



SYSTEMS, INC.



The *FASTEST* Solutions for Piping Design and Analysis.

Silicon Valley, Calif.

**Presents**



The *FASTEST* Solutions for Piping Design and Analysis.

# checkSTRESS™

## Key Benefits

- **HUGE Savings in Project Costs**
  - **Produce Code-compliant Layouts Quickly by reducing Design iterations between Layout and Stress Depts.**
  - **Dramatically Reduce Project Execution Time**
- **Designers become more active participants in layout process**
- **Engineers spend more quality time on critical analysis details**
- **Available for PDMS, CADMATIC, PDS, SmartPlant, CATIA, AutoPLANT and SolidEdge**
- **Generates input file for CAEPIPE / CAESAR-II / PIPESTRESS**



The *FASTEST* Solutions for Piping Design and Analysis.

# checkSTRESS

## Why checkSTRESS?

- Designers route piping systems mostly considering
  - Space constraints
  - Constructability
  - Operability
  - Reparability
- Stress Engineers check stress and suggest layout changes
- Designers reroute and Stress Engineers check again and this iteration goes on “back & forth”



## Why checkSTRESS? (continued)

- Nowadays, pressure and temperature are going up to increase plant production and efficiency
- Increased pressure increases pipe wall thickness
- Increased wall thickness increases pipe stiffness
- Increased pipe stiffness increases thermal stresses and nozzle loads
- So, designers need a tool to do a first-level “check stress” at design stage

## What checkSTRESS Does

- Reads piping geometry, properties, pressure & temperature and support details from 3D Plant Design systems (currently available for PDMS, CADMATIC, PDS, SmartPlant, CATIA, AutoPLANT and SolidEdge)
- Performs stress analysis & plots in basic colors
  - Thermal stress contours (blue, green, yellow, orange and red)
  - Weight stress contours (blue, green, yellow, orange and red)
  - Thermal deflected shape
  - Weight deflected shape
  - Operating load deflected shape



## What Designers Should Do

### Avoid orange and red in stress contour plots

#### ➤ To do this in thermal stresses

- Make piping flexible by:
  - Adding pipe bends and loops
  - Placing intermediate anchors to split thermal growth
  - Placing axial restraints to redirect thermal growth away from critical nozzles

#### ➤ To do this in weight stresses

- Support piping system vertically by:
  - Spring Hangers, Constant Support Hangers
  - Rod Hangers & Resting Supports



What is checkSTRESS?

# checkSTRESS Features

- Reads piping geometry, pipe section and material properties
- Uses temperature and pressure assigned at Branch level for carrying out piping stress analysis
- Can include different branches stored under different PIPE hierarchy to carry out stress check
- Reads pipe support details from 3D Plant Design and creates Supports, Hangers, Guides, etc. in checkSTRESS
- Enables piping code compliance by displaying **stress ratio contour plots** for Sustained (weight + pressure) and Expansion load cases
- Assists in locating hangers and supports by showing **deformed shapes** for Sustained, Operating and Expansion load cases
- Generates input file for CAEPIPE / CAESAR-II / PIPESTRESS



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# Conclusion

- **Make Piping Layout process more Enjoyable!**
- **Relieve stress for your Stress Engineers!**
- **Multiple iterations avoided between Design and Stress departments**
- **HUGE Time and Cost-savings**
- **Available for PDMS, CADMATIC, PDS, SmartPlant, CATIA, AutoPLANT and SolidEdge**
- **Avoid Manual generation of Input Files for CAEPIPE / CAESAR-II / PIPESTRESS (one-click transfer)**



**Thank you for your time.**

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