codes where the unbraced length ratios were calculated disregarding support provided by shells and solids. This error affected versions 17.0.0 to 17.3.0. Since the shell/solid supports were ignored, the resulting unbraced length in some cases could have been calculated as longer, thus conservatively resulting in larger stress or PMM ratios. The unbraced lengths actually used were being reported. |
| | 80830<br>80861 | An incident has been resolved in steel frame design per the AISC 360-10 code in which the design erroneously reported an error message that a section was not "Seismically Compact for Highly Ductile Members". This was a reporting issue only and the reporting was conservative. |
| * | 81180 | An incident was resolved in which frame design was not being performed for load combinations of type "Range Add". This affected any user-defined "Range Add" load combinations as well as any auto-generated load combinations containing a load pattern of type "Settlement". The design results for these "Range Add" load combinations were zero. Load combinations of other types ("Linear Add", "Envelope", "Absolute Add", and "SRSS") were not affected. Auto-generated load combinations that did not contain any loads defined as being of design type "Settlement" were not affected. Versions 10.1.0 to v17.3.0 were affected. |
| | 81232 | An incident has been resolved for steel frame design using the Australian AS 4100 code where the value of Lambda_wy for the major-axis bending mode was being used instead of the value of Lambda_wy for the axial mode while calculating the value of Mrx, the moment capacity in the presence of axial force for doubly-symmetric I- and box-sections and when Kf < 1.0 (slender in axial mode) (AS 8.3.2(b)). The design now uses the value of Lambda_wy for the axial mode. The previous result was slightly over-conservative. |
| | 81448 | An incident has been resolved for the Italian NTC 2008 steel frame design code in which the following issues have been addressed: 1.) Some of the interaction equations were referring to Eurocode. The references to the equations are now made to NTC and Eurocode as appropriate. 2.) The choice of interaction methods "Method A", "Method B", or "Method Both" has been introduced for stability check of Class 1, 2, and 3 sections under flexure and axial compression (NTC Eq. C4.2.32, Eq. C4.2.37, Eq. C4.2.38). 3.) The equation for Mb,Rd has been updated by updating the expression for chi. The new expression follows NTC Eq. 4.2.5.1. Previously chi was based on EC3 6.3.2.2(1) which is really a simpler version of NTC Eq. 4.2.5.1. 4.) The expression of psi = 1.75 - 1.05 * (Mb/Ma) + 0.3 * (Mb/Ma)^2 was corrected (NTC Eq. C4.2.31). Previously it was psi = 1.88 - 1.40 * (Mb/Ma) + 0.52 * (Mb/Ma)^2. 5.) The beam/column capacity ratio is determined with appropriate gamma_RD factor: 1.3 for DCH and 1.1 for DCL per code (EC8 4.4.2.3). Previously only one factor 1.3 was used. 6.) The buckling curve for the case of lateral |

| * | Incident | Description |
|---|---|---|
| | | torsional buckling of rolled I-shapes is now taken as "b" and "c" instead for "a" and "b" for h/b <= 2 and otherwise, respectively. |
| | 81687 | An incident was resolved in steel frame design per Eurocode EC 3-2005 with Eurocode 8:2004 where the design checked the section compactness for DCH-CBF and DCM-CBF per section EC8 6.5.3(2) and Table 6.3 correctly but unlike other frame types, this was reported through warning rather than error messages. Since this issue gave a warning instead of an error, the member was not colored Red, and the error message was not displayed in the summary window. Rather the warning was displayed in the details and in the database tables only. The design now issues an error message instead of a warning message. In addition, an omission in the manual has been fixed. This is in manual sections 9.4.2.1 and 9.4.2.2 regarding the required section class for beams and columns with behavior factor in DCM-MRF. |
| | 83457 | An incident was resolved for the Chinese Concrete frame design code for column design where the additional eccentricity moments were being added only on the positive side. Also the seismic moment modifiers, if overwritten, will now be applied even if the column compression ratio is below 0.15. |

## Results Display and Output

### *Incidents Resolved*

| * | Incident | Description |
|---|---|---|
| * | 38919 | An incident was resolved where the option "Provide Output" in the definition of a staged construction load case had no effect. Results were provided for every stage regardless of the setting. Now setting this option to "No" will cause the stage to produce no output except for the last stage or for stages with target-force loading, for which output will always be provided. The default value for this setting when defining a load case has been changed from "No" to "Yes". Models from previous versions, when opened in the new version, will have this option set to "Yes" for all stages in any load case where all stages were previously set to "No". Otherwise the settings will not be changed, but the number of output steps produced may differ between the new version and the old version. |
| | 82639 | An incident was resolved where in some instances the data shown in a report may appear in the wrong column. This was a report creation error only and did not affect the results as displayed in the tables or on the model. |

## Database Tables

### *Incidents Resolved*

| * | Incident | Description |
|---|---|---|
| | 82486 | An incident was resolved in which the database table filter criteria applied by the user was not being converted back to the current units when opening the form to modify or review the filter data. This did not affect any results. |
| | 82775 | An incident was resolved where the interactive database could experience an abnormal termination when sending a table to Excel, deleting all records in Excel, and then attempting to retrieve the table data from Excel back into the interactive database. |
| * | 83178 | An incident was resolved where tables exported to Excel using the command File > Export > SAP2000 Excel Spreadsheet could, under certain regional settings, produce incorrect values in the Excel file. Values were previously being exported as text in full precision, and the decimal separator could be lost. Now values are exported as numerical double-precision values to avoid this problem. This error only affected versions 17.2.0 and 17.3.0. When this occurred the error was usually obvious because the values could be incorrect by orders of magnitude. This error only affected the File > Export command. It did not affect Excel tables produced using the Display > Show Tables > Export Current/All Tables command nor the Excel tables accessed from the command Edit > Interactive Database Editor > Send Table to Excel. |

## Data Files

### *Incidents Resolved*

| * | Incident | Description |
|---|---|---|
| | 81238 | An incident was resolved where the XML schema was not correctly exported for database tables that included fields starting with a digit instead of a letter. |
| | 82924 | An incident was resolved in which import errors were generated when importing certain model text files containing data for ACI 318 concrete frame design preferences. |
| | 84264 | An incident was resolved in which frame section properties imported from the Indian.pro section property library did not have the correct plastic modulus value for I and channel sections. The section property library has been updated to correct this and has modified the properties of a few other I and channel sections to be consistent with the currently available sections. |

## Application Programming Interface

### *Incidents Resolved*

| * | Incident | Description |
|---|---|---|
| | 82939 | An incident was resolved in which the API function SapObject.SapModel.Results.BaseReact would always return a value of 1, indicating an error. |
| | 84182 | An incident was resolved wherein API functions SapModel.PointObj.SetPatternByXYZ and SapModel.PointObj.SetPatternByPressure would always set zero values. |
| | 84753 | An incident was resolved for the Application Programming interface (API) where calling the function SapObject.SetAsActiveObject() on an instance of SapObject that had previously been set as the active instance caused subsequent calls to SetAsActiveObject() on all other SapObject instances to fail. Consequently, no other SapObject instance could be set as the active instance until the active SapObject instance was destroyed by closing the program or calling the function SapObject.ApplicationExit(). No results were affected. |

## External Import/Export

### *Incidents Resolved*

| * | Incident | Description |
|---|---|---|
| | 81291 | An incident was resolved in which duplicate GUIDs (globally unique identifiers) could be exported from a single model. While this has no effect on analysis or design results, it could cause a conflict when importing the file into an application that uses GUIDs. Now when duplicate GUIDs are encountered during export to a file format that supports them, objects (frames, shells, etc.) with duplicate GUIDs are assigned new GUIDs before export, and load assignments with duplicate GUIDs are not exported. In the latter case, only the first instance of load assignments having the same GUID is exported, and a warning message is provided. |
| | 83632 | An incident was resolved that addressed two issues affecting the export and import of IFC files: 1.) Very small numbers, less than 1.0e-7, were incorrectly written out as zeroes in IFC files exported from SAP2000. When this happened, the geometry of the model was still correctly exported. This error was rarely significant, except for the case of mass or weight density in kN-mm units. Now the actual values are always written, no matter how small, except for distances and dimensions which are set to zero if smaller than 1.0e-7 meter. 2.) GUIDs (globally unique identifiers) were incorrectly read when an IFC file was imported. As a result the imported GUIDs in the SAP2000 model differed slightly from the GUIDs of the original IFC objects. This error had no impact on the SAP2000 model analytical validity or results. |

## Documentation

### *Incidents Resolved*

| * | Incident | Description |
|---|---|---|
| | 83626 | An incident was resolved in which the steel frame design manual for the Australian AS 4100-1998 code did not document the calculation of the overall slenderness, lambda_s for sections that were not hollow and circular. One paragraph is added in the documentation. This was a documentation issue only. No design results were affected. |