

## Design and Operate Your System with Greater Safety and Reliability

AFT Impulse is a powerful fluid dynamic simulation tool used to calculate pressure transients in piping systems caused by waterhammer. Designed for use in liquid systems containing water, petroleum and refined products, chemical products, cryogenics, refrigerants, and more, AFT Impulse is an essential tool with the ability to tackle your most demanding systems.



### Capabilities

- Model a wide range of system components and surge suppression devices for both design and operational cases
- Initiate transients based on time or events in the system
- Reduce surge magnitudes by slowing system component changes such as valve closures or pump speed
- Calculate transient unbalanced forces and define forces sets as location pairs or single points
- Specify alerts that automatically highlight output values that are out of range for flow, pressure or velocity
- Compile libraries of your frequently used piping components and quickly select them from a drop down list
- Experiment with operating conditions and scenarios
- Quickly and easily change system input data, including valve positions, pump operation, control set points, pressures and more
- Analyze waterhammer effects on systems containing non-Newtonian fluids containing settling or non-settling slurries

### Benefits

- Avoid potentially catastrophic effects of waterhammer and other undesirable system transients
- Alleviate possible financial and environmental issues associated with inadequate system designs or operational procedures
- Avoid lost revenue resulting from incidents that cause down time
- Validate the design of safety features
- Understand the transient response of your system
- Know the dynamic interaction of valves, pumps and other components

### Typical Applications

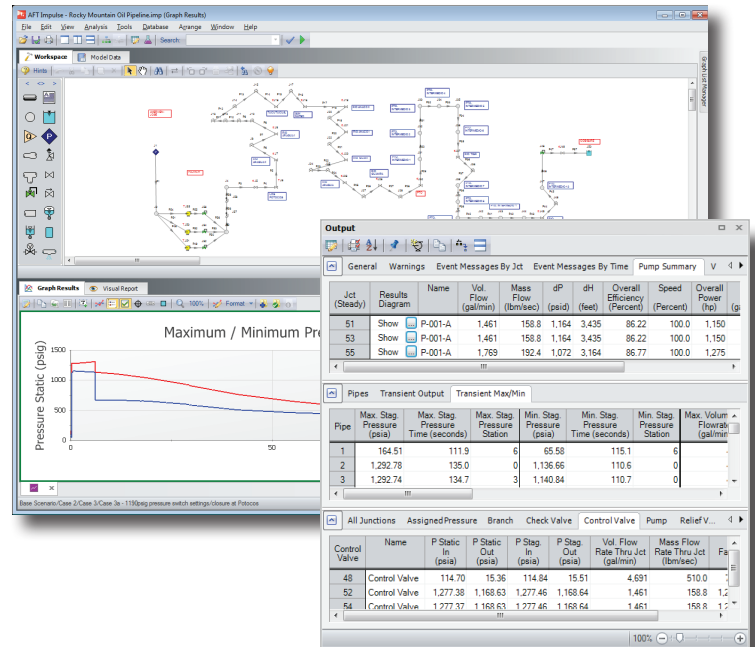
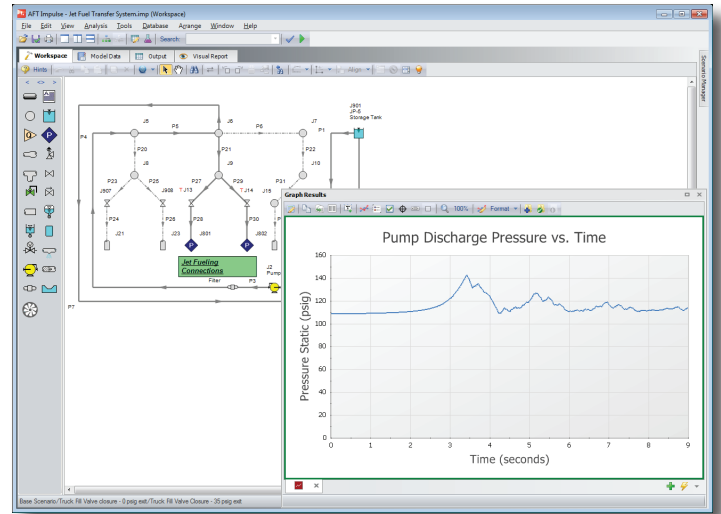
- Ensuring that pressure extremes are within design allowables
- Sizing and locating surge suppression equipment
- Determining imbalanced pipe forces for sizing structural supports
- Troubleshooting existing systems to determine the cause of operational problems
- Evaluating the effect of pressure surges due to vapor cavity collapse

## Features

- Advanced transient solver based on Method of Characteristics
- Built-in steady-state solver to automatically initialize waterhammer transient
- Detailed pump inertial modeling for trips and startups using one quadrant or four quadrant methods
- Extensive cavitation modeling including liquid column separation
- Built-in library of fluids and fittings
- Scenario Manager to track all design variants and operational possibilities in a single model file with data linkage
- Comprehensive relief valve modeling
- Integrated graphing and reporting
- Animation features to dynamically graph transients
- Create video files from animations to share your results
- Generates force imbalance files that can be automatically read into CAESAR II<sup>®</sup> and TRIFLEX<sup>®</sup> pipe stress dynamic models
- Built-in intelligence to guide you in building better models

## How does it work?

AFT Impulse incorporates a steady-state solver providing seamless transfer of initial conditions to the transient analysis. Steady-state solutions are determined using Newton-Raphson matrix iteration. The traditional Method of Characteristics is used to solve the transient mass and momentum equations of pipe flow.



## New in AFT Impulse 6!

- Significant enhancements to the graphing capability including multiple graphs on the same tab, stacked graphs, dual Y-axis, and synchronized animation
- Force summary in the output gives clear overview of all forces
- Design alerts are specified and named globally and applied to pipes, junctions, pumps, valves and reservoirs
- Improved language support, now including German and Chinese, for the output and menus

## Get the most out of your AFT Impulse software investment

Training by our professional staff helps you learn about the software's wide range of capabilities and modeling techniques. Our seminars review fundamental theory, basic through advanced techniques and hands-on modeling. Whether you're a new or experienced user, you'll find an AFT Impulse seminar a worthwhile investment of your time. AFT offers regularly scheduled seminars at our offices in the USA. Seminars can also be held at your facility. Visit [www.aft.com/learning-center/seminars](http://www.aft.com/learning-center/seminars) for more information.

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