GE Oil & Gas
Drilling & Production

Well Entry Simulation Tool (WEST)

WEST facilitates the planning and safe execution of wireline intervention in complex well profiles, such as highly deviated and horizontal wells.

Description

WEST software models the forces present on wireline and downhole tools during a logging job. Sophisticated 3-D algorithms compute the effects of well angle and curvature, as well as lift forces and viscous drag arising from the relative velocity between the well fuids and the downhole equipment. Algorithm accuracy has been confrmed by comparing the results with measured data in many different well profles and in a variety of well conditions.

Results are presented graphically allowing the user to assess the feasibility of wireline intervention quickly, to identify risks by comparing expected loads with equipment limits, and to optimise the selection of logging cables and weak points. In particular, for work in highly deviated wells, WEST indicates when tractor assistance is required to reach the target depth.

For conventional wireline operations, WEST automatically imports cable tension, depth, and speed from the Warrior logging system or from a Depth Interface Unit (DIU). Alternatively, customised interface modules are available to import cable data from third party logging systems. For operations in which a wireline tractor is required, WEST automatically imports tractor loads, depth, and speed from Sondex Tractor (MDT) control software.

By graphically comparing predicted curves with actual data trends in real-time, the simulations may be fne-tuned as the job progresses. Anomalous cable and tractor loads arising from adverse well conditions are readily identifed. This feature makes WEST an essential planning and job control aid for any wireline intervention in deviated wells or horizontal wells.

A well project fle is created that stores relevant well details, cable tension, and tractor load records.

Multiple job scenarios may be saved in a single well fle. A job scenario may be set up for each run in a well or for signifcant changes in well conditions during a single run. The well fle provides a permanent easy to read graphical review of the entire logging programme that is suitable for post job analysis or future reference for subsequent intervention in the same well.

Features
- Graphic user interface allows WEST project fles to be set up quickly
- Graphic presentation of results on a single plot allows rapid assessment of intervention feasibility and identifcation of risks
- Integration of real-time cable depth and tension overlaying model during job
- Simulates cable tension and tractor load buildup along well profle
- Predicts requirement and feasibility of pump down and tractor operations
- Cable pull limits and weak point calculation
- Indicates the effects of well fuid fow and well pressure
- Highlights adverse well conditions
- 3-D well profle plot
- Indicates maximum tool lengths through doglegs
- Ability to model pulling as well as pushing a toolstring
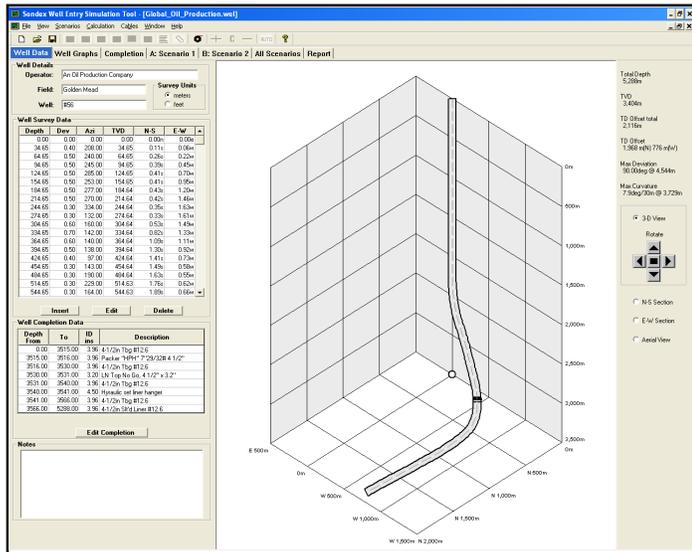- 64 bit Windows and Warrior 8 compatible

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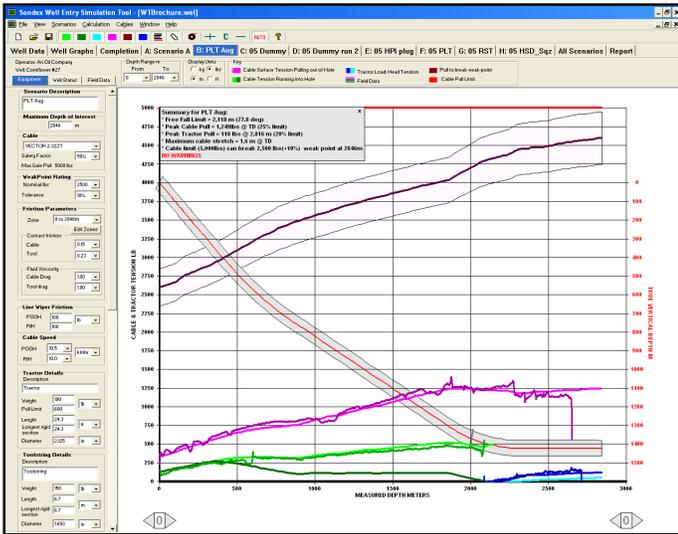
WEST screen showing well profile and computed tension data overlaid by real job data.

— Cable pull limit

— Run-in-hole cable tension

— Weak point limit and tolerance

— Head tension holdup indicator

— Pull-out-of-hole cable tension

— Tractor load

WEST screen showing well trajectory computed from the drilling deviation survey.

GE imagination at work

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