PRODUCT DATASHEET

VISUAL FLARE™ Safety Relief Design

Design and Modeling of Safety Systems and Pressure Relief Networks

Design, model and document plant fluid-flow systems with this rigorous, steady state simulator. VISUAL FLARE Safety Relief Design provides fast, reliable, and accurate solutions for applications that range from line sizing and vessel depressuring to the rating of complex relief systems. Comply with OSHA and HSE regulatory requirements with full network structure documentation. For all continuous process industries, including oil & gas, refining, petrochemical, and chemicals.

Product at a Glance

- Safer designs and operation
- Faster regulatory documents compliance
- More efficient flare network modeling
- Reduced capital cost
- Reduced operating cost
- 5-20% typical savings

VISUAL FLARE™ Safety Relief Design is used for designing, modeling, and documenting plant fluid-flow systems. VISUAL FLARE Safety Relief Design provides fast, reliable, and accurate solutions for applications that range from line sizing to the rating of complex relief systems. Process and safety engineers can design, rate, and analyze processes with this rigorous, steady state simulator.

Applications

- Flare Network
- Transfer Lines
- Utility Systems
- Critical, Multiphase Flow
- Line Sizing
- Relief Valve Sizing & Rating

Industries

- Oil & Gas Production
- Gas Processing
- Refining
- Petrochemicals
- Chemicals
- Engineering & Construction

Accuracy

VISUAL FLARE Safety Relief Design handles the toughest single and multiphase fluid-flow systems by using point-by-point thermodynamics and pressure drop calculations. Applications include relief networks, systems containing any configuration of multiple flares, relief valves, knock-out drums, and loops. VISUAL FLARE Safety Relief Design automatically checks for critical flow at all junctions and expansion points within relief systems. Rigorous flow models of utility networks ensure reduced capital costs and improved plant operation.

VISUAL FLARE Safety Relief Design calculates fluid equilibria and physical properties using industry standard thermodynamic packages with comprehensive pure component databanks using SIM4ME® Thermo.

SIM4ME Thermo provides considerable flexibility for defining components and allows the users to construct customized thermodynamic method slates. Additional component data can also be input for non-ideal chemical systems, including binary interaction parameters. Petroleum refiners can input petroleum pseudo-components and assay curves to characterize even the most complex streams.

VISUAL FLARE Safety Relief Design uses industry standard multiphase methods to calculate pressure drops, such as Beggs and Brill or Lockhart and Martinelli. It incorporates special modifications of the Beggs and Brill method for high-velocity calculations at or near critical flow and has the capability to size single and multiphase relief valves based on commercially available technology databases.

Intuitive GUI

A simple flow diagram describes the overall system structure with point-and-click access to data entry menus. Defaults can be defined for system components or any units of measure for input or output data. By pointing and clicking the mouse, complex piping isometrics can be defined using the interactive drawing tool. Pipe fittings such as elbows, tees, and expansions are automatically inserted by the program and then drawn to the screen. Users can also import streams directly from PRO/II Process Engineering. At any stage, context-sensitive, on-line help is readily available. VISUAL FLARE Safety Relief Design also provides a complete case study manager where users can add a new case using any previously-defined case as the base case. Similar to any Windows application, data can be easily copied between simulations or other applications using the Windows clipboard. Graphical data or tabular data can also be exported to programs such as Microsoft Excel® or Word®.

SIM4ME Portal – Integration with Excel

In addition to VISUAL FLARE Safety Relief Design's ability to run from third-party applications via an OLE compatible architecture, VISUAL FLARE Safety Relief Design has now been integrated with the SIM4ME Portal. Integration with the SIM4ME Portal allows VISUAL FLARE Safety Relief Design simulations to be controlled and modified all from an Excel interface that is constructed by dragging and dropping desired variables from a list onto an Excel workbook. Once the data from the simulation is placed in a SIM4ME Portal workbook, it can be manipulated and customized as needed via standard Excel functionality. This allows the simulation to be used by anyone, even people not familiar with constructing a model in VISUAL FLARE Safety Relief Design, expanding usage and enhancing the return on investment in the model.

Safety and Regulatory Compliance

The process industries are being challenged by regulatory agencies such as OSHA or HSE to ensure safe operation of their plants. A standard requirement of this assessment is a comprehensive model of the plant's flare relief systems with full documentation of the network structure, control systems and strategy, and maximum relief rate capacities. VISUAL FLARE Safety Relief Design is designed to address this need and to improve the productivity of teams assigned to complete this task either as part of a new design, a plant revamp, or an on-going operation. The case management capabilities provide an efficient means to ensure that a full analysis is completed for all scenarios from a limited number of base cases. VISUAL FLARE Safety Relief Design is also DIERS compliant, attaining results within tolerance on all DIERS benchmark case.

VISUAL FLARE Safety Relief Design

Technical Specifications

Pipes and Fittings

- Pipes
- Contraction
- Entrance/Exits
- Elbows
- Tees
- Expansion
- Bends
- Nozzles
- Venturimeters
- Orifice plates

Valves

- Gate valves
- Globe valves
- Butterfly valves
- Ball valves
- Check valves
- Relief valves
  - Rupture Disks
  - Pilot Valves

Equipment

- Pumps
- Compressors
- Source vessel
- Outlet
- Heaters
- Coolers
- Regulators
- Separators
- Heat Exchangers

Thermodynamic Methods and Physical Properties

- Access to over 1900 components
- Pseudo-components;
- Assay Characterization
- Multiple Component Slates; Cut Sets
- 30+ Thermodynamic Methods
  - Soave-Redlich-Kwong
  - Peng-Robinson
  - Industrial Form Steam Tables 1997
  - Scientific Form Steam Tables 1995
  - SRK Panagiotopoulos-Reid
  - SRKP Modified
  - SRK SIMSCI
  - Twu-Bluck-Coon
  - And more
- Phase Equilibrium Methods
  - Single-Phase (Vapor or Liquid)
  - Two-Phase
  - Rigorous 3-phase VLLE
  - Water Decant VLLE (Kerosene Method)
  - User-defined Decant method
- TRAPP Transport Properties
- Refinery Inspection Properties
- Automatic translation from VF SRK to SIM4ME SRK
- Automatic translation from bulk
- User-defined properties/components
- Binary interactions
- NBS/NRC steam tables
- User-Added thermodynamics
- Chung/Modified Andrade
- Hakim-Steinberg-Stiel
- API liquid density
- Simplified thermodynamics

Applications

Single Link

- Pressure drops
- Velocities
- Liquid holdup
- Phase equilibria
- Flow patterns
- Sonic velocity
- Critical flow
- Line sizing

Network

- Same as single link plus
- Gathering systems
- Distribution systems
- Hybrid systems
- Looped systems
- Flare/relief networks

Relief Valve Sizing

- API 520b
- HEM DIERS (Leung)

For more information on VISUAL FLARE Safety Relief Design, please visit: https://sw.aveva.com/engineer-procure-construct/engineering-and-design/visual-flare-safety-relief-design