The Tubing Analysis System (TAS) is a computer program that performs various calculations and simulations for tubular applications. It is an integrated modular program that includes Force and Stress Analysis, Fluid Circulation, and Unload Kill Fluids, along with numerous quick computations often needed in tubular computations. TAS can be used as a Coiled Tubing Job Simulator for designing velocity strings, drill pipe applications, underbalanced drilling, coiled tubing drilling, and wireline simulations. The first version of TAS was released in November 1992, and since then, it has evolved into a market leader of tubular simulations.

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TAS

Tubing Analysis System

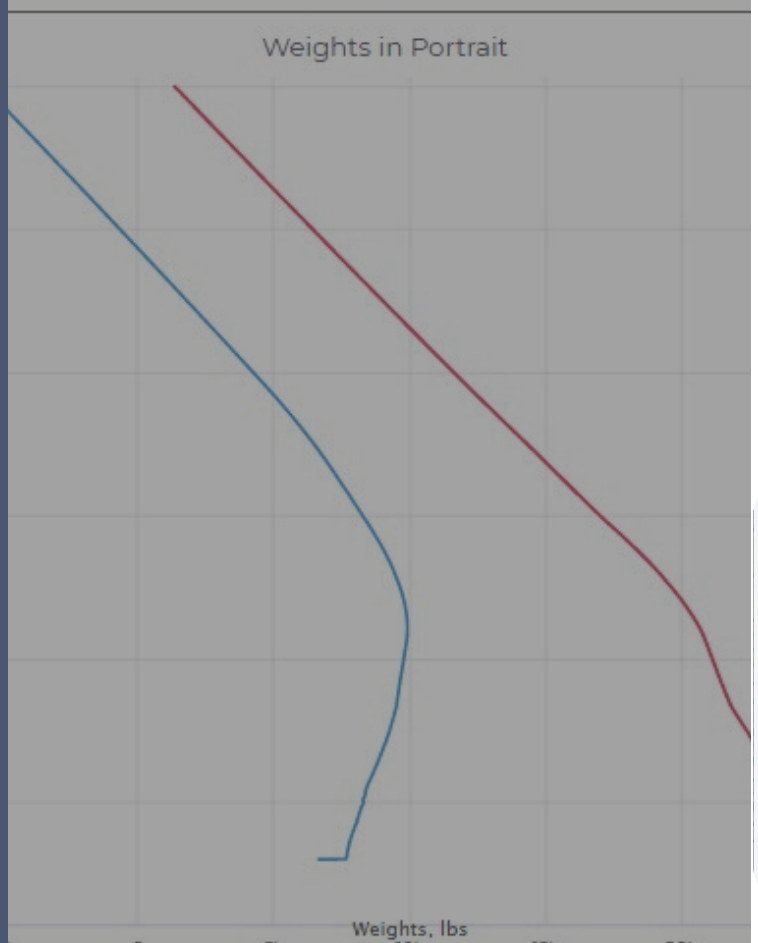
Modules

The Force and Stress Analysis module

includes various computations such as weight, friction, buoyancy, wellhead pressure, pressure drop through downhole tools, dogleg severity, and extra friction (in buckling modes, i.e. sinusoidal and helical). The module calculates three stress components, hoop, radial, and axial stress (including bending stress due to doglegs and when in buckling mode), and uses the Von Mises relationship to compute Tri-Axial Stress. The module can detect critical conditions such as lockup and severe dog-legs, and several options are available for simulating different scenarios such as applying weight-on-bit, bottom-hole pull, changing well conditions to account for fluid circulation effects, predicting maximum pull, and predicting maximum push to lockup.

The Fluid Circulation module

includes two models, one for single-phase flows and the other for multi-phase. The single-phase model includes three options for describing the rheological behavior of liquids as Newtonian, Power-Law, or Bingham Plastic. Foam is treated as a single-phase Bingham Plastic compressible fluid where the rheological properties are a function of the foam quality and the shear rate. The multi-phase model uses the Duns and Ros, Beggs and Brill, or Hagedorn and Brown algorithms for computations. The module also includes features such as velocity string designs, sand/cuttings cleanout, gas lift mandrels, and sensitivity analysis.



TAS is a powerful tool for performing various calculations and simulations for tubular applications. The system is user-friendly and provides detailed outputs for informed decision-making.

The Unloading Kill Fluids simulator

is designed for designing and optimizing unloading kill fluids using N2 through coiled tubing. The module performs a series of scenarios and reports a table of predicted liquid lift rates versus N2 flow rates at various depths. The module also reports total N2 and time required for the simulation.