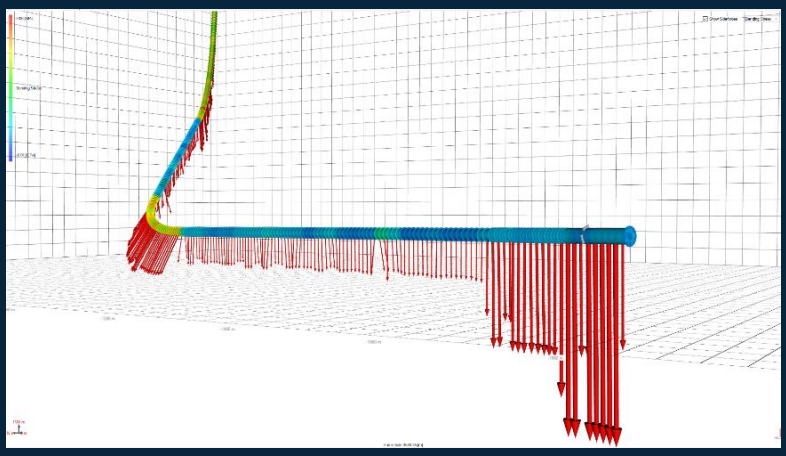
S-Drill

S-Drill is a Windows desktop drilling engineering application for the Oil & Gas and Geothermal industries that allows modelling of drilling and completion activities. The S-Drill product is a powerful, yet easy to use application that enables drilling personnel to understand what is occurring downhole and to produce output for both office and rig-site in user customisable formats.

S-Drill uses an integrated Torque & Drag and Hydraulics model coupled with comprehensive Wellbore and BHA models to simulate a wide range of operations. Including the following

- Sub-Sea / Riserless
- Managed Pressure
- Floated/Partially filled strings
- Friction Reduction Tools
- Centraliser Stand-off / Placement
- Split Flow / Diverters
- Swivel Tool, Agitators
- Cuttings Removal Tools
- Slant Rig / HDD
- Cementing / Fluid Displacement
- Circulating Temperature & HPHT fluid properties



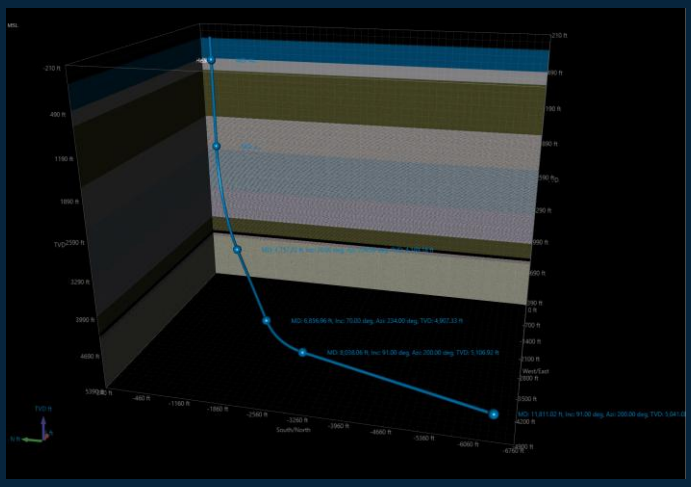
Features

Well

Configure Land, Offshore and Sub-Sea well types and define the surface location and vertical datum. Store logos for use in plots and reports and define a default unit system, currency and default file location for the current well.

Survey Data

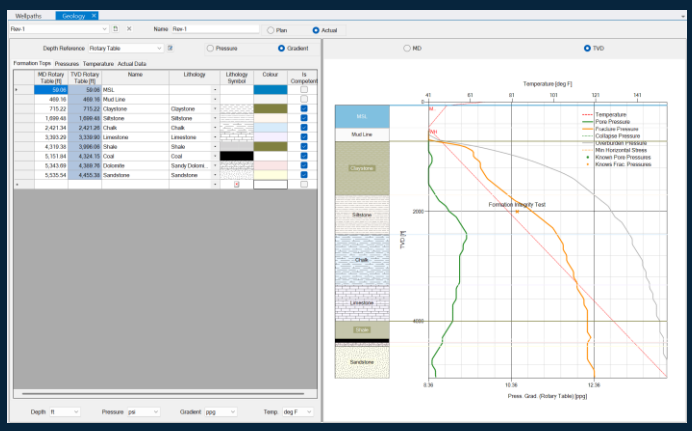
S-Drill provides both minimum curvature survey calculations and a full interpolation with associated 3D & 2D views. Enter and view survey data or well plans from multiple datum.



Geology

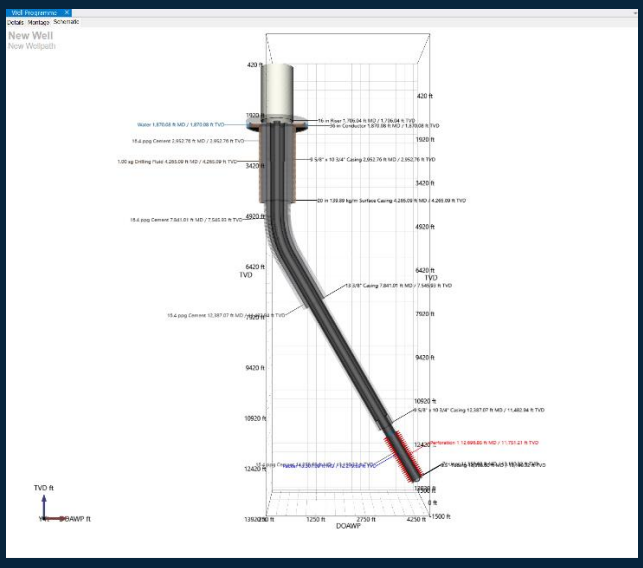
Enter lithology, pressures and temperature of the formation by measured depth or true vertical depth from multiple datum. Pressure data can be entered and viewed as either a pressure or gradient. Stratigraphic column and pressure data can be co-visualised with the engineering results.

Enter known pressure points such RFT or LOT values. Analyse pressure tests with the **Pressure Test Analyser**



Well Programme

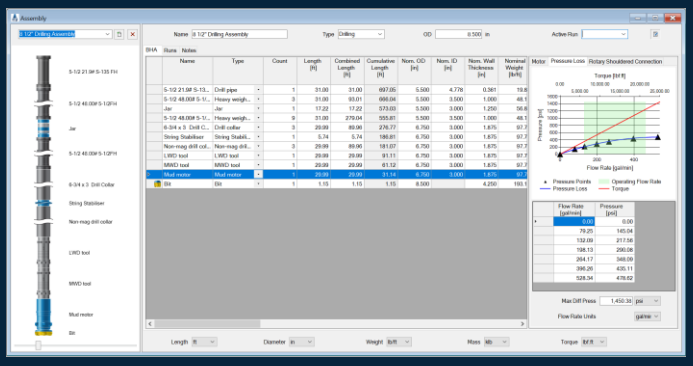
Define the well design and drilling programme by measured depth or true vertical depth. S-Drill provides a record of drilling activities so that both time and cost can be monitored. Run a simulation of the activity. Days v Depth and Activity plots are available in conjunction with design and operations montages. Define Well Control equipment for each stage of the Well and track the status. Montage & Schematics are available



S-Drill

Bottom Hole Assembly

The assembly model allows accurate definition of a range of drilling, completion, casing, cementing, fishing and workover tools. A user extensible catalogue of drill-pipe, casing and tubing is provided. Define the operating limits of downhole tools such as bits, motors, MWD tools, jars and packers etc. and check whether they have been exceeded in the simulation. View scalable vector images of components. Calculate Connection Make-up Torque and Tensile limits according to API RP7G.



Fluids

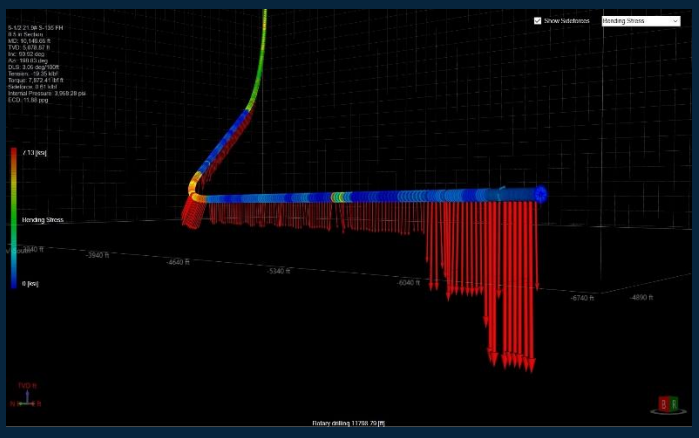
Define multiple fluids for use in the simulations and operations record. Newtonian, Bingham, Power Law and Herschel-Bulkley rheological models are supported. Calculate rheology from common parameters or viscometer data. Multiple viscometers are supported. HPHT fluid properties including HPHT viscometer data can be defined to calculate downhole fluid properties.

Rig

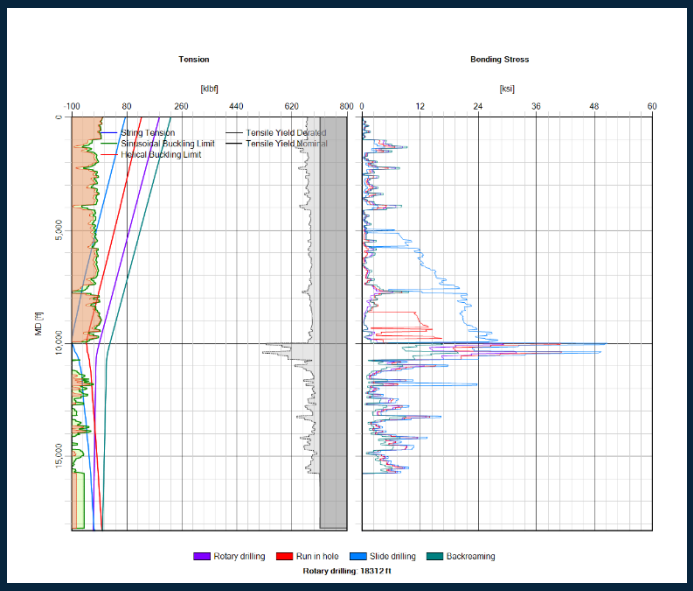
Multiple rigs can be defined for use in the calculations. Choose from Land, Semi-Sub, Jackup, Drillship. Define surface equipment limits and operating parameters. Select rig pumps from a built-in catalogue.

Simulation

The simulation includes 2 soft-string Torque & Drag models in combination with 4 rheological models. Multiple operating modes are supported allowing multiple operations to be modelled at any given depth. The user can run the simulation at multiple depths and display the data in user customisable plots. View the BHA in a 3D view with side forces and calculated parameters.



The simulation produces over 100 calculated parameters that can be viewed in tabular format or in user customisable plots. Add & edit plots to include parameter curves. Each curve can be customised with its own style. Custom layouts can be saved for re-use.

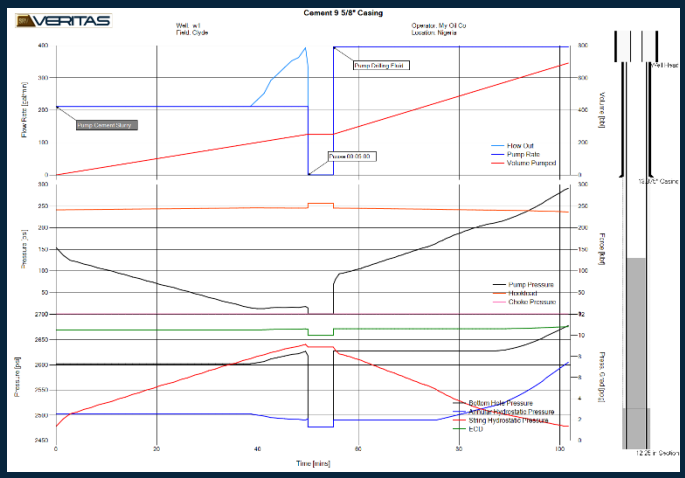


- Calculate Tension, Torque, Stress, Stretch and Twist
- Calculate buckling limits with or without the influence of torque
- De-rate pipe limits under the influence of tension, torque and bending.
- Include the effect of sheave friction on hook load.
- Calculate Slip Crush load.
- Calculate Fatigue Ratio & Cycles to failure
- Model the effect of accessory components such as pipe protectors, torque reducers, centralisers and mechanical cleaning devices
- Model complex downhole tools such as Jars, Motors, MWD/LWD, Diverters, Agitators, Bits, Packers, Underreamers and Tractors
- Calculate centraliser stand-off and running forces
- Simulate boosted riser, returns to seabed and applied annular pressure
- Calculate circulating temperature and modified mud properties
- Calculate cuttings beds and hole cleaning parameters.
- Model the effect of Hole Cleaning Devices
- Compare downhole pressures and equivalent circulating density with pore, fracture and collapse pressures in open hole
- Include the effect of eccentric and helical flow
- Compare the results with the operating limits of downhole tools
- Compare results against rig equipment limits
- View a summary pass fail table for each failure mode for each result
- Use Calliper logs for open hole diameters

S-Drill

Multi-Fluid Static mode allows simulation of floated and partially filled strings.

Multi-Fluid Dynamic mode allows simulation of fluid displacement activities such as cementing, wash trains and sweeps.



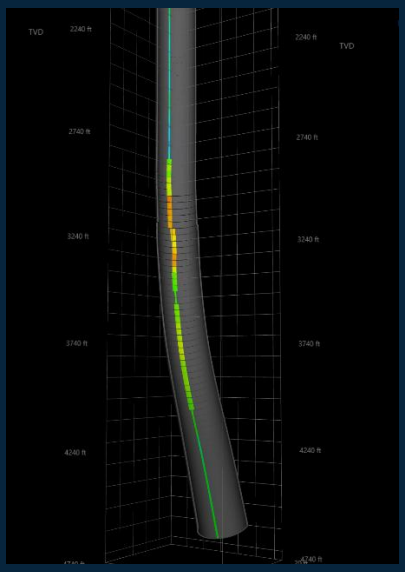
Centraliser Placement

Calculate the optimum centraliser running programme to obtain the minimum required stand-off. Simulate Bow Spring, Semi-Rigid and Rigid types. Account for Starting and Running forces and friction reduction properties in the Simulation.

Casing Wear

Calculate wear depth based on wear factors and rotary drilling operations. Single and multiple wear factors are supported. Wear logs can be exported for use in the Casing Stress Analysis.

A wear factor back calculation facility allows a range of wear factors to be calculated from wear logs.



Volume Calculator

The Volume Calculator provides a tool to perform common rig site volumetric calculations such as fluid displacement and pill spotting.

Sensitivity Analysis

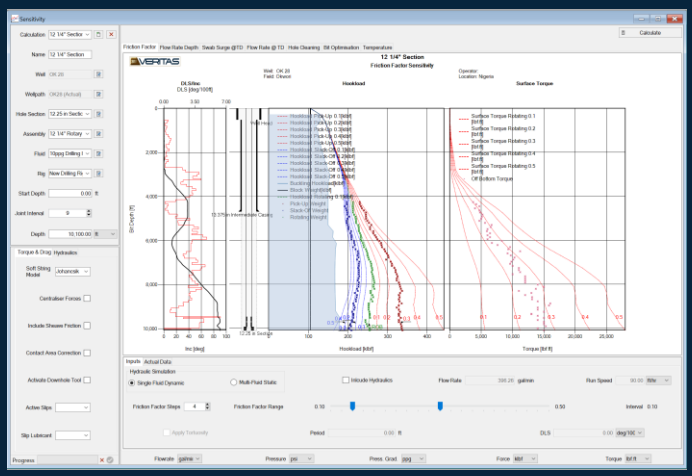
The Sensitivity Analysis module produces analyses suitable for rig-site drilling operations including...

- Friction Factor
- Flow Rate vs Depth
- Swab Surge @ TD
- Flow Rate @ TD
- Hole Cleaning
- Bit Optimisation
- Circulating Time

The Sensitivity Analysis module runs a full simulation for each analysis type, taking into account such parameters as Run Speed, ROP, RPM, Flow Rate, Open/Closed Pipe, Cuttings Size etc.

Incorporate Hookload, torque, pressure and ECD data. Calibrate Hookload values, correct for the effect of sheave friction, apply corrections, calculate simulated values based on drilling parameters and back calculate friction factors.

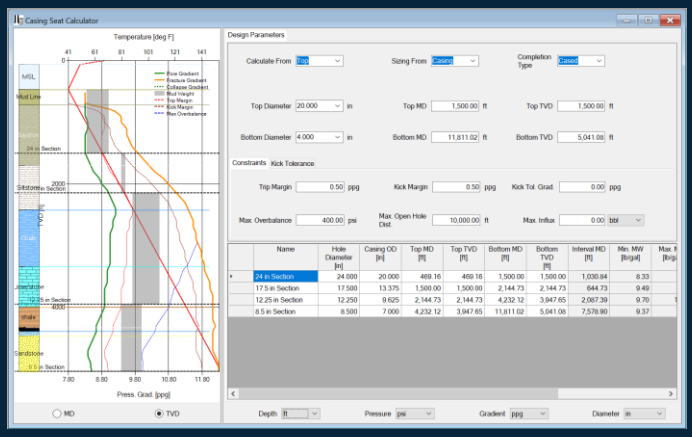
Generate plots and reports for distribution at office and rig site.



Log data can be associated with the Sensitivity Analysis to provide simulated versus actual comparison.

Casing Seat

The Casing Seat calculator allows appropriate selection of casing shoe depths according to pore & fracture pressures. Constrain the calculation by trip and kick margins, maximum open hole depth and max overbalance. Interactively place casing shoes on the plots and calculate max allowable gas influx for each hole section.

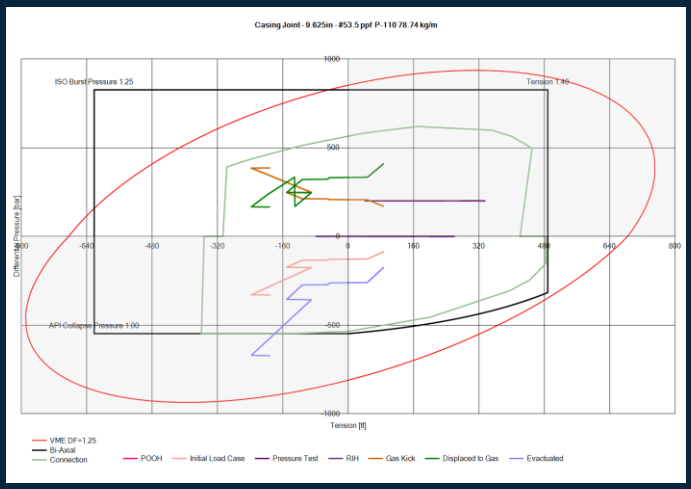


S-Drill

Casing Design

The Casing Design module provides casing stress analysis for casing and tubing strings according to API 5C3 / ISO 10400 standards. A library of fully customisable load cases is available. Include the influence of temperature with circulating and production temperature models. Account for casing wear and casing eccentricity and thermal yield strength reduction.

S-Drill's sophisticated assembly modelling allows for definition and casing and tubing strings from a catalogue of common diameters. Couplings and connections are modelled separately.



The Casing Design module also includes a Minimum Cost Design calculation to design a casing string according to the minimum allowable grade or wall thickness.

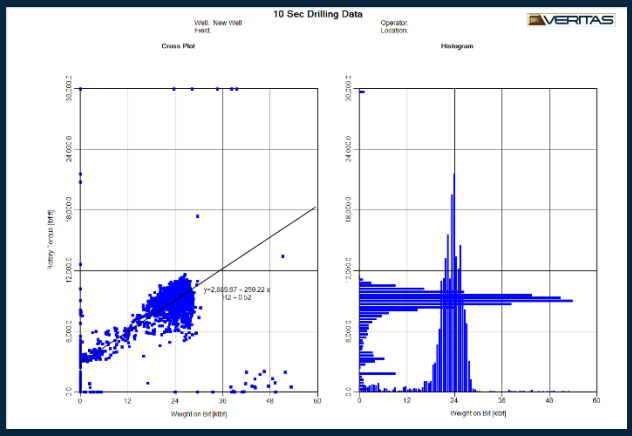
A Sour Service selector allow selection of appropriate grades according to the to the concentration of H2S and CO2

Log Data

S-Drill includes a generalised log model and viewer allowing high resolution depth and time-based logs to be associated with data. Customisable plots are available for each log.

Data Analysis

The S-Drill log viewer also includes analysis plots. Cross Plot allows any log curve to be plotted against another with the option of shading by a 3d parameter. It also includes regression and clustering tools. The Histogram tool allows statistical analysis of any log curve and can be linked to the Cross Plot. The Heatmap tool summarises 3rd parameter data by minimum, maximum, frequency and average value in cross plot form.



Report Editor

The Report Editor prepares plots for output. Plots can be configured and customized in Portrait or Landscape (A4 & Letter) format. Text and picture annotations are supported. It allows for convenient output to .pdf, Clipboard, Printer and MS Outlook.

PDF Reports

Rapidly generate pdf reports for all data types and calculation results using predefined templates. Customise reports with your corporate colour scheme, fonts and logo. Export charts directly to MS Outlook and pdf. Merge multiple pdf files into a single file.

Import/Export

Plots and underlying data can easily be exported to MS Excel. Copy plots as an Excel chart for use in MS Office applications. Export tables to Excel. User customisable import and export of data to MS Excel. Pre-defined import templates for common data formats. The Ascii importer allows convenient mapping of columns and units to underlying data structures. LAS files are also supported

Units

Enter and display data in any combination of units. Choose from pre-defined or user created unit sets. Update units immediately.

Multiple Languages

S-Drill is fully translated into Spanish and Russian

Features	License Bundle		
	Drilling Engineering	Casing Design	Well Engineering
Survey Editor / Viewer	✓	✓	✓
Simulation	✓		✓
Sensitivity	✓		✓
Casing Seat		✓	✓
Casing Design		✓	✓
Centraliser Placement	✓	✓	✓
Casing Wear	✓	✓	✓
Volume Calculator	✓		✓
Log Editor / Viewer	✓	✓	✓

Minimum System Requirements

S-Drill makes use of multi-threading technology to improve performance on the latest multi-core processors.

Operating System: Windows 10/11 64 bit
Processor: Multi-Core Processor
Memory: 8 Gb RAM
Screen Resolution: 1920 x 1080
(No network connection required)

Contact

sales@srv-veritas.com

SRV Veritas Ltd.
Union House, 111 New Union Street
Coventry
England
CV1 2NT
+44 (0) 161 399 2967

www.srv-veritas.com