

SynerGEE Gas Unsteady-State Module



Unsteady Flow Condition Analysis

SynerGEE® Gas's Unsteady-State Module (USM) performs off-line unsteady flow condition analysis in natural gas networks. Its ease-of-use and direct compatibility with SynerGEE make it the off-line transient module of choice for gas transmission planners and designers. While SynerGEE's steady-state capabilities are appropriate for a variety of modeling needs, unsteady-state—or transient analysis—is more applicable for others. You can also use USM to model gas composition, heat content and specific gravity as it varies with time as system supplies change.

Flexibility

USM lets you model simple or complex pipeline systems. Integrated models can include all facilities, including pipes, valves, regulators, compressors, storage fields and other special facilities. USM models complex regulator and compressor stations with multiple series elements on several parallel runs. With USM, you can model facilities as simply or in as much detail as you need.

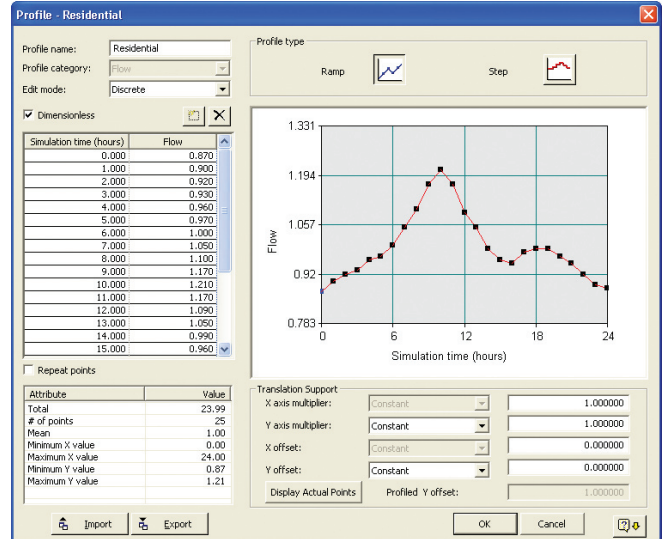
Despite the rate of change in your transient scenario analysis, you can balance your network volumetrically or thermally. Thermal balancing options include both heat content tracing and component tracing capabilities.

USM puts you in complete control of your simulation, allowing you to automatically or manually operate facilities during simulation. Each simulation can be paused and restarted as often as needed with the simple click of a mouse.

Enhanced Functionality

The key to off-line transient modeling is proper results management and interpretation. An unsteady state simulation can generate large amounts of data. USM lets you control data flow during simulation to make results interpretation easier. USM also offers features to enhance your overall modeling experience:

- **Logical Operating Scripts** expand USM's functionality and control for automating model events. The scripts capability exposes virtually all modeling features, variables and attributes for greater modeling flexibility.
- USM now offers **Fast and Slow Transient Modes**. The **fast transient** mode allows you to accurately simulate isothermal, time-varying events such as network line breaks and gas loss. The **slow transient** mode eliminates the unsteady-state momentum calculation to simulate slower network events occurring over time and saves considerable time and computations.
- A fully editable **Results Plan** allows you to interactively define charting variables before and during time-varying analysis. The plan is pre-populated with standard modeling attributes and enables you to add attributes including facilities, nodes, system variables and profile information.
- USM's **Charting** flexibility allows you greater control over model curve line colors, width and types and expands the number of plottable variables per axis. Hover over a point on the chart to view its associated information.



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