CSiPlant v8.1.0 Release Notes

Notice Date: 11-October-2023

This document lists changes made to CSiPlant since v8.0.0, released 24-March-2023. Items marked with an asterisk (*) in the first column are more significant.

Design – Piping

Enhancements Implemented

*	Ticket	Description
*	9508	An enhancement was made adding B31.3-2022 as an available design code. The key design differences from B31.3-2020 are: The calculation of expansion allowable stress has been updated as follows: Equation 1c has been updated to f =20(N)^(-0.333). Equation 1d has been updated to N =N_E+sum(r_i^3 N_i) for i = 1, 2, 3...., n.
*	9509	An enhancement was made adding B31.4-2022 as an available design code. The key design differences from B31.4-2019 are: The default calculation of SIF and Flex factors is based on ASME B31J. Sc and Sh have been updated to be the less (1/3)S_u or (2/3)S_y. The cyclic stress factor is now limited based on Su (1.2 when S_u < 75 ksi, otherwise, 1.0).
*	9510	An enhancement was made adding B31.8-2022 as an available design code. There are no key design differences between B31.8-2020 and B31.8-2022 implementation.
	9681	An enhancement was made affecting how reducer cone angles are handled. If the Cone Angle field on a reducer is not specified by the user, the program has been updated to use the equation for default cone angle given in ASME B31J Table 1-1 Note 11. This change has been applied to all SIF methods. For older models, there is potential for results to change. In those circumstances, if the previous SIF calculation is preferred, a User SIF method can be specified, allowing the SIF to be directly set to the previous value.
	9707	An enhancement was made to the implementation of B31.4 and B31.8 allowing the user more control over how the sustained longitudinal stress is considered during the calculation of allowable stress when performing displacement checks. The following options are available. Calculate the allowable stress as, S_A =f(1.25S_c+0.25S_h) Calculate the allowable stress as, S_A =f[1.25(S_c+S_h)-S_L] When S_L<S_h, use (2), otherwise use (1).
	9773	An enhancement was made to the generation of Design Summary reports to allow objects that were not designed to be included in the object selection without adversely affecting the process. Previously, users had to manually deselect objects that were not designed (i.e., valves, flanges, expansion joints) before generating the Design Summary.

External Import and Export

Enhancements Implemented

*	Ticket	Description
*	9640	The "Import Material" form has been enhanced to automatically import the Minimum Temperature Curves, Modulus Curves and Thermal Coefficient Curves for the selected materials. These curves are now automatically imported from the same XML file that was specified for the import of material properties. Previously, the user had to import the curves manually prior to being able to import materials that reference the curves.

Installation and Licensing

Enhancements Implemented

*	Ticket	Description
*	9506	The version number has been changed to v8.0.0 for a new major release.

Miscellaneous

Enhancements Implemented

*	Ticket	Description
*	9523	Auto meshing of pipe and frame elements has been enhanced with the following option, "Auto Mesh Objects using Variable Length Segments". Variable length segment meshing is applicable only when distributed supports are assigned to the pipe or frame element and may be used when a refined mesh is desired at certain locations of the objects while a coarse mesh is sufficient elsewhere for computational efficiency. In general, variable length segment mesh consists three zones. First, a region of refined mesh with segments of minimum length. Second, a transition region in which the length of segments gradually increases and lastly, a region of coarse mesh with segments of maximum length. The mesh generation is controlled by the following parameters which are described in detail in the help file: Biasing Method (available options are Curve Start, Curve End, Curve Center, Curve Start and End), Minimum Relative Stiffness Factor, Maximum Relative Stiffness Factor, Growth Rate and Number of Minimum Length Segments.

Results Display and Output

Enhancements Implemented

*	Ticket	Description
	9522	An enhancement was implemented allowing users to display analysis objects created for distributed supports. Such display can be requested via "View > Set Display Options > Analysis Model > Distributed Supports". Simple or Detailed display types can be chosen via "Options > Graphics Settings > Display Type > Distributed Support Analysis Object Display". For each analysis object location, the Simple display type option will show just one spring symbol, whereas the Detailed display type option will show separate spring symbol for each active DOF (degree of freedom).

Structural Model

Enhancements Implemented

*	Ticket	Description
*	7920	A new feature was implemented allowing users to assign distributed ground displacements to pipes and frames. The load assignment is made via the "Assigned Distributed Loads to Pipes" and "Assign Distributed Loads to Frames" forms. Distributed ground displacements act only on frames and pipes that have been assigned distributed supports. The ground displacements are applied to fixed joints of the links that are internally created along the pipe or frame elements to represent distributed supports.

Design – Piping
Incidents Resolved

*	Ticket	Description
	9492	An incident was resolved that corrected the design warning message for tee branch output stations that occur inside the tee main. The previous warning message stated that the entire branch was inside the tee main, which was incorrect. The updated warning message reports the first relative location being designed on the tee branch. Note that currently, this warning is only issued when designing with B31J SIFs. For all other SIF methods, the design is performed for all stations on the tee branch.
*	9517	An incident was resolved affecting the available SIF and Flex factor methods when B31.4-2019 was selected as the design code. Previously, if another SIF or Flex method (B31J, B31.3 etc.) was selected, "ASME B31.4 Table 402.1-1" was not in the dropdown list to allow reverting back to the design code default setting. The SIF and Flex factor dropdown lists now contains "ASME B31.4 Table 402.1-1" allowing it to be re-selected.
	10055	An incident was resolved for the B31.4-2019 design code where offshore unrestrained piping was designed as if it was restrained. It is now designed for the specified restraint condition.
*	10056	An incident was resolved when calculating the peak compressive stress when calculating local buckling checks per ASME B31.8-2020. The previous approach relied on the reported analysis stress. There were two shortcomings to this approach: The analysis stress only considers temperature or pressure stresses when the relevant elongation settings are enabled. If a scenario exists where the elongation settings for pressure and temperature are disabled, then the analysis stress underestimates the maximum compressive stress. The analysis stress is calculated at eight stress locations on the cross-section (spaced at pi/4). It is possible that the reported maximum compressive stress (obtained by examining the eight stress locations) does not capture the peak longitudinal bending stress. The updated approach no longer uses the reported analysis stresses but instead uses the calculated longitudinal stress, S_L, which manually adds in pressure and temperature stresses based on restraint condition if pressure and temperature elongation are disabled. Affected codes are as follows: ASME B31.4-2019, ASME B31.8-2018 & 2020.
*	10073	An incident was resolved where design load case chains containing 4 or more chained load cases were incorrectly assembled. For example, for a sequence of load cases A > B > C > D, the following design load case chain sequence was created: "root stage" > A > C > D. This has been corrected such that the following correct design load case chain sequence is now created: "root stage" > A > B > C > D. Analysis results for the <Base> result set were not affected. Design requests for affected models should be rerun in the new version to obtain correct results.

Drafting and Editing
Incidents Resolved

*	Ticket	Description
	9960	An incident was resolved where it was possible to draw an elbow whose radius was slightly too large to fit between two adjacent pipes resulting in a very short extraneous pipe with incorrect orientation to be created after elbow. This was resolved by enhancing the handling of tolerances and the program was updated to issue a warning that the elbow cannot be created for such scenarios.
	9961	An incident was resolved where the properties of a tee branch were not copied to the new objects when a tee object was replicated.
	9962	An incident was resolved where properties and assignments on a point object were not replicated to new objects when multiple instances were created at once using the replicate command.
	9973	An incident was resolved where dividing a pipe or frame object into multiple objects may have resulted in some point loads not being copied to the newly created objects. This was a rare issue that may have occurred when point loads were applied in close proximity of end joints of the objects created by the divide operation. The issue was resolved by using a smaller tolerance to check if loads are applied at the end joints of the divided elements.

Graphics

Incidents Resolved

*	Ticket	Description
	9963	An incident was resolved where the global axes were not shown in the correct orientation when the model was rotated while the draw command was in use.

User Interface

Incidents Resolved

*	Ticket	Description
	8718	An incident was resolved where checking the "Display Only Properties Currently in Use" checkbox on the "Select by Property - Link Property" form cleared the list of link properties instead of populating it by link properties in use.