Emergency Relief System Analysis and Design

TRI*HEADER™ designs and rates converging tree piping networks, including flare headers and gathering systems. It utilizes a built-in component database to perform rigorous VLE, heat transfer, and two-phase compressible flow calculations to accurately predict fluid behavior in the network. It takes into account such phenomena as liquid holdup, choked flow, and Joule-Thompson thermal effects. In design mode, TRI*HEADER optimizes the network, solving for the minimum pipe sizes necessary to meet the flow requirements. In rating mode, TRI*HEADER™ calculates the temperature and pressure distribution throughout the network and produces a detailed summary of the flow characteristics along the pipe network. In either mode, it can design pressure relief valves per API 520 specifications, separate liquid condensate from a pipeline headed toward the flare stack, and do rigorous parallel piping segment calculations for those instances where the addition of a pipe in parallel to an existing network segment is a better solution to solving a flow bottleneck than totally replacing the pipe segment.

GENERAL FEATURES

- Easy to follow menu driven data entry screens

- Extensive, easy to understand on-line help screens

- Both field and form input data verification

- Wide choice of user selectable units for all data entry and output fields, capable of being modified on the fly

- Convenient Pop-Up choice lists for input data fields

- Unique memory management features allow efficient solutions to extremely large piping systems with virtually no practical restriction limit on network size or complexity

- Accepts batch data files previously prepared and used for PipingSolutions's TRI*FLARE software package

- Support provided by experienced engineers

- Runs under MS-DOS or Command Prompt (WinNT)

TRI*HEADER APPLICATIONS

- Design new Emergency Relief Systems including pressure relief valves and knock-out drums

- Design additions to existing flare header systems including paralleling of runs with current piping segments

- Evaluate alternative designs by using simple spread sheet data entries

- Calculation of heat transfer and fluid flow characteristics for fluids flowing in converging tree networks.

TRI*HEADER™ PROVIDES

- Precise network flow analysis for pure components or mixtures in either liquid, vapor, or two-phase states

- Optimized design mode which selects proper network pipe sizes based on user specified limitations for maximum allowed velocity, percent of critical flow, and/or pressure drop

- Automatic adjustment for near sonic flow velocities

- Multiple option analysis mode to handle fluid choking and locate system bottlenecks

- Mix and match analysis and design modes on a single network, allowing design and What-If scenarios with additions to existing networks

- Intuitive "from node" - "to node" network segment specification strategy, simplifying both input and output as well as providing for efficient calculation algorithms

- Large insulation and piping material databases provided to simplify the data entry process

- DIN and ANSI standard pipe sizes as well as user specified custom pipe sizes supported in both data entry and calculations

- Automatic computation of both thermodynamic and transport properties of fluids using data from either an extensive built-in database or from customer specifications

- Large selection of user specified equations of state for modeling thermodynamic properties of components and mixtures.

- Input and output unit choices selectable from either standard or client configurable unit sets

- Rigorous heat transfer calculations from the piping network to a choice of environments including buried beneath the surface, submerged in water, or suspended in air

- Optional segregation of water in hydrocarbon mixtures, using built-in steam tables rather than hydrocarbon based equations of state.

TRI*HEADER™ OUTPUT

- Print or Browse forms indexed to either network nodes or segments detailing such items as pressure, temperature, liquid fraction, fluid properties, and heat transfer

- Output results to either printer or disk file

- Selectable units for all fields

- Automatic formatting for a wide variety of different manufacturer's printers.

- Print or Browse selected data input forms