

CAESAR II®

Product: CAESAR II

Number: SQBY001AA-1100A (purchase); SQBY034AA-1100A (lease)

Version: 2019 (11.00.00)

Date: APRIL 2019

Description: Hexagon PPM® CAESAR II is the industry leading pipe stress analysis program that evaluates the structural responses and stresses of piping systems to international codes and standards.

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System Requirements

★ **IMPORTANT** Beginning with Windows 10, Microsoft enforces the Internet Host Table Specification RFC 952 which mandates that component hostname labels can contain only alphanumeric characters. Hostnames using underscores ('_') are not allowed. Refer to Microsoft KB 101785.

Hexagon PPM® CAESAR II® is compatible with the Windows desktop operating systems listed below.

📘 **NOTE** The operating system compatibility details that follow refer to the latest released version of this software. Previous versions of the software may not work with newer operating systems.

Operating System	Compatibility Information
Windows 7 (32 & 64 bit) Windows 7 Business (32 & 64 bit) Windows 7/10 Enterprise (32 & 64 bit) Windows 10 Pro (32 & 64 bit)	These operating systems are tested by Hexagon PPM. CAESAR II does not support Windows 7 Starter, Home Basic, and Home Premium. The software also does not support Windows XP, Windows Vista and Windows 8/8.1.
Windows Server (all versions)	Only tested by Hexagon PPM for the installation of network licensing systems (NetHASP License Manager).



Prerequisites

Microsoft .NET 4.7.2 or greater

Adobe Reader 8.0 or greater

Recommended System Requirements for CAESAR II:

Processor: 3.0 GHz Intel Pentium IV or higher AMD Athlon dual-core processor or higher

Memory: 4 GB RAM or higher (Windows 7/8/8.1)

Display: 1280X1024 or higher, with True Color

Video Card: 512 MB or greater video RAM, Open GL 1.1 or later, DirectX 9.0 or later, drivers updated with the latest manufacturer's drivers (Motherboard-integrated video cards not recommended for desktop systems.)

Access to a DVD drive

Remote Technologies: Citrix XenApp 7.22 required on Windows Server 2016 Enterprise

Version Compatibility

For up-to-date information on the software compatibility of this product in a standalone or integrated environment, please refer to the Compatibility Matrix on the Hexagon PPM Support Web site at <https://smartsupport.intergraph.com/>.

Log on and perform the following steps:

1. Click the **View Downloads** tab.
2. Click the **Product Compatibility** link under **Useful Links** on the right side.
3. On the **Hexagon PPM Compatibility Matrix - Product Report** page, from the Select Product list, select CAESAR II
4. From the **Version** list, select the version of CAESAR II.

Special Instructions

CAESAR II 2019, Version 11.00.00, is a Windows (7/10)-based program. The input files created by Version 11.00.00 are not downward compatible with previous versions. However, Version 11.00.00 can read input files from any previous version.

Existing users should install this latest version in a different directory from any earlier existing version. CAESAR II displays the version number and build date in the lower right corner of the main menu for your reference.

★ IMPORTANT If you use an ESL and are moving to Version 11.00.00 from a version of CAESAR II prior to Version 5.20, your existing ESL may require a firmware update to permit Version 11.00.00 to run. You can find instructions on the program DVD in the \Info folder in the document, ICAS_Software_Licensing.doc.

This version of CAESAR II should be started by using C2.EXE.

When you start the CAESAR II application, you should select or specify a job name (by selecting **File > New** or **File > Open**) before using any other module. Most of the modules function using the current working directory. If this information is not available, the module cannot run. You can select **File > Set Default Data Directory** to save this working directory in the registry.



Windows Language Pack Considerations

If you are running Windows 10, and the CAESAR II language (such as Japanese or Chinese) is not the same as the Windows 10 language, you must install a language pack. For more information, see *Recommendations for Windows 10 users* in the Windows support article [Why does some text display with square boxes in some apps on Windows 10?](#)

Post Installation Considerations

CAESAR II installs the *NETUSERC2.BAT* batch file in the CAESAR II program directory: If you install CAESAR II to a network drive, only the installing workstation has the proper .dll files installed and registered. Run this batch file on all other workstations that will run CAESAR II to ensure the .dll files are current and registered.

CAESAR II installs the following three batch files in the CAESAR II System directory (...\\ProgramData\\Intergraph CAS\\CAESAR II\\<version number>\\System):

- *ACCESS2010.BAT* – Use this batch file to copy the MS Access 2010 template onto the active template used by CAESAR II.
- *ACCESS2007.BAT* – Use this batch file to copy the MS Access 2007 template onto the active template used by CAESAR II.
- *ACCESS2002-2003.BAT* – Use this batch file to copy the MS Access 2002-2003 template onto the active template used by CAESAR II. If you are using Access 2002/2003 already, you do not need to run this batch file.
- *ACCESS2000.BAT* – Use this batch file to copy the MS Access 2000 template onto the active template used by CAESAR II. If you are running Access 2000, run this batch file to use the appropriate template and to avoid having to convert database files individually.

For more information on installing CAESAR II, refer to the *CAESAR II Quick Reference Guide*, located on the software DVD.

Documentation

Use the **Help** ribbon to access the help files for this product.

For the latest support information for this product, connect to <https://hexagonppm.com/ppm-support>.

Printed documentation is not available for separate purchase.

Training

To register for training on Hexagon PPM products, call Training Registration at (800) 766-7701 in the U.S. Outside the U.S., call (256) 730-5400 or contact your local Hexagon PPM office.

For current information on training, see <http://www.intergraph.com/ppm/training/>.

For information on virtual training, see <https://hexagonppm.com/training/virtual-training>.

Customer Support

For the latest Support Services information for this product, including solutions to known software issues, connect to <https://hexagonppm.com/ppm-support>.

To open service requests outside the U.S., please contact your local Hexagon PPM office.



New Features in this Version

The latest CAESAR II release delivers new and extended capabilities in response to current market requirements and feedback from the CAESAR II user community.

CAESAR II 2019, Version 11.00

User Interface

- Optimized the performance of 3D model graphics, most notably with large model refresh times. Because of the improved performance, **View > Toggle Graphics Update** is no longer needed and has been removed. (DI-TX-23248)
- Added shortcut keys that are used consistently throughout the software. For more information, see *Shortcut Keys* in the *CAESAR II User's Guide* and the *CAESAR II Quick Reference Guide*. (DI-TX-24231, RI-TX-24977)
- Improved the **File** tab options on the main window ribbon, including improved existing options, and new folder and help access. (CR-TX-25240, DI-TX-28411)
- Removed the secondary menu from the main window. All commands are on the main window ribbon. (CR-TX-25241)
- Added a new **Layout** menu to the main window ribbon. The menu provides theme, language, and icon size options and allows you to reset to the default layout. (CR-TX-25239, CR-TX-26312, CR-TX-28056)
- Changed the default look of the software to a new light gray **Light** theme. The existing dark gray **Dark** theme is available on the **Layout** menu. (CR-TX-25776, CR-TX-28056)
- Changed some graphics defaults to better match the most commonly-used settings. New defaults include: **Default Operator (Select)**, **Hide Overlapping Text** (on), **Text Options** (12 pt. by default), and **Bottom** and **Top** background colors (white). (DI-TX-24698)
- Updated the **File > About** window to improve usability and appearance. Also updated the **Help** and **About** icons to provide a look consistent with other interface improvements. (CR-TX-26044)
- Updated the **Help** tab to eliminate unnecessary commands, better organize the remaining commands, and provide a new help search function. (CR-TX-25242)
- Revised product branding from Intergraph to Hexagon throughout the software. (DI-TX-22927)

Piping, Equipment, and Environmental Codes

- Added support for ASCE 7-2016 wind and seismic loads. (CR-TX-23218)
- Added support for the China GB 50009-2012 wind code. (CR-TX-23229)
- Added support for the ISO 14692 2017 piping code. The software also still includes support for ISO 14692 2005. (CR-TX-25780, CR-TX-26608)
- Updated the CODETI code to the November 2016 edition, and corrected CODETI code stress equations in the Quick Reference Guide. (TR-TX-25335, TR-TX-3832)
- Updated the KHK seismic design standard to the 2012 edition. (CR-TX-26612)
- Updated the ASME B31.1 code to the July 2018 edition. (DI-TX-27783)
- Updated the BS EN 13480 code to the June 2017 edition. (DI-TX-27783)



- Added support for the DNV 2017 (DNVGL-ST-F101) piping code, including a new **DNV Wall Thickness Calculator**. The software also still supports for DNV 1996. New features of the calculator include:
 - Definition of global DNV properties and element-specific properties.
 - Display of material, pressures, and design loads defined in the model.
 - Output results and graphs that update as you define or change properties.
 - Ability to update the wall thickness in **Piping Input**.
 - Saving calculator input values to the model.(RI-TX-24868, TR-TX-29168)
- Updated the **Errors and Warnings** grid to perform more like Microsoft Excel. The grid supports selection and copy of grid rows between the grid and Excel. (DI-TX-22923)
- For the **Seismic Wizard**, changed the default value for the ASCE 7 **Response Factor R** from 12 to 3.5 to comply with ASME B31 standards. (CR-TX-23265)
- Added support for displaying all component stress values (hoop, allowable, SIF) in reports instead of only the highest component stress. (CR-TX-26265)

Material and Content

- Updated the **Material Database Editor** grid to support copy, cut, paste, and delete of cells and rows within the grid and between the grid and Excel. (DI-TX-22915, DI-TX-28411)
- Updated the hanger table for LISEGA spring hangers. (CR-TX-10627)

Configuration

- Updated B31.4 and B31.8 codes to function similarly for non-default configuration settings and combination load cases. (DI-TX-24014)

Piping Input

- Added the **CAESAR II Determines** option to **Allowable Stress Indicator** for the B31.8 code, similar to the existing implementation for B31.4. **CAESAR II Determines** specifies that the software selects the stress equations based on the calculated axial load in the piping system. (CR-TX-20558)
- Added node name and node number formatting options to **Options > Node Numbers**. You can now display names and numbers with the same formatting available for **Options > Node Name** in the Static Output Processor. (CR-TX-16576)
- Updated and renamed the **Global Coordinates** and **Global** commands to **View/Set Coordinates**. The new **Global Coordinates** dialog box displays a list view of nodes and coordinates for all disconnected elements, and you can edit the values. (CR-TX-5232)
- Updated the **Coordinates** and **Elements** lists to support the new **View/Set Coordinates** command. The start (From) node displays in the **Node** column of the **Coordinates** list. Right-click > **View/Set Coordinates** displays on the **Coordinates** list. Disconnected element rows highlight in green in both lists. (CR-TX-24843)
- Extended the range for node numbers. A node number previously had a maximum value of 32,000. It now has a maximum value of 8 million. (CR-TX-1271, RI-TX-24353)
- Improved the efficiency of processing disconnected segments to function with the extended node number range. (CR-TX-24998)



- Improved the behavior of node names. The same node name now displays on all elements sharing the same node. (CR-TX-17148)
- Increased the maximum length of node names from 10 to 25 characters. (CR-TX-25865, RI-TX-17314)
- Increased the number of **Uniform Loads** from three to nine vectors. (RI-TX-24862)
- Added a restraint legend which allows you to visually identify and edit restraint gap values. (CR-TX-26518, CR-TX-27856)
- Added the **Rigid Type** option to the **Rigids** auxiliary data tab. When you define a rigid type, the software graphically displays the valve or flange rigid type in the model view. (CR-TX-1633, CR-TX-8390)
- For the ISO-14692 2005 code, allowed editing of the **Pressure SIF** box on the **SIFs/Tees** auxiliary tab. You can now change the value in both boxes from the default value of 1.3. (CR-TX-26736)
- Adjusted the density for material **(191) A335 P91**. (CR-TX-21550)
- Added the ability to create multiple toolbar and command profiles. You can switch between profiles as needed and share your profile view with others. Delivered a new functional profile as the default profile. (CR-TX-8772)
- Changed the display of hangers and cans. For non-vertical pipe, hangers and cans now display linearly and perpendicular to the pipe. (CR-TX- 26343)

Load Case Editor

- Added a properly formatted Microsoft Excel import file to the **Static Analysis - Load Case Editor**. The software also provides an example template file, *LCE_Template.xlsx*, in the C:\ProgramData\Intergraph CAS\CAESAR II\11.00\System\templates folder. (CR-TX-15419, CR-TX-3333)
- Added export of an Excel .xlsx file from the **Static Analysis - Load Case Editor**. You can now set up and share load conditions. (CR-TX-25081)
- Added an **Exclude** option that allows you to easily exclude a selected load case from the static analysis. (CR-TX-24847, CR-TX-25082)
- Updated the **Static Analysis - Load Case Editor** for the DNVGL-ST-F101 2017 edition, including a new limit state (**LMST**) stress type for combined load cases, and a new **Limit State Load Type** field for non-combined load cases and non-LMST combined loads. The software also includes an example DNV load case template file. (CR-TX-27148)
- For ASME NC-3658.3 flanged joint calculations, changed the hydrotest (HYD) load cases to use the same allowable as the occasional (OCC) load cases. (CR-TX-21979)

Equipment & Component Analysis

- Expanded the redesigned and renamed **Equipment Analysis** to include **API 617**, **API 560**, **API 661**, **NEMA SM23**, and **HEI Standard** equipment modules into the single **Equipment Analysis** window. (API 610 equipment was moved into the **Equipment Manager** in the previous release.) Changes include updates to calculations and updates to reports to meet **Equipment Analysis** standards. (CR-TX-3328, CR-TX-18354, CR-TX-18356, CR-TX-23231, DI-TX-25818, CR-TX-26262, TR-TX-29112)
- Added several usability improvements to **Equipment Analysis**. **Node Number** is now optional. Most recently used files are now available. Status and warnings for the equipment input display before analysis, in the status pane, and in the output report after analysis completes. (CR-TX-24168)



- Added support for EN-1591 flange leakage analysis with a new **EN-1591 Analysis** window. The user interface follows standards and workflow similar to **Equipment Analysis**, including:
 - Definition of flange, bolt, and gasket properties.
 - Definition of loads on the **Loads** tab.
 - Ability to update loads when the results of an imported and linked pipe stress analysis change.
 - Comprehensive output results on the **Output** tab.
- (DI-TX-19946)

Analysis

- For static analysis, clarified the usage of the wind load reduction factor for ASCE 7. You must explicitly apply this factor to the wind load component in a wind load case. (CR-TX-23265)
- For dynamic analysis, corrected the determination of the pressure stiffening effect on bends by excluding hydro pressure. (CR-TX-18264)

Isometrics

- Added the option to create .pdf files when you create .dwg files using **Create Isometric Drawings**. The software also saves .dwg drawing files and .pdf files in the same folder as the piping model. (CR-TX-16394)
- Updated **Generate Stress Isometrics** to Personal ISOGEN 2016 (10.0.0.1) and to I-Configure 2016 (06.00.00.11). (CR-TX-5279)
- Improved the creation of isometric drawings for models containing dummy legs. (CR-TX-22366, CR-TX-26317)
- Improved usability of stress isometric annotations. When you select a **Restraint/Hanger Types** or **SIF/Fitting Data** input feature, the software also selects the corresponding **Node Numbers** feature. (CR-TX-9557)

Underground Pipe Modeler

- Updated the **Underground Pipe Modeler** grid to support copy and paste of rows within the grid and between the grid and Excel. (CR-TX-5255)

Output Processor

- Added access to the **Data Export Wizard** from the **Static Output Processor**. (CR-TX-16573)
- Added a **Maximize/Restore** button to report windows for static reports. The software also saves the most recent window size and uses it when you open the next report window. (CR-TX-1206)
- Changed standard reports to more consistently report component stresses.
 - Created a standard **Stresses** report, which shows the corresponding component stress consistent with code stress instead of a generic engineering stress.
 - Created a new **Stresses (Multiple Code/Allow.)** report for transportation and offshore codes showing all code stresses instead of the highest code stress.
 - Changed the **Stresses Extended** report to the **Stresses Extended (Legacy)** report.



- Removed the previous **Stress** and **Code Compliance** reports.
- Renamed the **Code Compliance Extended** report to **Code Compliance**.

(CR-TX-25768, CR-TX-26310, CR-TX-26629, CR-TS-27189)

- Added standard reports for the DNV 2017 piping code: **DNV Components**, **DNV Details**, and **DNV Thickness Overview**. (CR-TX-28080, CR-TX-28083)

External Interfaces

- Improved **Import PCF** to allow you to import a large number of files. (CR-TX-23420)
- Added a new **PCF Mapping** utility to **Import PCF** and **Advanced PCF Import (APCF)**. This utility allows you to customize your PCF mapping and add attributes, such as additional temperature and pressure attributes. You can create a custom mapping from your 3D or CAD design PCF attribute directly to a CAESAR II field. (CR-TX-997, RI-TX-24981, RI-TX-25141)
- Added an interface for **BOSfluids** file import, using a dialog box similar to the other hydraulic module interfaces. Also added an option to directly open **Dynamic Analysis** after import completes. (CR-TX-20097)
- Updated the neutral file format so that line numbers, line color, line visibility, and bend overlay thickness now import and export. (CR-TX-4336)
- Improved the **Data Export Wizard** to allow multiple output report exports in one session. Improved defaults of the **Input and Output Files** window and changed the default output file format to .accdb (Microsoft Office 2007 and later Access database) to improve usability. (CR-TX-26737)
- The **DynPlot** dynamic output animation window allows you to export all time history dynamics data into a log file for use in post processing. (CR-TX-28404)

Documentation/Help

- Converted help to a new help viewer with an improved interface and search capabilities, and changed the format of units in the help to eliminate display issues. You can use tooltips or interface labels for the current units of a field. (DI-TX-24906, DI-TX-27046, DI-TX-22964, DI-TX-24906)
- Updated thermal coefficient of expansion topics to specify the length and temperature units of the model. (CR-TX-17740)
- Added more details and equations to the **CAESAR II Determines** option of **Allowable Stress Indicator** for finding the pipe restrained/unrestrained status in the B31.4 code. (CR-TX-22370)
- Revised and reorganized *Tutorial B* in the *CAESAR II Application Guide*. (DI-TX-23250)
- Clarified usage of the **Free Measure** option of **Distance**. The option should only be used in 2D views. (CR-TX-22845)
- Added a shortcut key overview. For more information, see *Shortcut Keys* in the *CAESAR II User's Guide* and the *CAESAR II Quick Reference Guide*. (DI-TX-24231, RI-TX-24977)
- Added information on editing ASCII text files. (CR-TX-24528, CR-TX-22747)
- Clarified descriptions of numeric calculations in delta and length fields of **Classic Piping Input**. (CR-TX-24463)
- Added descriptions for **Multiple Load Case Hanger Design Options** in the **Hangers** auxiliary panel, the **Hanger Design Control Data** dialog box of **Classic Piping Input**, and the **Technical Discussions** section. (DI-TX-25488, DI-TX-28115)



- Added a note to **Type** for **SIFs & Tees** that describes the importance of properly defining tees to avoid overly conservative SIF values. (SI-TX-27775)

Fixes

The following fixes have been made to CAESAR II:

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Configuration

- Fixed an issue with conflicting duplicate internal load case numbers in .tpl template files. (TR-TX-23116)
- Fixed an issue with memory allocation where large .c2 data files did not expand and recompress properly. Performance has also been improved for large models when launching CAESAR II and when displaying previews on the **Open** dialog box. (TR-TX-3296)

Piping Input

- Fixed a units issue where editing the direction cosines in the **Edit Deltas** dialog box changed the pipe length value from mm to m. This issue affected the BAR.FIL and FRANCE.FIL units files. (TR-TX-12592)
- Fixed an issue where the graphics shortcut keys, such as V, I, and Y, no longer worked after **List Input** was used. (TR-TX-1547)
- Fixed an issue where **Line Number** values could not be created when you opened a new file from within **Classic Piping Input**. (TR-TX-22851)
- Fixed cycle/stress values for **Fatigue Curve**, where carried-forward and manually-changed values did not display properly in the **Material Fatigue Data** dialog box. The dialog box now properly displays the correct values and matches the values in the **Allowables** list. (TR-TX-24137)
- Fixed an issue for **Flange Checks Peq** method, where the value of **Gasket Diameter, G** was incorrect for 2 in. to 1.25 in. OD diameter pipe when using the ASME-2009/2009M 900 lb. class. The software now correctly uses the average of gasket ID and gasket OD from B16.20. (TR-TX-24329)
- In static and dynamic analyses, fixed an issue where the incorrect allowable stresses were used for propagated user-entered values (SH1 through SH9) in mixed piping code models. (TR-TX-25867)
- For the **Custom** option of **Nozzle Flex** in **Classic Piping Input**, clarified that the nozzle and vessel centerlines cannot be colinear and must have a minimum angle of 20 degrees. (TR-TX-22220)
- Updated the content and renamed the hanger tables for Bergen Pipe Supports, Inc (formerly Bergen Power), Carpenter & Paterson, and Bergen Pipe Priv Ltd (India) (formerly Pipe Supports Ltd). (TR-TX-25125)
- Fixed an issue on the **Hangers** tab, where the hanger table did not save **Extended Range**, **Cold Load**, and **Hot Load Centered** selections. (TR-TX-28730)
- Fixed an issue where the software did not always properly clear an operating condition elastic modulus when the temperature was above the maximum or below the minimum for the material. The software now assigns a value of 0 for these conditions. (TR-TX-25322)
- Fixed an issue with the **Expansion Joint Modeler** where a dialog did not display when there was a difference between the test temperature and the analysis temperature. The dialog now properly displays and prompts you to adjust the joint stiffness. (TR-TX-29477)



Piping Code

- Resolved small issues with the CODETI and Canadian Z662 codes. (TR-TX-25172)
- Corrected code stress calculations for the Canadian Z662 code. As specified by the code, the software always uses the pipe outside diameter (OD) and ignores the configuration setting for Base Hoop Stress On. (TR-TX-28055)
- Corrected the issuance date for CFE Sismo in the *CAESAR II Quick Reference Guide*. The correct date is 1993. (TR-TX-25204)

Structure

- Fixed an issue where the software prevented proper warning and error messages from displaying when opening a CADWorx or GTSTRUDL .str file in CAESAR II. The fix includes messages for translation of unknown cross-sections and conversion of cross-sections that do not have a match in CAESAR II. (DI-TX-24902, DI-TX-26928)

Equipment & Component Analysis

- Fixed a problem for API 610 in **Equipment Analysis** when importing some loads with incorrect formatting. An error dialog box now displays without stopping the software. (TR-TX-22831)

Load Case Editor

- Removed the following wind shape factors from the **Wind Loads** tab of **Static Analysis - Load Case Editor**: **Force Coefficient (CF)** for the EN 1991 1-4 wind code, **Drag Coefficient (Ca)** for the Mexico wind code, and **Size Effect Factor (Ca)** for the BS 6399-2 wind code. The software uses **Wind Shape Factor** in **Classic Piping Input** for static analysis calculations for all codes. (TR-TX-20677)
- Refined how to use **Free Surface Elevation** on the **Wave Loads** tab. You can define one value for the first wave case and the software uses the same value for the other wave cases. (TR-TX-26326)
- Fixed an issue where imported wind and wave loads did not display on the **Wind Loads** and **Wave Loads** tabs of **Static Analysis - Load Case Editor**. The software now properly updates and displays the imported loads. (TR-TX-28775)
- Fixed an issue with the Coordinate list when using the English.fil units file where the inches unit displayed as "in" instead of "in.". The period at the end of the unit now correctly displays. (TR-TX-28726, TR-TX-28376)

Static Analysis

- Prevented an **Error Check** abort when a Cnode is incorrectly defined with a restraint but without a restraint type. The Cnode is now flagged as an error and is in the list of global coordinates, allowing the error check to complete. (TR-TX-20278)
- Fixed an issue in the **Recommend load cases** option of the **Load Case Editor** where a load case with a value of three digits or greater could not be used in combination load cases. (TR-TX-23492)
- In error checking, corrected the displayed values of the minimum wall thickness and the y-correction factor when OD/t_{min} was less than 6.0. (TR-TX-23322)
- For IGE\TD\12, fixed an issue for fatigue (FAT) load cases where the software used the value of elastic modulus at ambient temperature. The resulting allowable stresses were non-conservative because the elastic modulus decreases with increasing temperature. The



software now uses the elastic modulus value at the maximum defined operating temperature. (CR-TX-22925)

- Fixed a calculation issue where the software did not incorporate the header corrosion in the effective section modulus for the branch intersection node of a reducing tee. (TR-TX-13396)
- Removed wind and wave loads, which were incorrectly included on zero-weight rigid elements. (TR-TX-27620)

Dynamic Analysis

- Fixed a dynamic analysis issue, where the dynamic animation of a time history file displayed incorrect spikes. (TR-TX-23942)
- Fixed an error with the **DLF/Spectrum Generator** when more than 15 rows of user-defined pulse data was provided. The software now processes the first 15 rows and ignores rows greater than 15. (TR-TX-9129)

Isometrics

- Fixed a problem where a limit (LIM) restraint would sometimes display an incorrect GUIDE restraint symbol in a stress isometric drawing. (TR-TX-16297)
- Fixed a problem where the software used data from the incorrect hanger table in isometrics. (TR-TX-26329)
- Fixed problems that caused excessive splitting of large isometric drawings. (TX-TX-3402)

Underground Pipe Modeler

- Made improvements to how the software calculates virtual anchor length (VAL) by checking for undefined or missing pressure, delta T, or thermal expansion coefficient and reporting appropriate messages on screen. (TR-TX-9130)
- Fixed a problem where many elements in the **Elements** tab of **List Input** in **Classic Piping Input** displayed as manual values (in red) after a model was buried. In some cases, insulation and cladding values were changed to 0. Values now display correctly and can be changed globally. (TR-TX-5632, TR-TX-22144)
- Fixed an issue in the **Underground Pipe Modeler** where **File > Open** always saved a converted file to the **Examples** folder even when another location was selected. (CR-TX-5255)

Output Processor

- Fixed an issue where selected Alt-SUS and Alt-OCC load cases did not display in custom reports. (TR-TX-16957)
- Fixed analysis results for local coordinate restraint reports due to an incorrect coordinate system transformation in combination load case calculations. The software now applies the combination methods separately to the global and local restraint loads. (TR-TX-4701)
- Fixed a calculation issue for combination load cases in the restraint summary report. Data from duplicate node numbers in the restraint report could come from different load cases because the combination method had already been applied. The software now adds restraint forces and moments for the summary report to the duplicate nodes before applying the combination method. (TR-TX-17741)
- Fixed an issue with miscellaneous reports, where a user-defined SIF displayed as "USER" instead of the value, and a user-defined K-factor displayed a default value instead of the user-defined value. (TR-TX-1746)



- Fixed an issue with export to Microsoft Excel where memory allocation for Excel was not released after export completion. (TR-TX-23927)
- Fixed an issue where the weld strength reduction factor (W_c) was not properly applied to the allowable stresses in reports for all tees. (TR-TX-28415)

Graphics

- Fixed an issue related to DirectX11 graphics drivers when working on a virtual machine. The issue occurred when you clicked on graphics, imported DWG files, or opened structural files. (TR-TX-25708)

External Interfaces

- Fixed an issue in the **Data Export Wizard** which exported a text file with no titles in some columns. (TR-TX-8355)
- Fixed an issue that prevented an exported .c2 file from importing into CADWorx if a static analysis had been run in CAESAR II. (TR-TX-24184)
- Fixed an issue where **Data Export Wizard** did not export hanger figure numbers and size information to an .mdb file when the hanger manufacturer was changed. (TR-TX-24150)
- Fixed an issue where the **Quick XML Export** option of the **Data Export Wizard** did not display any data in the output file. (TR-TX-18453)
- Fixed an issue where .pcf file importing reversed the X and Y coordinates and the sign of the Y coordinate when using **Advanced PCF Import**. (TR-TX-26462)

Documentation/Help

- Fixed F1 help for the **Edit > List > Coordinates** list and improved descriptions of global and delta coordinates. (TR-TX-22847)
- Corrected the description of **Long-Period Transition Period TL** for ASCE 7 by removing table references, adding a section reference, and clarifying that TL applies to ASCE 7-2005 and ASCE 7-2010. (TR-TX-18229)
- Removed unnecessary indenting on property descriptions throughout the help to improve readability. (DI-TX-23251, DI-TX-22964)
- Removed old text-based help for the **Underground Pipe Modeler**. F1 help now opens the current help. (DI-TX-24123)
- Clarified that **Stiffness Factor for Friction** in **Dynamic Analysis** always uses units of 1/inch unit. (TR-TX-22162)
- Corrected the equation for **Slug Flow** in **Dynamic Analysis** by changing ρ (fluid density) to $\Delta\rho$ (fluid density - vapor density). (CR-TX-23683)
- Clarified possible values for **Wind Exposure** for the ASCE 7 wind code in the **Load Case Editor** of **Static Analysis**. Also clarified **Structure Natural Frequency** for all wind codes. (TR-TX-19179)
- Corrected **Dynamic Analysis** help for **Relief Load Synthesis** by moving **Ratio of Gas Specific Heats** and **Gas Constant** tables to the correct locations and clarifying the text for **ID of Vent Stack Piping**. (TR-TX-23017)
- Corrected the B31.4 Chapter IX longitudinal stress formulas in the *CAESAR II Quick Reference Guide*. (TR-TX-26132)



- Corrected the input data for a hinged joint example in the *CAESAR II Application Guide*. The data now properly displays the correct nodes for the restraint and the expansion joint. (CR-TX-19088)
- Corrected the descriptions of **WW** and **WNC** loads in the **Static Analysis - Load Case Editor** regarding when the software includes insulation weight. Also added a similar note to **Include Insulation in Hydrotest** in the **Configuration Editor**. (TR-TX-28480)



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