



# TAS - Tubing Analysis System

**TAS** is a computer program designed to perform various calculations and simulations often needed in tubular applications. TAS is used as a Coiled Tubing Job Simulator, designing velocity strings, drill pipe applications, under-balanced drilling, coiled tubing drilling, cementing, and wireline simulations. TAS is an integrated modular program incorporating **Force and Stress Analysis, Fluid Circulation, and Unload Kill Fluids**, in addition to numerous quick computations often needed in tubular computations. **The system runs on any Windows 95 or above operating systems. The first release of TAS was in November 1992. TAS has since been evolving to a market leader of tubular simulations.**

## Force and Stress Analysis Module

The computations in this module include the effects of weight, friction, buoyancy, wellhead pressure, pressure drop through downhole tools, dogleg severity, and extra friction (in buckling modes, i.e. sinusoidal and helical).

Three stress components are computed, hoop, radial and axial stress (includes bending stress due to dog-legs and when in buckling mode). Von Mises relationship is used to compute Tri-Axial Stress.

The module will automatically detect critical conditions such as lockup and severe dog-legs. Furthermore, 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.

## Fluid Circulation Module

This is made up of two models, one for single-phase flows and the other for multi-phase.

### Single Phase Model:

- Any one of three models may be used to describe the rheological behaviour of liquids as Newtonian, Power-Law or Bingham Plastic.
- The single-phase fluids can be compressible as in the case of gas.
- Foam is treated as a single phase Bingham Plastic fluid where the rheological properties are a function of the foam quality and the shear rate. Foam is a compressible fluid.

### Multi-Phase Model:

- Computations are based on the Duns and Ros, Beggs and Brill, or Hagedorn and Brown algorithms. The user has a choice of selecting the preferred method of computation.

### Other Features:

- Velocity string designs
- Sand/cuttings cleanout
- Gas lift mandrels
- Sensitivity analysis

### Unloading Kill Fluids

This simulator is for designing and optimising unloading kill fluids using N<sub>2</sub> through coiled tubing.

The module performs a series of scenarios and reports a table of predicted liquid lift rates versus N<sub>2</sub> flow rates at various depths. Total N<sub>2</sub> and time required are also reported.

