## 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, cryogens, refrigerants, and more, AFT Impulse is an essential tool with the ability to tackle your most demanding systems.

## Capabilities

- Easily change system input data to experiment with operating conditions and scenarios
- Model a wide range of system components 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 force sets as location pairs or single points
- Specify alerts that automatically highlight output values that are out of range for flow, pressure or velocity
- Prevent issues with transient pressures by determining proper size and location for surge equipment, such as surge tanks, gas accumulators, and relief valves
- Utilize the output data to summarize the codes and standards used within the models
- Compile catalogs of your frequently used piping components and select them from a drop down list

## Benefits

- Understand the transient response of your system
- Avoid damaging effects of waterhammer and other undesirable system transients
- Alleviate issues associated with inadequate system designs or operational procedures
- Validate the design of safety features
- Visualize the dynamic interaction of valves, pumps and other components

## Applications

- Ensure pressure extremes are within design allowables
- Size and locate surge suppression equipment
- Determine imbalanced pipe forces for sizing structural supports
- Troubleshoot existing systems to determine the cause of operational problems
- Evaluate the effect of pressure surges due to vapor cavity collapse

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## Add-On Modules

**SSL**

### Settling Slurry

The only commercial software solution that can model both non-settling and settling slurry waterhammer effects.

**PFA**

### Pulsation Frequency Analysis

Helps identify and avoid resonant frequencies in systems, especially in those caused by positive displacement pumps.

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# Features

- Built-in steady-state solver to automatically initialize waterhammer transient

- Robust integration with Microsoft Excel for importing and exporting of data

- Compound transient event logic to model complex control sequences

- Detailed pump inertial modeling for trips and startups using one quadrant or four quadrant methods

- Extensive cavitation modeling including liquid column separation

- Scenario Manager to track all design variants and operational possibilities in a single model file

- Comprehensive modeling of relief valves, surge tanks, and gas accumulators

- Integrated graphing and reporting

- Animation tools for visual interpretation of complex transient interactions

- Generates force imbalance files that can be automatically read into CAESAR II ®, ROHR2, and TRIFLEX ® pipe stress dynamic models

- Built-in libraries of fluids (including NIST REFPROP and ASME Steam Tables) and fittings which can be extended and customized
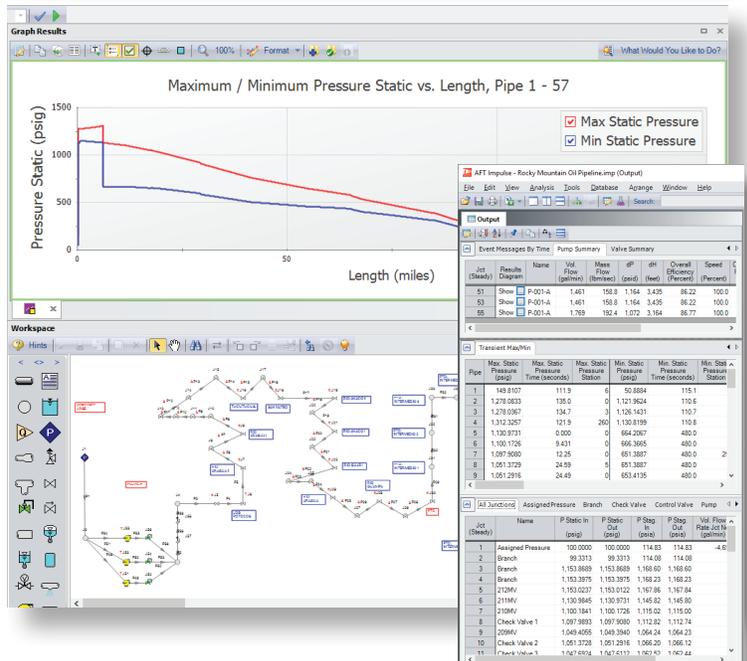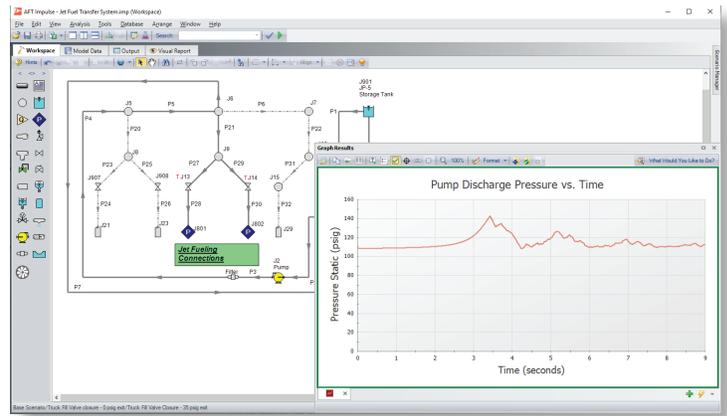
# Data Integration

- Import piping layouts and dimensional data from GIS shapefiles, EPANET, CAESAR II neutral files, as well as PCF files from AutoCAD Plant 3D, SmartPlant, PDS, CADWorx, and others

- Robust import/export Excel integration

## 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.

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## World Class Support

Your software includes one free year of product upgrades and technical support.
Additionally, AFT offers a variety of training for all levels of knowledge.

### Training Seminars
This classroom style setting accelerates your skills and teaches you how to be an AFT analysis and simulation expert.

### Free Webinars
Hosted webinars talk about products and solutions-based uses. Recorded webinars are located on our website.

### Expert Assistance
Have more projects than you can handle or need expert analysis? Extend your team with our Flow Expert Package.

### Tips & Tricks
Each month, an AFT engineer gives newsletter readers a new tip and trick to keep you up to date.

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