

# **Engineer's Desktop™**

## **Software Version 5000.15**

### **Release Notes**

#### **Contents**

<a href="#">What's In This Release?</a> .....	2
<a href="#">Introduction To Engineer's Desktop™</a> .....	3
<a href="#">System Requirements</a> .....	9
<a href="#">Installation</a> .....	10
<a href="#">Licensing</a> .....	11
<a href="#">International Trade Compliance</a> .....	12
<a href="#">Enhancements, Fixed Issues, and Known Issues</a> .....	14
<a href="#">Third-Party Software</a> .....	259
<a href="#">Contacting Landmark Customer Support</a> .....	261
<a href="#">Copyright and Trademarks</a> .....	264

**HALLIBURTON** | Landmark

## What's In This Release?

The function of the 5000.15 release is to update the installation process, update supported operating systems and Citrix configurations, as well as a significant number of enhancements and bug fixes for EDT applications and utilities. Patch releases were ported to this release as well.

**The licensing system has been upgraded to use the LGCX system. You will need new license features to continue to use the EDT applications after upgrading to version 5000.15. Contact a Landmark Account Manager to obtain new licenses for the 5000.15 release.**

Descriptions of Enhancements, Fixed Problems, and Known Issues for each application in the EDT suite are provided.

To go directly to the enhancements, bug fixes, and known issues for individual applications, click the blue links below:

<b>AutoSync</b>	<a href="#">Enhancements</a>	<a href="#">Fixed Issues</a>	<a href="#">Known Issues</a>
<b>CasingSeat™</b>	<a href="#">Enhancements</a>	<a href="#">Fixed Issues</a>	<a href="#">Known Issues</a>
<b>CasingWear™</b>	<a href="#">Enhancements</a>	<a href="#">Fixed Issues</a>	<a href="#">Known Issues</a>
<b>COMPASS™</b>	<a href="#">Enhancements</a>	<a href="#">Fixed Issues</a>	<a href="#">Known Issues</a>
<b>Data Analyzer™</b>	<a href="#">Enhancements</a>	<a href="#">Fixed Issues</a>	<a href="#">Known Issues</a>
<b>EDM™</b>	<a href="#">Enhancements</a>	<a href="#">Fixed Issues</a>	<a href="#">Known Issues</a>
<b>Engineer's Desktop™ (EDT™)</b>	<a href="#">Integration Enhancements</a>	<a href="#">Integration Fixed Issues</a>	<a href="#">Integration Known Issues</a>
<b>OpenWells®</b>	<a href="#">Enhancements</a>	<a href="#">Fixed Issues</a>	<a href="#">Known Issues</a>
<b>PROFILE™</b>	<a href="#">Enhancements</a>	<a href="#">Fixed Issues</a>	<a href="#">Known Issues</a>
<b>StressCheck™</b>	<a href="#">Enhancements</a>	<a href="#">Fixed Issues</a>	<a href="#">Known Issues</a>
<b>WELLCAT™</b>	<a href="#">Enhancements</a>	<a href="#">Fixed Issues</a>	<a href="#">Known Issues</a>
<b>Well Cost</b>	<a href="#">Enhancements</a>	<a href="#">Fixed Issues</a>	<a href="#">Known Issues</a>
<b>WellPlan™</b>	<a href="#">Enhancements</a>	<a href="#">Fixed Issues</a>	<a href="#">Known Issues</a>

To see the most up-to-date version of these release notes visit the online [Landmark Documentation Library](#) (login to iEnergy is required).

 Go To "What's In This Release?"

# Introduction To Engineer's Desktop™

Welcome to the 5000.15 release of Engineer's Desktop™ (EDT™) software. The Windows-based Engineer's Desktop software enables the Drilling & Completions applications—Well Engineering, Tubular Design, and Well Data Management—to run on a shared data model.

EDT release 5000.15 update is installed via an executable file obtained via the Electronic Software Delivery system, using Landmark Software Manager.

**IMPORTANT:**

- **EDT 5000.15 applications can not co-exist with previous versions of EDT applications on the same machine.**

The following sections of this document provide more information about the Engineer's Desktop release and the enhancements, issues fixed and known issues for releases 5000.1.13 through 5000.15.

## ***Applications Included in the Engineer's Desktop Software Release***

All of the EDT software applications in the release are described briefly below. Further information on individual tools can be found in the online help for any of the applications.

### **Drilling Engineering Applications**

#### **COMPASS Software**

The COMputerized Planning and Analysis Survey System software is a comprehensive tool used by oil companies and directional drilling contractors for directional well design and construction. COMPASS software offers a fast and accurate means of well planning and identification of potential directional drilling or anti-collision problems at the earliest possible stage.

It includes all the features required for complex well trajectory design, survey and anti-collision monitoring, and analysis. COMPASS software also includes tools for survey data management, multiple planning methods, torque-drag optimization, anti-collision plotting, and analysis, and platform optimization.

Click [here](#) to view the COMPASS enhancements, fixed issues, and known issues for 5000.15.

 Go To "What's In This Release?"

## **CasingSeat Software**

Landmark's CasingSeat software is used to design viable schemes consisting of casing shoe setting depths and casing sizes. It provides rigorous shoe selection calculation routines to optimize shoe locations based on pore pressure, fracture gradients and user-defined design constraints. It features inventory-based management of permissible hole and casing size combinations. The application provides layer- and lithology-based characterization of subsurface boundary conditions and operating constraints, including those associated with wellbore stability, minimum overbalance, and differential sticking.

CasingSeat software is fully integrated with StressCheck software, enabling a precise engineering workflow for more detailed design and stress load analysis of the casing design.

Click [here](#) to view the CasingSeat enhancements, fixed issues, and known issues for 5000.15.

## **CasingWear Software**

CasingWear™ software, is integrated Landmark Engineer's Desktop application (EDT). CasingWear™ software supports data sharing as well as engineering workflows across other Landmark engineering software applications through Landmark's Engineering Data Model (EDM). Its modern Decision Space® user interface, Output driving Inputs approach simplifies user's learning experience, software-user interaction and workflow process; allowing easy application lay out customization, easy access to relevant analysis information, powerful visualization and synchronization of results presented in traditional XY plots/tabular format, 2D and 3D advance format, summary tables, reports and convenient access training videos.

CasingWear™ software takes advantage of the synergy of Landmark Engineer's Desktop by applying proven Soft and Stiff String Torque & Drag engineering models (WellPlan™) to determine drill pipe tool joint casing inner wall contact points and side forces applied to Casing Wear Analysis. CasingWear™ software allows diverse Wear factor input definition options (single, multiple along casing or drill string). Wear factor selection from traditional DEA-42 wear factors catalog or User defined wear factor catalogs. CasingWear™ analysis includes Linear or non-Linear wear factor wear analysis, as well as API or linear remaining casing strength calculations.

 Go To "What's In This Release?"

Among other features; CasingWear™ software analyzes riser-off set and riser-less affecting casing wear; use of Stand-off Devices (Pipe Protectors, Hard-banding material) and their corresponding wear factors to add more granularity to casing wear analysis, Dogleg severity overrides affecting casing wear, and sensitivity analysis of drilling operation parameters (WOB, RPM), wear factor and Dogleg severity override.

CasingWear™ workflow supports chronological casing wear analysis of specified drilling operation sequence including Drilling, Back reaming, Rotate off bottom, slide drilling and reciprocation within a Casing\liner(s) wellbore configuration or across multiple wellbores represented by multiple sidetrack case analysis. Casing Wear™ enables workflows across engineering applications; e.g., sharing remaining casing wall thickness results with Tubular applications including StressCheck™ and WELLCAT™ software to compare results of remaining wall thickness against Maximum Allowable Wear to determine remaining Casing integrity.

CasingWear™ software is a next-generation software application to predict the locations and magnitudes of cased pipe damage due to the friction and galling of drilling operations.

CasingWear™ software provides greater accuracy and consistency than the sometimes erratic results generated by older casing wear models. Integrated with Landmark's existing EDM™ database, CasingWear™ software also provides an extensible solution that can be integrated with other industry-leading applications.

Click [here](#) to view the CasingWear™ enhancements, fixed issues, and known issues for 5000.15.

### **StressCheck Software**

Landmark's StressCheck software is a graphics-based casing design product for Microsoft Windows. It incorporates an array of attributes to enable the user to quickly, systematically, and accurately evaluate casing wear limits, minimum cost design, and working-stress design for burst, collapse, axial installation, and service-life load cases.

StressCheck software is based on casing design principles that are broadly accepted and employed in the petroleum industry. CasingSeat and StressCheck software are referred to as 'Tubular' applications.

Click [here](#) to view the StressCheck enhancements, fixed issues, and known issues for 5000.15.

 Go To "What's In This Release?"

## **Well Cost Software**

Landmark created Well Cost software so that Drilling and Completion Engineers could quickly perform accurate and efficient cost and planning operation analysis throughout the life of a well. Well Cost software provides engineers with the ability to generate cost estimates for either low-level budgeting purposes (such as during initial project scope), or the more detailed Authorization for Expenditure (AFE).

Well Cost is Landmark's replacement for DrillModel™ software, a tool that provides deterministic Cost AFE analysis but does not offer probabilistic modeling and is not integrated with other applications or databases. Well Cost software places a powerful tool in the hands of engineers that is:

- integrated with OpenWells and EDM software
- capable of performing deterministic and probabilistic analysis
- flexible and easy to configure
- intuitive and easy to use with an interface that is similar to other Engineer's Desktop applications.

Click [here](#) to view the Well Cost enhancements, fixed issues, and known issues for 5000.15.

## **WELLCAT™ Software**

WELLCAT™ software provides precise solutions for both wellbore analysis and integrated casing and tubing design. The software calculates accurate downhole temperature and pressure profiles which can be used for pipe-body movement and casing and tubing load analysis. WELLCAT software is the tool of choice for many companies operating in high-pressure, high-temperature (HPHT) deepwater or heavy oil drilling and production environments. The software integrates five modules into a common environment to provide more accurate and reliable solutions to complex design problems. Thermal effects are modeled for drilling and production operations. A comprehensive analysis of loads and stresses on casing and tubing is provided, including service life analysis. Detailed analysis of the entire casing system is provided to understand the effects of annular pressure buildup and the interaction in the casing and tubing systems within a well. Loads and their resulting wellhead movement are evaluated to determine the integrity of the well tubulars.

Click [here](#) to view the WELLCAT enhancements, fixed issues, and known issues for 5000.15.

 Go To "What's In This Release?"

## **WellPlan Software**

The 5000.15 release adds WellPlan™ software to the EDT™ suite. This new evolution in well design is built on the industry leading WELLPLAN™ software. WellPlan™ software uses a output-driven input methodology, by automatically identifying data required for analysis. Prior to joining the EDT™ suite, WellPlan™ was previously released by Landmark as DecisionSpace® Well Engineering.

WellPlan software is a drilling engineering analysis system designed for use at the rig site and the office to provide both well planning and operations analysis. The different engineering modules of WellPlan software are seamlessly integrated and address aspects of data collection, analysis, well planning, and modeling.

WellPlan software can be used to improve well designs, prevent stuck pipe and BHA failures, prevent drilling problems, and essentially drill the right wells the first time at a lower cost. General well information is entered through common editors to enable basic Case data components to be entered (e.g., wellbore editor, string editor, fluid editor, and survey editor). These editors are generally available in most WellPlan modules depending on which module or mode of analysis is being used. Additional data required for particular analyses are entered using editors available within each analysis module (e.g., Torque/Drag Actual Loads, Cement Job Editor, etc.).

Click [here](#) to view the WellPlan enhancements, fixed issues, and known issues for 5000.15.

## **Data Management Applications**

### **AutoSync Software**

The EDM AutoSync Client, included in the 5000.14 release, provides the ability to synchronize field operations reports and configuration between a regional/head office and disconnected computers typically located at rig sites with intermittent connectivity.

Using the EDM Autosync Client also requires installation of the EDM Autosync Server service in the regional/corporate environment. The EDM Autosync Server application is available as a separate download from Landmark's electronic software distribution site (LSM).

Click [here](#) to view the AutoSync enhancements, fixed issues, and known issues for 5000.15.

 Go To "What's In This Release?"

### **Data Analyzer Software**

Data Analyzer software provides an easy-to-use, powerful tool for EDT Drilling & Completions users, which enables them to realize maximum value from their captured well operations and engineering information. Data Analyzer software provides all user levels the ability to quickly and easily build simple and complex ad-hoc queries against drilling and well services data. Ad-hoc queries can be generated, with the user selecting from the same user-defined labels and data input structure that they are familiar with in the applications.

Click [here](#) to view the Data Analyzer enhancements, fixed issues, and known issues for 5000.15.

### **OpenWells Software**

OpenWells is the industry leading software used by over 130 operators worldwide for field operations reporting of the entire well delivery lifecycle including Site Scouting, Construction, Drilling, Completions, Well Services, Remediation, Reclamation and Abandonment. It is a fully integrated and comprehensive, communications, analysis and corporate engineering information data management system. OpenWells is a comprehensive solution built upon EDM and integrated with the industry leading Engineers Desktop suite of applications (CasingSeat, CasingWear, StressCheck, COMPASS, WellPlan, Data Analyzer, PROFILE, WELLCAT, and Well Cost).

Click [here](#) to view the OpenWells enhancements, fixed issues, and known issues for 5000.15.

### **PROFILE Software**

PROFILE software enables any user, from a rig supervisor to a completions engineer to a business analyst, to quickly visualize currently installed and historical wellbore information and downhole equipment in the form of wellbore schematics and reports. This allows them to be updated quickly with the current well configuration and history.

Click [here](#) to view the PROFILE enhancements, fixed issues, and known issues for 5000.15.

 Go To "What's In This Release?"

## System Requirements

Complete system requirements for software and hardware, third party information, and a list of supported platforms are contained in the *Engineer's Desktop™ 5000.15 Release Installation Guide*.

 Go To "What's In This Release?"

# Installation

The following EDT™ guides can be found by visiting the [Landmark Documentation Library](#) on iEnergy (a login to iEnergy is required).

*Engineer's Desktop™ 5000.15 Release Installation Guide*

*Engineer's Desktop™ 5000.15 Release Database Guide*

*Engineer's Desktop™ 5000.15 Release Citrix Guide*

 Go To "What's In This Release?"

# Licensing

Landmark's Application Manager (LAM) is the license system used to control access to Landmark applications.

## New Licensing System

Licensing system has been upgraded to use the LGCX system. Contact a Landmark Account Manager to obtain new licenses for the 5000.15 release.

WellPlan™ software requires the following LGCX valid licenses to run:

- EDM (Engineer's Data Model)
- Any of the following according to the module to be run:

Product Name	License String (feature)	Module(s)
WellPlan Torque & Drag	WELLPLAN_TORQUE_DRAG	Torque & Drag
WellPlan Hydraulics	WELLPLAN_HYDRAULICS	Hydraulics
WellPlan Cementing	WELLPLAN_CEMENTING	Cementing
WellPlan Underbalanced Hydraulics	WELLPLAN_UNDERBAL_HYDRAULICS	UB Hydraulics
WellPlan Swab/Surge & Well Control	WELLPLAN_SURGE_WELLCONTROL	Swab & Surge, Stuck Pipe
WellPlan BHA Dynamics & Stuck Pipe	WELLPLAN_BHA_DYNAMICS_S_PIPE	BHA Dynamics, Stuck Pipe
WellPlan Centralization	WELLPLAN_CENTRALIZATION	Cementing (Centralization only)

 Go To "What's In This Release?"

# International Trade Compliance

This application is manufactured or designed using U.S. origin technology and is therefore subject to the export control laws of the United States. Any use or further disposition of such items is subject to U.S. law. Exports from the United States and any re-export thereafter may require a formal export license authorization from the government. If there are doubts about the requirements of the applicable law, it is recommended that the buyer obtain qualified legal advice. These items cannot be used in the design, production, use, or storage of chemical, biological, or nuclear weapons, or missiles of any kind.

The ECCN's provided in Release Notes represent Landmark Graphics' opinion of the correct classification for the product today (based on the original software and/or original hardware). Classifications are subject to change. If you have any questions or need assistance please contact us at [FHOUEXP@halliburton.com](mailto:FHOUEXP@halliburton.com)

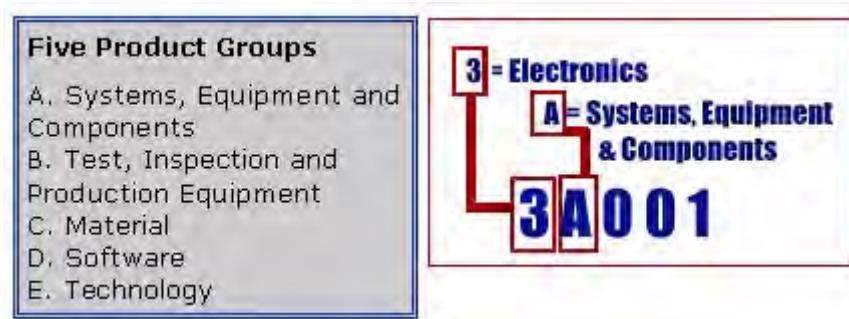
Under the U.S. Export Administration Regulations (EAR), the U.S. Government assigns your organization or client, as exporter/importer of record, responsibility for determining the correct authorization for the item at the time of export/import. Restrictions may apply to shipments based on the products, the customer, or the country of destination, and an export license may be required by the Department of Commerce prior to shipment. The U.S. Bureau of Industry and Security provides a web site to assist you with determining the need for a license and with information regarding where to obtain help.

The URL is: <http://www.bis.doc.gov>

## ***Definitions***

CCATS (Commodity Classification Automated Tracking System) - the tracking number assigned by the U.S. Bureau of Industry and Security (BIS) to products formally reviewed and classified by the government. The CCATS provides information concerning export/re-export authorizations, available exceptions, and conditions.

ECCN - Export Control Classification Number - The ECCN is an alpha-numeric code, e.g., 3A001, that describes a particular item or type of item, and shows the controls placed on that item. The CCL (Commerce Control List) is divided into ten broad categories, and each category is further subdivided into five product groups. The CCL is available on the [EAR Website](#).

[Go To "What's In This Release?"](#)

The ECCN number, License Type, and the CCATS Numbers for this product are included in the table below. Also included is the date the table was last updated.

Product/Component/R5000	ECCN Number	License	CCATS Number	Last Date Updated
Engineer's Data Model (EDM)	5D002	ENC	G060075	3/29/2010

 Go To "What's In This Release?"

# Enhancements, Fixed Issues, and Known Issues

Descriptions of Enhancements, Fixed Issues, and Known Issues for the applications in the EDT software suite are provided.

To go directly to the enhancements, bug fixes, and known issues for individual applications, click the blue links below:

[AutoSync](#)

[CasingSeat™](#)

[CasingWear™](#)

[COMPASS™](#)

[Data Analyzer™](#)

[EDM™](#)

[Engineer's Desktop™ \(EDT™\)](#)

[OpenWells®](#)

[PROFILE™](#)

[StressCheck™](#)

[WELLCAT™](#)

[Well Cost](#)

[WellPlan™](#)

 Go To "What's In This Release?"

---

## AutoSync Software

[Enhancements](#)[Fixed Issues](#)[Known Issues](#)

This section outlines the changes made to AutoSync software.

### AutoSync Enhancements and New Functionality

The AutoSync enhancements and new functionality are described below for releases 5000.14 through 5000.15.

#### Release 5000.15

There are no enhancements to AutoSync for this release.

#### Release 5000.14

- Support for the EDT™ data model and platforms has been added to AutoSync for this release.

[!\[\]\(7377a3302f3d0fb3a834bf90f4594228\_img.jpg\) Go To "What's In This Release?"](#)

## AutoSync Fixed Issues

The AutoSync issues fixed for releases 5000.14 through 5000.15 are described below.

### **Release 5000.15**

Defect No.	Description
958158	AutoSync client can inadvertently save invalid credentials during the registration process

### **Release 5000.14**

Defect No.	Description
887897	AutoSync stopped syncing/showing errors due to control character (DLE/ "&#16)
948251	AutoSync Client does not transfer data from CD_BHA_COMP_BIT if the CD_ASSEMBLY_COMP is not modified
950555	Bridge Adapter fails to transfer 'Memo' fields
924271	Unable to transmit attachments with size more than 1mb when network loss is more than 2%
878713	AutoSync errors logged as a result of a column mismatch between the CD_PAD table on the Oracle database and MSDE database

 Go To "What's In This Release?"

## AutoSync Known Issues

The following AutoSync known issues for releases 5000.14 through 5000.15 are described below.

### **Releases 5000.14 through 5000.15**

There are no additional AutoSync known issues for these releases.

 Go To "What's In This Release?"

---

## CasingSeat™ Software

[Enhancements](#)[Fixed Issues](#)[Known Issues](#)

This section outlines the changes made to CasingSeat™ software.

### **CasingSeat Enhancements and New Functionality**

The CasingSeat enhancements and new functionality for releases 5000.1.13 through 5000.15 are described below.

#### **Releases 5000.1.13 through 5000.15**

There are no enhancements to CasingSeat for these releases.

 Go To "What's In This Release?"

## CasingSeat Fixed Issues

The CasingSeat issues fixed for releases 5000.1.13 through 5000.15 are described below.

### **Releases 5000.1.13 through 5000.15**

There are no CasingSeat issues fixed for these releases.

 Go To "What's In This Release?"

## CasingSeat Known Issues

The CasingSeat known issues for releases 5000.1.13 through 5000.15 are described below.

### Release 5000.15

There are no CasingSeat known issues for this release.

### Release 5000.14

Defect No.	Description
955155	CasingSeat does not display newly added Hole Sizes and Casing ODs

### Release 5000.1.13

There were no additional CasingSeat known issues for this release.

[Go To "What's In This Release?"](#)

## CasingWear™ Software

[Enhancements](#)[Fixed Issues](#)[Known Issues](#)

This section outlines the changes made to CasingWear™ software.

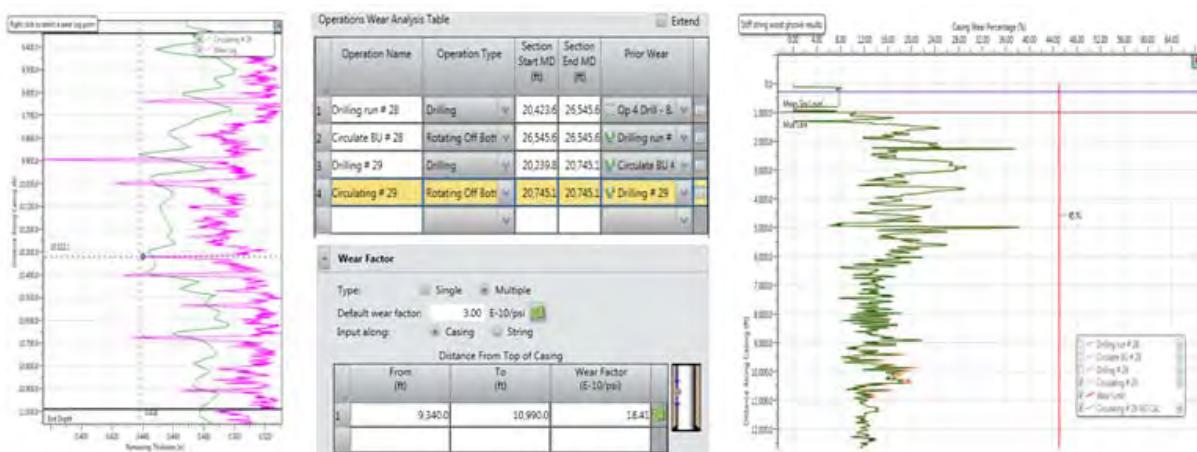
### CasingWear Enhancements and New Functionality

The CasingWear enhancements and new functionality for releases 5000.14 through 5000.15 are described below.

#### Release 5000.15

##### *Wear Factor Modeling Tool*

CasingWear “wear factor modeling tool” allows wear factors generation from logs (e.g. ultrasonic); by selecting multiple log remaining wall thickness measurements of interest compared with predicted CasingWear remaining wall thickness values at different depths of interest and back calculated wear factor values to match adjust predicted CasingWear values to log measured remaining wall thickness values. Log calibrated wear factors can be used to overwrite or insert single wear factor or multiple wear factor intervals along the casing length.

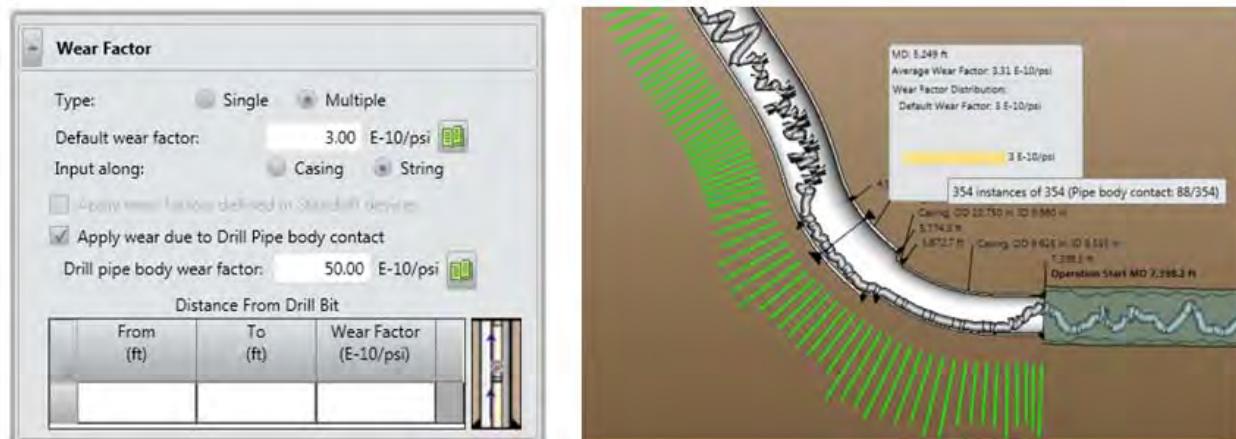


[Go To "What's In This Release?"](#)

### Drillpipe Body Wear Factor

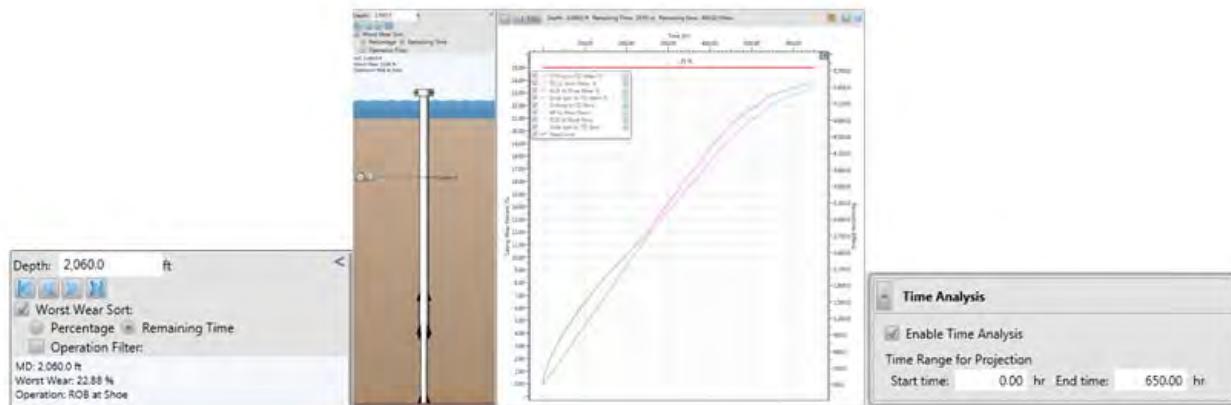
In addition to CasingWear volume calculation based on contact forces applied along drill pipe tool joints; CasingWear analyzes drillpipe body to casing contact mode along the wellbore to determine additional wear due to drill pipe body contact. In addition to the use of user defined; single, multiple tool joint wear factors and/or standoff devices (Pipe protector, hard banding) wear factors; CasingWear applies drillpipe body wear factors in multiple wear factors along the drillstring modeling option.

In an ideal wellbore mechanical conditions of drillpipe to casing in contact conditions, dogleg severity, and drillpipe tensile/compressive conditions, drillpipe body wear factor is factored into existing drill pipe tool joint wear factors (Multiple Drill String mode) causing an increase on overall casing wear calculations.



### Time Plot; Remain Time and Revs

In addition to enable clear visualization of progressive casing wear build up over time with respect to the number of drillstring revolutions; CasingWear displays remaining time and revolutions. Remaining time is the estimated time remaining to reach the stipulated wear limit in the hole section. Remaining revs is the estimated revs remaining to reach the stipulated wear limit in the hole section.

[Go To "What's In This Release?"](#)

### Release 5000.14.1

CasingWear software enhancements for 5000.14.1 include the following:

- Stiff String Prior Wear from Wear Logs Option

### Release 5000.14

CasingWear for 5000.14 consists of the following key features:

- Multiple Drill String Configurations
- Casing Wear Modeling
  - Linear Wear Equation
- Use of Proven WellPlan™ Torque and Drag Models
  - Soft String Model
  - Stiff String Model
- Wear Factor Analysis Options
  - Linear Wear Factors
  - Non-Linear Wear Factors
- Rating Calculations
  - API 5C3
  - Linear
- Wear Factor Input
  - Single
  - Multiple (along the Casing; along the Drill String)

 Go To "What's In This Release?"

- Standoff Devices Wear Factors (Pipe Protectors, Hard-banding)
- Wear Factors Source
  - User Defined
  - DEA-42 Catalog
  - User Defined Catalog
- Drilling Operations
  - Drilling
  - Back-reaming
  - Rotate off Bottom
  - Slide Drilling
- Prior Wear
  - None
  - Prior operation
  - Prior Case (Sidetrack scenario)
- Other features
  - 3D Visualization
  - Schematic and Casing Cross Section
  - Time Plot
  - Sensitivity Analysis
    - WOB
    - RPM
    - Single Wear Factor
    - Dogleg Severity
  - Riser Offset – Riserless Offset
  - Workflows across applications (WELLCAT™ and StressCheck™)
    - Predicted Wear vs. Maximum Allowable Wear
  - Predicted Wear Log Validation

 [Go To "What's In This Release?"](#)

## CasingWear Fixed Issues

The CasingWear issues fixed for the release 5000.14 through 5000.15 are described below.

### Release 5000.15

Defect No.	Description
959741	Token to allow importing planned wellpath data into Wellplan and CasingWear allows access to actual data
963125	Unchecking lines on legend does not remove grid results in wear log editor
963126	Exception when attempting to drag the dogleg plot view splitter
963127	Erroneous groove depth equation in help
963128	Bogus dogleg calculation in inserted dogleg overrides
963129	Prior wear showing "N" when wear log is used as prior wear

### Release 5000.14.1

Defect No.	Description
957739	Operation validation causing delay entering values while adding new standoff devices - Citrix
957740	Linked operation is not persisting in Copy case - Causing Time Plot to Crash
957741	Multi-Track does not fit to view on after new tracks are added
957742	"Apply Global Changes" for "wear factor along string" not triggering Calc
957743	"NaN" display in the collapse column in collapse plot when no Collapse rating is undefined
957744	Exception: missing Services folder in CasingWear for GHB Rheology Fluid Model
957745	Changing operation name does not update in the Multi-track when the operation name is changed
957746	CasingWear Report shows "R" trademark instead of "TM"
957747	Operation's prior Wear Avg. tool joint OD does not display when the user defined is launched (Soft String)
957748	Changing operation name re-fires the calculation engine
957749	Plots keeps reloading or blinks when the Bit Catalog dialog is open
957750	Wear log comparison shows incremental groove results

[!\[\]\(b6caec9f099fb8657f94ea092216c378\_img.jpg\) Go To "What's In This Release?"](#)

Defect No.	Description
957751	Enable Automatic Calculation message keeps blinking on the plots
957752	Tool tip displays pipe protector instead of Hardbanding
957753	Collapse and Burst rating validation does not update after entering value
957754	Hyperlink does not display in Time plot after unchecking "Enable Time Analysis"

### **Release 5000.14**

There were no CasingWear fixed issues for this release.

 Go To "What's In This Release?"

## CasingWear Known Issues

The following CasingWear known issues for the releases 5000.14 through 5000.15 are described below.

### Release 5000.15

Defect No.	Description
960371	Report issue (density fluid)
960373	Report issue (units of time)
960950	Modeling casing wear in calculations in loop when prior wear defined from prior table
963891	iEnergy script error in WellPlan and CasingWear introduction screen
963893	WellPlan and CasingWear crash on Windows 10 when the application is left open and the server machine is accessed via remote session

### Releases 5000.14

There were no CasingWear known issues for this release.

[Go To "What's In This Release?"](#)

## COMPASS™ Software

[Enhancements](#)[Fixed Issues](#)[Known Issues](#)

This section outlines the changes made to COMPASS™ software.

### COMPASS Enhancements and New Functionality

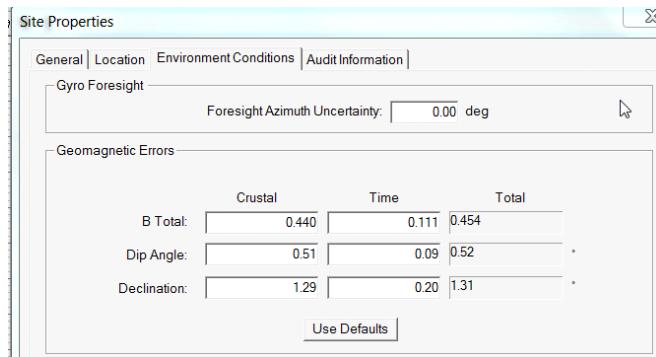
The COMPASS enhancements and new functionality for 5000.1.13 through 5000.15 are described below.

#### Release 5000.15

##### *Error Models and Anti-Collision*

A number of changes to error models are made. These do not affect existing error models but allow for enhancements to the mwd and derived models.

- Geomagnetic reference errors – use SESTEMsite environment setup. Existing error models remain unchanged. New keywords from IPM files are used to load the geomagnetic errors (field=MFE, dip=DPE, and declination=DCE). The stored values for these are 1 sigma.



A button to call a web service (from default mag model) to supply error values has been added.

- Reference based anti-collision additions. A radial projection error 'c' type is added for the ISCWSA standard collision calculation.

[← Go To "What's In This Release?"](#)

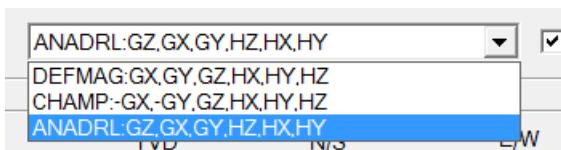
- Plan interpolations. In 5000.14.0, plans were interpolated by default every 100' or 30m depending on the unit settings. It is now possible to have an interpolation interval associated with a survey tool program in the plan settings. This was included in 5000.14.1 but has been improved upon in 5000.15. The error model allows error terms that are sensitive to station length.
- Additions to the error models for course length and random misalignment. These are changes in the IPM definitions.
- Random misalignment angle error is used on tie-station at surface (currently assumes zero).
- Surface location error picklist included.

### *Raw Magnetic Data, and Magnetic Calculations and Validation*

Improved import of raw magnetic data that earlier did not properly handle units and different conventions for raw magnetic input data. Here is an example of the data input.

Time	Depth(m)	Inc (deg)	Az Orig (d)	Ax (g)	Ays (g)	Azs (g)	Mxs (nT)	Mys (nT)	Mzs (nT)
18/09/2014 02:00	2331.93	0.2	95.9	1.0001	0.0024	0.0019	55359	-10510	9595
18/09/2014 08:00	2341.68	0.2	81.2	0.9999	0.0023	0.0016	55505	-12231	7300
18/09/2014 11:55	2351.46	1.8	312.6	0.9997	-0.0243	0.0201	55615	11755	7007
18/09/2014 15:10	2361.22	3.58	316.41	0.9978	0.0007	-0.0618	55774	-12683	3735
18/09/2014 20:20	2371.63	5.08	318.789	1.0009	0.0016	0.0675	55786	12683	-3564
18/09/2014 22:00	2381.38	6.1	319.228	0.9971	-0.0522	-0.0921	55994	-9546	7544
18/09/2014 23:40	2391.13	7.38	323.12	0.9943	0.0788	0.1029	56189	8362	-8313
19/09/2014 02:30	2400.88	8.79	317.2	0.9909	0.1065	0.111	56091	9644	-7837
19/09/2014 04:30	2410.63	10.12	306.9	0.987	0.1363	-0.1123	55664	-4858	-13464
19/09/2014 06:00	2420.38	11.8	303.037	0.9814	0.1504	-0.1388	55322	-4004	-15076
19/09/2014 08:30	2430.1	14.18	302.91	0.9725	0.0968	0.2257	54956	16602	3284
19/09/2014 11:05	2439.85	16.08	302.93	0.9642	-0.2058	0.1865	54639	842	17969
19/09/2014 14:45	2449.63	17.01	304.244	0.9592	-0.1349	0.2613	54553	6775	17004
19/09/2014 16:50	2459.39	17.01	304.921	0.9586	-0.0423	-0.2904	54590	-15186	-9790
19/09/2014 19:00	2469.14	18.12	308.53	0.953	0.3066	0.0537	54614	14185	-11218
19/09/2014 23:00	2478.89	19.71	309.45	0.9438	0.2408	-0.2369	54333	208	-18848
20/09/2014 09:15	2488.65	21.39	310.73	0.9331	0.3663	0.0136	53979	15222	-12708

In the raw data import dialog on the survey type page, you can now choose the axis configuration and the unit type for the values.



There are three configurations for the axes:

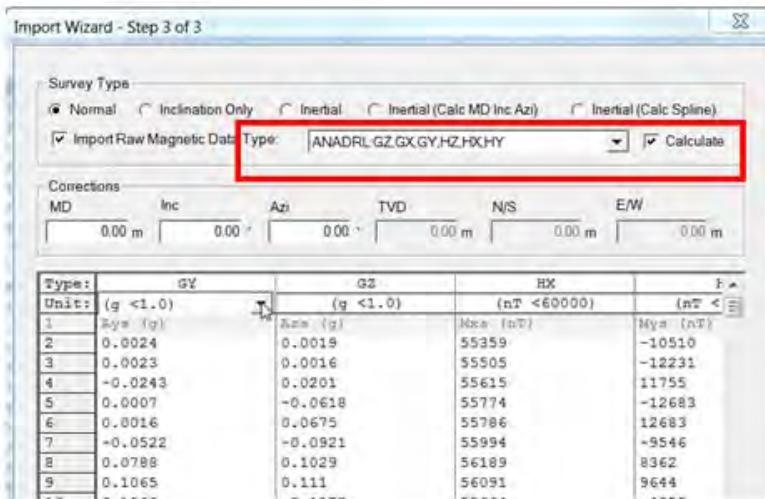
- DEFMAG is used for BHI, Sperry, EMS and many other tools

[Go To "What's In This Release?"](#)

- CHAMP is the format for the original commercial EMS tool (X and Y accelerometer are reversed)
- ANADRL is for Anadrill type MWD where the X axis is the long axis of the tool  
Accelerometer data is normally entered in units of gravity (values 0-1) or milligravity (values 0 to 1000). The current display is in ft/s-2 or m/s-2.

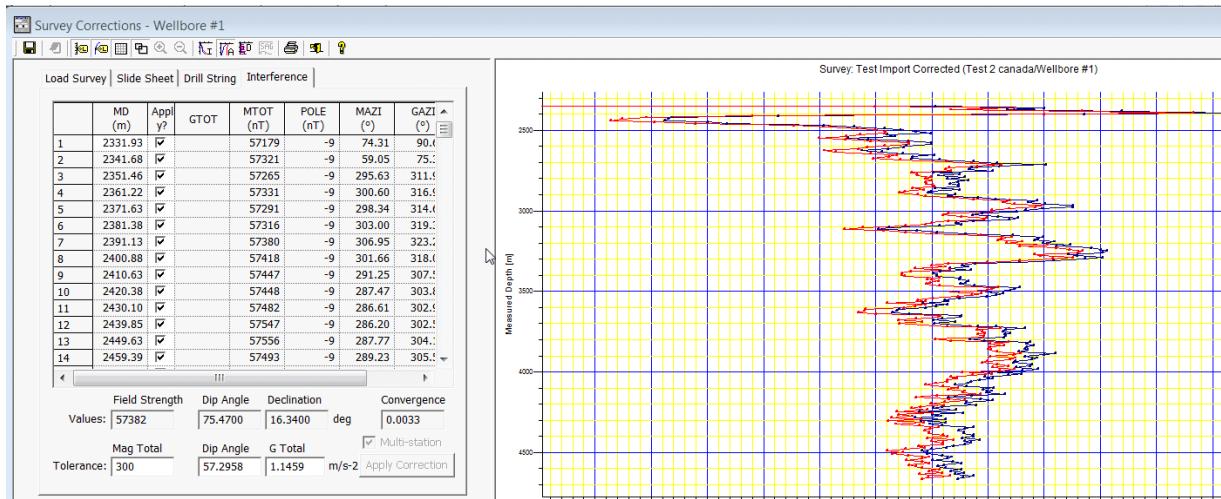
Magnetometer data can be entered in a variety of units, nT – nano tesla (values for total field are from 40000 to 60000), microTesla (values 40 to 60), Gauss (0.4 to 0.6) and finally Anadrill units which are nanoTeslas/50 (values 500 to 1000).

Use the **Calculate** check box to calculate inclination and azimuth from the raw magnetic values. This checks whether the axis or units configurations are correct.



The magnetic corrections expect the standard configuration of axes and unit conversions. In magnetic corrections, quality filtering based on tolerances is shown below.

[← Go To "What's In This Release?"](#)



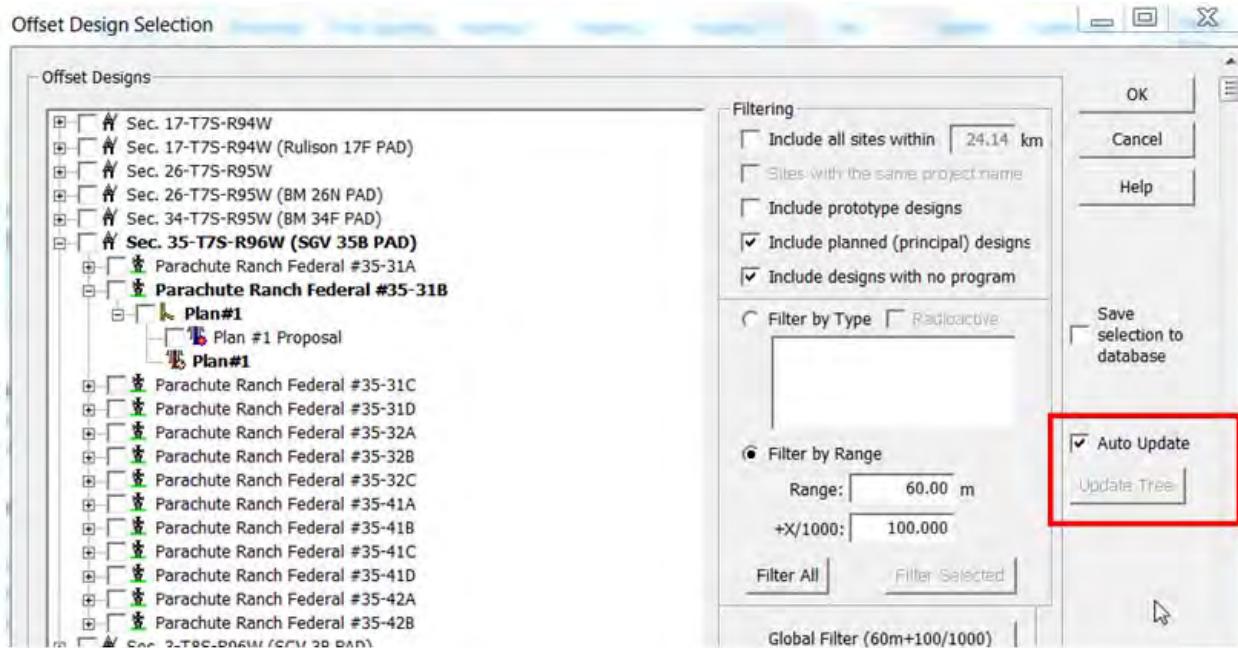
### Offset Wells Dialog – Performance

Performance improvements in the offset wells dialog for 10,000 wells. Now, the tree control will not be updated every time you make a change.

The Auto Update check box and the Update Tree button have been added.

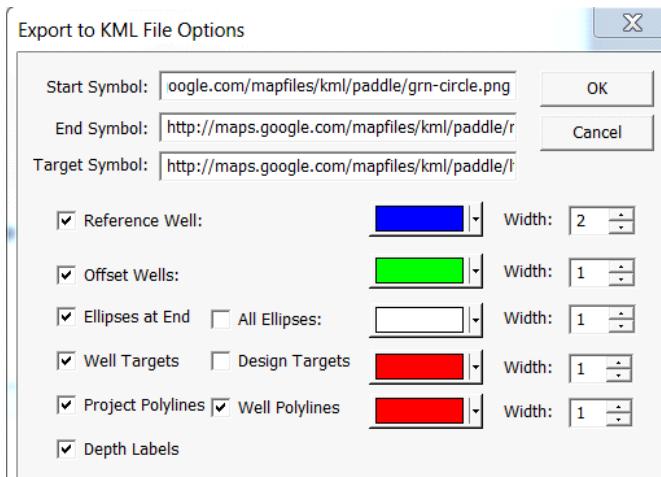
- **Auto Update** check box will turn on/off updates to the tree until you are ready. By default, initially it is turned on.
- **Update Tree** button will force an update of the offset wells tree when in manual update mode.

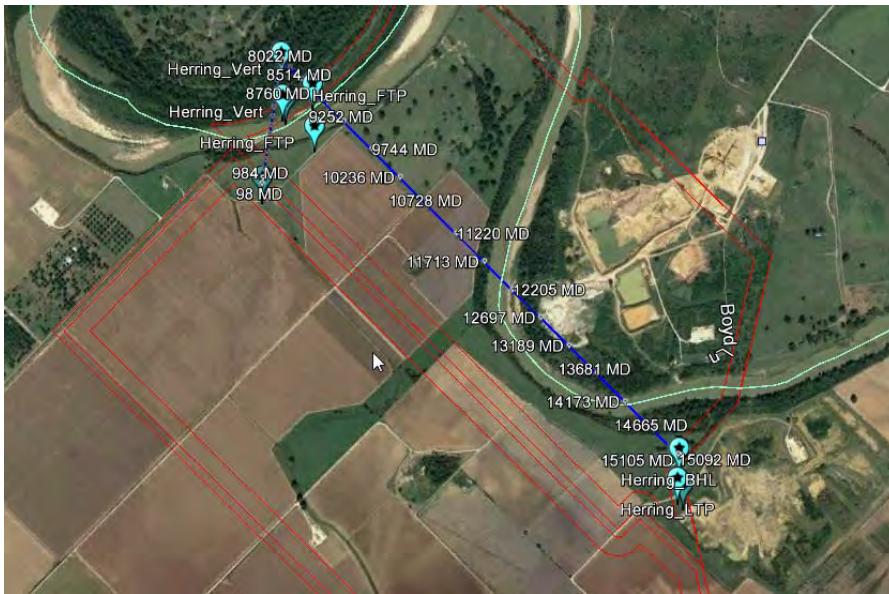
[Go To "What's In This Release?"](#)



### KML Export

Export to KML – for exporting polylines – have enhanced options on the features to export.



[Go To "What's In This Release?"](#)

### *Inclusion of Additional Items*

#### **Header/Footer**

- WELLUID
- WELLBOREUID
- USERNAME
- APPNAME
- FILEDATETIME
- STARTDATETIME
- ENDDATETIME
- ENGNAME
- GRIDCORUSED
- AVERAGEDOGLEG
- DDI
- MAXDLSVALUE
- MAXDLSDEPTH
- TORTUOSITY
- WELLLEGALNAME
- WELLAPINO

 Go To "What's In This Release?"

- WELLBORELEGALNAME
- WELLBOREAPINO

### Station Items

- STATIONUID
- STATDATETIME
- STATIONTYPE
- GRAVAXIALRAW
- GRAVTRAN1RAW
- GRAVTRAN2RAW
- MAGAXIALRAW
- MAGTRAN1RAW
- MAGTRAN2RAW
- COVXX, COVXY, COVXZ, COVYY, COVYZ, COVZZ
- BIASX, BIASY, BIASZ
- DEPTHUNIT
- DOGUNIT
- ANGLEUNIT
- MAPUNIT
- ACDEPTH
- ACSEP
- ACTFO
- ACHIGH
- ACRIGHT
- INTERPTYPE

### *ADP Enhancements - Sperry*

COMPASS generates an ADP file that is consumed by a CAM within Sperry InSite. Changes are made in the ADP file that is being generated.

- For metric (SI) units (or any unit system where depth is in m), distance to which offset wells are included has been changed to 152.4m (equivalent to 500') for consistency with English (API) units (or any unit system where depth is in ft).

 Go To "What's In This Release?"

- The precision of boundary location (DISTANCE column in BOUNDARY data) has been changed to at least 3 decimal places.
- In the offset well data, above the sea level EDGSEP distance is shown as 0 (at these depths error doesn't exist). EDGSEP is displayed same as C-C or a value is used so that you can differentiate this region from regions where the EDGSEP is truly 0.
- The boundary creation method has been updated.
  - Earlier, only wells with C-C < 500' were used for boundary creation. Now, wells that are < 500' (edge separation) are included in the boundary creation.
  - If C-C<500', then it is included (null edge separation being handled).
  - Edge separation is used instead of C-C to select wells.
- Convergence angle is included in the ADP initial data to convert planned azimuth between true and grid north.

#### *UI Enhancements*

- Windows size position are remembered.
- Column widths in all grid controls are remembered.
- Custom defaults can be set for interpolation variable.
- Improvements in dialog layout for medium large fonts included.
- Survey tool editor does not respond to arrow keys and mouse wheel scroll – its moving focus.

[Go To "What's In This Release?"](#)

### Computation of Intercept on Boundary

Intercepts (MD) of wellpath can now be computed on boundaries.

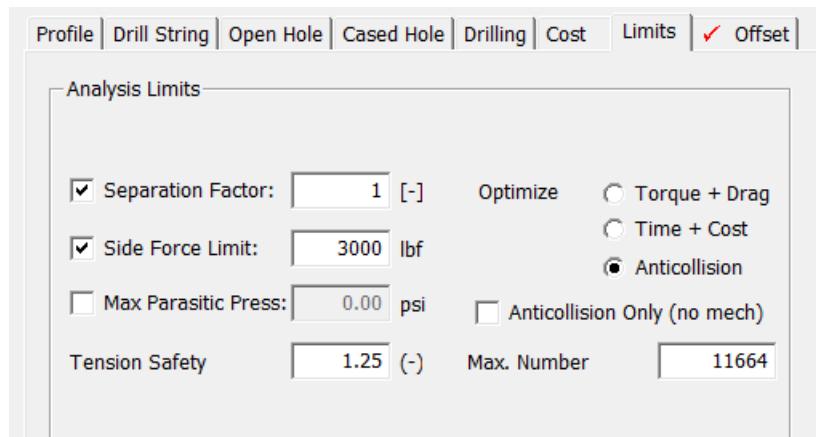
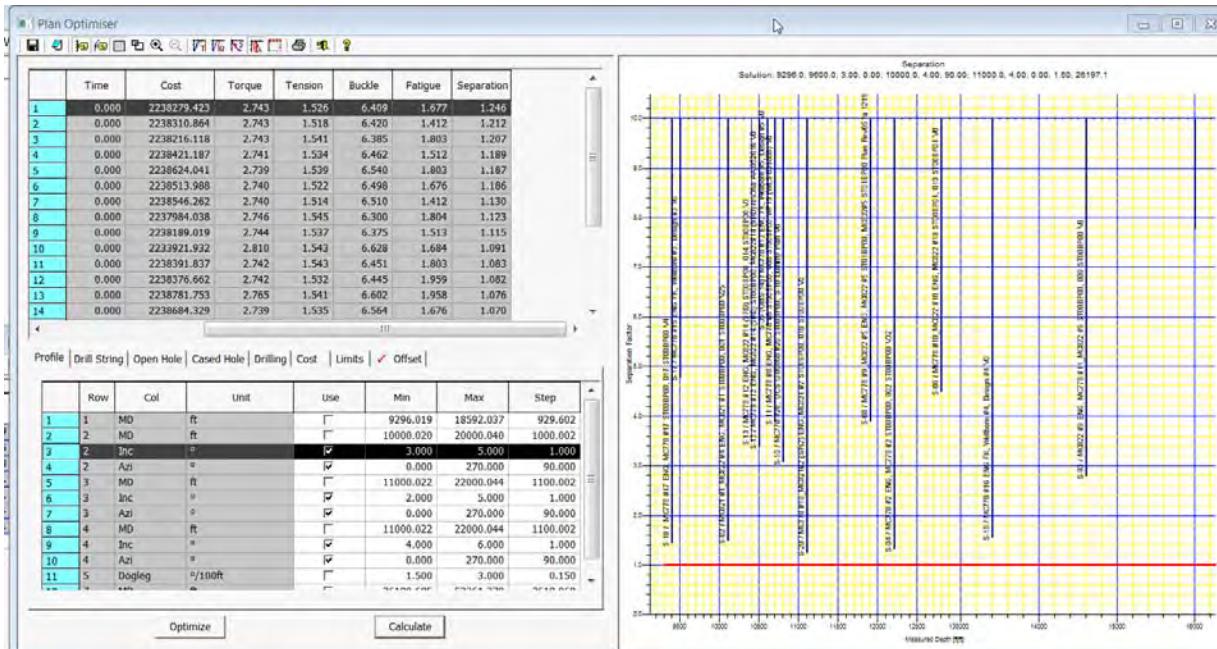
	MD (m)	TVD (m)	Name
3	460.00	459.80	Start Build 2.03
4	600.00	598.39	Start Build 2.03
5	750.00	741.40	Start DLS 3.05 TFO -53.9086
6	972.14	932.25	Start 1138.78 hold at 972.14 MD
7	2110.92	1811.05	Start DLS 3.05 TFO -48.5745
8	2329.26	1958.20	BB3 06/09/13 Entry at 2329.26 MD
9	2358.85	1974.24	Start 444.48 hold at 2358.85 MD
10	2388.08	1989.56	BB3 06/09/13 Exit at 2388.08 MD
11	2768.31	2188.84	FB T228 27/08/2013 Entry at 2768.31 MD
12	2803.33	2207.20	Start 103.03 hold at 2803.33 MD
13	2838.39	2225.57	FB T228 27/08/2013 Exit at 2838.39 MD
14	2906.37	2261.20	Start 40.00 hold at 2906.37 MD
15	2946.37	2282.16	TD at 2946.37
16			



[← Go To "What's In This Release?"](#)

## Plan Optimizer Changes

Extra plot has been added with Separations to Offset wells.



Option to do optimization for anti-collision only (not mechanical problems) has been added.

 [Go To "What's In This Release?"](#)

### Other Enhancements

Enhancement	Description
CEF - Custom WITSML 1.4.1 Exports from COMPASS	
873285	Add CEF Stations keywords for X & Y Offset to Plan
888399	Add keywords for Well Legal Name and API Number to CEF format
901868	Export Distance to Plan in the CEF export survey formats
951033	CEF file for exporting out Survey Start date from design properties
957399	Add DDI to Survey data export
Miscellaneous Changes	
911480	User-defined Interpolation Spacing in Plan Editor (Landmark Worldwide)
937486	WBP Site level export contains all project targets
944337	Default filtering for offset design selection
945253	Replace '-'s with '/'s or '---'s in Multi-Design export file names
951950	MD Labels cannot be applied on Projected Portion of a Survey Plan
956832	Error Surface and the options available for choice are not the same that appear referenced on COMPASS Contents (documentation)
957134	Include designs with no program not explained (documentation)
957844	Keep calculated geodetic results stored in the database
958201	Directional data export in xml format
959205	Option to have IFR to replace 'User Defined' for Magnetic Model in COMPASS
959513	Toolface display in planned wellpath
959820	Inconsistent graphics options in COMPASS - need configurable well labels in all displays
959902	Marking frac stages/intervals
961406	North reference (true/grid) option is read-only when site level is locked
961633	Workarounds for Oracle 12 problems (saving datums & casings: ORA-01461)
962467	Add plan TURNPOINTS to standard survey export

 [Go To "What's In This Release?"](#)

### **Release 5000.14.1**

The following enhancement was included in this release.

- Ability to launch new data exchange functionality using DesicionSpace Integration Server (DSIS)

### **Release 5000.14**

The following list of enhancements were included in this release.

Enhancement	Description
596591	<b>Travelling Cylinder Depth Slice.</b> An option has been added to the traveling cylinder depth slice (boundaries) to show 3 ellipse radii (1,2,3 sigma) about the reference for the purposes of overlap survey comparison and quality checking.
935965	<b>Surface Anti-collision Rule.</b> In some anti-collision policies it is required to add a minimum separation rule based on a separation distance or depth ratio. The separation criteria are based on the minimum ellipse distance or the separation. The separation distance and cone is defined on the anti-collision alerts tab.
939186	<b>Compass License check on start-up.</b> On request, though a registry setting, compass will present a dialog so that the user can choose the level of compass license (survey, survey_plan or survey_plan_ac) when starting the program.
952005	<b>In Global Scan, notify the user when the error diameter is bigger than the cone</b> applied by the Global Filter function in selecting offset wells. The global scan will now check the maximum radius of the offset well at 3 sigma level against the scan distance. It will include the well in the selection when this radius is larger than the specified radius (e.g., 200+100*MD )
952059	<b>Update Compass OpenWorks live link to OpenWorks 5000.10.1.</b> Compass has been updated to work with OpenWorks 5000.10.1, 5000.10.2 and 5000.10.3 versions
952403	<b>Lock North Reference on the Toolbar.</b> It is required for compass to lock the selection of the North Reference and Local-coordinate system on the toolbar when the selected project or site is locked.
952534	<b>Update Wellbore BHL when well or site location is shifted.</b> The wellbore bottom hole coordinates are updated whenever and dependent location information is changed. These database fields are used for external reporting purposes.
952913	<b>The ellipses do not overlap in 3D Solids View.</b> The 'ellipsoid separation' calculation will provide a separation factor that will be 1.0 when the ellipse tunnels touch in the 3D solids view.
953113	<b>Ability to draw error boundaries on plots for values of SF&gt;1.</b> In some anti-collision policies there is the requirement to represent no-go lines on plots that are for separation factors greater than 1.0. This is accomplished by checking one of the Warning Levels and making it the default collision rule.

 [Go To "What's In This Release?"](#)

Enhancement	Description
953294	<b>Added Survey Tool Program to Standard Plan Reports.</b> This request is to add the survey tool program to standard plan reports with more information about the planned surveys. An additional 'info' dialog is provided in the planned survey tool program to allow the user to specific more information about the survey requirements and station frequency
953369	<b>Update template IPM files to include OWSG Rev 2 changes.</b> The OWSG Rev survey tool models are added to the EDT_5000.1\COMPASS\Config\IPM Templates folder. These can be selected to make up a company survey tool suite.
953475	<b>Recalculate definitive surveys by site.</b> The user can now choose to select a site to compute all designs by site (as well as project). This is for projects and servers that have problems with the volume of data.
953677	<b>Latitude &amp; Longitude to WGS84 (GPS).</b> It is now possible to display Latitude and Longitude to WGS84 reference while the map co-ordinates remain to the local map datum reference. This option is set in the project properties.
953700	<b>3D View zoom capabilities.</b> In the 3D view Compass will allow more zooming in, though the user may find that they lose context.
954381	<b>Unable to convert to Belgian 72 coordinates.</b> The Belgium 72 coordinate system is now supported.
954849	<b>Additional context information requested in diagnostics output.</b> It is required to present more well, wellbore context information in the survey error diagnostics file output.(SE***.txt)
955852	<b>Add Magnetic Model from Web Service.</b> Compass now has the capability to obtain magnetic field data from a web service provider. The connection URL, login and password need to be defined in the Magnetic Properties dialog.
956576	<b>Expose wellbore Number and License Number in Wellbore properties Compass.</b> These fields can now be added to compass custom reports.
956590	<b>Targets in Ladder and TC Plots.</b> An option has been added to show Wellbore Targets in the perspective of the Ladder and Travelling Cylinder views.

## Release 5000.1.13.1

### *Earth Curvature Correction*

COMPASS™ software now provides an option in the Project Properties dialog to make full corrections to the project data conversions.

### *KLM Export from COMPASS to Google Earth*

COMPASS™ software now supports export of KML files for Google Earth. If Google Earth is installed, then it will launch showing the data in context.

 Go To "What's In This Release?"

### *Improvements in the Magnetic Interference Correction*

The Survey Corrections dialog is enhanced to support raw magnetic data.

### *Additional Surface Import Formats*

This release supports new file formats for importing surface:

- GXF Grid
- ZMAP Grid
- Contours
- XYZ Points

## **Release 5000.1.13**

### *ISCWSA Survey Tool Error Models Upgrade*

COMPASS™ software now supports the ISCWSA (Industry Steering Committee on Wellbore Survey Accuracy), OWSG (Operators Wellbore Surveying Group) survey tool error model standard sets A, B, and D. For more information, check the [ISCWSA.org](http://ISCWSA.org) website and look for the OWSG section.

### *Improvements in the Definition and Selection of Survey Tools*

A number of improvements have been made to survey tools selection in COMPASS™ for this release.

- Survey Tools OWSG Tab

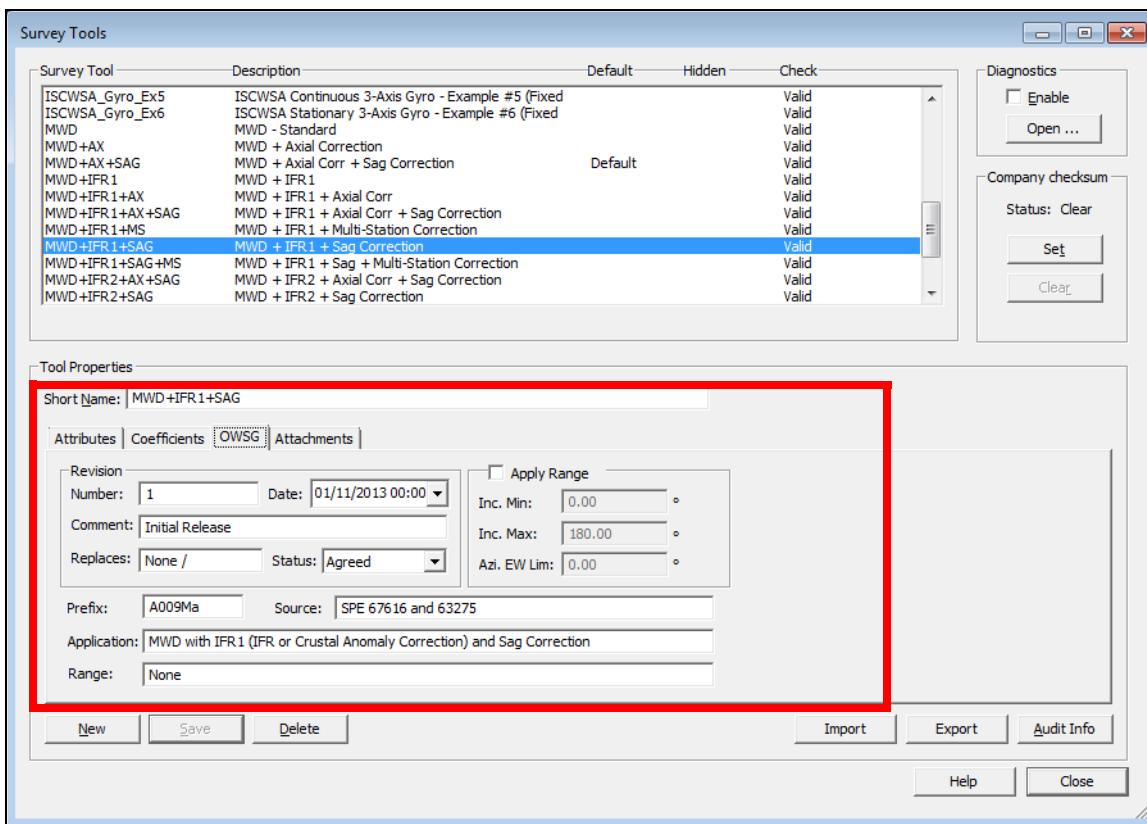
In order to offer better support to the OWSG set of uncertainty models, the Survey Tools dialog box now offers an OWSG Tab. From this tab OWSG Sets A, B, and D survey tool error model templates can be reviewed for additional information about the error models.

The OWSG tab contains additional attributes required by this ISCWSA sub-committee to identify and classify each survey tool error model. For non OWSG tool error models, these fields can be left in blank.

Although, these OWSG error models are backward comparable with previous versions of COMPASS™, much of the supporting information is lost.

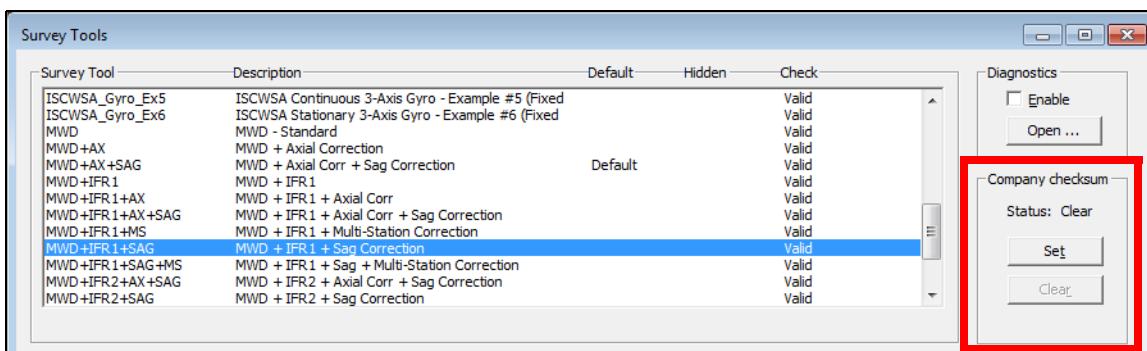
[Go To "What's In This Release?"](#)

COMPASS™ can now load supporting information, such as derivation, revisions, and usage from the OWSG tab in the Survey Tools dialog.



- Company Checksum

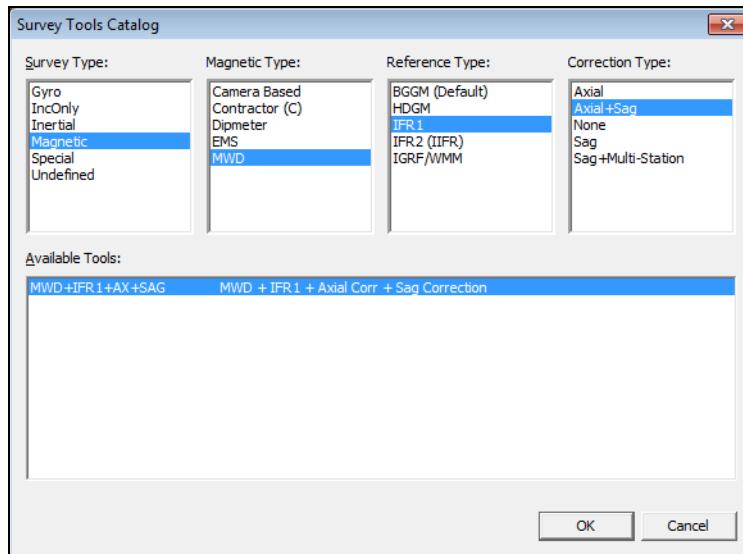
To protect the integrity of the new survey tool set from external changes, a checksum can be applied to individual survey tools and to the company set.



[Go To "What's In This Release?"](#)

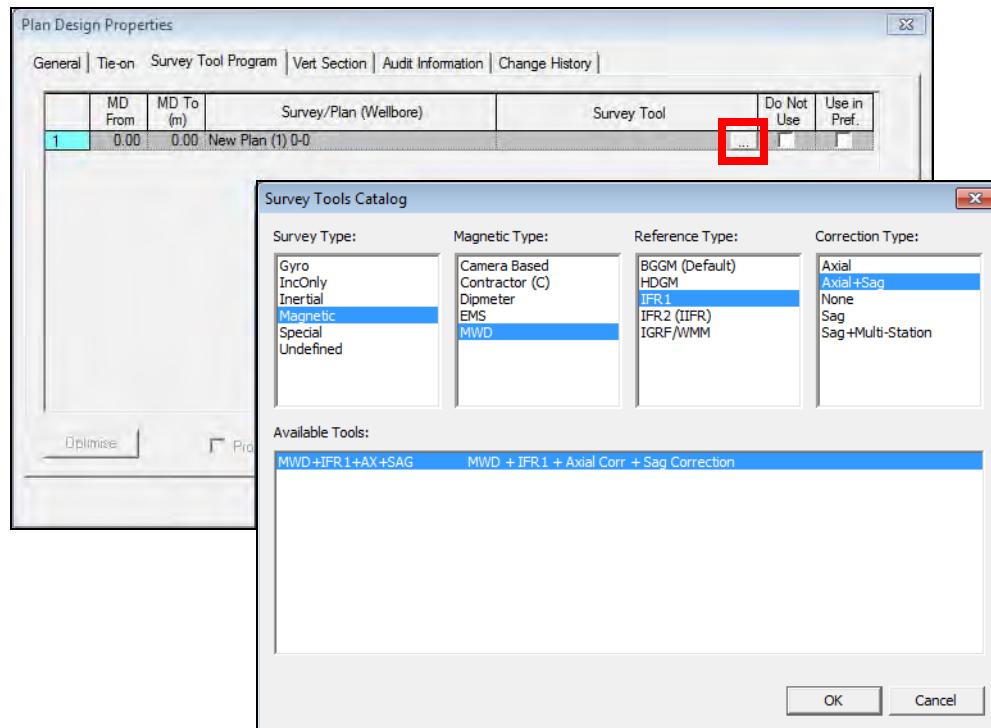
- Survey Tools Selection Dialog Improvements

The new Survey Tools Catalog dialog allows the selection of a survey tool by filtering the Survey Tools catalog.



- Plan Design Survey Tool Catalog

An ellipse button is now available in the Plan Design Properties, Survey Tool Program spreadsheet, which allows you to select survey tools from the Survey Tools Catalog.



 Go To "What's In This Release?"

## COMPASS Fixed Issues

The COMPASS issues fixed for 5000.1.13 through 5000.15 are described below.

### Release 5000.15

Defect	Description
824036	COMPASS - Plan Optimizer plot not agreeing with the results
824516	No field for depth, map angle units in CEF export for stations or header
869752	Multi design export does not work
921981	COMPASS survey export CEF file MAGDECCONV
922428	Not working: Landmark - Compass - CDB Error Ellipse Export
932050	Unit Error with COMPASS WPC - Magnetic Field Strength
939191	COMPASS is rounded Map coordinates decimals to 1 when export-import a *.wbp file
953234	Inside point polyline does not respect distance
956212	User-defined vertical section angle changes when switching between designs
957993	DXF export is invalid
958173	Casing Editor Data is not getting saved
958468	OpenWells blank row in Well Properties Associated Partners tab is crashing COMPASS
958582	COMPASS crashes when exporting to WPB format at Site Level
958971	Changes requested to the ADP file in COMPASS
959083	COMPASS WCL Defect - Well Coordinates File
959108	Anticollision - MD Interpolations
959212	WPC Magnetics rounding issue
959345	AntiCollision for Assumed Verticals
959393	COMPASS Export Format (CEF) not indicating interpolated stations properly
959495	User getting Undefined Tool when they are taking export
959521	COMPASS target problem
960299	COMPASS 5000.14.1.2, unable to add casing to an actual design
960461	Incorrect Wall-Wall Distance on Anticollision with Risk report
960469	TC Depth Slice (BP) showing old data
960590	Magnetic Calculator reference coordinates not updating when Site/Well toggled

 [Go To "What's In This Release?"](#)

Defect	Description
960936	OWSG Gyro surveys large errors when tied onto another survey

### **Release 5000.14.1**

Defect	Description
955686	Warning Message removal from EDM 5000.1.13.1- Warning, Plan is user tied
955870	COMPASS to enable field CD_WELLBORE.license_no in reports
956458	Extrapolating TD depth in the definitive survey
956520	Compass freezes when user clicks on a site node
956576	Expose wellbore Number in Wellbore properties Compass
956832	COMPASS contents update enhancement
957134	Include designs with no program not explained (documentation)
957148	COMPASS crashing when using Project Ahead feature
957275	Formation depths change (TVD Path)
957365	Target adjust crash
957526	Actual Design Survey Annotations crash
957595	Error in plotted ellipse of uncertainty
957839	Depth based errors in error model too small for high altitude land wells
957888	Anticollision/TC Reports - Casing - Hole Size Column
957827	Issues with tie-on point - creates duplicate station in Planned Wellpath

### **Release 5000.14**

Defect	Description
902986	Compass Offset Design Selection Risk Based drop down selector list appears blank
947680	Compass is crashing when selecting targets in Target Editor on Citrix
949029	Paste of raw magnetic data into survey editor was not getting saved
950577	Changing the survey type from standard to inclination only resets the azimuth value and incorrect survey is calculated.
951207	Plan plots show ellipses at chosen depths not working correctly
952104	Hold to vertical section reverts to 0, if a negative value is input
952134	Zero error zones are not shown on Traveling Cylinders plot

 [Go To "What's In This Release?"](#)

Defect	Description
952154	Lease Boundary calculation in ladder view is incorrect
952251	Problem with orientation of imported formation surface
952252	Side-track does not show parent wellbore casings when above MSL
952500	RIP Test error in azimuth and Bias the wrong way on survey comparison plots
952807	KML File Export Issue – file format & illegal characters
952811	Actual design tvd is not calculated correctly for inc. only surveys
953004	Anomaly in results of Relative Instrument Performance Test (Data Analysis)
953113	Requirement to draw lines on anti-collision plots at a separation factor greater than 1.0
953163	Failed to load plot & run collision calculations
953206	Look-ahead design, failed to return to plan
953365	Compass Survey Program Editor Projected TD Validation Issue
953557	Separation Factor Plot settings are not saved permanently
953903	Problems with OpenWorks link
953960	Problems with equivalent magnetic distance line
954029	Survey Editor imported Date & Time Entry and Raw Magnetic Values do not save
954139	Some IPM OWSG Rev 2 Tools Import with Invalid Checksum
954637	Shift in coordinates when importing Polyline
954770	Wrong wellpath is displayed in the section view. Slant well plans show a kink on section plots.
954819	Inconsistency in displaying casing on offset wells.
954956	Separation factors calculation discrepancy regarding casing subtraction
956458	Problem extrapolating TD depth in the definitive survey

### Release 5000.1.13.1

Defect No.	Description
894391	Compass: Plan View Options not saving - unable to save to the defaults file.
897666	TC Survey Report not displaying values Measure Depth on Plan, Distance to Plan, and Toolface to Plan in Compass
907567	Anti-collision Settings: Entering no data value for Separation Factor causes Compass to go into a loop that you cannot exit from.
911673	Users can view Survey Properties without opening the parent design

 [Go To "What's In This Release?"](#)

Defect No.	Description
916156	Live Views Ladder & Travelling Cylinder not updating when the AC settings are adjusted if Depth range limits fall outside Survey range.
928548	Anti-collision giving differing results.
934873	Anti-collision Reports Ellipses size differently
939494	Pasting values from excel into compass survey editor loses values on save.
944431	Survey program wipes out when perform anti-collision with side-track field
944818	Recalculating SESTEM inclination only survey will reset the type to normal
945763	In the anti-collision report the distance between centres is incorrect.
946660	Tie-on inconsistency., Tie-on issue leading to different anti-collision Separation Factor results.
949123	Geodesy: Whole Earth Curvature correction for Map to Local Conversions
950637	Interpolated plan and reports show wrong azimuth.
951101	Include Geomagnetic models for 2015 (WMM and IGRF)
951377	Change to User settings registry for Company Name and User Name

### Release 5000.1.13

Defect No.	Description
903067	Message appears prompting that the data should be recalculated. User is added to the Change History journal.
904708	Unable to add Casing information through drag and drop.
906584	Template data is saved only if you use the save option from the tool bar.
909862	Survey/SESTEM Tool Editor Help - Directory for diagnostic file needs to be updated.
915139	Request to have a warning message to restart Compass after changes in survey tool editor.
923548	Compass error message when importing an IPM file with a long remarks section.
926623	Survey Editor crashes when entering blank inclination on first line.
929623	Compass does not recognize folders from other EDM applications at database level.
933903	Wall plot composer freezes when opening a template in Wall plot Composer with the HDGM error model.
935720	Compass help file update: Document that Ellipsoid Separation error surface was formerly called Sperry Type.

 Go To "What's In This Release?"

Defect No.	Description
938329	SAM is sending large numbers of “invalid message argument” messages which is affecting the performance in the EDM applications.
941289	The "Use Definitive" check box is altering the survey tool program in plans.

 Go To "What's In This Release?"

## COMPASS Known Issues

The following COMPASS known issues for releases 5000.1.13 through 5000.15 are described below.

### ***Releases 5000.1.13 through 5000.15***

There are no additional COMPASS known issues for these releases.

 Go To "What's In This Release?"

---

## **Data Analyzer™ Software**

[Enhancements](#)[Fixed Issues](#)[Known Issues](#)

This section outlines the changes made to Data Analyzer™ software.

### **Data Analyzer Enhancements and New Functionality**

The Data Analyzer enhancements and new functionality for releases 5000.1.13 through 5000.15 are described below.

#### **Release 5000.15**

There are no enhancements to Data Analyzer for this release.

#### **Releases 5000.1.13 through 5000.14**

Support for a variety of new tables and fields added during the development of EDT™ software were added to Data Analyzer software for these releases.

 Go To "What's In This Release?"

## Data Analyzer Fixed Issues

The Data Analyzer issues fixed for 5000.1.13 through 5000.15 are described below.

### **Release 5000.15**

Defect No.	Description
958261	Data Analyzer - Tree View - Table/Column only shows CD_WELL table

### **Releases 5000.1.13 through 5000.14**

There were no Data Analyzer issues fixed for these releases.

 Go To "What's In This Release?"

## Data Analyzer Known Issues

The following Data Analyzer known issues for releases 5000.1.13 through 5000.15 are described below.

### **Releases 5000.1.13 through 5000.15**

There are no additional Data Analyzer known issues for these releases.

 Go To "What's In This Release?"

---

## ***EDM™ Database***

[Enhancements](#)[Fixed Issues](#)[Known Issues](#)

This section outlines the changes made to EDM™ database.

### **EDM Enhancements**

The EDM enhancements and new functionality for releases 5000.1.13 through 5000.15 are described below.

#### ***Releases 5000.1.13 through 5000.15***

There are no enhancements to EDM for these releases.

 Go To "What's In This Release?"

## EDM Fixed Issues

The EDM issues fixed for 5000.1.13 through 5000.15 are described below.

### Release 5000.15

Defect No.	Description
875628	Increase the length of the Hole Sections Name from 20 to 30 characters
877603	Request that a new Treatment # field be added to the DM_STIM_TREATMENT entity in the EDM schema

### Release 5000.14

Defect No.	Description
895540	SSUTILS (SQL Server Utility) will not work if the sa password contains special characters such as L@ndmark12012!
899691	Add a new field to the wellbore properties to track the bottom hole temperature
907037	Add two new fields to wellbore properties to track user defined depth measurements
952219	Increase the length of daily cost - description from 100 characters to 150 characters length

### Release 5000.1.13

Defect No.	Description
907745	Autosync is not updating the field status colors in case of a system change
938052	EDM storage units for covariance are feet instead of feet squared

 Go To "What's In This Release?"

## EDM Known Issues

The following EDM known issues for releases 5000.1.13 through 5000.15 are described below.

### ***Releases 5000.1.13 through 5000.15***

There are no additional EDM known issues for these releases.

 Go To "What's In This Release?"

---

## ***EDT™ Software***

[Enhancements](#)[Fixed Issues](#)[Known Issues](#)

This section outlines the changes made to EDT™ integration.

### **EDT Enhancements and New Functionality (Integration)**

The EDT integration enhancements and new integration functionality for releases 5000.1.13 through 5000.15 are described below.

#### ***Releases 5000.1.13 through 5000.15***

There are no enhancements to EDT for these releases.

 Go To "What's In This Release?"

## **EDT Fixed Issues (Integration)**

The EDT integration issues fixed for releases 5000.1.13 through 5000.15 are described below.

### **Release 5000.15**

There are no EDT integration issues fixed for this release.

### **Release 5000.14**

Defect No.	Description
955867	Some EDT™ applications can experience application exceptions occur on systems with high volumes of concurrent activity.

### **Release 5000.1.13**

There were no additional EDT integration issues fixed for this release.

 Go To "What's In This Release?"

## EDT Known Issues (Integration-related)

Known issues related to EDT integration for releases 5000.1.13 through 5000.15 are described below.

### Releases 5000.14 through 5000.15

There are no additional EDT integration known issues for these releases.

### Release 5000.1.13

Defect No.	Description
942774	Errors will be displayed during copy/paste workflows if the database upgrade was run when logged in as "edmadmin" rather than "sa". To prevent this issue run the database upgrade as a system administrator.

 Go To "What's In This Release?"

---

## OpenWells® Software

[Enhancements](#)[Fixed Issues](#)[Known Issues](#)

This section outlines the changes made to OpenWells™ software.

### OpenWells Enhancements and New Functionality

The OpenWells enhancements and new functionality for releases 5000.1.13 through 5000.15 are described below.

#### **Releases 5000.14 through 5000.15**

There are no enhancements to OpenWells for these releases.

#### **Release 5000.1.13**

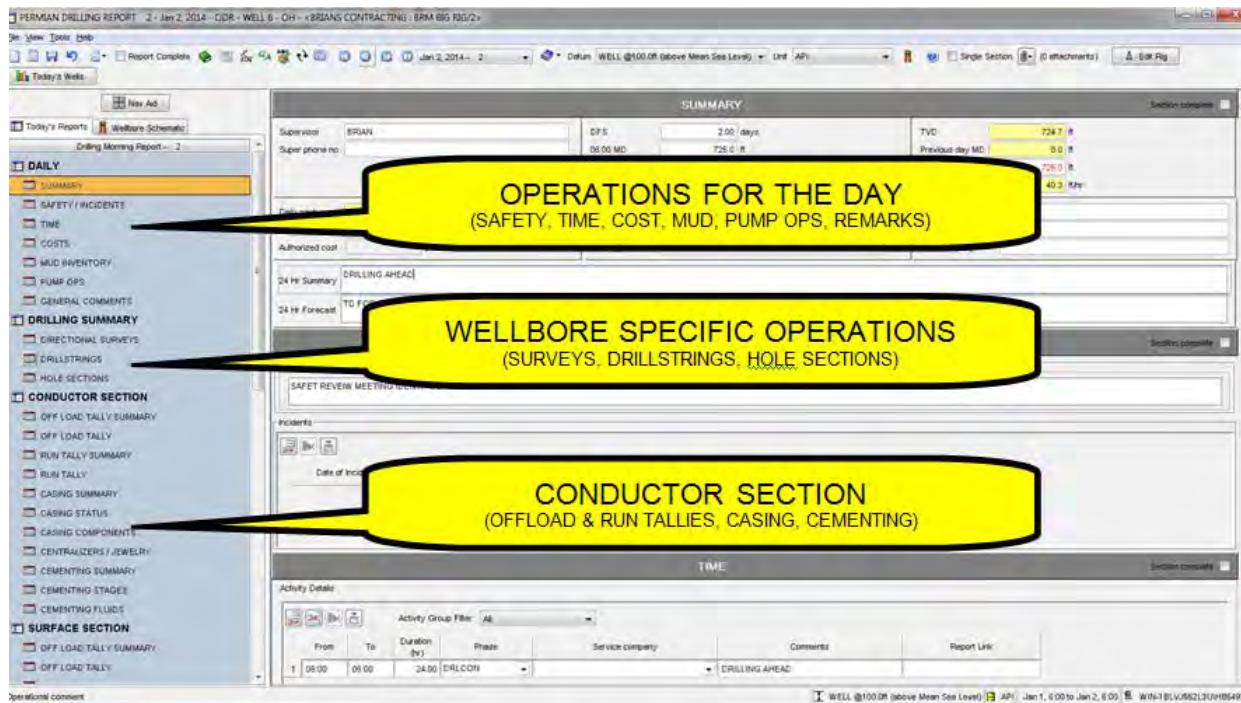
##### *Reporting by Workflow – One Report Per Day at the Rig*

To ensure accurate field reports, your supervisors need a system that is easy to use and that matches their workflows.

OpenWells now supports reports that follow the field's workflow thus reducing the time taken to enter the data and to look up that information in future operations.

Below is an example of a workflow-oriented report for drilling supervisors. This one report now combines the details traditionally associated with individual daily operations, pipe tally, casing and cementing reports for a typical shale well which involves a conductor, surface, intermediate, and horizontal section.

[← Go To "What's In This Release?"](#)



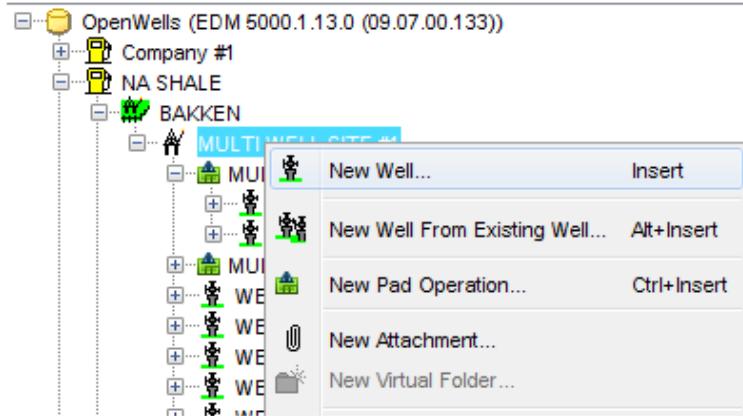
By default OpenWells comes with drilling, completions, and workover reports that are configured for typical workflows at the rigsites. Additional workflow-oriented reports can be created by administrators using the EDM Administration Utility tool.

#### *Recording Multi-Well/Pad Operations*

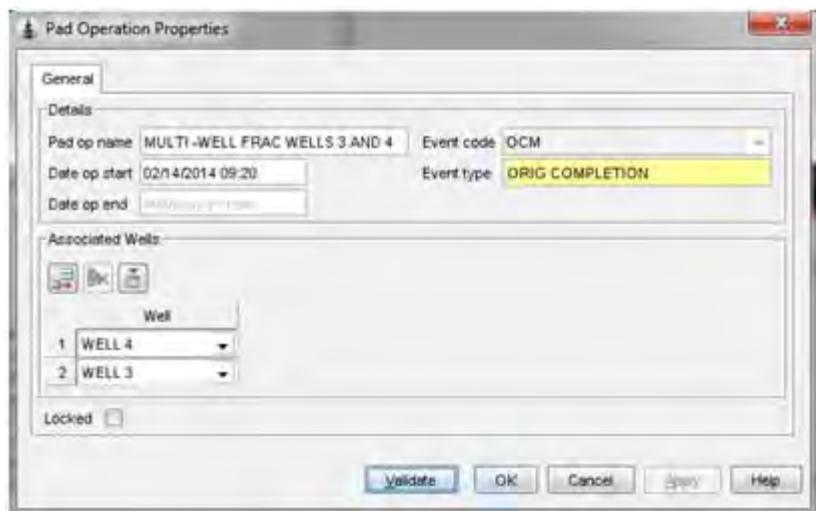
Recording costs, activity, bulk usage, and material transfers are unique challenges for supervisors of multi-well or pad operations.

OpenWells now supports “pad operations” which simplify the entry of costs, activity, bulk usage and material transfers for these types of operations.

To create a pad operation, right-click on a site node within the OpenWells hierarchy and select **New Pad Operation**.

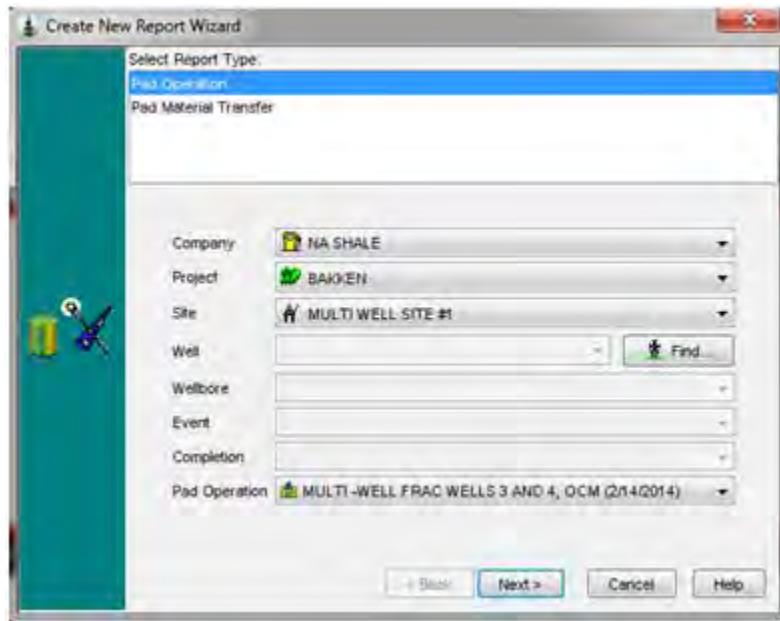
[Go To "What's In This Release?"](#)

Provide a name for the pad operation, the start date for the operation, the type of operation via an event code and associate the wells which are part of the pad operation to the list of associated wells.



[Go To "What's In This Release?"](#)

A pad operation will then be created in the well explorer. With the pad operation node selected, press the **Create New Report** button and select the “Pad Operation” report from the list.



The Pad Operation Report allows simplified entry for costs, activity and bulks across multiple wells in a single report:

## Costs

MULTI WELL COSTS			70% WI	50% WI	Total
Class	Code	Description	WELL 1 (\$)	WELL 3 (\$)	Total amount (\$)
1	0	LABOR - INSTALL MANIFOLD TO TREATERS AND TANKS	3,000.00	3,000.00	6,000.00
2	0	EQUIPMENT - TANKS/TREATERS MANIFOLD	8,000.00	8,000.00	16,000.00
3	0	LABOR - INSTALL FLOW LINE TO WELL 1 AND TIE IN TO MANIFOLD	10,000.00	0.00	10,000.00
4	0	EQUIPMENT - WELL 1 FLOWLINE, METER, AND CONNECTORS	45,000.00	0.00	45,000.00
5	0	LABOR - INSTALL FLOW LINE TO WELL 3 AND TIE IN TO MANIFOLD	0.00	12,000.00	12,000.00
6	0	EQUIPMENT - WELL 3 FLOWLINE, METER, AND CONNECTORS	0.00	36,000.00	36,000.00
7	1	MATERIALS AND SUPPLIES	1,500.00	1,500.00	3,000.00
8	1	PERSONNEL AND TRANSPORTATION	500.00	500.00	1,000.00
9	1	ROADS AND LOCATION	3,000.00	3,000.00	6,000.00
10	C	SEPARATORS/TREATERS	26,000.00	0.00	26,000.00
11	S	SITE PREP	2,000.00	2,000.00	4,000.00
12	S	SUPERVISOR	500.00	500.00	1,000.00
13	S	PERMITS	1,200.00	1,800.00	3,000.00
14	S	PRESSURE TESTING	800.00	800.00	1,600.00

Multi-Well Cost Entry:  

- Allocate shared costs to one or more wells.
- Avoids duplicate cost entry

[← Go To "What's In This Release?"](#)

## Activity

Time Summary							Section complete: <input type="checkbox"/>
Operation Time Summary							
Well	From	To	Duration (hrs)	Code	Operation	Service company	
1 WELL 3	06:00	12:00	6.00	25	FRAC STAGES 12-18	HALLIBURTON	
2 WELL 4	12:00	18:00	6.00	21	FRAC STAGES 6-8	HALLIBURTON	
3 WELL 3	18:00	06:00	12.00	22	FRAC STAGES 6-12	HALLIBURTON	

### Multi-Well Time Entry:

- Easily record activity by well in a single spreadsheet
- Enter duration and have time's calculate to speed up data entry.

## Bulk Usage

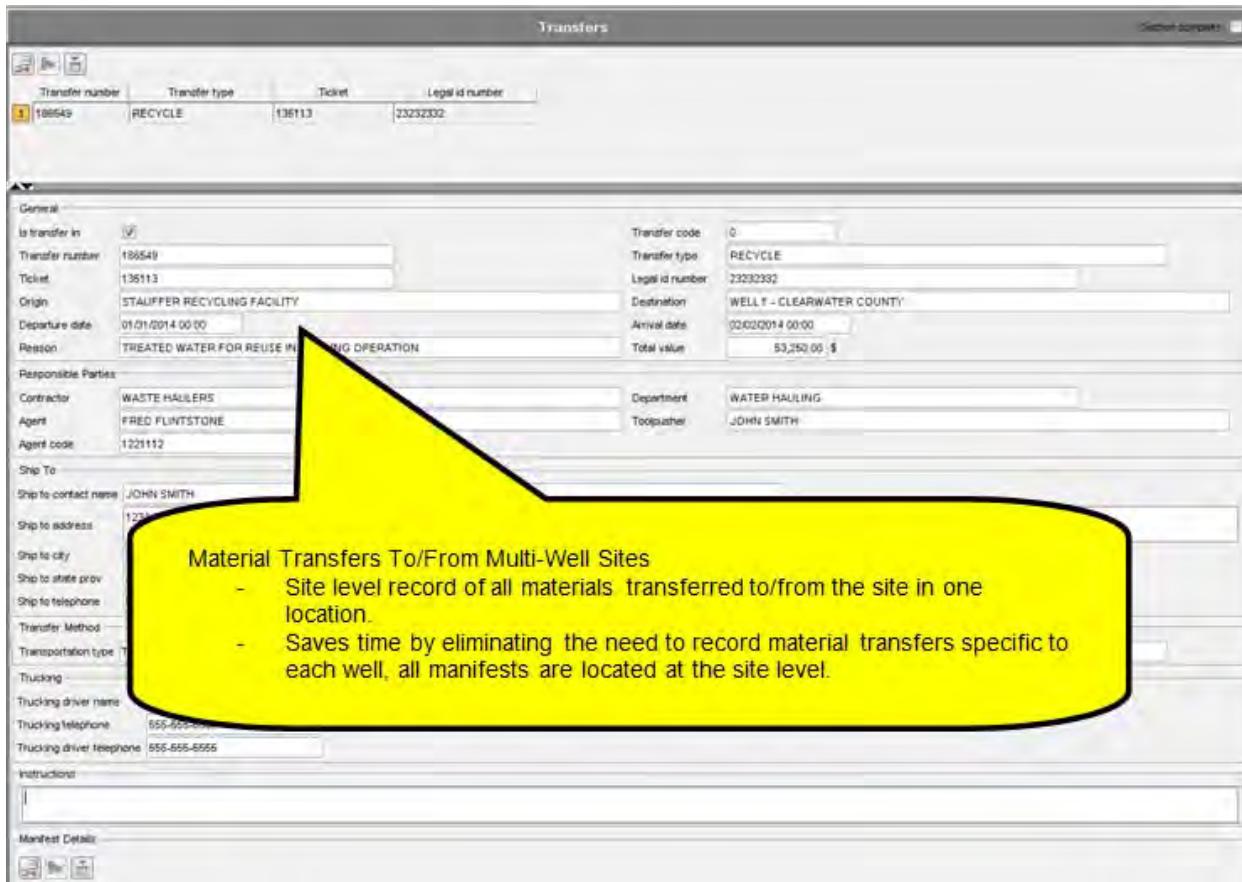
Bulks							
Bulk Transactions							
Product name	Unit size	Quantity start	Quantity adjusted	Quantity received	Quantity returned	Quantity used	Quantity end
1 WATER, DRILLING	BBL	0.0	0.0	1,500.0	0.0	200.0	1,300.0
2 BARITE SACKS	SAK	0.0	0.0	150.0	0.0	50.0	100.0
3 DIESEL	BBL	0.0	0.0	1,800.0	0.0	350.0	1,450.0
4 CEMENT	SAK	0.0	0.0	2,000.0	0.0	0.0	2,000.0

### Bulk Usage at the Site:

- Easily record bulk usage as measured at the site/pad.
- Avoids the need to maintain separate bulk volumes and usage on a per well basis.

[Go To "What's In This Release?"](#)

## Material Transfers



The screenshot shows the 'Transfers' screen with various input fields for a material transfer record. A yellow callout box highlights the 'General' section, specifically the 'Transfer type' field set to 'RECYCLE'. The callout box contains the following text:

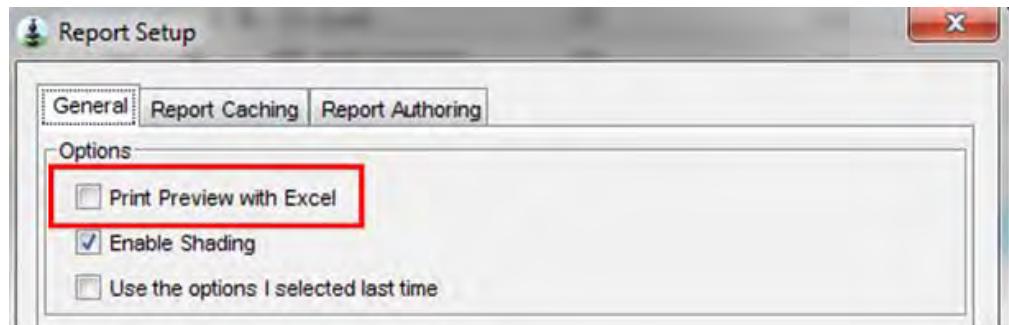
**Material Transfers To/From Multi-Well Sites**

- Site level record of all materials transferred to/from the site in one location.
- Saves time by eliminating the need to record material transfers specific to each well, all manifests are located at the site level.

## New User Preferences

### Print Directly To Excel

Users now have the option to print reports from OpenWells directly to Microsoft Excel. Select **Print Preview with Excel** to enable this option from the Tools > Report Setup menu.



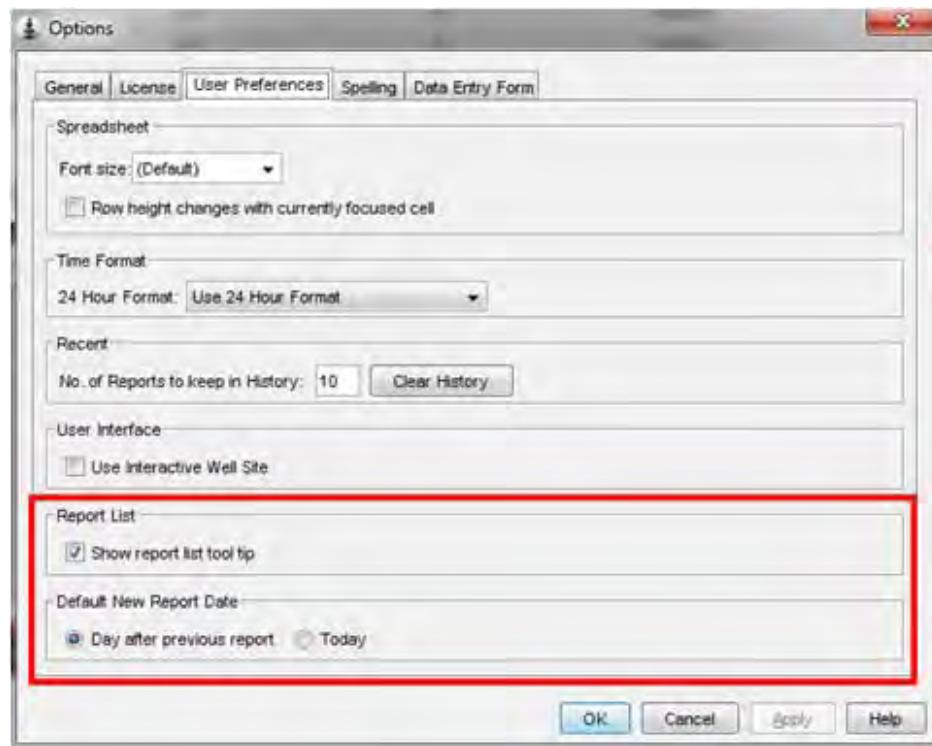
[Go To "What's In This Release?"](#)

Once enabled, any printed report based on the traditional “Crystal Reports” system will print directly to Microsoft Excel.

### Preference to Default Report Date and to Enable/Disable Tool Tips

OpenWells users now have access to the following user preferences from the Tools > Options menu.

- The “Default New Report Date” allows users to specify the date for newly created reports. Available options are “Today” and “Day after previous report”.
- The “Show report list tool tip” preference allows users to enable/disable the tool tip that appears in the OpenWells reports list window.



[Go To "What's In This Release?"](#)

### Simplified Hole Section Entry

A new simplified entry format for hole sections is now available in OpenWells. This screen is applicable to operations that do not require records of complex hole section details necessary for engineering analysis.

The screenshot shows a software interface titled "HOLE SECTIONS". At the top right is a checkbox labeled "Section complete". Below the title are three icons: a file icon, a back arrow icon, and a forward arrow icon. A table lists two hole sections:

Section	Hole Diameter (in)	Start Date/Time	MD top (ft)	End Date/Time	MD base (ft)
1 CONDUCTOR	8.750	01/02/2014 00:00	0.0	01/02/2014 12:00	250.0
2 SURFACE	7.000	01/03/2014 00:00	250.0	01/04/2014 12:07	2,000.0

### Simplified Workflow When Partially Pulling a String

Supervisors now have the ability to designate a "Partial Pull" when pulling a portion of an assembly.

The screenshot shows a software interface titled "Assembly Removal". At the top right is a close button (X). Below the title is a label "List of Installed Assemblies:". A table lists seven installed assemblies:

1	OCM	TUBING	2/11/2014
2	OCM	ROD	2/11/2014
3	OCM	TUBING ASSEMBLY #1	2/2/2014
4	ODR	HORIZONTAL	1/6/2014
5	ODR	CONDUCTOR	1/6/2014
6	ODR	INTERMEDIATE	1/6/2014
7	ODR	SURFACE	1/6/2014

At the bottom are several buttons: "Pull Date" (with a date/time picker set to 7/14/2014 16:39), "Pull", "Partial Pull" (which is highlighted with a red box), "Pull / ReRun", "Cancel", and "Help".

[Go To "What's In This Release?"](#)

After designating a partial pull, supervisors are presented with a list of all the components that make up the tubing or rod string being pulled.

The screenshot shows a Windows-style dialog box titled "Partial Pull". The main title bar says "Partial Pull" with a close button. Below it, a sub-header says "Select Deepest Component Pulled". The dialog contains a table with columns: "Section type", "Component type", "MD TOP (ft)", "MD base (ft)", "Body OD (in)", and "Body ID (in)". The table lists various components pulled from a wellbore, including Tubing, Casing, and Wellbore Equipment like Bell Shear Subs and Pile Entry Guide. The last row shows an Electrical Submersible Pump (ESP Pump) at the bottom of the list.

Section type	Component type	MD TOP (ft)	MD base (ft)	Body OD (in)	Body ID (in)
Tubing	Tubing Pup Joint	0	5.79	2.375	1.75
Casing	Blast Joint(s)	6.79	9.64	3.062	1.75
Tubing	Tubing	9.84	42.35	2.375	1.75
Tubing	Tubing Pup Joint	42.35	44.5	3.062	1.75
Tubing	Tubing Pup Joint	44.5	47.51	2.375	1.75
Tubing	Tubing Pup Joint	47.51	51.58	2.375	1.75
Tubing	Tubing Pup Joint	51.58	61.68	2.375	1.75
Wellbore Equip.	Bell Shear Sub	61.68	62.66	2.375	1.75
Wellbore Equip.	Pile-Entry Guide	62.68	63.01	2.375	1.75
Tubing	Tubing Pup Joint	63.01	73.21	2.375	1.75
Tubing	Tubing Pup Joint	73.21	83.37	2.375	1.75
Tubing	Tubing Pup Joint	83.37	91.52	2.375	1.75
Tubing	Tubing	91.52	124.07	2.375	1.75
Tubing	Tubing	124.07	600	2.375	1.75
Casing	Blast Joint(s)	600	599.88	2.375	1.75
Tubing	Tubing	599.88	631.58	2.375	1.75
Tubing	Tubing Pup Joint	631.58	634.62	2.375	1.75
Tubing	Tubing	634.62	794.82	2.375	1.75
Tubing	Tubing Pup Joint	794.82	795.88	2.375	1.75
Wellbore Equip.	Seal Assembly	795.88	799.58	2.375	1.75
Wellbore Equip.	Sliding Sleeve	799.58	802.4	3.125	1.75
Wellbore Equip.	Profile Nipple	802.4	803.6	2.375	1.75
Casing	Blast Joint(s)	803.6	823.48	2.375	1.75
Wellbore Equip.	No Go Nipple	823.48	824.83	3.062	1.75
Casing	Blast Joint(s)	824.83	844.71	3.062	1.75
Packer	Packer	844.71	847.72	4	1.75
Tubing	Tubing	847.72	16,847.72	2.375	1.75
Tubing	Tubing Pup Joint	16,847.72	16,850.83	2.375	1.75
Tubing	Tubing	16,850.83	16,916.01	2.375	1.75
Slotted Pipe	Slotted Casing	16,916.01	16,416.01	1.75	1
Electrical Subm.	ESP Pump	16,416.01	16,419.01	1.75	1

Supervisors then select the deepest component pulled to complete the partial pull workflow. OpenWells will then create a new string describing the components left in hole and update the statuses of the original string and its components to indicate they were pulled.

[Go To "What's In This Release?"](#)

### Simplified Entry of Stimulation & Improved WITSML 1.4.1 Support

Entry of multi-stage stimulations has been greatly simplified in this release of OpenWells.

The screenshot shows the OpenWells software interface. At the top, there is a toolbar with icons for file operations and a 'Copy Existing Treatment...' button. Below the toolbar is a table titled 'TREATMENTS' with columns for 'Treatment Type', 'Zone', 'Interval top (ft)', 'Interval base (ft)', and 'Wellbore formation'. There are four rows in the table, each representing a fracture treatment in zones 1 through 4. The bottom half of the screen displays a detailed 'Treatment Details' dialog box for the fourth treatment stage. This dialog box includes tabs for General, Fluids, Proppants, Chemicals, and Steps. The General tab shows treatment type as 'FRACTURE TREATMENT', zone as 'ZONE 4', time start as '02/05/2014 00:00', and time end as '02/05/2014 00:00'. It also includes sections for Diagnostics (Fluid efficiency, Frac gradient, Length created, Conductivity average, Edit joints) and Rates / Pressures (Initial flow rate, Final flow rate, Min. flow rate, Max. flow rate, Average flow rate, Min. treatment pressure, Max. treatment pressure, Formation break rate, Net pressure, Average pump, Inject ratio min., Inject ratio average). The Fluids tab shows various fluid properties like pump rate, viscosity, and density. The Proppants tab shows proppant type, concentration, and volume. The Chemicals tab shows chemical additives. The Steps tab shows a list of steps with descriptions and parameters. On the right side of the dialog box, there is a 'GPP Data' section with tables for initial shut-in pressure, intermediate shut-in pressures, and final shut-in pressures across three stages. At the bottom of the dialog box, there are sections for Tubule Data (String depth, Bridge plug depth, String weight, Bridge plug removal date, Nominal size, Packer depth) and a Text description field.

General details, Fluids, Proppants, Chemicals and the treatment steps are now grouped in one location for each treatment interval.

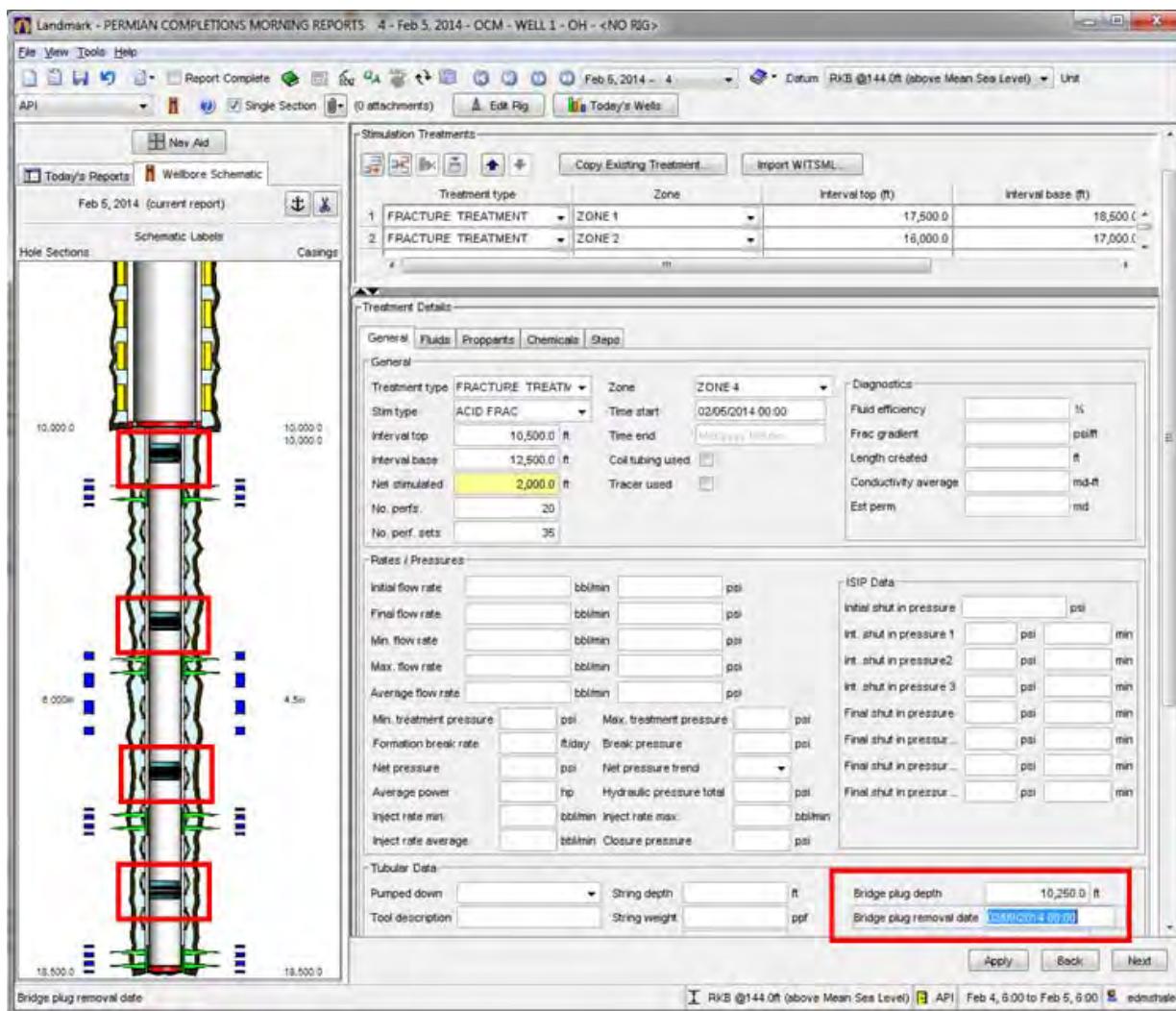
The new Import WITSML button now appears in the Fluids section of the Daily Operations report, and in the General and the Treatments sections of the Stimulation report. This button allows you to import WITSML objects into the report.

The ability to import stimulation jobs from vendors providing data in the WITSML 1.4.1 format has also been improved in this release

[Go To "What's In This Release?"](#)

### Ease of Recording Bridge Plugs During a Stimulation Job by Supervisors

Supervisors can easily record bridge plug depths and the date those plugs were removed as part of a stimulation job. The OpenWells wellbore schematic will display the plugs based on the date and depths entered in the stimulation report.



[Go To "What's In This Release?"](#)

**Supervisors can Enter and Review “Lessons Learned” Directly from the Daily Operations Report**

Entering and reviewing “Lessons Learned” is easier through the use of the new lessons learned section available in the daily operations report. Instead of having to move away from the operations report into a separate lessons dialog supervisors can now enter all pertinent information directly into their morning report.

The screenshot shows the 'Daily Operations Lessons' dialog box. At the top, there are icons for saving, canceling, and closing, and a checkbox labeled 'Section complete'. Below this is a 'General' tab with fields for 'Drilling Supervisor' (FRED FLINTSTONE), 'Super1 Name' (BARNEY RUBBLE), 'Super2 Name' (JOHN H.), and 'Reference no.' (1566489). A toolbar below these fields includes back, forward, and search buttons. The main area contains tabs for General, Lesson, Incident, Status, Discussion, Actions, Bibliography, Author, and User Defined. Under the General tab, there are sections for 'Details' and 'Summary'. The 'Details' section includes fields for Drilling Supervisor (FRED FLINTSTONE), Reference no. (1566489), Super1 Name (BARNEY RUBBLE), Super2 Name (JOHN H.), Responsible Party (empty), Vendor Name (ABC VENDOR), Drilling plan/prog. ref. (empty), Externally Reported (checked), External Reference (FIELD OPERATIONS MANUAL), Change Mgmt. Required (unchecked), and Change Mgmt. Reference (empty). The 'Summary' section contains the text 'COMPLETE ALL PAD PREP WORK PRIOR TO RIG MOVES'. The 'Comments' section is empty. At the bottom, there is an 'Approval' section with fields for Reviewer (JEFF), Approval status (Approved), Lesson Review Date (06/13/2014 14:54), Lesson Approval Date (empty), and a note about 0 attachments.

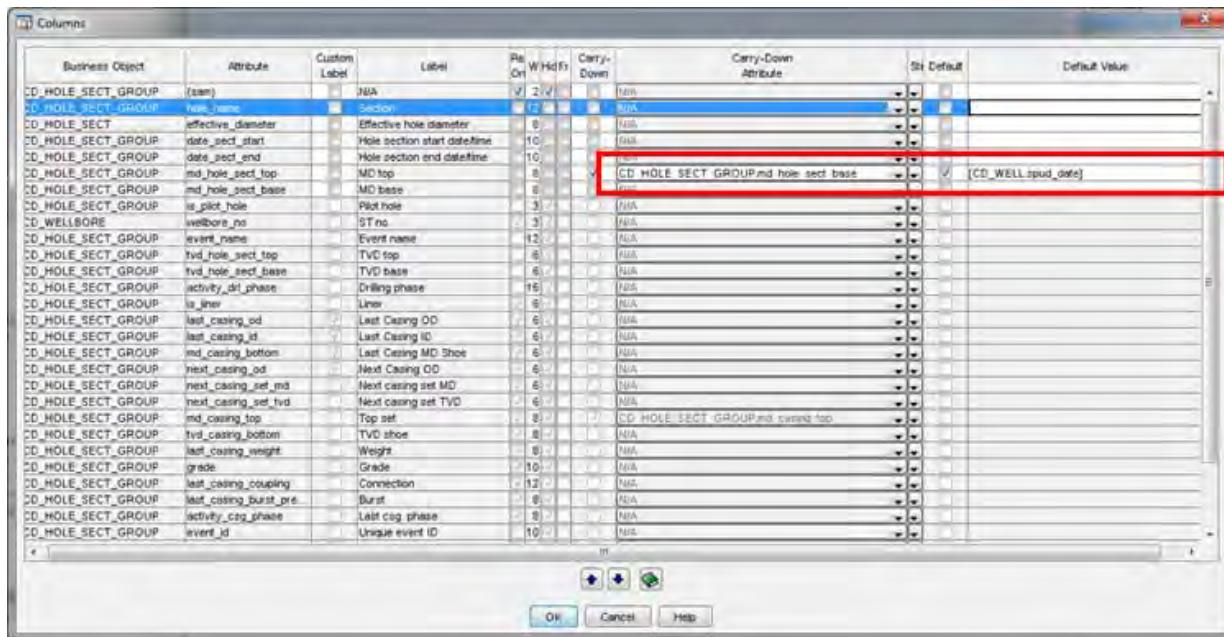
**Reduce Duplicate Entry Through the Use of Default Values**

Supervisors will have less repetitive entry through the use of “default values” within OpenWells. One such example is a scenario where the start date of the very first hole section is the same date as the spud date for the well.

[Go To "What's In This Release?"](#)

The configuration below shows the default and carry-down rules setup for the hole sections spreadsheet. In this configuration the start date of the very first hole section will default to the spud date as entered in the well properties. Subsequent hole section records will use the carry down attribute, meaning that the second hole section's start date will default to the previous hole sections end date.

Default values can be configured for any spreadsheet column and are able to reference information within a particular reports hierarchy, such as well and wellbore properties.



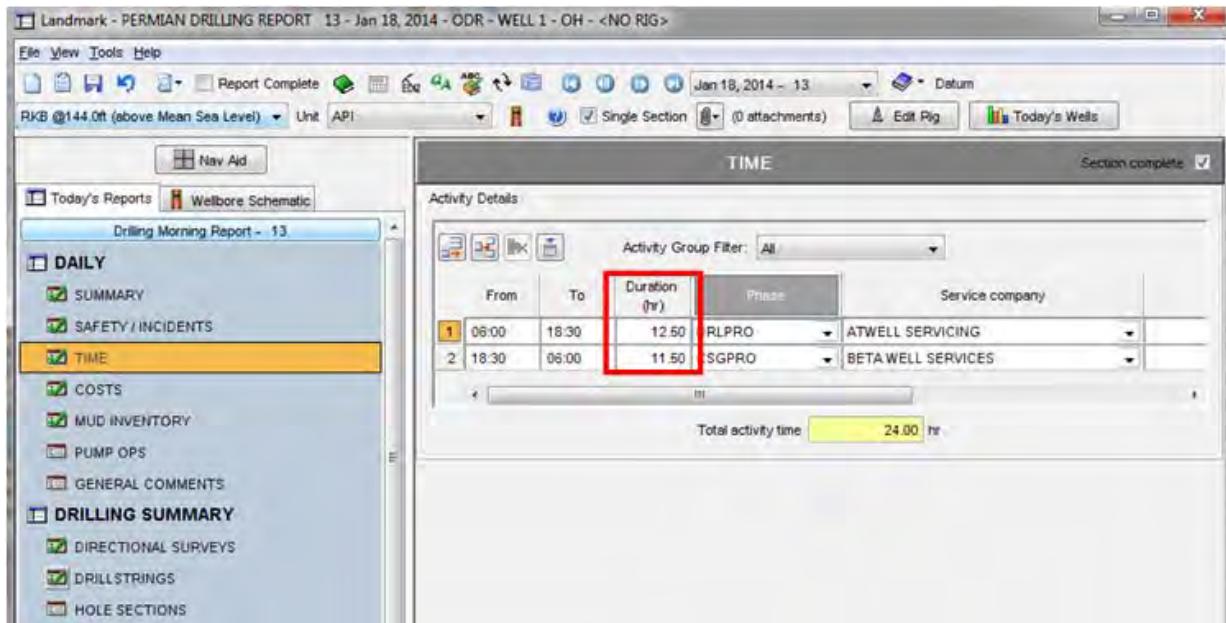
The screenshot shows the 'Columns' dialog box from a software application. The dialog has a grid of columns for defining attributes. The columns are labeled: Business Object, Attribute, Custom Label, Label, Re On W Hdr F1, Carry-Down, Carry-Down Attribute, Sh Default, and Default Value. A red box highlights the 'Carry-Down Attribute' column for the first row, which is 'CD\_HOLE\_SECT\_GROUP.hole\_start'. The 'Default Value' column for this row contains the formula '[CD\_WELL.spud\_date]'. Other rows in the grid represent various hole section attributes like 'effective\_diameter', 'date\_sect\_start', etc., each with their own specific configurations.

Business Object	Attribute	Custom Label	Label	Re On W Hdr F1	Carry-Down	Carry-Down Attribute	Sh Default	Default Value
CD_HOLE_SECT_GROUP	(name)		JMSA	✓ 2 ✓				
CD_HOLE_SECT_GROUP	hole_name	Section		✓ 2 ✓		MD base		
CD_HOLE_SECT	effective_diameter	Effective hole diameter		B		N/A		
CD_HOLE_SECT_GROUP	date_sect_start	Hole section start datetime		10		N/A		
CD_HOLE_SECT_GROUP	date_sect_end	Hole section end datetime		16		N/A		
CD_HOLE_SECT_GROUP	md_hole_sect_top	MD top		B		N/A		
CD_HOLE_SECT_GROUP	md_hole_sect_base	MD base		B		CD_HOLE_SECT_GROUP.md_hole_sect_base	✓	[CD_WELL.spud_date]
CD_HOLE_SECT_GROUP	is_pilot_hole	Pilot hole		3		N/A		
CD_WELLBORE	wellbore_ns	ST no.		3		N/A		
CD_HOLE_SECT_GROUP	event_name	Event name		12		N/A		
CD_HOLE_SECT_GROUP	tvd_hole_sect_top	TVD top		6		N/A		
CD_HOLE_SECT_GROUP	tvd_hole_sect_base	TVD base		6		N/A		
CD_HOLE_SECT_GROUP	activity_drl_phase	Drilling phase		16		N/A		
CD_HOLE_SECT_GROUP	is_liner	Liner		9		N/A		
CD_HOLE_SECT_GROUP	last_casing_od	Last Casing OD		6		N/A		
CD_HOLE_SECT_GROUP	last_casing_id	Last Casing ID		6		N/A		
CD_HOLE_SECT_GROUP	md_casing_bottom	Last Casing MD Shoe		6		N/A		
CD_HOLE_SECT_GROUP	next_casing_od	Next Casing OD		6		N/A		
CD_HOLE_SECT_GROUP	next_casing_set_md	Next casing set MD		6		N/A		
CD_HOLE_SECT_GROUP	next_casing_set_tvd	Next casing set TVD		6		N/A		
CD_HOLE_SECT_GROUP	md_casing_top	Top set		9		CD_HOLE_SECT_GROUP.md_topping_top		
CD_HOLE_SECT_GROUP	tvd_casing_bottom	TVD shoe		8		N/A		
CD_HOLE_SECT_GROUP	last_casing_weight	Weight		8		N/A		
CD_HOLE_SECT_GROUP	grade	Grade		16		N/A		
CD_HOLE_SECT_GROUP	last_casing_coupling	Coupling		12		N/A		
CD_HOLE_SECT_GROUP	last_casing_burst	Burst		8		N/A		
CD_HOLE_SECT_GROUP	activity_csg_phase	Last csg phase		8		N/A		
CD_HOLE_SECT_GROUP	invert_id	Unique event ID		10		N/A		

[Go To "What's In This Release?"](#)

### Enter Durations Instead of from/to Times When Entering Time Summary into the Morning Report

Supervisors can now save time by simply entering the duration of an activity instead of having to type the from and to times for each time summary record. In the example below the from time of the first activity defaults to the starting time based on the reporting standard. The supervisor simply enters 12.5 hours in the duration field and the “to” time is automatically updated. Supervisors can also override the initial “from” time if operations for non 24 hour operations.



[Go To "What's In This Release?"](#)

### Easily View Hole Sections and BHA Strings Using the “today”, “wellbore”, and “all” Filters

Supervisors now have the ability to filter the BHA's and hole sections displayed in the current morning report by using filters which will show the active hole section/BHA for the day, all sections/BHA's in the wellbore or all sections/BHA's associated with the well.

The screenshot shows the DRILLSTRINGS software interface. At the top, there is a toolbar with icons for copy, paste, and other functions. Below the toolbar is a menu bar with 'DRILLSTRINGS' and 'Section complete' checked. A red box highlights three buttons in the toolbar: 'Show All', 'Show Selected Wellbore', and 'Show Today'. The main area displays a table of BHA runs:

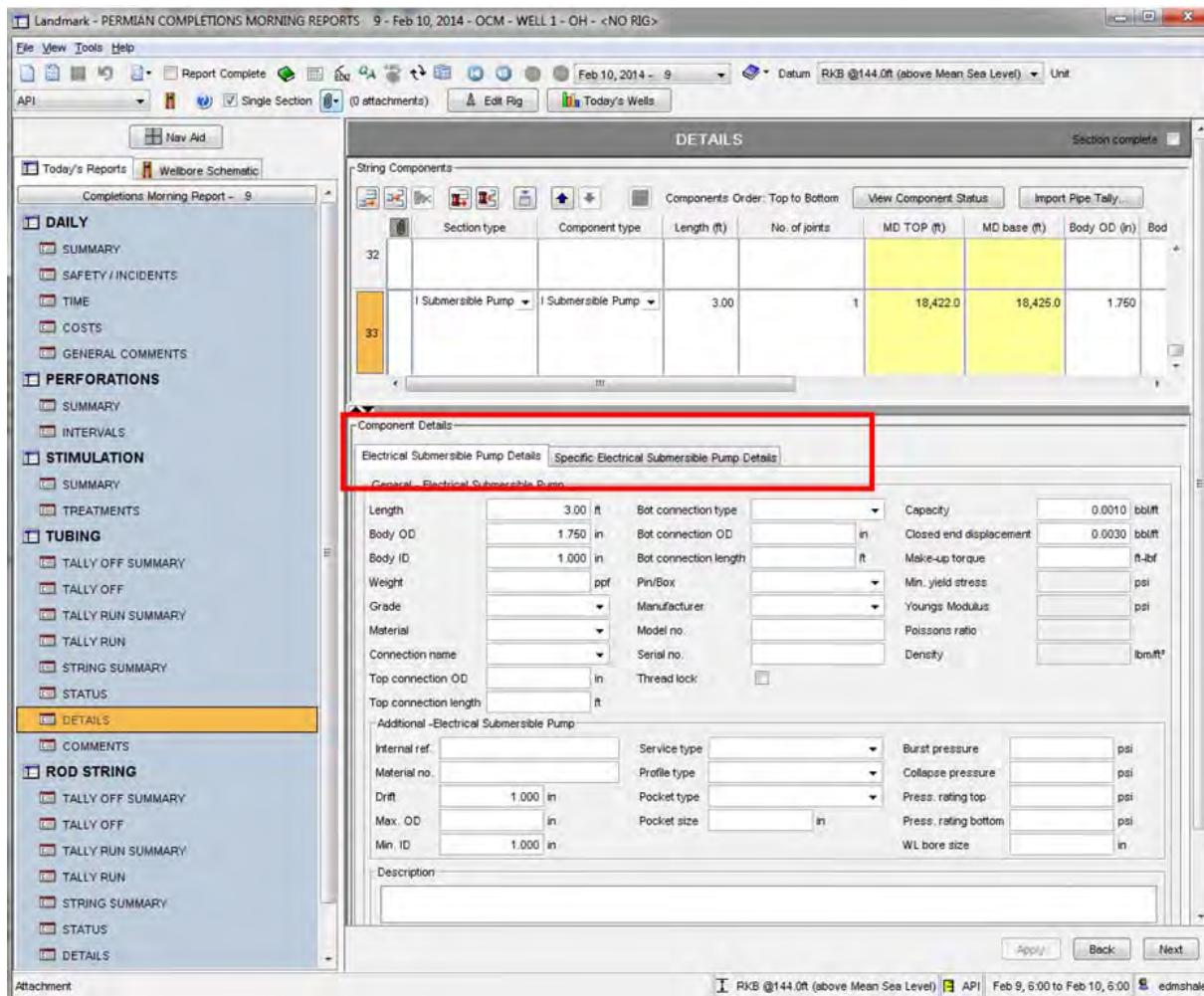
ST no.	BHA no.	Hole size (in)	Date/Time in	MD in (ft)	Date/Time out	MD out (ft)
1	OH	15" SURFACE BHA	15.000 01/08/2014 00:00	100.0	01/09/2014 00:00	2,000.0
2	OH	10" INT BHA	10.000 01/10/2014 07:00	2,000.0	01/15/2014 00:00	10,000.0
3	OH	6" HORIZ BHA	6.000 01/16/2014 05:00	10,000.0	01/18/2014 04:00	18,500.0

Below the table, there is a summary section with tabs for 'Summary', 'Components', 'BHA Operations', and 'Bit Operations'. The 'Summary' tab is selected. It contains fields for BHA number (6" HORIZ BHA), hole size (6.000 in), date/time in (01/16/2014 05:00), date/time out (01/18/2014 04:00), MD in (10,000.0 ft), and MD out (18,500.0 ft). There is also a 'Progress Summary' section with fields for total sliding hrs (0.00 hr), total rotating hrs (0.00 hr), total circulating hrs (0.00 hr), total sliding footage (0.0 ft), and total rotating footage (0.0 ft). At the bottom, there is a 'BHA Run Comments' section with a large text input field.

[Go To "What's In This Release?"](#)

### Artificial Lift Equipment can be Documented From the Tubing/Rod String in the Completions Morning Report

Supervisors are now able to enter a comprehensive summary of artificial lift equipment in a single Completions Morning Report. The relevant details for equipment such as an ESP are now available from the Wellbore Equipment report and therefore supervisors no longer need to create a separate report specific to the artificial lift system.



### New Microsoft Word Reports

This release of OpenWells includes three reports which use Microsoft Word templates to define the layout of the report:

[← Go To "What's In This Release?"](#)

## The Texas W2 Completions Report

The Texas W2 Completions report is available from the wellbore node in the OpenWells well explorer.

### RAILROAD COMMISSION OF TEXAS

#### Oil and Gas Division

Tracking No.:	This facsimile W-2 was generated electronically from data submitted to the RRC.		API No.:	7. RRC District No.:
Status:				8. RRC Lease No.:
<b>Oil Well Potential Test, Completion or Recompletion Report, and Log</b>				
1. FIELD NAME (as per RRC Records or Wildcat) SHALE FIELD NO. 1,	2. LEASE NAME WELL 6		9. Well No. OH	
3. OPERATOR'S NAME (Exactly as shown on Form P-5, Organization Report) NA SHALE	RRC Operator No.		10. County of well site BURKE	
4. ADDRESS			11. Purpose of filing Initial Potential <input type="checkbox"/> Retest <input type="checkbox"/> Reclass <input type="checkbox"/> Well record only <input type="checkbox"/> (Explain in remarks)	
5. If Operator has changed within last 60 days, name former operator				
6a. Location (Section, Block, and Survey)	6b. Distance and direction to nearest town in this county.			
12. If <del>workover</del> or <del>reclass</del> , give former field (with reservoir) & Gas ID or oil lease no.	GAS ID or OIL LEASE #	OIL-O Gas-G	Well #	
13. Type of electric or other log run	14. Completion or recompletion date			

**4. SECTION I - POTENTIAL TEST DATA IMPORTANT:** Test should be for 24 hours unless otherwise specified in field rules.

15. Date of test	16. No. of hours tested	17. Production method (Flowing, Gas Lift, Jetting, Pumping, Size & Type of pump)	18. Choke size	
19. Production during Test Period ►	Oil - BBL/S	Gas - MCF	Water - BBL/S	Gas - Oil Ratio Flowing Tubing Pressure PSI
20. Calculated 24-Hour Rate ►	Oil - BBL/S	Gas - MCF	Water - BBL/S	Oil Gravity-API: 60° Casing Pressure PSI
21. Was swab used during this test? Yes <input type="checkbox"/> No <input type="checkbox"/>	22. Oil produced prior to test (New & Reworked wells)			23. Injection Gas-Oil Ratio
REMARKS:				

[Go To "What's In This Release?"](#)

## The Shale DDR Single Page Report

The “Shale DDR Single Page” report is a single page summary of drilling operations available from daily drilling reports.

Shale Daily Drilling Report Single Page												
Project name	SAKKEN		Site	BALD WELL SITE #	Well	WELL 6	Spud Date		Report Date	1/3/2014	Event	OIL/GAS DRILLING
Wellbore	OH	Rig	HSL 3	Well Type			Progress	750(%)	Engineer			
24 Hr ROP	34.1'(ft/hr)	Last Casing:	(in)	TVD:	(ft)	Next Casing:	(in)	Est Days		Hole Size	(ft)	
Formation	Upper Sakkien Shale	Formation MD	2500 (ft)	Current Status:								
BHA Information												
BHA Name		Purpose	MD In (ft)	MD Out (ft)	Date In	BHA Length (ft)	Components		24 Hr Summary: DRILL SURFACE SECTION			
Drilling			9.0	289.0	01/1/2014 8:59:00 AM	218.75	Hole Opener/Positive Displacement Motor,Cross Over,Tri-Cone Bit, Drill Pipe,Non-Mag Drill Collar		24 Hr Forecast:			
VERTICAL			250.0		1/2/2014 12:00:00 PM	197.75	Polycrystalline Diamond Bit, Non-Mag Drill Collar,Cross Over,Cross Over,Muleshoe Sub,Steerable Motor, Drill Pipe,Spiral Drill Collar,Non-Mag Drill Collar					
Bit Details:												
Bit Runs	Bit Size (in)	TFA (in³)	Footage (ft)	HRS	WOB Min (kN)	WOB Max (kN)	Type	Serial No.	Manufacturer	Nozzles	Model No.	
8.75							Tri-Cone Bit	4002085	Varel	3.0x12/0.3.0x11.0	VM615P	
8.75	1.175						Polycrystalline Diamond Bit	12158042	HALLIBURTON	0.0x15.0	PX650	
Surveys												
Date/Time	MD (ft)	Incl. (°)	Azimuth (°)	Pump Ops		Shaker Ops		NPT, Costs & Depth vs Days				
				Date Installed	Stroke Length	gpm	Liner Size (in)	Install Date	Type	Mesh Size (per inch)	Max Flow (gpm)	
											Daily Cost: \$000.00(\$) Cum. Cost: \$2915.15(\$) Planned Cost: (\$)	

[← Go To "What's In This Release?"](#)

## The Shale Daily Drilling Report Full

The “Shale Daily Drilling Report Full” is a detailed summary of drilling operations available from daily drilling reports.

NA SHALE

Shale Daily Drilling Report Full

1/2/2014



### 1. Daily Status

Well Name: WELL 6	MD:250.0(ft)	Abstract:	Event:ORIG DRILLING
State: NORTH DAKOTA	TVD:250.0(ft)	People on Location:8	Rig Type:LAND
County/ Parish: BURKE	GE:(ft) 12.5	Spud Date:2014-05-01	Big Rig STR Date:
Field: SHALE FIELD NO. 1	RKB: (ft) 8.5	Spud Date:2014-05-12	Big Rig RLS Date:
Drilling Rig:H&L 3	PROGRESS:250.0(ft)	Spud Date:2014-05-02	Re-entry Date:
Drilling Supr(Day): BRIAN	Planned TD :(ft) 18500	Prop NO:8	Days from Spud:1.00
Drilling Supr(Night):	HRS Drilled:6.00(hr)	AFE Drilling:(\$)6500000	Days on Location:2.00
TED	Hole Size: 8.750(in)	AFE Total:2480496.00(\$)	AFE NO:AFE1234
Drilling ENG: KELLY	Avg. ROP:41.7(ft/hr)	Daily Cost:23415.15(\$)	Directional Co:DIRECTIONAL SERVICES
PH Number:555-555-5555	Mud Weight:(ppg)	Drilling Total:36915.15(\$)	MWD Co:MWD SERVICES
			MUD Co:MUD SERVICES

### 2. Summary of Activities

HSE Summary	No incidents today
Current Activity	Circulating surface
24 HR Summary	Rig up, spud.
24 HR Forecast	DRILL SURFACE SECTION

 [Go To "What's In This Release?"](#)

### New Report – Well Quick Reference Sheet

A new printed report (Crystal) has been added to OpenWells that provides workover supervisors with a quick summary of important information about a completion prior to departing to a job site.

## WELL QUICK REFERENCE SHEET

### Well Information

Legal well name	WELL 1	Common well name	WELL 1
Region	NORTH AMERICA	State/Province	
District	NORTHERN	County	
API no.	123456798	Spud date	1/7/2014
Active datum	RKB @144.0ft (above Mean Sea Level)	Ground elevation	132.0 (ft)
Latitude	72° 45' 21.408 N	Longitude	134° 53' 14.549 W
Easting	-3,185,868.50 (m)	Northing	11,245,249.02 (m)
UWI	3C-01		

### Well Summary

#### Lesson Learned

Date	Type	Description

#### Events

Event	Objective	Start date	End date	Rig name no.	Authorized cost	Total Cost	Est days	Actual Days
DRIG DRILLING		1/2/2014	1/20/2014			2,915,840.70		15.00
DRIG COMPLETION	COMPLETION	2/2/2014	2/26/2014			0.00		5.00
WORKOVER	ESP FAILURE	5/2/2014	5/5/2014			0.00		1.00

### Wellbores

Common name/ST no.	Parent wellbore	Wellbore type	Kick off date	Reason	Top-Base MD (ft)	Bottom hole location
OH/OH	—None—		1/7/2014		0.00	

### Hole Sections

ST no.	Pilot hole	Section	Effective hole diameter (in)	MD top (ft)	MD base (ft)	TVD top (ft)	TVD base (ft)	Start Date	End Date
CH	N	20° CONDUCTOR HS	30,000	0.0	100,0			1/6/2014	1/7/2014
	N	15° SURFACE HS	15,000	100,0	2,000,0			1/6/2014	1/6/2014
	N	10° INT HS	10,000	2,000,0	10,000,0			1/10/2014	1/18/2014
	N	6° HORIZ HS	6,000	10,000,0	18,500,0			1/16/2014	1/18/2014

### Simplified Deployment for Field/Rig Laptops

Installation of field/rig laptops is greatly simplified with the OpenWells “Standalone” installer. A single install routine now provides:

 Go To "What's In This Release?"

- OpenWells
- PROFILE
- Data Analyzer
- EDM Administration Utility
- A default SQL Server Express database
- Database configuration required for Autosync Client

*Simplified Autosync Installation using an Oracle EDM Database*

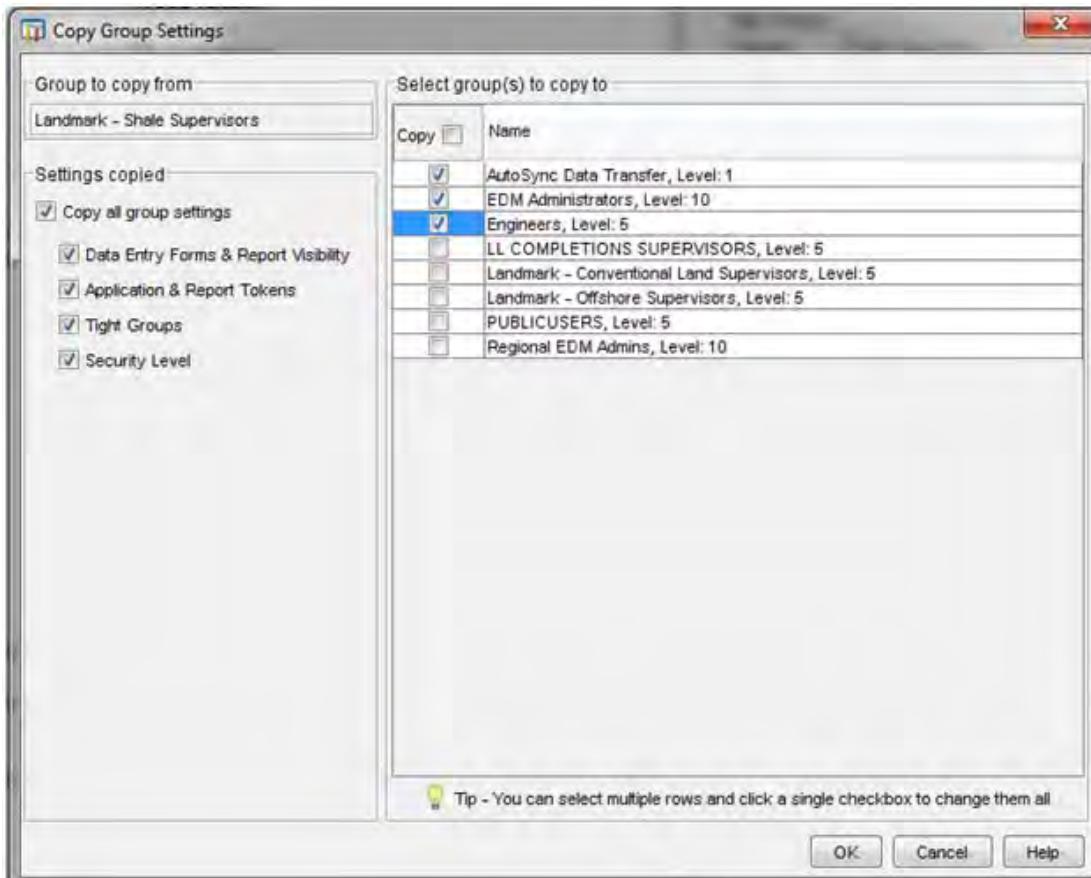
Administrators no longer need to run Autosync server scripts when installing an Oracle EDM database. All of the Autosync database configuration is now included in the EDM database installation.

For Oracle installations the Autosync “triggers” are turned off by default so that upgrades and database maintenance can be completed without having Autosync detection. Once upgrade and maintenance work is complete Administrators can simply enable the triggers.

[Go To "What's In This Release?"](#)

### Administrators can Easily Copy Configurations Between User Groups

Administrators have a greatly improved interface which provides them with the ability to easily copy user group settings between groups of users.



[!\[\]\(76d38023a5fd60324c5f081f54334901\_img.jpg\) Go To "What's In This Release?"](#)

## OpenWells Fixed Issues

The OpenWells issues fixed for 5000.1.13 through 5000.15 are described below.

### **Release 5000.15**

Defect No.	Description
895503	Wellbore openings added in Profile against an actual design are not shown in OpenWells
918565	OpenWells users can accidentally create 2 default datum's if they click apply in the well properties dialog before they enter a default datum
947434	Request for additional Surface Casing Vent Flow (SCVF) fields
949446	Reference Log field required in Perforation report
956500	Restore the Conventional Rod Pump data entry forms
956952	All Data Validation rules are treated as Mandatory if a user configuration enables OpenWells Plugins
957198	Prevent EDM data corruption by validating data imports against duplicate report journal identifiers
957897	Wellhead outlets configured in a center location are now displayed in Profile, as indicated in the OpenWells outlets picklist
958083	Data Validation Rules with an unmatched single quote become corrupted (save failure)
958321	Improved OpenWells Performance in wells with large amounts of data/reports
958595	Pressing any of the synchronize buttons in OpenWells will automatically start the Autosync service if needed
958679	Improved error logging for scenarios in which the primary report is missing for a particular type of activity (configuration corruption issue)
958683	Add the ability to track vented and flared gas/hours to the daily operations report
960100	OpenWells Section navigator is blank for activity based reports which are configured in a scenario where the first report in the list has the "shared" box checked (enabled)
960106	OpenWells does not display wellbore equipment strings that are in hole when executing a pull-and-rerun workflow using the activity based wellbore equipment reports (WO event configuration)
960107	Cost Estimate and AFE reports configured as read only (via the layout manager) still continue to show spreadsheet columns in a read/write format
960108	Read-only user token is not respected when using activity reports that display Cost Estimate and AFE report sections
960109	Multiple Cost Estimate and AFE reports created when using activity based reports configured with the AFE report as a shared report in the event

 [Go To "What's In This Release?"](#)

Defect No.	Description
960679	Pulled Components chosen from the Associated Report in the Production Equipment Failure report do not automatically populate chosen component's attributes from parent report
960800	User customized Daily Fluid Section tabs not displayed correctly by OpenWells
960759	Well Planning based Activity does not create a design
961194	Simple way to quickly create new reports when moving from day 1 to day 2

### **Release 5000.14.1**

Defect No.	Description
900240	Wrong Company Name showing in Personnel tab, unable to select correct Company Name
931391	Include the Service field in the Personnel Tab in the Daily Report so that users can differentiate between two crews from the same service company that are performing different services
939565	OpenWells saves Cyrillic characters (Russian) as question marks (?) when comments are entered in fields that are a memo data type
951166	Cyrillic (Hungarian and Russian) characters do not store/display properly when entered in OpenWells ntext/memo data types
954525	Mandatory validation rules can be bypassed by selecting a different report in the "Todays Reports" column
957013	Unable to save property dialogs when non-mandatory rules fail and the "EnablePlugins" system setting is enabled
957146	Mandatory validation rule bypassed by selecting "File Properties" or selecting "Edit Rig" from the report menu and/or toolbar

### **Release 5000.14**

Defect No.	Description
53090	Additions to pick lists are not saved to the database
887806	Add new fields to the stimulation additive and additive concentration tables to support the new regulatory requirements for the Pennsylvania Completion Report
887810	Data Model Changes - Add additional field for Global Vendor field for NPT / Equipment Failure Properties
893664	SA requires a strong complex password
894248	Add New Field in the Stimulation Report "Water Management Plan ID No."

 [Go To "What's In This Release?"](#)

Defect No.	Description
909835	Typos in data dictionary in OW-Description details should read "condition", presently reads as "bondition"
909836	Typos in data dictionary in OW- Data Dictionary contains misspelled word for gauge...shows "guage"
911297	OpenWells Stimulations Field Additions for BC-OGC F
926043	DM_STIM_JOB.Supervisor field is blank after EDT database upgrade
929808	Advanced tab of Data Validation, all rows appear instead of the ones which fail the rule in spreadsheets
937844	Increase the field size of the daily operations comment to 1200 characters.
948032	A unique workflow can cause multiple default datum's to be created when users create a new well using OpenWells
951373	Validations to ensure that two BHA strings are not in hole on the same date/time are erroneously using planned and prototype BHA's in addition to the actual BHA runs. The validation should only use actual BHA runs to validate strings in hole
951475	Need to expose the Stimulation Stage Interval Top and Interval Base fields in OpenWells in order to have Stimulation Schematic drawn by Profile
951501	Restore support for the WITSML 1.3.1.0 standard when importing frac data into OpenWells
953531	Daily costs not carrying over to next day when using Plugins option
954052	Unable to delete personnel from the spreadsheet in the daily operations report
954131	Slow performance in OpenWells BHA components entry when selecting Component Types in scenarios with many BHA strings
954341	Data validation scripts (advanced scripting) are truncated after 2000 characters
954777	Inaccurate Calculation formula indicated in OpenWells Online Help
956166*	Individual components in a wellbore equipment string should change status from "Pulled" to "Installed" when the status of the string is changed
956252*	Data Disappearing from OpenWells property dialog box

\*Defect fixes not included in the Beta release.

### Release 5000.1.13

Defect No.	Description
898229	Supervisors recording NPT need the NPT Gross Time calculation to use the sum of activity recorded during the operation so that it calculates correctly in scenarios where the rig moves off of the well due to the NPT event and later returns
899404	Pipe Tally - Importing Off Load into Run tally doesn't refresh properly

[!\[\]\(b1297194d7c82318a4266d0917bd4e3f\_img.jpg\) Go To "What's In This Release?"](#)

Defect No.	Description
927296	OpenWells can become unresponsive for minutes when receiving SAM reload notifications
931471	Production Equipment report "Associated report" picklist does not retain the selected value after closing and reopening the report
931474	"Associated report" picklist in Production Equipment report displays all the Plunger lift report from all across Wells from all Companies in the Well Explorer
931482	OpenWells is slow when loading daily operations reports which have over 200 surveys associated with them
933723	Component names are not populated when importing a pipe tally into a casing report
935534	Data validation rule failure causing problem with locks
938212	SAM reload notification is causing unsaved BHA data to be lost
938901	Well Name does not populate on Lessons Learned dialog when certain tabs are hidden

 Go To "What's In This Release?"

## OpenWells Known Issues

The following OpenWells known issues for releases 5000.1.13 through 5000.15 are described below.

### **Releases 5000.14 through 5000.15**

There are no additional OpenWells known issues for these releases.

### **Release 5000.1.13**

Defect No.	Description
941703	If printed report configurations do not contain the *Filtered.xsd and *Tables.xml files, they cannot be printed. This issue only affects the OpenWells "Standalone" install, it does not affect OpenWells when installed using the EDT installer.
942244	Opening the Catalog Editor from the Well Explorer tree results in an error message. This issue only affects the OpenWells "Standalone" install, it does not affect OpenWells when installed using the EDT installer.

 Go To "What's In This Release?"

---

## **PROFILE™ Software**

[Enhancements](#)[Fixed Issues](#)[Known Issues](#)

This section outlines the changes made to PROFILE™ software.

### **PROFILE Enhancements and New Functionality**

The PROFILE enhancements and new functionality for releases 5000.1.13 through 5000.15 are described below.

#### **Releases 5000.1.13 through 5000.15**

There are no enhancements to PROFILE for these releases.

 [Go To "What's In This Release?"](#)

## PROFILE Fixed Issues

The PROFILE issues fixed for 5000.1.13 through 5000.15 are described below.

### Release 5000.15

Defect No.	Description
917503	Add support for Tubing Punches to Profile by adding a related wellbore opening type, symbol map and rendering in the wellbore schematic
918294	Request that Profile ignore picklist filters on the cd_wellbore_opening.opening_type field
949184	In some scenarios, Profile does not correctly draw cement plugs within the (tubing) string in which they are located
958702	Enhancement request - PROFILE Data Box Split Functionality. Allow Data Box to be Split by Set Item #
959132	Perforations disappear on the diagram in Profile when tubing string is selected to be shown at the same time
959732	The Profile installation is missing the configuration for 2D symbols

### Release 5000.14

Defect No.	Description
952125	Request to have the Assembly Name from Casing Details and Slurry Top MD from the Pumping Schedule added to Cementing Data for the Data Box Object
954686	Profile scaling issue related to Casing and Bridge Plugs specific to certain data scenarios
954687	Disable the ability to open templates in locked designs
954690	Introduce a token to control who can unlock templates
954826	In some scenarios Profile, when launched in the context of a specific report in OpenWells, opens to the last day of the last event instead of opening to the report date in context in OpenWells
955306	The symbol used for plugs recorded during a frac operation need to be configurable so that they are not confused with similar symbols representing other types of plugs
955307	The wellbore schematic does not respect the install/removed dates when drawing retrievable components
955364	Provide the ability to include approval history comments in the PROFILE wallplots using a databox

 Go To "What's In This Release?"

Defect No.	Description
955671	Wellbore schematic between OpenWells and Profile are inconsistent when the current MD is entered in OpenWells during a workover operation

**Release 5000.1.13**

Defect No.	Description
926842	Tether Lines do not disappear when Tether Lines Checkbox is not checked if Floating Labels Checkbox is checked

 Go To "What's In This Release?"

## PROFILE Known Issues

The following PROFILE known issues for releases 5000.1.13 through 5000.15 are described below.

### **Releases 5000.14 through 5000.15**

There are no additional PROFILE known issues for these releases.

### **Release 5000.1.13**

Defect No.	Description
942247	Opening the Catalog Editor from the Well Explorer tree results in an error message This issue only affects the Profile when installed using the "OpenWells Standalone" install, it does not affect Profile when installed using the EDT installer.

 Go To "What's In This Release?"

---

## StressCheck™ Software

[Enhancements](#)[Fixed Issues](#)[Known Issues](#)

This section outlines the changes made to StressCheck™ software.

### StressCheck Enhancements and New Functionality

The StressCheck enhancements and new functionality for releases 5000.1.13 through 5000.15 are described below.

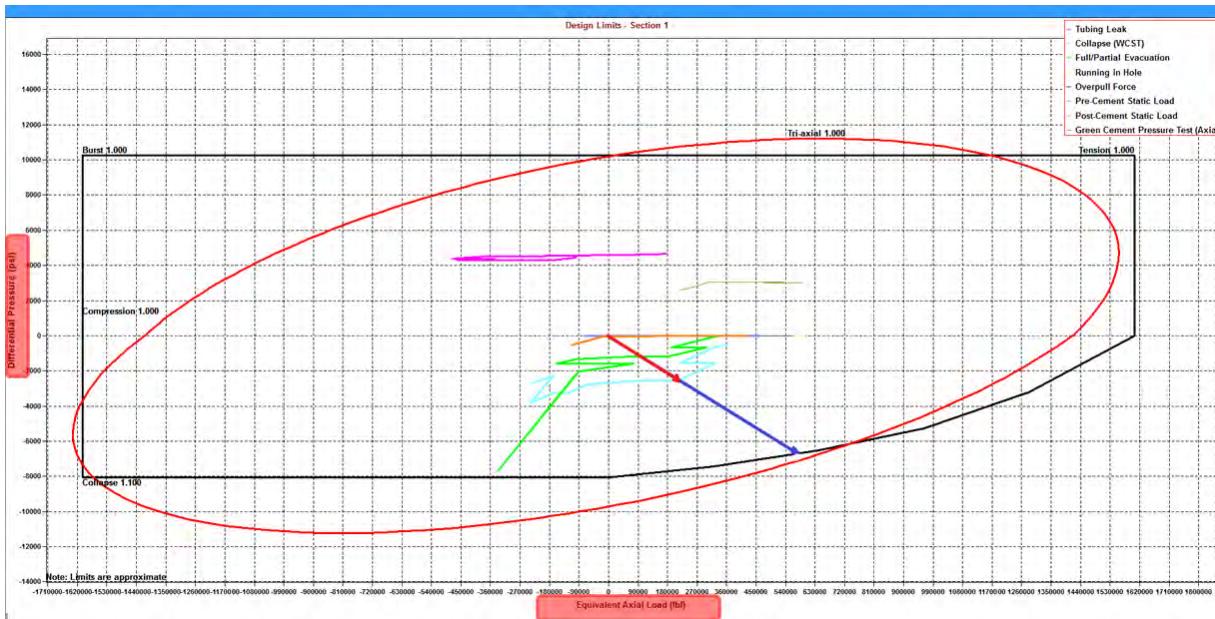
#### Release 5000.15

##### *Design Limit Plot Update*

The design limit plot has been updated according to API TR 5C3 addendum 2015 as follows:

- Re-Label Design Limit Plot axis titles to Differential Pressure (psi) in the Y axis and Equivalent Axial Load (lbf) in the X axis.
- Shifting of load data points to graphically align with triaxial safety factors, new collapse safety factors.
- Uniaxial Design Limit adjustment option to display the Axial Limit Lines with and/or without the effect of counter-load pressure ( $P_i$  for collapse,  $P_o$  for burst).

[Go To "What's In This Release?"](#)



## Release 5000.14

### *2015 5C3 Collapse formula*

More rigorous calculation modification for the collapse by combining the effect of axial stress and internal pressure has been determined technically necessary by the API Subcommittee on Tubular Goods. The changes are based upon the API 5C3 Addendum, October 2015 on the API Technical Report 5C3, First Edition, December 2008. The equation numbers and chapter numbers (if shown) are also referring the equations in API TR5C3, 1<sup>st</sup> edition, 2008.

For further details, please refer to the API 5C3 Addendum, issued in October 2015, on API 5C3 First Edition, 2008.

### Collapse pressure under axial stress and internal pressure

The external pressure at collapse under combined axial stress and internal pressure can be calculated by replacing the collapse resistance  $p_c$  by the collapse pressure differential  $p_c - p_i$  and at the same time modifying the yield stress to a combined loading equivalent grade according to Equation (42):

 [Go To "What's In This Release?"](#)

**Formula 42 is changed to:**

$$f_{ycom} = \{ [1 - 0.75((\sigma_a + p_i) / f_{ymn})^2]^{1/2} - 0.5(\sigma_a + p_i) / f_{ymn} \} f_{ymn} \quad (\text{for } \sigma_a + p_i \geq 0) \quad (42)$$

**Where**

$f_{ycom}$  is the combined loading equivalent grade, the equivalent yield strength in the presence of axial stress and internal pressure;

$f_{ymn}$  is the specified minimum yield strength;

$\sigma_a$  is the component of axial stress not due to bending;

$p_i$  is the internal pressure;

$p_c$  is the collapse resistance.

Collapse resistance equation factors and D/t ranges for the combined loading equivalent grade are then calculated by means of Equations (36), (38), (40), (44) or (49), (45) or (50), (46) or (51), (47) or (52), and (48) or (53). Using equation factors for the combined loading equivalent grade, collapse resistance under axial stress and internal pressure is calculated by means of Equations (35), (37), (39) and (41).

API collapse resistance equations are not valid for the yield strength of combined loading equivalent grade ( $f_{ycom}$ ) less than 24 000 psi.

**Effect of internal pressure on collapse**

The external pressure equivalent of external pressure and internal pressure is determined by means of Equation (43) in API 5C3 is not applicable anymore according to the Addendum, Oct. 2015 where the original equation (43) in the first edition 2008 has been deleted in the addendum, Oct. 2015. Instead, the differential pressure of external pressure and internal pressure is used.

**Reference**

TR 5C3 /ISO 10400:2007, Technical Report on Equations and Calculations on Casing, Tubing, and Line Pipe Used as Casing or Tubing; and Performance Properties Tables for Casing and Tubing, First Edition, December 2008

**Addendum, October 2015**

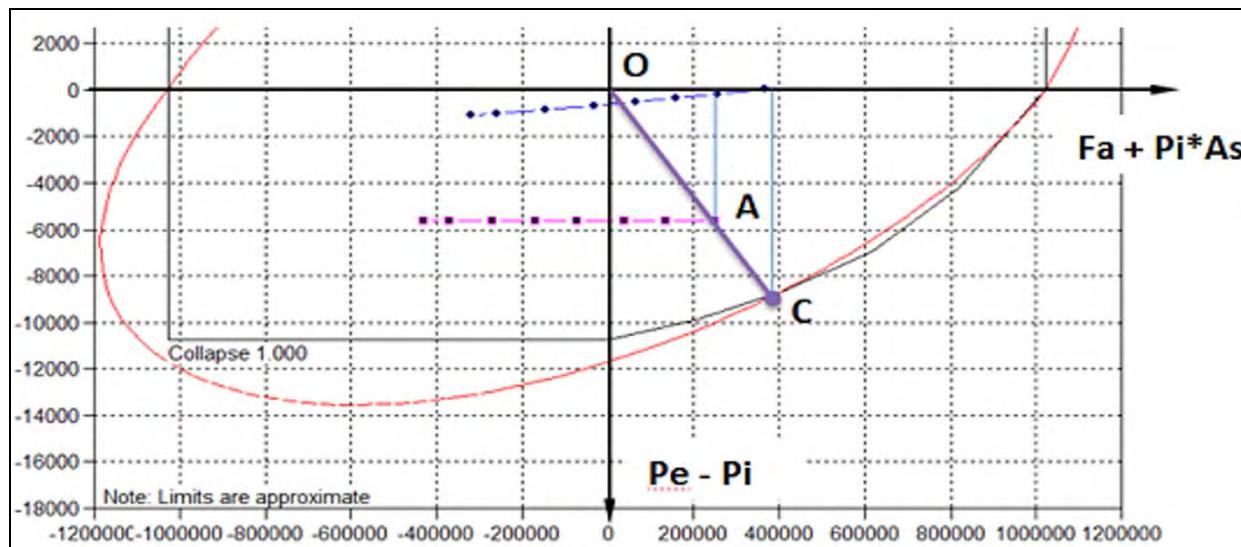
CLINEDINST, W.O., Calculating Collapse Resistance under Axial Stress using Existing API Collapse Formulas and the Strain Energy of Distortion Theory of Yielding, report prepared for the American Petroleum Institute, December 1, 1980

[Go To "What's In This Release?"](#)

API 5C3 Addendum, issued in October 2015, on API 5C3 First Edition, 2008

### Radial Collapse Safety Factors

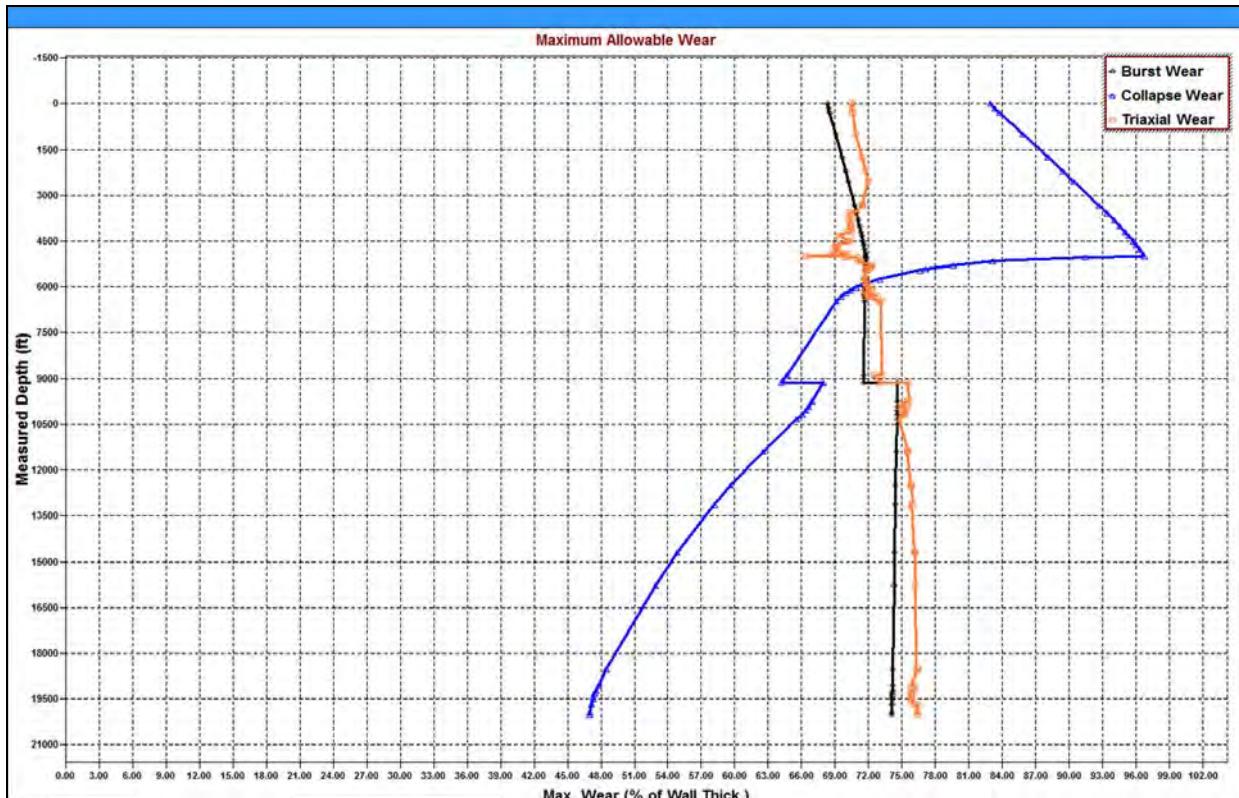
Collapse safety factors in Design Limit Plot, fourth quadrant ( $dP$  vs.  $F_{eff}$ ,  $dP = Pe - Pi$ ,  $F_{eff} = Fa + Pi * As$ , where  $Pi$  is internal pressure,  $Pe$  is external pressure,  $Fa$  is axial force;  $SF = OC/OA = dPc/dP0$  is considered more conservative than  $s'f = dPD/DP0$ , where  $dPD$  is the differential collapse pressure calculated using 2015 API 5C3 equations. Refer to the image below.



### Maximum Allowable Wear based on Triaxial Safety Factor

In addition to Burst and Collapse maximum allowable wear allowance, StressCheck™ 5000.14 calculates maximum allowable casing wear based on triaxial safety factor. The maximum allowable wear is determined by maintaining the triaxial safety factor equal to the appropriate design factor as a function of depth. Allowable wear is presented as a percentage of nominal wall thickness and the maximum wall loss the pipe can tolerate using the load conditions. Even though maximum allowable wear based on triaxial safety factors results are reported along burst and collapse, it is primarily intended to casing design analysis using triaxial safety factors instead of the traditional burst safety factors.

[← Go To "What's In This Release?"](#)

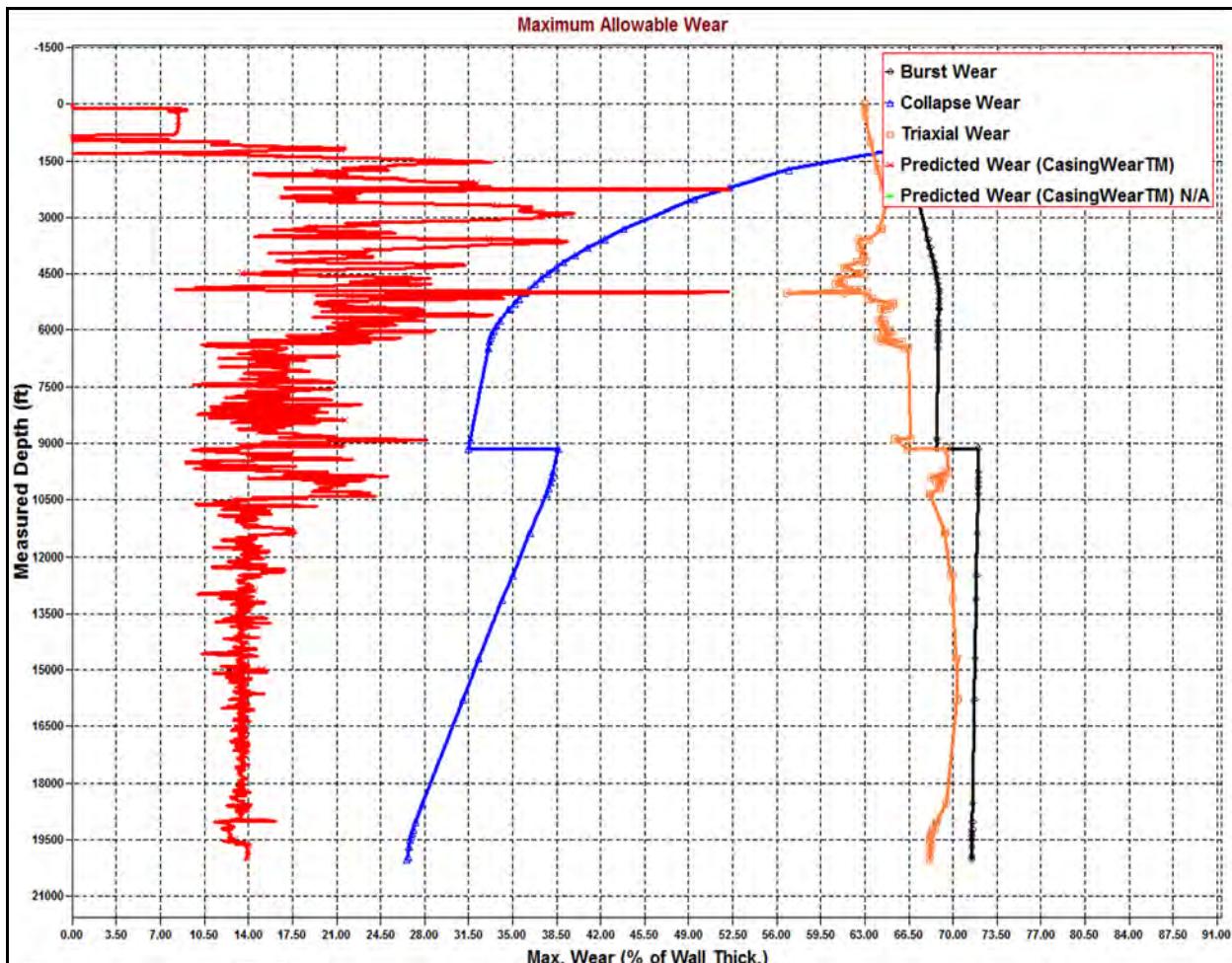


### CasingWear™ Link

Provided there is access to the new Landmark CasingWear™ software; users can initiate casing/liner wear analysis from existing StressCheck™ designs.

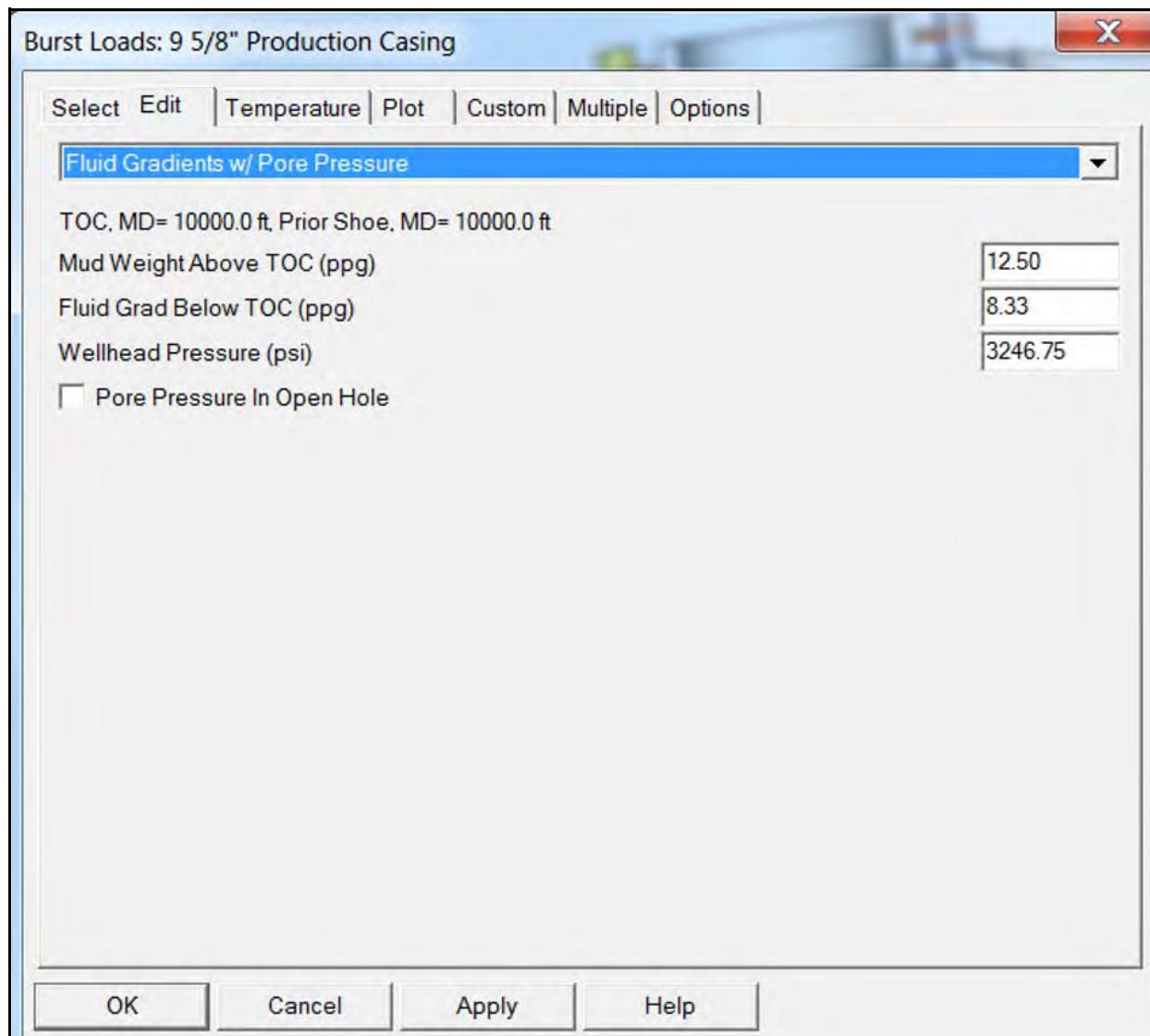
CasingWear™ defines chronological wear analysis (linking wellbores, sidetracks) applying soft and stiff string torque and drag models to a specified sequence of drilling operation simulations (drilling, rotate off bottom, Back-reaming, slide drilling or reciprocation), applying diverse wear factor definition options (along; casing, string tool joint, pipe protectors, hard-banding) and several other sensitivity analysis options (WOB, RPM, Dogleg severity, wear factor).

User can quickly import CasingWear™ predicted wear results into StressCheck™ evaluate remaining casing integrity while comparing predicted wear vs maximum allowable wear, save results in database for future well re-entry evaluation opportunities (sidetrack, multilateral, and save well cost).

[Go To "What's In This Release?"](#)

### Fluids Gradient with Pore Pressure, Wellhead Pressure

Fluids Gradient with Pore Pressure external profile allows the definition of Wellhead pressure. The default wellhead pressure is calculated based on the specified mud weight above TOC. These additions simplify the analysis of dual external pressure profiles in StressCheck casing designs applying Fluids Gradient with Pore Pressure profile.

[Go To "What's In This Release?"](#)

#### *Triaxial Results, Table, Internal, External Pressure*

The Triaxial results table includes the internal and external load pressure profiles to simplify loads reporting needs.

 Go To "What's In This Release?"

Triaxial Results													
	Depth (MD) (ft)	Axial Force (lbf)		Bending Stress at OD (psi)	Absolute Safety Factor				Temperature (°F)	Pressure (psi)		Add'l Pickup To Prevent Buck. (lbf)	Buckled Length (ft)
		Apparent (w/Bending)	Actual (w/o Bending)		Triaxial	Burst	Collapse	Axial		Internal	External		
1	100	107465	50509	4196.5	1.68	1.48	N/A	9.62	227.25	4466.47	58.18	N/A	N/A
2	150	105115	48159	4196.5	1.68	1.48	N/A	9.83	227.25	4492.44	87.27		
3	600	83965	27009	4196.5	1.67	1.49	N/A	12.31	227.25	4726.21	349.09		
4	1175	56957	0	4196.5	1.68	1.51	N/A	18.15	227.25	5024.72	683.43		
5	1175	-56957	-0	4196.5	1.66	1.51	N/A	(18.15)	227.25	5024.73	683.44		
6	2500	-119247	-62291	4196.5	1.62	1.53	N/A	(8.67)	227.25	5713.21	1454.54		
7	2500	-204683	-62292	10491.3	1.51	1.53	N/A	(5.05)	227.25	5713.22	1454.55		
8	3100	-232676	-90285	10491.3	1.49	1.55	N/A	(4.44)	227.25	6022.63	1801.08		
9	3100	-265277	-102175	10491.3	1.68	1.79	N/A	(4.46)	227.25	6022.64	1801.09		
10	4715	-340454	-177352	10491.3	1.61	1.83	N/A	(3.48)	227.25	6752.60	2618.65		
11	4715	-242594	-177353	4196.5	1.75	1.83	N/A	(4.88)	227.25	6752.60	2618.66		
12	4750	-243925	-178684	4196.5	1.75	1.83	N/A	(4.85)	227.25	6765.53	2633.13		
13	4750	-243926	-178685	4196.5	1.75	1.83	N/A	(4.85)	227.25	6765.54	2633.14		
14	5400	-268515	-203274	4196.5	1.73	1.84	N/A	(4.41)	227.25	7004.29	2900.55		
15	5400	-268515	-203275	4196.5	1.73	1.84	N/A	(4.41)	227.25	7004.30	2900.56		
16	6800	-321477	-256236	4196.5	1.67	1.87	N/A	(3.68)	227.25	7518.55	3476.52		
17	6800	-186172	-120931	4196.5	1.91	1.87	N/A	(6.36)	227.25	7518.56	3476.53		
18	8100	-164716	-99475	4196.5	1.93	1.84	N/A	(7.19)	227.25	7996.08	3887.19		
19	8100	-196693	-125889	4196.5	2.82	2.76	N/A	(8.99)	227.25	7996.09	3887.20		
20	8249	-194176	-123342	4196.5	2.83	2.76	N/A	(9.10)	227.25	8050.87	3934.32		
21	8249	-194176	-123342	4196.5	2.83	2.75	N/A	(9.10)	227.25	8050.88	3934.32		
22	8956	-182245	-111411	4196.5	2.84	2.73	N/A	(9.70)	227.25	8310.61	4157.69		
23	8956	-182245	-111411	4196.5	2.84	2.73	N/A	(9.70)	227.25	8310.62	4157.70		
24	9700	-169697	-98863	4196.5	2.86	2.70	N/A	(10.42)	227.25	8583.81	4392.64		
25													
26		( ) Compression											
27													

### Pipe Inventory Summary

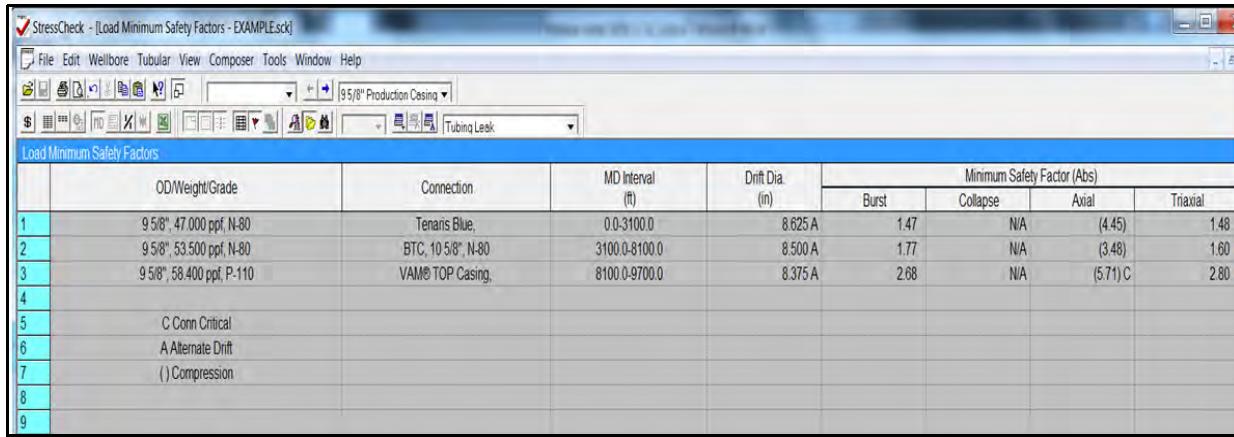
The Pipe Inventory Summary table displays a summary of the pipe properties StressCheck is using for a design.

Pipe Inventory Summary														
	OD (in)	Weight (pbf)	Grade or Name	ID (in)	Yield (psi)	Int Drift (in)	Pipe Type	Burst (psi)	Collapse (psi)	Axial (lbf)	UTS (psi)	Wall Thick. (% of Nom.)	Plain End Cost (\$/ft)	In Inven. (ft)
1	4,000	9,500	N-80	3.548	80000.0	3.423	Standard	7910.00	6586.92	214363	100000.0	87.50	4.19	
2	7,000	29,000	N-80	6.184	80000.0	6,059	Standard	8160.00	7025.60	679564	100000.0	87.50	12.79	
3	9,625	47,000	N-80	8.881	80000.0	8,625	Standard	8865.45	4754.04	1085789	100000.0	87.50	20.73	
4	9,625	53,500	N-80	8.835	80000.0	8,800	Standard	7927.27	6617.23	1243719	100000.0	87.50	23.99	
5	9,625	58,400	P-110	8.435	110000.0	8,375	Standard	11900.00	9767.56	1856724	125000.0	87.50	30.05	
6	13,375	54,500	K-55	12.515	55000.0	12,459	Standard	2734.58	1130.82	853242	95000.0	87.50	19.07	
7	18,625	87,500	H-40	17.755	40000.0	17,567	Standard	1634.90	627.31	984333	60000.0	87.50	30.63	
8														

### Release 5000.1.13.1

#### Minimum Safety Factor Table per String Section per Load

A new summary table of minimum safety factors per string section per load in StressCheck.

[Go To "What's In This Release?"](#)

The screenshot shows the StressCheck software interface with a menu bar (File, Edit, Wellbore, Tubular, View, Composer, Tools, Window, Help) and a toolbar with various icons. A dropdown menu shows '9 5/8" Production Casing'. The main window displays a table titled 'Load Minimum Safety Factors' with the following data:

	OD/Weight/Grade	Connection	MD Interval (ft)	Drift Dia. (in)	Minimum Safety Factor (Abs)			
					Burst	Collapse	Axial	Triaxial
1	9 5/8", 47.000 ppf, N-80	Tenaris Blue,	0.0-3100.0	8.625 A	1.47	N/A	(4.45)	1.48
2	9 5/8", 53.500 ppf, N-80	BTC, 10 5/8", N-80	3100.0-8100.0	8.500 A	1.77	N/A	(3.48)	1.60
3	9 5/8", 58.400 ppf, P-110	VAM® TOP Casing,	8100.0-9700.0	8.375 A	2.68	N/A	(5.71) C	2.80
4								
5	C Conn Critical							
6	A Alternate Drift							
7	( ) Compression							
8								
9								

### **Release 5000.1.13**

There were no enhancements to StressCheck for this release.

 [Go To "What's In This Release?"](#)

## StressCheck Fixed Issues

The StressCheck issues fixed for 5000.1.13 through 5000.15 are described below.

### Release 5000.15

Defect No.	Description
954624	StressCheck failed when loading large no. of entries to pore pressure table
960362	Drill Ahead load affecting other loads
960840	StressCheck design export performance issue (transfer file, xml)
961812	Incorrect minimum hanger depth default value in Drill Ahead load
962018	Worse case Lost Returns not calculated correctly

### Release 5000.14.1

Defect No.	Description
955266	Well Schematic not appearing on detailed report
955452	Well Schematic not in center when Print Preview
956620	Incorrect calculation of EUJ jump out strength
956999	StressCheck WELLCAT: Inconsistent API connection rating calculations
957136	The internal pressure profile are different at the point where the tieback ends and the liner begins, when MASP is applied
957724	Incorrect temperature profile applied while enable or disable custom loads

### Release 5000.14

Defect No.	Description
953191	StressCheck losing load data when save as and reopened
955387	Refresh Collapse Rating values in Pipe Inventory

### Release 5000.1.13.1

Defect No.	Description
908851	StressCheck crashes when selecting Burst designs

[!\[\]\(b92afa65eab342d413230058e3c524dc\_img.jpg\) Go To "What's In This Release?"](#)

Defect No.	Description
946001	Unexpected External pressure result for HID load when there is an open hole weaker formation in Fracture gradient than Frac at Shoe value
946002	Incorrect pressure calculation for casing-liner cases when MASP to Frac at Shoe is checked
949267	Schematic refresh issue in StressCheck
950003	The first cell in the default bit size dialog was read only

### **Release 5000.1.13**

Defect No.	Description
884083	Problems with Geological Column in Wallplots across EDT apps, multiply formation columns from more than one design showing in StressCheck Wallplot Geo Column
922753	Different values for axial and triaxial minimum absolute safety factor while switching MD/TVD
932743	StressCheck problem with bit sizes using Regional language
932808	StressCheck show measure labels with powers incorrectly with Russian regional

 Go To "What's In This Release?"

## StressCheck Known Issues

The following StressCheck known issues for releases 5000.1.13 through 5000.15 are described below.

### Release 5000.15

Defect No.	Description
957886	Observed permeable zone results inconsistencies compared to WELLCAT

### Release 5000.14.1

Defect No.	Description
957754	Reporting lowest Axial Design Factor for connection

### Release 5000.14

Defect No.	Description
954624	StressCheck failed when loading large number of entries to Pore pressure table
955266	Well Schematic not appearing on detailed report

### Release 5000.1.13.1

There were no additional StressCheck known issues for this release.

### Release 5000.1.13

There were no additional StressCheck known issues for this release.

 Go To "What's In This Release?"

## **WELLCAT™ Software**

[Enhancements](#)[Fixed Issues](#)[Known Issues](#)

This section outlines the changes made to WELLCAT™ software.

### **WELLCAT Enhancements and New Functionality**

The WELLCAT enhancements and new functionality for releases 5000.1.13 through 5000.15 are described below.

#### **Release 5000.15**

##### *Limit State Formulas*

In addition to API TR 5C3 deterministic formulas which are useful for well design based on conservative geometry and material properties, WELLCAT 5000.15 supports limit state formulas for better accuracy of pipe-body strength and for future probabilistic calculation of an individual sample whose distributions of geometry and material properties are given.

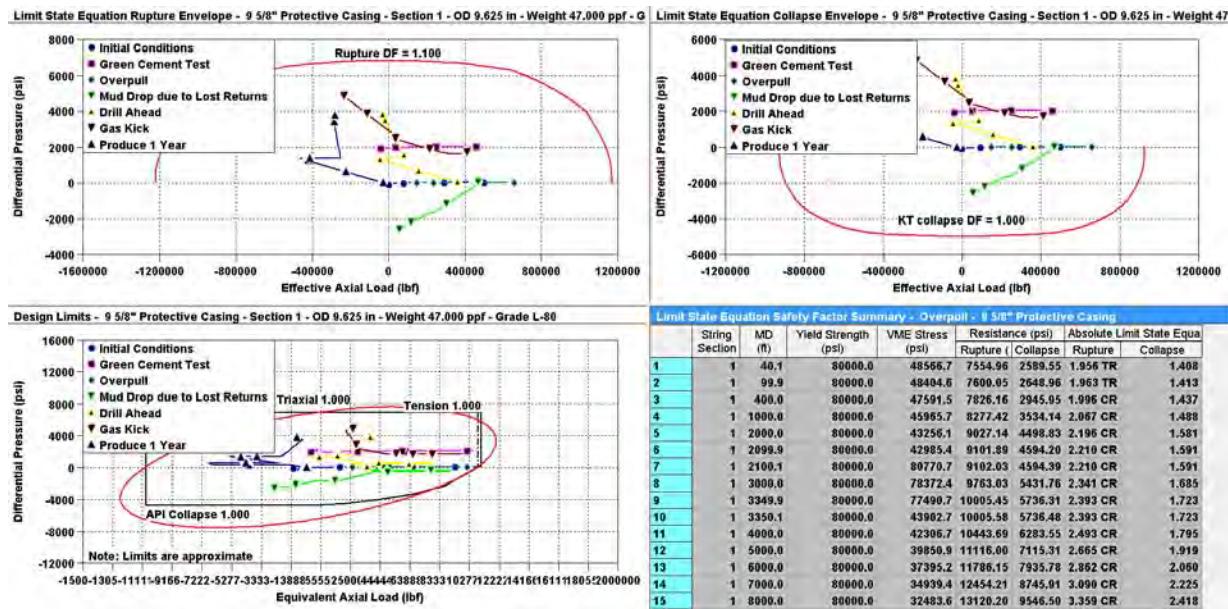
- Ductile Rupture Formulation (Klever – Steward)

API TR 5C3 Yield formulas are intended to describe the onset of permanent plastic deformation and not loss of pressure integrity. Ductile Rupture (Klever – Steward) Limit State Formulation represents the actual failure of the pipe body due to internal pressure and/or axial tension in the plastic deformation range. Rupture formulation is intended to describe the ultimate pressure capacity of the pipe at a pressure which fails the pipe body with loss of internal pressure integrity and so shall be used with caution.

- Collapse (Klever – Tamano)

In addition to API Bulletin 5C3 deterministic collapse strength design formulas, WELLCAT 5000.15 enables limit-state Klever – Tamano collapse formula. This limit state formula excels other known limit state collapse formulas in terms of bringing more accuracy and resolving old collapse formulation's limitations.

[Go To "What's In This Release?"](#)

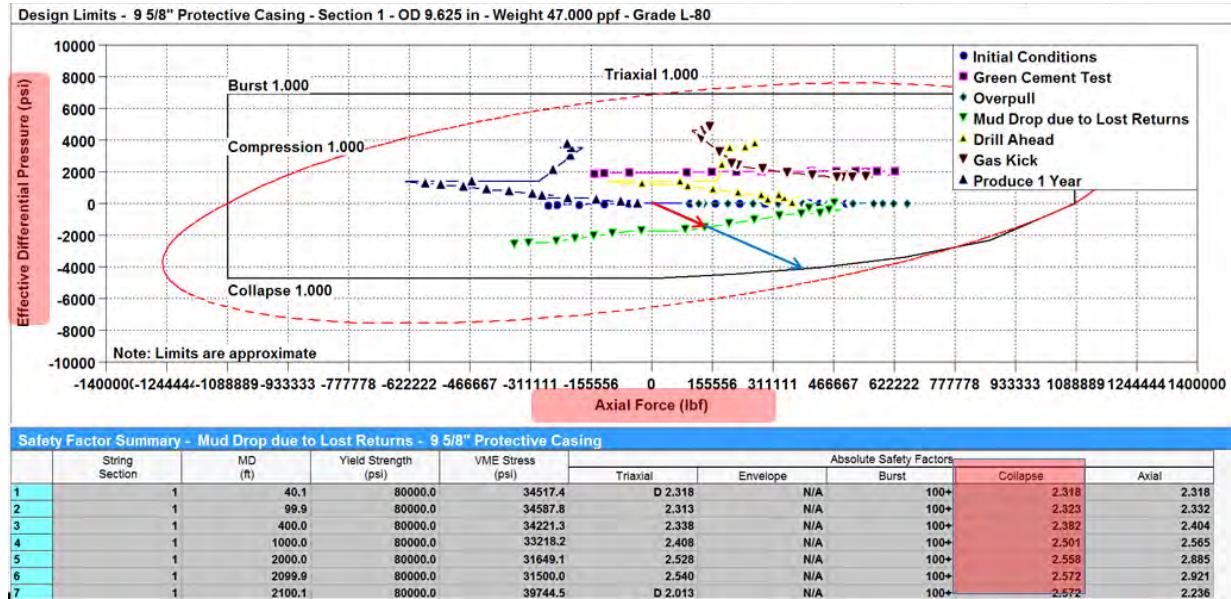


### Design Limit Plot Update

The design limit plot has been updated according to API TR 5C3 addendum 2015 as follows:

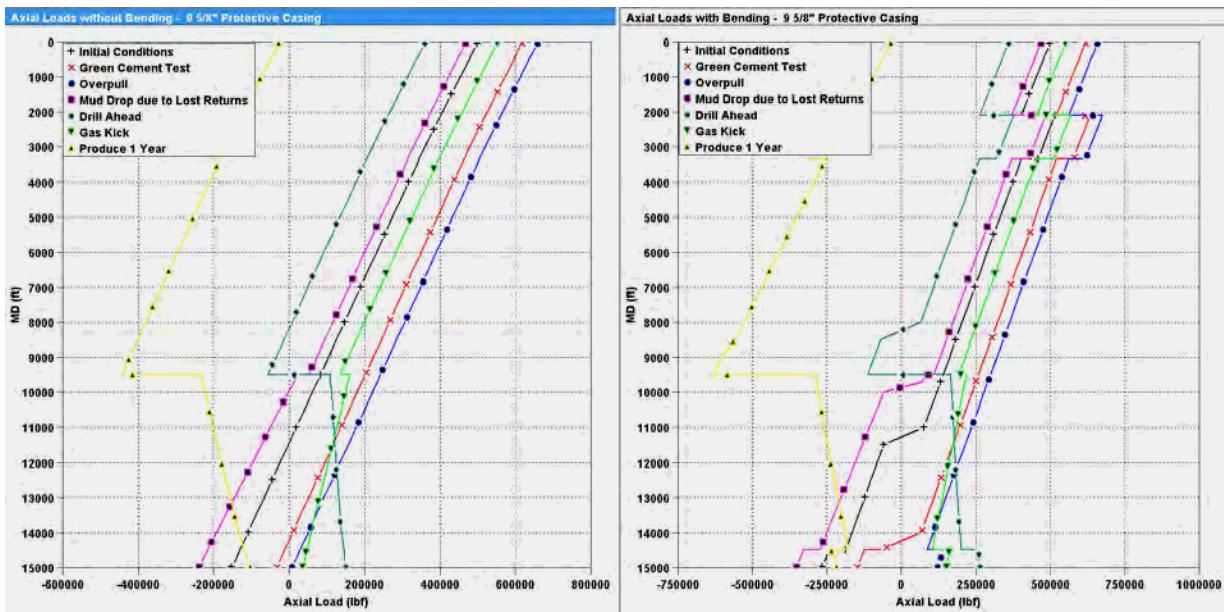
- Re-Label Design Limit Plot axis titles to Differential Pressure (psi) in the Y axis and Equivalent Axial Load (lbf) in the X axis.
- Shifting of load data points to graphically align with triaxial safety factors, new collapse safety factors, and ISO Connection safety factors.
- Uniaxial Design Limit adjustment option to display the Axial Limit Lines with and/or without the effect of counter-load pressure ( $P_i$  for collapse,  $P_o$  for burst).

[Go To "What's In This Release?"](#)



### Multiple Axial Load

Multiple Load results support both Axial Load without bending and Axial Load with Bending plots for Casing, Tube, and Multistring modules.



[← Go To "What's In This Release?"](#)

### Tubing Centralizer

Tube Module now supports tubing centralization, allowing user to analyze the reduction of dogleg severity and bending stress due to buckling. Users can configure tubing string with user-defined or catalog centralizers in selected tubing sections. Input parameters include rigid or bow type and other details such as centralizer OD, weight, relative friction, frequency, and forces if applicable.

### Tubing Load Summary - Early Shutin FW Backup - 4 1/2" Production Tubing

MD (ft)	Axial Force (lbf)	Dogleg (°/100ft)	Torque (ft-lbf)	Friction Force (lbf/ft)	
14000.0	-30925	2.28	0.1	0.0	
14499.9	-37994	2.35	0.1	0.0	
14500.1	-37994	4.36	0.1	0.0	
14799.9	-42333	4.53	0.1	0.0	
14800.1	-42333	5.61	1.1	0.0	
14999.9	-45315	5.76	1.3	0.0	
15000.1	-45315	3.79	1.3	0.0	
15999.9	-60384	4.07	1.7	0.0	
16000.1	28312	3.67	2.6	0.0	

### Centralizer Contents

	Distance from TD (ft)		Centralizer	Rigid ?	Centralizer		Relative Friction Drag	Frequency	
	Start	End			OD (in)	Weight (lbm)		Units	Joints
1	1000.0	10000.0	Catalogs...	Yes	5.750	20.00	0.10	1	1
2									

### Release 5000.14

#### 2015 5C3 Collapse Formula

More rigorous calculation modification for the collapse by combining the effect of axial stress and internal pressure has been determined technically necessary by the API Subcommittee on Tubular Goods. The changes are based upon the API 5C3 Addendum, October 2015 on the API Technical Report 5C3, First Edition, December 2008. The equation numbers and chapter numbers (if shown) are also referring the equations in API TR5C3, 1<sup>st</sup> edition, 2008.

 [Go To "What's In This Release?"](#)

For further details, please refer to the API 5C3 Addendum, issued in October 2015, on API 5C3 First Edition, 2008.

### Collapse pressure under axial stress and internal pressure

The external pressure at collapse under combined axial stress and internal pressure can be calculated by replacing the collapse resistance  $p_c$  by the collapse pressure differential  $p_c - p_i$  and at the same time modifying the yield stress to a combined loading equivalent grade according to Equation (42):

$$f_{ycom} = \{ [1 - 0.75((\sigma_a + p_i) / f_{ymn})^2]^{1/2} - 0.5(\sigma_a + p_i) / f_{ymn} \} f_{ymn} \quad (\text{for } \sigma_a + p_i \geq 0) \quad (42)$$

#### Where

$f_{ycom}$  is the combined loading equivalent grade, the equivalent yield strength in the presence of axial stress and internal pressure;

$f_{ymn}$  is the specified minimum yield strength;

$\sigma_a$  is the component of axial stress not due to bending;

$p_i$  is the internal pressure;

$p_c$  is the collapse resistance.

Collapse resistance equation factors and D/t ranges for the combined loading equivalent grade are then calculated by means of Equations (36), (38), (40), (44) or (49), (45) or (50), (46) or (51), (47) or (52), and (48) or (53). Using equation factors for the combined loading equivalent grade, collapse resistance under axial stress and internal pressure is calculated by means of Equations (35), (37), (39) and (41).

API collapse resistance equations are not valid for the yield strength of combined loading equivalent grade ( $f_{ycom}$ ) less than 24 000 psi.

### Effect of internal pressure on collapse

The external pressure equivalent of external pressure and internal pressure is determined by means of Equation (43) in API 5C3 is not applicable anymore according to the Addendum, Oct. 2015 where the original equation (43) in the first edition 2008 has been deleted in the addendum, Oct. 2015. Instead, the differential pressure of external pressure and internal pressure is used.

[Go To "What's In This Release?"](#)**Reference**

TR 5C3 /ISO 10400:2007, Technical Report on Equations and Calculations on Casing, Tubing, and Line Pipe Used as Casing or Tubing; and Performance Properties Tables for Casing and Tubing, First Edition, December 2008

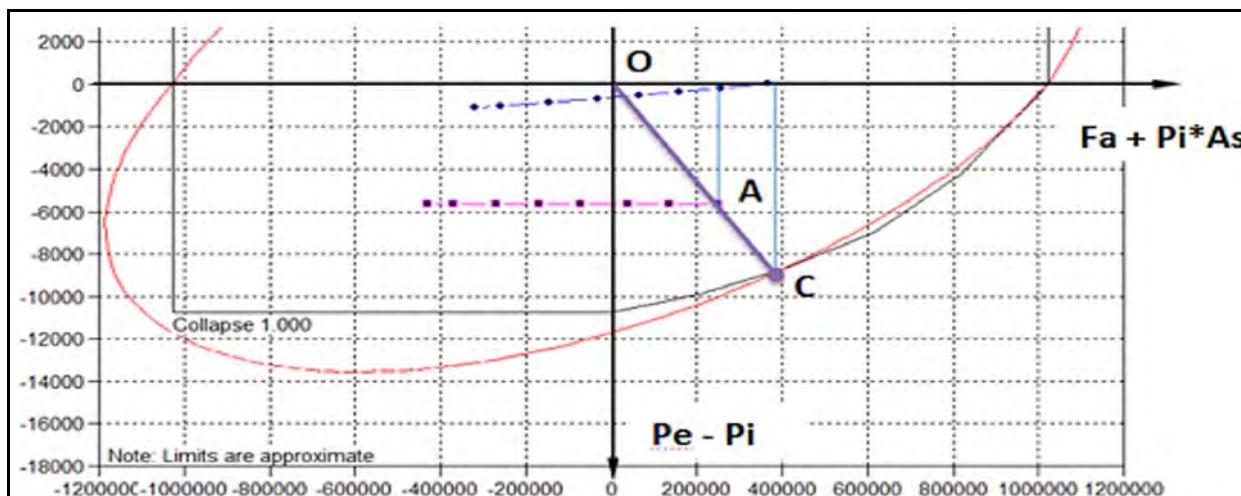
**Addendum, October 2015**

CLINEDINST, W.O., Calculating Collapse Resistance under Axial Stress using Existing API Collapse Formulas and the Strain Energy of Distortion Theory of Yielding, report prepared for the American Petroleum Institute, December 1, 1980

API 5C3 Addendum, issued in October 2015, on API 5C3 First Edition, 2008

***Radial Collapse Safety Factors***

Collapse safety factors in Design Limit Plot, fourth quadrant ( $dP$  vs.  $F_{eff}$ ,  $dP = Pe - Pi$ ,  $F_{eff} = Fa + Pi * As$ , where  $Pi$  is internal pressure,  $Pe$  is external pressure,  $Fa$  is axial force;  $SF = OC/OA = dPc/dP0$  is considered more conservative than  $sf' = dPD/DP0$ , where  $dPD$  is the differential collapse pressure calculated using 2015 API 5C3 equations. Refer to the image below.

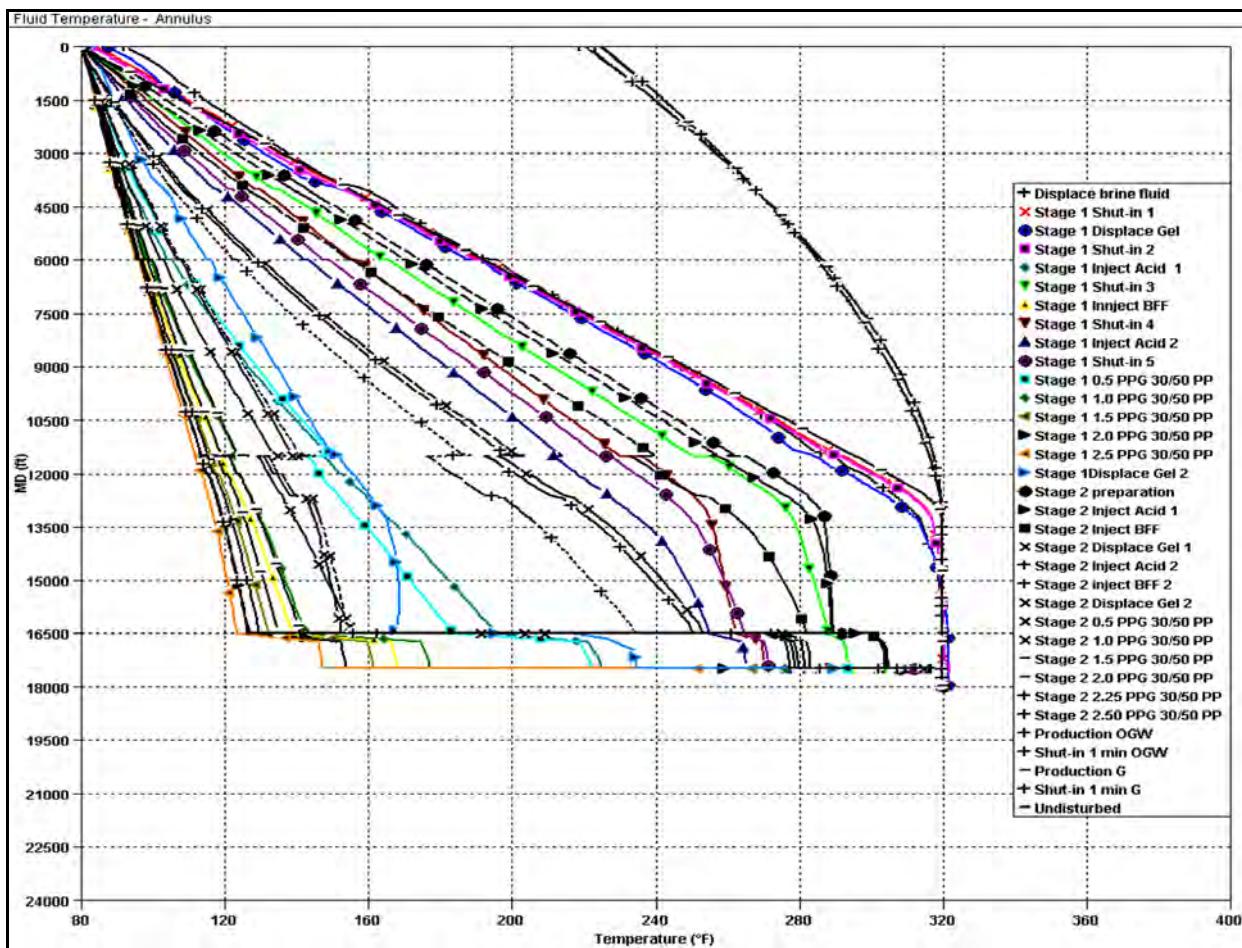


[Go To "What's In This Release?"](#)

### Circulation/Injection above end of tubing

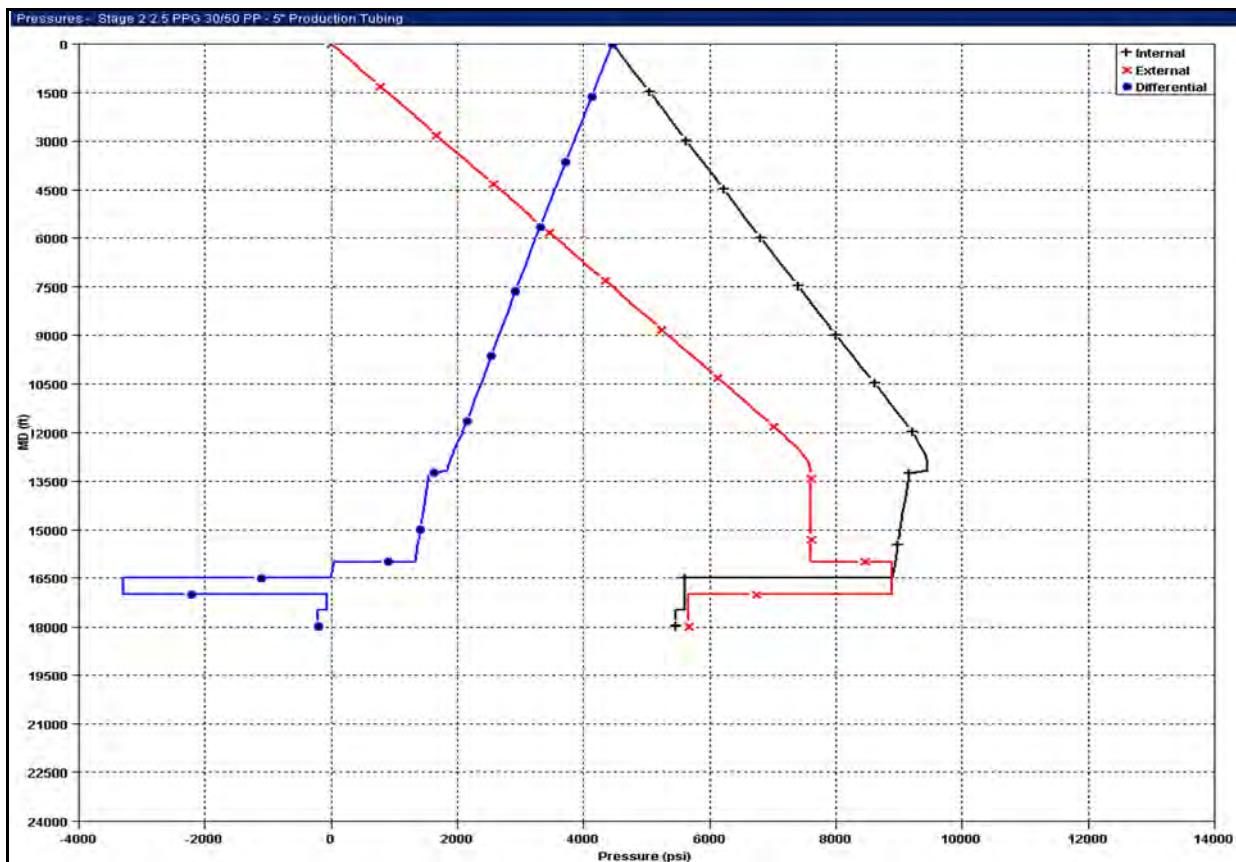
WELLCAT 5000.14 supports circulation and injection events specified above the end of string depth for single completion wellbore configuration only. If the circulation depth is above the end of the string then a plug is assumed in the tubing just below the circulation depth. In tube module, packer depth shall be specified at proper depth for purposes of perform string load analysis.

Prior operation fluid definition above and below circulation/injection depth (above end of string depth) operations is tracked applying assumptions according to prior fluid type and location above and below prior circulation/injection depth of interest (i.e.; steam, Black Oil, Single phase hydrocarbon, non- hydrocarbon gas, VLE, File Defined Hydrocarbon, Foam).



[Go To "What's In This Release?"](#)

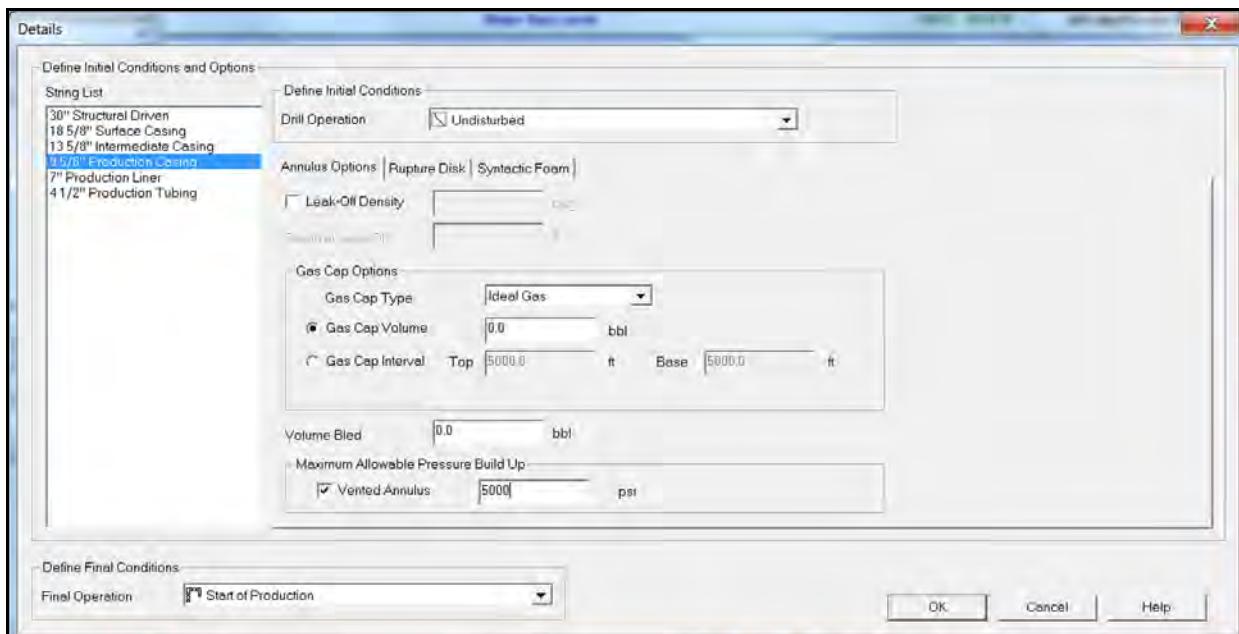
Circulation/injection operations pressure profile at depths above EOT is supported by custom load only. This includes multiple circulation/injection plugs along the internal pressure profile and packers specified along the external pressure profile.



[Go To "What's In This Release?"](#)

### Multistring Vented Annulus Pressure pop off valve

Users can now limit maximum allowable annuli pressure by specifying annulus venting condition to atmosphere to certain pressure (pop off valve).

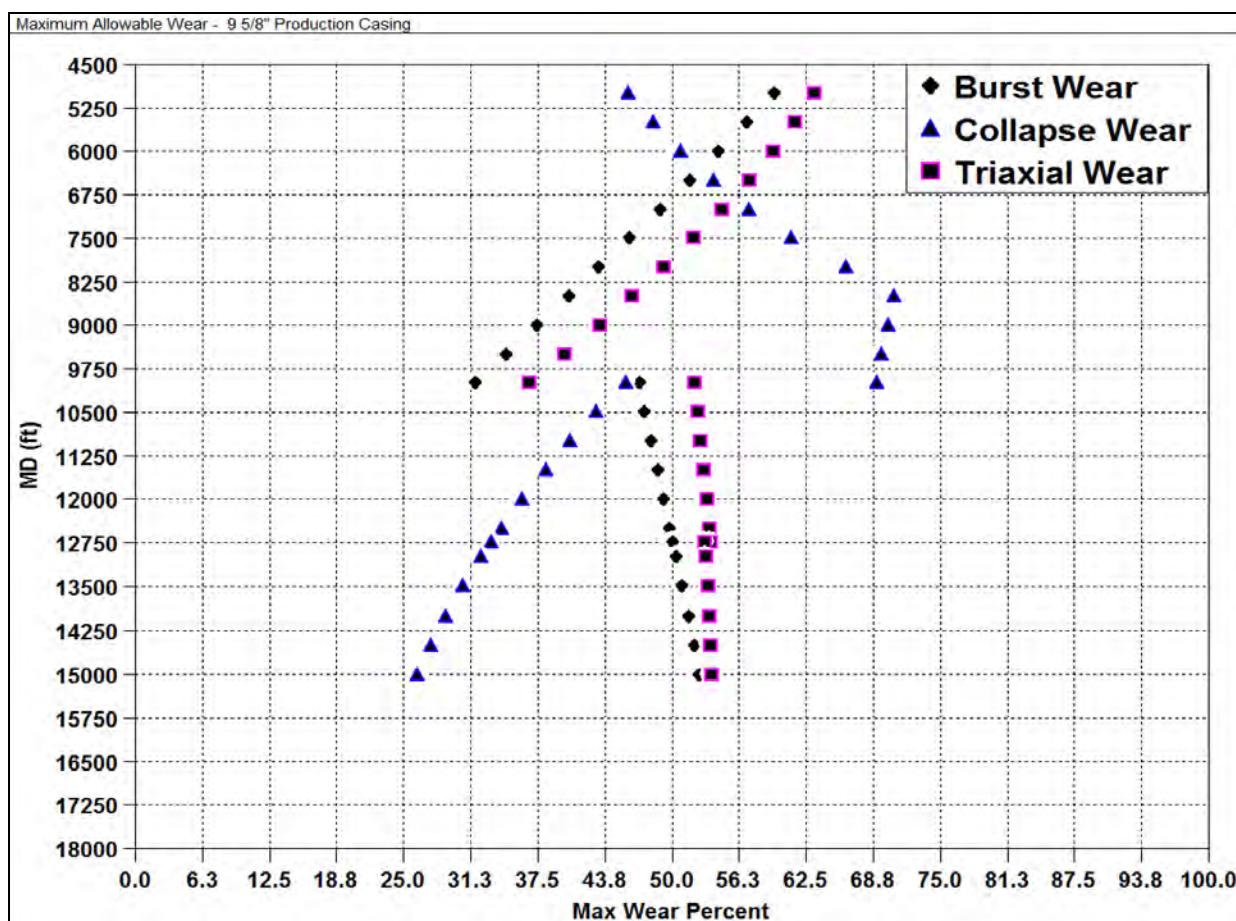


[Go To "What's In This Release?"](#)

### Maximum Allowable Wear based on Triaxial Safety Factor

In addition to Burst and Collapse maximum allowable wear allowance, WELLCAT 5000.14 calculates maximum allowable casing\tubing wear based on triaxial safety factor. The maximum allowable wear is determined by maintaining the triaxial safety factor equal to the appropriate design factor as a function of depth.

Allowable wear is presented as a percentage of nominal wall thickness and the maximum wall loss the pipe can tolerate using the load conditions. Maximum allowable wear based on triaxial safety factors results are reported along burst and collapse, and it is primarily intended to casing design analysis using triaxial safety factors instead of the traditional burst safety factors.



### CasingWear™ Link

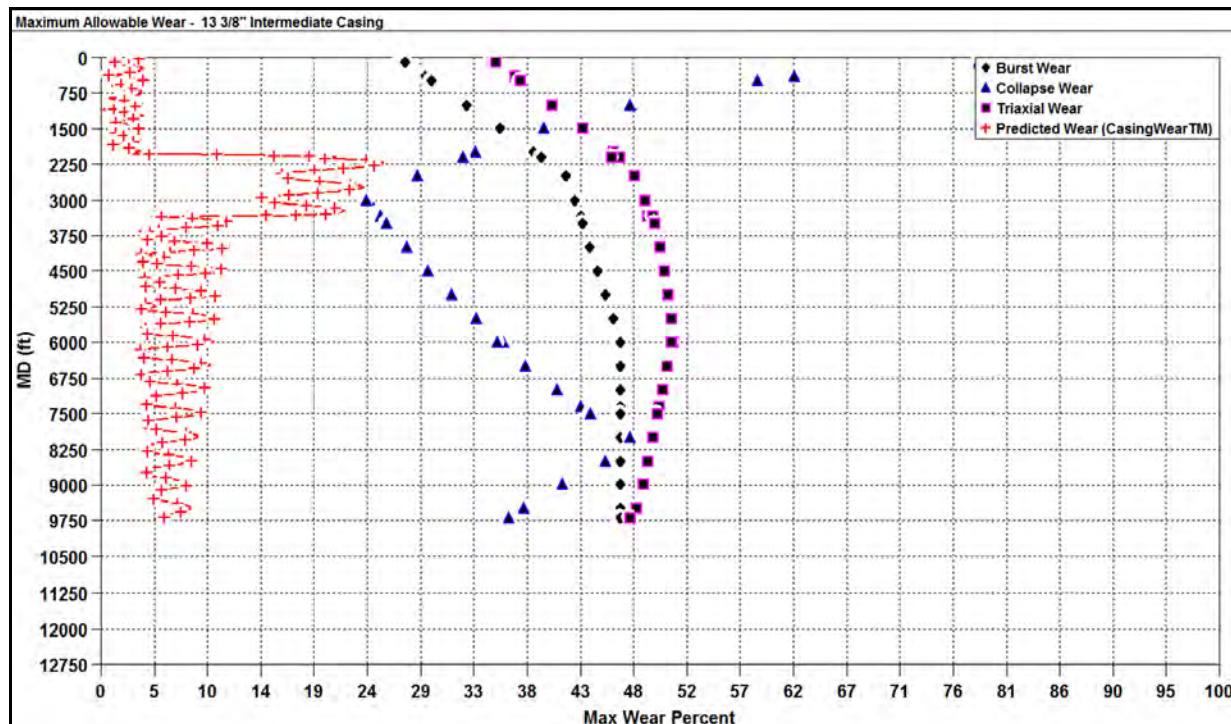
Provided there is access to the new Landmark CasingWear™ software; users can initiate casing/liner wear analysis from existing WELLCAT™ designs.

CasingWear™ define chronological wear analysis (linking wellbores, sidetracks) applying soft and stiff string torque and drag models to a specified sequence of

[Go To "What's In This Release?"](#)

drilling operation simulations (drilling, rotate off bottom, Back-reaming, slide drilling or reciprocation), applying diverse wear factor definition options (along, casing, string tool joint, pipe protectors, hard-banding) and several other sensitivity analysis options (WOB, RPM, Dogleg severity, wear factor).

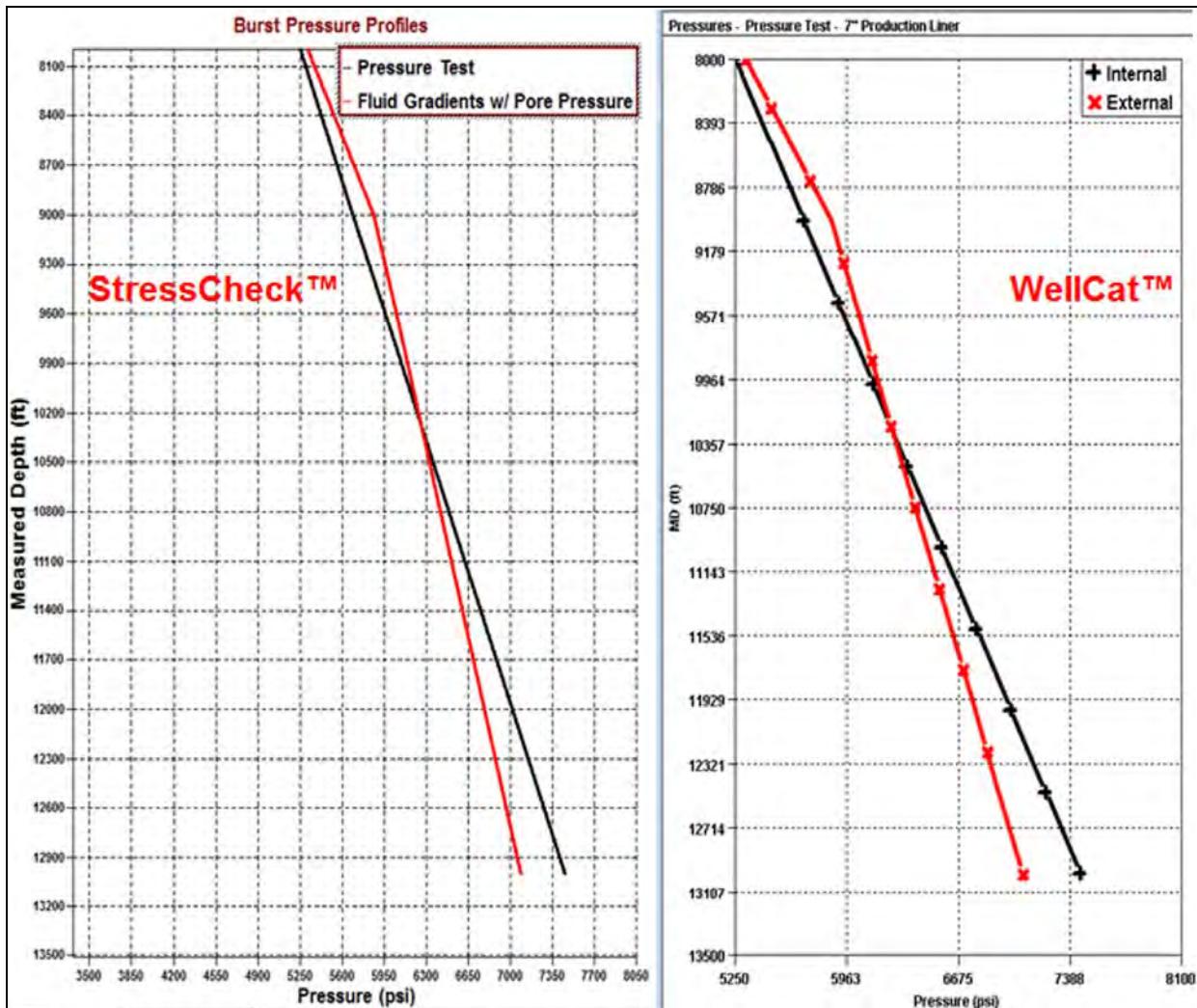
User can quickly import CasingWear™ predicted wear results into WELLCAT™ evaluate remaining casing integrity while comparing predicted wear vs maximum allowable wear, save results in database for future well re-entry evaluation opportunities (sidetrack, multilateral, and save well cost).



[Go To "What's In This Release?"](#)

### Fluids Gradient w/Pore Pressure

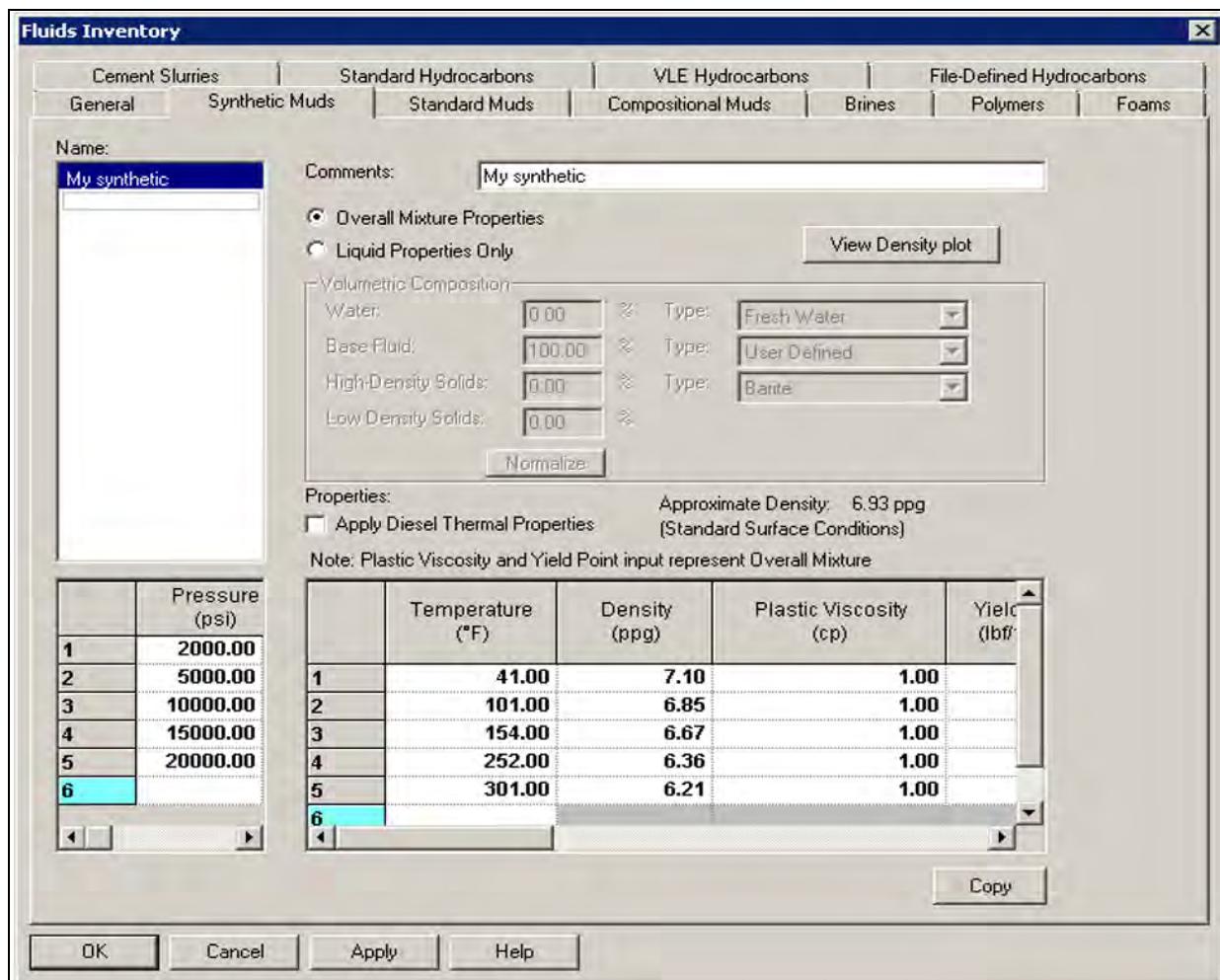
WELLCAT™ Casing module, Fluid Gradients (w/Pore Pressure) external profile includes a check box option which if applied will define the pressure at TOC/TOL based on the Mud weight Above TOC specified in the input dialog, allowing the generated external pressure profile to be like StressCheck™ Fluid Gradients w/ Pore Pressure profile.



[Go To "What's In This Release?"](#)

### Copy Synthetic Fluid

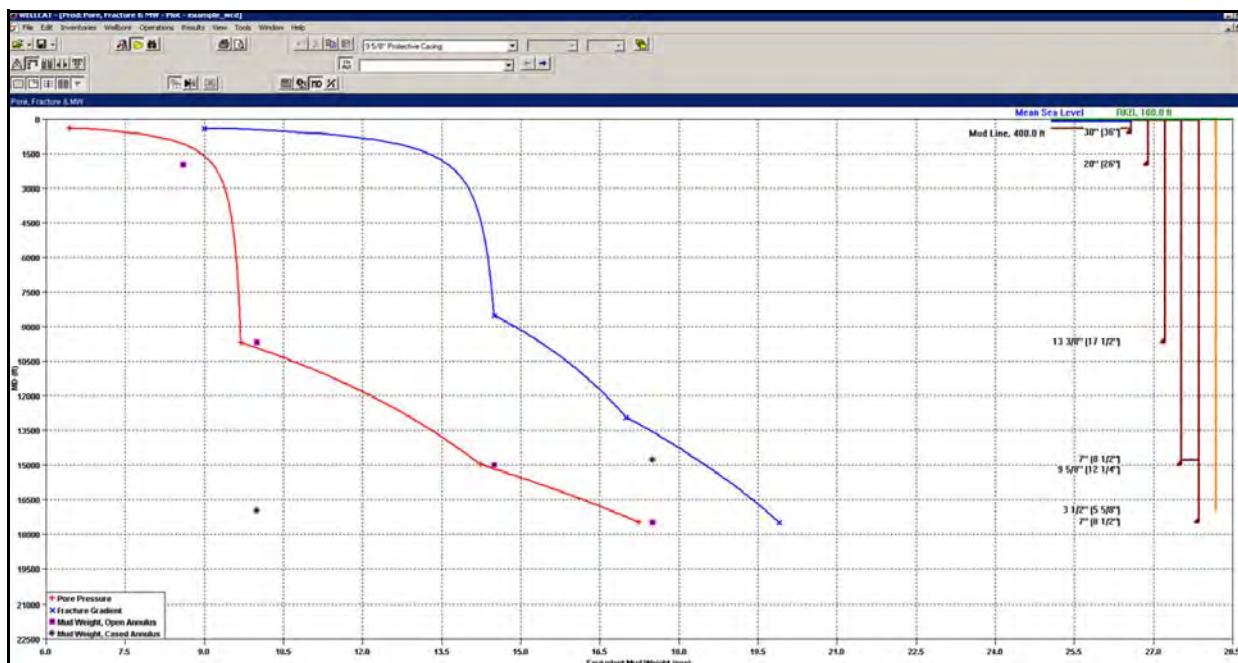
WELLCAT 5000.14 allows copy synthetic fluid description and save time re-entering detailed fluid properties while performing extensive sensitivity analysis.



[Go To "What's In This Release?"](#)

### Pore, Fracture & MW Plot

The new Pore, Fracture & MW plot displays pore pressure and fracture pressure both characterized as EMW and the mud weight at the casing shoe (Mud at Shoe) for each string in the Casing and Tubing Configuration spreadsheet as a function of either MD or TVD. This plot is based on user-entered data specified in the Pore Pressure, Fracture Gradient, and Casing and Tubing Configuration spreadsheets, which are available from the Wellbore menu.



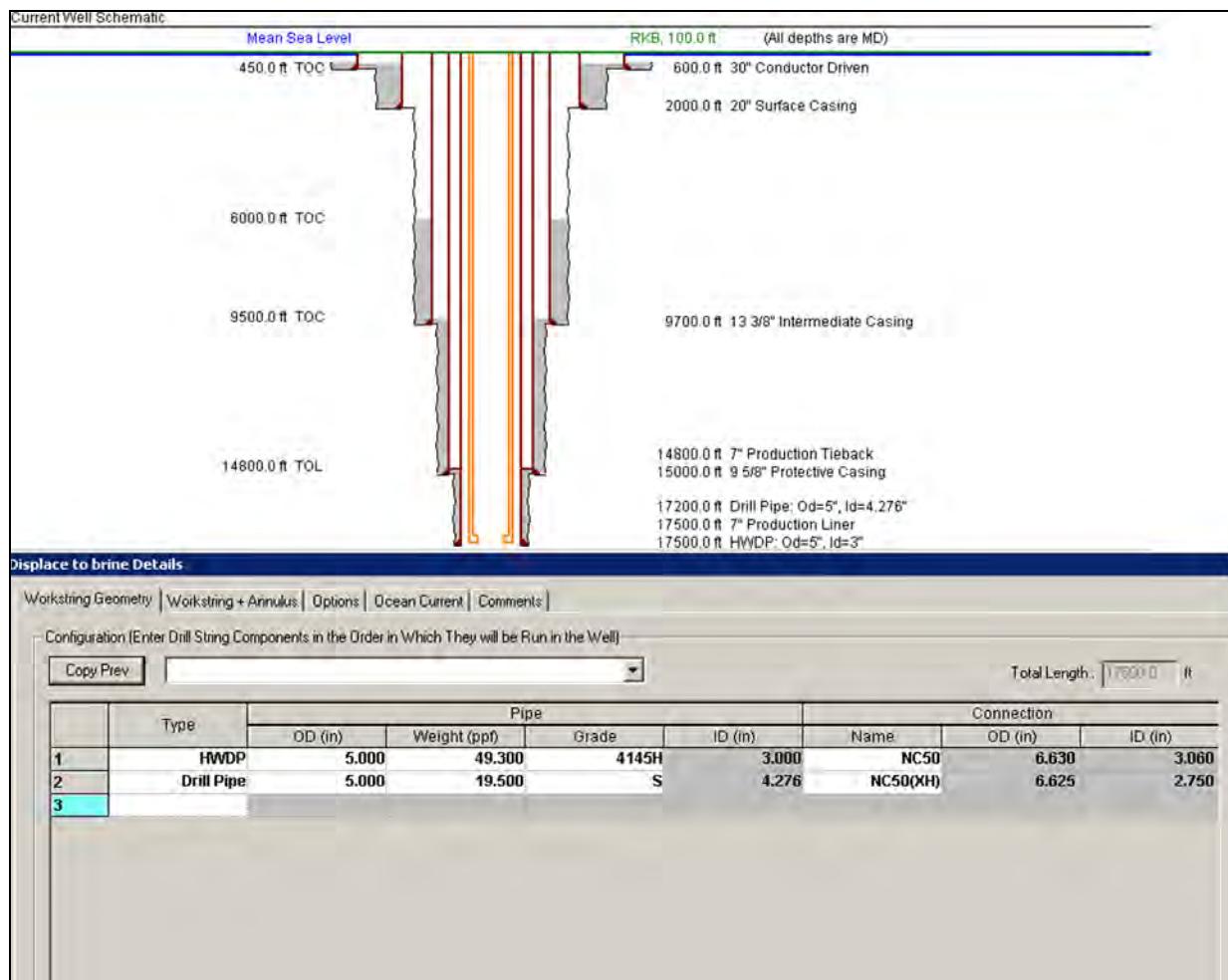
### Iso Service Load Test Data

The maximum number of rating loads has increased to 200.

[← Go To "What's In This Release?"](#)

### Production Operation Workstring Configuration

In addition to the use of tubing inventories, workstring can now be configured based on drill pipe, heavy weight drill pipe and collars inventory geometries improving the accuracy of workstring definition.



Go To "What's In This Release?"

### Drill String Inventory

The drill string inventory has been updated according to API RP7 guidelines.

	Type	OD (in)	Weight (lb/in³)	Diameter Name	ID (in)
87	Drill Pipe	6.625	25.200	S	5.969
88	Drill Pipe	6.625	25.200	K	5.965
89	Drill Pipe	6.625	27.700	E	5.961
90	Drill Pipe	6.625	27.700	G	5.961
91	Drill Pipe	6.625	27.700	S	5.961
92	Drill Pipe	6.625	27.700	X	5.961
93	HWDP	3.500	23.200	1340	2.250
94	HWDP	3.500	23.200	1115H	2.250
95	HWDP	3.500	23.200	E	2.250
96	HWDP	3.500	25.200	1340	2.250
97	HWDP	3.500	25.200	1115H	2.250
98	HWDP	3.500	25.200	E	2.250
99	HWDP	3.500	25.300	1340	2.263
100	HWDP	3.500	25.300	1115H	2.263
101	HWDP	3.500	25.300	E	2.263
102	HWDP	4.000	27.200	1340	2.563
103	HWDP	4.000	27.200	1115H	2.563
104	HWDP	4.000	27.200	E	2.563
105	HWDP	4.000	29.700	1340	2.563
106	HWDP	4.000	29.700	1115H	2.563
107	HWDP	4.000	29.700	E	2.563
108	HWDP	4.500	41.900	1340	2.750
109	HWDP	4.500	41.900	1115H	2.750
110	HWDP	4.500	41.900	E	2.750
111	HWDP	5.000	49.300	1340	3.000
112	HWDP	5.000	49.300	1115H	3.000
113	HWDP	5.000	49.300	E	3.000
114	HWDP	5.000	49.700	1340	3.000
115	HWDP	5.000	49.700	1115H	3.000
116	HWDP	5.000	49.700	E	3.000
117	HWDP	5.000	57.000	1340	3.375
118	HWDP	5.000	57.000	1115H	3.375
119	HWDP	5.000	57.000	E	3.375
120	HWDP	6.625	70.800	1340	4.569
121	HWDP	6.625	70.800	1115H	4.569
122	Collar	6.625	70.800	E	4.569
123	Collar	2.075	16.077	1115H small	1.500
124	Collar	2.075	16.077	15-15L C small	1.500
125	Collar	2.075	17.914	15-15L C small	1.250
126	Collar	2.075	17.914	1115H small	1.250
127	Collar	2.075	18.418	1115H small	1.000
128	Collar	2.075	18.418	15-15L C small	1.000
129	Collar	3.000	38.040	1115H small	1.500
130	Collar	3.000	38.040	15-15L C small	1.500
131	Collar	3.000	39.477	1115H small	1.250
132	Collar	3.000	39.477	15-15L C small	1.250

### Drill String Grade Inventory

Additional grades have been defined for Heavy weight and Collars records.

ID	Type	Grade	Yield (psi)	UTS (psi)	Young's Modulus (GPa)	Poisson's Ratio	Thermal Expansion Coefficient (E (in/in))	Anisotropy (%)		Temperature Variation	Heat Conduction Coefficients	Cost Factor
								Radial	Long			
1	Collar	15-15L C large	100000.0	110000.0	3000000.0	0.300	6.00	100.00	100.00	Steel (default)	CS_APISCT	1.00
2	Collar	15-15L C small	110000.0	120000.0	3000000.0	0.300	6.00	100.00	100.00	Steel (default)	CS_APISCT	1.00
3	Collar	1115H large	110000.0	120000.0	3000000.0	0.300	6.00	100.00	100.00	Steel (default)	CS_APISCT	1.00
4	Collar	1115H small	110000.0	140000.0	3000000.0	0.300	6.00	100.00	100.00	Steel (default)	CS_APISCT	1.00
5	HWDP	1115H	110000.0	110000.0	3000000.0	0.300	6.00	100.00	100.00	Steel (default)	CS_APISCT	1.00
6	HWDP	1340	55000.0	50000.0	5000000.0	0.300	6.00	100.00	100.00	Steel (default)	CS_APISCT	1.00
7	Drill Pipe	G	105000.0	115000.0	3000000.0	0.300	6.00	100.00	100.00	Steel (default)	CS_APISCT	1.00
8	Drill Pipe	E	75000.0	105000.0	3000000.0	0.300	6.00	100.00	100.00	Steel (default)	CS_APISCT	1.00
9	Drill Pipe	S	120000.0	145000.0	3000000.0	0.300	6.00	100.00	100.00	Steel (default)	CS_APISCT	1.00
10	Drill Pipe	X	95000.0	125000.0	3000000.0	0.300	6.00	100.00	100.00	Steel (default)	CS_APISCT	1.00
11	Drill Pipe	I	75000.0	100000.0	3000000.0	0.300	6.00	100.00	100.00	Steel (default)	CS_APISCT	1.00
12												

[← Go To "What's In This Release?"](#)

### Proprietary Connection Inventory

Drill Pipe, HWDP and Collar drill string components can be fully specified in reference to OD, Weight and Grade as well as Connection OD, ID, Grade and ratings when applicable.

Proprietary Connections Inventory											Cost Per Joint (\$)	
Type	Name	Pipe			Grade	Connection			Internal Pressure (psi)	Tension Rating (lb)	Compression Rating	
		OD (in)	Weight (psi)	Grade		OD (in)	ID (in)	Grade				
1	Collar	8 1/2	8 1/2	160,352	15-15LCLarge	8.500	3.500	15-15LCLarge				122.64
2	HWDP	5PCI	5,000	49,300		1340	6.630	3,060		1340		72.19
3	Drill Pipe	5pci	5,000	19,500		S	7.000	3,500		S		72.19
4												

### WELLCAT Compiler Upgrade

Starting from WELLCAT 5000.14, Landmark has upgraded to the latest Intel® Visual Fortran Compiler to build the calculation engines. In the past releases, we have been using Compaq Visual Fortran (CVF) as the compiler for the calculation engines. CVF is an aged product and Hewlett-Packard dropped support several years ago. Additionally, CVF could only be installed on Windows XP as the officially supported platform. In 2014, Microsoft ended support for Windows XP. Landmark has already officially phased out all the Windows XP machines. All these make it necessary for Landmark to change the Fortran Compiler. Intel®Visual Fortran is the successor to Compaq Visual Fortran from the same development team and the industry leader for building high performance applications. It does not have the XP limitation. It can be installed on machines with any recent Windows Operating Systems. It is the natural choice as the new Fortran compiler for the WELLCAT product.

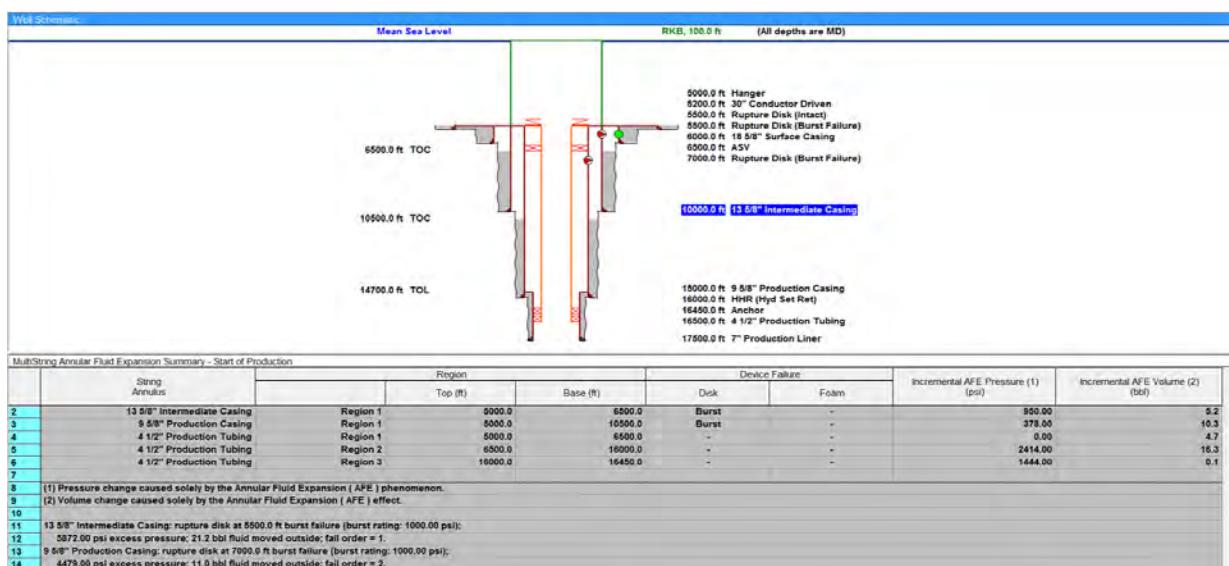
All the WELLCAT calculation engine source files have been successfully migrated to the Intel® Visual Fortran. Test scripts have been developed to compare calculations results to identify and resolve any issues.

[Go To "What's In This Release?"](#)

## Release 5000.1.13.1

### Rupture Disk

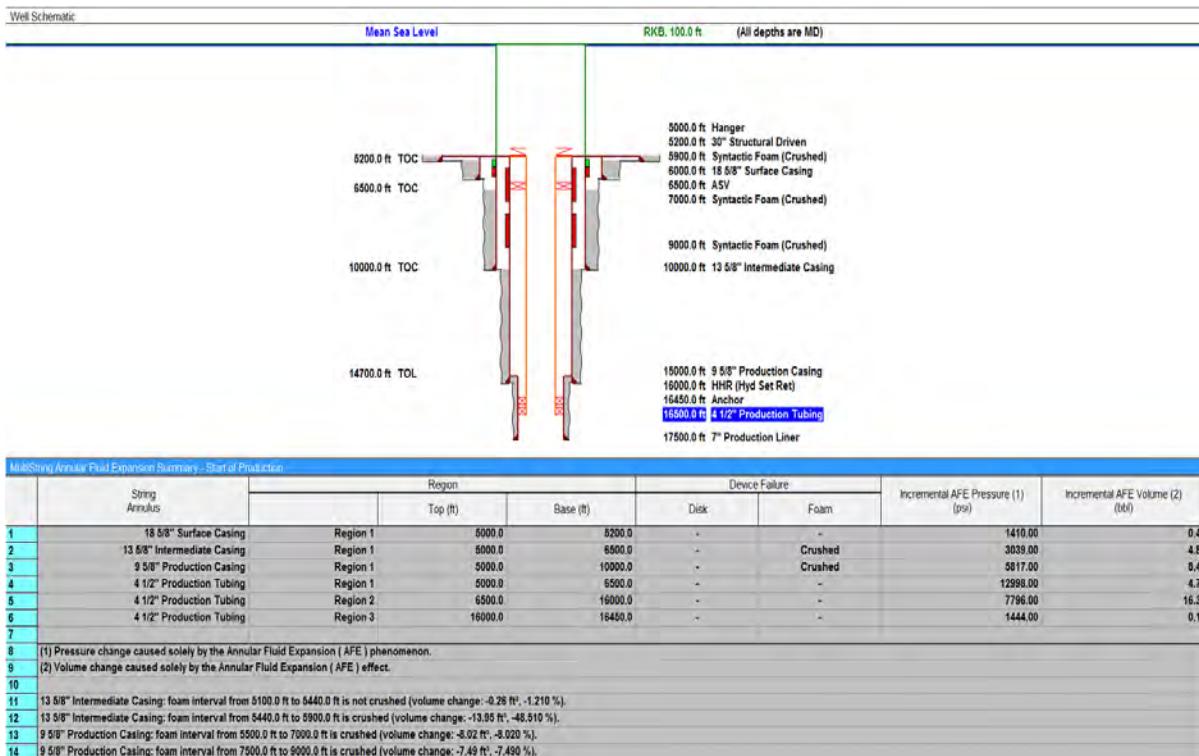
Casing rupture disk is a well-known AFE mitigation technique. It is used by operators as part of the well casing integrity design. It enables the failure of a casing system in a preferential way such that the disk collapses inwards (or bursts outwards) to avoid collapsing (or bursting) the casing system, ensuring well integrity.



### Syntactic, Crushable Foam

The syntactic foam contains small, hollow glass spheres filled with air (or nitrogen) at atmospheric pressure. In an annular fluid expansion scenario the incremental pressure added to the initial annulus hydrostatic fluid pressure column can exceed the foam crushing pressure. In such scenario, the hollow spheres collapse to help prevent further pressure increase due to annular fluid expansion. Syntactic foam is designed to crush at a specified pressure and temperature creating additional volume for fluid expansion.

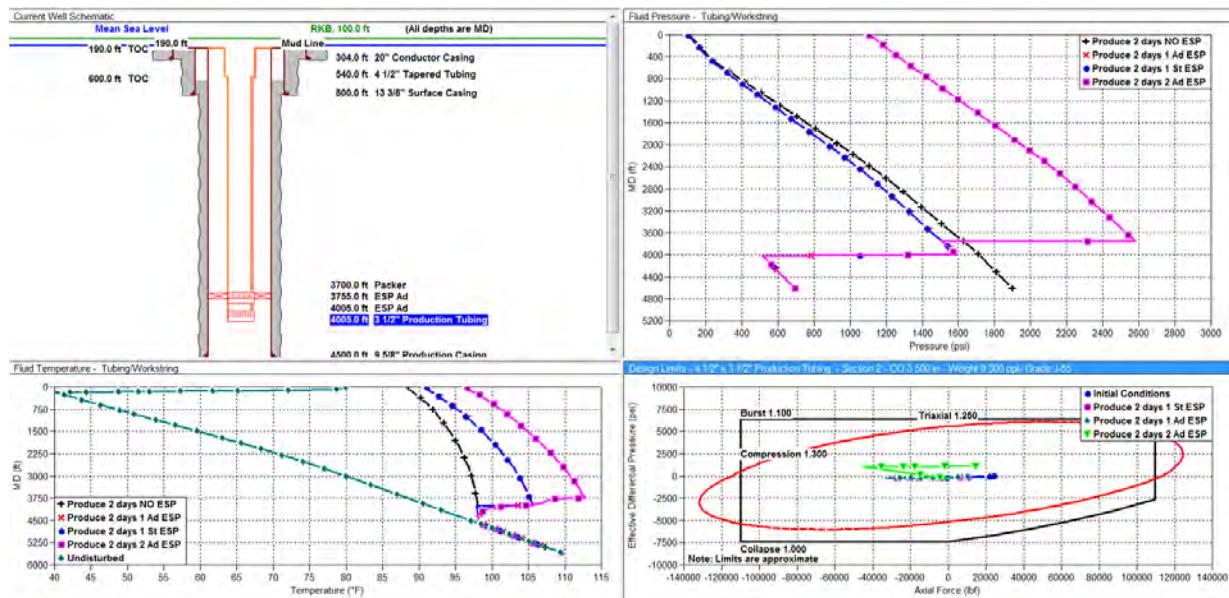
[Go To "What's In This Release?"](#)



### Electric Submersible Pump (ESP)

Extreme to ultra-deep HPHT reservoirs present the challenges of having low natural flow ability, the use of sub-mudline system such as electric submersible pumps (ESP) would help to increase production rates and also increase well recovery volumes. WELLCAT software includes Production Thermal flow simulation with ESP. Production thermal flow simulation with ESP can be specified based on basic or advance ESP definition. The thermal flow simulation results of wellbore temperature and pressure can be applied to tubing stress analysis as well as multistring trap annular pressure and wellhead movement analysis.

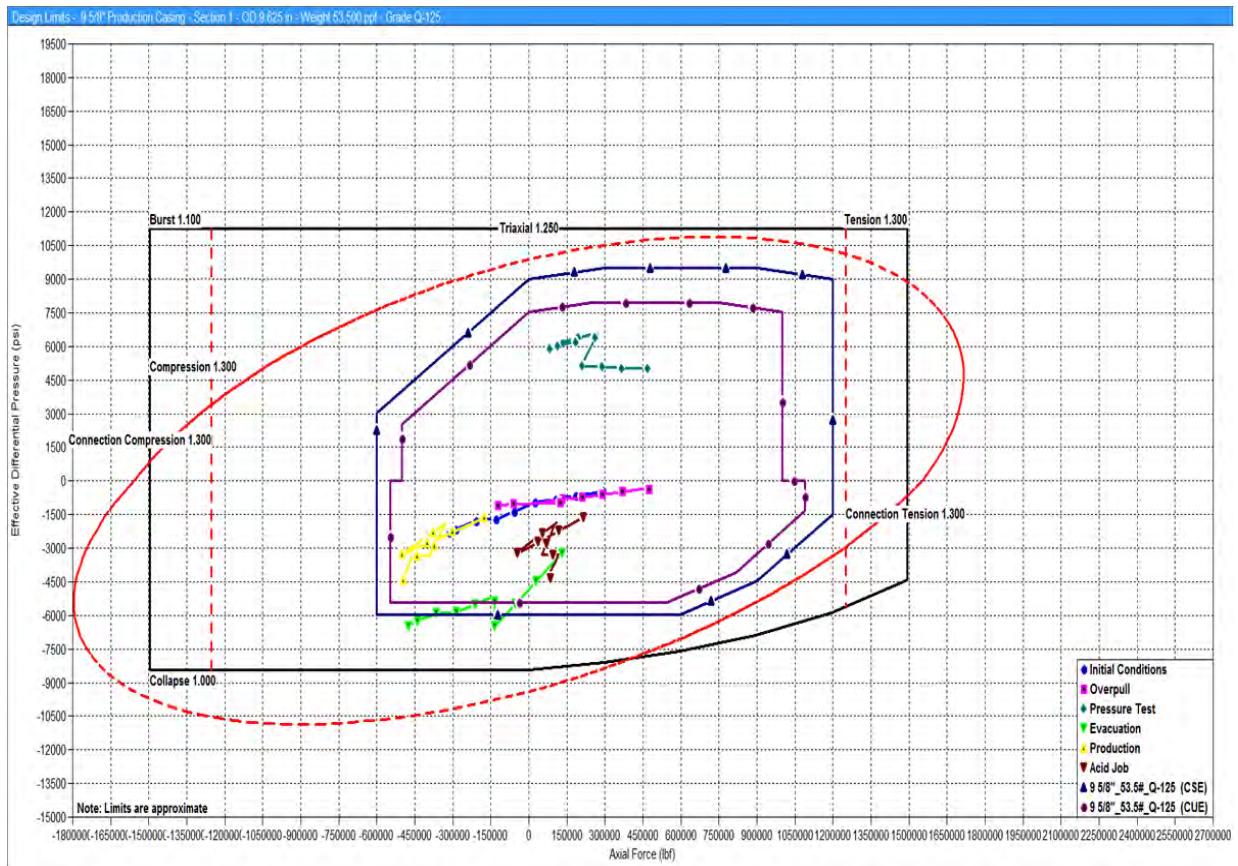
[Go To "What's In This Release?"](#)



### ISO Connection Envelope Design Factors

Burst and Collapse design factors can now be applied to connection strength envelope (CSE) rating data points to generate connection user envelope (CUE) in design limit plot.

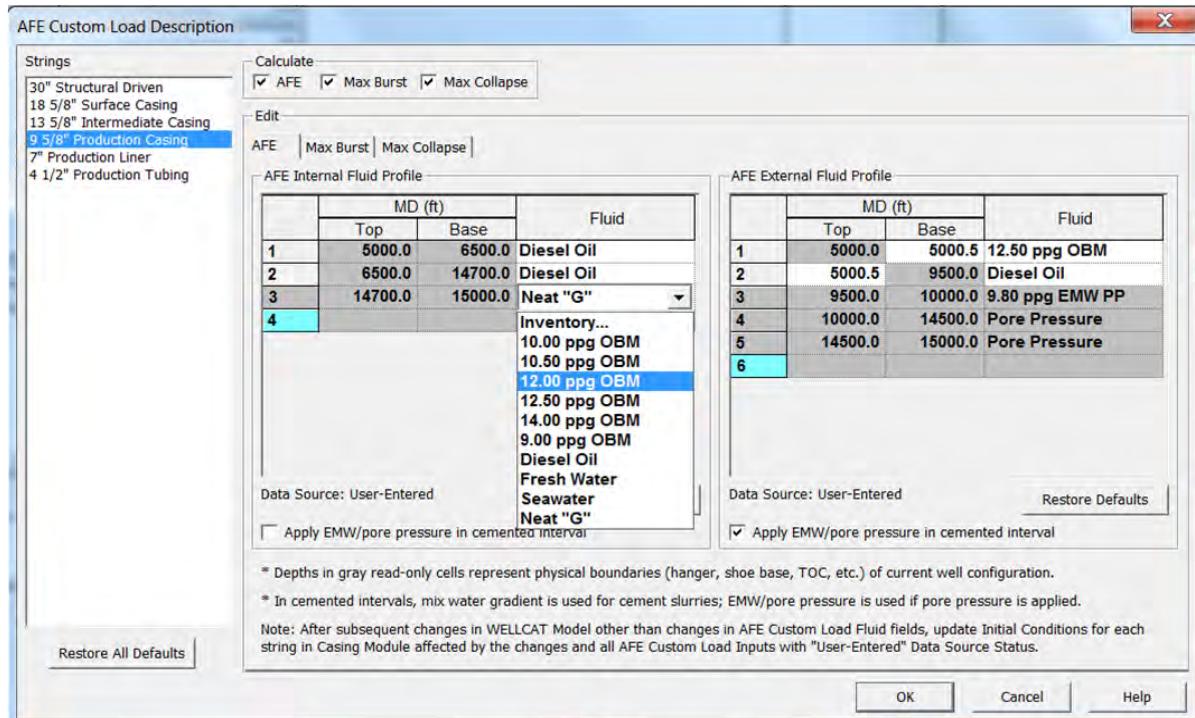
[Go To "What's In This Release?"](#)



### Flexibility of AFE Custom Loads Analysis

WELLCAT allows in multistring module custom load analysis, row insertion within existing top/base fluid/cement intervals and allow editing default fluid and mix water gradient in un-cemented and cemented intervals to apply instead other fluid gradients. EMW/pore pressure can be applied in cemented intervals.

[Go To "What's In This Release?"](#)



### Minimum Safety Factor Table per String Section per load

A new summary table of minimum safety factors per string section per load in WELLCAT Casing, Tubing and Multistring modules.

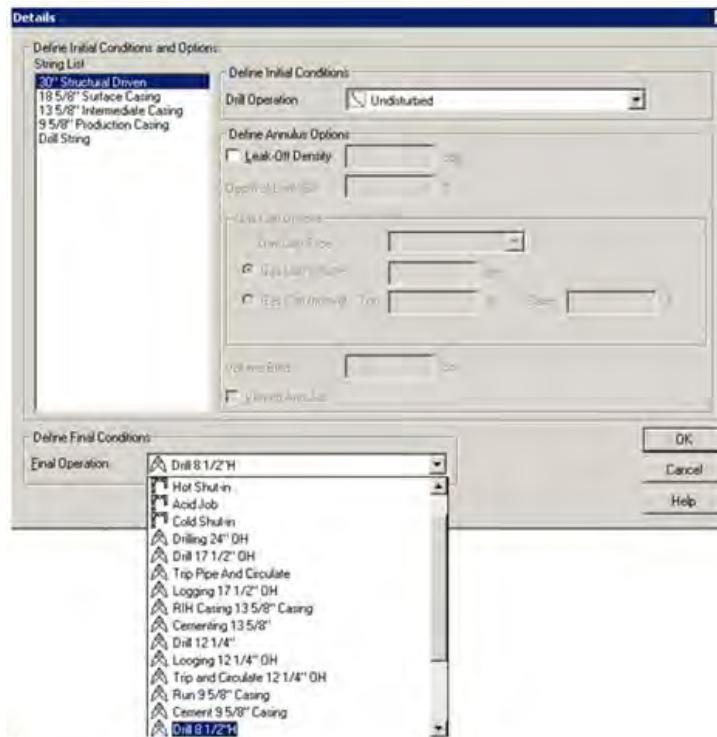
Line Minimum Safety Factors - 7" x 4" Production Tubing							
String Section	MD Interval (ft)	Pipe OD/Weight/Grade	Connection Name/OD/Grade	Minimum Absolute Safety Factor			
				Triaxial	Envelope	Burst	Collapse
1	0.1-8299.9	7", 29,000 pcf, N-80	<N/A>	2,422	N/A	2,343	100+
2	9000.1-12799.9	4", 9,500 pcf, N-80	<N/A>	DN 1.116"	N/A	3,233	8,751
3							M 1.240"
4	* Safety factor < Design factor						
5	Burst and Axial Flags						
6	Default = Pipe Body, L = Connection Leak, B = Connection Burst, F = Connection Fracture, J = Connection Jump-out, Y = Connection Yield, C = Connection						
7	Axial Flags						
8	Default = Tension, M = Compression						
9	Triaxial Flags						
10	Default = Inner Wall and Positive Bending OR No Bending, D = Outer wall safety factor, N = Negative Bending						
11	Envelope Flags						
12	EB = Envelope Burst, EC = Envelope Collapse, N/A = no ISO Connection						

[Go To "What's In This Release?"](#)

## Release 5000.1.13

### *Drilling AFE (Annular Fluid Expansion)*

The annular fluid expansion analysis in the MultiString module has been modified to support temperature and pressure of drilling operations as final conditions. All drill operation types are supported.



### *Support WCST Collapse Loads*

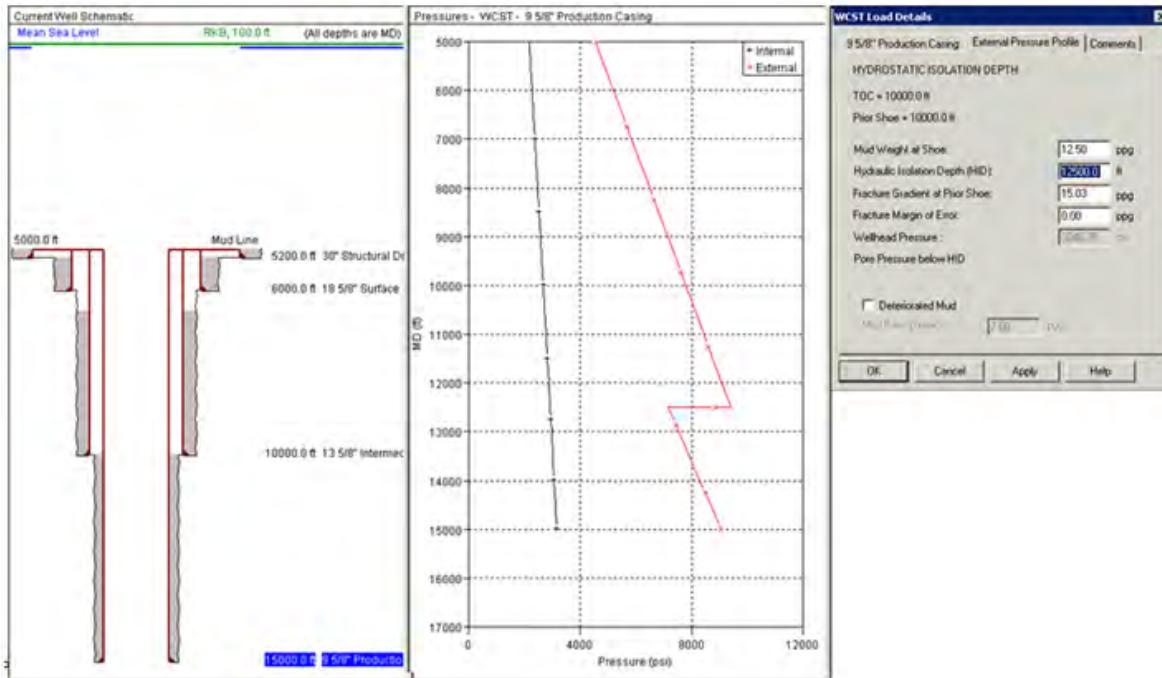
Version 5000.1.13 provides a new casing load case, *WCST Collapse*, which supports scenarios used in the BSEE WCST (Well Containment Screening Tool), L1L2 Rev. 1.18 instructions document. A new external pressure profile, *Hydrostatic Isolation Depth*, supports this new load. The new collapse load must be checked to obtain a permit to drill in Gulf of Mexico deepwater scenarios.

The new load consists of the following:

- **Internal Pressure:** Seawater gradient from sea level to the mudline plus minimum hydrocarbon gradient based on the standard fluid gradient criteria given in the WCST instructions.

[Go To "What's In This Release?"](#)

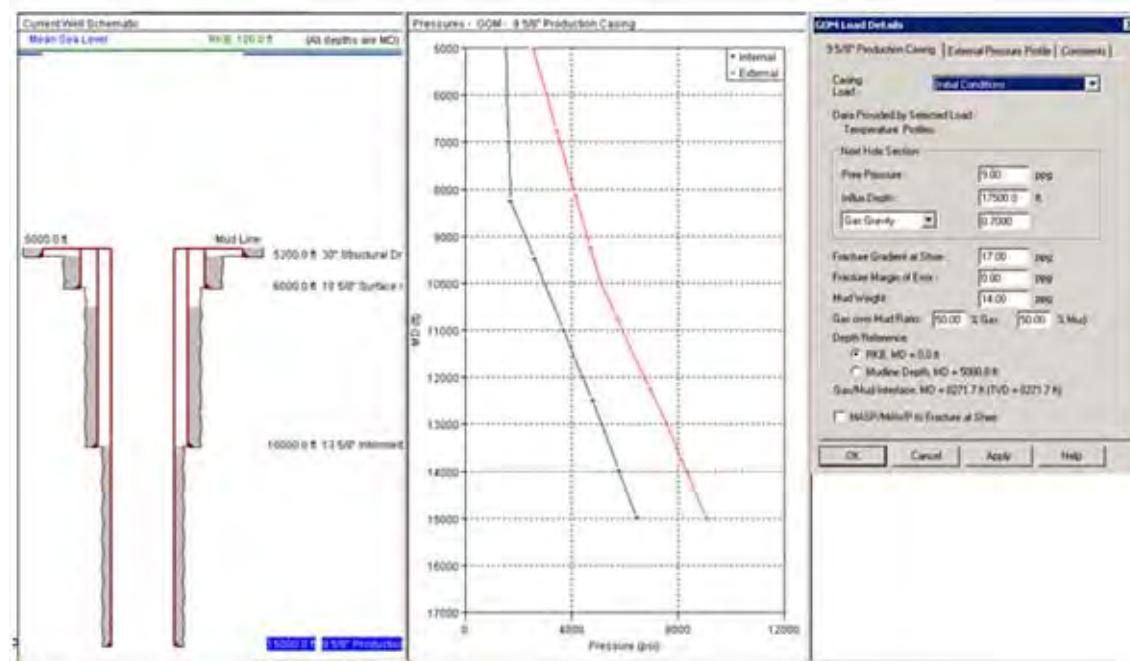
- **External Pressure:** Fracture gradient at previous casing shoe plus setting mud weight to hydraulic isolation depth (HID). Local pore pressure below depth of HID is effectively the assumed top of good cement where hydraulic isolation is achieved in the annulus.



### Gas Over Mud (MASP/MAWP) Internal Pressure Profile

The Gas Over Mud load case illustrates the ratio of well control gas to drilling mud. This is an internal pressure profile that is enabled for all casing strings associated to a next open hole section.

[Go To "What's In This Release?"](#)

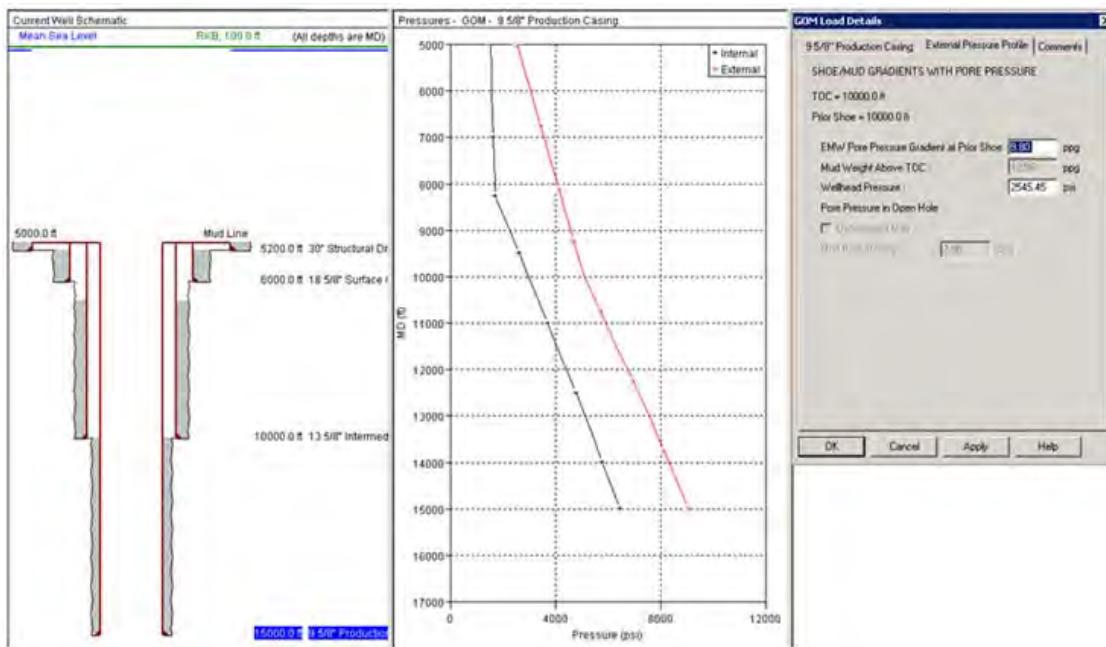


### Shoe/Mud Gradients with Pore Pressure External Pressure Profile

The Shoe/Mud Gradients with Pore Pressure external pressure profile combines a mud weight pressure column if top of cement is at shallower than prior shoe setting depth, a pressure discontinuity with an equivalent mud weight pore pressure gradient at the prior shoe setting depth, and pore pressure in the open hole. This profile supports two scenarios:

- Top of cement (TOC) below prior shoe depth
- TOC above prior shoe depth

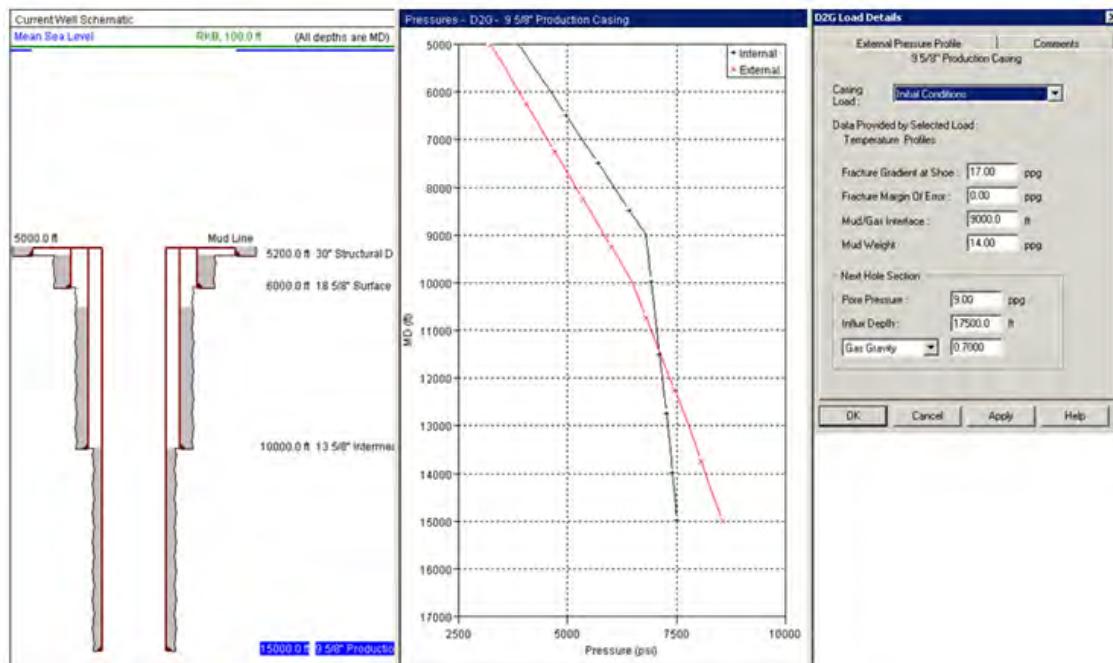
[Go To "What's In This Release?"](#)



### *Displacement to Gas Mud/Gas Interface - EOS*

The Displacement to Gas load case now includes the mud/gas depth interface and models gas gravity by applying a modified Redlich-Kwong (RK) cubic equation of state (EOS).

[Go To "What's In This Release?"](#)



### Version Compatibility

WELLCAT supports the use of .WCD files for migrating well design data between software versions. WELLCAT version 5000.1.13 includes some important changes in the engine input and output data and includes some new load cases that were not part of previous releases. These changes mean that .WCD files created by previous versions of WELLCAT will be fully supported for import to version 5000.1.13, but those .WCD files created by version 5000.1.13 will not be supported for older WELLCAT versions. To open a new .WCD file in an older version of WELLCAT, remove any new loads before saving your .WCD file.

### Vallourec 2014 Connections Catalog

Catalogs used to populate the WELLCAT Casing and Tubing Spreadsheet and the Connection Spreadsheet now include the Vallourec Casing and Tubing catalogs and the new Vallourec Connections catalogs (2014 updates).

Name	Manufacturer	Model	Nominal Diameter	Nominal Weight	Grade	OD (in)	ID (in)	Grade	Coupling Length	Total Weight (Coupling + Joint Count)	Type	Seal Type	Tension Zone Strength	Compression Zone Strength	Internal Yield Pressure	External Yield Pressure	Maximum Torque (lb-in)	Cost (\$)	Material Number	Lockout
1. VAM 21			5"	P-110	67.250	4.254	P-110	0.8	18.00 TC	PM	590.0	590.0	0.67	5450.0	42.00					
2. VAM 21			5"	P-115	67.250	4.254	P-115	0.9	18.00 TC	PM	590.0	590.0	0.67	5450.0	42.00					
3. VAM 21			5"	L-80	67.250	4.254	L-80	0.9	18.00 TC	PM	420.0	420.0	0.49	5450.0	42.00					
4. VAM 21			6"	G-125	67.360	4.254	G-125	0.8	18.00 TC	PM	650.0	650.0	0.76	5450.0	42.00					
5. VAM 21			6"	G-136	67.360	4.254	G-136	0.8	21.40 TC	PM	505.1	505.1	0.70	12100.0	42.00					
6. VAM 21			6"	P-110	69.388	4.126	P-110	0.8	21.40 TC	PM	505.1	505.1	0.69	12100.0	42.00					
7. VAM 21			5"	L-80	69.388	4.126	L-80	0.8	21.40 TC	PM	501.1	501.1	0.59	12100.0	42.00					
8. VAM 21			5"	Q-125	69.388	4.126	Q-125	0.8	21.40 TC	PM	703.1	703.1	0.59	12100.0	42.00					
9. VAM 21			5"	L-80	69.388	4.126	L-80	0.8	21.40 TC	PM	240.0	240.0	0.49	12100.0	42.00					
10. VAM 21			5"	Q-125	69.388	4.126	Q-125	0.8	21.40 TC	PM	140.0	140.0	1.01	11050.0	42.00					
11. VAM 21			5"	Q-136	69.388	4.126	Q-136	0.8	21.40 TC	PM	940.0	940.0	0.49	11050.0	42.00					

[Go To "What's In This Release?"](#)

## WELLCAT Fixed Issues

The WELLCAT issues fixed for 5000.1.13 through 5000.15 are described below.

### **Release 5000.15**

Defect No.	Description
934750	Access Control Tokens for catalog to inventory function are inconsistent with other EDT applications
956946	Negative cross-sectional area error associated to tie-backs present on the design
957446	Unable to launch HELP from data selection box
958105	Incorrect internal pressure profile computed for gas kick loads
958276	Fluid Inventory casing load error
958649	ISO connection safety factor calculation does not include the effect of Pi on Axial Force
958673	Envelop safety factors issue (use of CUE instead of CSE)
959078	Missed fluid in cementing operation
959194	C&TC spreadsheet fails to show the VIT which existed in older wcd file in 5000.14.0 version
959264	Dp/hw/dc lengths are not converted to meters in the "casing Input" or "custom report" for Gas Kick load
959556	Gas kick, not kick tolerance warning
959702	Have CSE and CUE visible all time
959703	Incorrect CSE data points check ISO connection envelope
959704	Replace Pi for Po effect for Burst in ISO connection SF
960674	WellCat save is very slow in 5000.14 compared to 5000.1.13
961172	Packer does not stop load even though there is no movement allowed
961193	Packer schematic Nominal casing cross section area with an expansion joint packer schematic; the drawing points out the ID of the casing instead of the OD
962230	Casing goes into tension when land the 7" tubing string
962233	Fluid in "shut in" load changes to a bogus Mud 7.21 ppg fluid

 [Go To "What's In This Release?"](#)

## **Release 5000.14.1**

Defect No.	Description
884597	Prod module operations pressures are not properly represented in Casing module custom load link
917555	WellCat StressCheck: Inconsistent API connection rating calculations
941068	Bogus axial force results in specific casing and tubing string section configuration and plug depth
951614	CT production ignores the specified multi-phase correlation
953088	Incorrect scab liner casing and tubing configuration validation
955328	Incorrect restart file when linking a tubingless operation to a prior coiled tubing operation
955358	Specific scab liner configuration causes fluid temperatures spikes matching high production temperatures in long-term shut in operations
955360	Casing temperature seems artificially low for scab liner configuration
956128	WELLCAT doesn't show the "Recalculate" message for Design Limit Plot in Tube Module
956530	Disable/Enable Release notes WELLCAT Help tab options, only available at Landmark Software Manager Web page
956575	Steam calculation do not progress in certain circulation operation definition
956619	Incorrect calculation of EUJ jump out strength
956622	Incorrect connection "B" flag displayed in single and multiple safety factor table
956821	Wrong Latching force result
956823	Packer schematic crashes when trying to display the latching force
956860	WELLCAT doesn't show the "Recalculate" message for Design Limit Plot in Casing module
957079	Missing valid pipe weight from pick list on string section table
957127	Drilling operation pressures are not properly represented in Casing module Custom load link
957128	Extra horizontal bar in well schematic for some scab liners
957133	Incorrect Prod wellbore casing temperature profile mapped using custom load link
957339	WellCat fails while defining a second tubing string in a two pane window
957340	The internal pressure profile are different at the point where the tieback ends and the liner begins, when MASP is applied
957345	Remaining thickness of predicted wear not being switched on the max wear allowable plot

 [Go To "What's In This Release?"](#)

## Release 5000.14

Defect No.	Description
893870	Cannot specify grade for the connection when adding a drillpipe connection
919846	Fails when partial ISO connection envelope ratings are inputted
935713	UI input files need more DEVIATION data to get more accurate TUBE and CASING engines results
947779	Incorrect results for "Hooke's Law" and "Balloon" in the Length Change Summary for Dual Tubing
950351	Wrong initial conditions pressure balance in a specific packer scenario
950918	Bogus custom load Internal Pressure spike in a Liner/scab liner/packer configuration
951404	Drastic axial load change while applying high coefficient of friction in some scenarios
951541	Bogus trap annular pressure reported in a tail pipe scenario
951778	Fluid temperature does not update while updating initial mud pit temperature
952634	Incorrect liner isolation packer mapping cause bogus safety factor results
952866	Bogus temperature plot anomaly while applying VIT average K value inpu.
953303	Wrong help file displayed when applying F1 to navigate to Displacement to Gas documentation
953339	Not enough input temperature values applied to calculate AFE custom loads in some specific scenarios
953675	Assumes single string section geometry to determine RIH bending loads
953821	Bogus temperature results in a steam scenario
953845	Incorrect application of Axial Design Factor (Compression) in normalized minimum safety factor results table
954040	Inconsistent pressures around plug depth in a custom load case
954172	Casing calculation halt in design scenarios of large well TD and number of load cases specified. Calculation exceeds calculation time
954173	No Wear Allowed for collapse loads even though the reported collapse safety factors are larger than the design limit (100+)
954399	Remove duplicated ODs and sort them out in increasing order in Ratings dialog
954859	Incorrect fluid profile following an operation that it's prior operation is a SI (File Defined Hydrocarbon)
955049	Foam in annulus does not crush even though annulus and temperature and pressure conditions are within the foam temperature and pressure range
955104	Incorrect fluid interface associated to gas lift operation

 [Go To "What's In This Release?"](#)

Defect No.	Description
955345	Custom load external pressure changes while changing the casing configuration (cement gap)
955359	How plug depth definition affects custom load pressure profiles
955361	Add clarifications regarding axial load change after packer set topic
955388	Update collapse formula applied to max allowable wear in UI and refresh collapse rating values in pipe inventory
955950	Inconsistent tubing load results if Scab Liner base depth is above TD in production annulus

### Release 5000.1.13.1

Defect No.	Description
632093	GUI needs to check if insulation will fit inside the annular gap outside a pipe
839240	Circulating a lighter mud with heavier mud results in less than zero pressures inside the tubing
902452	First row hanger row in custom load is delete-able, however user input pressure data is not honored in calculations
906691	Tube - Improper changes to Custom Loads when changing other data
920486	WELLCAT Error when calculating Tube loads
923670	Incorrect report of Forces when applying packer setting sequence option other than default
933717	Displacing packer 1 cm Annulus pressure change 1000 psi
934906	DL Plot for IC, overpull, and RIH
935752	Internal pressure in Gas Kick not limiting volume at shoe
938012	Insulation defined for scab liner does not apply to prod calculations
939728	Delete Liner without Liner packer and save this crash application
940013	Pasting values into WELLCAT wellpath editor produces error message
942240	Allowable centralizer OD is ok for casings but not for Tiebacks
942943	Unexpected high pressures in MultiString output
943120	Need flexibility updating uncemented gap top and base depth
944501	Error while Calculations in Casing Module (WS tube engine has stopped working)
944923	Drill Module Calculation Produces re-start file error
946562	Incorrect pressure calculation in Casing-Liner cases for Gas Over Mud load

[!\[\]\(20c91a8780eda48b60574163a625c0a0\_img.jpg\) Go To "What's In This Release?"](#)

Defect No.	Description
946563	Incorrect pressure result for casing-liner cases when MASP to Fracture at Shoe is checked
946564	Unexpected external pressure Collapse HID load result in a weak formation scenario
946565	Can't input wellhead pressure if TOC or HID depth is deeper than prior shoe depth in WCST Collapse load
946566	Incorrect Displacement to gas load result in casing-liner cases
946600	SCAB LINER card has wrong fluid ID for Drill module
946839	Gas Kick Load; different results is obtained when there is a change in BHA
946857	VIT pipe does not include bending in axial load calculations
949387	Prod Link temperature profile incorrect in Scab Liner load case
949639	Residual differential pressure in Tube Code (overpull and Run in hole)
950173	Enable Current schematic option in Tube Module
951235	Add more VIT temperature data
951256	Bogus Annulus pressure - Custom load scenario
951618	Incorrect external pressure across un-cemented gap
951704	Incorrect casing AFE custom load internal pressure+ trap annular pressure below scab liner interval

### **Release 5000.1.13**

Defect No.	Description
884995	Support BOEMRE NEW COLLAPSE LOAD
890915	Support Drilling operations Annular Fluid Expansion Analysis
915837	Two 'Coiled Tubing' Radio-buttons on 'Data Selection' window
916737	Support in "displace to gas" load in Casing module-mud/gas interface depth - and R-K EOS gas modeling
919059	Application stop calculations when using Capstan effect for large number of survey points (>1000)
929073	Time step control issue while simulating permafrost thawing
930166	Tube load calculations top in a specific survey data set
931737	WELLCAT does not apply Critical Dimension should the string type is special (documentation issue)

[!\[\]\(f69893b8d2acf4badd5778ccd2454aa8\_img.jpg\) Go To "What's In This Release?"](#)

Defect No.	Description
932795	Support gas over mud internal pressure profile and MASP/MAWP
935719	Real gas model in Gas Cap and UTUBE calculation apply incorrect EOS for gas type selected
935981	Incorrect well schematic with un-cemented gaps

 [Go To "What's In This Release?"](#)

## WELLCAT Known Issues

The following WELLCAT known issues for releases 5000.1.13 through 5000.15 are described below.

### Release 5000.15

Defect No.	Description
957670	Wrong interpolation of pore pressure in external pressure profile
958097	Observed permeable zone results inconsistencies compared to StressCheck
958920	Special character issue in workspace
962388	Switching-deleting datum in Compass generates crashes/corruptions in WELLCAT designs
962758	No change in pressure profile below and above packer

### Release 5000.14.1

Defect No.	Description
956946	Negative cross-sectional area error associated to tie-backs present on the design
957445	Force and Stress Table, the seal mode shows inconsistent behavior
957446	Unable to launch HELP from data selection box

### Release 5000.14

Defect No.	Description
951614	CT production ignores the specified multi-phase correlation
952381	Incorrect prior shoe definition in Fluid Gradient w/Pore Pressure External profile in a liner tieback configuration
953088	Incorrect scab liner casing and tubing configuration validation
954575	File takes a long time to load due to high amount of pore and frac pressure records
955328	Incorrect restart file when linking a tubingless operation to a prior coiled tubing operation
955358	Specific scab liner configuration causes fluid temperatures spikes matching high production temperatures in long-term shut in operations
955360	Casing temperature seems artificially low for scab liner configuration

 [Go To "What's In This Release?"](#)

Defect No.	Description
956128	WELLCAT does not show "Recalculate" message for Design Limit Plot in Tube Module
956530	Disable Release notes application Help tab options, available through Landmark Software Manager
956575	Steam calculation do not progress in certain circulation operation definition

### **Release 5000.1.13.1**

Defect No.	Description
941068	Bogus axial force results in specific casing and tubing string section configuration and plug depth
947779	Incorrect results for "Hooke's Law" and "Balloon" in the Length Change Summary for Dual Tubing
950351	Wrong initial conditions pressure balance in a specific packer scenario
950918	Questionable Production casing AFE Internal Pressure Profile
951404	Increasing Coefficient of Friction change drastically Axial Load
951541	Bogus Trap annular pressure reported in a tail pipe scenario

### **Release 5000.1.13**

Defect No.	Description
933717	Displacing packer 1 centimeter Annulus pressure change 1000 psi
935752	Internal pressure in Gas Kick not limiting volume at shoe
938012	Insulation defined for scab liner does not apply to prod calculations
938122	Incorrect external profile for fully cemented liner
939728	Delete Liner without Liner packer and save this crash application

[Go To "What's In This Release?"](#)

## Well Cost Software

[Enhancements](#)[Fixed Issues](#)[Known Issues](#)

This section outlines the changes made to Well Cost™ software.

### Well Cost Enhancements and New Functionality

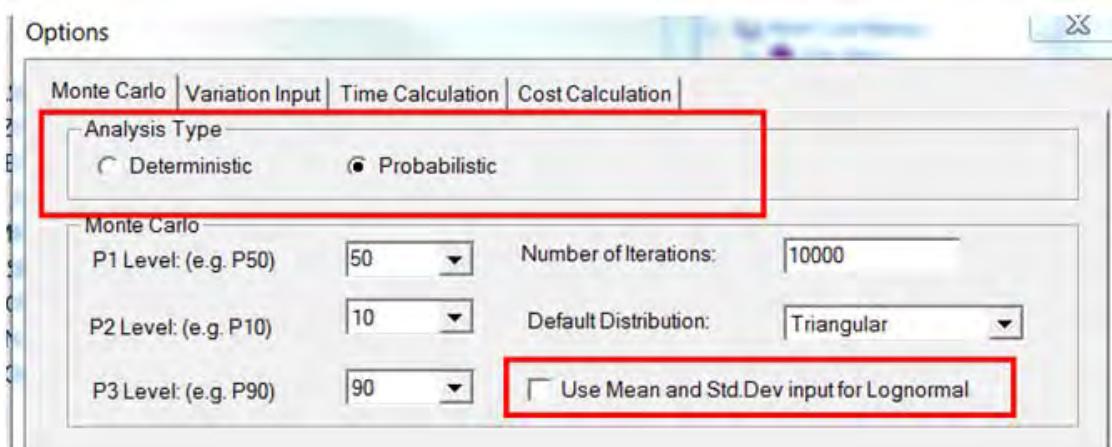
The Well Cost enhancements and new functionality for releases 5000.1.13 through 5000.15 are described below.

#### Release 5000.15

##### *Options*

Options dialog from Input Menu – a number of options have changed.

- Monte Carlo Tab

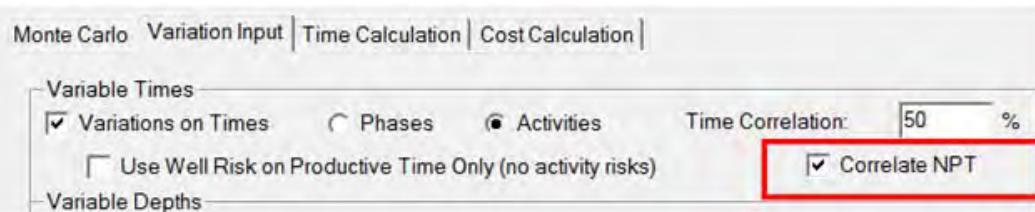


**Analysis Type:** Deterministic or Probabilistic – This option reflects whether the analysis is deterministic or probabilistic from the main toolbar. A design will automatically be set to probabilistic if 'variations on times' is active.

**Use Mean and StdDev for Lognormal:** There are two versions of input for Lognormal data input, the default is to enter the mean and standard deviation of the log of the input values. Use this check box to base the Lognormal input on the mean and standard deviation of the original values (not logged).

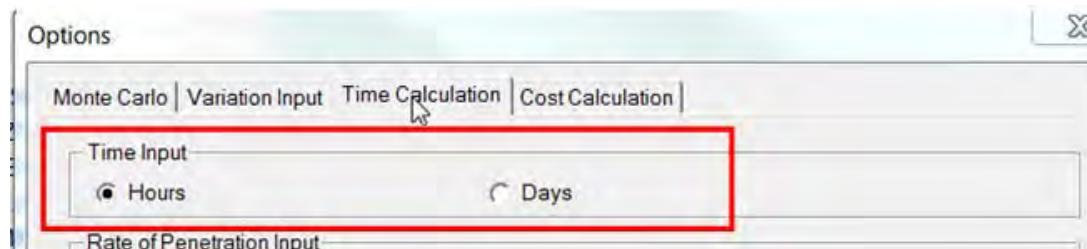
[Go To "What's In This Release?"](#)

- Variation Input Tab



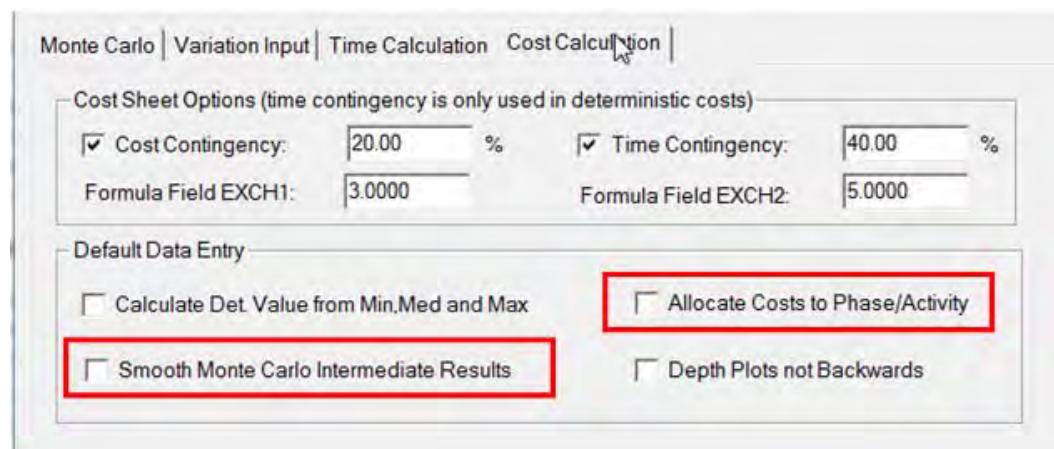
**Correlate NPT:** Check this box to include all NPT occurrences in the general time correlation. The default is turned on, which leads to greater variation of P10 to P90 times. Remove the check box if NPT is not required to be correlated, this emulates the behavior of some other comparative software.

- Time Calculation Tab



**Time input:** Select time input in Hours or Days.

- Cost Calculation Tab



**Allocate Costs to Phase/Activity:** Use this option to allocate costs to activities based on the activity codes. In some configurations, the phases are applied one per hole section and lack the granularity to correctly calculate costs for drilling

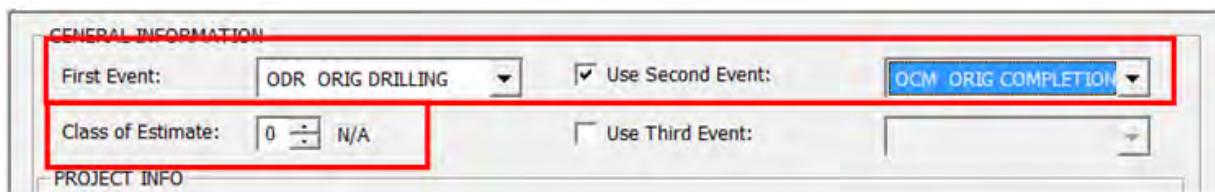
[Go To "What's In This Release?"](#)

or casing/cementing separately. If the activity code supports tasks like drilling or cementing, then costs can be applied to separate activities within the phase. The cost groups each unique activity in the phase, even if there is repetition (like drilling-casing-drilling).

**Smooth Monte Carlo Intermediate Results:** The results in the Monte Carlo output spreadsheet are listed in order from P5 to P95 in 5% steps. It is expected that the results will increase monotonically at each P level, but this is not always the case with minor contributors. (they are lost in the wash). It is in the nature of a Monte Carlo simulation that there is a certain random behavior in individual elements while the total is sorted in order. This option will smooth these output P% levels so that they increase monotonically.

**Expose Offset Query Timeout:** This option has been removed.

### *General Information*



The layout of the event definition in the general tab has been changed.

**First Event:** The documentation refers to Start Event, Completion Event, and Abandonment Event. They are now called First Event, Second Event, and Third Event. They are activated through two check boxes. This makes the choice of event type to the user more flexible than just drilling, completion, and abandonment.

**Class of Estimate:** Enter the level or class of cost estimate. This field is used to record the level of cost estimate from preliminary (WAG=5) to full detail (AFE=1 or 2). This field may be used when the cost estimates are reviewed in a dashboard.

### *Time Configuration*

In the time configuration tab, a spreadsheet is added at the bottom of the data entry area and will depend on whether it is an Event, Phase, or Activity

**Event Panel:** List risks that apply to this event.

[← Go To "What's In This Release?"](#)

List Risks that apply to this Event									
	Use	Event Risk Comment	Occurrence Percent %	Consequence		Range of Consequence			
				Unit	Value	Distribution	Type	Value	Type
1	<input checked="" type="checkbox"/>	WOW	100.00	Percent	10.00	None			

The user can list well risks for this event (and subsequent ones). This is an alternate to inserting the well risk as an activity at the start of the event. There are three types for the unit for the consequence. The occurrence percent will activate depending on the choice.

- Days: Enter the number of days delay for this risk – as a total over the entire well. Enter the risk occurrence %.
- Percent: Enter the percent or the total well planned time for the NPT. The occurrence percent will be locked at 100%.
- Percent/day: Enter the percent chance of this occurrence per planned day. The consequence will be 1 day unless a variation is required.

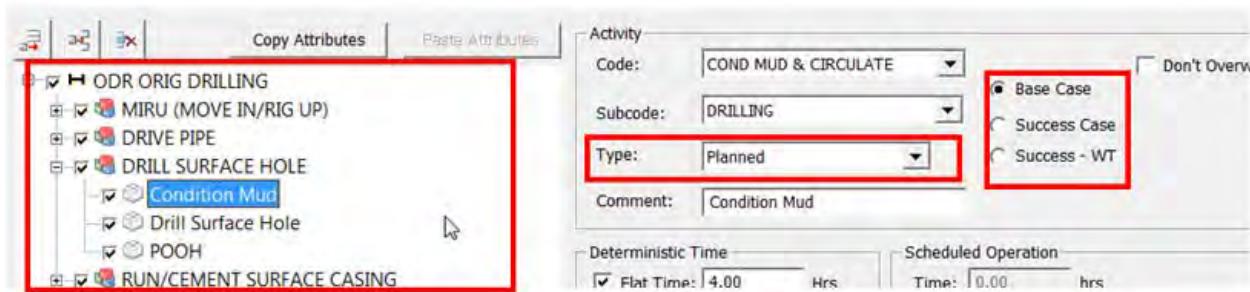
**Phase Panel:** List costs that only apply to this phase.

List Costs that only apply to this Phase										
	Class	Code	Subcode	Description	Cost	Type	Quantity	Comme	Vendor	Contract
1	INTANGIBLE	INTANGIBLE DRILLING COSTS	DIRECTIONAL	DIRECTIONA	5,000.00	Single	EXCH2	GYRO S		

This is an alternate to applying phases in the cost configuration. Enter single costs that apply only to this phase. Select the cost class, code and subcode for the cost type. The custom cost item will appear in the correct place in the cost configuration. If a cost applies to more than one phase or activity, it should be allocated to phases in the cost configuration.

**Activity Panel:** The activity in activity tree no longer shows the Code and Subcode – and shows only the comment field.

[Go To "What's In This Release?"](#)



**Type:** The type menu now includes a type for “Risk Level 0”. This allows the user to insert a risk item into the main schedule without being dependent on a parent activity.

**List costs that apply to this activity:** This spreadsheet will appear if costs can be applied to activities and applies in a similar manner to costs on phases.

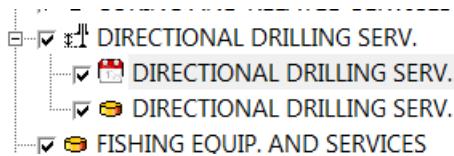
**Planned Operations:** Base Case, Success Case and Success – WT (with testing). Select the operation type based on exploration/evaluation criteria for costing. This allocation is used in separating costs in the AFE (excel output), for example:

- Base case = drilling dry hole
- Success case = completion – post logging

#### *Cost Configuration*

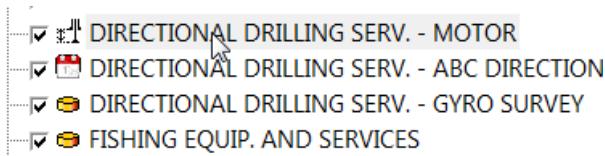
Custom Cost Items are inserted into the tree at the same level as the subcode item (that were previously parent items).

Previous – old version of well cost showed the custom cost items as child items from the original cost subcode item. This leads to confusion in understanding which cost items are used and checking parent cost item behavior.



[Go To "What's In This Release?"](#)

Now – custom cost items are shown below the parent cost item without intensionation.



Primary subcodes have the description field disabled.

A screenshot of the 'Identification' panel. It includes fields for Subcode (set to 8), Vendor, Description (containing 'DIRECTIONAL DRILLING SERV.'), Contract, Type (set to 'Phs. Depth'), Item, and Comment (containing 'MOTOR'). The 'Description' field is grayed out, indicating it is disabled.

Custom cost items have the description field enabled and can be changed.

A screenshot of the 'Identification' panel. It includes fields for Subcode (set to 8), Vendor, Description (containing 'DIRECTIONAL DRILLING SERV.'), Contract, Type (set to 'Single'), Item, and Comment (containing 'GYRO SURVEY'). The 'Description' field is not grayed out, indicating it is enabled.

To add a custom cost item, select the primary subcode and right-click to add the item.

- Cost Item Panel – Limit to Phases

The cost to phase/activity panel has two additional columns.

[Go To "What's In This Release?"](#)

	Start		End		Adjustments	
	Phase	Activity	Phase	Activity	Multiply	Add
1	DRILL SURFACE HOLE	DRILL			1.00	4.00
2	DRILL 1ST INTERMEDIATE ZON	DRILL			1.00	
3	DRILL 2ND INTERMEDIATE ZON	DRILL			1.00	
4	DRILL TO PRODUCTION CASIN	DRILL			1.00	2.00

**Multiply:** For this phase or range, apply a multiplier to the unit cost. For example, a day rate for a service where for some phases two people are required and others require only one.

**Add:** Place an additional quantity to that phase. For example, a service personnel charge would have an additional few days at the start for callout in advance and some additional days at the end when waiting for transportation.

Note that for a range of phases, it's not possible to select an activity, and assume that it will only apply to that activity in each of the phases.

### Phases and Activities

- Activity Spreadsheet Fields

Note that the column order is now Activity, Comment, Depth, Deterministic Time, Probabilistic Time, and Rate.

	Activity		Comment	Depth (ft)		Deterministic Time		Prob. P50 Time		Rate (ft/hr)	Actual Time	
	Code	Subcode		From	To	Hrs	Cum Days	Hrs	Cum Days		Hrs	Cum Days
1	COND MUD & CIRCUL	DRILLING	Condition Mud	300.0	300.0	4.00	0.17	19.14	0.80	0.00	0.00	0.00
2	DRILL	NEW HOLE	Drill Surface Hole	300.0	900.8	6.68	0.44	3.65	0.95	90.0	0.00	0.00
3	TRIPPING	BHA	POOH	900.8	900.8	4.50	0.63	7.23	1.25	200.0	0.00	0.00

### Release 5000.14

#### Day Cost Tracking

A new pane is available to allow you to track actual time and cost associated with a project. This functionality can be accessed by pressing the Day Cost workflow button, or through the menus at the following location: **Input > Review and Analysis > Daily Cost Tracking**

[← Go To "What's In This Release?"](#)



						Import Day Costs	Current Depth:	15,250.00	Days:	64.27	Cost:	90,339,409.7	Calculated	User Entered
						<input type="checkbox"/> Projected to end of Well:		Days:	64.27	Cost:	90,339,409.7	From Reports:	From Import	
	Code	Item	Comment	Cost (\$)	Type	Day No:	1	2	3	4	5	6	7	
						Phase:	DRIVE PIPE	DRIVE PIPE	DRILL SURFA	DRILL SURFA	DRILL SURFA	RUN/CEMENT	RUN/CEMENT	
						Depth (ft):	468.00	468.00	468.00	1,590.00	3,721.00	4,205.00	4,205.00	
						Hours:	21.50	3.50	5.50	24.00	24.00	24.00	24.00	
						11/21/1996	11/22/1996	1/28/1997	1/29/1997	1/30/1997	1/31/1997	2/1/1997		
	1000	Rig												
	A	Rig - Rental		5,000,000.00	Day			4,479,167	4,594	1,145,833	5,000,000	5,000,000	5,000,000	
	B	Rig - Other		2,000.00	Lump Sum			43	2,181	63			59	
	C	Transportat		3,000.00	Day			2,687	642	687	3,000	3,000	3,000	
						Total (\$)	4,481,897	7,417	1,146,584	5,003,000	5,003,000	5,003,059	5,003,000	

Costs can be entered in the following ways:

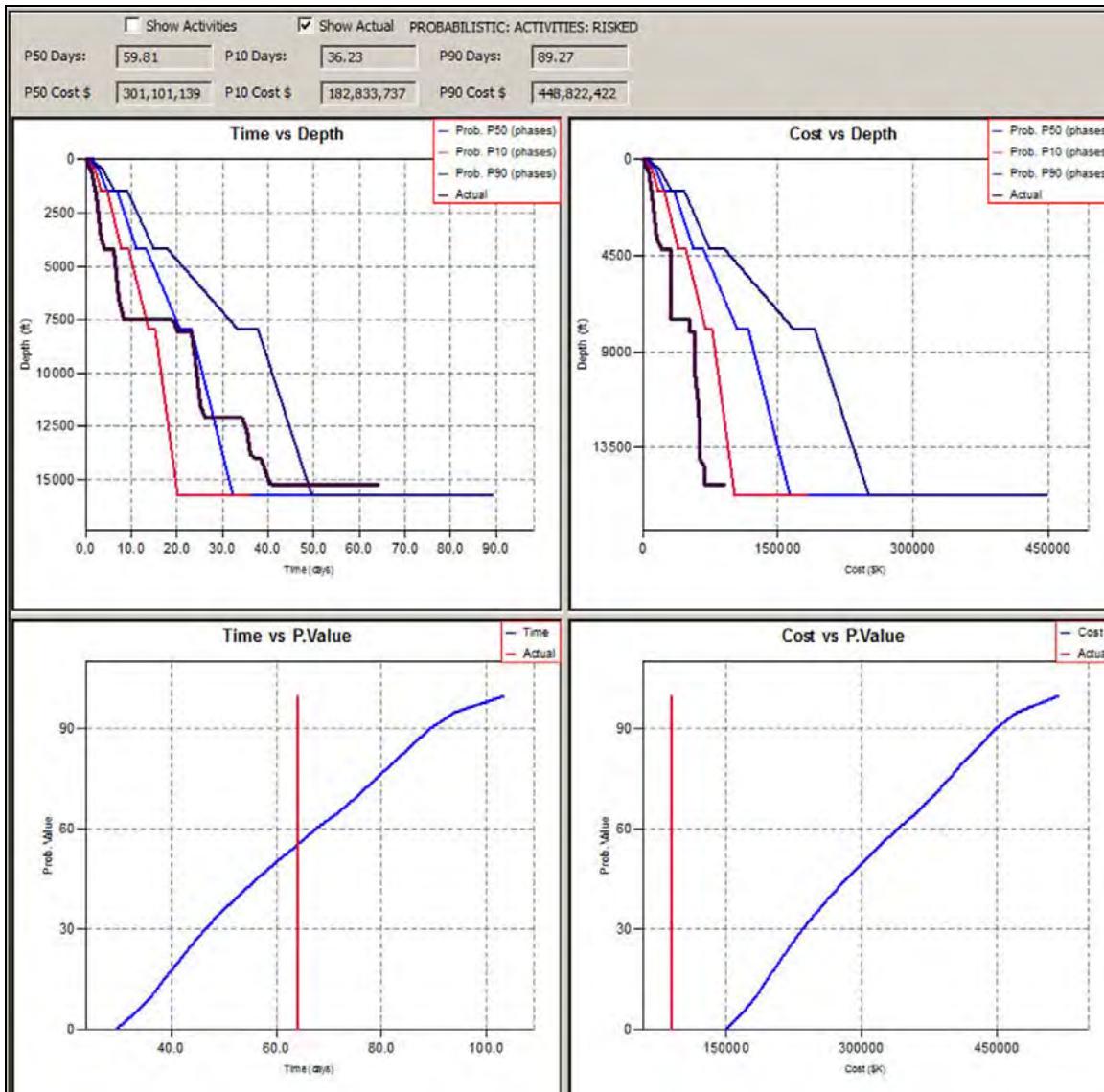
- Automatically calculated from the plan (estimated) by adding one or more days
- Entered directly into the cells
- Imported from a reporting system, such as OpenWells, or from tabular data

Once the available data has been entered, it is shown in the Phases and Activities pane, and this allows you to compare actual against estimate:

	Phase	Depth (ft)		Deterministic Time		Prob. P50 Time		Complete	Actual Time/Depth/Cost					
		Desc	From	To	Hrs	Cum Days	Hrs	Cum Days	Hrs	Cum Days	Depth	Cost		
1	MIRU (MOVE IN/RIG UP)		0.00	0.00	11.01	0.46	26.67	1.11	<input checked="" type="checkbox"/>		7.50	0.31	467.00	138,516.30
2	DRIVE PIPE		82.90	460.90	30.97	1.75	34.87	2.56	<input checked="" type="checkbox"/>		39.00	1.94	461.00	90,933.00
3	DRILL SURFACE HOLE		460.90	1,500.89	127.01	7.04	50.73	4.68	<input checked="" type="checkbox"/>		67.00	4.73	4,205.00	262,499.00
4	RUN/CEMENT SURFACE CASING		1,500.89	1,500.89	18.00	7.71	47.78	8.87	<input checked="" type="checkbox"/>		50.00	8.81	4,205.00	101,348.00
5	DRILL 1ST INTERMEDIATE ZONE		1,500.89	4,187.08	326.49	21.31	101.76	10.91	<input checked="" type="checkbox"/>		337.50	20.88	8,060.00	1,744,179.20
6	RUN/CEMENT 1ST INTERMEDIATE CASING		4,187.08	4,187.08	61.87	23.89	53.46	13.14	<input checked="" type="checkbox"/>		167.00	27.83	8,060.00	414,127.00

The actual data can be included on many of the standard plots by checking the Show Actual box:

[← Go To "What's In This Release?"](#)



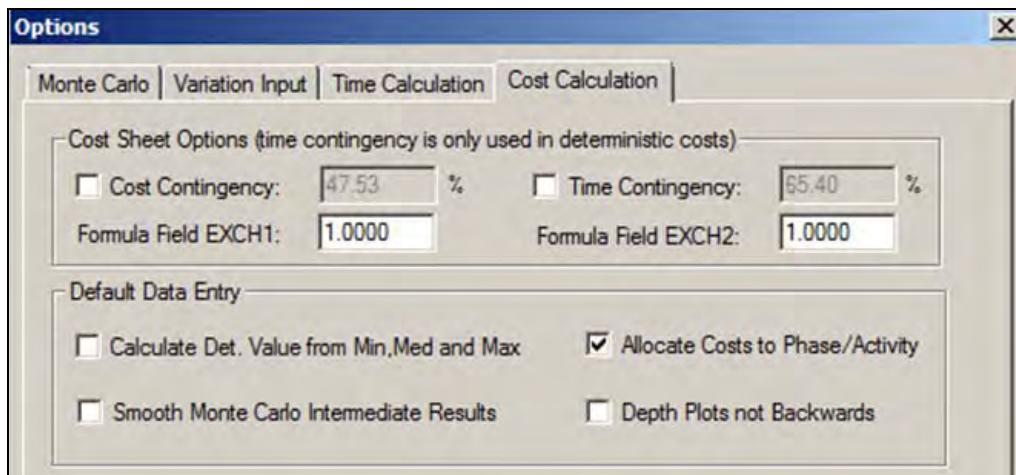
Day Cost Tracking can also be used to project costs to the end of well.

### Associating Costs with Activities

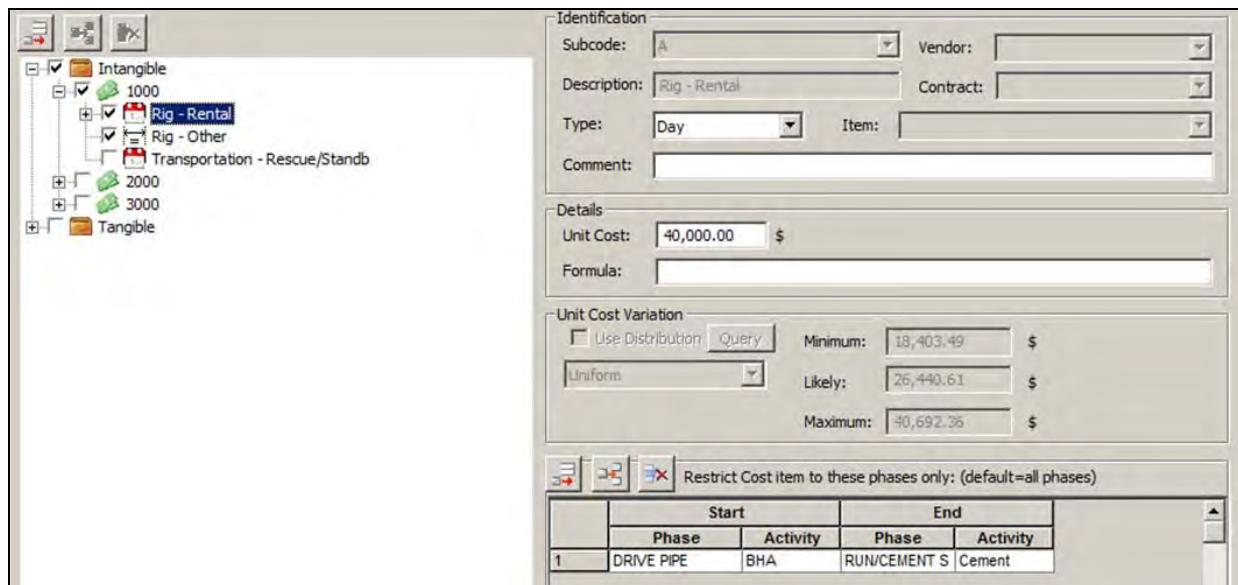
Previous versions of the Well Cost software allow you to associate up to six (6) individual phases or ranges of phases to a given cost item. In this release, the capability has been extended to allow you to associate both phases and activities with a given cost item. The restriction on the number of associations has also been removed.

[Go To "What's In This Release?"](#)

By default, the association will remain between cost items and phases. If you wish to instead associate cost items with activities, you must first check the **Allocate Costs to Phase/Activity** on the **Cost Calculation** tab of the **Input > Options** dialog:

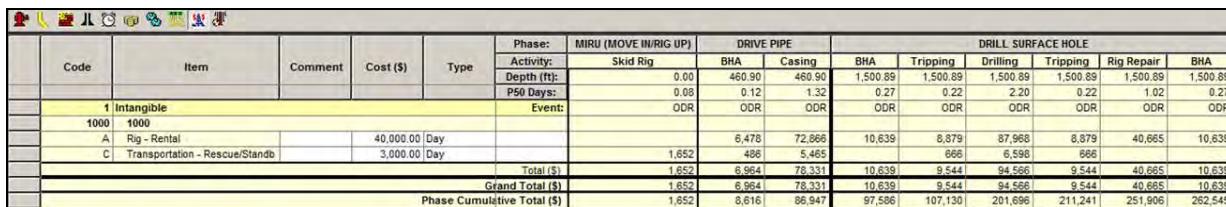


After selecting this option, you can further select the Start and End Activities to be associated with the cost item:



Costs in the cost spreadsheet will now show phase and activity instead of hole section and phase:

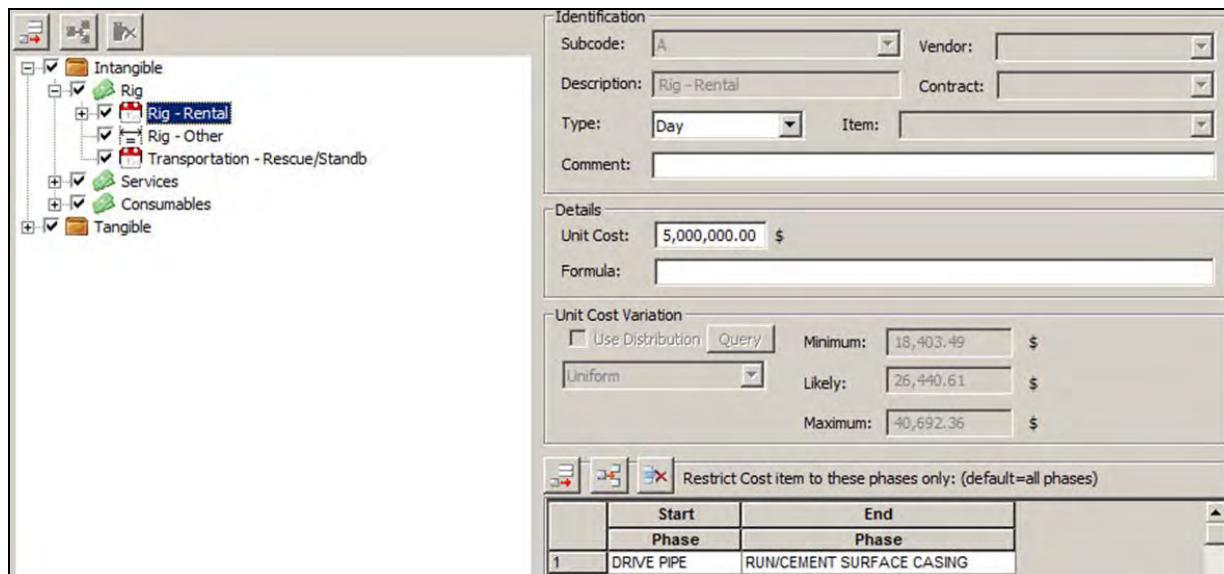
[Go To "What's In This Release?"](#)



Code	Item	Comment	Cost (\$)	Type	Phase:	MIRU (MOVE IN/RIG UP)		DRIVE PIPE		DRILL SURFACE HOLE			
						BHA	Casing	BHA	Tripping	Drilling	Tripping	Rig Repair	BHA
					Depth (ft):	0.00		0.27	0.22	2.20	0.22	1.02	0.27
					P50 Days:	0.06	0.12	1.32					
1 Intangible					Event:	ODR	ODR	ODR	ODR	ODR	ODR	ODR	ODR
1000 1000								6,478	72,866	10,639	8,879	87,968	8,879
A Rig - Rental			40,000.00	Day				486	5,465	666	6,598	666	
C Transportation - Rescue/Standb			3,000.00	Day		1,652							
					Total (\$)	1,652	6,964	78,331	10,639	9,544	94,566	9,544	40,685
					Grand Total (\$)	1,652	6,964	78,331	10,639	9,544	94,566	9,544	40,685
					Phase Cumulative Total (\$)	1,652	8,816	86,947	97,586	107,130	201,696	211,241	251,906
													262,545

### Note:

If the Allocate Costs to Phase/Activity is not checked, then you are able to associate cost items with phases as in previous releases, refer to the image below.

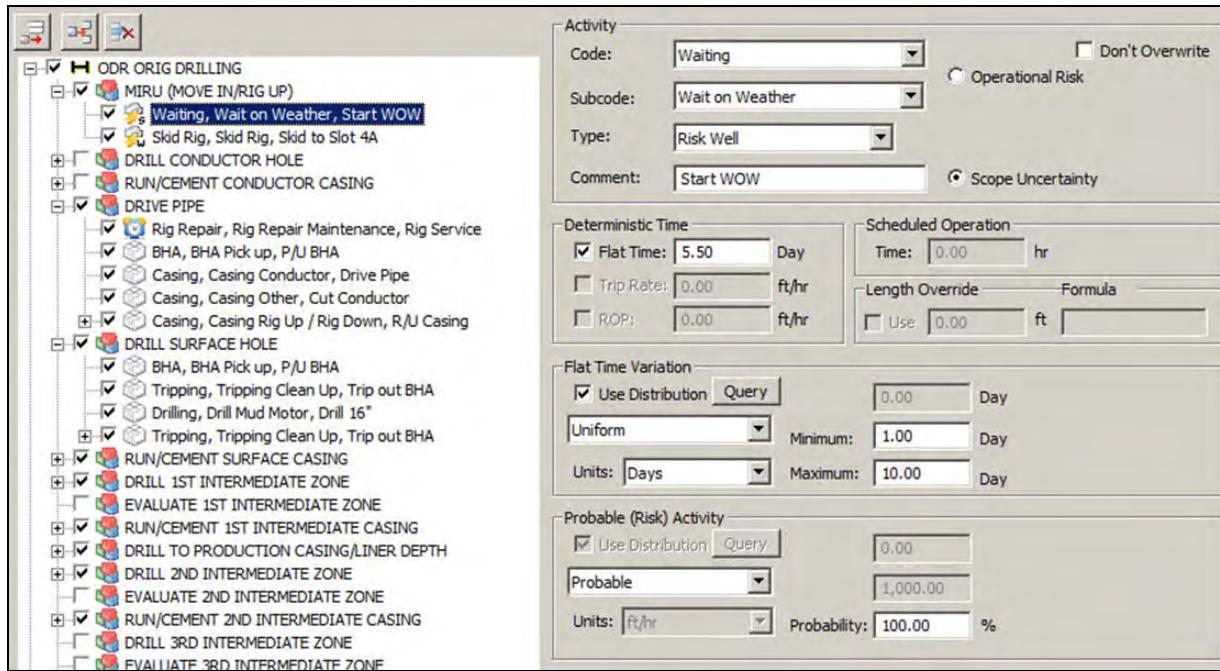


### Scope Uncertainty

Many customers have asked for the Well Cost software to be able to designate certain activities as Scope Uncertainty. This is required since at an early stage in a design, certain time and cost factors remain undecided or unknown. As the design progresses and is ready to be approved as an AFE, all such scope uncertainties would have been removed. Any remaining uncertainties will be mitigated residual risks that can happen when the well is being drilled.

To accommodate this, a Risk Well activity can now be marked as either an Operational Risk or Scope Uncertainty:

[Go To "What's In This Release?"](#)



The simulation process now determines the percent increase of risks and scope uncertainty on top of the un-risked (clean) time and cost estimates, and provides additional output data, as listed below:

- *Unrisked*: All risks are removed and static (deterministic) costs are used. Planned time variation is still applied.
- *Risked*: Standard time risks are included. No Scope Uncertainties or Cost Variations are included.
- *Full Model*: All risks including scope uncertainties as well as cost and depth variations are included.

The above data is shown in the header of the Phases and Activities pane:

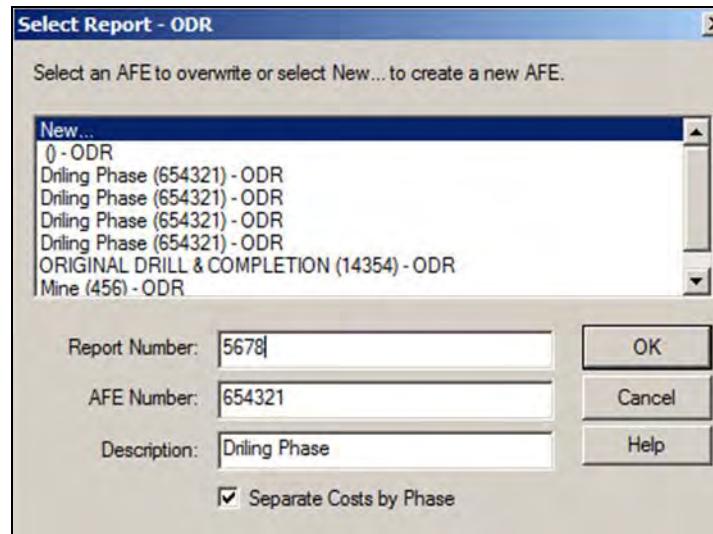
Planned Sections:	Unrisked Mean	Risked Mean	Full Model Mean	P90
All Sections	Days: 25.06	Days: 55.26 % 120.5	Days: 61.18 % 10.7	Days: 108.51 % 77.4
Days/10Kft:	Cost: 147,966	Cost: 218,051 % 47.4	Cost: 248,129 % 13.8	Cost: 403,448 % 62.6

#### Export Activity Data to OpenWells' Cost Estimate and AFE Report

The AFE data exported by Well Cost software to OpenWells has previously been sent as a single cost item per event. Now you have the option to have this data broken down by phase, and to also have the hole sections added. To utilize this

[Go To "What's In This Release?"](#)

new functionality, select the menu option **Actions > Transfer Costs to AFE**. The resulting Transfer dialog will have a new check box, which you tick in order to separate the costs by phase:



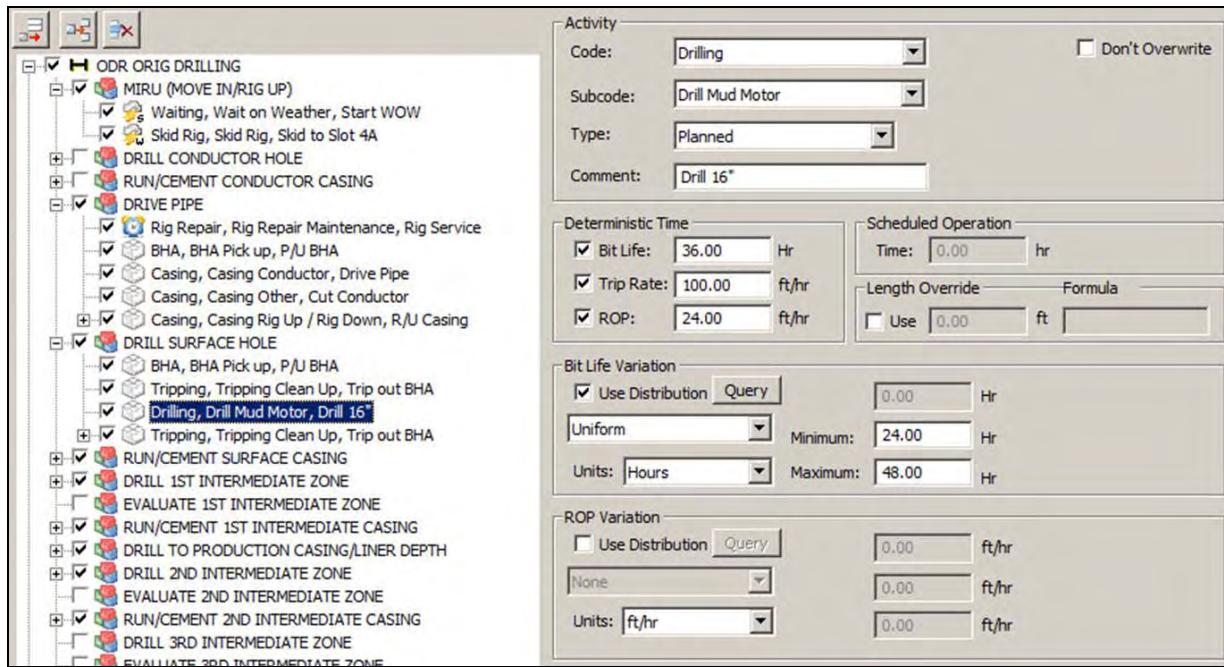
Once the transfer completes, you will see the additional detail in the Cost Estimate and AFE Report.

Cost Estimates															
#	Class	Code	Subcode	Quantity	Item cost (\$)	Size	Units	Surcharge (\$)	Cost est. base curr. (\$)	Other AFE amount (\$)	Comments	Activity class	Activity code	Activity subcode	Activity phase
1	1	1000	A		9,197.17		2		9,197.17			TRIP			DRLSUR
2	1	1000	A		9,197.17		2		9,197.17			TRIP			DRLSUR
3	1	1000	A		6,979.48		2		6,979.48			BHA			CSDDRV

### Bit Life and Trip Rate

When a Bit Life is employed in an ROP activity, the Well Cost software will use the “nearest tripping operation” to perform a trip operation when the bit life is used up. As the precise meaning of the “nearest tripping operation” was not clear to many users, it has been requested to have the Trip Rate editable on any ROP operation that also uses a Bit Life.

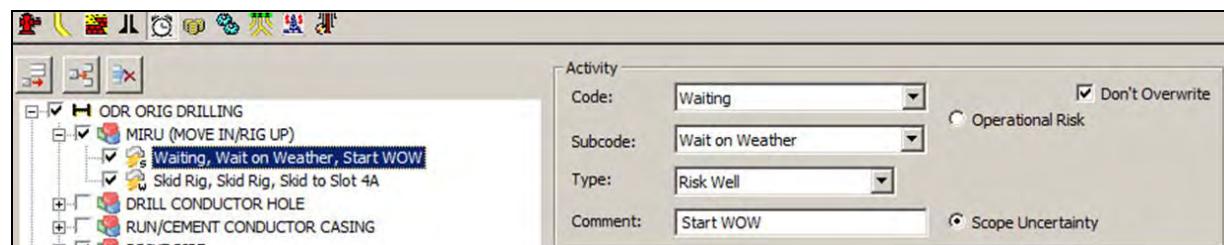
[Go To "What's In This Release?"](#)



Note that if a trip rate is added to an ROP activity that does not have a bit life specified, it will add the trip time as a trip out from the current TD. If the bit life is specified, then it will add two (2) times the trip time from the depth of the bit change (round trip).

#### *Do not Override Activity Definition*

When Offset Wells are used to fit distributions to historical data, the Run Sample Statistics functionality overwrites all activities. There are times when a user may want to enter the fit data directly into the activity and not have this information overwritten by the Run Sample Statistics functionality. To accomplish this, a "Don't Overwrite" checkbox has been added to the activity definition.



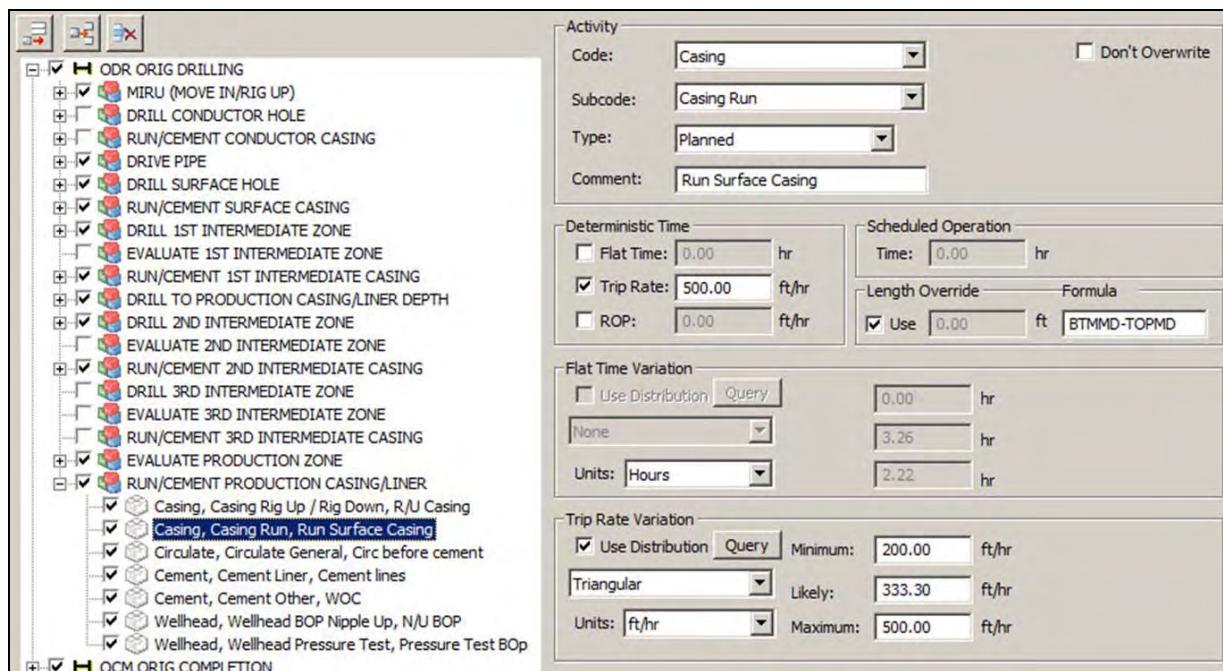
When checked, the color of the activity in the Offset Wells pane is changed to grey, and Run Sample Statistics will not update any values in its configuration.

[Go To "What's In This Release?"](#)

	Activity	Depth From	Depth To (ft)	MIN	MAX	AVG	Distribution	Type	Value	Type	Value	Type	Value
1	MIRU, Waiting, Wait on Weather, Start WOW, W ROP/Trip Rate (ft/hr)	0.00	0.00	0.00	0.00	0.00	Uniform			Min=	24.00	Max=	240.00
2							Probable			Prob%*	100.00		
3	MIRU, Skid Rig, Skid Rig, Skid to Slot 4A, W ROP/Trip Rate (ft/hr)	0.00	0.00	0.00	0.00	0.00	None			User=			
4							Probable			Prob%*			
5	DRLCON, Casing, Casing Run, Run Surface Ca ROP/Trip Rate (ft/hr)	0.00	0.00	0.00	0.00	0.00	Triangular	Min=	200.00	Likely=	333.33	Max=	500.00
6								Min=	1.50	Likely=	2.00	Max=	4.00
7	DRLCON, Casing, Casing Rig Up / Rig Down, R ROP/Trip Rate (ft/hr)	0.00	0.00	0.00	0.00	0.00	Triangular	Min=		Likely=		Max=	
8								Min=		Max=		Prob%*	
9	CSGCON, Cement, Cement Casing, Cement_P ROP/Trip Rate (ft/hr)	0.00	0.00	0.00	0.00	0.00	Triangular	Min=	5.00	Likely=	6.00	Max=	8.00
10								Min=		Max=		Prob%*	

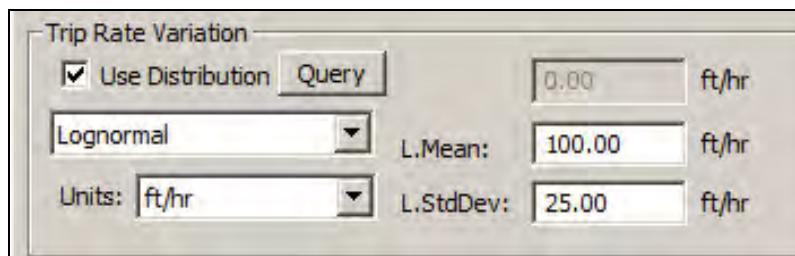
### Length Override Formula

In previous versions of the Well Cost software, a constant Length Override value could be entered, or a formula could be entered into the Comment field. Now a formula field is available so the length override can be calculated as desired.

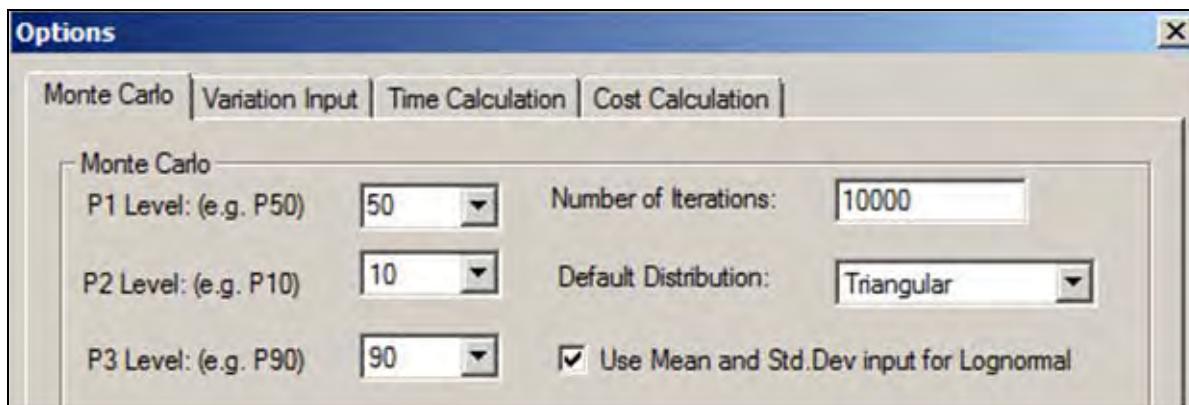


### Mean and Standard Deviation for Lognormal Distribution

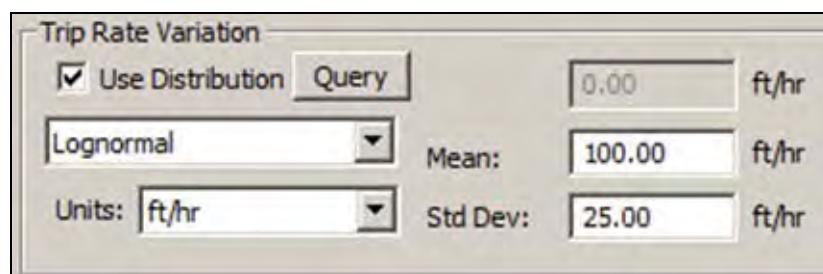
In previous versions of the Well Cost software, the lognormal distribution was configured through a special mean and standard deviation, which was mean and standard deviation after taking the natural log of the individual sample values. The resulting mean and standard deviation were designated as L.Mean and L.StdDev.

[Go To "What's In This Release?"](#)

Some customers are using external statistical software which provides the parameters for this distribution in terms of sample mean and standard deviation, i.e. not taking the natural log of the data values before computing the mean and standard deviation, so that such data can be directly used. A new option “Use Mean and Std. Dev input for Lognormal” has been added to the Monte Carlo tab of the Input > Options dialog.



When the “Use Mean and Std. Dev input for Lognormal” option is checked, the expected parameters for the Lognormal distribution are also updated.



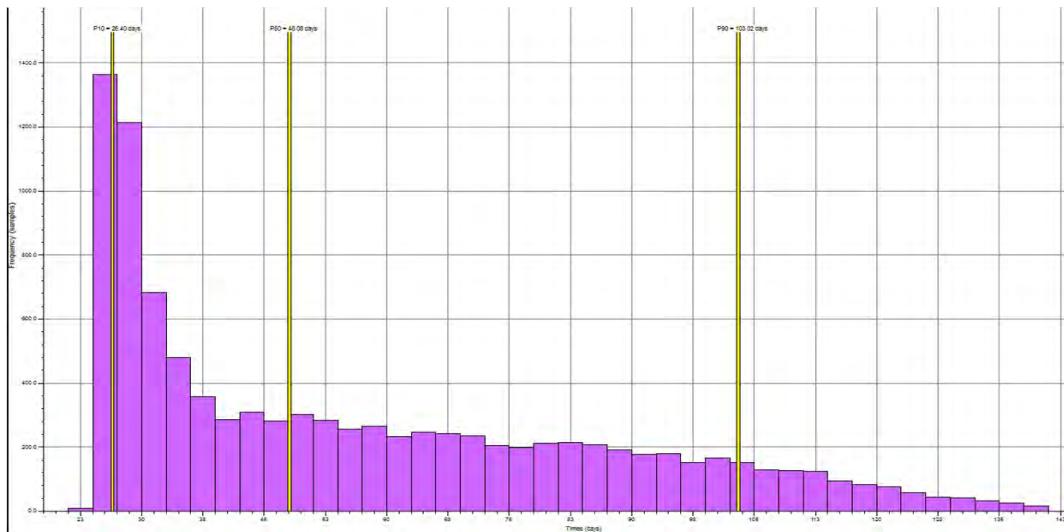
[Go To "What's In This Release?"](#)

## **Release 5000.1.13.1**

Well Cost software enhancements for 5000.1.13.1 include the following:

### *Distribution Plot with P-values*

The Time and Cost histograms have been decreased to smaller bucket size so that the overall shape of the distribution is better represented. Now P-values are also shown on the plots.



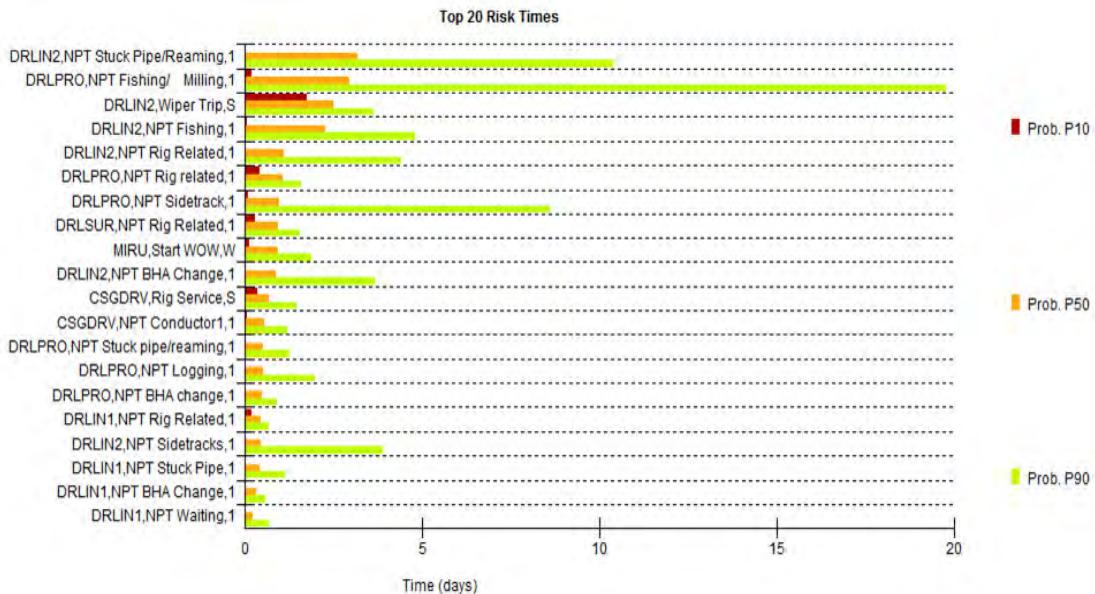
### *Tornado Plot*

When analyzing at the activity level, there are two new histograms available to show you the activities that have the highest contribution for the design:

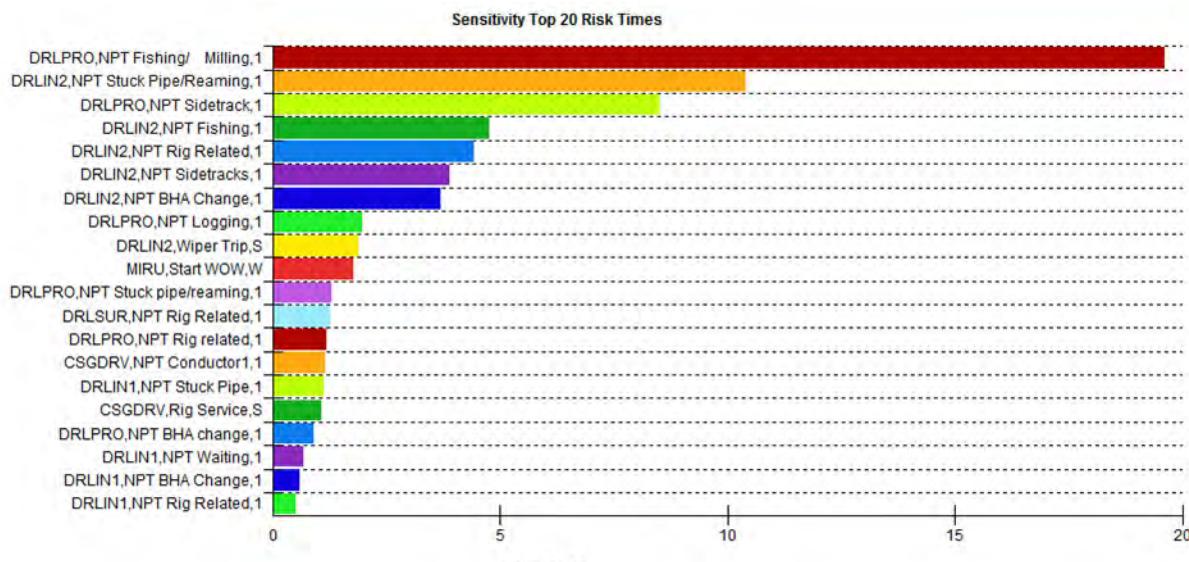
- Top 20 Time

[← Go To "What's In This Release?"](#)

- Top 20 Costs



When viewing one of these plots, you can also select Sensitivity using the right-mouse button. Selecting this option will change the plot to show the risks that have the largest difference between P90 and P10.



 [Go To "What's In This Release?"](#)

## **Release 5000.1.13**

Well Cost software enhancements for 5000.1.13.0 include the following:

### *Average Frequency of Activities*

The average frequency of an activity can now be found in the Phases and Activity panel. When you select the Phase in the panel, the corresponding activities are displayed in the bottom pane. If the frequency of the activity varied during the simulation, the average number of times the activity was executed will appear in brackets in the Comment column. This is useful when you need to determine the average number of trips in a hole section. For example, in the panel below, you can see that the Rig Repair and BHA Other activities occurred at an average frequency of 0.86 and 0.14 respectively (shown in the Comment column), indicating that they were not executed in every iteration of the simulation.

	Activity		Rate (ft/hr)	Depth (ft)		Deterministic Time		Prob. P50 Time		Comment
	Code	Subcode		From	To	Hrs	Cum Days	Hrs	Cum Days	
1	BHA	BHA Pick up		1,500.89	1,500.89	2.00	0.08	3.52	0.15	P/U BHA
2	Tripping	Tripping Clean Up	1,500.0	1,500.89	1,500.89	1.00	0.12	0.98	0.19	Trip out BHA
3	Drilling	Drill Mud Motor		1,500.89	1,500.89	0.00	0.12	0.00	0.19	Drill 16"
4	Tripping	Tripping Clean Up	1,500.0	1,500.89	1,500.89	1.00	0.17	2.59	0.30	Trip out BHA
5	Rig Repair	Rig Repair		0.00	0.00	0.00	0.17	21.52	1.19	NPT Rig Related (0.86)
6	BHA	BHA Other		0.00	0.00	0.00	0.17	2.37	1.29	NPT BHA Change (0.14)

 [Go To "What's In This Release?"](#)

## Well Cost Fixed Issues

The Well Cost issues fixed for 5000.1.13 through 5000.15 are described below.

### Release 5000.15

Defect No.	Description
962923	Wrong unit system when importing daily cost records from OpenWells via day cost
963137	Please enter no more than 40 characters – remove this message
963139	Incomplete Phase picklist showing Number only
963142	Orphan activity when converting to use activity costs
963143	Behavior of check boxes in cost configuration
963145	Problem creating a cost under a phase activity
963147	Calculation of Bit Trip time for ROP is incorrect
963148	Risk times incomplete when using branched risks (80/20)
963150	Risk Cost item not generating expected results

### Release 5000.14.1

Defect No.	Description
750397	Audit history is not hooked up in well cost
956145	Well Cost Toolbar Probabilistic button enhancement
956200	Allow user to decide which activities are not updated by sample statistics
956234	Configuring phase and formula TDEPTH in cost configuration
956235	Time and Cost Configuration - Add save button
956260	Expand and Collapse option in Times and Costs configuration Explorer
956352	Multi-well simulations do not run for the required number of iterations
957058	No information displayed on hovering mouse over the Well Cost time and cost configuration icon
957101	Change the default correlation
957104	Improved smoothing algorithm
957108	Option to Exclude Activity Risk Times from % NPT calculations
957111	Splash screen contains Build Information text

 [Go To "What's In This Release?"](#)

Defect No.	Description
957122	Simulator is always run three times
957123	In Day Cost Tracking, the Total Columns have units of Days
957124	Added % used column to Day Cost Tracking panel
957125	Update Authorized_md and Authorized_tvd when a casing or survey change is made
957130	Well Risk grid for each event
957131	Auto-size the event/risk and cost/phase grids
957132	Well Risk does not always include the last activity time

### Release 5000.14

Defect No.	Description
911265	If the Well Schematic is being displayed, any changes to the design are not reflected unless another plot is selected first before re-opening the schematic
916466	Cannot delete a formation in the Formation pane
916485	Import All through EDM Admin clears Well Cost's event table picklist linkage
937212	Pressing F7 for Data Dictionary causes the application to freeze
928120	Entry of phase comment not restricted to 40 characters
947804	Beta/PERT distribution with no associated time gives different results than a NONE distribution
951122	Editing casing information can cause the casings to be displayed out of sequence or be orphaned
951815	Distribution output values (such as P5 / P95 and Min / Max) should be the same for purely deterministic estimates but have been seen to differ when the number of simulation iterations is large
951838	When the schematic options are changed, the well schematic does not automatically update. To update the schematic, another plot has to be opened first and then re-opening the schematic causes the new options to be applied.
951839	Formations cannot be deleted in the Formations pane
952479	When a multi-well campaign is created, all associated costs are incorrectly designated a Risk Costs
952669	Transfer to OpenWells Cost Estimates & AFE needs to include the Phase and Activity
953725	For activities with a bit type, allowing a tripping time to be entered

 [Go To "What's In This Release?"](#)

Defect No.	Description
954823	Importing activities sometimes results in a “blank” type
955371	For wells with very small durations (less than a day), the x-axis on the plots show duplicate values
955449	Well Cost crashes when simulating a project with activity subcodes being dependent on activity codes
955609	Well Cost well schematic does not resize automatically
955881	Planned activity types always show three greyed out radio buttons
956352	Multi-well simulations do not run for the configured number of iterations

### **Release 5000.1.13**

Defect No.	Description
934025	Pressing the Get Actual Data from Reports button can yield an error on Oracle
934026	The cursor changes frequently from the hour glass back to the pointer icon even when no operations are ongoing
934027	The drop box for the Activity Code can present data off the screen making it hard to select items
936226	All Well Risks defined as % are accounted for in last phase rather than being distributed to all phases
936245	AFE Generation opens WellCostResults.xls when it should open WellCostAFE.xls

 Go To "What's In This Release?"

## Well Cost Known Issues

The following Well Cost known issues for releases 5000.1.13 through 5000.15 are described below.

### Release 5000.15

Defect No.	Description
946010	Inconsistency in Monte Carlo Output Report and Well Cost Results for Cost

### Release 5000.14

Defect No.	Description
717514	Copy/Paste shifts data by two columns in the Offset Wells pane.
767546	Plot properties are not saved with the design.
918385	Percent (%) consequence calculates incorrectly if a risk well is included

### Release 5000.1.13

There were no additional Well Cost known defects for this release.

[Go To "What's In This Release?"](#)

## WellPlan™ Software

[Enhancements](#)[Fixed Issues](#)[Known Issues](#)

This section outlines the changes made to WellPlan™ software.

### WellPlan Enhancements and New Functionality

The WellPlan enhancements and new functionality for releases 5000.1.13 through 5000.15 are described below.

#### Release 5000.15

Enhancement	Description
926048	Parasite string Injection Rate cannot be greater than 4000 scfm
957489	Documentation: Include on the Installation Guide Russian Language configuration
951864	Side Force Calculation equation clarification
959763	Include formula for absolute tortuosity estimation
959818	Tool Joints or Standoff Device when calculating the Critical velocity
960022	WellPlan can only accept 12 lines on the travelling block
960171	Cementing System options in documentation
960367	Unable to see all the formations in Formation tops plot
961598	Hybrid Model - Missing Tool Joint Length from BHA components causes incorrect result on Effective Tension calculation
961966	Make Up torque in online help documentation
962045	Riserless Analysis Overview in help

#### Release 5000.14.1

WellPlan software enhancements for 5000.14.1 include the following:

- Implementation of Locking Node Functionality in the Well Explorer
- Improved legend for the BHA Drill ahead (Plan and Vertical Section)
- Upgrade BHA Analysis Calculation for 1000 nodes (FEA)

 Go To "What's In This Release?"

- Expose Mesh Properties

## **Release 5000.14**

### **Cementing Module**

The Cementing module can be used to optimize cementing operations and minimize the possibility of costly cementing errors. This dynamic computer modeling tool simulates what happens in the well during cementing operations, providing insight into potential problems and their remedies.

The Cementing module calculates the impact of complex well conditions and changes in the slurry during operations based on the user-defined downhole conditions and cementing-related input parameters. It also calculates, reports, and plots various conditions that can help provide success and avoid failure of the cementing design. You can adjust the inputs and repeat the analysis to optimize the design. Stages and events can be defined for cementing jobs.

Some highlights of the Cementing Module include:

- Interactive Schematics help you to do the Fluid Job Schedule and its parameters details
- Fluid Job Animation on schematics and plots with embedded controls.
- Effect of temperature from the geothermal gradient and drilling fluid circulation.
- Time & Volume Plots allow to plan, monitor, correct and optimize the full Cementing Operation and adjustments can be done to the operation or fluids parameters and re-run the scenario.
- Monitor the ECD and Pressure for the zone(s) of interest during simulation.
- Jobs with Foamed Fluids
- Scenarios of jobs with inner string and Riserless can be modeled
- Support for vertical, deviated and horizontal wells.

### **Available Analysis Outputs:**

The following Plots and tables have been added under the Cementing Module

- Fluid Job Schematic
- Fluid Job Grid
- Fluid Position Animation

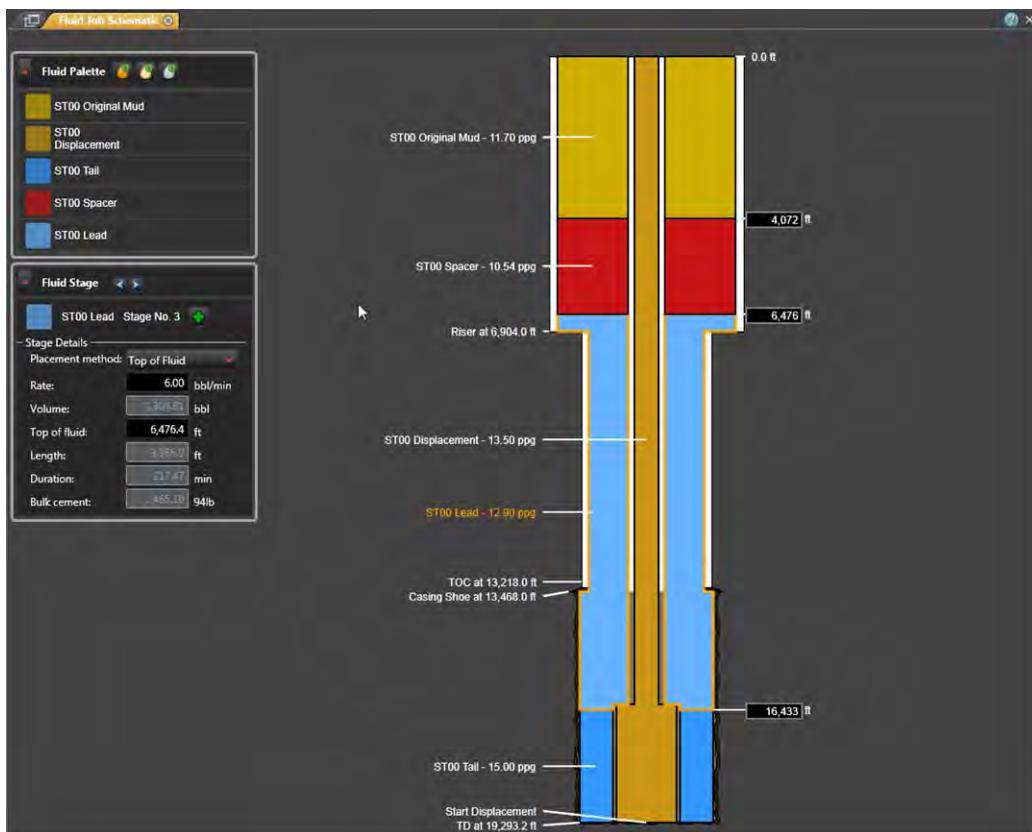
 Go To "What's In This Release?"

- Calculated Wellhead/ Surface Pressure
- Rate in & Rate Out
- Hydrostatic Pressure
- ECD
- Hook Load Simulation
- Final Density and Gradient
- Down hole Pressure Profile
- Erodibility Profile
- Flow Potential Factor
- Temperature Profile
- Pressure to Break Circulation
- Foam Schedule
- Nitrogen Rate
- Quality

[Go To "What's In This Release?"](#)

## Fluid Job Schematic

This input page provides a partial visual illustration of the wellbore by displaying hole sections and fluid distributions. This interactive schematic is used to define the final stage of the fluid placement in the wellbore. The fluid profile defined here is used by the cementing module for calculations. If no fluid placement is defined, the active fluid is used wherever appropriate.



[Go To "What's In This Release?"](#)

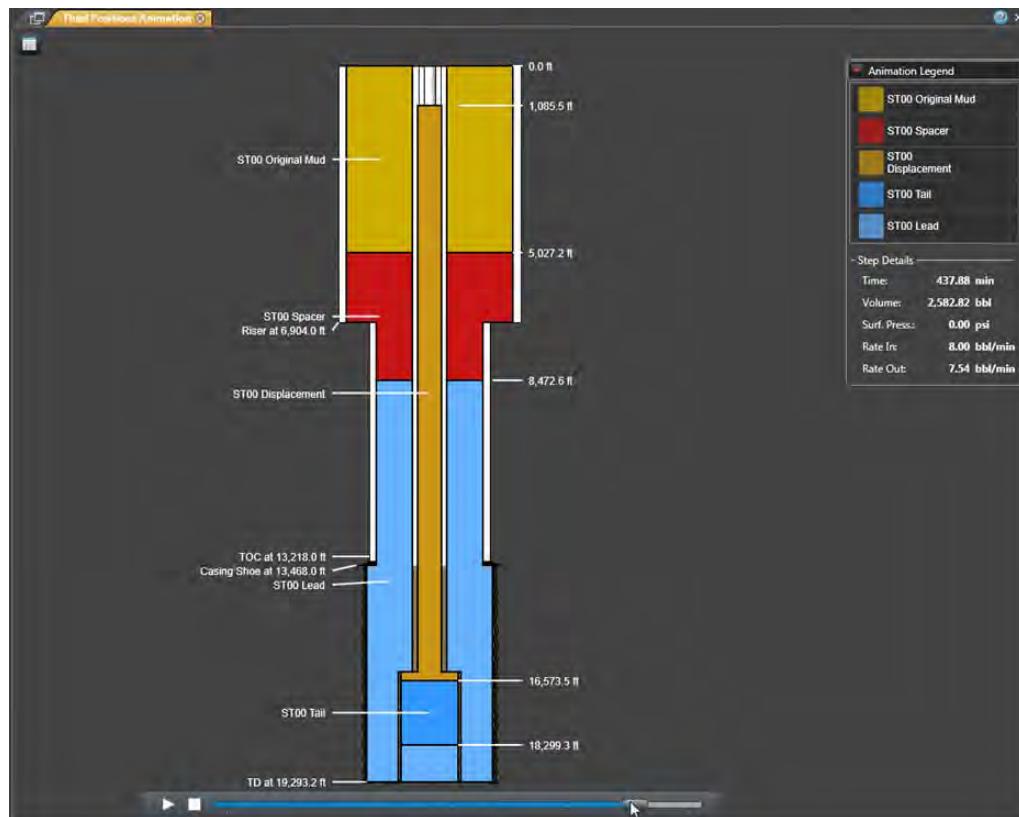
## Fluid Job Grid

The Fluid Job Grid is a tabulation of the following parameters arranged column-wise: Stage No; New Stage; Fluid Type; Fluid; Placement Method; Rate; Volume; Top of Fluid; Length; Duration and Bulk Cement.

Stage No.	New Stage	Fluid Type	Fluid	Placement Method	Rate (bbl/min)	Volume (bbl)	Top of Fluid (ft)	Length (ft)	Duration (min)	Bulk Cement (94lb sacks)
1		Drilling Fluid (Mud)	ST00 Original Mud		4.00	0.00	0.0	4,072.0	0.00	
2		Spacer	ST00 Spacer	Volume	5.00	763.00	4,072.0	2,404.4	152.60	
3		Cement	ST00 Lead	Top of Fluid	6.00	1,304.81	6,476.4	9,956.9	217.47	1,465.19
4		Cement	ST00 Tail	Bulk & Yield	7.00	192.34	16,433.3	2,859.9	27.48	359.98
Start Displacement										
5		Mud	ST00 Displacement		8.00	643.73	0.0	19,293.2	80.47	

## Fluid Position Animation

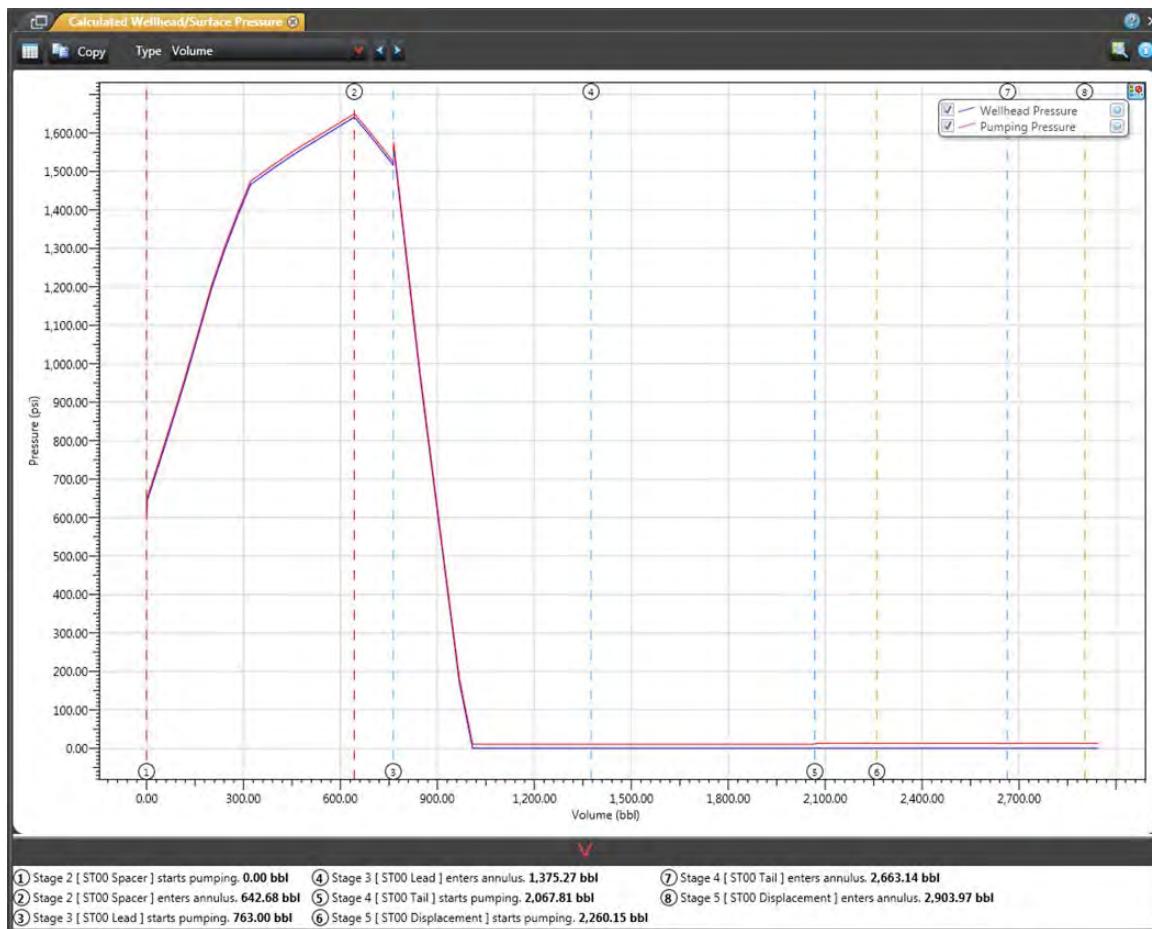
The Fluid Positions Animation provides an animated illustration of the cement job along with dynamically updating Step Details.



[Go To "What's In This Release?"](#)

## Calculated Wellhead/ Surface Pressure

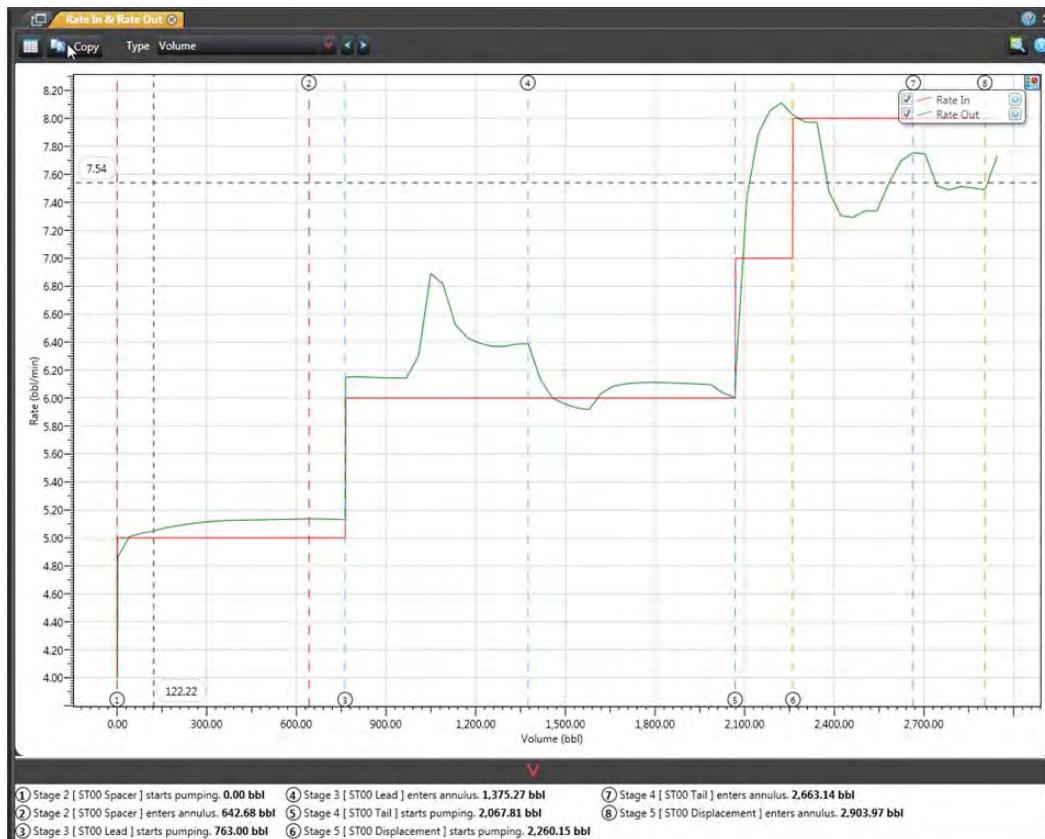
The calculated wellhead pressure graph reflects pressure changes as fluids with different densities are pumped through the well at varying rates. The calculated wellhead pressure is lower than pump pressure due to the hydrostatic head, and due to the friction in the lines between pump head and cementing head.



[Go To "What's In This Release?"](#)

## Rate in & Rate Out

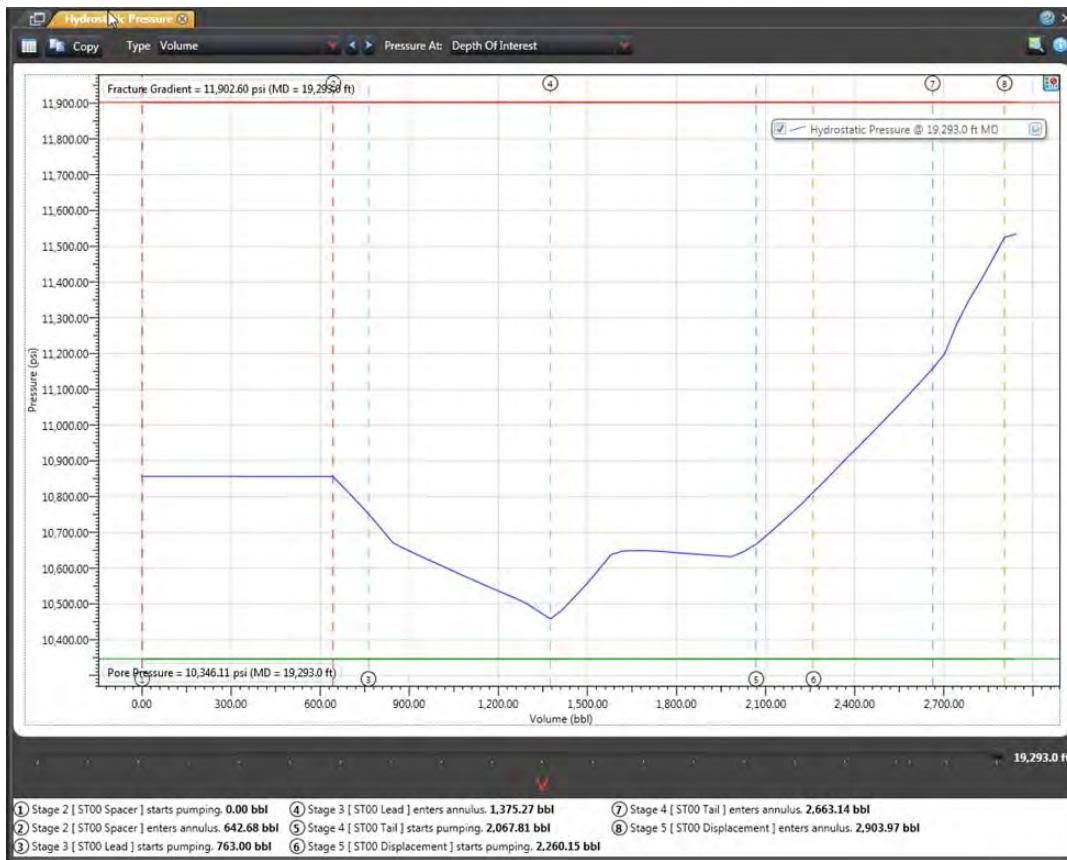
This plot displays the total annular return rate and corresponding pump rate versus the fluid pumped into the well (a comparison of the volume of material pumped in with the volume coming out of the well).



[Go To "What's In This Release?"](#)

## Hydrostatic Pressure

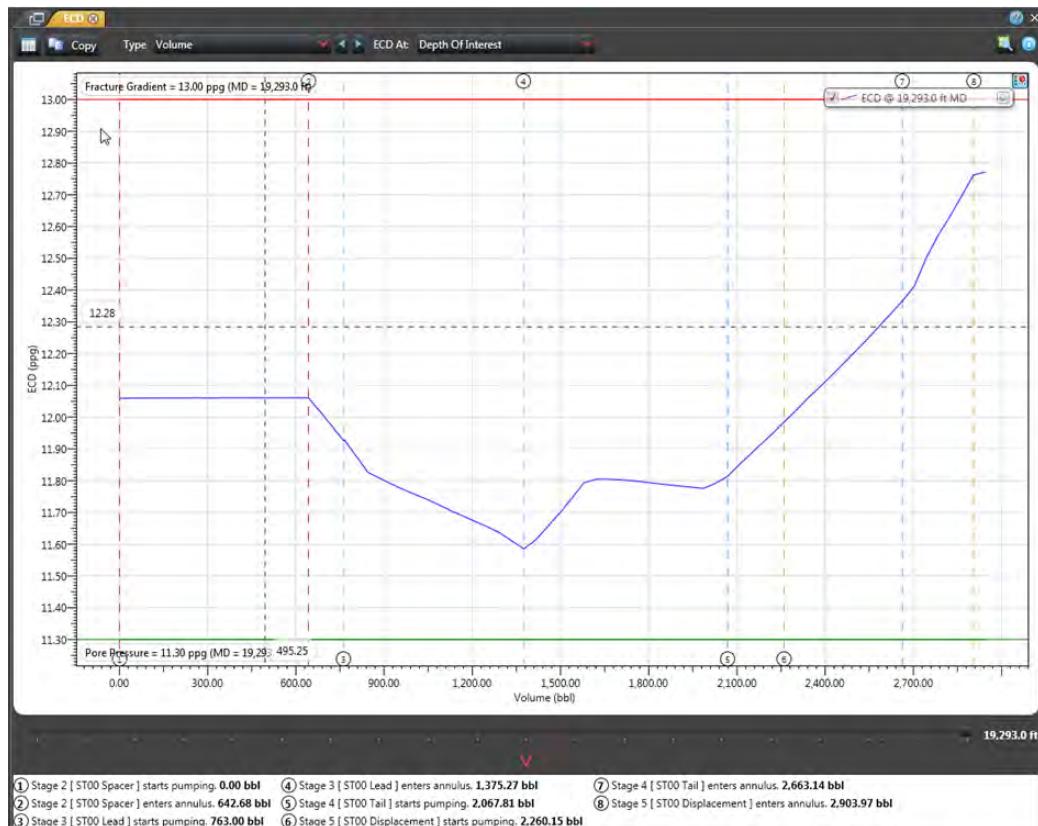
This plot shows the downhole annular pressures versus fluid volume pumped or time at a given Measured Depth. Reference lines for fracture gradient and reservoir pressure are also shown.



[Go To "What's In This Release?"](#)

## ECD

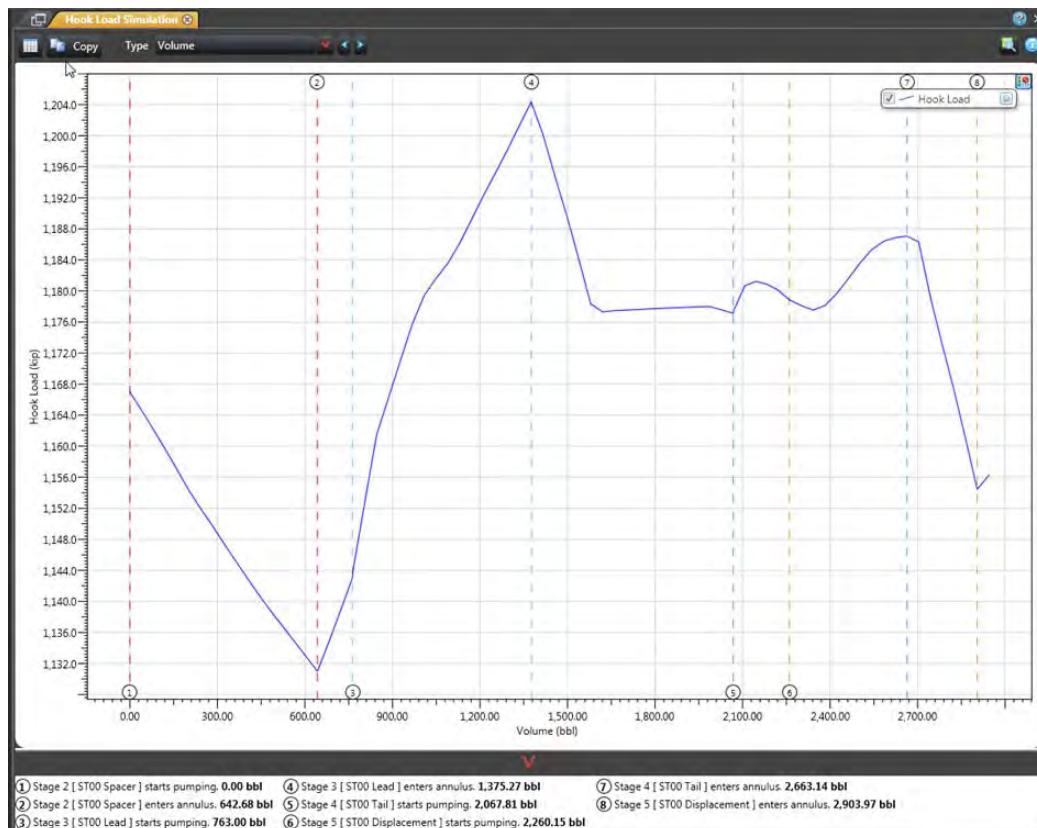
This plot can be used to visualize ECD (Equivalent Circulating Density) versus time or volume of the fluid pumped.



[Go To "What's In This Release?"](#)

## Hook Load Simulation

This plot displays a prediction of the expected hook load during the job. The first point represents the predicted hook load observable while conditioning the mud.



[Go To "What's In This Release?"](#)

## Final Density and Gradient

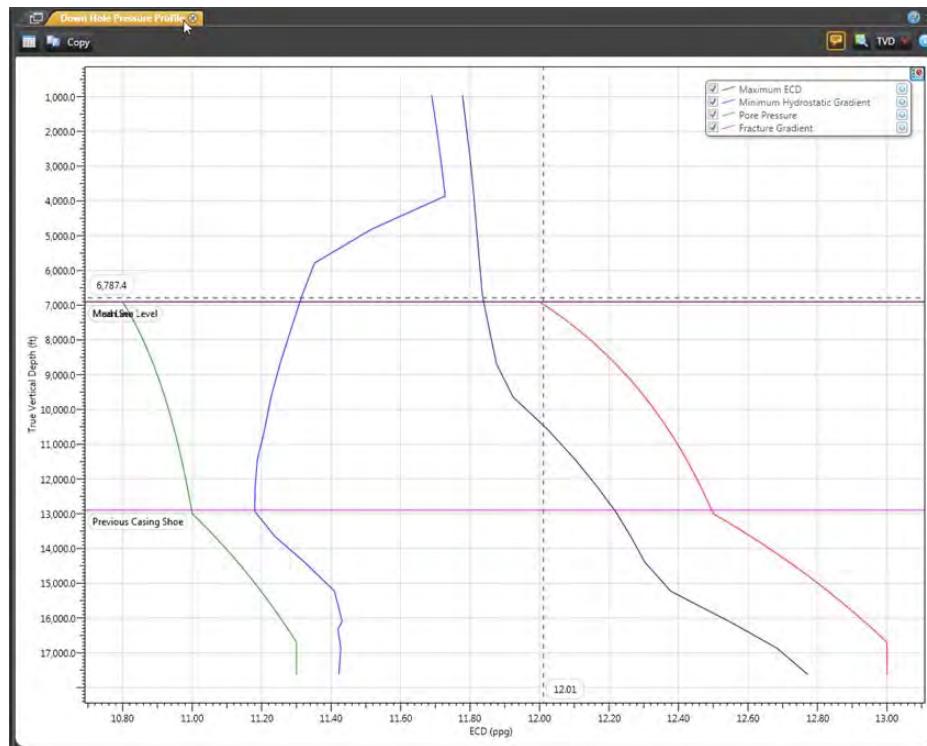
A prediction of the final, in-place down-hole fluid density and hydrostatic profiles vs. depth is displayed. The density portion of this plot was designed with foam cementing in mind. This plot shows the density at every depth. In other words, the user can get a more complete view of the foam final densities.



[Go To "What's In This Release?"](#)

## Down hole Pressure Profile

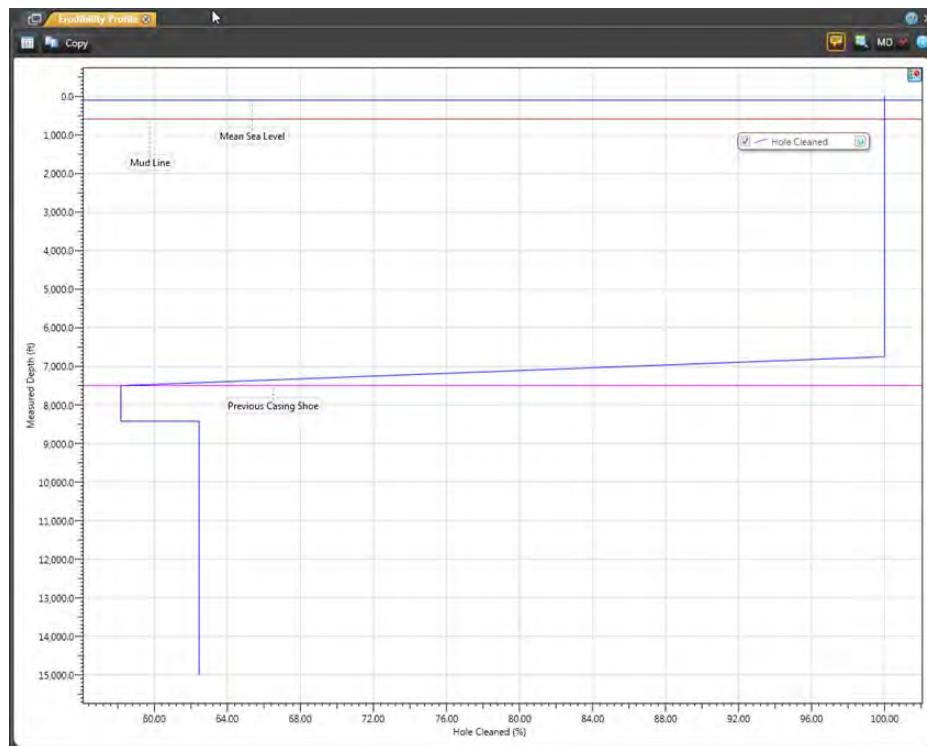
This graph compares the entered Pore Pressure Gradient with the calculated Minimum Hydrostatic Gradient, and the entered Fracture Gradient with the calculated Maximum ECD.



[Go To "What's In This Release?"](#)

## Erodibility Profile

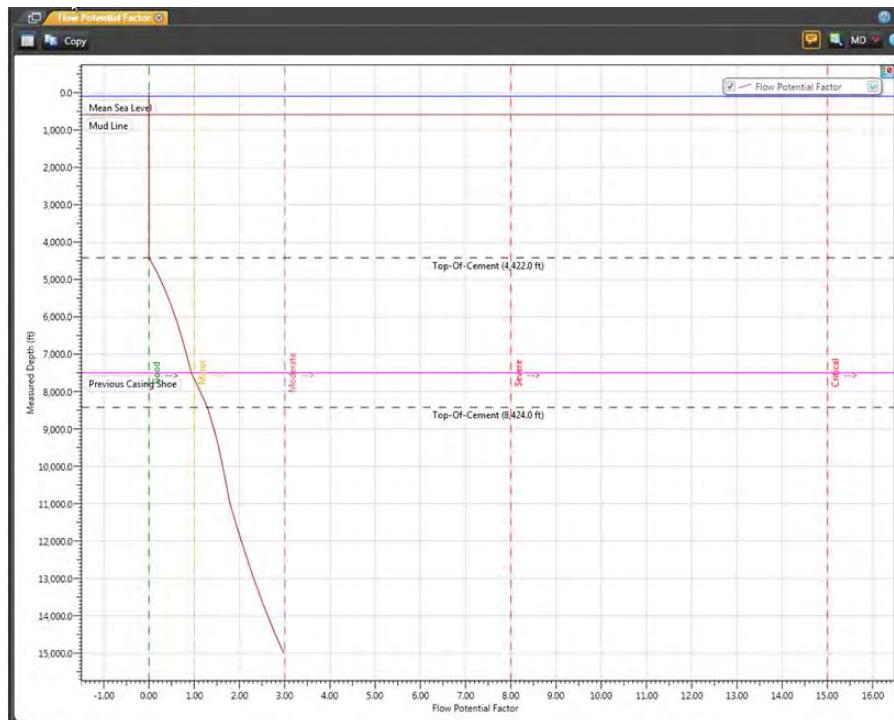
This plot displays a prediction of the job quality. It helps understand how effective the job design has been at getting the mud out of the annulus. The horizontal axis is labeled Hole Cleaned (%) but it can be also thought of as Displacement Efficiency (%).



[Go To "What's In This Release?"](#)

## Flow Potential Factor

Flow potential reflects the potential of the fluid to flow through the annular cement column. The flow potential is calculated based on the Measured Depth of the Reservoir Zone.



[Go To "What's In This Release?"](#)

## Temperature Profile

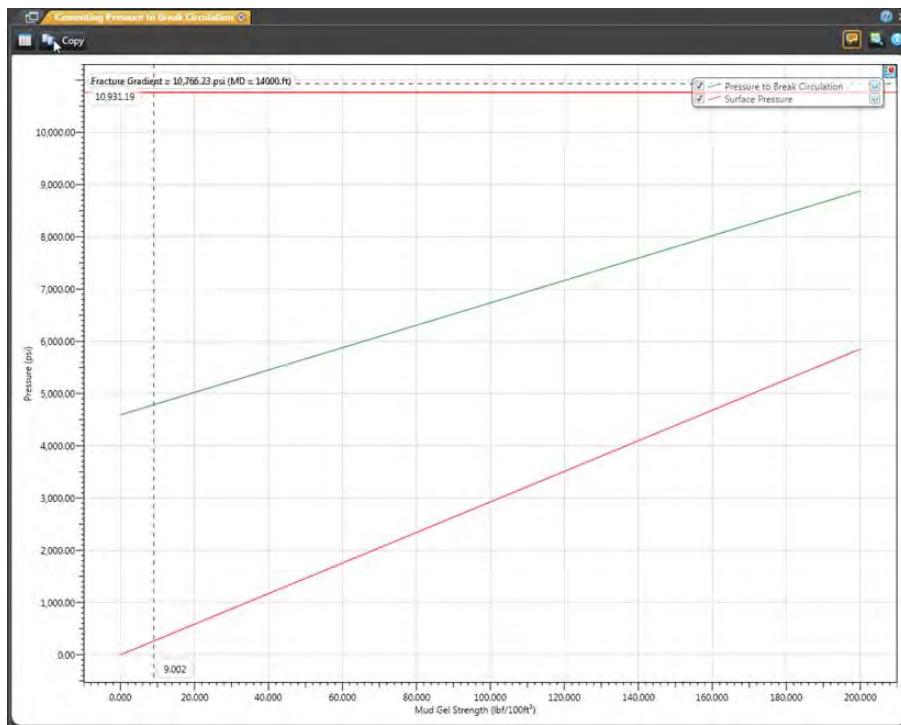
Use this plot to visualize temperature variations in the wellbore with respect to depth. The resulting temperatures are used to calculate gas pressures and volumes without modifying the density or rheology parameters of the drilling mud.



[Go To "What's In This Release?"](#)

## Pressure to Break Circulation

The Pressure to Break Circulation plot can be utilized to determine the pressure required to break the gel for various gel strengths.



## Foam Schedule

The Foam Schedule plot can be used to determine the volume of the unfoamed slurry, nitrogen ratios for dynamic placement, initial nitrogen ratio and volume calculations, modification of nitrogen ratio optimization, improvised down-hole density control ramping, hydrostatic pressure calculation with foamed fluids, and optimal stress protection for foamed cements determination. The Foam Setup button can be used to launch the Foam Setup window containing the Foam Calculation Method and details of the foamable stages.

[← Go To "What's In This Release?"](#)

Stage No.	Fluid	Foamed?	Top of Fluid (ft)	Length (ft)	Liquid Volume (bbl)	Adj. Liquid Volume (bbl)	Gas Conc. (scf/bbl)	Adj. Gas Conc. (scf/bbl)	Nitrogen Rate (scfm)	Density at Top (ppg)	Density at Bottom (ppg)
1 2	12 PPG Kill Mud	N/A	2,172.5	492.5	500.00					12.00	12.00
2 3	16.5 PPG Reg Spacer	N/A	2,665.0	247.2	158.64					16.50	16.50
3 4	16.94 PPG Perm+DWFS+ZS	✓	2,912.2	1,050.2	158.71	158.71	381.314	381.314	2,287.88	11.48	12.56
4 5	16.94 PPG Perm+DWFS+ZS	✓	3,962.4	677.8	106.06	106.06	198.845	198.845	1,193.07	14.30	14.69
5 6 - 1	16.94 PPG Perm+DWFS+ZS	✓	4,640.2	96.5	14.38	14.38	285.701	285.701	1,428.50	13.91	13.96
6 6 - 2	16.94 PPG Perm+DWFS+ZS	✓	4,736.7	156.3	21.83	21.83	390.918	390.918	1,954.59	13.15	13.25
7 7	8.54 PPG SeaWater	N/A	0.0	4,893.0	223.97					8.54	8.54

**Foam Calculation Method**

- Constant or staged gas flow
- Constant density

**Foamable Stages:**

Stage No.	Fluid	Foamed?	Volume (bbl)	Top of Fluid (ft)	Total Length (ft)
1 4	16.94 PPG Perm+	✓	233.55	2,912.2	1,050.2
2 5	16.94 PPG Perm+	✓	126.42	3,962.4	677.8
3 6 - 1	16.94 PPG Perm+	✓	18.00	4,640.2	96.5
4 6 - 2	16.94 PPG Perm+	✓	29.15	4,736.7	156.3

**Foam details for selected stage: 4**

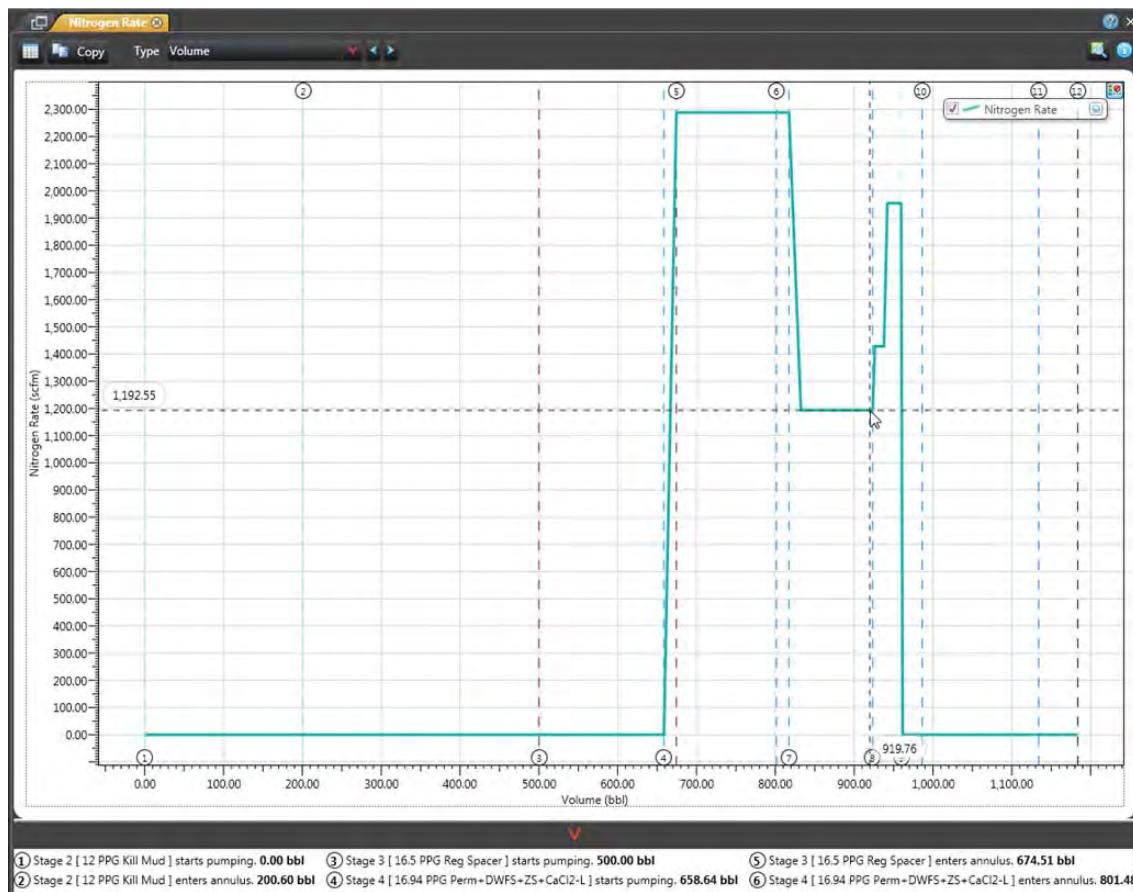
Length (ft)	Foamed?	Foam Density (ppg)	Quality (%)	New Gas Conc?
1,050.2	✓	12.00	31.81	✓

Calculate Cancel

[Go To "What's In This Release?"](#)

## Nitrogen Rate

This plot displays Nitrogen Rate versus Volume pumped into the well and is applicable to foamed jobs only.



[Go To "What's In This Release?"](#)

## Quality

This graph displays the foam quality changes as varying fluids are being pumped through the well. The quality is expressed in the graph using percentages. The optimum range varies between 18% and 38%.



## Stuck Pipe Module

The Stuck Pipe Module can be used to determine the location of the stuck pipe, the overpull possible without yielding the pipe, the measured weight required to set the jars and the surface action required to achieve the desired conditions at the backoff point. It can be used to facilitate Stuck Pipe analysis, using which, the forces acting on the string at the stuck point can be calculated.

Using the Stuck Pipe Module is superior to hand calculations because hand calculations assume the wellbore is vertical, frictionless and that the drill string is all drill pipe. The Stuck Pipe Module includes the frictional effects of the drill string

 Go To "What's In This Release?"

in a three-dimensional wellbore and adjusts for stretch when the string is buckled. Stuck Pipe uses the Torque Drag Analysis calculations, including equilibrium equations and stress, stretch and buckling calculations. Yield load limits are based on the calculated effective yield stress.

Some highlights of the Stuck Pipe Module are:

- Use of Enhanced schematics to better visualize the area where the pipe is stuck.
- Auto calculated Measured weight when stuck
- Computation of the Stuck point or Analysis where the stuck point MD is given

Available Analysis Outputs:

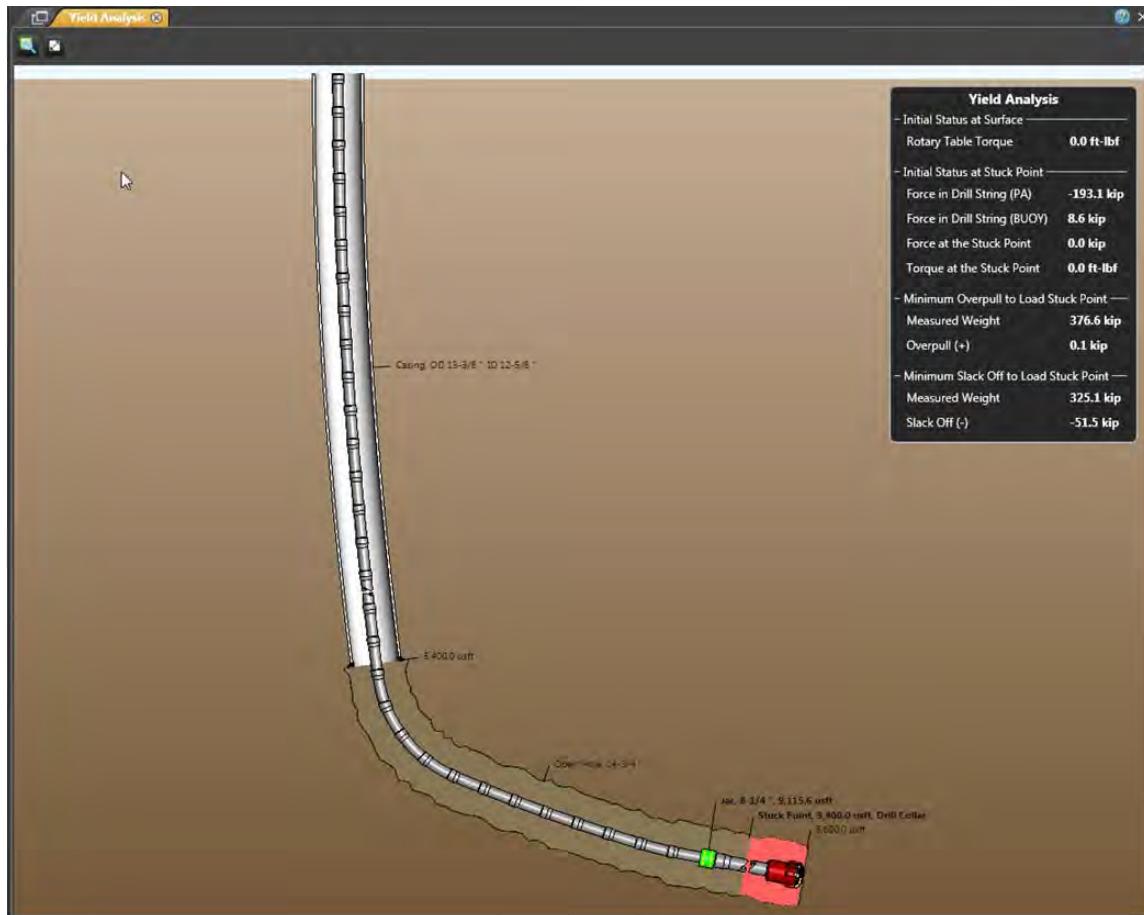
The following Plots and tables have been added under the Stuck Pipe Module

- Yield Analysis
- Applied Force Plot
- Yield Analysis Details
- Jar Operation Analysis
- Backoff Analysis

[Go To "What's In This Release?"](#)

## Yield Analysis

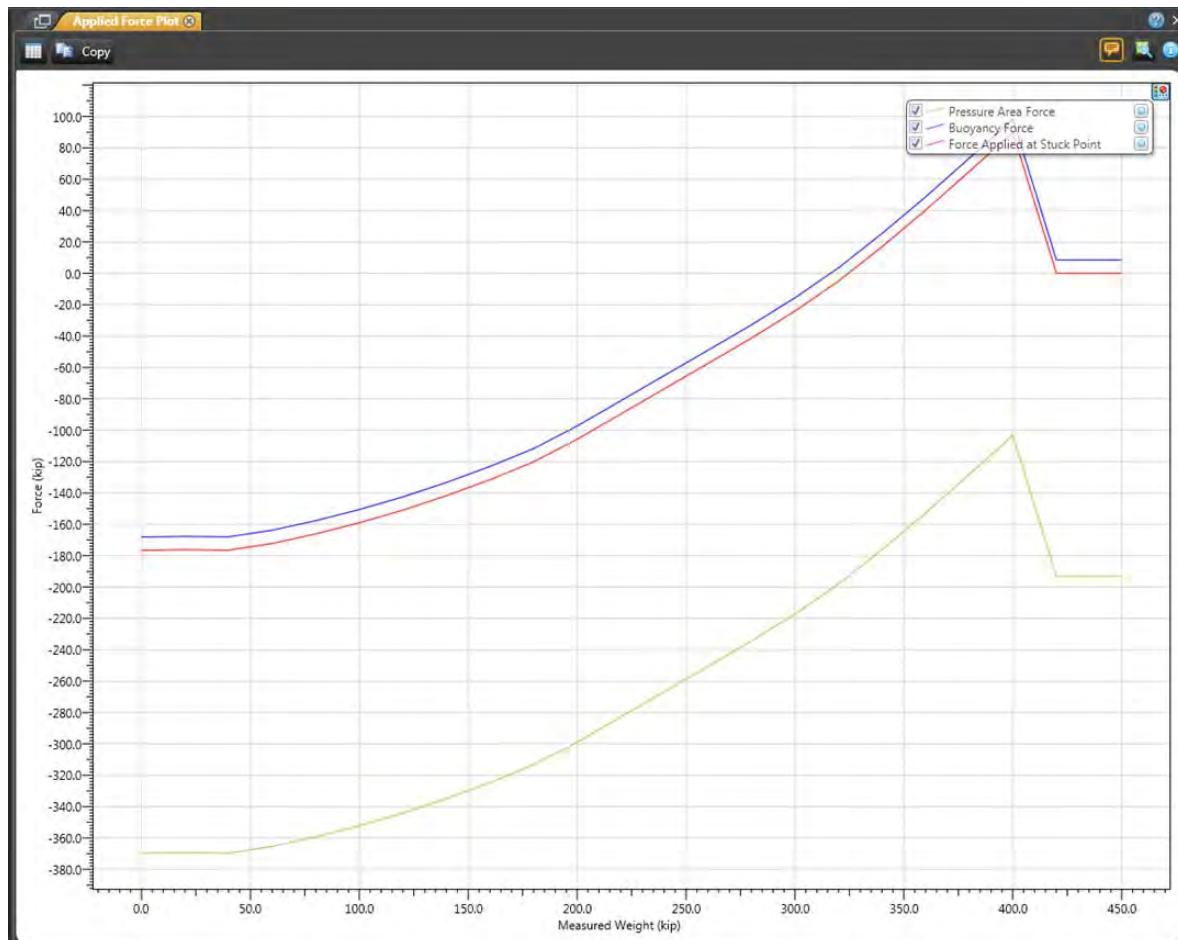
The Yield Analysis schematic provides a visual illustration of the string relative to the subsurface and facilitates Yield Analysis of the Stuck Pipe.



[Go To "What's In This Release?"](#)

## Applied Force Plot

This plot displays axial force at the stuck point (calculated by both the pressure area and the buoyancy methods) over the measured depth range and facilitates Yield Load Analysis.



[← Go To "What's In This Release?"](#)

## Yield Analysis Details

Yield Analysis Details summarizes the Applied Measured Weight, Maximum Rotary Torque, Overpull/Slackoff, Yield Point, Force in String and Stuck Point.

**Yield Analysis Details**

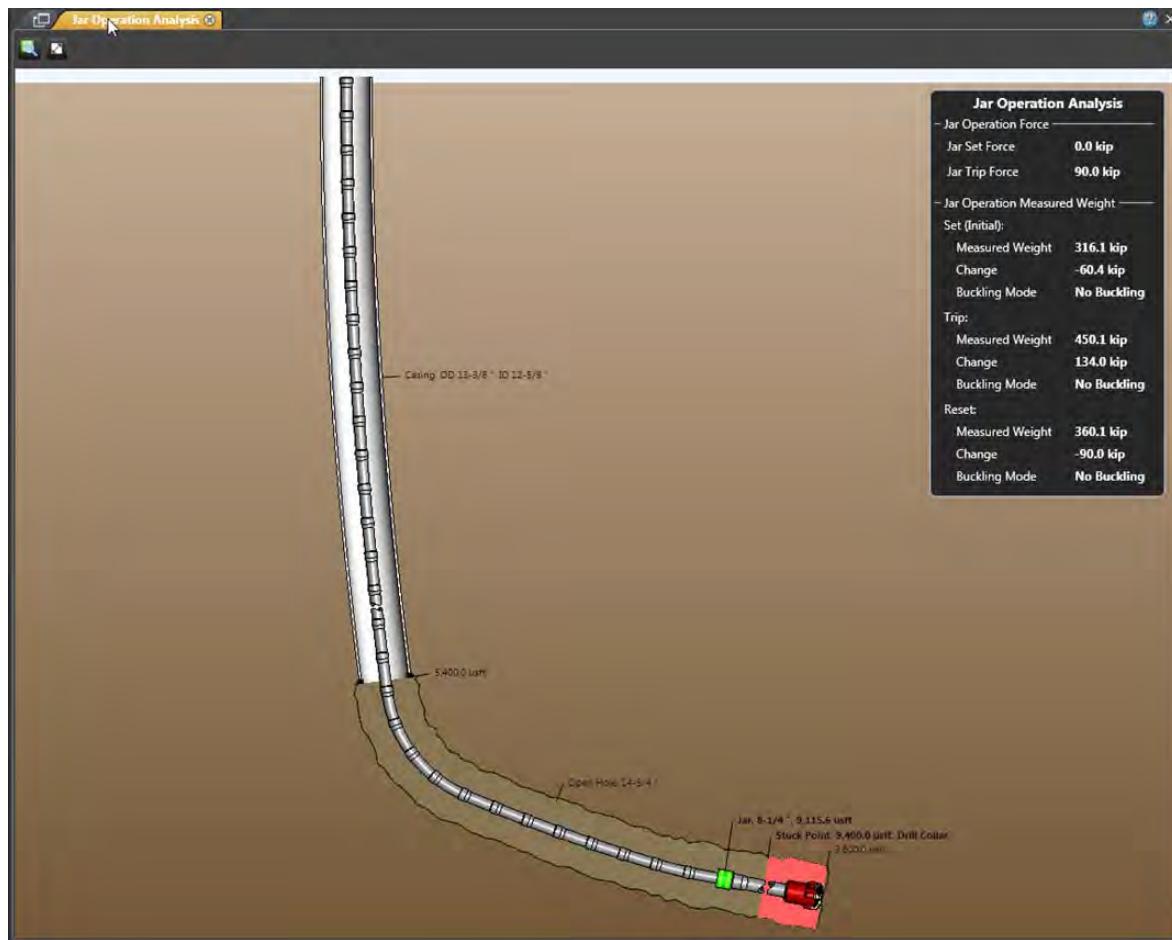
**Copy**

Applied Measured Weight (kip)	Maximum Rotary Torque (ft-lbf)	Overpull (+) / Slack Off (-) (kip)	Yield Point		Force in Drill String		Stuck Point	
			Section	Measured Depth (usft)	Pressure Area (kip)	Buoyancy (kip)	Force (kip)	Buckling
0.0	106,003.5	-376.5	DP	0.0	-369.7	-168.1	-176.6	No Buckling
20.0	106,248.0	-356.5	DP	0.0	-369.3	-167.7	-176.2	No Buckling
40.0	106,416.9	-336.5	DP	0.0	-369.6	-168.0	-176.4	No Buckling
60.0	106,510.6	-316.5	DP	0.0	-365.4	-163.8	-172.2	No Buckling
80.0	106,529.3	-296.5	DP	0.0	-359.2	-157.6	-166.1	No Buckling
100.0	106,473.1	-276.5	DP	0.0	-352.2	-150.6	-159.0	No Buckling
120.0	106,341.8	-256.5	DP	0.0	-344.1	-142.5	-150.9	No Buckling
140.0	106,135.2	-236.5	DP	0.0	-334.9	-133.3	-141.8	No Buckling
160.0	105,852.8	-216.5	DP	0.0	-324.7	-123.1	-131.5	No Buckling
180.0	105,493.9	-196.5	DP	0.0	-313.3	-111.7	-120.2	No Buckling
200.0	105,057.9	-176.5	DP	0.0	-298.9	-97.3	-105.7	No Buckling
220.0	104,543.8	-156.5	DP	0.0	-282.8	-81.2	-89.7	No Buckling
240.0	103,950.3	-136.5	DP	0.0	-266.7	-65.1	-73.6	No Buckling
260.0	103,276.1	-116.5	DP	0.0	-250.6	-49.0	-57.5	No Buckling
280.0	102,519.7	-96.5	DP	0.0	-234.4	-32.8	-41.3	No Buckling
300.0	101,679.2	-76.5	DP	0.0	-217.2	-15.6	-24.0	No Buckling
320.0	100,752.5	-56.5	DP	0.0	-198.0	3.6	-4.9	No Buckling
340.0	99,737.1	-36.5	DP	0.0	-176.1	25.5	17.0	No Buckling
360.0	98,630.4	-16.5	DP	0.0	-152.8	48.8	40.3	No Buckling
380.0	97,429.3	3.5	DP	0.0	-128.2	73.4	65.0	No Buckling
400.0	96,130.1	23.5	DP	0.0	-103.2	98.4	89.9	No Buckling
420.0	94,729.0	43.5	DP	0.0	-193.1	8.6	0.1	No Buckling
440.0	93,221.1	63.5	DP	0.0	-193.1	8.6	0.1	No Buckling
450.0	92,425.6	73.5	DP	0.0	-193.1	8.6	0.1	No Buckling

[Go To "What's In This Release?"](#)

## Jar Operation Analysis

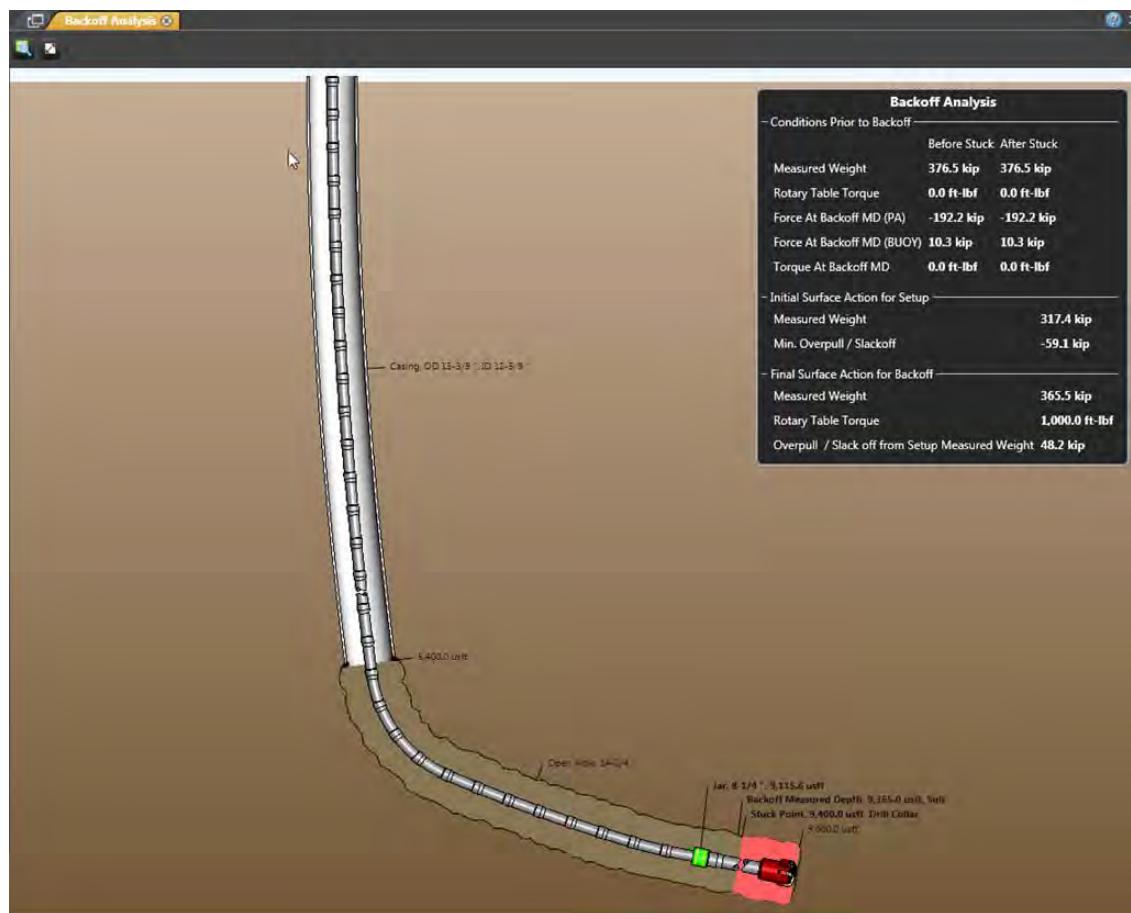
The Jar Operation Analysis schematic provides a visual illustration of the string relative to the subsurface and facilitates Jar Analysis of the Stuck Pipe.



[Go To "What's In This Release?"](#)

## Backoff Analysis

Backoff Analysis provides a visual illustration of the string relative to the subsurface and facilitates Backoff Analysis of the Stuck Pipe.



## BHA Dynamics

The BHA Dynamics module facilitates 3D analysis of the static bottom hole assembly configured according to various wellbore geometries at different inclinations and directions.

The BHA Dynamics Module is an evolved module merging the previous BHA Analysis and Critical Speed Analysis modules . This Module helps you to predict a range of rpms that may cause vibratory problems. In addition, it helps predict the directional drilling performance of bottom hole assemblies. The plots available under this module can be used for calculating the build, hold, drop tendencies of various assemblies, directional tendencies for predicting left or right hand walk

 Go To "What's In This Release?"

rate, and to perform Critical Speed Analysis. Contact forces at the bit, stabilizers, and collars are also calculated and can be used to determine the proper amount of stabilization needed.

The solution scheme uses a general purpose finite element program. Finite element analysis (FEA) is a relatively recent and very powerful technique used to solve field problems in various engineering fields.

Based on these assumptions, it is possible to predict the build and walk rates. As the bit progresses in the wellbore, forces are generated in three directions i.e., axially (hole axis), vertically (inclination axis), and horizontally (direction axis). In addition, bending characteristics of the bottom hole assembly confined in a wellbore will result in a bit tilt in both the inclination and azimuth axes. The interaction of these variables will determine the wellbore trajectory. The application calculates and displays all of these values for a given location.

Additionally, BHA Dynamics can be used to identify critical rotary speeds and areas of high stress concentration in the drill string. Results obtained can be used to avoid critical rotary speeds that accelerate pipe fatigue resulting in catastrophic drill string failure. The stresses calculated are relative (not absolute) and should be only used for locating critical frequencies.

The Drillahead solution is based on the following assumptions:

- The bit will drill in the direction in which it is pointed.
- The bit will cut sideways due to the presence of side forces generated in the inclination and direction axes.
- The formation has isotropic rock properties.

Some highlights of the BHA Dynamics Module are:

- Profile Schematic allows you to see the BHA displacements on the position
- Multitrack plot allows you to have a general view of the current situation
- Dual graphs for Vibrational Analysis in which the graph on the left side displays the variable to measure vs. RPM, while the graph on the right displays the Position (Distance from Bit) Phase Angle at the selected RPM
- Sensitivity Analysis is available for BHA Analysis and Vibrational Analysis

Available Analysis Outputs:

The following Plots and tables have been added under the BHA Dynamics Module

- BHA Plots:

 Go To "What's In This Release?"

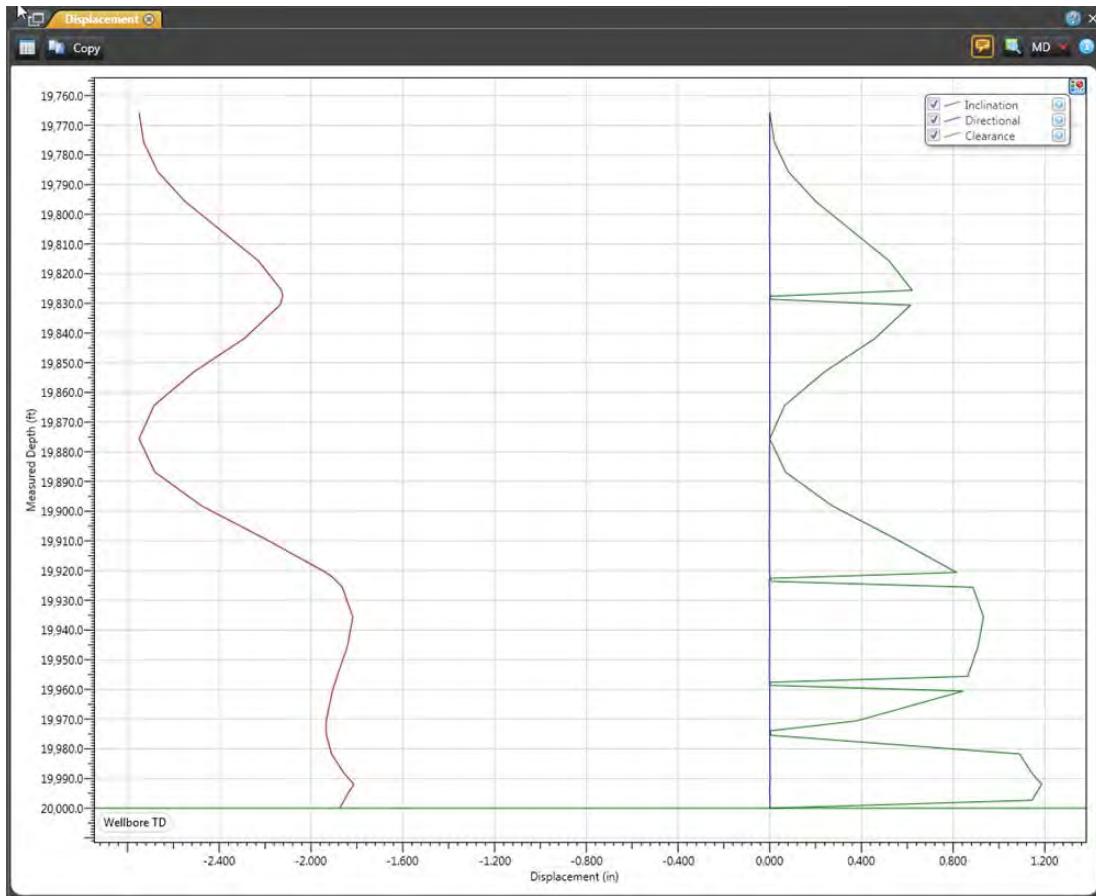
- Displacement
  - Side Force
  - Profile
  - Drill Ahead Plots: Vertical Section
  - Drill Ahead Plots: Plan View
  - Drill Ahead Plots: Inclination
  - Drill Ahead Plots: Azimuth
  - Drill Ahead Plots: Dogleg Severity
  - Drill Ahead Plots: Build
  - Drill Ahead Plots: Walk
  - Drill Ahead Plots: Predict Results
  - Quick Look
- Vibration Analysis
    - Stress Components
    - Displacements
    - Resultant Stresses
    - Shear Rate
    - Moments
    - Axial Force
    - Axial Displacement
    - Torque
    - Torsional Displacement

[Go To "What's In This Release?"](#)

- **BHA Plots**

### Displacement:

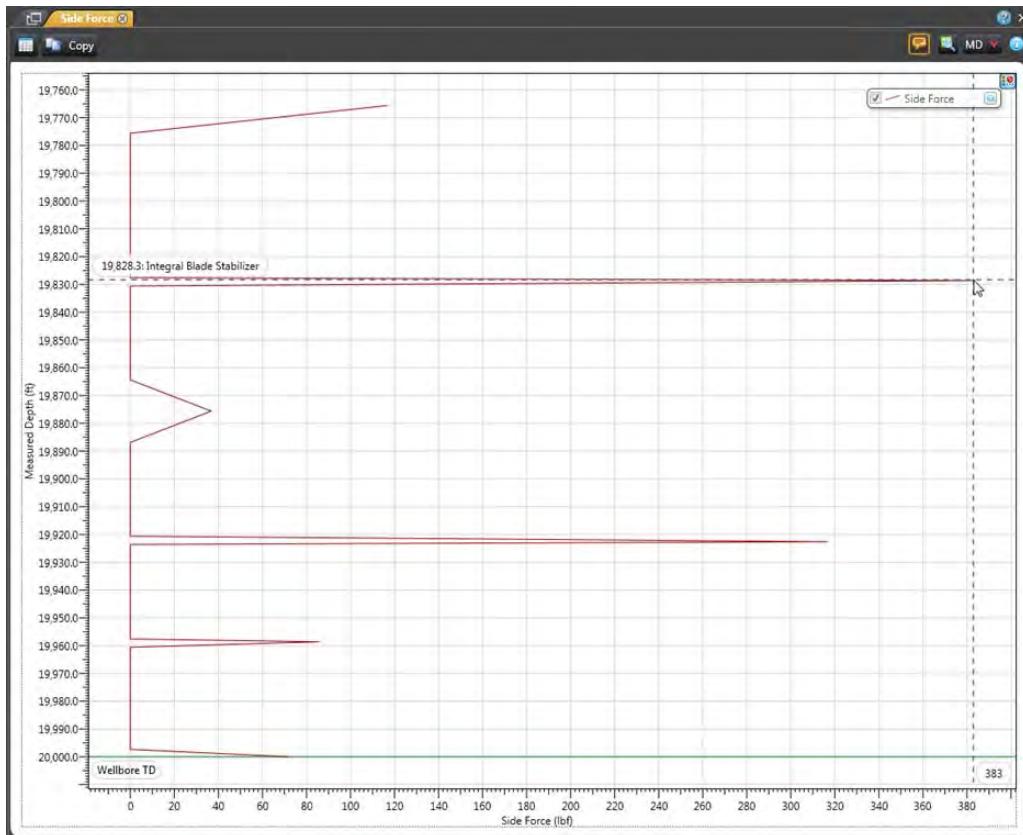
The BHA Analysis Displacement plot shows the relevant parameters in a graph of Measured Depth versus Displacement.



[Go To "What's In This Release?"](#)

### Side Force:

Plots the resultant forces (side force) versus the distance from bit. Use this plot to locate points along the well that may be subject to high forces. Identifying areas subject to high force can help prevent casing wear or development of key seats



[← Go To "What's In This Release?"](#)**Profile:**

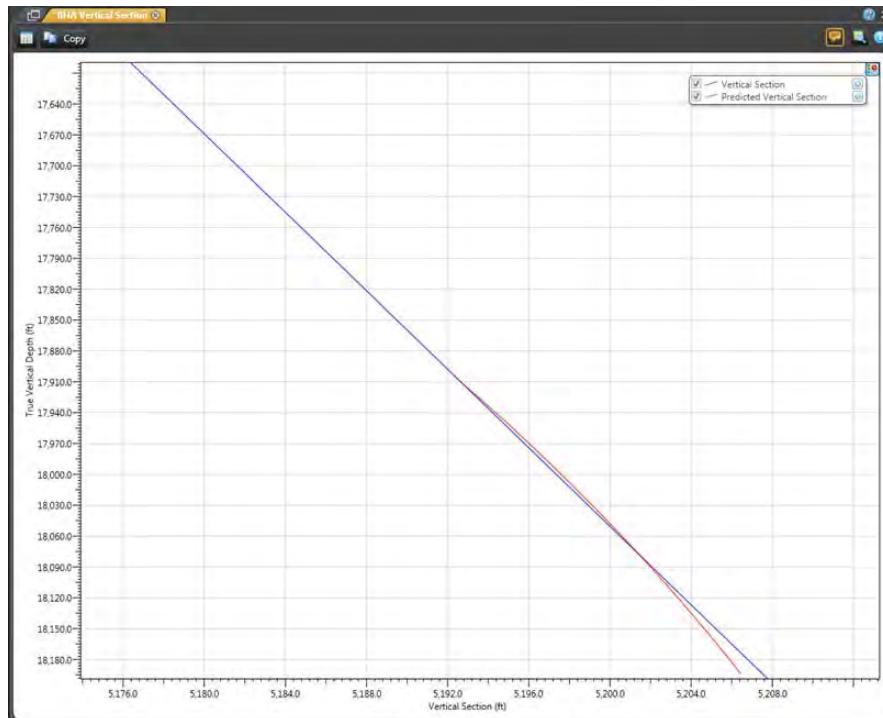
BHA Profile Plot determines the inclination and directional displacement of the BHA within the open hole as a function of measured depth. This plot shows the inner diameter, outer diameter, hole size, and the stabilizers (real and pseudo) that are making contact with the open hole.



[← Go To "What's In This Release?"](#)

## Drill Ahead Plots: Vertical Section

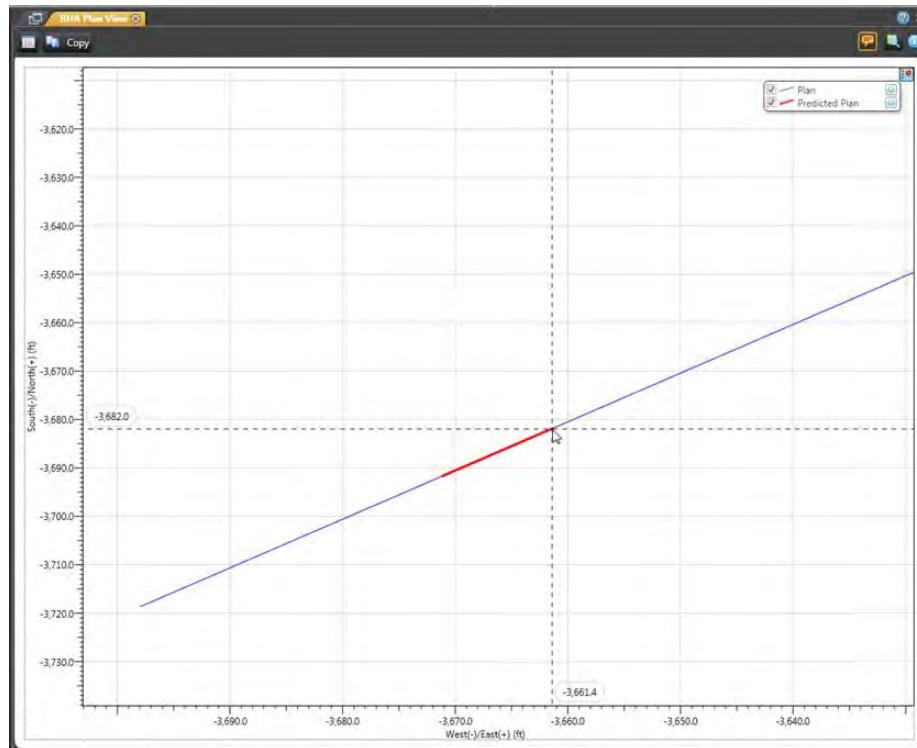
The Vertical Section predictive plot displays the elevation view of the wellpath. It is drawn based on the predicted Inclination and predicted Azimuth to facilitate Drill Ahead analysis. Prediction begins where the planned wellpath ends. Specifically, this plot displays vertical section vs. true vertical depth (TVD).



[Go To "What's In This Release?"](#)

## Drill Ahead Plots: Plan View

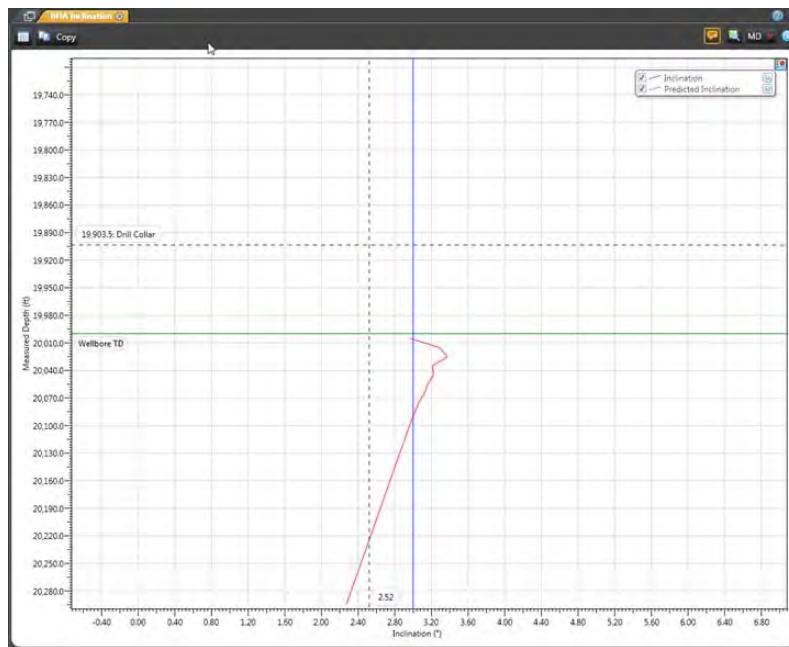
The Plan View predictive plot displays the plan view of the wellpath. It is drawn based on the predicted Inclination and predicted Azimuth to facilitate Drill Ahead analysis. Prediction begins where the planned wellpath ends. Specifically, this plot displays South/North cardinal directions vs. West/East cardinal directions.



[Go To "What's In This Release?"](#)

### Drill Ahead Plots: Inclination

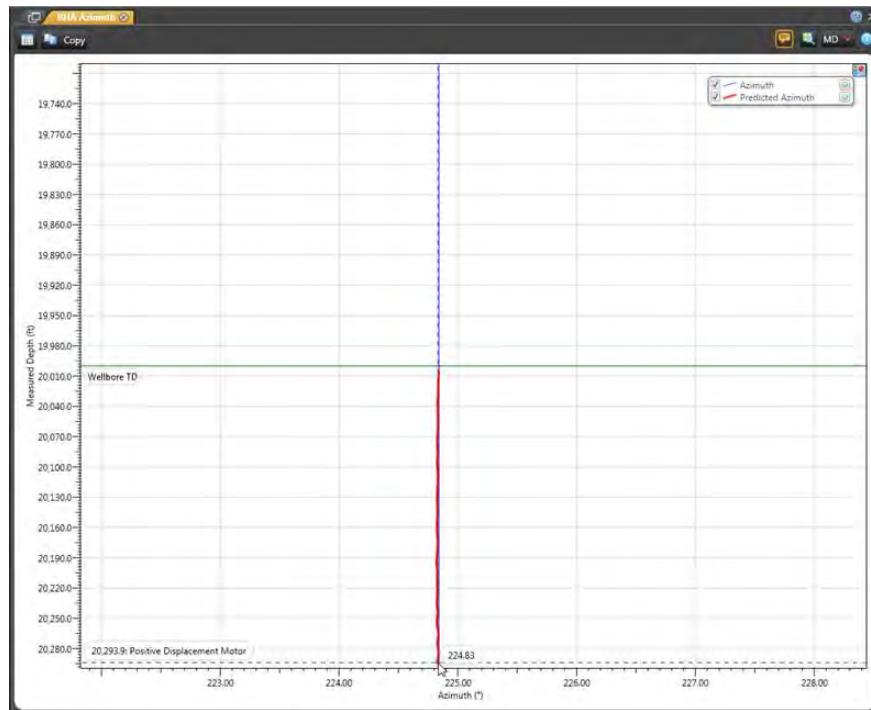
Use this drillahead BHA Inclination Predicted Plot to display the predicted wellbore inclination vs depth based on the data or data ranges entered.



[Go To "What's In This Release?"](#)

### Drill Ahead Plots: Azimuth

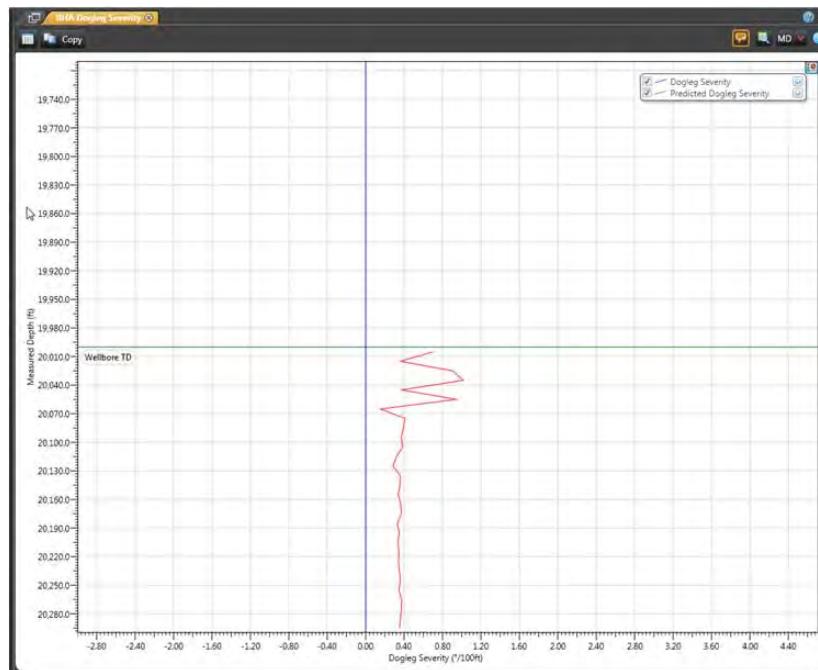
Use this BHA Azimuth Predicted drillhead plot to display the predicted wellbore azimuth vs depth based on the data or data ranges entered.



[← Go To "What's In This Release?"](#)

## Drill Ahead Plots: Dogleg Severity

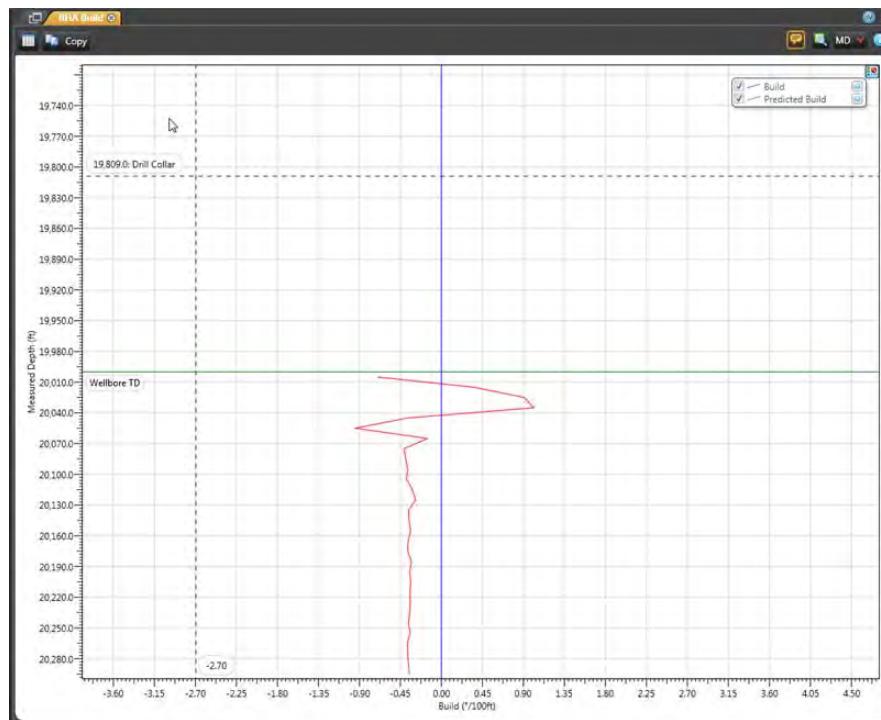
Use this BHA Dogleg Severity Predicted drillahead plot to display the predicted wellbore curvature or DLS vs depth based on the data or data ranges entered.



[Go To "What's In This Release?"](#)

## Drill Ahead Plots: Build

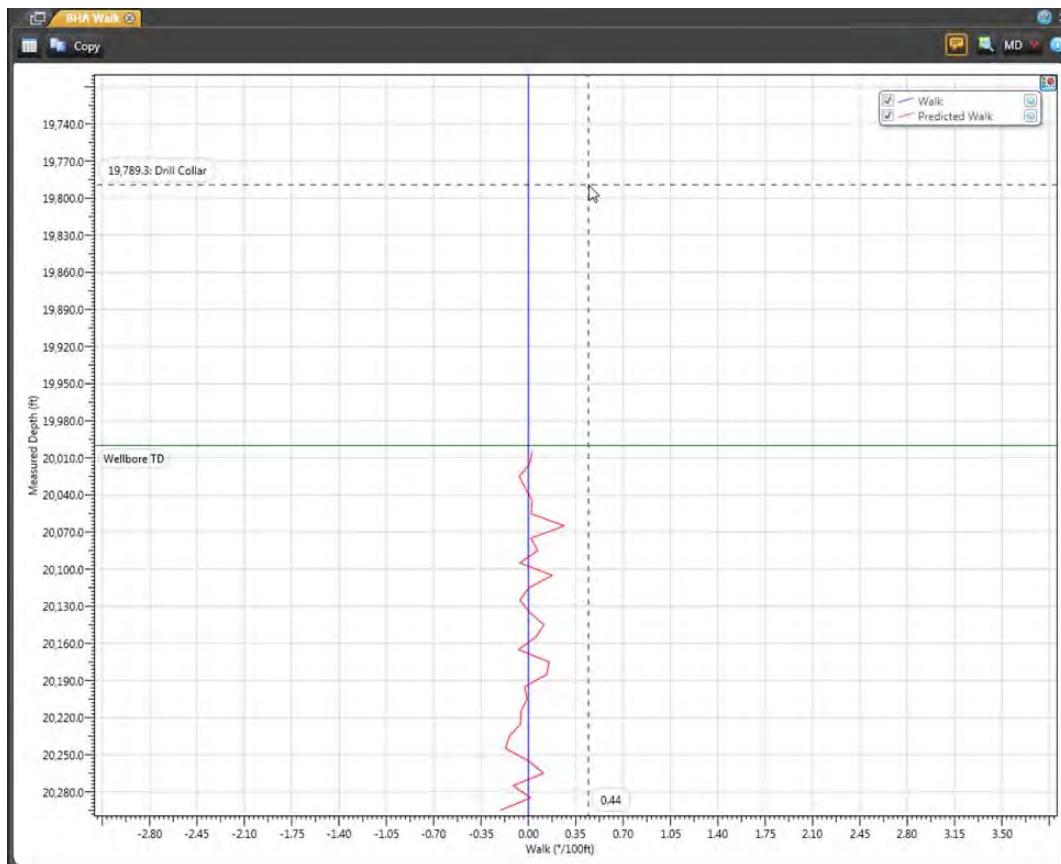
Use this BHA Build Predicted drillahead plot to display the predicted build rate vs depth based on the data or data ranges entered.



[Go To "What's In This Release?"](#)

## Drill Ahead Plots: Walk

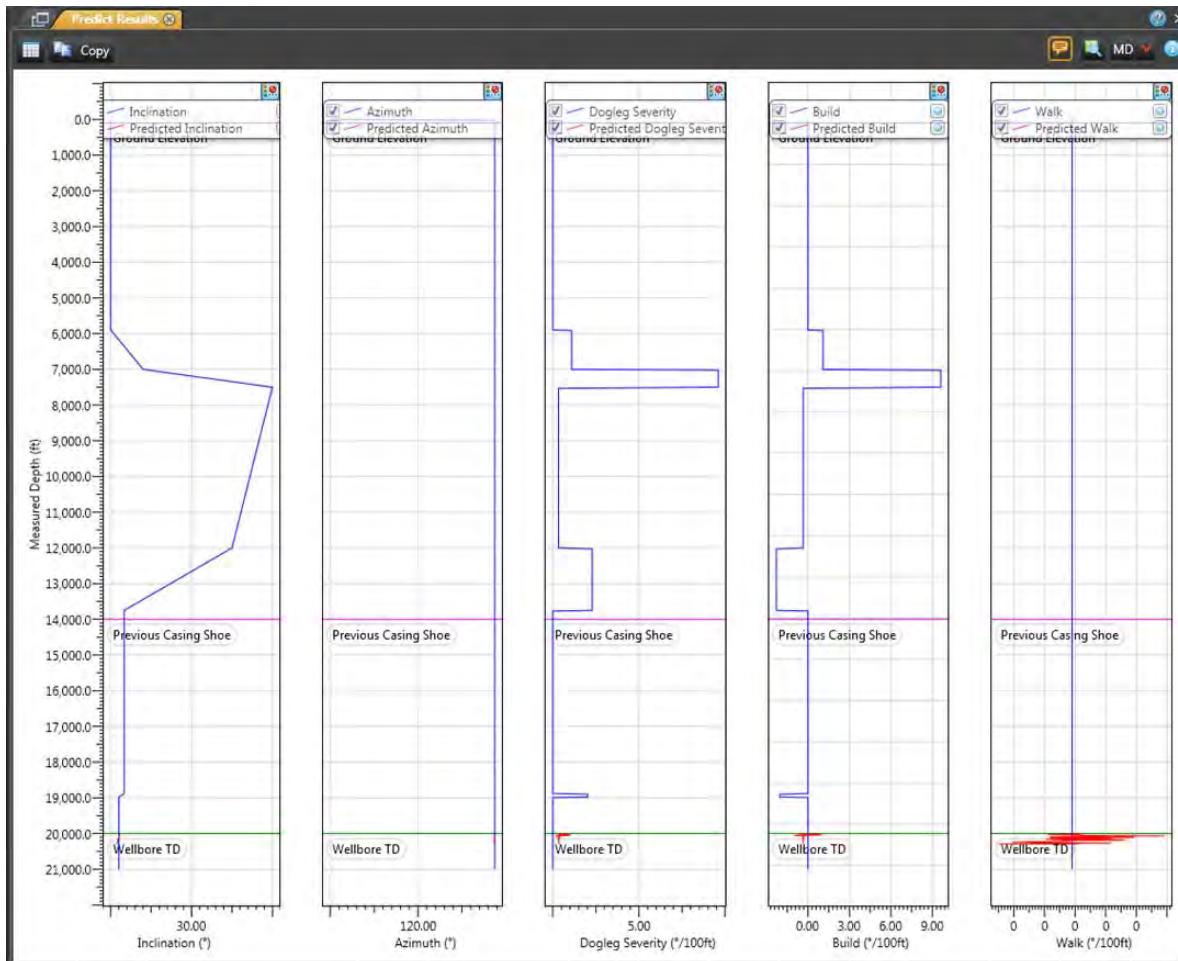
Use this drillahead plot to display the predicted walk rate vs depth based on the data or data ranges entered.



[Go To "What's In This Release?"](#)

## Drill Ahead Plots: Predict Results

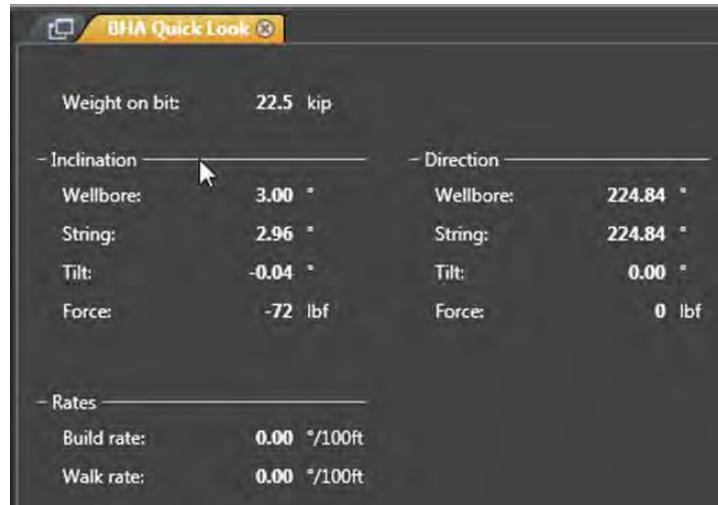
### BHA Predict Results Plot Information



[Go To "What's In This Release?"](#)

## BHA Quick Look

Information in the Quick Look table describes what is happening at the bit in the inclination and direction planes as well as build and walk rates.

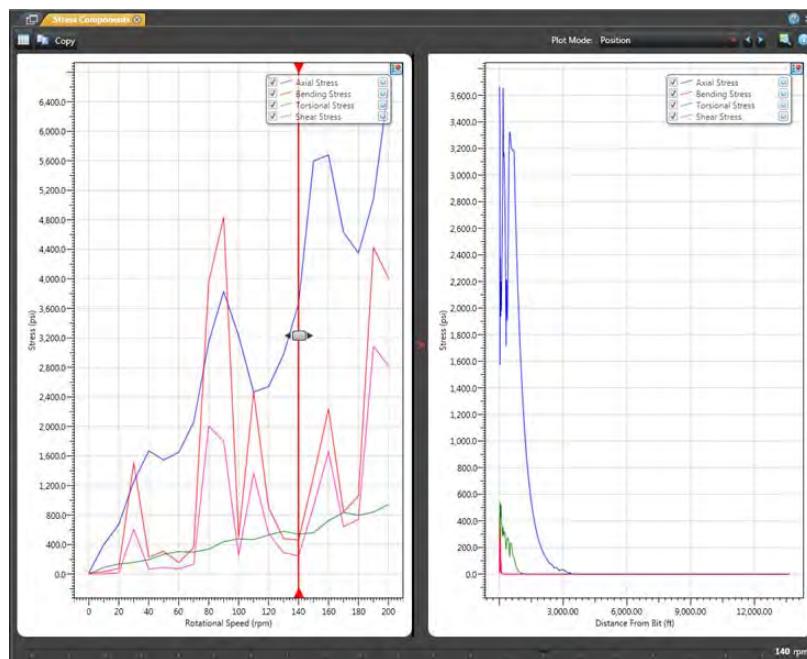


[Go To "What's In This Release?"](#)

- Vibration Analysis

### Stress Components:

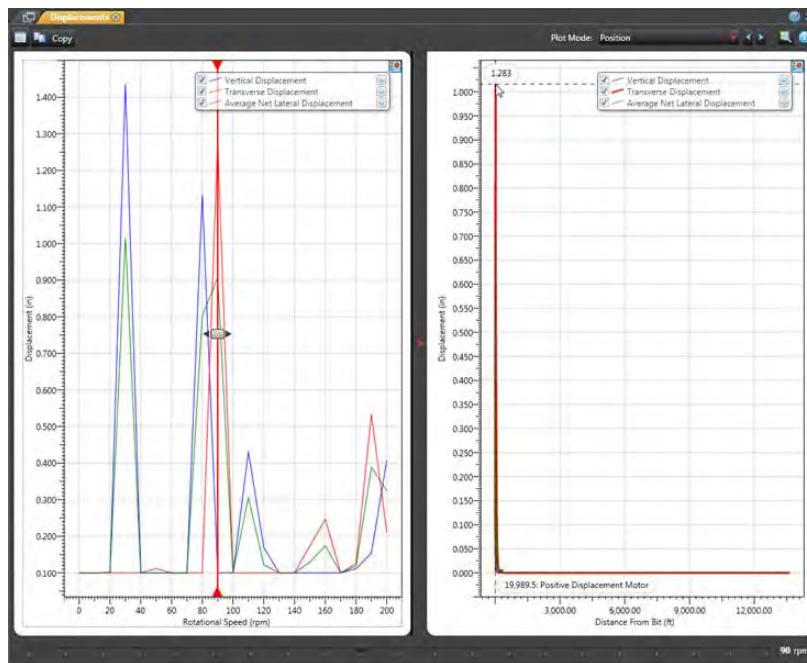
The Stress Components plot displays the maximum relative value of each of the four stress components: Axial Stress, Bending Stress, Torsional Stress and Shear Stress. You can switch on the plot area to RPM to identify the maximum stress at any given point on the string. You can determine the location in the string of the maximum relative value or Phase Angle to visualize the excitation force traveling up and down the string as the bit rotates.



[Go To "What's In This Release?"](#)

## Displacements:

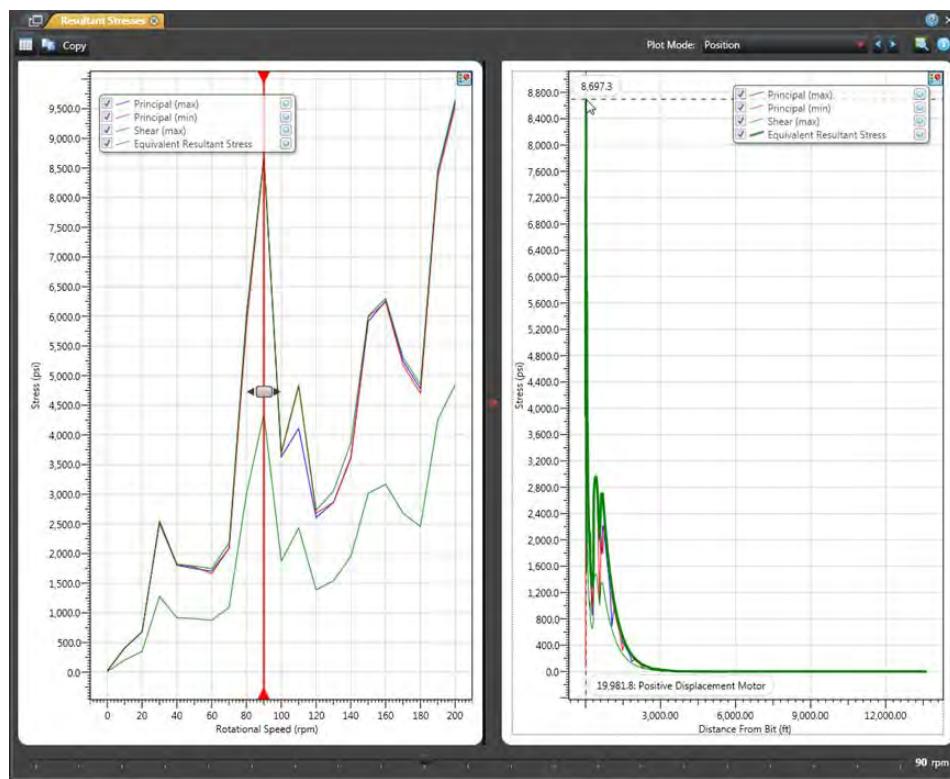
The Displacements plot displays the maximum relative displacement. You can switch on the plot area to RPM to identify the maximum displacement at any given point on the string. You can determine the location in the string of the maximum relative value or Phase Angle to visualize the excitation force traveling up and down the string as the bit rotates.



[Go To "What's In This Release?"](#)

### Resultant Stresses:

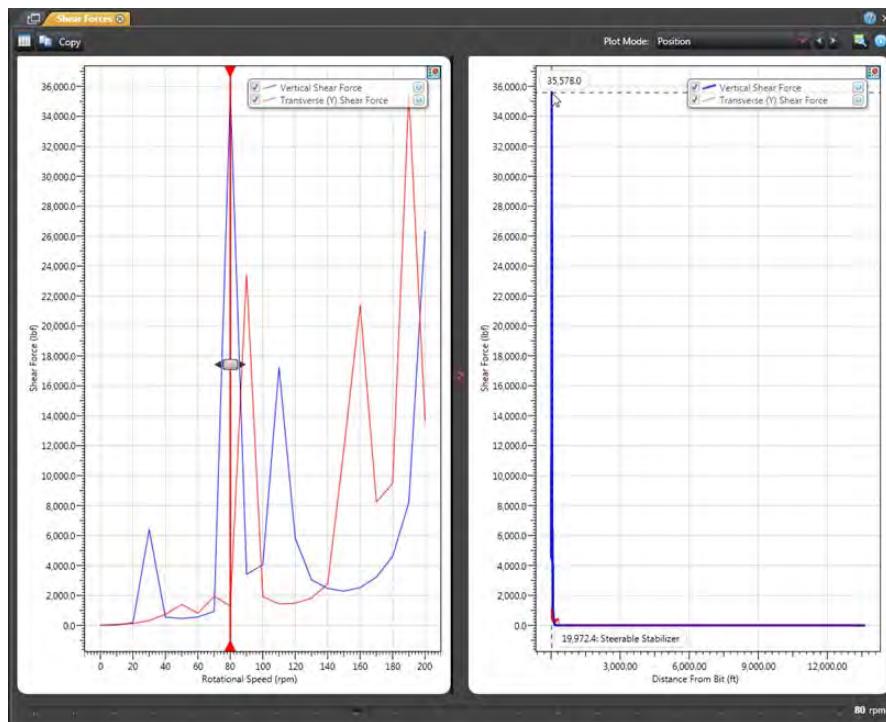
The Resultant Stresses plot displays the maximum relative stress (above and beyond steady state stresses) caused by vibrations. They are relative to the magnitude of the forcing function used and, thus, should be used only for the location of critical (or dangerous) rotating speeds. You can switch on the plot area to RPM to identify the maximum stress at any given point on the string. You can position to determine the location in the string of the maximum relative value or Phase Angle to visualize the excitation force traveling up and down the string as the bit rotates.



[Go To "What's In This Release?"](#)

## Shear Rate

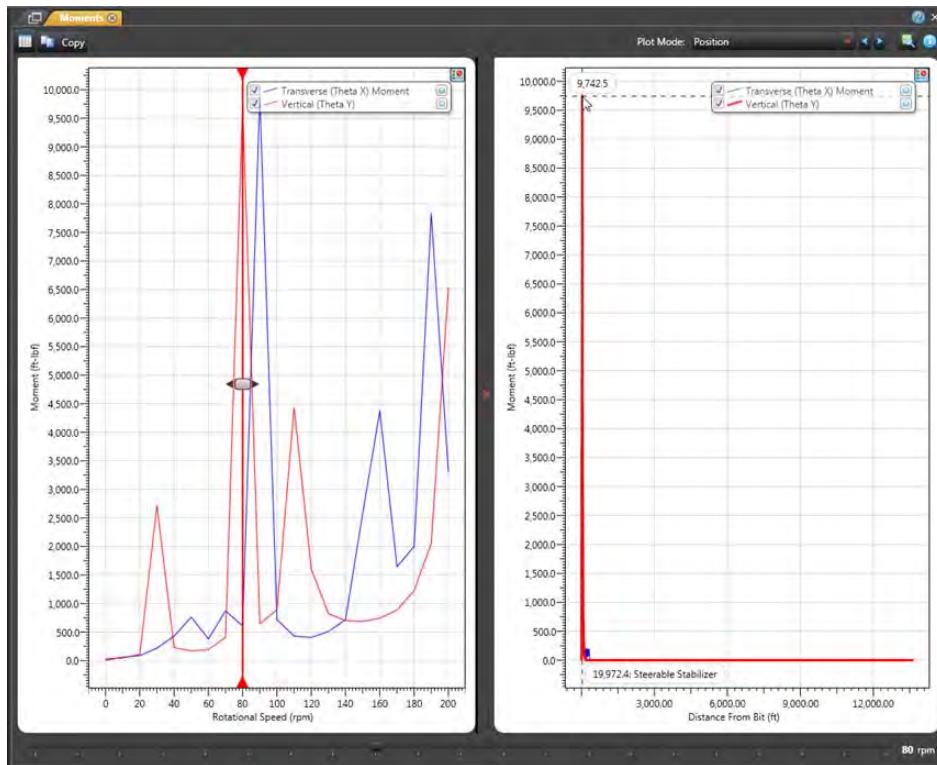
The Shear Forces plot displays the shear forces along each axis. You can switch on the plot area to RPM to identify the maximum stress at any given point on the string. You can determine the location in the string of the maximum relative value or Phase Angle to visualize the excitation force traveling up and down the string as the bit rotates.



[Go To "What's In This Release?"](#)

## Moments

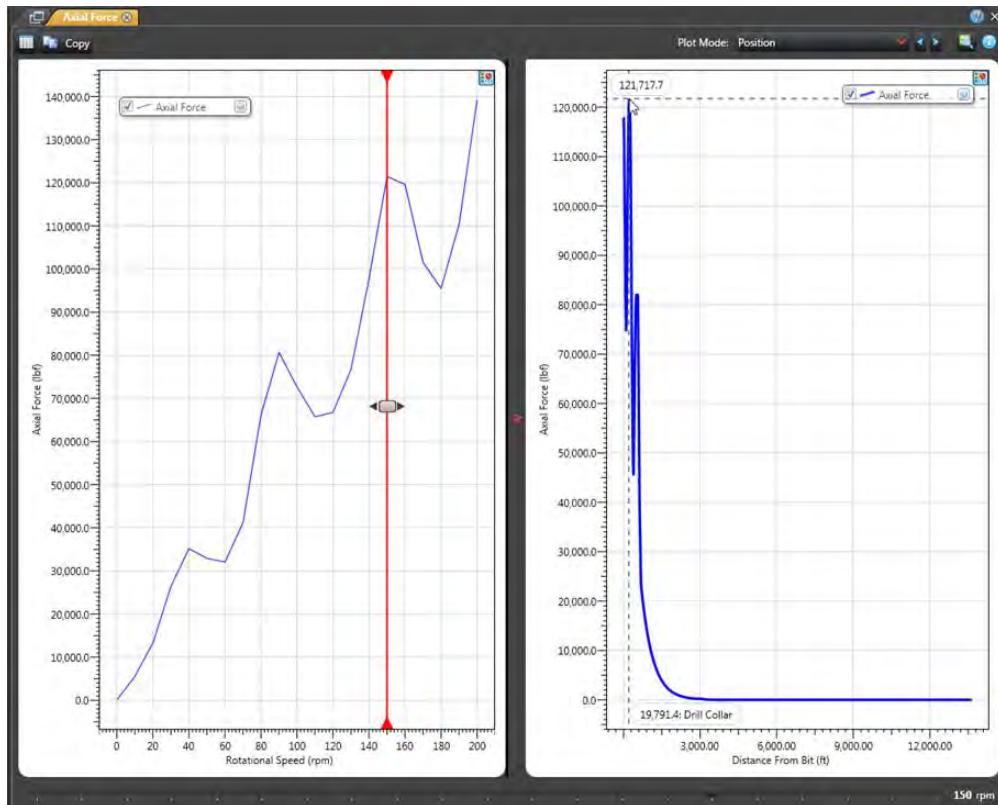
The Moments plot displays the moment. You can switch on the plot area to RPM to identify the moment at any given point on the string. You can determine the location in the string of the maximum relative value or Phase Angle to visualize the excitation force traveling up and down the string as the bit rotates.



[Go To "What's In This Release?"](#)

### Axial Force:

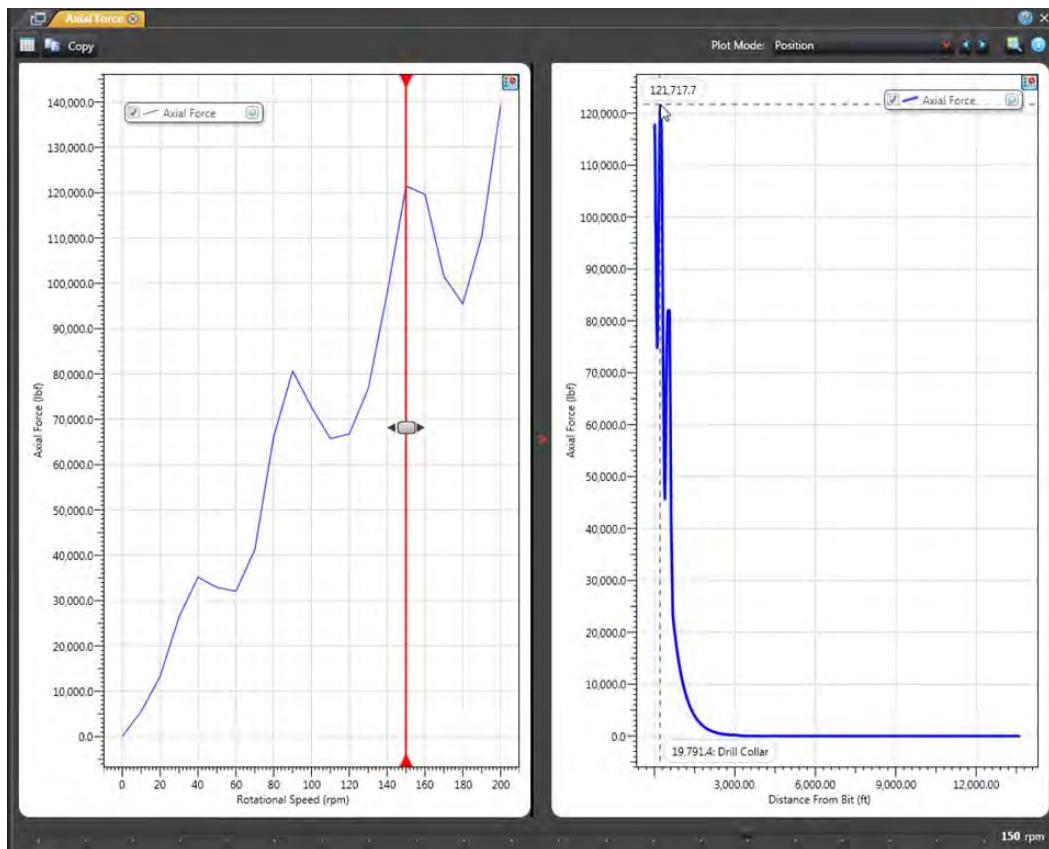
The Axial Force plot displays the maximum relative axial force. You can switch on the plot area to RPM to identify the maximum stress at any given point on the string. You can determine the location in the string of the maximum relative value or Phase Angle to visualize the excitation force traveling up and down the string as the bit rotates.



[Go To "What's In This Release?"](#)

### Axial Displacement:

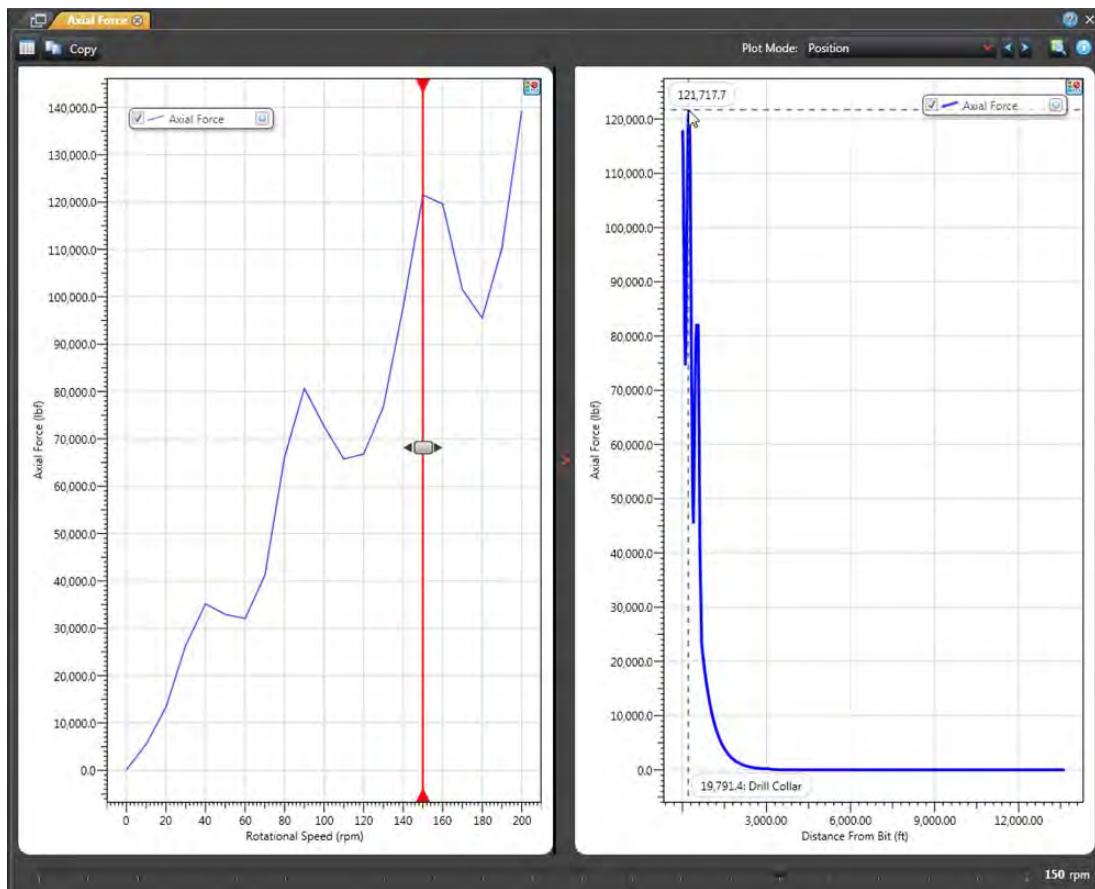
The Axial Displacement plot displays the maximum axial displacement. You can switch on the plot area to RPM to identify the maximum stress at any given point on the string. You can determine the location in the string of the maximum relative value or Phase Angle to visualize the excitation force traveling up and down the string as the bit rotates.



[Go To "What's In This Release?"](#)

## Torque

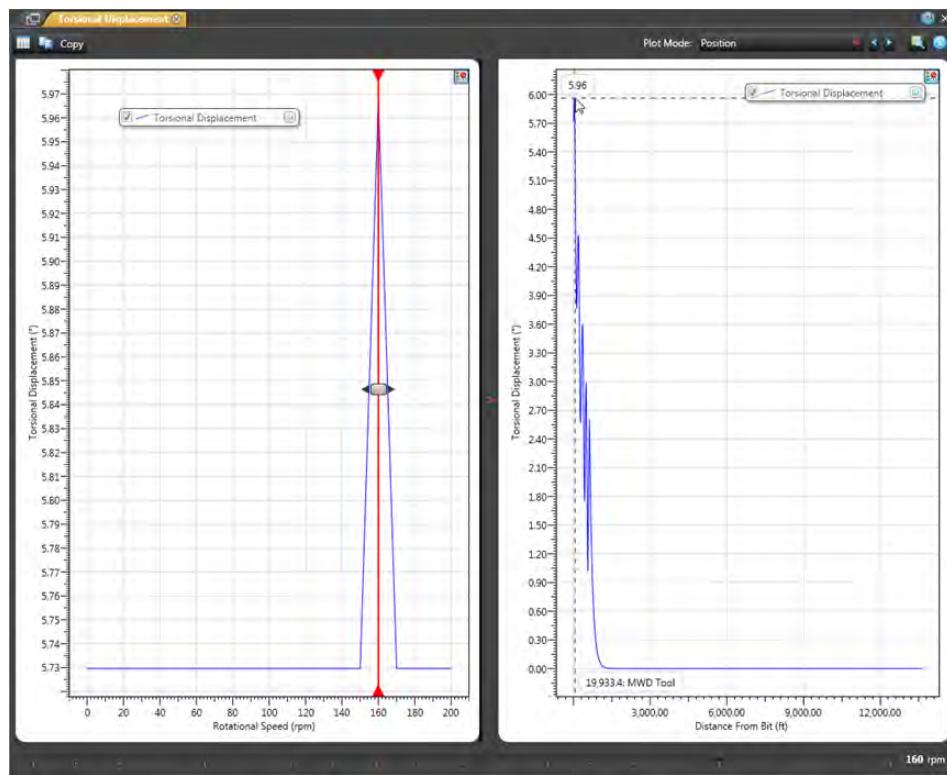
The Torque plot displays the maximum torque. You can switch on the plot area to RPM to identify the maximum stress at any given point on the string. You can determine the location in the string of the maximum relative value or Phase Angle to visualize the excitation force traveling up and down the string as the bit rotates.



[Go To "What's In This Release?"](#)

## Torsional Displacement

The Torsional Displacement plot displays the maximum torsional displacement or twist. You can switch on the plot area to RPM to identify the maximum stress at any given point on the string. You can determine the location in the string of the maximum relative value or Phase Angle to visualize the excitation force traveling up and down the string as the bit rotates.



## Hydraulics

The DFG (Drilling Fluid Graphics) model is available as an analysis option. Cuttings Loading effect and Temperature Effect, along with downhole properties change due to Temperature and Pressure can be considered at the same time.

DFG calculations apply to the following plots in the Hydraulics Module:

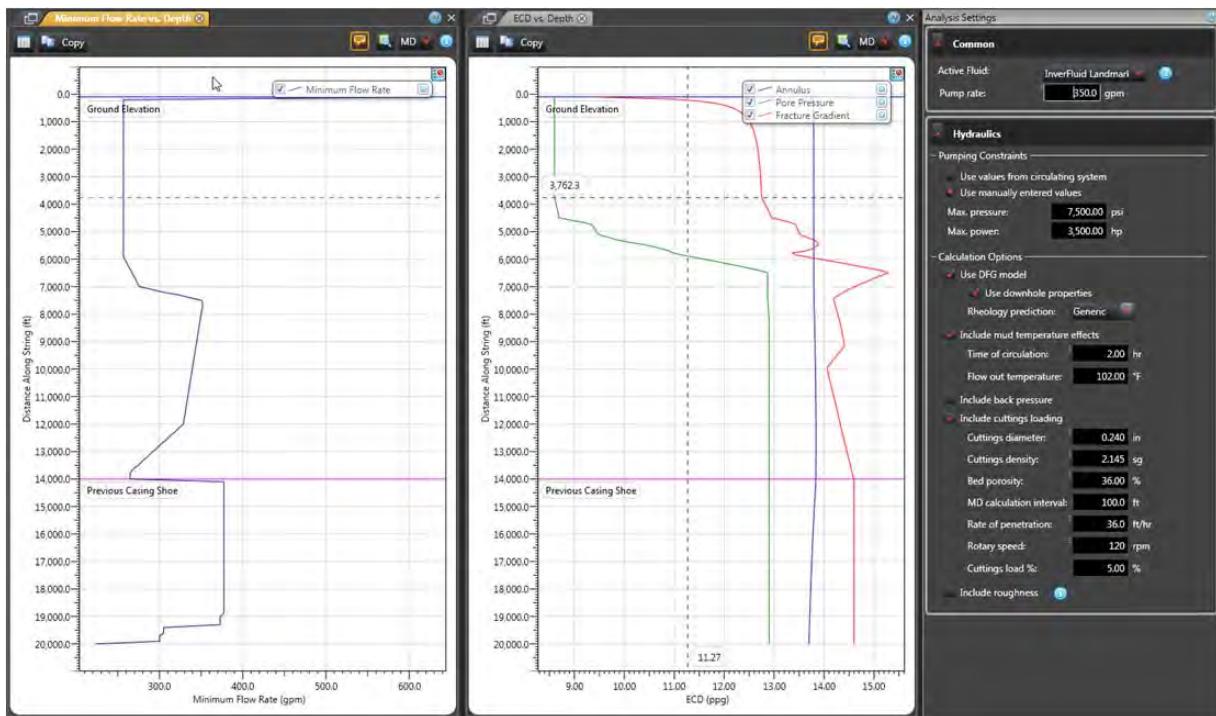
- Hole Cleaning Plots: Minimum Flow Rate vs. Depth and Minimum Flow Rate vs. ROP.
- Pressure and ECD Plots: Pressure Loss vs. Pump Rate, Circulating Pressure vs. Depth, ECD vs. Depth, Critical Pump Rate vs. Depth, Annular Velocity vs.

[Go To "What's In This Release?"](#)

## Depth, Flow Regime, Component Pressure Losses, and Component Power Losses.

- Roadmap Plots: ECD vs. Run Depth and Circulating Pressure vs. Run Depth.
- Bit Optimization Plots: Bit Power/Area, Bit Impact Force, Bit Pressure Loss, Bit Nozzle Velocity.
- Steady State Swab/Surge Plots: ECD vs. Trip Time Open Ended, ECD vs. Trip Time Close Ended, ECD vs. Run Depth Open Ended, and ECD vs. Run Depth Close Ended.
- Summary: Hydraulics Summary and Temperature Profile.

DFG Model only supports Power Law and Herschel Buckley rheology models for Bit Optimization.



## Torque & Drag

In addition to the previously implemented Torque and Drag Module a new output was added: Slack off/ Pick up drag plot. A new Analysis settings is also available for the tripping in Operation to be used for the Drag Chart

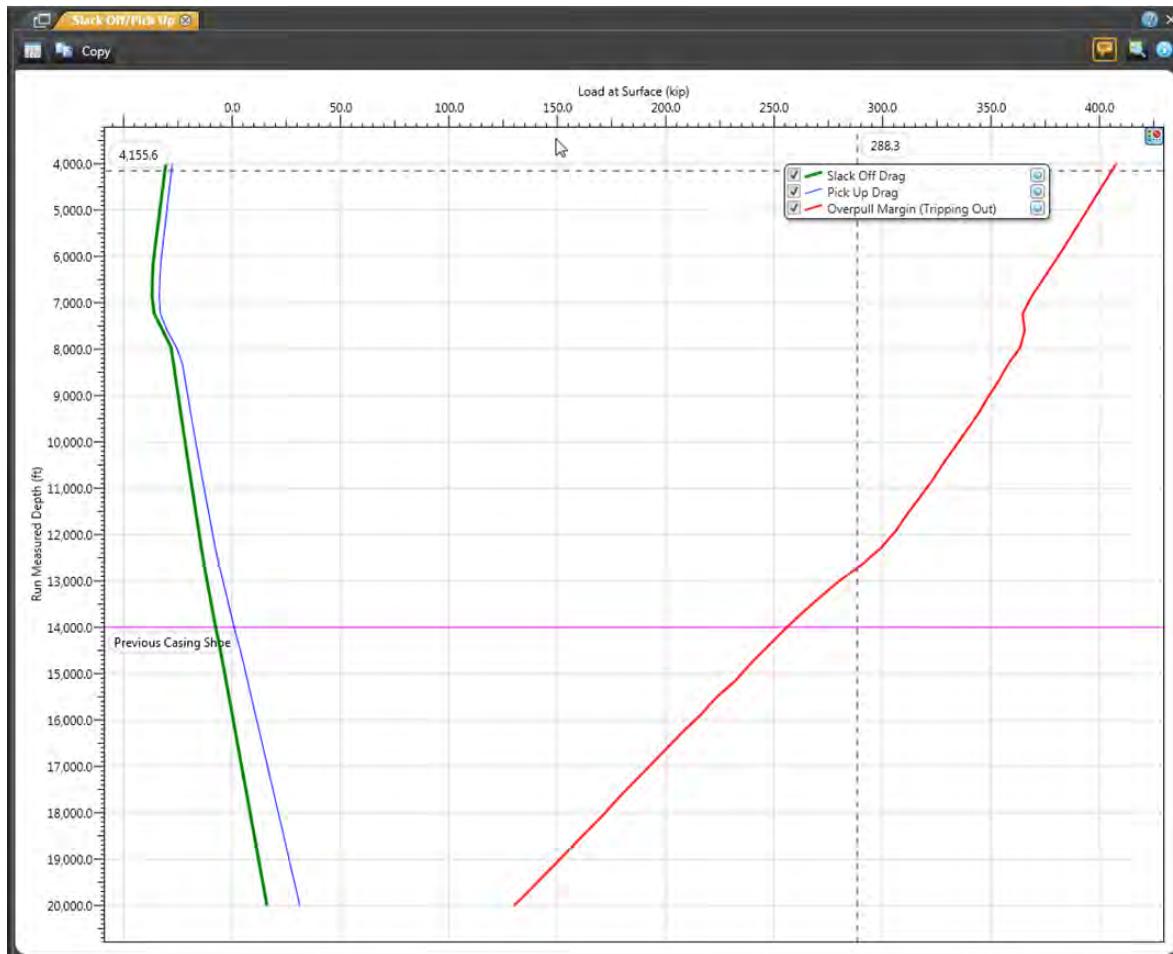
[Go To "What's In This Release?"](#)

### Available New Analysis Outputs:

The following Plots and tables have been added under the existing Torque & Drag Module

- Slack off/Pick up

In this context, drag refers to the cumulative force required to trip in and trip out pipe. These are experienced along the axial direction of the pipe. The drag forces can be comparable to the hook load (weight of the string measured at the surface). Measured from the rotating string weight, the Pick-up Drag can be potentially greater than the Slack-off Drag.



### UB Hydraulics

In addition to the previously delivered Multiphase Model, One additional analytical model was added for Underbalanced Hydraulics: Foam & Air Mist.

 Go To "What's In This Release?"

Foam has been used in the petroleum industry for decades. It has proven to be effective and economic as a circulating fluid for hole cleaning and drilling operations. Important advantages of foam drilling over conventional mud drilling include higher penetration rates, higher cuttings transport ratios, and decreased formation damage. In areas with low bottom-hole pressure or where water for drilling fluid is scarce, the use of a lighter fluid, such as foam, is required.

This model solves the foam flow problem using a non-Newtonian flow in a three dimensional wellbore. Flow regimes ranging from laminar to turbulent are considered.

Some of the Highlights for the Foam/Air Mist Model on the UB Hydraulics Model are:

- Includes tool joint pressure losses
- Formation Influx and parasite string flow can be included on the analysis
- Uses Non-Newtonian - Bingham Plastic and Power Law rheology models
- The model can be calibrated using pressure or rheology factors
- Sensitivity Analysis enabled
- Enable for all the existing UB Hydraulics outputs except the Operating Envelop.

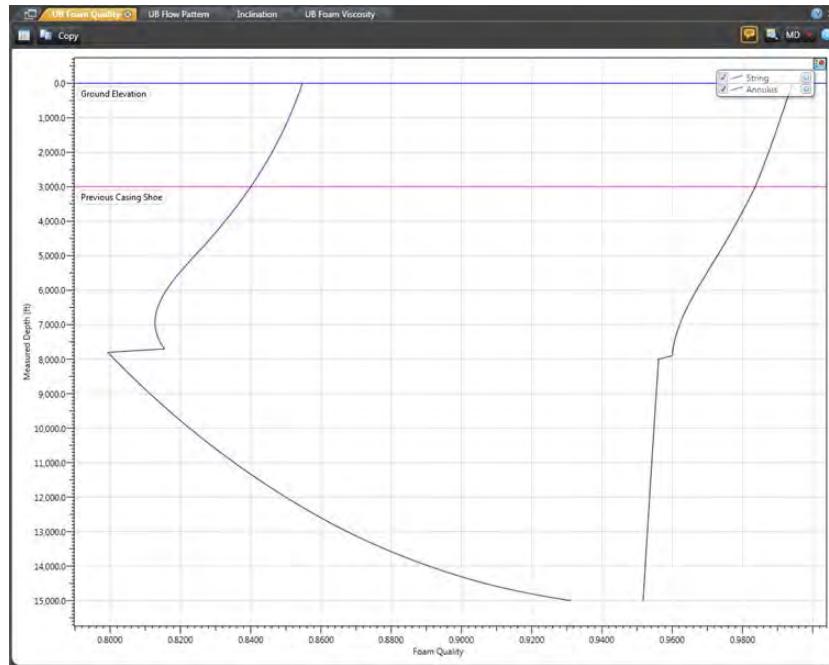
#### Available New Analysis Outputs:

The following Plots and tables have been added under the existing UB Hydraulics Module

- Foam Viscosity
- Foam Quality

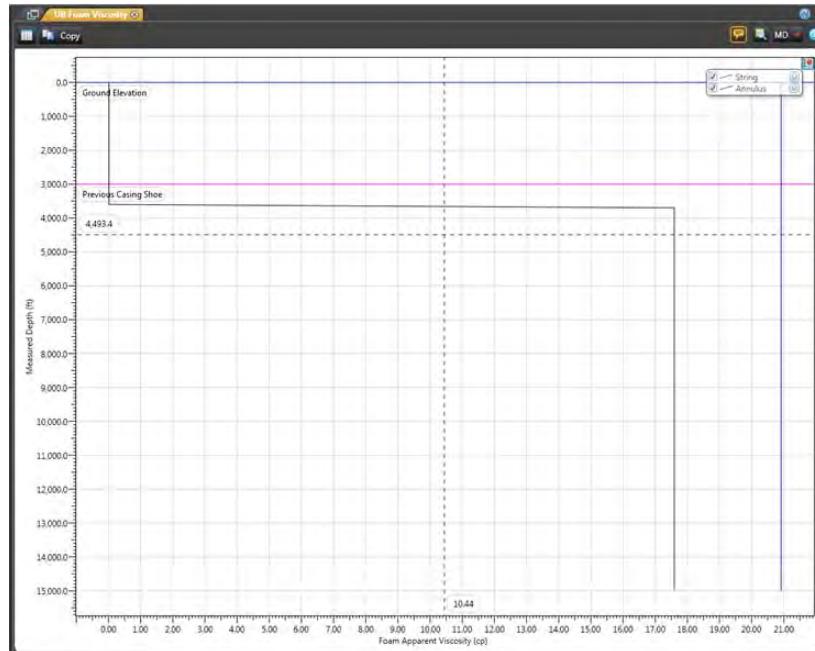
#### Foam Quality

The Foam Quality plot is available when the Foam/Air option is included. Foam quality is the ratio of volume percentage of gas to total fluid volume. Since gas is compressible, foam quality depends on pressure and temperature. Foam Quality's importance relies its ability to control the cuttings-lifting. Based on field experience the foam quality must be approximately above 0.55 (55%) at the hole bottom.

[Go To "What's In This Release?"](#)

## Foam Viscosity

The Foam Viscosity plot is available when the Foam/Air option is included.



 Go To "What's In This Release?"

### **Swab and Surge**

As an addition to the previously implemented Transient Swab and Surge Module (release 500.1.13.0) new plots were added to highlight the transient changes to the ECD for Swab, Surge including the Optimized Trip ECD, and also for Reciprocation.

Another important enhancement done is the fact you can input your maximum trip speed to be used by the optimized trip schedule

Some highlights for the Swab and Surge Module include:

- Support of the FYSA for Generalized Hershel Buckley Fluids
- Addition (to the fluid job schematic) of the Fluid Job grid use to refine or input the fluids final placement.

### **Available New Analysis Outputs:**

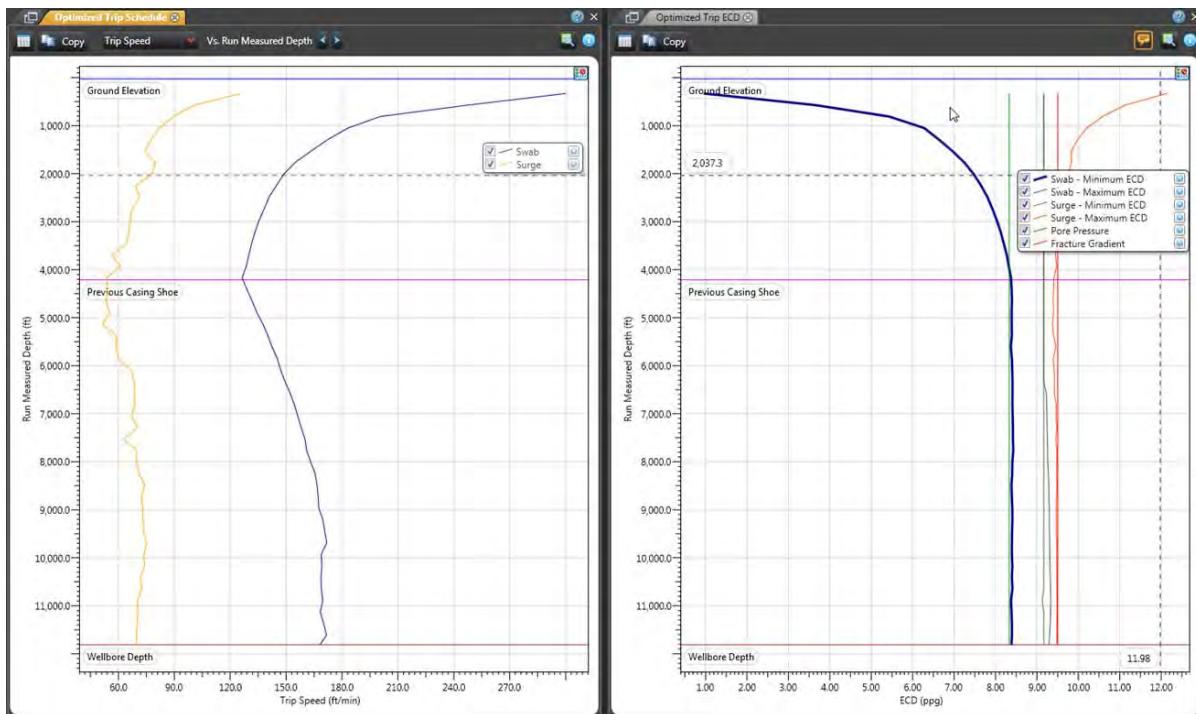
The following Plots and tables have been added under the existing Swab and Surge Module

- Optimized Trip ECD
- Transient ECD (Swab & Surge)
- Transient ECD (Reciprocation)
- Fluid Job Grid

[Go To "What's In This Release?"](#)

## Optimized Trip ECD

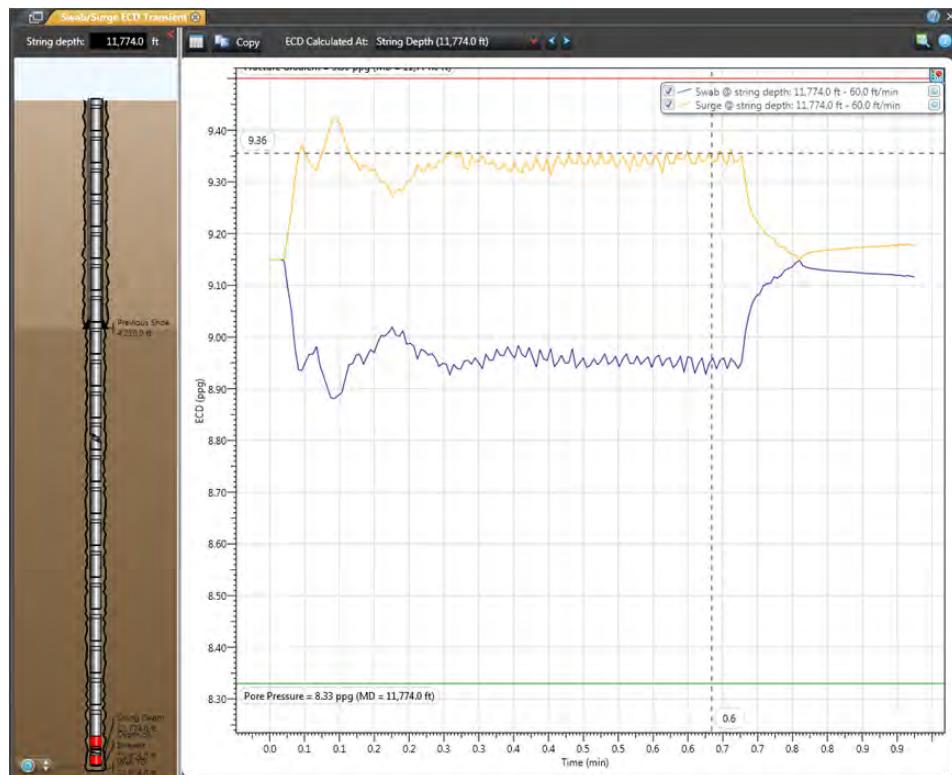
The Optimized Trip ECD plot is available from the Swab & Surge Plots category of the Swab & Surge ribbon. This plot is used to display the minimum and maximum trip ECD, while tripping in and out of the hole at the calculated optimized trip speed. This optimization is made to avoid falling outside of the bounds set by the pore pressure and fracture gradient (represented by the green and red lines). If the trip ECD falls outside of the bounds set by the pore pressure and fracture gradient, a kick or loss of circulation could occur.



[Go To "What's In This Release?"](#)

## Transient ECD (Swab & Surge)

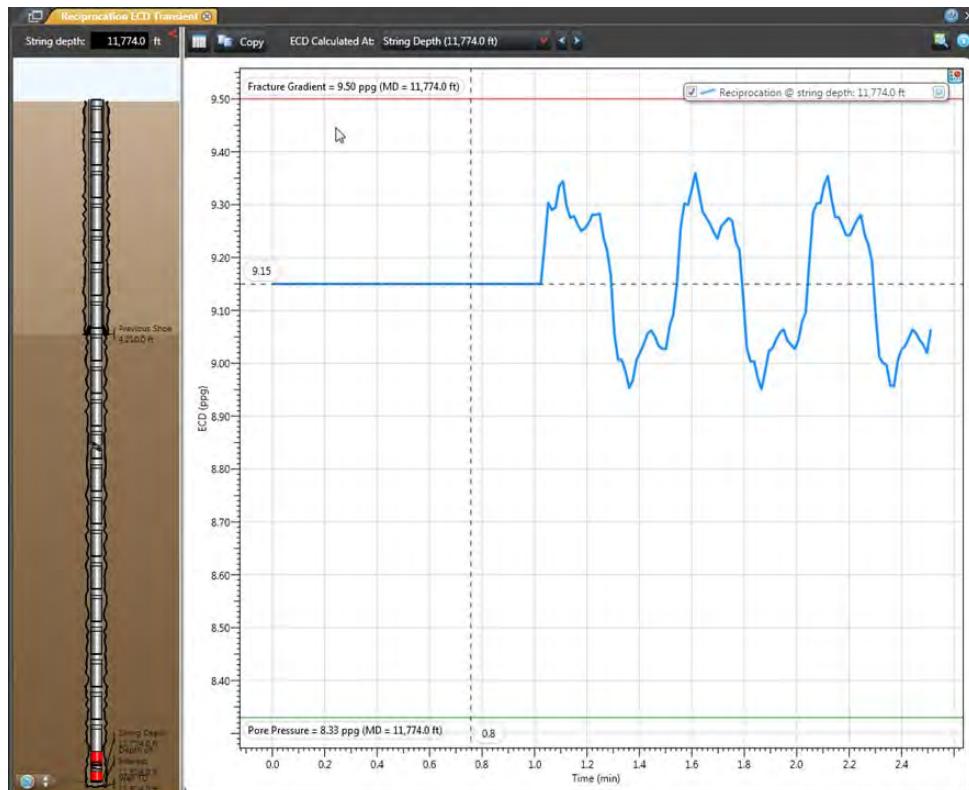
The ECD Transient plot is available from the Swab & Surge Plots category of the Swab & Surge ribbon. This plot is used to display transient ECD responses at a specified string depth and pipe speed.



[Go To "What's In This Release?"](#)

## Transient ECD (Reciprocation)

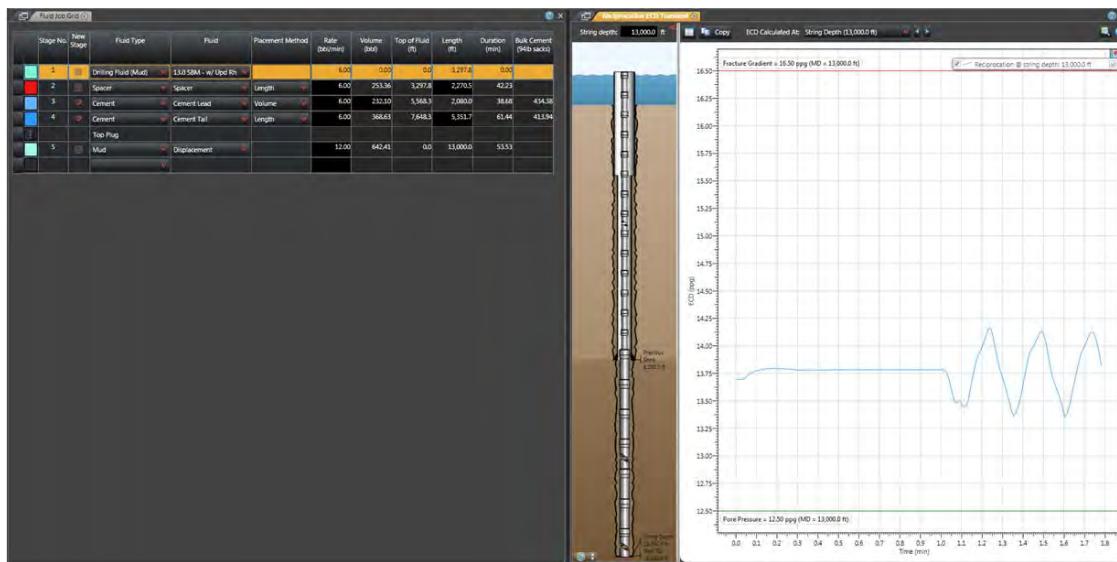
The ECD Transient plot is available from the Reciprocation Plots category of the Swab & Surge ribbon. This plot is used to display transient ECD responses at a specified string depth and pipe speed, taking into account fluid circulation.



[← Go To "What's In This Release?"](#)

## Fluid Job Grid

Fluid Job Grid is the same one available for the Cementing module. The Fluid Job Grid is a tabulation of the following parameters arranged column-wise: Stage No; New Stage; Fluid Type; Fluid; Placement Method; Rate; Volume; Top of Fluid; Length; Duration and Bulk Cement.



This screenshot shows the 'Fluid Job Grid' window with the same data as the previous one, but without the accompanying graph window.

Stage No.	New Stage	Fluid Type	Fluid	Placement Method	Rate (bbl/min)	Volume (bbl)	Top of Fluid (ft)	Length (ft)	Duration (min)	Bulk Cement (94lb sacks)
1	Drilling Fluid (Mud)	13.0 SBM - w/ Upd Rh			6.00	0.00	0.0	3,297.8	0.00	
2	Spacer	Spacer	Length		6.00	253.36	3,297.8	2,270.5	42.23	
3	Cement	Cement Lead	Volume		6.00	232.10	5,568.3	2,080.0	38.68	434.38
4	Cement	Cement Tail	Length		6.00	368.63	7,648.3	5,351.7	61.44	413.94
5	Mud	Displacement			12.00	642.41	0.0	13,000.0	53.53	

### General Enhancements

- The name was changed from DS Well Engineering to WellPlan
- Encompassing the vision of being a truly global product, the application now offers the infrastructure in place to support the besides the Russian, the Chinese language. This is aimed at optimizing quality of the global user

 [Go To "What's In This Release?"](#)

experience by catering to the needs of our international clientele. Refer Help Documentation for set-up details. Chinese Language Support.

- Sensitivity Range Annotations
- Sensitivity Range was enabled for Choke Pressure on UB Hydraulics
- Duplicate Mud Pump feature available on the Rig Editor
- Enhancement to the Generalized Hershel Buckley rheology model
- Well Control New Kill Methods: Lube and Bleed and Migration and Bleed
- Search Capability in the Well Explorer for all the nodes
- Open case on a New Windows
- Foamed Fluid options are available on the Fluid Editor
- The eccentric stabilizer details were added to be accounted for the BHA Dynamics Module
- When Casing are added using the catalog on the Hole editor, the fields imported are shown are read only. If the user want to manually change something they need to click on the checkbox User Defined
- The opened plots display a close icon on the tab left corner, and if several plots are opened at the left side of the tabs with a windows icons you can see listed all plots
- Centralization Module is now Merged with the Cementing Module

#### *Other Enhancements on WellPlan 5000.14*

Defect	Description
831781	Critical speed for usable analysis (distance along string)
863945	Set Default line properties to graphs in Wellplan
891890	Improvement for air drilling (hydraulics)
931861	Include for the Roadmap analysis the Overpull vs. Run Depth
933159	Maximum allowable bend in a Mud Motor
938346	Model pipe fill while Tripping in the hole at any depth
947582	Add sensitivity (range) to the choke pressure field in the UB Hydraulics module
954768	Generalized Hershel Buckley Rheology with Fann data always shows for n= 0.5 and m=0.5

 Go To "What's In This Release?"

## **Release 5000.1.13.1**

### ***Well Control Module***

The Well Control Module offers a range of Kick Tolerance Plots, General Plots, Kill Sheet Plots and Tables. This Module can be used to simulate the kick class of an influx, assist with casing design (in terms of shoe settings depths), forecast field conditions arising due to an influx and generate kill sheets.

Analyses can be performed for the following types of influxes: oil, water, and gas. If the influx happens to be gas, for calculation purposes, a single methane gas bubble is assumed. The density of this influx would be equal to that of methane at the corresponding temperature and pressure. Dispersed gas influxes are not modeled. The compressibility factor, Z, is based on the critical temperature and pressure of methane.

In-order to efficiently circulate the influx out of the wellbore, two Well Control Methods are provided: The Driller's Method and Wait & Weight Method.

Temperature distributions are based on 3 different models: Constant Temperature Model, Geothermal Gradient and Steady State Temperature Model.

The Kill Sheet was formulated based on industry standard methodologies to be used by both the Engineer and personnel at the Rig. Users are offered the capability of being able to generate Kill Sheets quickly, with minimal data entry.

Some highlights of the Well Control Module include:

Kick Tolerance analysis along with complete modeling of pressure effects observed in the wellbore during kill operations.

Detailed Pressure variation plots at any given depth of interest, and dynamic simulation of pressures during influx circulation.

Well Control Simulation Animation on schematics and plots with embedded controls.

Support for vertical, deviated and horizontal wells.

Effect of temperature from the geothermal gradient and drilling fluid circulation.

The functionality of being able to assist with Casing design in terms of shoe setting depths (based on maximum influx volume policies and its calibration based on wellbore conditions).

 Go To "What's In This Release?"

### *Available Analysis Outputs*

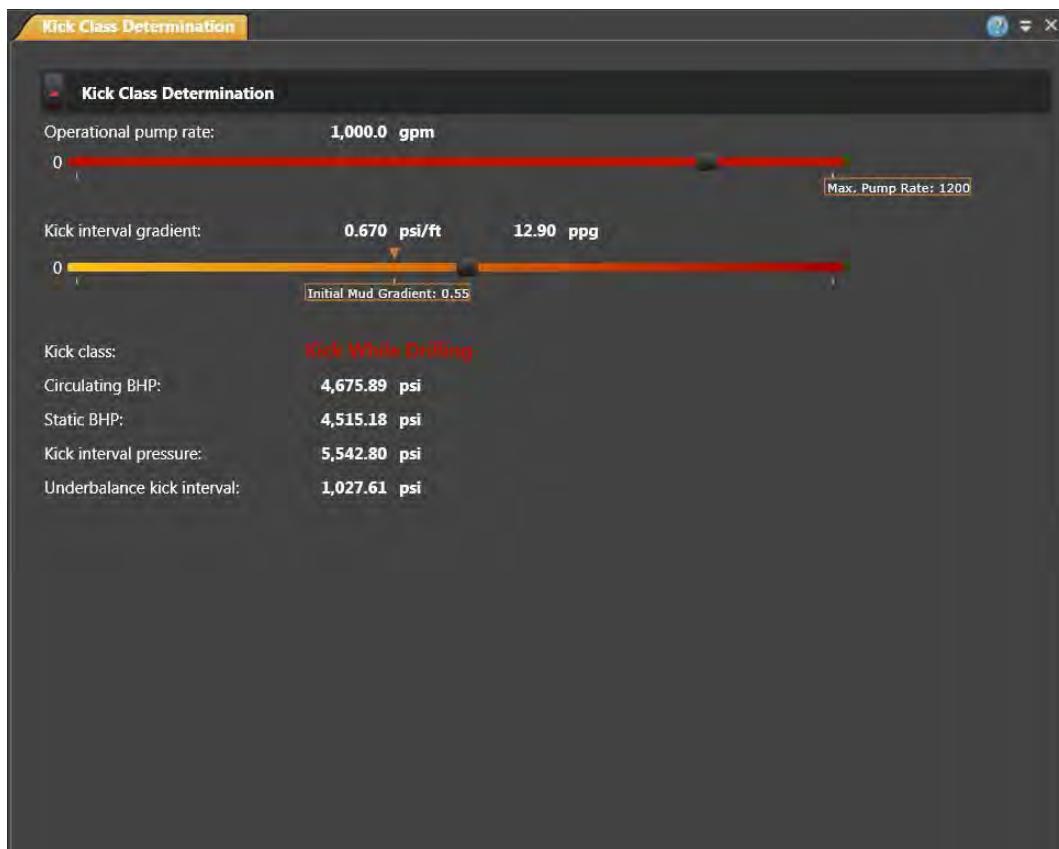
The following Plots and tables have been added under the Well Control Module.

- Kick Class Determination
- Temperature Profile
- Allowable kick volume
- Safe Drilling Depth
- Maximum Pressure
- Formation Breakdown Gradient
- Full Evacuation to Gas
- Pressure at Depth
- Animation
- Circulating Pressure Profile
- Pit Gain vs. Time
- Kill Sheet
- Kill Graph

[Go To "What's In This Release?"](#)

### Kick Class Determination

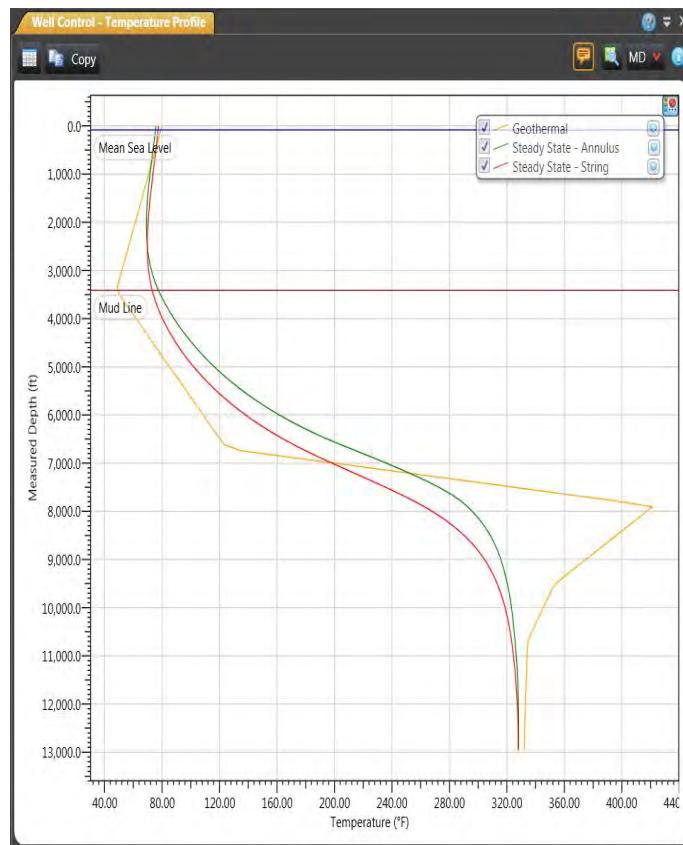
This plot can be used to calculate the Bottom Hole Pressures, Kick Class, Kick Interval Pressure and the Underbalance Kick Interval at the moment an influx occurs.



[← Go To "What's In This Release?"](#)

### Temperature Profile

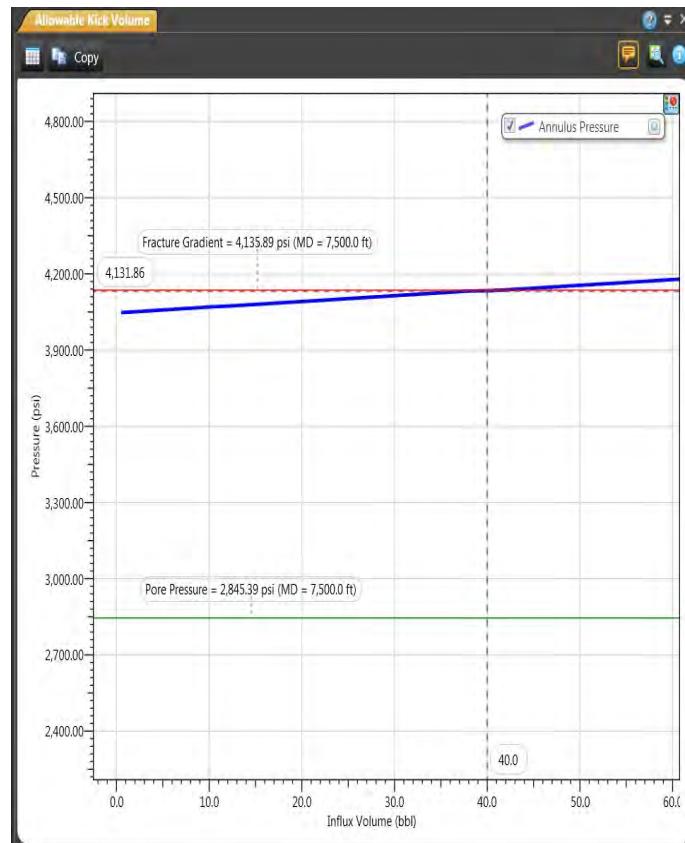
Temperature Profile plot displays the temperature model in use. Three models are available: Constant Temperature, Geothermal Profile, and Steady State Circulating (as shown in figure).



[Go To "What's In This Release?"](#)

### Allowable Kick Volume

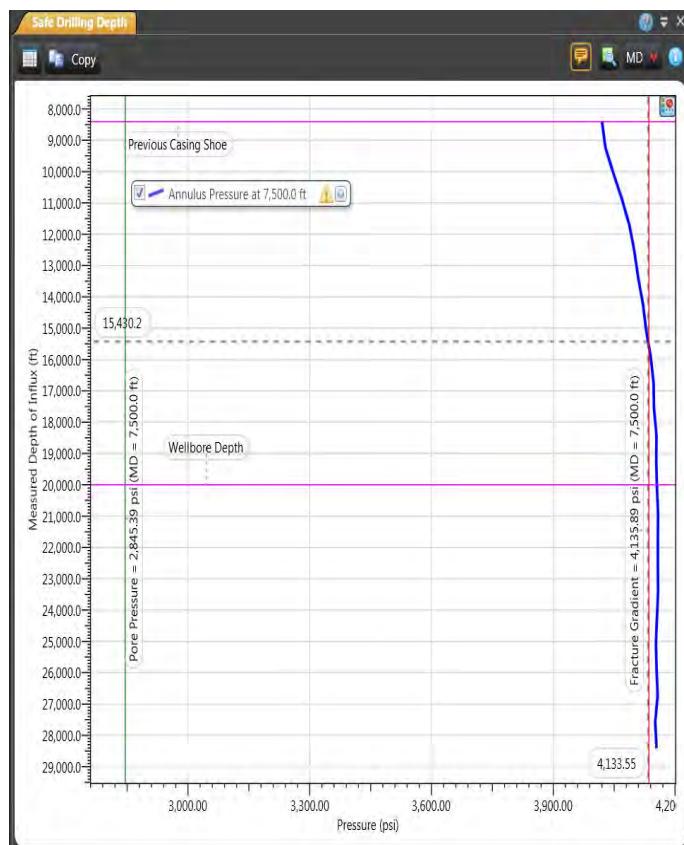
This plot is used to determine the maximum influx volume that can be circulated out of the wellbore without fracturing the formation at a specified depth of interest. As shown in the figure below, the intersection between the Fracture Pressure (red line) and the Annulus Pressure (blue line) corresponds to the maximum influx volume.



[← Go To "What's In This Release?"](#)

### Safe Drilling Depth

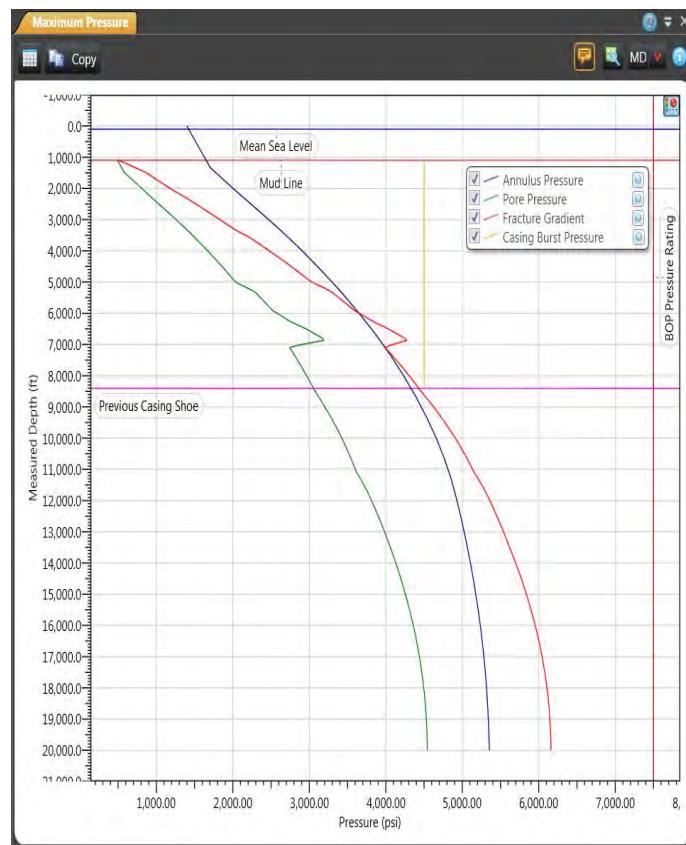
This plot is used to determine how deep the well can be drilled without fracturing the formation. As shown in the figure below, the intersection between the red line and blue line determines the maximum depth.



[Go To "What's In This Release?"](#)

### Maximum Pressure

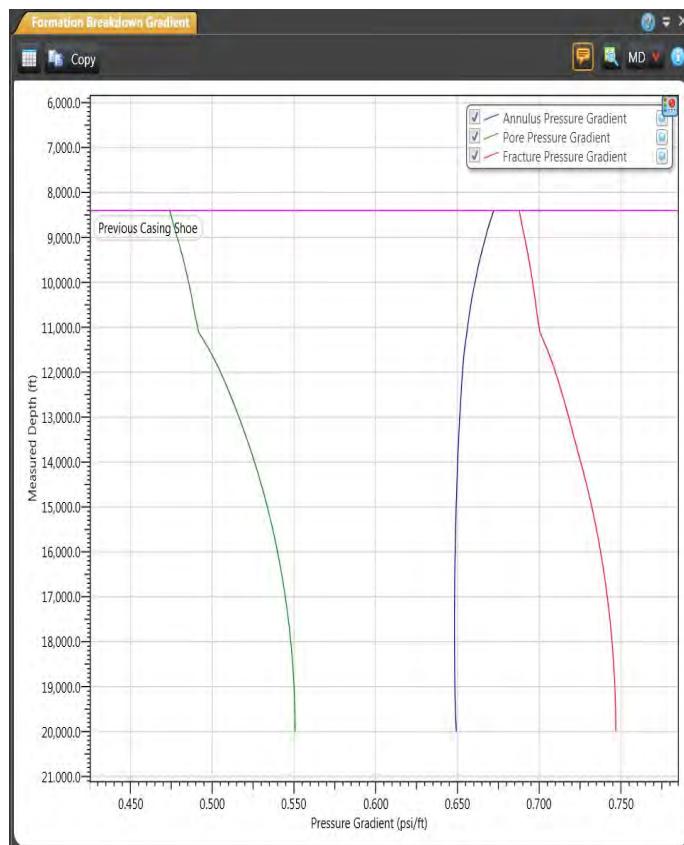
This plot displays the annular pressures that will occur at any measured depth with an influx of constant volume in the well.



[← Go To "What's In This Release?"](#)

### Formation Breakdown Gradient

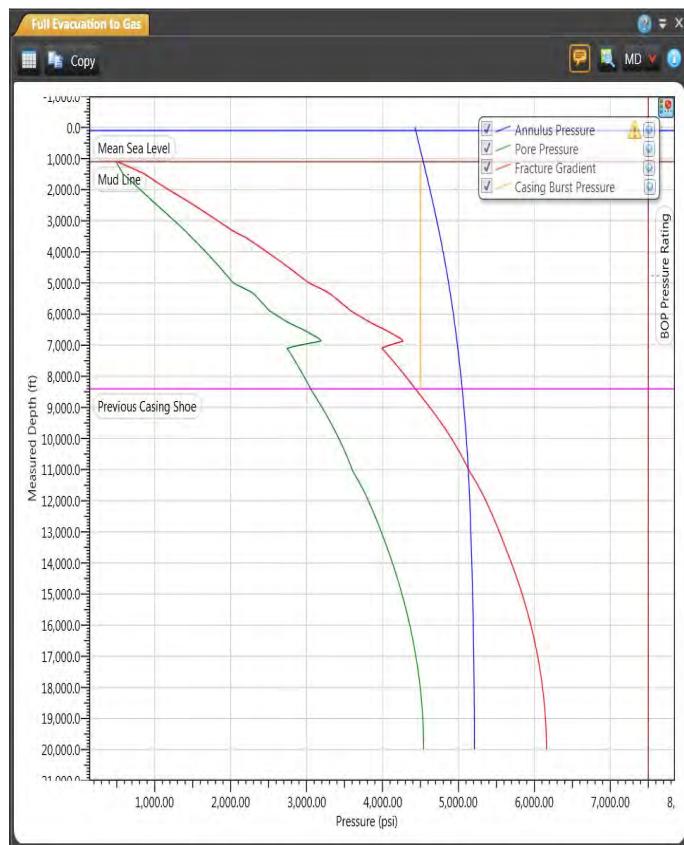
This plot displays the maximum pressure (expressed as a gradient) that will occur as a result of the specified influx size.



[Go To "What's In This Release?"](#)

### Full Evacuation to Gas

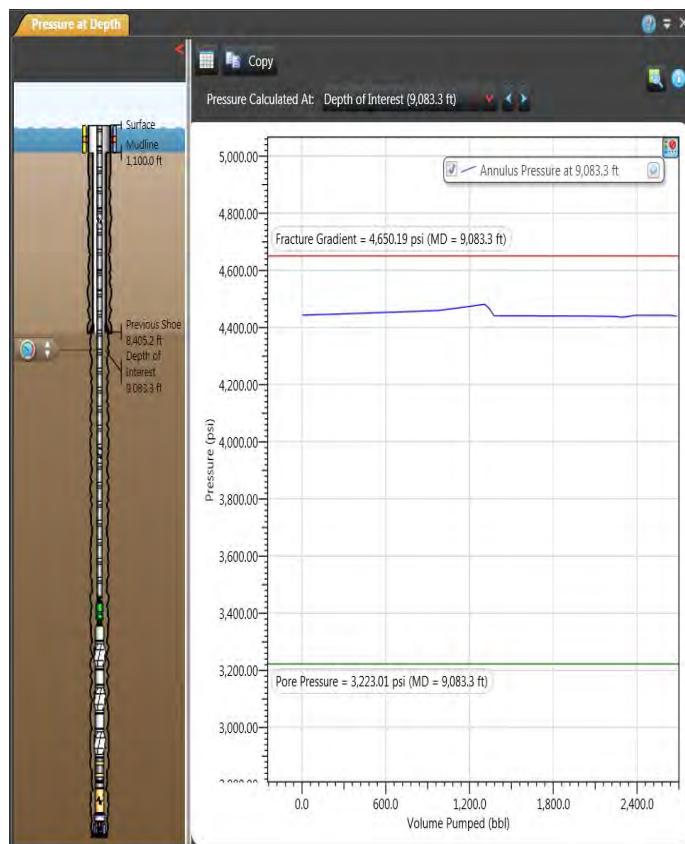
This plot displays the pressure that will occur at any measured depth in the well as a result of filling the entire annulus with methane. An assumption is made that the bit is at the string depth specified in the String Editor spreadsheet. The plot displays the last shoe setting depth as specified in the Hole Section Editor spreadsheet.



[Go To "What's In This Release?"](#)

### Pressure at Depth

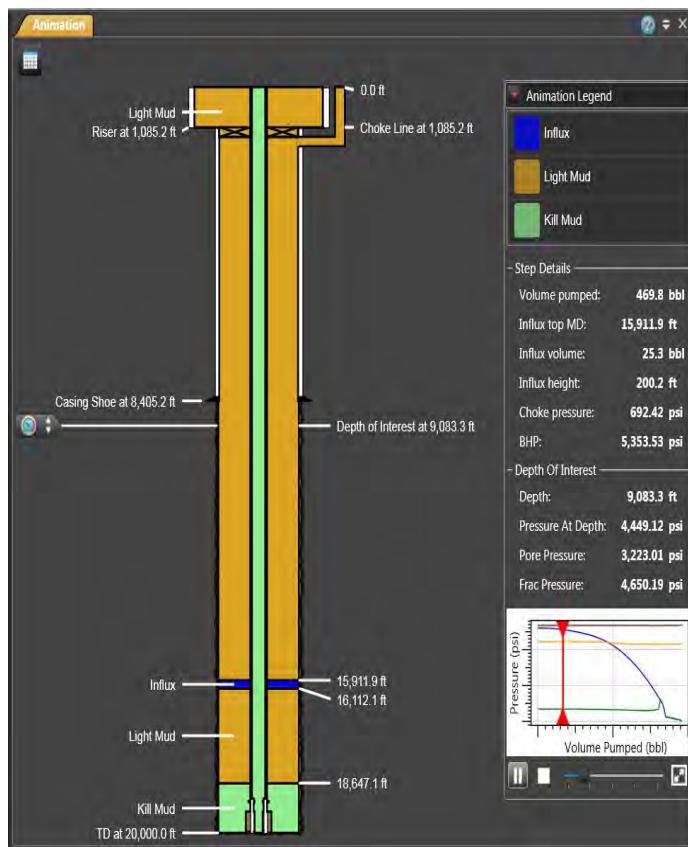
This plot displays the pressure at a specified depth of interest in the annulus to view how the pressure varies as the influx gets circulated out of the well.



[Go To "What's In This Release?"](#)

### Animation

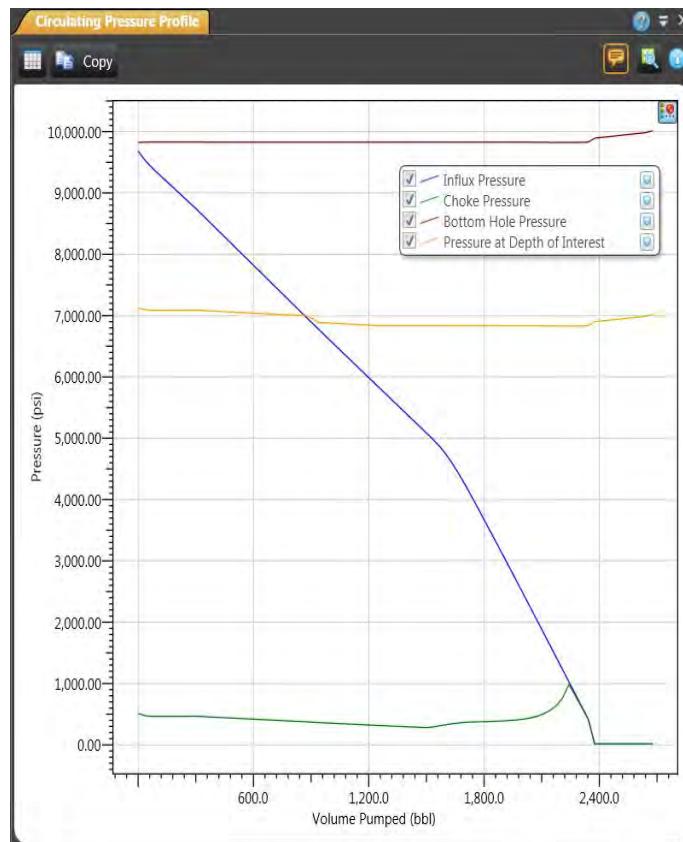
The Animation Schematic visually illustrates how the influx is circulated out of the well, along with step details that update automatically. The step details are tabulated to provide an overview of the Volume pumped, Influx top MD, Influx volume, Influx height, Choke pressure, BHP, Depth, Pressure at Depth, Pore Pressure, and Frac Pressure.



[Go To "What's In This Release?"](#)

### Circulating Pressure Profile

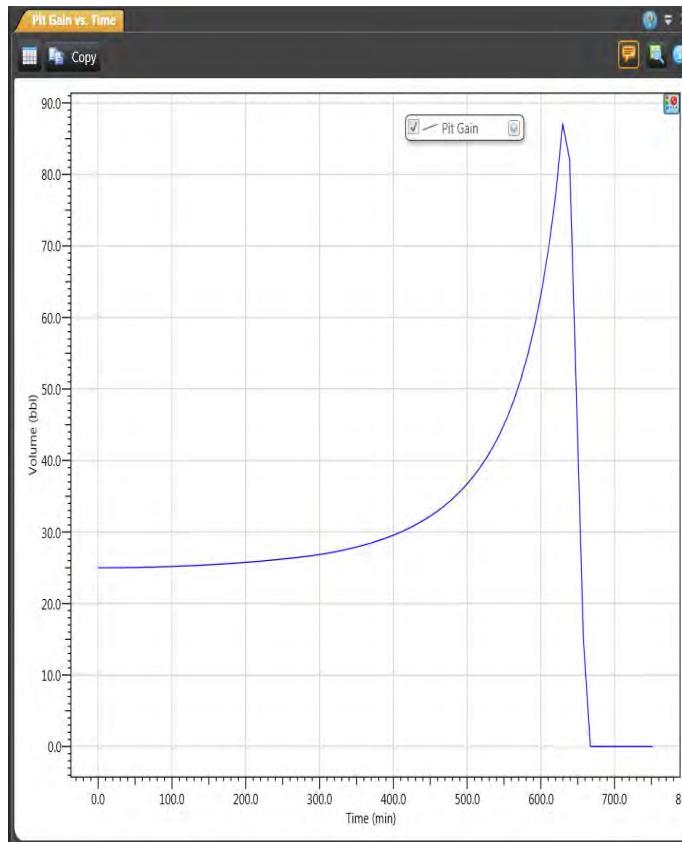
The Circulating Pressure Profile plot provides a graphical representation of the Animation Schematic. It plots values of pressures against the volume pumped, as the influx is circulated out of the wellbore.



[Go To "What's In This Release?"](#)

### Pit Gain vs. Time

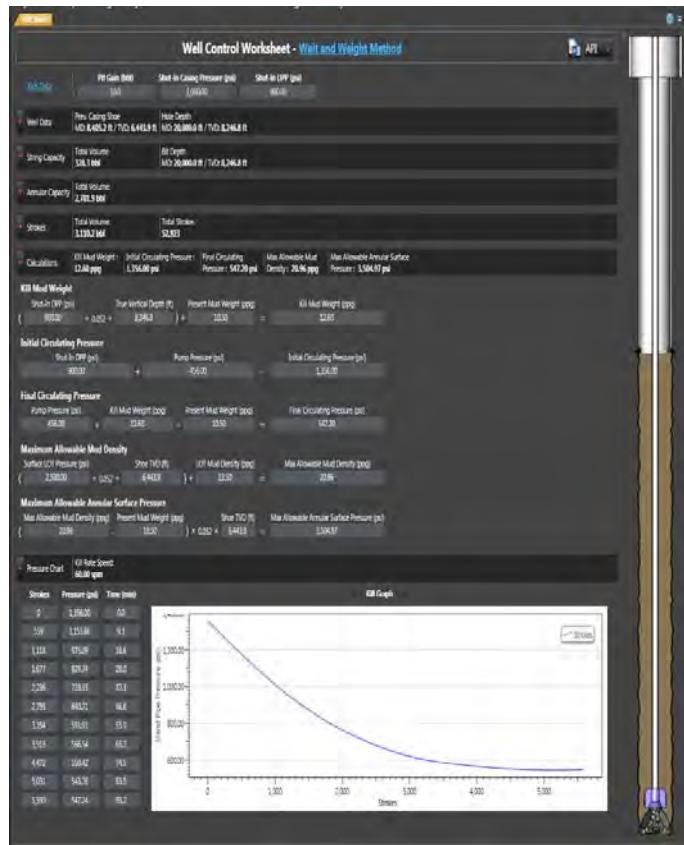
This plot can be used to view variations in the pit fluid volume with respect to time as the influx is circulated out of the wellbore.



[← Go To "What's In This Release?"](#)

## Kill Sheet

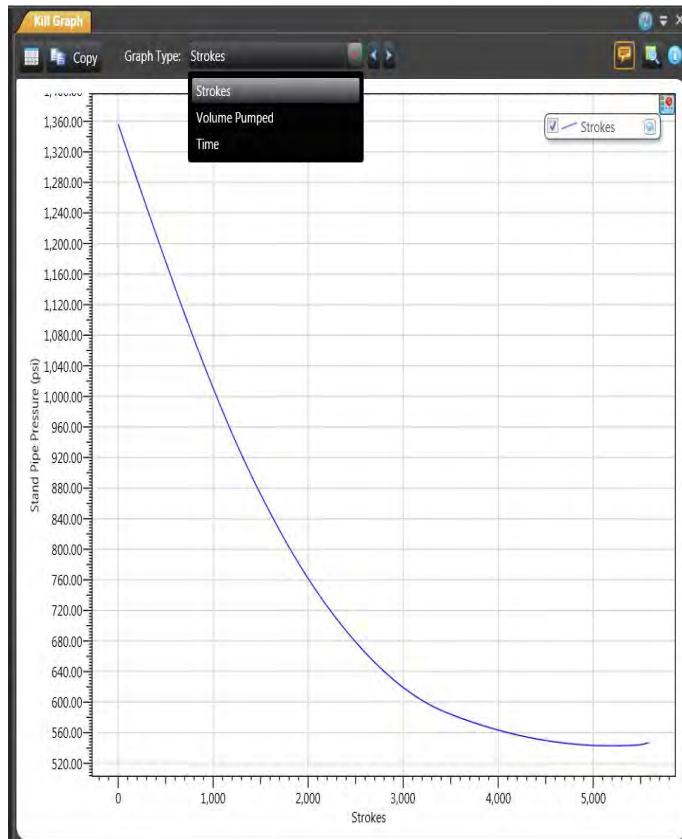
The Kill Sheet was formulated based on industry standard methodologies. Drawing information based on data loaded in your case, the application automatically pre-populates all relevant fields in this interface. This provides the capability to generate a Kill Sheet quickly with minimal data entry.



[Go To "What's In This Release?"](#)

### Kill Graph

This plot shows the Stand Pipe Pressure as the kill mud displaces the influx out of the wellbore. Choose to depict the Stand Pipe Pressure as a function of Strokes, Volume Pumped, or Time.



### General Enhancements

- Custom Reports can be defined and used in the application. Several options for customization are available. Users can change styles, fonts, colors, edit report schema, etc. Refer Help Documentation for additional details.
- The Steady State Temperature Model utilizes information specified under the Circulating System (Mud Pit Section). This enhances prediction accuracy.
- A field for Well Depth has been included under Wellpath Editor. The Geothermal Temperature model is now complete and compatible with the rest of the EDT Suite Design applications.
- Trip Schedule and Pressure Schedule from Swab & Surge Module was enhanced. Start depth, end depth, and interpolation steps can be defined for optimization of trip speeds in the casing and riser sections.

 Go To "What's In This Release?"

- Burst rating and Collapse rating can be defined or imported from the EDM catalog to the hole casing sections. More accurate warnings are displayed when annular pressures are predicted.
- Interpolation Interval was moved to a general area under Wellpath Editor. Previously, it was located under the Tortuosity Section.
- EDT Libraries (fluids and strings) can be imported into the application.
- Input Bottom-up string was incorporated. A Flip String capability was also added to allow the user to correct the input data order if necessary.
- Numerical values of results affected by sensitivity can be visualized using a grid view. This offers users the flexibility to perform further analyses.

### **Release 5000.1.13**

#### ***Swab and Surge Module***

The Swab and Surge Module provides several outputs to facilitate the analysis of a broad spectrum of parameters. Functionalities are segregated under Swab and Surge Plots or under Reciprocation Plots. Choose to run the analyses in Swab mode, Surge mode, or both by specifying the pipe acceleration and pipe deceleration. Additionally, a Reciprocation mode can be utilized by specifying additional parameters like Reciprocation Length and Reciprocation Rate. The Stand length, active fluid, pump rate string depth, and depth of interest can be declared in the Analysis Settings tab.

Some highlights of the Swab and Surge model include:

- The capability of being able to verify whether operating conditions would respect the critical boundaries of operation, or, otherwise, how much of a deviation would be observed from the established norms. When considering procedures, like those that do not involve Under-Balanced or Over-Balanced Drilling, operating conditions ideally fall between the in-situ Pore Pressure and Fracture Gradient. The new Optimization plots (Optimized Trip Schedule and Optimized Trip Pressure) enable users to forecast adherence to safe, and recommended operating guidelines. This helps in preserving the formation integrity, predicts instances of lost circulation, forecasts potential depths of unforeseen fractures, and provides informative foresight regarding additional parameters.
- Detailed Pressure variation plots: Analyze transient pressure responses at any depth of interest, and/or forecast variance in stand pipe pressure with time.

 Go To "What's In This Release?"

- Other pertinent Engineering/Scientific plots and schematic illustrations that reflect field conditions arising out of Swab and Surge, or Reciprocation operations.

### *Available Analysis Outputs*

The following Plots and tables have been added for the Swab and Surge module.

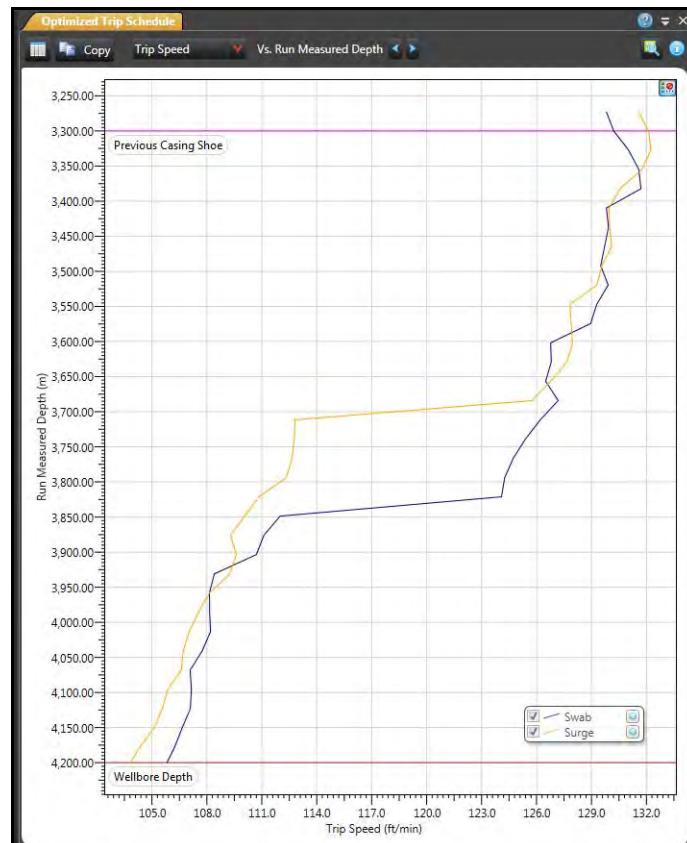
- Optimized Trip Schedule
- Optimized Trip Pressure
- Pressure Transient
- Cement Job Definition
- Hook Load vs. Time
- Surface Results
- Annulus Return Flow Rate
- Bit Depth

### *Optimized Trip Outputs*

Two of the available Optimized Trip Outputs are the Optimized Trip Schedule and Optimized Trip Pressure:

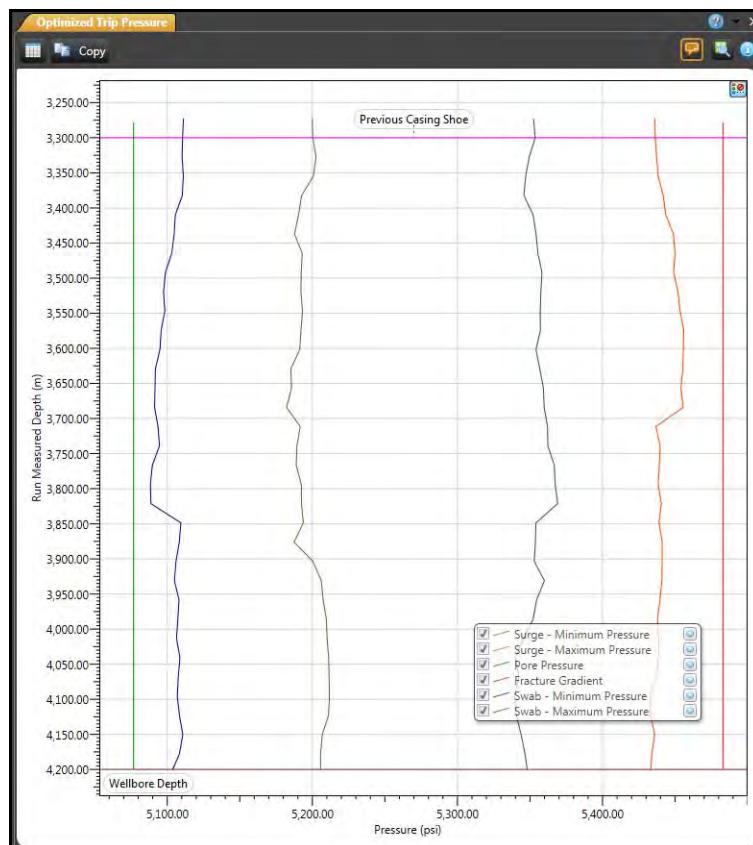
[Go To "What's In This Release?"](#)

- The Optimized Trip Schedule graphs the Run Measure Depth against either the Stand Period, or Stand Frequency, or Trip Speed. Results can be superimposed for both Trip In and Trip Out (Swab and Surge) operations.



[Go To "What's In This Release?"](#)

- The Optimized Trip Pressure compares both the minimum and maximum Swab and Surge Pressures against the Run Measured Depth. The results are graphically compared against the critical window that lies between the Pore Pressure and Fracture Gradient.



[Go To "What's In This Release?"](#)

### Pressure Transient Outputs

View Pressure signatures during Swab and Surge or Reciprocation mode plotted between the pore pressure and fracture gradient window. The plots display pressure with respect to time intervals pertaining to either completing one stand of a trip operation or one cycle of a reciprocation operation. Pressure responses take into account the fluid circulation and pipe speeds. Analyze pressure at a depth of interest or select pre-determined depths from the drop down menu whether it be at the string depth, previous cashing shoe, or well depth. The incorporated wellbore schematic contains an adjustable slider that provides the capability to simply drag the pressure gauge bar to the depth of interest.

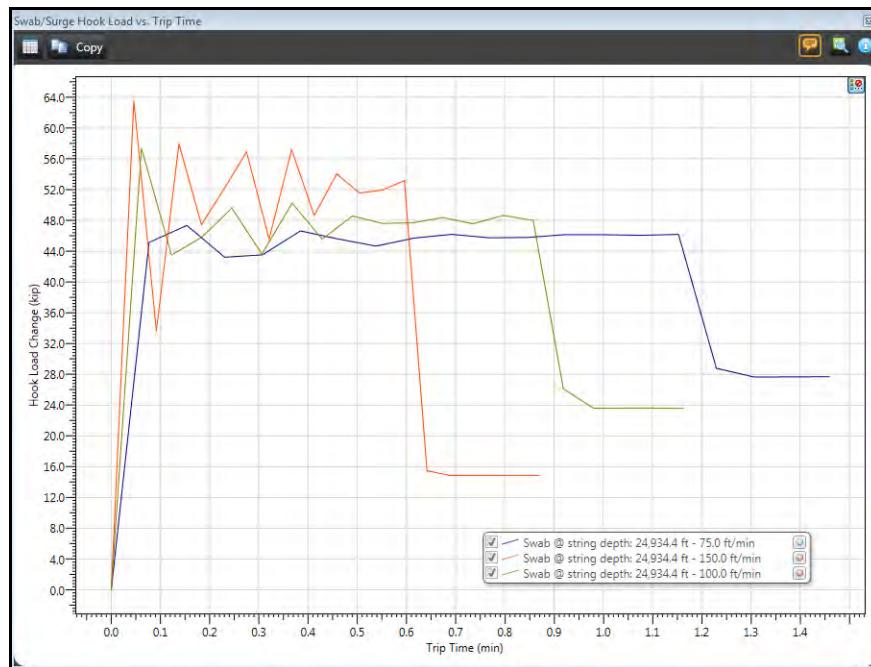


### Hook Load vs. Trip Time or Reciprocation Time

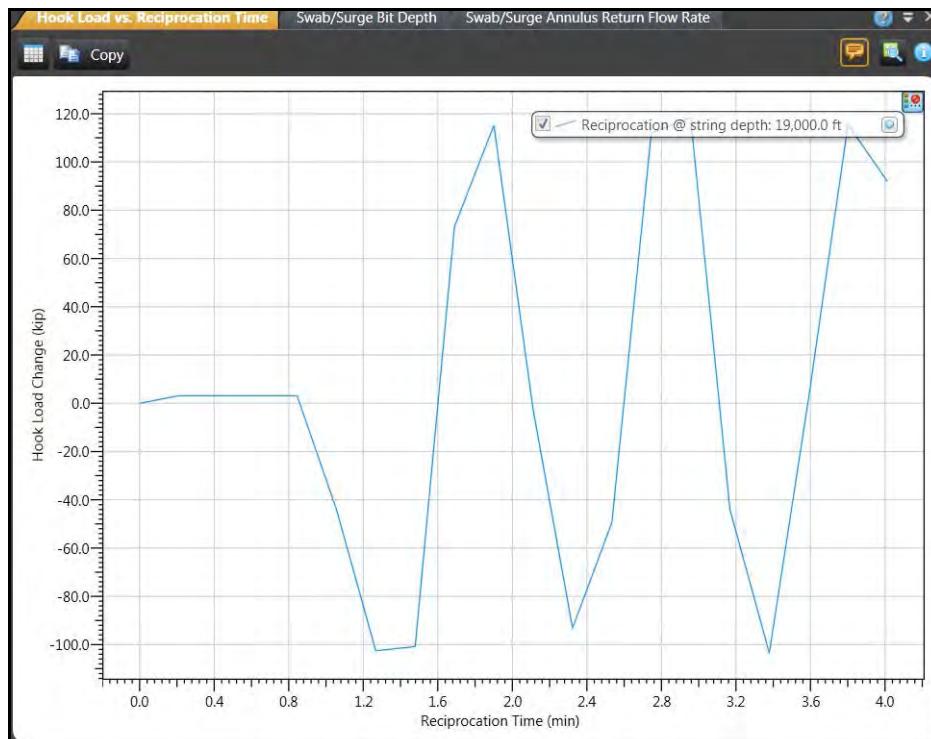
Monitor dynamic hook load with respect to the time it takes to complete one stand of a trip operation or one cycle of a reciprocation operation. Operational cycles induce reverse cyclic stresses, the effects of which should be monitored over time and at critical stages of operation.

[Go To "What's In This Release?"](#)

### Sample Hook Load vs. Trip Time



### Sample Hook Load vs. Reciprocation Time

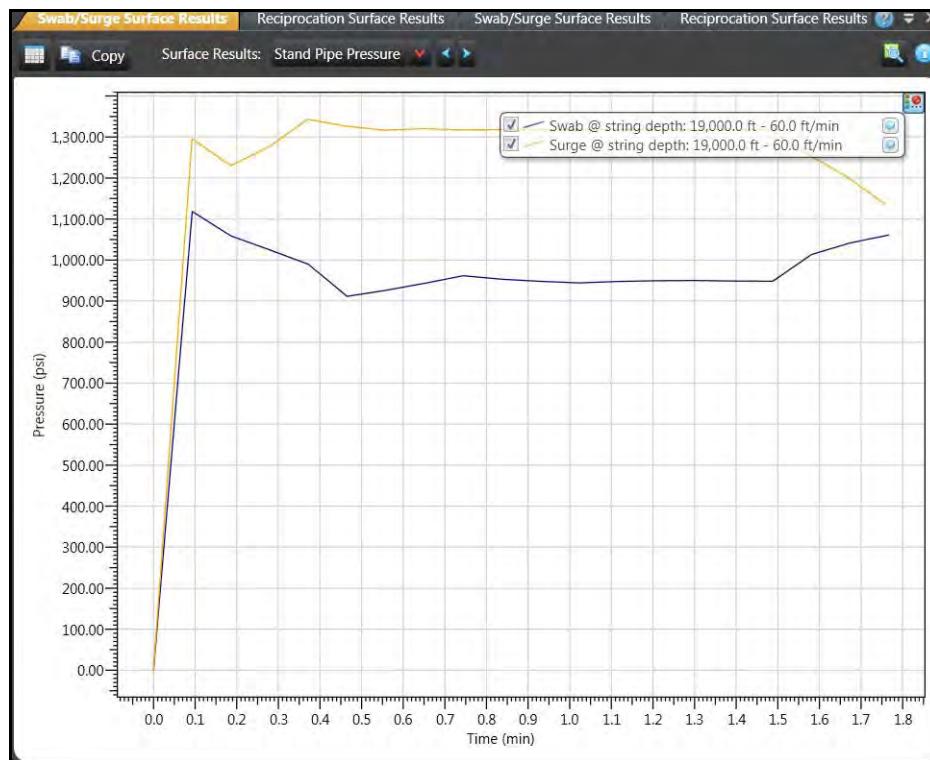


[← Go To "What's In This Release?"](#)

### Surface Results

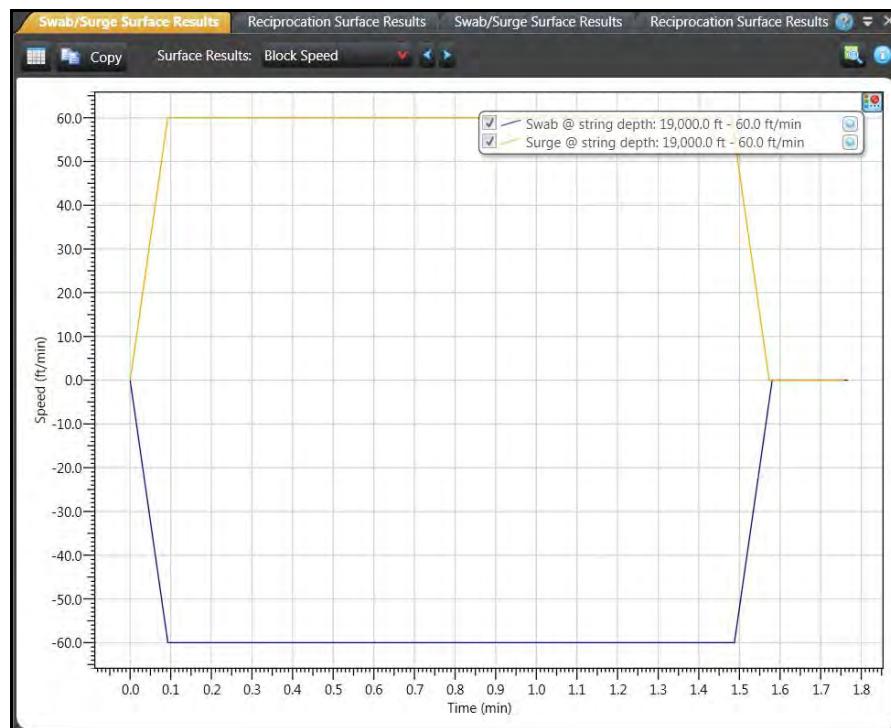
View Stand Pipe Pressure or Block Speed with respect to time. Stand Pipe Pressure wont exist if there is no fluid circulating.

#### Sample Stand Pipe Pressure during Swab and Surge



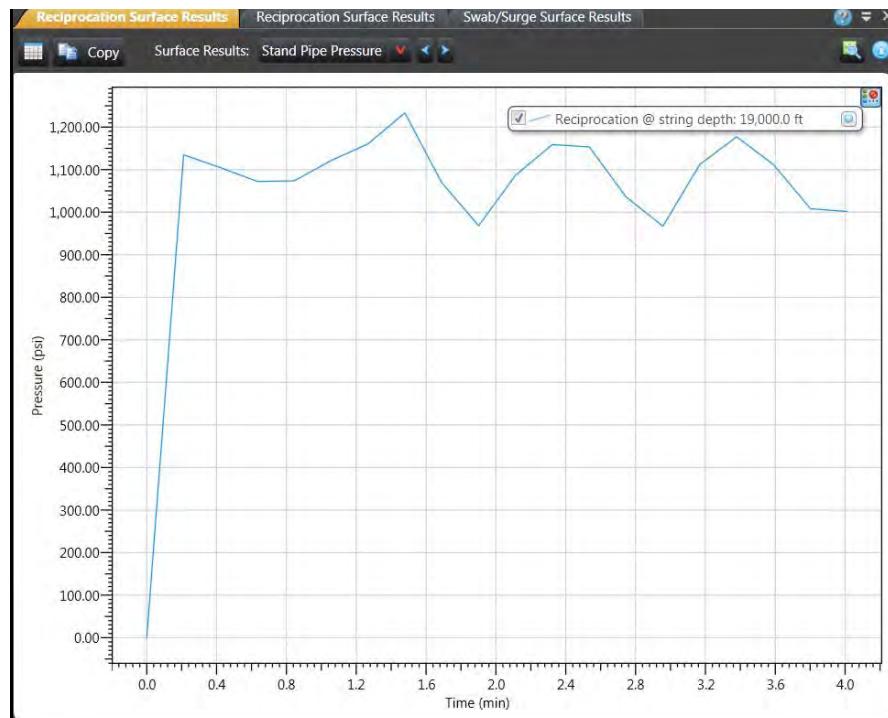
[Go To "What's In This Release?"](#)

### Sample Block Speed during Swab and Surge



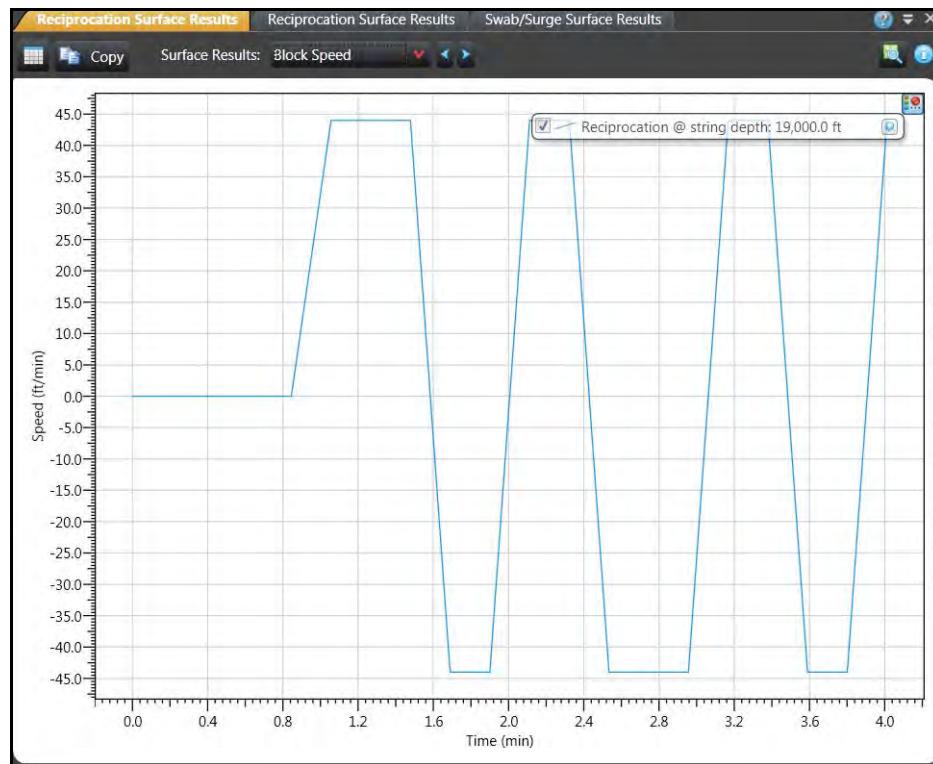
[← Go To "What's In This Release?"](#)

### Sample Stand Pipe Pressure during Reciprocation



[← Go To "What's In This Release?"](#)

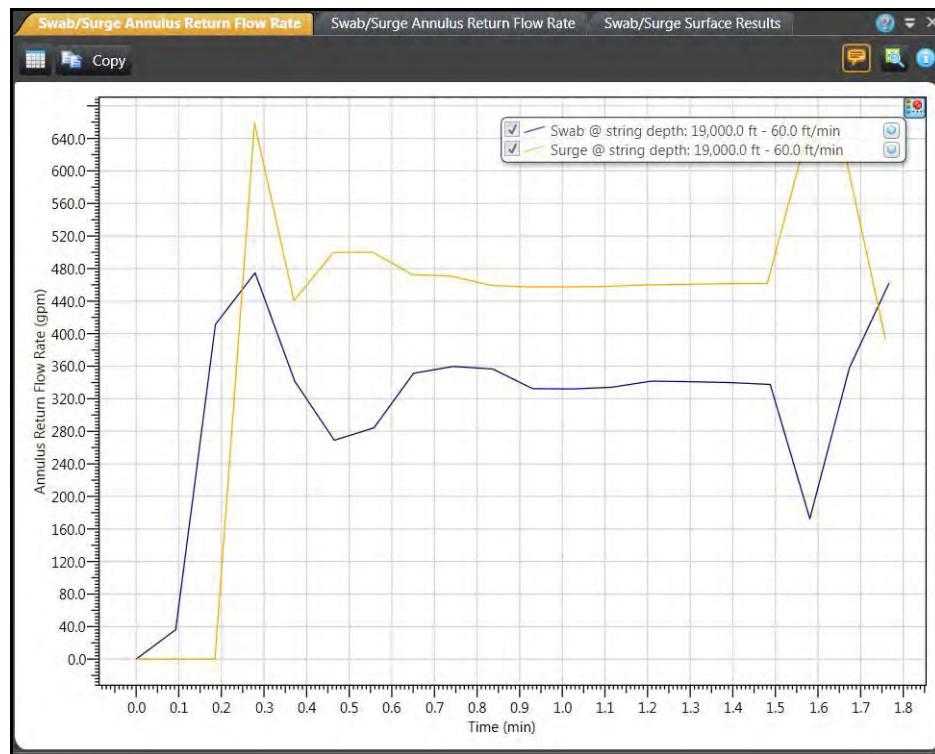
### Sample Block Speed during Reciprocation



[Go To "What's In This Release?"](#)

### Annulus Return Flow Rate

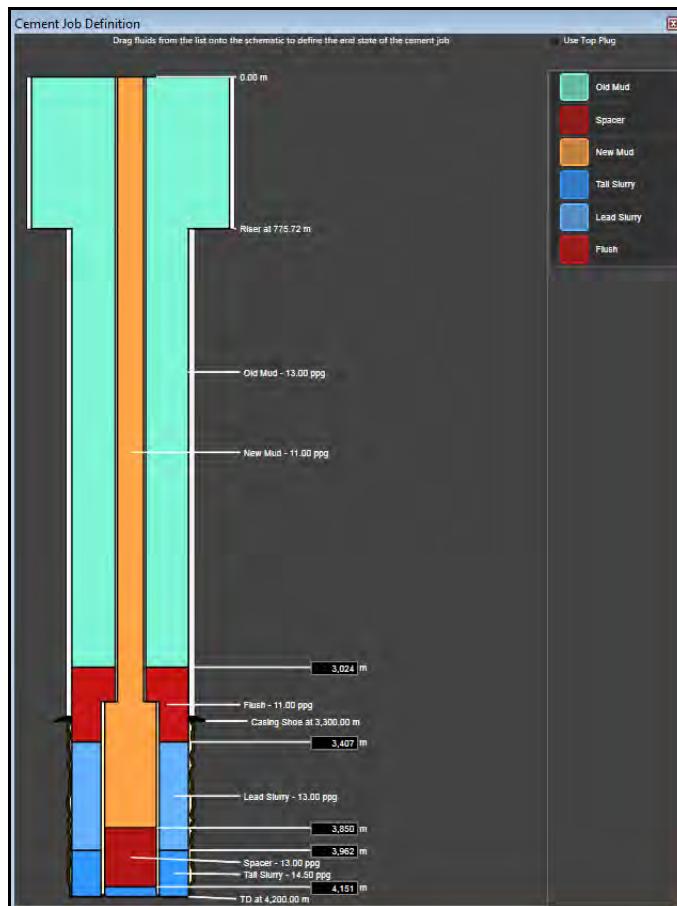
A graphical plot mapping the Annulus Flow Return rate against time.



[Go To "What's In This Release?"](#)

### Cement Job Definition

Available under Reciprocation Plots, use this tool to specify the final placement of fluids pumped during a cement job. This interactive wellbore schematic allows you to easily place fluids within the wellbore (in and out the string) and adjust the top of each fluid using the mouse to “drag and drop” constituents from an adjacent display legend. The top depth of each fluid can be also adjusted interactively using the mouse.

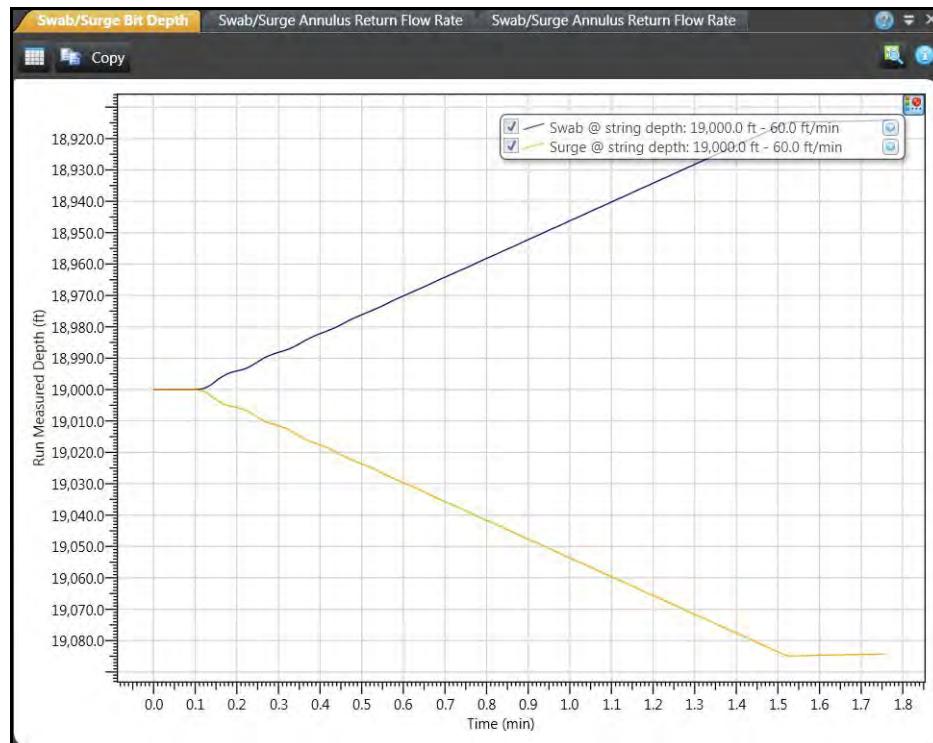


### Bit Depth

A graphic view of the measured run depth at relevant time intervals.

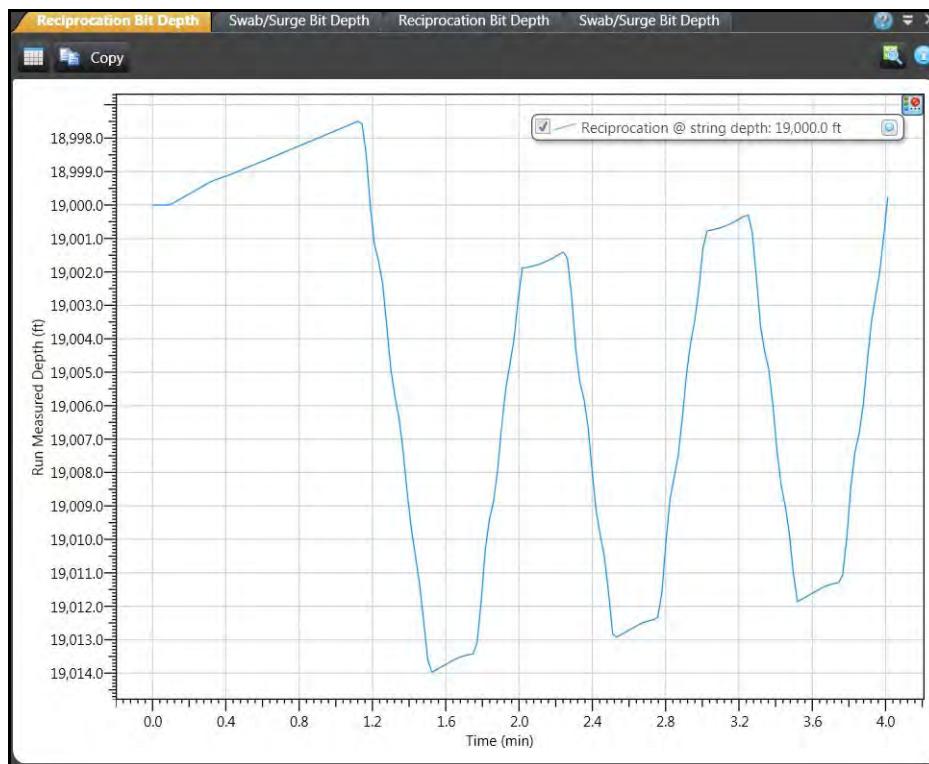
[Go To "What's In This Release?"](#)

### Swab and Surge Bit Depth



[Go To "What's In This Release?"](#)

### Reciprocation Bit Depth.



### General Enhancements

- Encompassing the vision of being a truly global product, the application now offers the infrastructure in place to support the Russian language. This is aimed at optimizing quality of the global user experience by catering to the needs of our international clientele. Refer Help Documentation for set-up details.
- The Operations tab has now been optimized as per the notion of “Outputs driving Inputs” where-in only the required information is made available based on the currently open plots. Previously, the Operations tab was designed to provide all information whether necessary or unnecessary.
- Users can now copy and paste Projects, Sites, Wells, Wellbores, Designs and Casings in the Well Explorer tree.
- A “Save As” support capability is available for any given case.
- Default names for newly defined fluids will follow a clear and concise Syntax. For example, a newly created cement will be labeled “Cement #N” by default where “N” is an ordered natural number. Taking another example, the first defined Spacer would be labeled “Spacer 1”; subsequent ones would be labeled “Spacer 2”, “Spacer 3” and so forth.

 Go To "What's In This Release?"

- Custom applications can be launched from the software based on contextual information regarding the well that is currently being worked upon. Information gets passed as arguments to the custom applications. The contextual information passed are DSN Name, User Name (for non-windows authentication) and Case ID of the currently open case; for example: "DSN Name; User Name; Case ID".
- The term "Yield Point" was re-labeled to "Yield Strength" in the context of Herschel Bulkley rheology model.
- The software allows users to define Spacers and Cements under the Fluids Editor tab.
- A fluid export/import capability has been provided for additional fluids like cements and spacers.

 [Go To "What's In This Release?"](#)

## WellPlan Fixed Issues

The WellPlan issues fixed for 5000.1.13 through 5000.15 are described below.

### Release 5000.15

Defect	Description
781378	Online help needs to mention optimize trip schedule is not available for surge Low Clearance mode
913041	TD> Summary Table shows different results than load for buckling conditions: Rot On Bottom (buckling)
934687	Allowable Kick Volume graph does not show influx volume > 100 bbl for Kick After Pump Shutdown and Kick While Drilling
955129	Torque and Drag error after adding two reamers BHA
956664	Hookload plot showing high value - Flow rate
957659	UB Foam Quality plot unable to calculate
959047	Steady state swab surge results shown are not as expected when booster pump is on
959146	Kick Pad OD greater than mud motor OD causes NON-CONVERGE SOLUTION
960030	Minimum Flowrate vs. Depth decreases when inclination increases
960378	Deleting jar from BHA causes minimum flow rate vs ROP changes unrealistically
960649	Slack off/Pick up plot shows "Pipe fails" when pick up exceeds overpull margin
961269	Max Allowable Volume limited to 100 bbls
961301	Cementing module shows "object reference not set to an instance of an object" when changing regional settings to other language
961598	Hybrid Model - Missing Tool Joint Length from BHA components causes incorrect result on Effective Tension calculation
962041	Buckling Limit Factor - modified sinusoidal buckling equation
963155	Expected Discrepancies on some Surge and Swab results due to the change in the Fortran compiler and adjustments to the temperature effect
963243	The Geothermal Gradient shows the TVD at Hole section instead of the TVD for the given Depth
963244	Missing Validation when temperature is enabled and the Fluid is synthetic
963248	Exception in Centralization Intervals cause by a missing validation
963251	Crash when trying to delete frozen lines after a Save As action when the open on a New Windows is enabled

 [Go To "What's In This Release?"](#)

Defect	Description
963252	Surge and Swab (reciprocation) calculation is not using the Well depth to adjust the Temperature
963254	When an UNR is replaced by a Hole Opener on the String and the Catalog pop up windows is cancel, you can see an Unreadable message
963255	UB Pressure calculation gets different result if a different rheology (to the supported ones) is used and then switch back to supported rheology
963349	Data of Standoff Devices data grid does not match with expected after clicking on "Use <X> centralizers for required %" button

### Release 5000.14.1

Defect	Description
956330	Add definition to help for Standoff at Centralizer (Red curve) on standoff plot (Documentation)
957025	Stuck Pipe schematics does not show component properly when tubing/casing component does not exist
957011	BHA Dynamics calculation does not converge due to bit type
957375	EDM license error when launching COMPASS and WellPlan
957537	Unable to save/create a case when using negative Ground Elevation
957024	Issues with WellPlan 5000.14 Beta: Services are not being installed properly
952611	Warnings are not coming in proper manner
957407	Hole and string components are out of order on report
957481	WellPlan 5000.14 crash after search in Well Explorer
957835	WellPlan report messed up
957882	Riserless Surge Swab Modeling

### Release 5000.14

Defect	Description
898245	For some Resolutions "String palette screen" floating CLOSE button at the bottom of the screen is hidden and not accessible
906864	Hole section: Friction factors: toggling on/off using FF from hole or per operations has no effect on sensitivity
913655	Giant Memory Leak> Around the Standoff Devices grid
924700	The Site Property dialog shows a warning message indicating for invalid value

 Go To "What's In This Release?"

Defect	Description
926084	UB Cuttings Transport Ratio plot does not have a Mean Sea Level line or label
926394	"Can't Calculate" message should not be displayed in a field that the user can edit (Geothermal Gradient - Gradient field)
927355	The pressure to break gel shows incorrect results when a different plot is opened first
927520	When a hole opener or Underreamer is brought from the catalog and Hydraulics calculations are run, if diverted flow is selected and there's no previous TFA/Nozzle area defined, you'll see an error that TFA needs to be greater than zero
927639	Pressure to Break Gel output doesn't match Classic Wellplan if it is not the first output being opened
945687	FYSA field is not supported on DS Well Engineering
952185	Copy and paste a case into the same or different design leaves empty the hole section, the string and the analysis settings (plugin)
952286	Discrepancies on the Well Control Animation Data and Circulating Pressure Profile when Steady State Temperature Model is u=in use and Mud inlet temperature is selected
953322	Stretch not correct for Ballooning and Temperature in Wellplan/DSWE. The stretch calculation related to a unit conversion problem
953513	Unable to use WellPlan created Sand Control Screen Catalog in DSWE
953941	BHA Quicklook error: Length 2 must be less than or equal to string length of 755m
954076	Max. Pump HP Calculations Contradiction in WellPlan vs DSWE - Hydraulics Modules
954326	HYD EhydPrscurvDataOrdermm HydPressProfile message is shown when the flow rate/pump on the Mud motor is redundant
954760	Validation stops the calculation after changing inputs to the Stretch on the Stuck Pipe Analysis
954895	Incorrect Plot description on the Slack up/ pick up plot (it shows the same description as the Hook Load).
955086	Crash while performing a Save As of an existing Case when using the Oracle 11.2.0.4 32-bit Client
955401	User created catalogs not appearing or active in the String Editor in DSWE (MANDREL)
955731	Standoff Devices Catalog Documentation
955859	Differences on Buckling and other TD results between WELLPLAN and DS Well Engineering
966096	DSWE, Slide Drilling FF's have influence on Tripping Out FF, Overpull Margin and Pick-up drag

 [Go To "What's In This Release?"](#)

The following issues were reported on WELLPLAN, but addressed and fixed on WellPlan™ for the 5000.14 release.

Defect	Description
782603	Hydraulics ECD VS Depth and ECD& SPP Drag Chart results do not match when changing the base type from Synthetic to water and back to Synthetic
783192	Wellhead Pressure and HookLoad when cement slurry turns the corner
783996	Misleading errors on launching HYD- Pressure loss reports
784884	Default 0 MD survey station, becomes editable when wellpath ascii file is imported
784927	Auto: Density Spellings are wrong on Foamed Rheology Data window when density is out of bound
785348	Pressure plot changes to a bad plot with no grids on changing from BP to HB rheology with only 2 fann data (not valid for HB rheology)
785350	Application locks up and then crashes for invalid fann data for HB rheology (only 2 fann 600,300 dial readings) and when mud temp effects is used
785734	TDA - Advanced Friction Factors, the data for factors which are disabled shouldn't be displayed
788152	Critical Speed not working when a mud motor is a component in the drillstring
796625	Enhancement: Add an Undo/Redo button feature
799334	Wellplan -Design Name if given greater than 60 characters shows up the message "enter No more than 60 characters" but shows this message twice
806490	When there is no shoe the DOI is automatic adjustment should not be carried out
807623	Appl crashes on triggering Surge trip schedule results with invalid data-negative test to check the error message
817253	Drillhead interval doesn't allow deeper than, 1000ft, user needs to be notified with an informational message
818491	Multiple Tab Delete
819085	BHA changes trajectory (drillhead direction)
819675	WellPlan Surge Module - Optimized Trip Schedule crashes when fluid rheology model is PV-YP as opposed to Fann
819958	Blanking out temperature, density, PV/YP and other rheology parameters in SI system, defaults the cell to its corresponding API defaults
821564	Trying to execute an Opticem-Cementing calculation without rights
829613	Problem with cementing simulator
834442	Temperature stretch is not included on the Documentation included
844567	WellPlan freezes on applying friction factor greater than 0.3
848644	DrillString component for a component that doesn't even exist in the string editor

 [Go To "What's In This Release?"](#)

Defect	Description
848767	Missing buttons in fluid positions animation
848840	Top of fluids on job data do not match the animation
850349	Animation fluids interface does not have smooth lines
851761	Fluid Positions - An extra, bogus fluid stage appears where there was none before
852535	Problem with Geothermal Gradient Plot
855025	WELLPLAN: WellPlan shows exception message if user enters more than 60 characters for case name, using Save Case As functionality
855183	Find not working correctly
856149	Text appearing on graph where it should not
857369	Error message is not clear when using riserless/inner string mode with unsupported configuration
857812	If you delete Mud Motor from Critical Speed Module results disappear and error message appear
859897	Reporting issues in riserless option
860700	Error in Kick Class Determination Quick Look section calcs for specific data set
861081	VCR buttons used to navigate the Animation plot in OptiCem disappear
861107	WellPlan - Survey last row of MD value is not matched with Well Depth MD value on top
861927	WELLPLAN Unit Converter converts some units incorrectly for Flow rate
863945	Set Default line properties to graphs in WellPlan
865140	Legend overlaps plot lines in standard reports
870769	Swab/Surge Module - possible Underreamer Defect
873918	Ambiguous calculations in Weight On Bit and Surface Load Calculations in Mode Data Parameter
873920	Switching between Top Down and Bottom up radio buttons make changes in their values automatically (incorrectly)
874152	Entering load values that physically don't make sense in the Top Down Analysis dialog might display erroneous results and halt the application. (i.e. a surface weight greater than the total weight of the workstring)
874750	Copy/Paste of a Case causes circulating fluid to disappear from surge operations data dialog (can cause crash)
876121	Slide Drilling load is getting affected by BLF value in Manual Friction Calibration plot
876702	Drag calculation in progress is triggered without a change
876835	Minimum WOB results at depth = 0 are not properly initialized in the dataset

 [Go To "What's In This Release?"](#)

Defect	Description
880336	Help About More Information button does not work on 64 bit machines (causes crash)
882675	Prefer default setting for calculation of mud inlet temperature to be "Use Average Mud Inlet Temperature" rather than "Use Mud Pit to Calculate"
882677	WellPlan Problem Hydraulics - results very wrong for Range mode vs Fixed when an Underreamer is on the BHA
882679	Spelling Mistake in WELLPLAN for the word 'Principal' in Principal (min) Resultant Stress
891521	Trying to execute a Torque Drag calculation without rights
891555	Column's headers of some tables are copied to clipboard although user chose copy data from table without the column's headers
893828	Riserless calculations the side force was not passed to the engineering code
895395	Well Plan classic crash/Hydraulic module
897337	Wellplan Surge&Swab problem (Statoil ASA)
899022	The transient response plot sometimes triggers a NaN result depending on the depth of the Moving Pipe (Swab)
900135	Error to generate the T&D graph
901447	Torque Point Plot when POI is @ bit for the Rot. On bottom operation shows the torque at bit of the Backreaming operation
901448	The Logo don't get saved on the Company Properties
902822	Check the Annulus Fluid data depth. Depth should be in ascending order
906181	Cement Job Simulator Crashes when creating a circulating pressure and density plot
908914	Steady State Surge and Swab results are being affected after checking/unchecking the cuttings loading from on other Hydraulics Module
910478	WELLPLAN - Wellplan closes when double clicking column in Opticem
910663	Include a warning message to fill the information in order and correctly
912049	The Wellplan application is crashed/hanged up after entering the data into the Mode Data - Top Down Analysis dialog
920613	Wrong Values in Plot ECD- Run Depth chart
925724	Summary Table shows different Results than load for buckling conditions: Rot On Bottom (buckling)
933384	Moving graphs label position in the plot
933451	T&D feature is been triggered by the code when opening a case.Wellplan takes unneeded
939785	Swab/Surge Pressure and ECD Pressure - ECD / Trip Rate Report the Swab: Closed End table will not populate with 90' stands

 [Go To "What's In This Release?"](#)

Defect	Description
942451	Include Stiff String Model for Drag Chart mode
943741	The torque drag license check out even no module been selected in WELLPLAN.
945959	Trip Schedule Calculation (Swab) crashes after switching to Fann data and then back to the Rheology when Newtonian model is used
946937	Special Characters in Workspaces - Supported on layouts
951045	Stand Pipe pressure does not change after changing the FYSA value
952406	Lithology - geological column display composer different in Wellplan and Compass
952753	WellPlan crash using OptiCem
953322	Stretch not correct for Ballooning and Temperature in WellPlan/DSWE. The stretch calculation related to a unit conversion problem
953457	Hydraulic calculation using underreamer
954324	Surge transient response graph Equivalent Mud Weight Vs Time (low clearance)
954745	Top plug comes back after deleting it and saving
954850	Incorrect Documentation about Centralizers

### Release 5000.13.1

WELLPLAN™ issues fixed in WellPlan™ (previously known as DecisionSpace® Well Engineering)

Defect	Description
785964	Kill Sheet Report (Section Well control Setup): additional field is displayed section String/Annulus Volumes - Total Annulus Length is different than that in the application
836018	WELLPLAN displays incorrect geo-thermal gradient temperatures in certain cases
876752	Geothermal Gradient Plot incorrect in Well Control module
878052	Kick Tolerance Report behavior
950300	Incorrect Casing Weight shown in String Editor when working with SI unit system

The following additional issues were fixed for the 5000.1.13.1 release.

Defect	Description
782313	Enhancement: Added to Wellplan - Mud Pits are shown in Well Control module, but not used in this module
926264	Enhancement: When the Use average inlet temperature is blanked out, the Mud Pit Sausage title still has the old value

 [Go To "What's In This Release?"](#)

Defect	Description
930221	Ground Elevation Plotted on depth plot
933251	Login with Windows Authentication does not work when using SQL Server 2008 sp1
934665	Unable to Import issue
938126	Enhancement: Input Bottom-Up string design
943653	High ECD issue in DSWE
945686	Geothermal Gradient/Temperature is different (EDT). If the Well Depth (MD) is deeper than the last open hole base MD
947551	Enhancement: Library Transfer Files Import/Export
947835	If DSWE 1.13 is installed on EDT 1.13 there's no Notification/warning for a database update even though it is required for the DSWE Report
948713	Enhancement: Enable additional lines to be added to the Sensitivity Spreadsheet.
950366	DSWE Side Force plot error with Ground Elevation
951527	Users unable to launch DS Well Engineering when they access from different tight groups
951620	DSWE bug while importing a tool in the catalog editor
951686	Crash or exception when the case was created on Wellplan and a Section Type was left empty on String editor
951720	Users unable to launch DS Well Engineering when they access from different tight groups
951791	DS Well Engineering generates blank reports (generates cover page and rest blank) when the format is set to Russian in Language settings

### **Release 5000.1.13**

WELLPLAN™ issues fixed in WellPlan (previously known as DecisionSpace® Well Engineering).

Defect	Description
854559	WP - Stand Off devices not taken into account for Surge Transient Pressure calculations
907427	Once the Case is created and the user decides to do changes on datum properties in WELLPLAN, all hydraulics plots display an unreadable message
945679	Wrong Units of SOD (Standoff devices) length ft/inches
945680	If the Shutdown stage is defined on job data, the results get modified
945682	Radial Clearance is not being validated on Standoff devices

 [Go To "What's In This Release?"](#)

Defect	Description
945683	When Port collars are included on the string, if port open is set as CHECKED, it doesn't affect the calculation, until the case is closed and reopened again

The following additional issues were fixed for the 5000.1.13 release.

Defect	Description
906868	Missing validation that affects all Hydraulic Calculations when HB is selected on rheology Data
907411	Makeup Torque should not be a required field for non-Torque & Drag calculation
907413	When Collapse resistance is "0" calculations doesn't run (Hydraulics and TD)
907415	When the Hole Section is shallower than the Wellpath, the Geothermal Gradient has weird behavior: NaN on Hydraulics Calculations
907416	Centralization Intervals output doesn't show the hyper link
907417	POI > Torque Point, when POI=0, the rotating on bottom operation shows the torque at bit of the backreaming operation
907418	Missing information on the Operations TAB show up like validations in the affected and non-affected plots
907421	Report: Adobe needs to be installed warning the first time the report is running (with Adobe X installed 10.1.4)
907424	When running ECD with HerschelBulkleyWithTemperatureEffect first then running BinghamPlasticWithBackpressure ECD, the results are different
907426	New (Copy of) Report takes LONG time to load when there's large number of centralizers or Survey stations
908900	Enhancement: Hook Load, String Summary, and String Position outputs are affected by the Bending Stress Mag. Factor, even though there's no user interface for it
908902	Enhancement or defect: Discrepancy on the Steady State Swab and Surge on the ECD vs. Time plots
909824	Switching the Datum on Riserless scenarios produces incorrect depth adjustment
912257	Min. Wt. Hel. Buckle (Tripping In) column disappears from the Hook Load data table when selecting "Measure at X ft from TD" radio button
913068	Affected backward compatibility for Riserless cases, when these cases are opened on WELLPLAN (offshore and sub-sea scenarios)
917143	Exception or Incorrect Drag Calculation if the calculation is able to run
921315	DSWE crashes when trying to create a report
921341	Remaining Coiled tubing length is not releasing error aggregation when input is from 1 - 25000 ft
924736	When a UBD case is duplicated to the same design, the Active Gas, the Gas Injection Rate, and the Injection temperature are not being transferred

 [Go To "What's In This Release?"](#)

Defect	Description
928850	Information regarding Hybrid Torque and Drag model is not available in the help content
930708	Login with Windows Authentication does not work when using SQL Server 2008 sp1
933128	DSWE crashing on login
933135	Read Only Wellpath gets overwritten when using the Import button
933251	Login with Windows Authentication does not work when using SQL Server 2008 sp1
933301	WP- Yield Point (YP) should be replaced by Yield Stress (YS) in Herschel-Bulkley model
934357	On the Effective Tension Plot, changing the % Yield does not produce changes on the tension limit curve
935403	Exception occurs and Application crashes when displaying Formation Tops (Polish)
943653	High ECD issue in DSWE
944746	Deviated Schematic plot not updating when inputs are changed. Reproducible in 5000.1.11.1.
944747	When the schematic is shown in "To Scale" mode in DSWE, some string components get replaced by drill collar (such as casing)
944748	Exporting a case does not export design and well bore properties
945073	Altering 'Max Overpull using % of Yield' in WELLPLAN would update the tension limit lines in the Hook Load and Effective Tension plots. In DSWE, this change is only in the Hook Load plot and is not reflected in the Effective Tension plot
945677	The well path created in compass has different AZIMUTH when loaded on DSWE

 Go To "What's In This Release?"

## WellPlan Known Issues

The following WellPlan known issues for releases 5000.1.13 through 5000.15 are described below.

### Release 5000.15

Defect ID	Description
963891	iEnergy script error in WellPlan and CasingWear introduction screen
963893	WellPlan and CasingWear crash on Windows 10 when the application is left open and the server machine is accessed via remote session

### Release 5000.14

There were no additional WellPlan known issues for this release.

### Release 5000.1.13.1

Defect ID	Description
951951	When user clicks "creating_custom_reports.pdf" hyperlink from online Help Documentation, the attachment does not open

### Release 5000.1.13

Defect ID	Description
945685	If you have 2 top plugs defined on WELLPLAN Job data, only the last one can be visualized on the Cement job definition in DSWE
945686	Geothermal Gradient/Temperature is different (EDT). If the Well Depth (MD) is deeper than the last open hole base MD
945687	FYSA field is not supported on DS Well Engineering, so if there are existing fluids with FYSA, the results will be different to those obtained from WELLPLAN

[Go To "What's In This Release?"](#)

## Third-Party Software

Landmark uses various third-party applications in the development of its software.

Landmark acknowledges that certain third party code has been bundled with, or embedded in, Landmark's software. The licensors of this third party code, and the terms and conditions of their respective licenses, may be found at the following location:

[Installdir]\Documentation\Third\_Party.pdf

The following table describes the third party applications that are installed by Release 5000.15.

Installed Product/Package	Version for all supported Operating Systems
Apache/XML Xerces	1.4.x
Blue Marble Geographic Calculator	6.2
Commons BeanUtils	1.4.1
Commons Collections	2.0
Commons Logging	1.0.2
ComponentOne LLC Chart™	7.0
Crystal Project, © 2008 The Yellow Icon. All rights reserved.	N/A
Crystal Reports™ (note that one Crystal Reports™ Developer license per site is required if you want to customize reports)	11.5 SP3
DEX	2003.14.3.70
Geobase® (Digital Elevation Data, and Satellite Imagery)	N/A
Hewlett-Packard Development Company, L.P., Compaq Visual Fortran	6.1a
Infragistics NetAdvantage for WPF	12.1
iText	2.1.6
Macrovision™ Corporation FLEXnet Publisher™	11.4
Macrovision™ InstallShield Admin Studio™	6.0
Microsoft® Data Access Components (MDAC)	2.8 SP1
Microsoft® J# FrameWork	1.1
Microsoft® SQL Server 2014 Express Edition (replaces MSDE)	SP2
Microsoft® .NET Framework 3.5	3.5

 [Go To "What's In This Release?"](#)

Installed Product/Package	Version for all supported Operating Systems
Microsoft® Visual C++ 2005 Service Pack 1 Redistributable Package ATL Security Update (filename: vcredist_x86.exe)	2005 SP1 (v. 8.0)
Rogue Wave	6.0.4
Rogue Wave™ Software, Inc., Stingray Studio – Objective Grid PRO	8
Rogue Wave™ Software, Inc., Stingray Studio – Objective Grid Standard	8
Rogue Wave™ Software, Inc., Stingray Studio – Objective Toolkit Standard	8
SCGrid.com, SCGrid Active X grid Control	4.5.0.3
Silicon Graphics®, Inc. OpenGL®	1.2
Sun Microsystems, Inc., JOGL (Java Bindings for OpenGL). Copyright © 2003-2007 Sun Microsystems, Inc. All rights reserved.	1.1.1a
TCL Library (Tclib)	8.2.3

The following table describes *prerequisite* applications (these are not included in the release 5000.15 install). Some are required for all features (for example, operating system, Adobe Acrobat, Microsoft® Internet Explorer) and some are required only for certain applications or to enable specific features.

Prerequisite Product/Package	Version
Adobe® Systems Inc., Adobe® Reader®	latest
Hummingbird® Ltd., Exceed®/Exceed 3D	2007  If OpenWorks Basic is installed (instead of the Full install), then not required
Microsoft® Internet Explorer	latest
Microsoft® SQL Server 2014	SP2
MKS Inc., MKS Toolkit® for Enterprise Developers (formerly known as NuTCRACKER)	9.2.0100  If OpenWorks Basic is installed (instead of the Full install), then not required
Oracle Corporation, ORACLE® Server	12c 64-bit
Sun Microsystems™ Inc., Java™ 2 Runtime Environment, Standard Edition	1.6.1

 Go To "What's In This Release?"

# Contacting Landmark Customer Support

Landmark Customer Support operates Technical Assistance Centers (TACs) in Malaysia, the United Kingdom, and the United States. Customer Support provides technical assistance on Landmark applications. The website for Landmark is:

[Halliburton | Landmark \(https://www.landmark.solutions/\)](https://www.landmark.solutions/)

Requests for support can be made by:

- [Landmark Customer Support Portal](#)

See [Submitting a Request for Technical Assistance](#) below.

- **Email**

<a href="mailto:apsupport@landmarksoftware.com">apsupport@landmarksoftware.com</a>	Asia Pacific
<a href="mailto:soporte@landmarksoftware.com">soporte@landmarksoftware.com</a>	Latin America (Spanish)
<a href="mailto:suporte@landmarksoftware.com">suporte@landmarksoftware.com</a>	Latin America (Portuguese)
<a href="mailto:support@landmarksoftware.com">support@landmarksoftware.com</a>	Africa, Eurasia, Europe, Middle East, North America

- **Telephone**

See [Technical Assistance Centers](#) below.

## ***Submitting a Request for Technical Assistance***

To submit a request for technical assistance:

1. Open [Landmark Customer Support Portal \(https://www.landmark.solutions/Support\)](#) in a browser.
2. Click **Log On To Customer Support** under the Need Help? heading. The Sign In page displays.

However, if you have previously signed in and the system has remembered your credentials, the Customer Support page displays.

3. If the Sign In page is displaying, log in. The Customer Support page displays.
4. Under the Need Help? heading, click **Customer Support Portal**. The Landmark Customer Support page appears in the browser.

 Go To "What's In This Release?"

5. In the Case & Defect Information area on the right, select **Create A New Case**. The Add Case page appears in the browser.
6. Fill in the requested information.

Provide:

- Details about your technical concern, including any error messages.
- Workflow steps where the problem occurred.
- Attachments of screen shots that capture the problem.

7. Click **Submit**.

A support analyst in the nearest Technical Assistance Center will respond to your request.

## **Technical Assistance Centers**

The hours of operation are:

8:00 a.m. - 5:00 p.m., local time

Monday-Friday, excluding holidays

The phone numbers for the Technical Assistance Centers are:

- **Asia Pacific, Malaysia**

+61-8-9481-4488

Toll Free +1-800-803-687 (Malaysia)

- **Europe, Africa, Middle East, Eurasia, United Kingdom**

+44-1372-868686

- **Latin America, USA**

+1-713-839-3405 (Spanish, Portuguese, English)

 Go To "What's In This Release?"

- **North America, USA**

+1-713-839-2200 (Houston, TX, USA)

Toll Free +1-877-435-7542

For more information about contacting Customer Support, see:

<https://www.landmark.solutions/Support>

 Go To "What's In This Release?"

# Copyright and Trademarks

© 2017 Halliburton  
All Rights Reserved

This publication has been provided pursuant to an agreement containing restrictions on its use. The publication is also protected by Federal copyright law. No part of this publication may be copied or distributed, transmitted, transcribed, stored in a retrieval system, or translated into any human or computer language, in any form or by any means, electronic, magnetic, manual, or otherwise, or disclosed to third parties without the express written permission of:

**Halliburton | Landmark**  
3000 North Sam Houston Parkway East, Houston, Texas 77032-3219, USA  
P.O. Box 60087, Houston, Texas 77205-0087, USA  
Phone: 281.871.4000  
Internet: <https://www.landmark.solutions/>

## Trademarks

3D Drill View, 3D Drill View KM, 3D Surveillance, 3DFS, 3DView, Active Reservoir Surveillance, Adaptive Mesh Refining, ADC, Advanced Data Transfer, Analysis Model Layering, ARIES, ARIES DecisionSuite, Asset Data Mining, Asset Decision Solutions, Asset Development Center, Asset Development Centre, Asset Journal, Asset Performance, AssetConnect, AssetConnect Enterprise, AssetConnect Enterprise Express, AssetConnect Expert, AssetDirector, AssetJournal, AssetLink, AssetLink Advisor, AssetLink Director, AssetLink Observer, AssetObserver, AssetObserver Advisor, AssetOptimizer, AssetPlanner, AssetPredictor, AssetSolver, AssetSolver Online, AssetView, AssetView 2D, AssetView 3D, Barrier Assurance Monitoring, BLITZPAK, Buckle, CartoSnap, CasingLife, CasingSeat, CasingWear, CDS Connect, CGMage Builder, Channel Trim, Chromoframe, COMPASS, Contract Generation, Corporate Data Archiver, Corporate Data Store, Data Analyzer, DataManager, DataServer, DataStar, DataVera, DBPlot, Decision Management System, DecisionSpace, DecisionSpace 3D Drill View, DecisionSpace 3D Drill View KM, DecisionSpace AssetLink, DecisionSpace AssetPlanner, DecisionSpace AssetSolver, DecisionSpace Atomic Meshing, DecisionSpace Automated Fault Interpretation, DecisionSpace Base Module, DecisionSpace Data Quality, DecisionSpace Desktop, DecisionSpace Dropsite, DecisionSpace Fracture Productivity, DecisionSpace Geoscience, DecisionSpace GIS Module, DecisionSpace GRC Module, DecisionSpace Nexus, DecisionSpace Reservoir, DecisionSuite, Deeper Knowledge, Broader Understanding., DepthTeam, DepthTeam Explorer, DepthTeam Express, DepthTeam Extreme, DepthTeam Interpreter, Desktop Navigator, DESKTOP-PVT, DESKTOP-VIP, DEX, DIMS, Discovery, Discovery 3D, Discovery Asset, Discovery Framebuilder, Discovery PowerStation, Discovery Suite, DMS, Drillability Suite, Drilling Desktop, DrillModel, DrillNET, Drill-to-the-Earth-Model, Drillworks, Drillworks ConnectML, Drillworks Predict, DSS, Dynamic Frameworks to Fill, Dynamic Reservoir Management, Dynamic Surveillance System, E&P Blueprint, EDM, EDM AutoSync, EDT, eLandmark, Emergent Oilfield, Engineer's Data Model, Engineer's Desktop, Engineer's Link, ENGINEERING NOTES, eNotes, ESP, Event Similarity Prediction, Exploration Insights, ezFault, ezModel, ezSurface, ezTracker, ezTracker2D, ezValidator, FastTrack, Field Scenario Planner, FieldPlan, FieldPlan Express, For Production, FrameBuilder, Frameworks to Fill, FZAP!, GeoAtlas, GeoDataLoad, GeoGraphix, GeoGraphix Exploration System, Geologic Interpretation Component, Geometric Kernel, GeoProbe, GeoProbe GF DataServer, GeoSmith, GES, GES97, GesFull, GESXplorer, GMAPplus, GMI Imager, Grid3D, GRIDGENR, H. Clean, Handheld Field Operator, HHFO, Horizon Generation, I<sup>2</sup> Enterprise, iDIMS, iEnergy, Infrastructure, iNotes, Iso Core, IsoMap, iWellFile, KnowledgeSource, Landmark (*as a service*), Landmark (*as software*), Landmark Decision Center, Landmark Field Appliance, LandNetX, Landscape, Large Model, Lattix, Limits, LithoTect, Live Drilling Advisor, LogEdit, LogM, LogPrep, MagicDesk, Make Great Decisions, MathPack, MDS Connect, MIMIC, MIMIC+, Model Builder, Neftex, NETool, Nexus, Nexus View, No Well Left Behind, Object MP, OneCall, OpenBooks, OpenEarth, OpenJournal, OpenLink, OpenSGM, OpenVision, OpenWells, OpenWire, OpenWire Client, OpenWire Production, OpenWire Server, OpenWorks, OpenWorks Development Kit, OpenWorks Well File, Operations Management Suite, Output-Driven-Input, PAL, Parallel-VIP, Parametric Modeling, Permedia, PetrisWINDS, PetrisWINDS Enterprise, PetroBank, PetroBank Explorer, PetroBank Master Data Store, PetroWorks, PetroWorks Asset, PetroWorks Pro, PetroWorks ULTRA, PLOT EXPRESS, PlotView, Point Gridding Plus, Pointing Dispatcher, PostStack, PostStack ESP, PostStack Family, Power Interpretation, PowerCalculator, PowerExplorer, PowerExplorer Connect, PowerGrid, PowerHub, PowerModel, PowerView, PrecisionTarget, Presgraf, PressWorks, PRIZM, Production, Production Asset Manager, PROFILE, Project Administrator, ProMAGIC Connect, ProMAGIC Server, ProMAX, ProMAX 2D, ProMAX 3D, ProMAX 3DPSDM, ProMAX 4D, ProMAX Family, ProMAX MVA, ProMAX VSP, pSTAx, Query Builder, Quick, Quick+, QUICKDIF, Quickwell, Quickwell+, Quiklog, QUIKRAY, QUIKSHOT, QUIKVSP, RAVE, RAYMAP+, Real Freedom, Real Time Asset Management Center, Real Time Decision Center, Real Time Operations Center, Real Time Production Surveillance, Real Time Surveillance, Real-time View, Recall, Reference Data Manager, Reservoir, Reservoir Framework Builder, RESev, ResMap, RTOC, SCAN, SeisCube, SeisMap, SeisMapX, Seismic Data Check, SeisModel, SeisSpace, SeisVision, SeisWell, SeisWorks, SeisWorks 2D, SeisWorks 3D, SeisWorks PowerCalculator, SeisWorks PowerJournal, SeisWorks PowerSection, SeisWorks PowerView, SeisXchange, Semblance Computation and Analysis, Sierra Family, SigmaView, SimConnect, SimConvert, SimDataStudio, SimResults, SimResults+, SimResults+3D, SIVA+, SLAM, Smart Change, Smart Deploy, Smart Flow, Smart Skills, Smart Start, Smart Sustain, Smart Transform, Smart Vision, SmartFlow, smartSECTION, smartSTRAT, Spatializer, SpecDecomp, StrataMap, StrataModel, StratAmp, StrataSim, StratWorks, StratWorks 3D, StreamCalc, StressCheck, STRUCT, Structure Cube, Surf & Connect, SurfNet, SynTool, System Start for Servers, SystemStart, SystemStart for Clients, SystemStart for Servers, SystemStart for Storage, Tanks & Tubes, TDQ, Team Workspace, TERAS, T-Grid, The Engineer's DeskTop, Total Drilling Performance, TOW/cs, TOW/cs Revenue Interface, TracPlanner, TracPlanner Xpress, Trend Form Gridding, Trimmed Grid, Tubular Basic, Turbo Synthetics, Unconventional Essentials, VESPA, VESPA+, VIP, VIP-COMP, VIP-CORE, VIPDataStudio, VIP-DUAL, VIP-ENCORE, VIP-EXECUTIVE, VIP-Local Grid Refinement, VIP-THERM, Voice of the Oilfield, vSpace, vSpace Blueprint, vSpace Onsite, WavX, Web Editor, Well H. Clean, Well Seismic Fusion, Wellbase, Wellbore Planner, Wellbore Planner Connect, WELLCAT, WELLPLAN, WellSolver, WellXchange, WOW, Xsection, You're in Control. Experience the difference., ZAP!, ZEH, ZEH Plot, ZetaAnalytics, Z-MAP, Z-MAP Plus, and ZPS are trademarks, registered trademarks, or service marks of Halliburton.

All other trademarks, service marks and product or service names are the trademarks or names of their respective owners.

## Note

The information contained in this document is subject to change without notice and should not be construed as a commitment by Halliburton. Halliburton assumes no responsibility for any error that may appear in this manual. Some states or jurisdictions do not allow disclaimer of expressed or implied warranties in certain transactions; therefore, this statement may not apply to you.

 Go To "What's In This Release?"**Third Party Licenses and Attributions**

Halliburton acknowledges that certain third party code has been bundled with, or embedded in, its software. The licensors of this third party code, and the terms and conditions of their respective licenses, may be found at the following location:

*<Installation Directory>/Documentation/Third\_Party.pdf*

**Disclaimer**

The programs and documentation may provide links to external web sites and access to content, products, and services from third parties. Halliburton is not responsible for the availability of, or any content provided on, third party web sites. You bear all risks associated with the use of such content. If you choose to purchase any products or services from a third party, the relationship is directly between you and the third party. Halliburton is not responsible for: (a) the quality of third party products or services; or (b) fulfilling any of the terms of the agreement with the third party, including delivery of products or services and warranty obligations related to purchased products or services. Halliburton is not responsible for any loss or damage of any sort that you may incur from dealing with any third party.