# SIMFLEX-IV

## THE E²G DIFFERENCE

**BUILT BY EXPERTS**

Developed by Liang-Chuan Peng,

**PIONEER OF PIPING TECHNOLOGY**

Technical accuracy, incorporates latest

**CODES AND STANDARDS**

Used by E²G engineers on

**CONSULTING PROJECTS**

Development team uses its facility and owner-operator experience to solve

**INDUSTRY-SPECIFIC CHALLENGES**

### INDUSTRIES

- Chemical & Specialty Chemicals
- Fertilizers
- Nuclear
- Oil & Gas
- Petrochemicals
- Pipelines
- Pharmaceuticals

## STATIC & DYNAMIC PIPING STRESS ANALYSIS

Piping systems are designed to withstand a variety of external and internal stresses; however, any variation in mechanical or thermal loading, fluid flow, or weight may cause failure. With SIMFLEX-IV, a cloud-based pipe stress analysis software, you can proactively evaluate dynamic and static stresses to maintain integrity and code compliance across your entire piping system.

Apply the once-through workflow to calculate code compliance analysis, spring hanger design, rotating equipment load compliance reports, anchor and support load combination tables, nozzle stresses, with or without friction, all in one run. With SIMFLEX-IV, you can quickly model your piping system, visualize your geometry and support locations, analyze the effects of both dynamic and static stresses, and compare results to ASME piping code requirements.

- **MITIGATE PIPING INTEGRITY ISSUES AND FAILURES**
- **PROACTIVELY DESIGN FOR OPERATIONAL OR PROCESS CHANGES**
- **IMPROVE PLANT-WIDE COMMUNICATION**
- **VISUALIZE IMPACT OF STATIC AND DYNAMIC PIPE STRESSES**
- **FAST ANALYSIS**

### ADVANCED NONLINEAR ANALYSIS CAPABILITIES

Account for fully nonlinear restraints in the piping design process, including limit stops with lift-off, gapped restraints, and translational and rotational friction. The numerical implementation of SIMFLEX-IV is modern, allowing for a stable solution to be achieved even with multiple single acting and nonlinear restraints. SIMFLEX-IV is a fast and easy way to integrate advanced nonlinear piping stress analysis into your daily workflow.

### SIMFLEX-IV evaluates pipe stress caused by:

| | | | | |
|---|---|---|---|---|
| **Thermal Expansion** | **Pressure** | **Wind** | **Support Displacement** | **External Forces** |
| **Thermal Bowing** | **Weight** | **Earthquakes** | **Support Friction** | **Other Loads** |

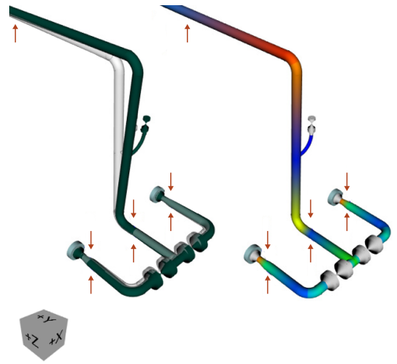
### DYNAMIC ANALYSIS

Be prepared to address any dynamic load change. Proactively calculate the natural frequencies and modal shapes of the piping system, plus determine loads, displacements, and stresses; and evaluate code compliance.

| RESPONSE SPECTRA ANALYSIS | HARMONIC ANALYSIS | TIME HISTORY ANALYSIS |
|---|---|---|
| Forcing functions that are random in motion (e.g., earthquakes)<br><br>Includes absolute combination of closely spaced modes & residual term compensation | Well-defined harmonic motion (e.g., steady vibration)<br><br>Accounts for potential deviations in frequency that may have a large effect on system response if not properly accounted for | Well-defined impulse forcing functions (e.g., water hammer)<br><br>Both modal integration and direct integration methods are available |

### MODERN VISUALIZATION

Model piping systems and explore calculation results using SIMFLEX-IV's advanced 2D and 3D visualization capabilities. The modern graphics make it easy to check your input piping system and view deformations and stress contours for all load cases analyzed.



### INTEGRATED B31.J ANALYSIS CAPABILITIES

ASME B31.J provides standardized flexibility and SIFs for all piping components and branch connections. The B31.J standard is now fully integrated into SIMFLEX-IV for faster and easier analysis. With just a single keyword, SIMFLEX-IV will automatically detect an unlimited number of SIF locations in your piping system and update them according to ASME B31.J.

## LATEST FEATURES

- Latest codes and standards (ASME B31.1, B31.3. B31.4, B31.8, and ASME Section III Class 2 & 3 Piping Codes)
- Fully integrated ASME B31.J analysis capability
- Unlimited model size or stress intensification factor (SIF) locations
- Modern solver for static and dynamic analysis



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