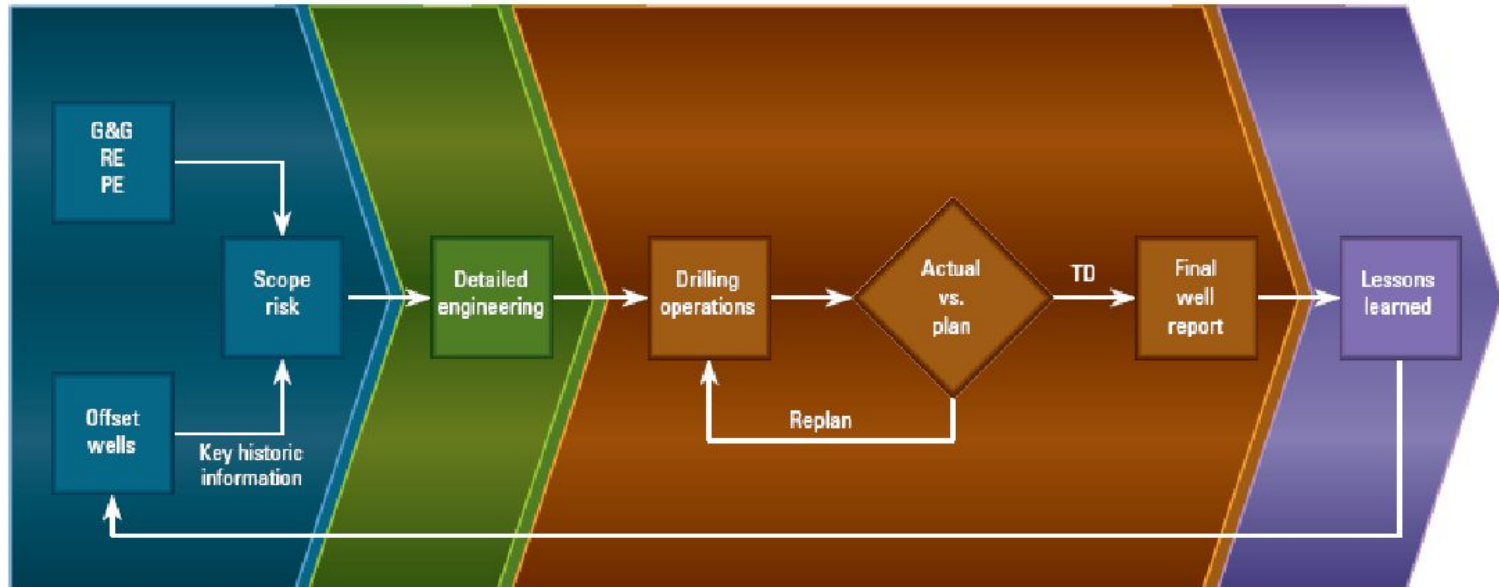


СТРУКТУРА ПРОЕКТИРОВАНИЯ БУРЕНИЯ СКВАЖИН

G&G = Geology and geophysics RE = Reservoir engineering PE = Production engineering OSC = Operation Support Center TD = Total depth

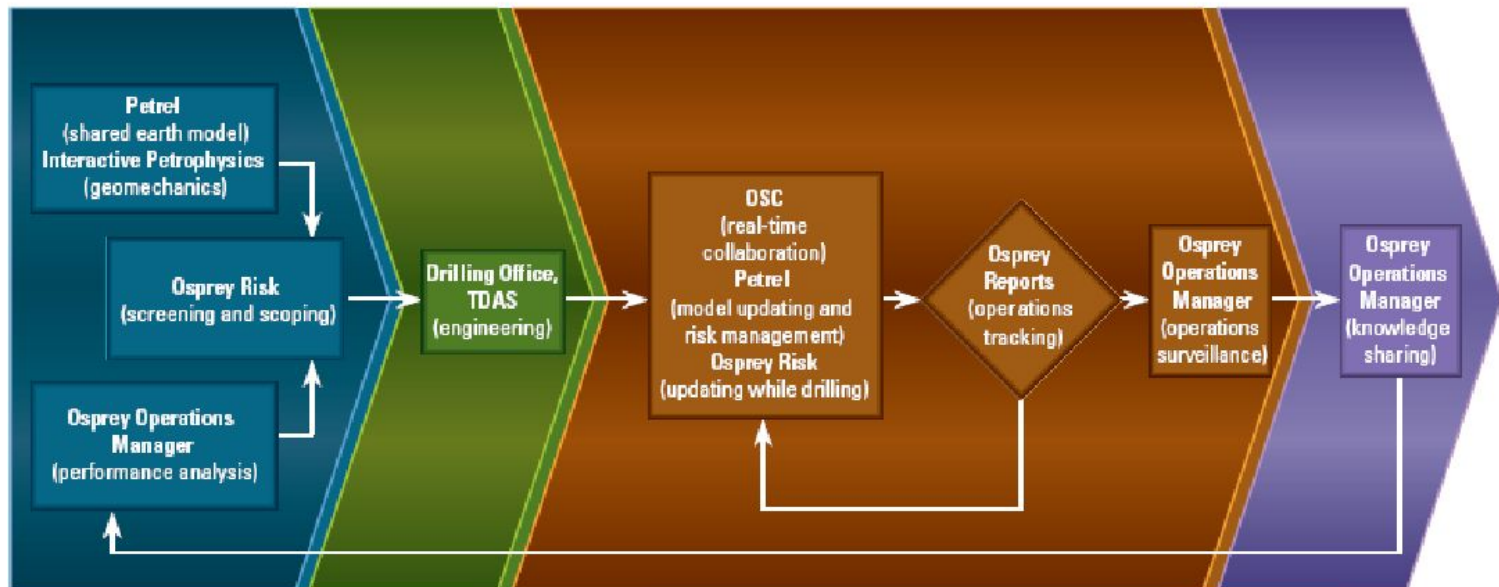


Shared Earth Model

Planning

Execution—Real-Time Monitoring—Replanning

Evaluation



ФОРМИРОВАНИЕ РАСЧЕТНОГО ВАРИАНТА В ПРОГРАММЕ OSPRAY RISK

Well engineering montage can be used for peer reviews or as a drilling road map.

Schlumberger Osprey Risk [Standard] - wildcat (Default Configuration)

File Edit View Tools Help

Montage

Workflow

Input Data

- Scenario Info
- Trajectory
- Earth Properties
- Rig Selection
- Resample

Wellbore Geometry

- Casing Points
- Wellbore Sizes
- Casing Design
- Cement Design
- Schematic

Drilling Parameters

- Drilling Fluids
- Bit Selection
- Drillstring Design

Quick Tips

What You Can Do

- View montage of well design

Hints

Displayed from left to right:

- Trajectory vertical section
- Time vs Depth
- Cost vs Depth
- Wellbore Schematic
- Risk log for well MD
- Fracture gradient, pore pressure mud weight profile with casing points

Scenario Name: wildcat

Well Name: Well_0001

Author Name: I.M. Driller

Date Printed: 11/03/2006 15:51:35

Wellbore Schematic: 11/3/2006 (KB-Grd: 80.0 ft)

RKB (MD)

Schematic - Actual

0

280

2072

2369

2372

7374

7671

7674

9008

9305

9308

10437

12394

12691

12694

13926

14223

14226

1, Surface, 24, 22.500 in, 0.0 ft, 2371.9 ft

2, Intermediate, 18 5/8, 17.239 in, 0.0 ft, 7674.4 ft

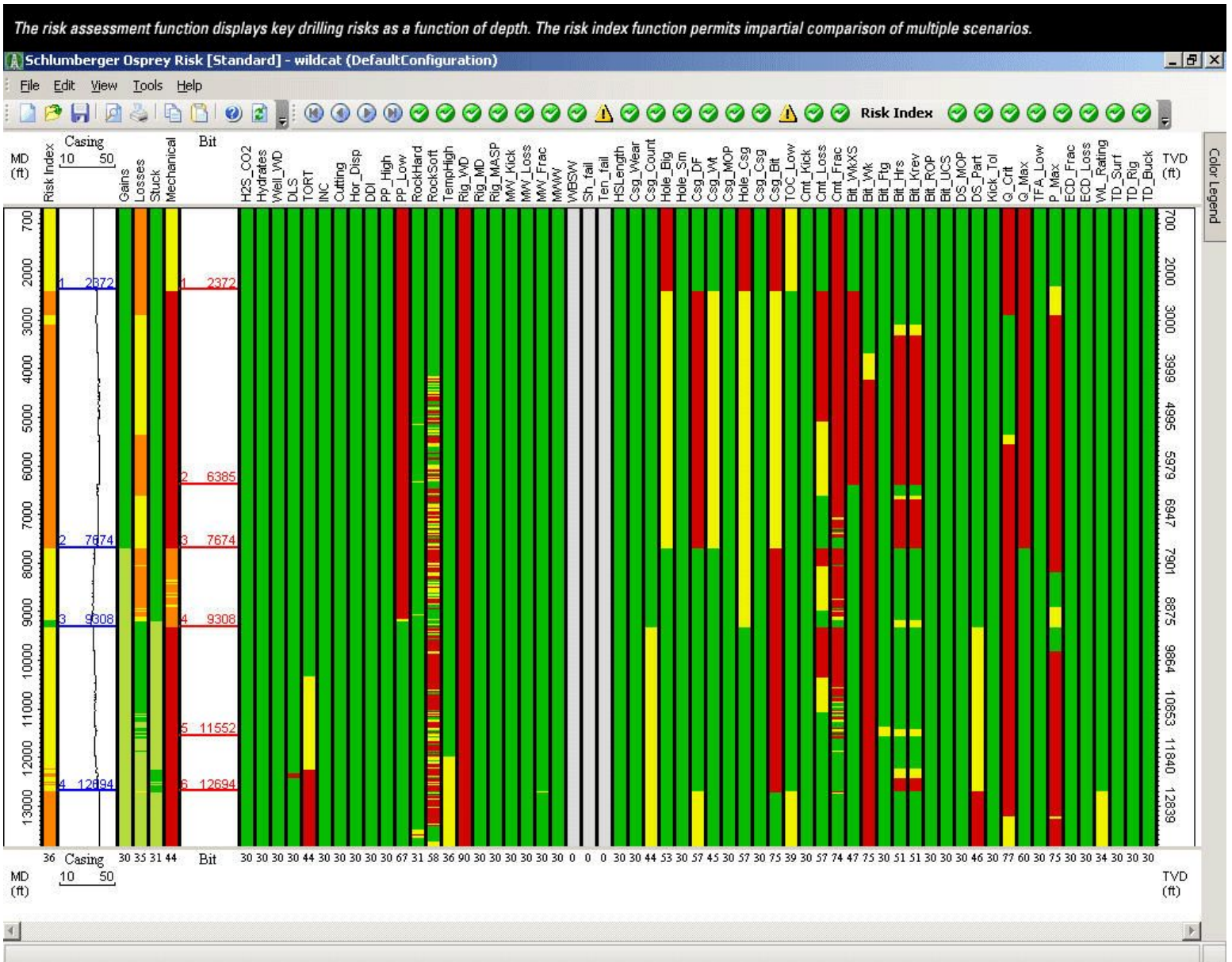
3, Intermediate, 13 3/8, 11.907 in, 0.0 ft, 9308.2 ft

4, Production, 9 5/8, 8.435 in, 0.0 ft, 12694.0 ft

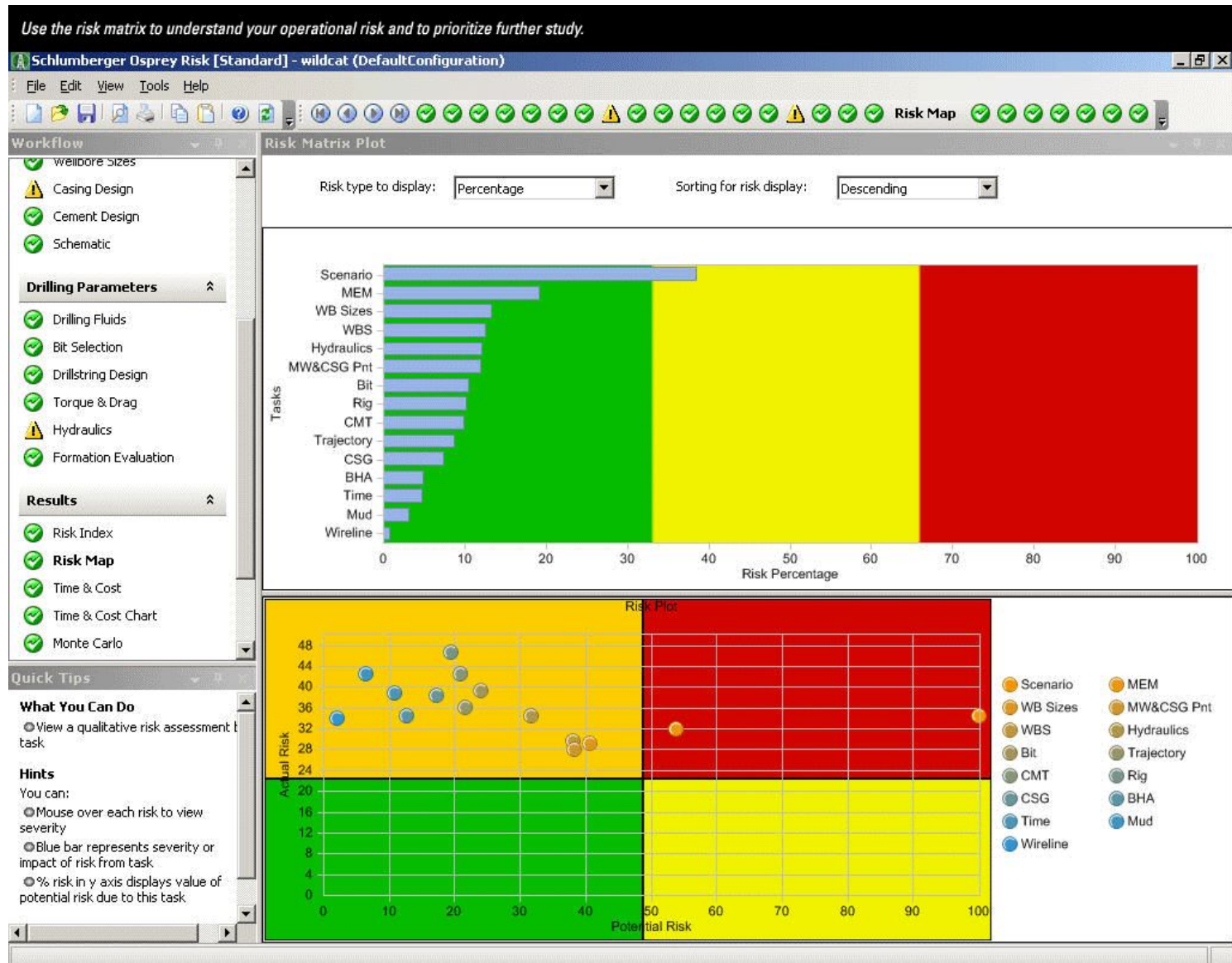
5, Production Liner, 6 5/8, 5.675 in, 12394.0 ft, 1832.2 ft

MD BHA CLSM 0FCED18 1R0001 0 0644 0 P 05819 V
ft 3684 0 FG18 490001 002044 0 B319 ft
0 PP18 1R0P42 00 0044
0 MVM8 00 0044

РЕЗУЛЬТАТЫ РАСЧЕТА ИНДЕКСА РИСКА В ПРОГРАММЕ OSPRAY RISK

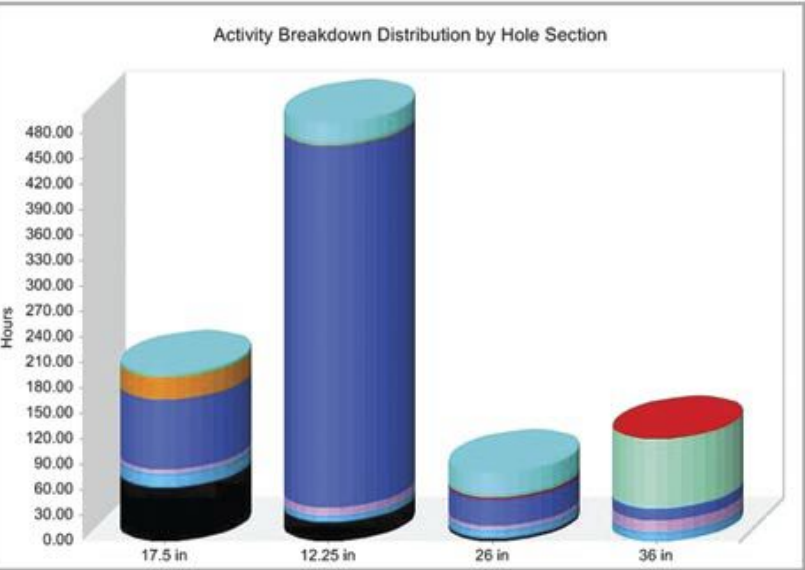
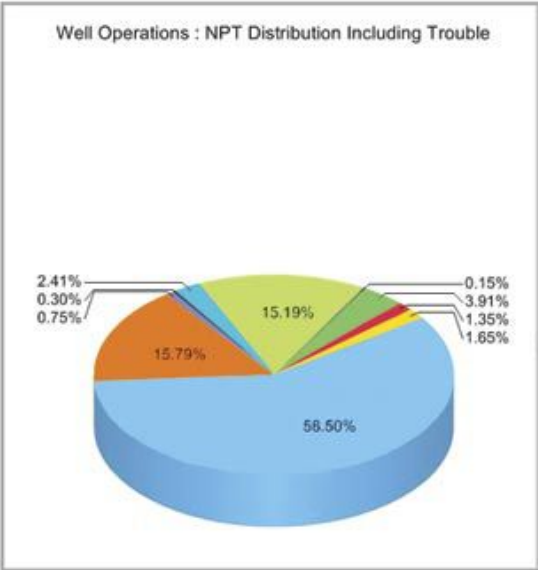
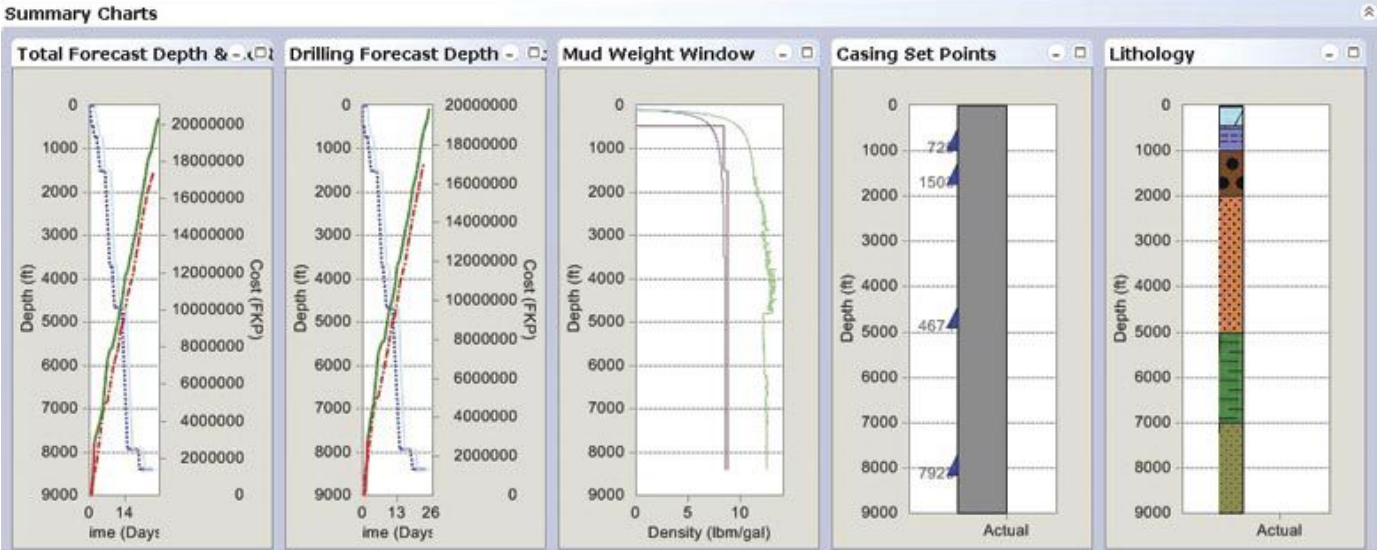


КАРТА РИСКОВ, СПРОГНОЗИРОВАННАЯ В ПРОГРАММЕ OSPRAY RISK



ОЦЕНКА ТЕХНОЛОГИЧЕСКИХ РЕШЕНИЙ ПРИ ПОМОЩИ OSPRAY RISK

Analyze KPIs in a few clicks.



РЕЗУЛЬТАТЫ АНАЛИЗА МЕТОДОМ МОНТЕ-КАРЛО

Accurately determine your financial exposure with Monte Carlo probabilistic analysis of time and cost.

Schlumberger Osprey Risk [Standard] - wildcat (Default Configuration)

File Edit View Tools Help



Input Probability

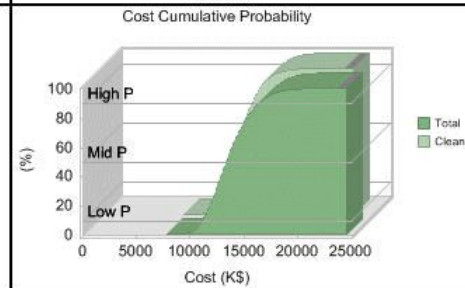
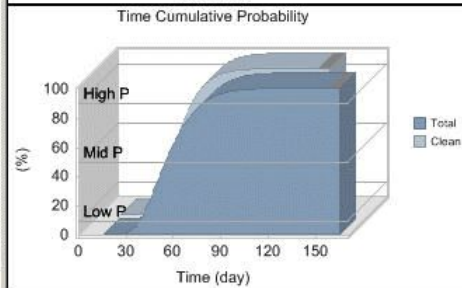
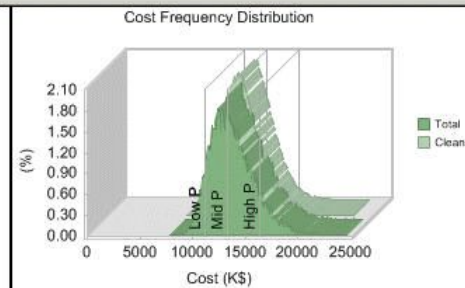
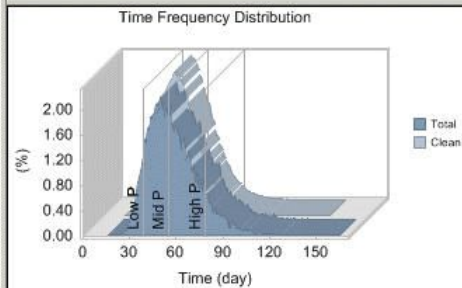
Number Of Iterations: 12000 Low P% Time: 10 Mid P% Time: 50 High P% Time: 90 Show Clean

Monte Carlo Detailed Grid

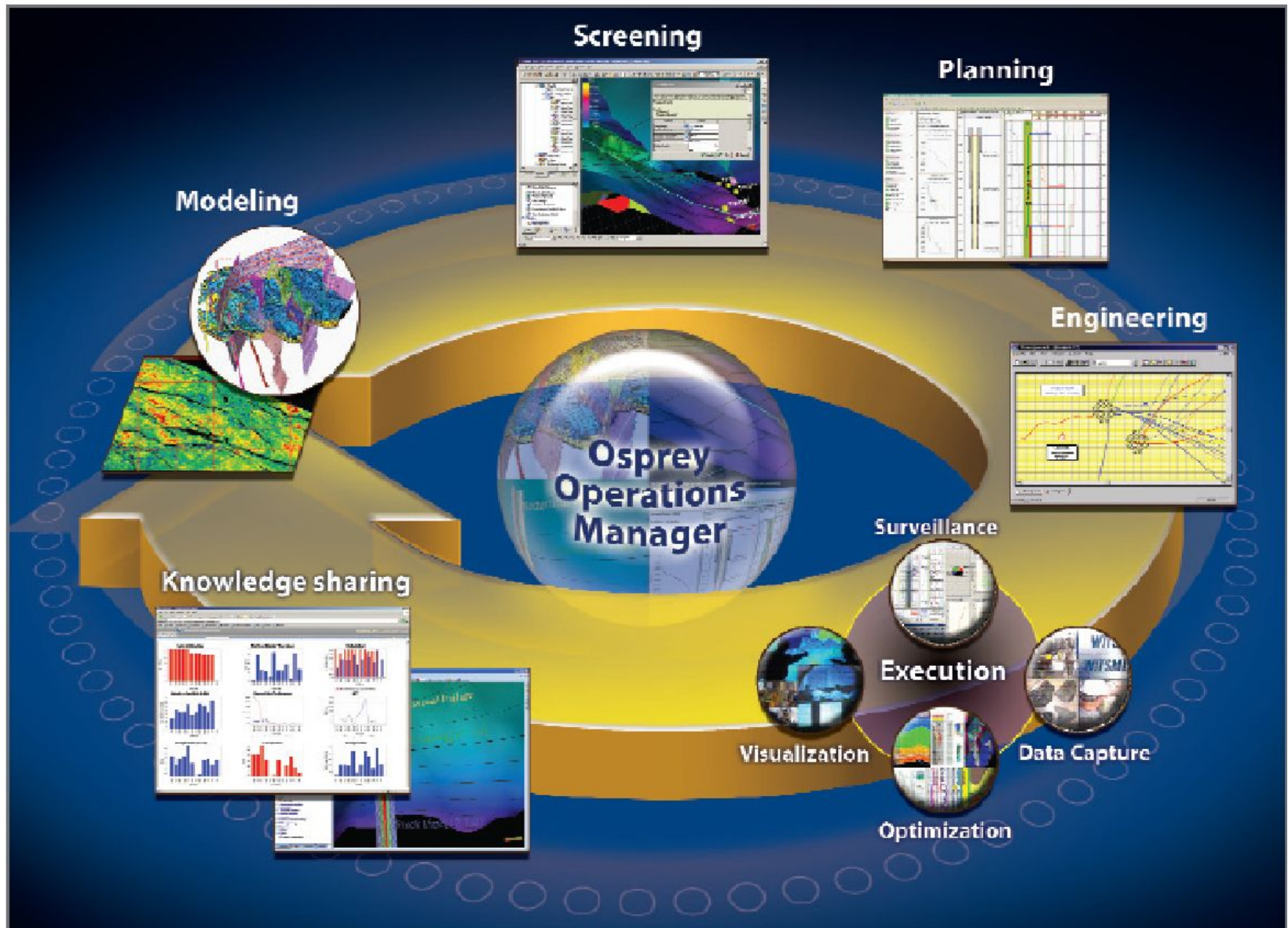
	Task Name	Low P% Time h
1	Total	861.11
2	Mobilize Rig Job	35.81
3	Tow Rig	18.19
4	Inspect Area	0.76
5	Safety Meeting	0.33
6	Position Rig	3.03
7	Extend Leg	5.26
8	Jack Up Rig	5.26
9	Skid Drilling Tower	0.76
10	Pick Up And Make Up Tub	2.23
11	Drill Wellbore Job	766.19
12	Surface	140.01
13	Drill Surface	94.49
14	Drill Rotary	84.78
15	Circulate	2.35
16	Short Trip	1.93
17	Circulate	2.35
18	Pull Out Of Hole	1.01
19	Pull Out And Lay	2.05
20	Wiper Trip	8.48
21	Safety Meeting	0.32
22	Pick Up And Make	1.91
23	Run In Hole	0.92
24	Circulate	2.36
25	Pull Out Of Hole	0.92
26	Pull Out And Lay	2.05
27	Run Surface	10.35
28	Clear Rig Floor	0.41
29	Assemble Equipm	0.41
30	Safety Meeting	0.32

Monte Carlo Summary Grid

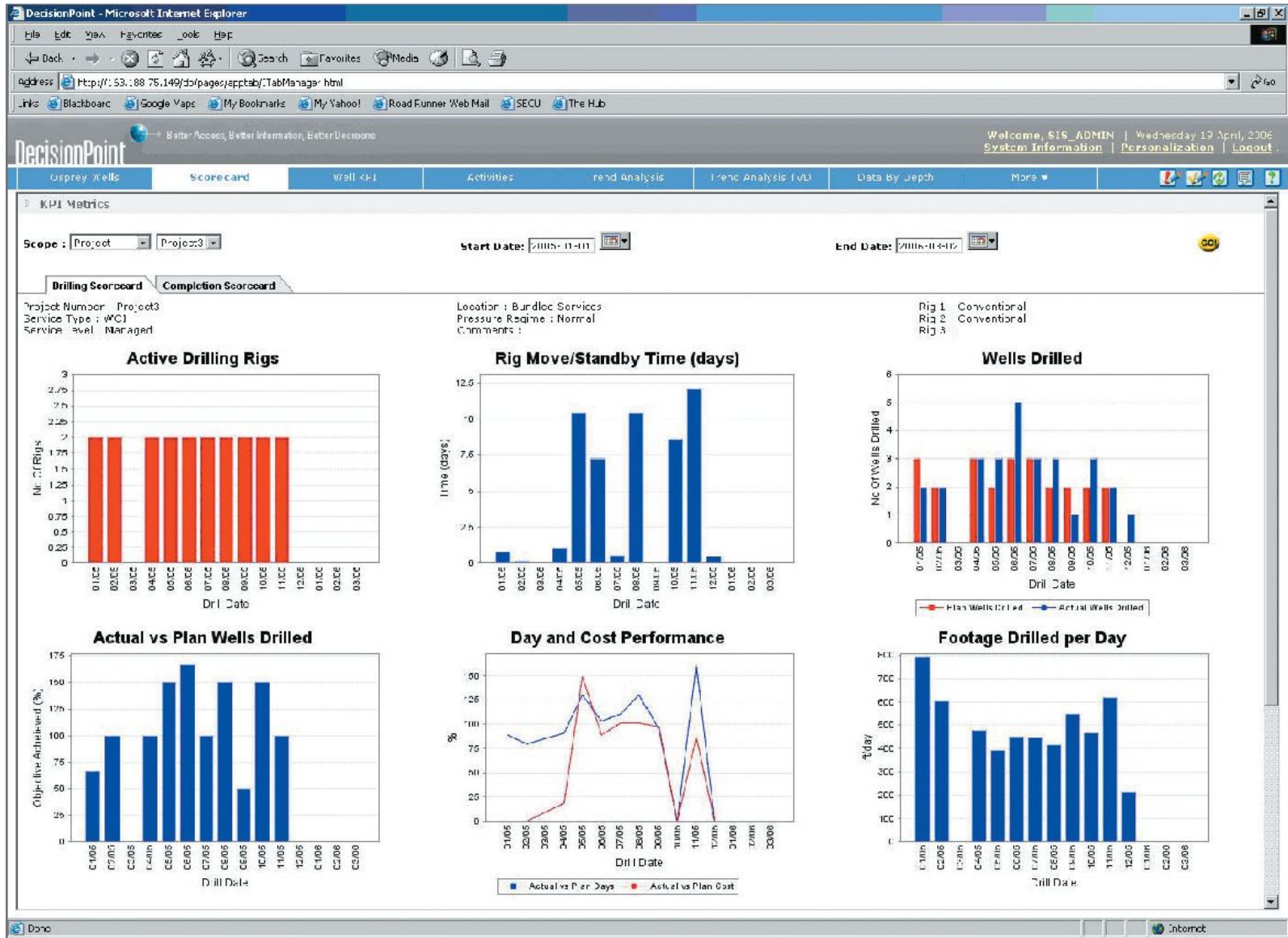
	Task Name	Low P% Time day	Mid P% Time day	High P% Time day	Low P% Cost K\$	Mid P% Cost K\$	High P% Cost K\$
1	Total	38.78	54.69	78.67	11,076	13,253	16,483
2	Mobilize Rig Job	1.68	2.39	3.51	151	215	316
3	Drill Wellbore Job	34.33	48.34	69.36	10,506	12,508	15,466
4	Well Completion Job	0.55	0.79	1.16	219	244	283
5	Demobilize Rig Job	2.22	3.17	4.64	199	285	418



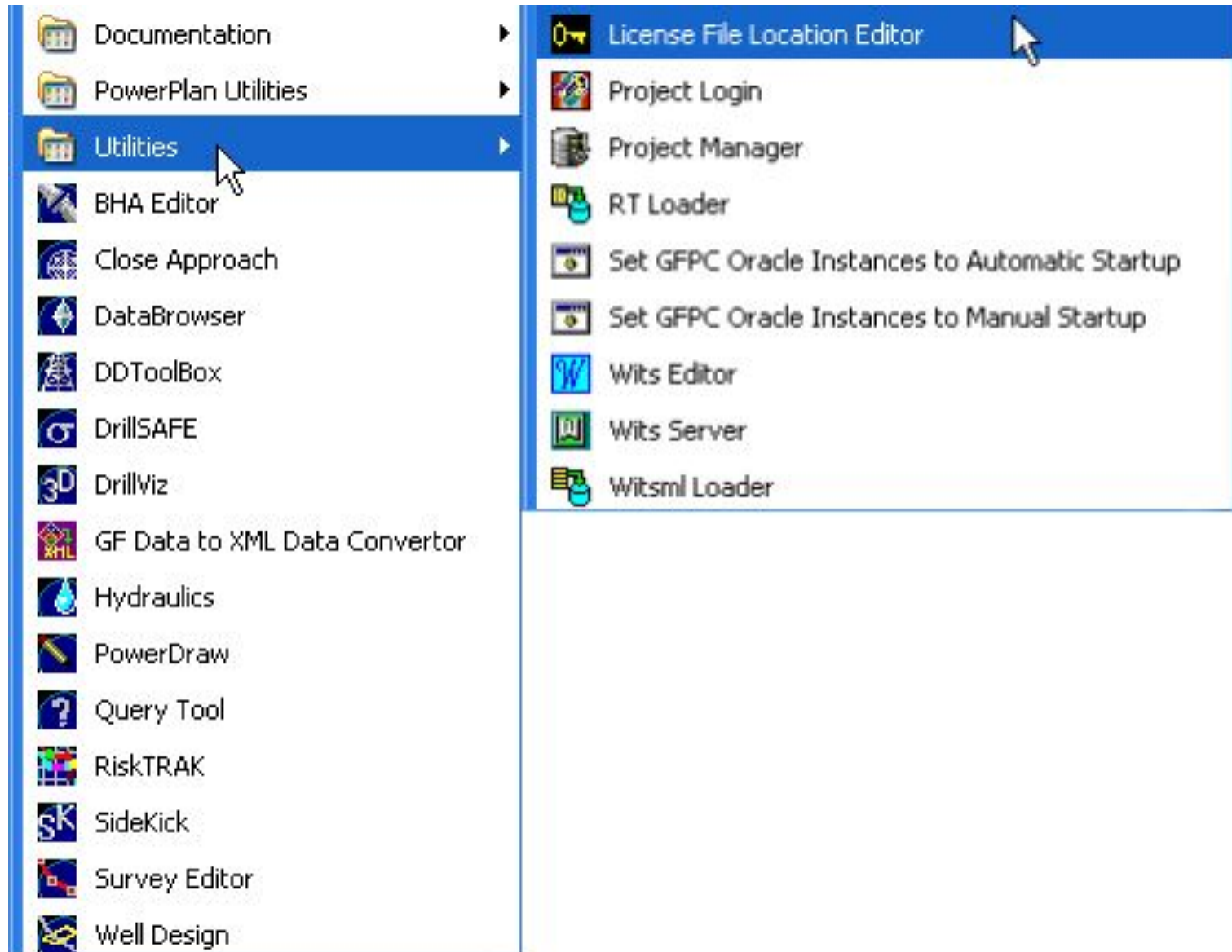
ДИНАМИЧЕСКОЕ УПРАВЛЕНИЕ БУРЕНИЕМ СКВАЖИНЫ НА БАЗЕ OSPREY OPERATIONS MANAGER



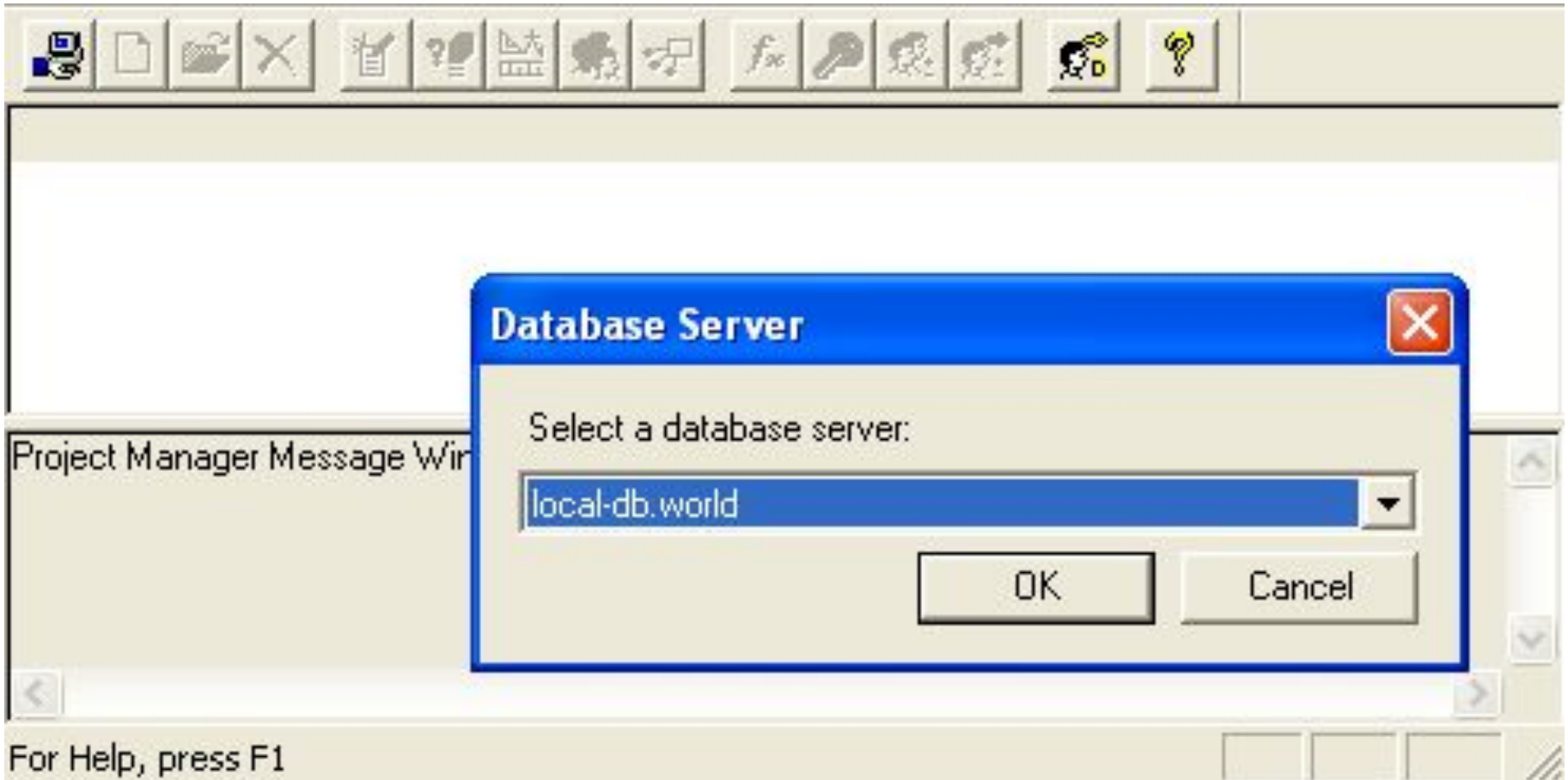
ДАННЫЕ, ОТСЛЕЖИВАЕМЫЕ OSPRAY OPERATIONS MANAGER



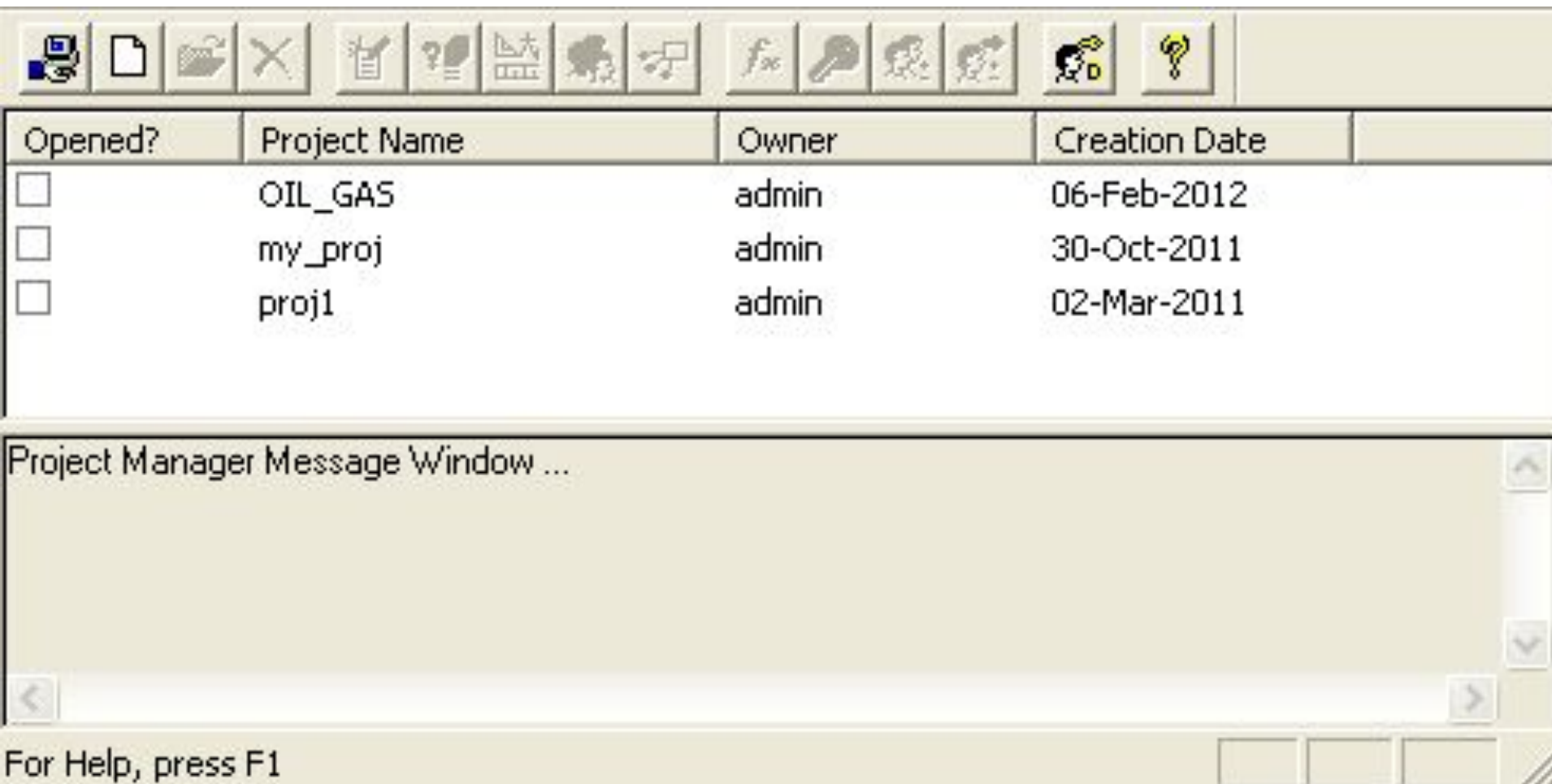
СТРУКТУРА ИНЖЕНЕРНОГО ПАКЕТА DRILLING OFFICE



PROJECT MANAGER – ВЫБОР СЕРВЕРА БАЗЫ ДАННЫХ



PROJECT MANAGER – ВЫБОР СУЩЕСТВУЮЩЕГО ПРОЕКТА



The screenshot displays the Project Manager application interface. At the top is a toolbar with various icons for file operations and project management. Below the toolbar is a table listing existing projects. The table has four columns: 'Opened?' (checkboxes), 'Project Name', 'Owner', and 'Creation Date'. Below the table is a 'Project Manager Message Window' which is currently empty. At the bottom of the window, there is a status bar with the text 'For Help, press F1'.

Opened?	Project Name	Owner	Creation Date
<input type="checkbox"/>	OIL_GAS	admin	06-Feb-2012
<input type="checkbox"/>	my_proj	admin	30-Oct-2011
<input type="checkbox"/>	proj1	admin	02-Mar-2011

Project Manager Message Window ...

For Help, press F1

PROJECT MANAGER – СОЗДАНИЕ НОВОГО ПРОЕКТА



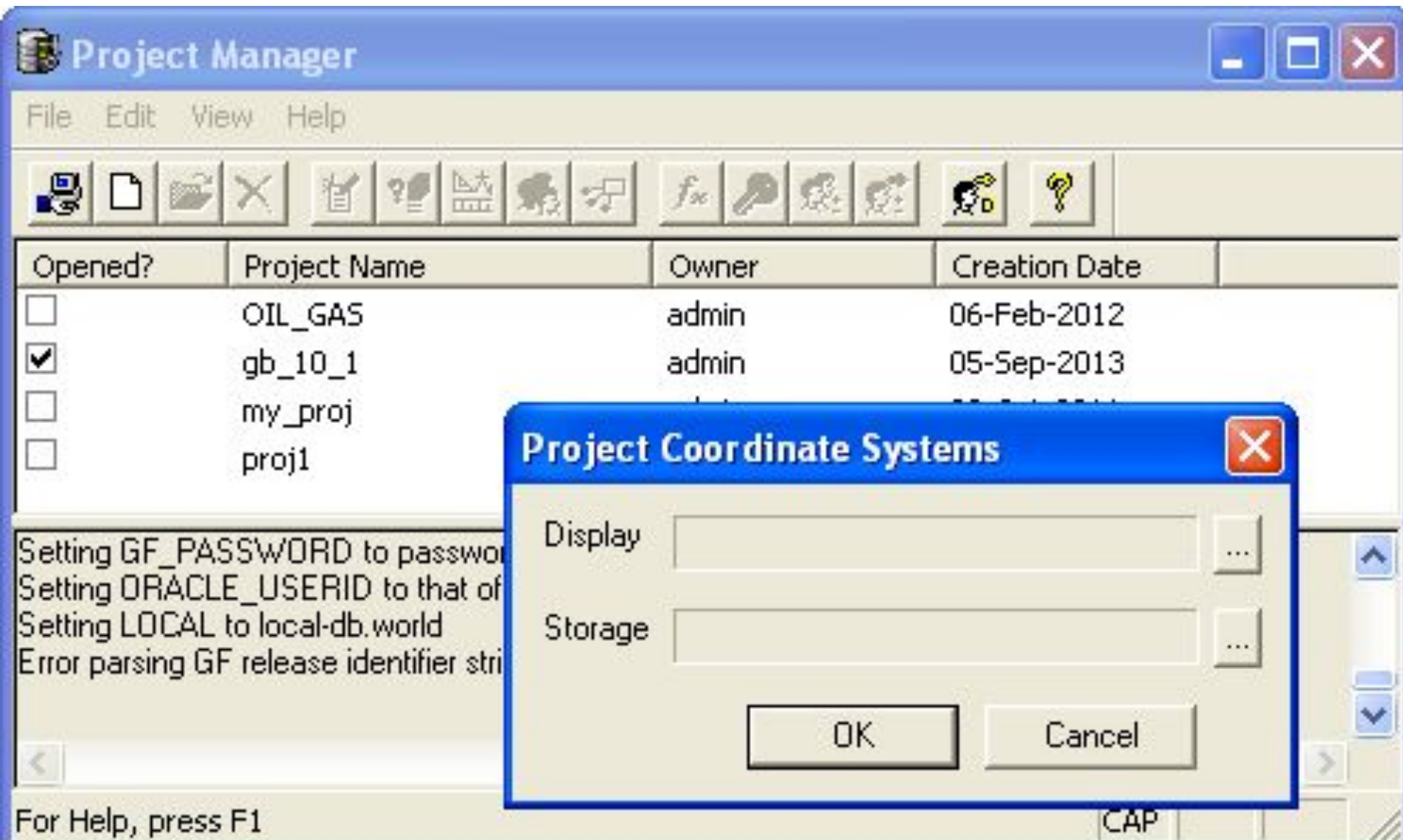
New Project Name

Catalog

Password

Password Verification

PROJECT MANAGER – ЗАДАНИЕ СИСТЕМЫ КООРДИНАТ ДЛЯ НОВОГО ПРОЕКТА



The screenshot shows the 'Project Manager' application window. The title bar reads 'Project Manager'. The menu bar includes 'File', 'Edit', 'View', and 'Help'. The toolbar contains various icons for file operations and project management. Below the toolbar is a table with the following columns: 'Opened?', 'Project Name', 'Owner', and 'Creation Date'. The table lists four projects: 'OIL_GAS' (not opened, admin, 06-Feb-2012), 'gb_10_1' (checked, admin, 05-Sep-2013), 'my_proj', and 'proj1'. A dialog box titled 'Project Coordinate Systems' is open in the foreground, featuring two input fields labeled 'Display' and 'Storage', each with a browse button ('...'). At the bottom of the dialog are 'OK' and 'Cancel' buttons. The background window shows a status bar with 'For Help, press F1' and 'CAP'.

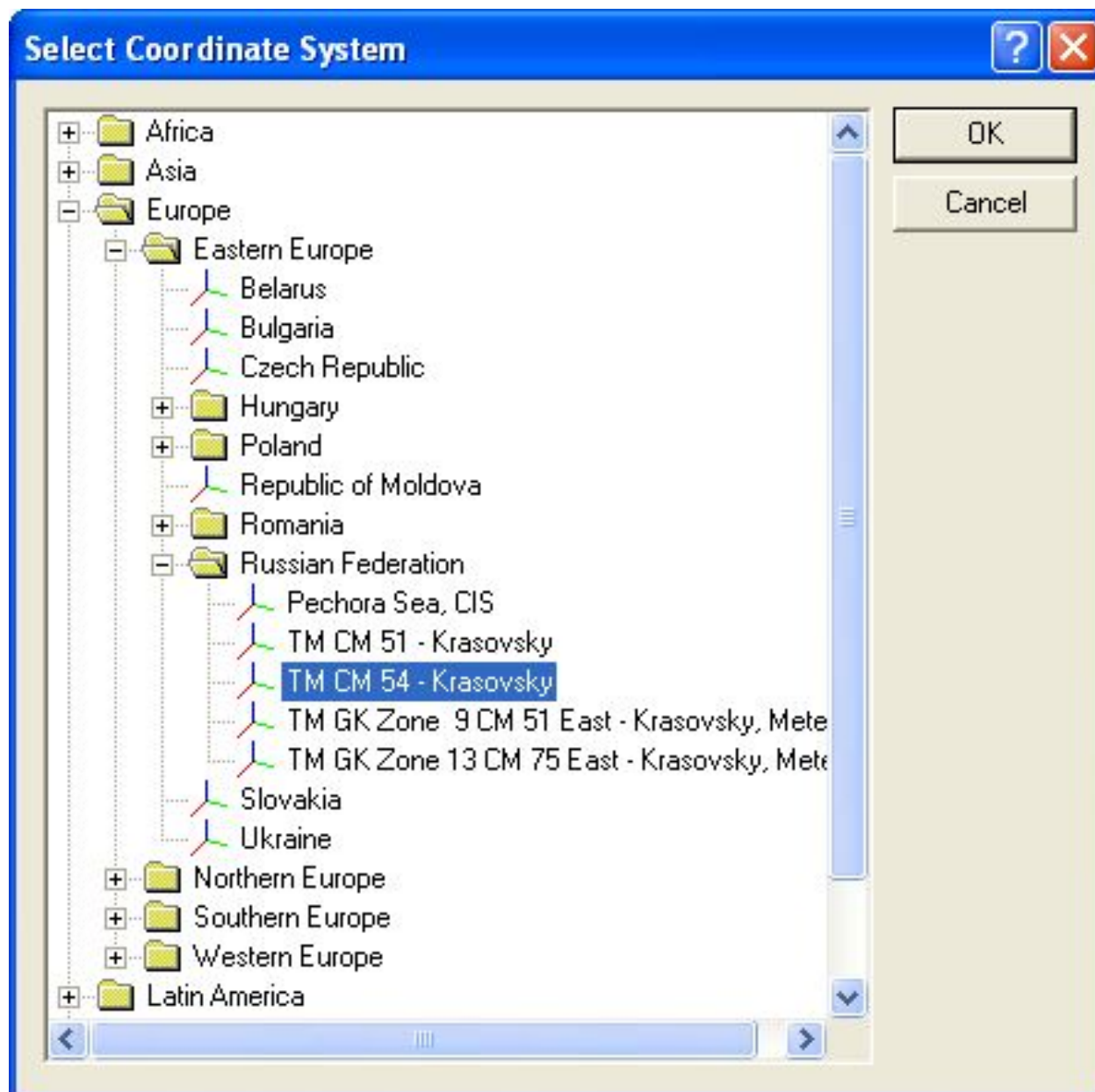
Opened?	Project Name	Owner	Creation Date
<input type="checkbox"/>	OIL_GAS	admin	06-Feb-2012
<input checked="" type="checkbox"/>	gb_10_1	admin	05-Sep-2013
<input type="checkbox"/>	my_proj		
<input type="checkbox"/>	proj1		

Setting GF_PASSWORD to password
Setting ORACLE_USERID to that of
Setting LOCAL to local-db.world
Error parsing GF release identifier stri

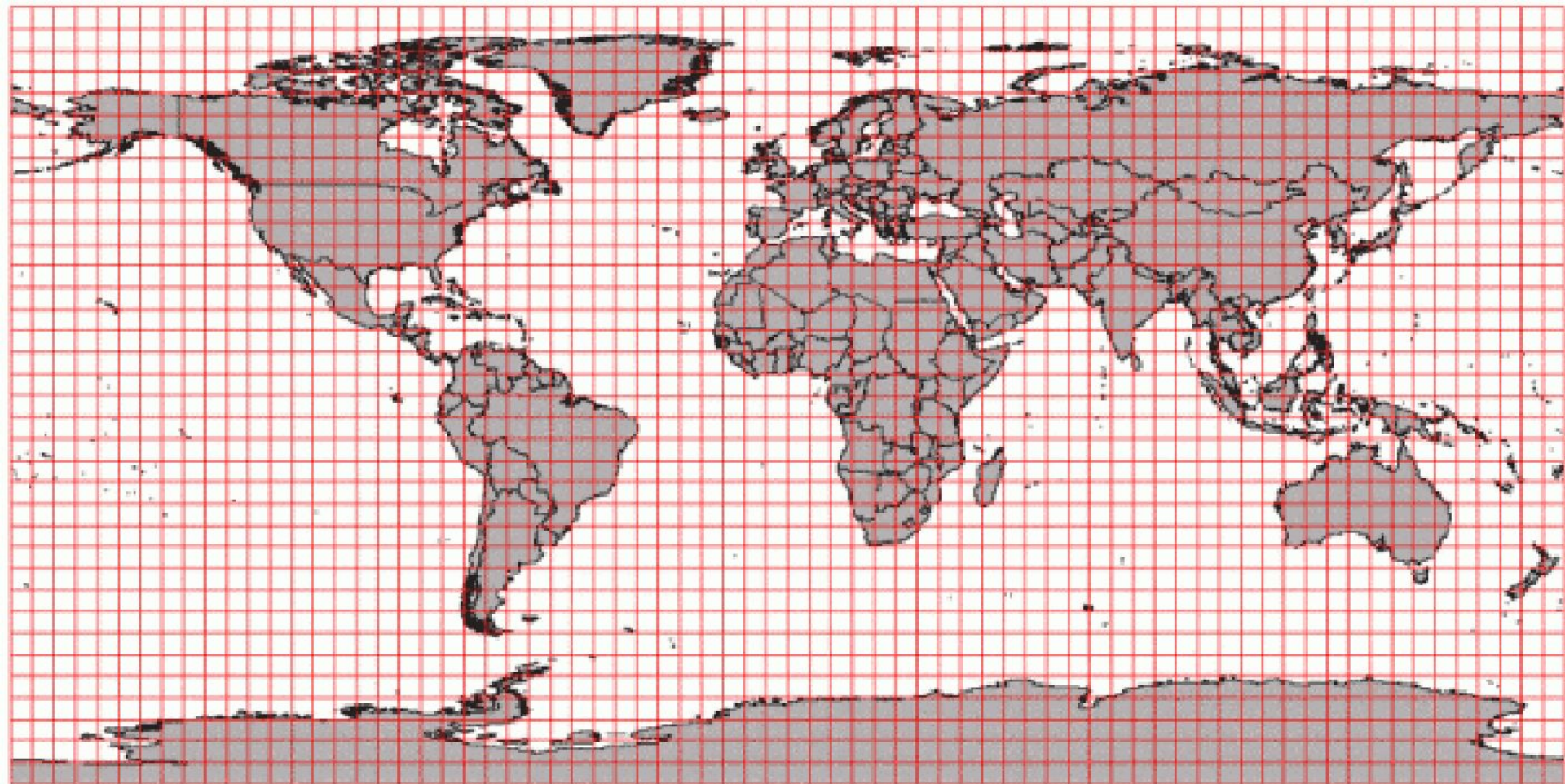
For Help, press F1

CAP

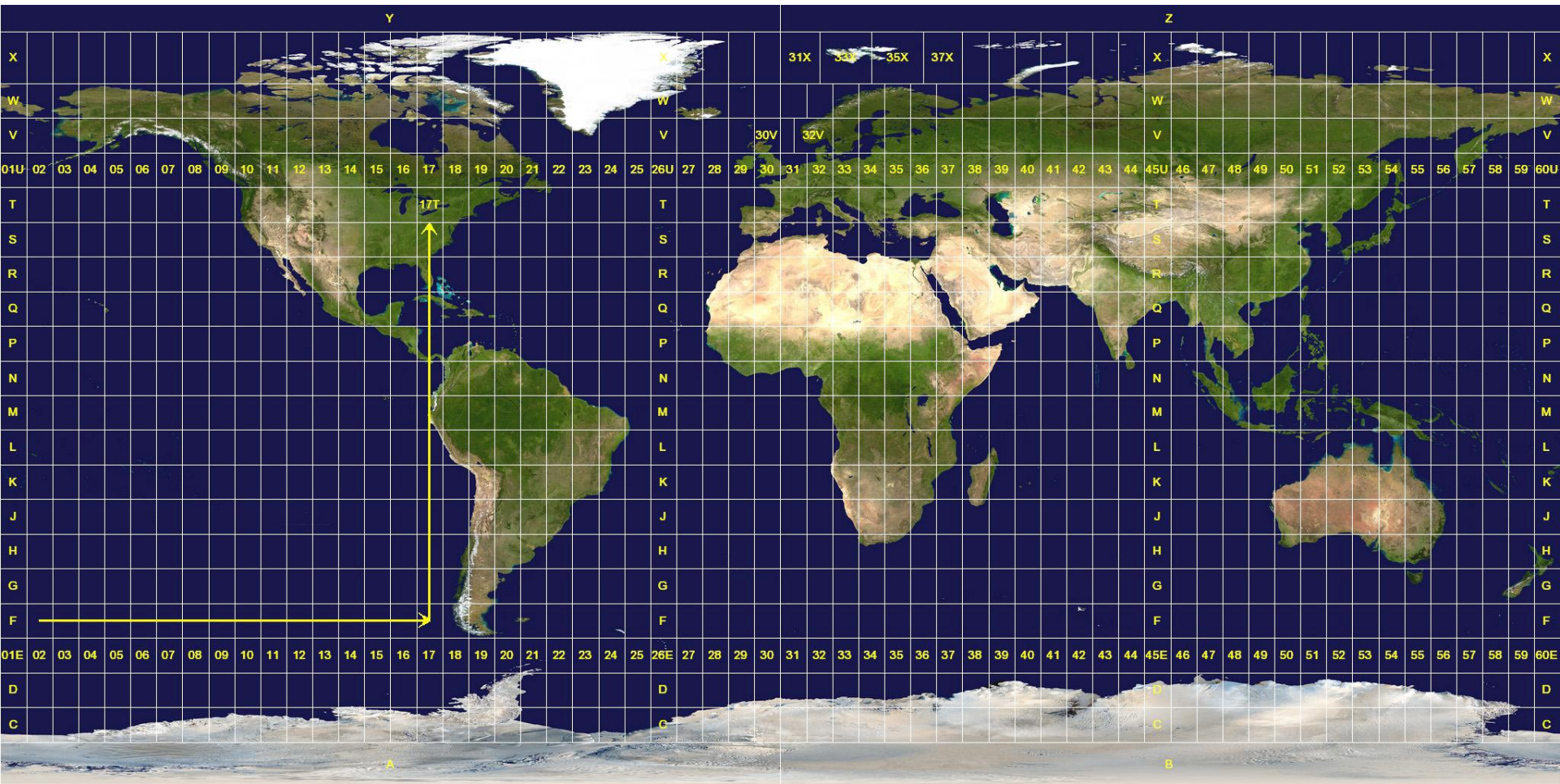
PROJECT MANAGER – ЗАДАНИЕ СИСТЕМЫ КООРДИНАТ ДЛЯ НОВОГО ПРОЕКТА



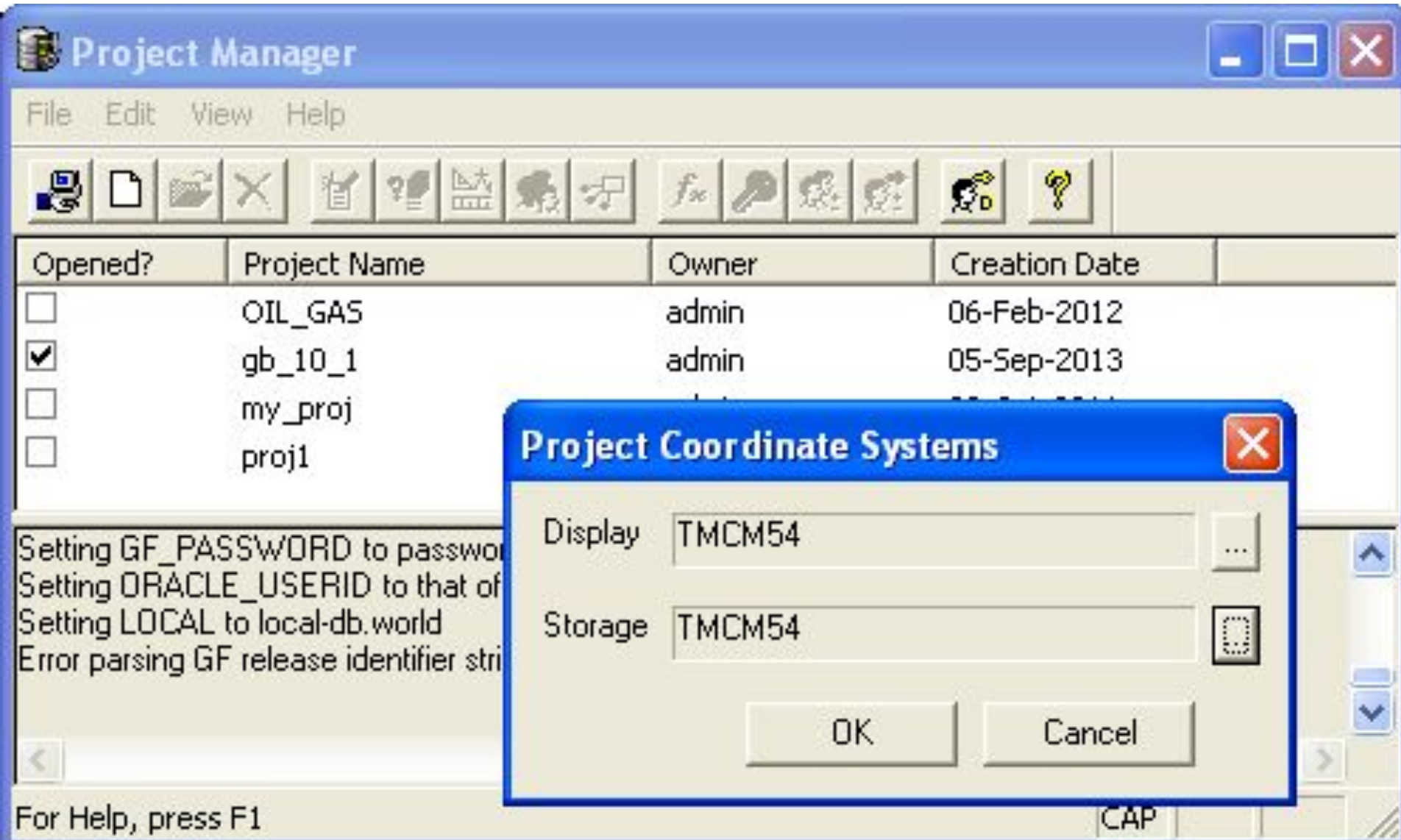
PROJECT MANAGER – ЗАДАНИЕ СИСТЕМЫ КООРДИНАТ ДЛЯ НОВОГО ПРОЕКТА



PROJECT MANAGER – СИСТЕМА КООРДИНАТ UTM



PROJECT MANAGER – ЗАДАНИЕ СИСТЕМЫ КООРДИНАТ ДЛЯ НОВОГО ПРОЕКТА



The screenshot displays the Oracle Project Manager application window. The main window has a menu bar (File, Edit, View, Help) and a toolbar with various icons. Below the toolbar is a table listing projects. The table has columns for 'Opened?', 'Project Name', 'Owner', and 'Creation Date'. The project 'gb_10_1' is selected with a checkmark. A dialog box titled 'Project Coordinate Systems' is overlaid on the main window, showing input fields for 'Display' and 'Storage', both set to 'TMCM54'. The dialog also has 'OK' and 'Cancel' buttons.

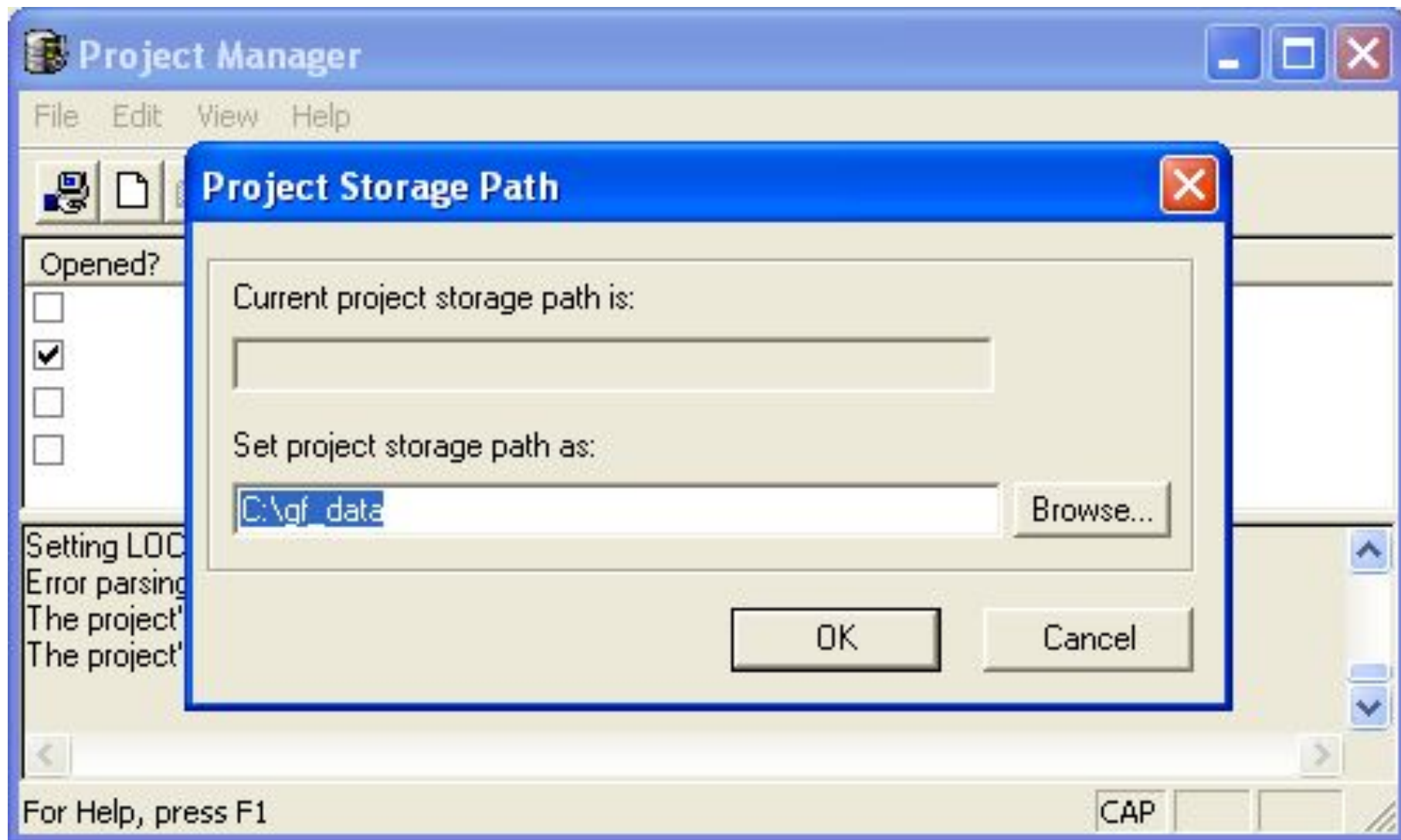
Opened?	Project Name	Owner	Creation Date
<input type="checkbox"/>	OIL_GAS	admin	06-Feb-2012
<input checked="" type="checkbox"/>	gb_10_1	admin	05-Sep-2013
<input type="checkbox"/>	my_proj		
<input type="checkbox"/>	proj1		

Setting GF_PASSWORD to password
Setting ORACLE_USERID to that of
Setting LOCAL to local-db.world
Error parsing GF release identifier stri

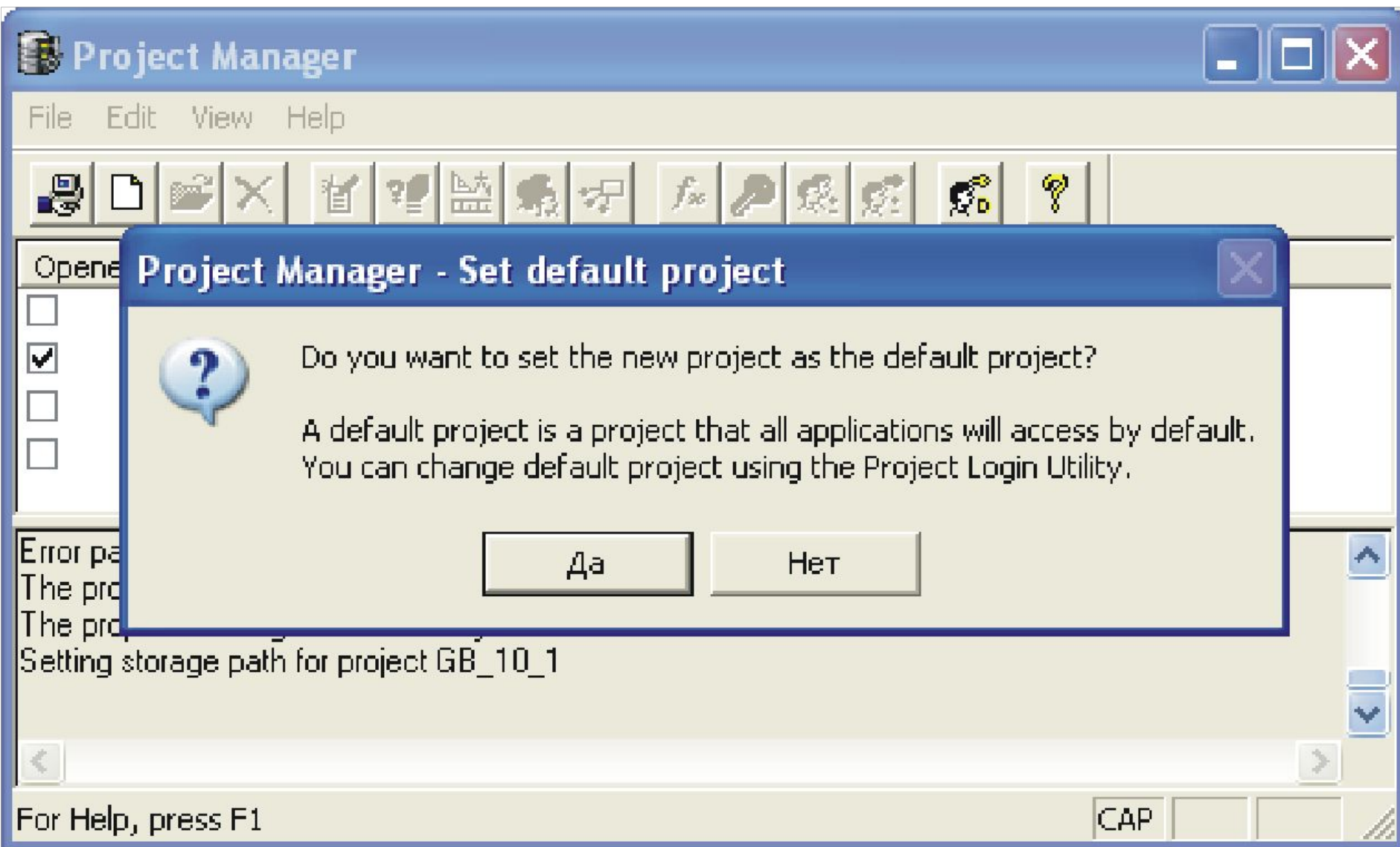
For Help, press F1

CAP

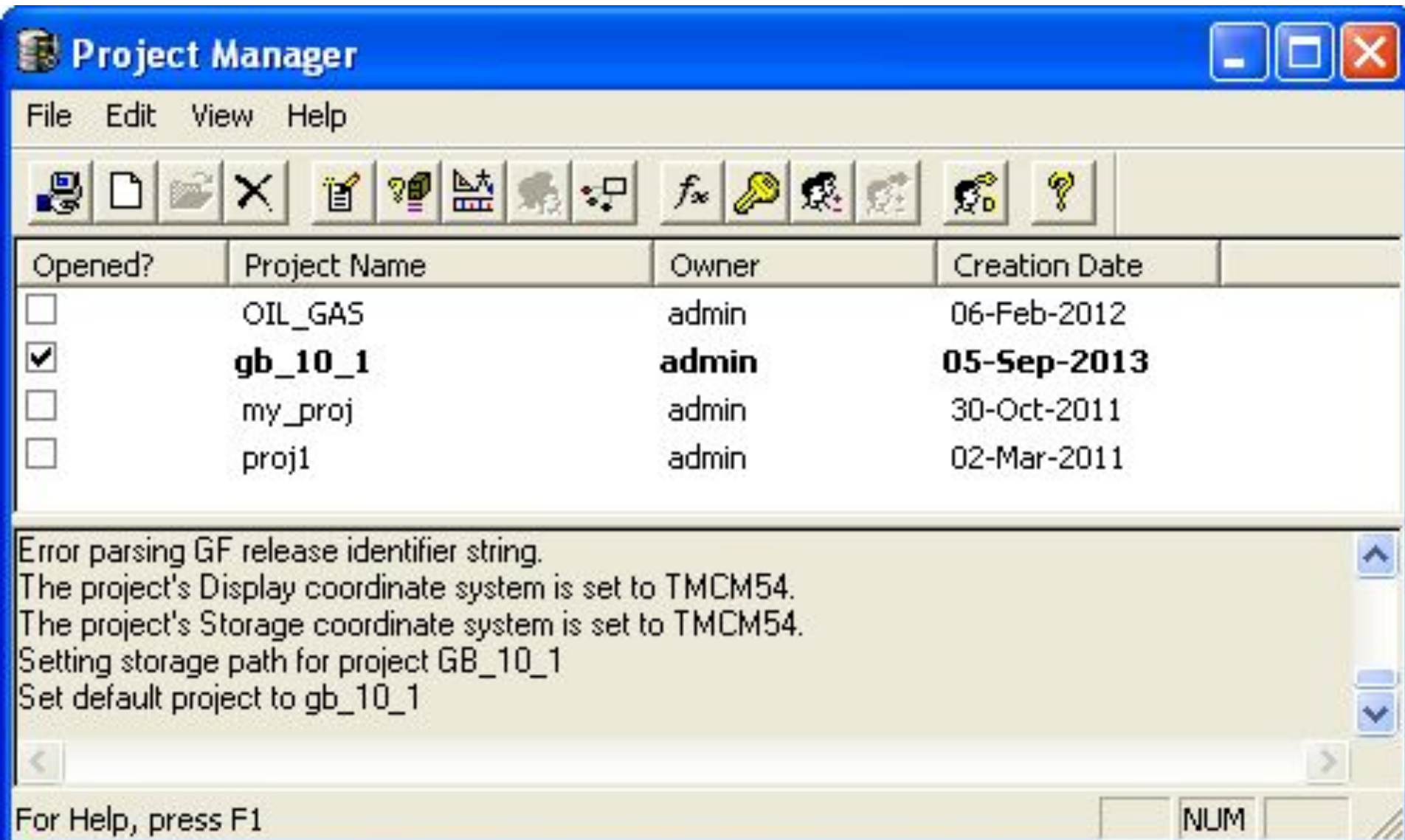
PROJECT MANAGER – ЗАДАНИЕ КАТАЛОГА ХРАНЕНИЯ ДАННЫХ ДЛЯ НОВОГО ПРОЕКТА



PROJECT MANAGER – ЗАДАНИЕ УМОЛЧАНИЙ ДЛЯ НОВОГО ПРОЕКТА



PROJECT MANAGER – РЕЗУЛЬТАТ ОТКРЫТИЯ НОВОГО ПРОЕКТА



The screenshot shows the 'Project Manager' application window. The title bar reads 'Project Manager' and includes standard window controls. The menu bar contains 'File', 'Edit', 'View', and 'Help'. The toolbar features various icons for file operations and project management. The main area displays a table of projects with columns for 'Opened?', 'Project Name', 'Owner', and 'Creation Date'. The project 'gb_10_1' is selected, indicated by a checked checkbox and bold text. Below the table, a status bar displays a message: 'Error parsing GF release identifier string. The project's Display coordinate system is set to TMCM54. The project's Storage coordinate system is set to TMCM54. Setting storage path for project GB_10_1. Set default project to gb_10_1'. The bottom status bar shows 'For Help, press F1' and a 'NUM' indicator.

Opened?	Project Name	Owner	Creation Date
<input type="checkbox"/>	OIL_GAS	admin	06-Feb-2012
<input checked="" type="checkbox"/>	gb_10_1	admin	05-Sep-2013
<input type="checkbox"/>	my_proj	admin	30-Oct-2011
<input type="checkbox"/>	proj1	admin	02-Mar-2011

Error parsing GF release identifier string.
The project's Display coordinate system is set to TMCM54.
The project's Storage coordinate system is set to TMCM54.
Setting storage path for project GB_10_1
Set default project to gb_10_1

For Help, press F1

PROJECT MANAGER – НАСТРОЙКА СИСТЕМЫ ЕДИНИЦ ИЗМЕРЕНИЯ ПРОЕКТА



Project Unit Systems [X]

Current Project Unit System Settings

Display Unit System: Metric

Storage Unit System: ProductionMetric

Inspect Unit Systems

Select the type of unit system:

Display [v]

Select the base unit system for the selected type:

Metric [v]

OK Apply Cancel Details ...

PROJECT MANAGER – НАСТРОЙКА СИСТЕМЫ ЕДИНИЦ ИЗМЕРЕНИЯ ПРОЕКТА



Project Unit Systems [X]

Current Project Unit System Settings

Display Unit System: Metric

Storage Unit System: ProductionMetric

Inspect Unit Systems

Select the type of unit system:

Storage

Select the base unit system for the selected type:

ProductionMetric

OK Apply Cancel Details ...

ЗАДАНИЕ МЕСТОРОЖДЕНИЯ В МОДУЛЕ DATA BROWSER

Insert Field [X]

Field Data | Hardlines/Leaselines

Name: Zeus

Region: North America

Time Zone: (GMT-06:00) Central Time (US & Canada)

Coordinate System: UTM Zone 31 on ED50 Datum

Reference Point

Geodetic		Grid	
Latitude:	N 61 24 12.763 deg	Northing:	6808028.074 m
Longitude:	E 2 26 23.462 deg	Easting:	470087.703 m
Scale Factor:	0.99961096	Grid Convergence:	-0.49182187 deg

Elevation

Elevation Name: MSL

OK Cancel Help

ЗАДАНИЕ ПЛОЩАДИ В МОДУЛЕ DATA BROWSER

Edit Structure [X]

Structure Data | Slots

Name: Client:

Coordinate System: ...

Time Zone:

Location

Azimuth Reference: Grid North True North

Plan to: Slot Structure

Geodetic

Latitude: deg

Longitude: deg

Grid

Northing: m

Easting: m

Local Cartesian

+N/-S: ft

+E/-W: ft

Local Polar

Distance: ft

Azimuth: deg

Scale Factor: Grid Convergence: deg

Surface Uncertainty

Radius: ft

Default Survey Tool Error Model

Model Name:

Elevation (Positive up)

Elevation Name: ft relative to MSL

Sea Bed/Ground Level: ft relative to MSL

OK Cancel Help

ЗАДАНИЕ СКВАЖИНЫ В МОДУЛЕ DATA BROWSER

Insert Well [X]

Well Data | Administrative Data

Name: API#:

Coordinate System: UWI#:

Assigned Slot:

Location

Reference: Azimuth Reference:

Geodetic		Grid	
Latitude:	<input type="text" value="N 61 24 12.763"/> deg	Northing:	<input type="text" value="6808028.07"/> m
Longitude:	<input type="text" value="E 2 26 23.492"/> deg	Easting:	<input type="text" value="470088.148"/> m

Local Cartesian		Local Polar	
+N/-S:	<input type="text" value="0"/> ft	Distance:	<input type="text" value="0"/> ft
+E/-W:	<input type="text" value="0"/> ft	Azimuth:	<input type="text" value="0"/> deg

Scale Factor: Grid Convergence: deg

Elevation (Positive up)

Elevation Name:

<input type="text" value="-115"/>	ft	relative to Platform Elevation
<input type="text" value="5"/>	ft	relative to MSL
<input type="text" value="115"/>	ft	relative to Sea Bed/ Ground Level

OK Cancel Help

ЗАДАНИЕ СТВОЛА В МОДУЛЕ DATA BROWSER

Insert Borehole [X]

Borehole Data | Targets | Hardlines/Leaselines

Name: API#:

Rig: Edit ... UWI#:

Drilling Contractor: Edit ...

Elevation (Positive up)

Elevation Name: <input type="text" value="RKB"/>	<input type="text" value="147.7"/>	ft	relative to Top of Slot
	<input type="text" value="32.7"/>	ft	relative to Platform Elevation
	<input type="text" value="152.7"/>	ft	relative to MSL
	<input type="text" value="262.7"/>	ft	relative to Sea Bed/ Ground Level

Data

Begin MD: ft End MD: ft

Definitive Survey: ... Clear

Well Info

Well Purpose: Well Type:

OK Cancel Help

ЗАДАНИЕ ЦЕЛИ БУРЕНИЯ В МОДУЛЕ DATA BROWSER

Create Target [?] [X]

Name:

Remark:

Location

Azimuth Reference: Grid North True North

Geodetic		Grid	
Latitude:	<input type="text" value="N 61 24 32.281"/> deg	Northing:	<input type="text" value="6808622.507"/> m
Longitude:	<input type="text" value="E 2 27 39.437"/> deg	Easting:	<input type="text" value="471219.655"/> m

Local Cartesian		Local Polar	
+N/-S:	<input type="text" value="1951"/> ft	Distance:	<input type="text" value="4196.321"/> ft
+E/-W:	<input type="text" value="3715.2"/> ft	Azimuth:	<input type="text" value="62.294"/> deg

Scale Factor: Grid Convergence: deg

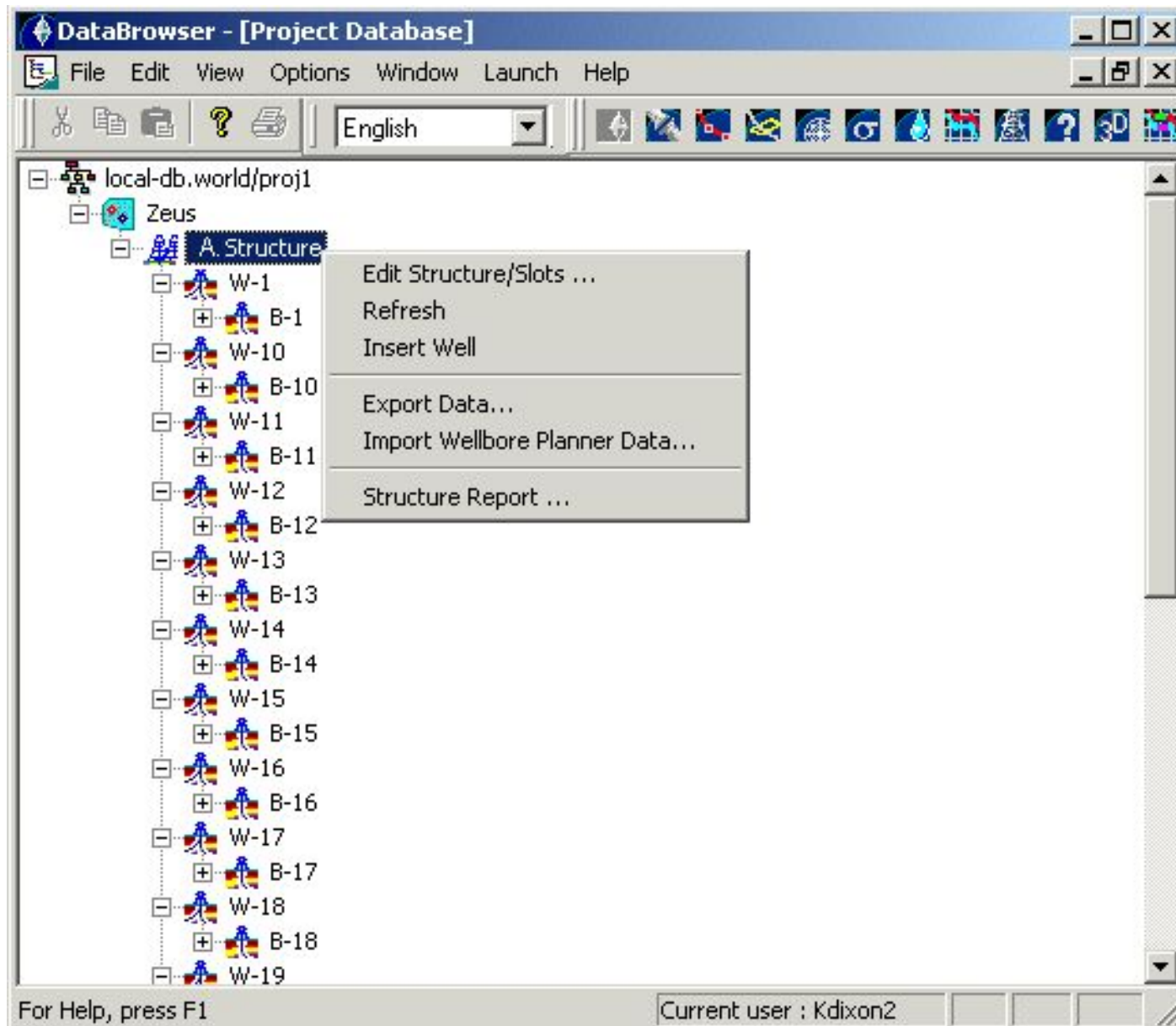
TVD: ft Below MSL

Geometry

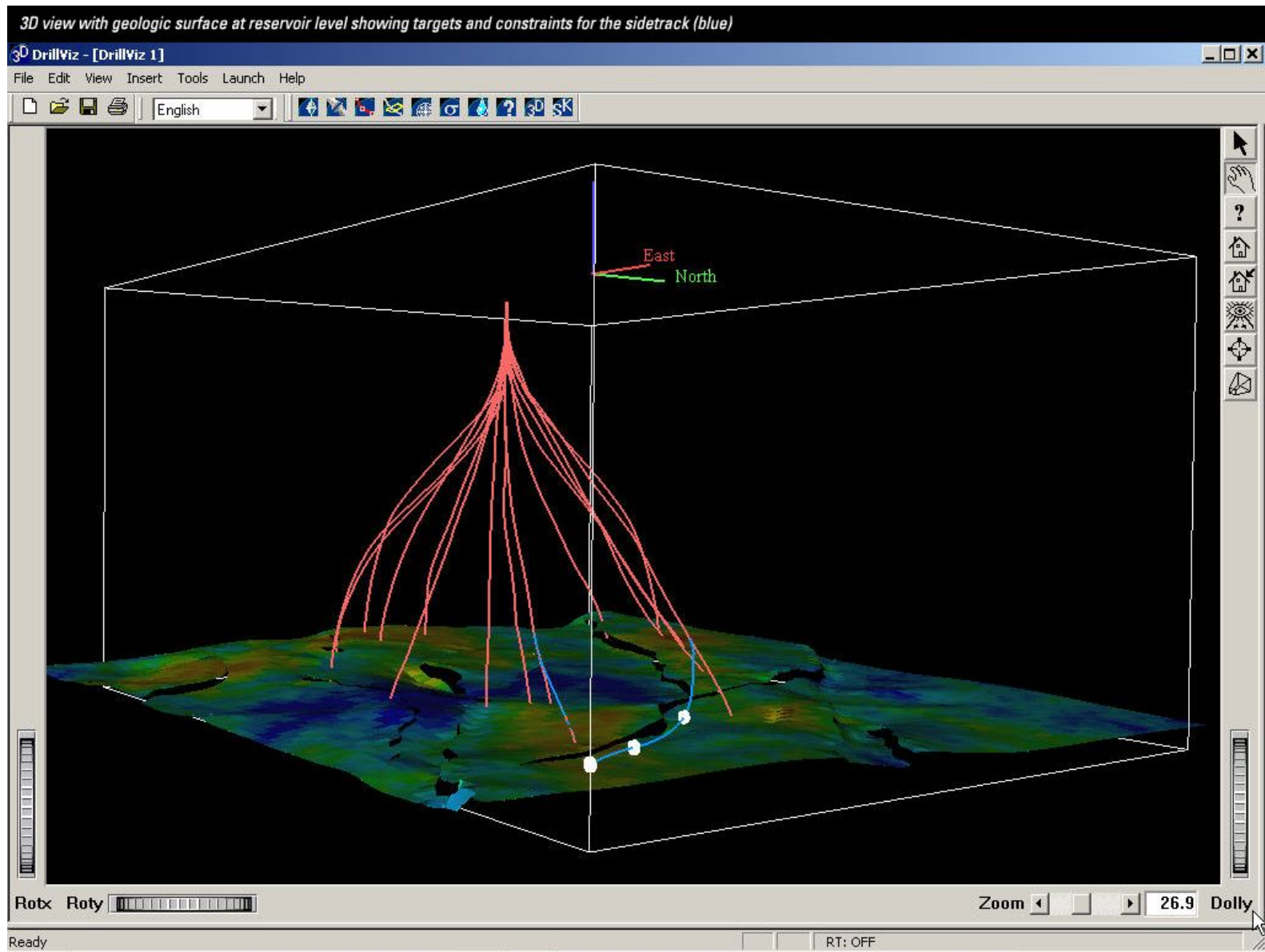
Shape:

Length (NS):	<input type="text" value="50"/> ft	Thickness:	<input type="text" value="10"/> ft
Width (EW):	<input type="text" value="30"/> ft	Dip:	<input type="text" value="0"/> deg
Rotation:	<input type="text" value="0"/> deg	Dip Azimuth:	<input type="text" value="0"/> deg

СТРУКТУРА ДАННЫХ В МОДУЛЕ DATA BROWSER



РЕЗУЛЬТАТЫ РАБОТЫ DRILLVIZ



ВВОД ДАННЫХ ПО СКВАЖИНЕ В МОДУЛЬ HYDRAULICS

The screenshot displays the 'Hydro - Hydraulics Inputs' software window. The main window has a menu bar (File, Edit, View, Options, Window, Launch, Help) and a toolbar with various icons. Below the toolbar is a smaller window titled 'Hydraulics Inputs' containing the following data and controls:

Parameter	Value	Unit
BHA:	BHA (Horizontal)	ft
Well Geom:	Well Geometry #1	ft
Survey:	Tutorial #1	ft
Bit Depth:	14089.33	ft

Additional controls include a 'Filter' button and 'Run Plots' and 'Run Report' buttons.

The 'Rheology' tab is selected, showing the following settings:

- Model: Power Law
- Use: PV-YP
- P-T: Off

The 'Properties' section includes the following input fields:

- Mud Weight: 0 lbm/gal
- Consistency Index (K): -1 eq. cP
- Flow Behavior Index (n): -1
- Plastic Viscosity: 0 cP
- Yield Point: 0 lbf/100ft²
- Fann 300: 0 lbf/100ft²
- Fann 600: 0 lbf/100ft²

The status bar at the bottom shows: Zeus -> A. Structure -> Slot #13 -> W-13 -> B-13 -> Plan. The current user is identified as Kdixon2.

ВВОД ДАННЫХ ПО РЕОЛОГИИ В МОДУЛЬ HYDRAULICS

Rheology | Bit/Flow | Rig | Tools/Misc | Motor | Cuttings | Swab/Surge

Settings

Model Use P-T

Properties

Mud Weight	<input type="text" value="10"/>	lbm/gal	Fann 3	<input type="text" value="6"/>	lbf/100ft ²
Consistency Index (K)	<input type="text" value="827.1"/>	eq. cP	Fann 6	<input type="text" value="8"/>	lbf/100ft ²
Flow Behavior Index (n)	<input type="text" value="0.481"/>		Fann 100	<input type="text" value="23"/>	lbf/100ft ²
Yield Point	<input type="text" value="2.46"/>	lbf/100ft ²	Fann 200	<input type="text" value="31"/>	lbf/100ft ²
<input checked="" type="checkbox"/> Use Fann Data			Fann 300	<input type="text" value="37"/>	lbf/100ft ²
			Fann 600	<input type="text" value="51"/>	lbf/100ft ²

ВВОД ДАННЫХ ПО РАСХОДАМ В МОДУЛЬ HYDRAULICS

Rheology | Bit/Flow | Rig | Tools/Misc | Motor | Cuttings | Swab/Surge

Pump / Flow

Pump Flowrate gal/min

Plot: Min Flow gal/min

Plot: Max Flow gal/min

Pump Stroke Volume bbl

Max Pump Pressure psi

Sensitivity

Min Flow gal/min

Max Flow gal/min

Nozzles

Count	Size (1/32")
3	15

Save to BHA

Total Flow Area in²

Nozzle Optimization

Method

Planned Pump Press psi

ВВОД ДАННЫХ ПО ОБОРУДОВАНИЮ В МОДУЛЬ HYDRAULICS

Rheology | Bit/Flow | Rig | Tools/Misc | Motor | Cuttings | Swab/Surge

Surface Equipment

Type

Equiv Length

 ft

Equiv ID

 in

Choke

Riser required to activate this option

Chokeline ID

 in

Chokeline Length

 ft

Choke Position

 (0-1)

Riserless Drilling

Use WG filter to expose hole to sea

Air Gap

 ft

Water Depth

 ft

Sea Water Density

 lbm/gal

ВВОД ДАННЫХ ПО ИНСТРУМЕНТУ В МОДУЛЬ HYDRAULICS

Rheology | Bit/Flow | Rig | Tools/Misc | Motor | Cuttings | Swab/Surge

Non-Catalog Tool Pressure Drop psi/gal/min

None	0
None	0
None	0
None	0
None	0

Miscellaneous

Ignore Eccentricity

User ECD Depth (MD) ft

Casing Protectors

Casing Protectors

Start Depth (MD) ft

End Depth (MD) ft

Count

Length ft

External Diameter in

Tool Joints

Tool Joints

Fractional TJ length %

ВВОД ДАННЫХ ПО ДВИГАТЕЛЮ В МОДУЛЬ HYDRAULICS

Rheology | Bit/Flow | Rig | Tools/Misc | **Motor** | Cuttings | Swab/Surge

Motor Specifications

Motor Type: A675M4570XP

Flow range: 300 - 600 gal/min

%Wear: 5 %

Rotor Nozzle: 12 /32in

Flow : Pwr 378.0 Nozz 72.0 gal/min

Motor Bearing Flow: 5 %

Bit Type: Insert

Bearing Capacity: 30 1000 lbf

Optimization

Power Drilling

WOB: 0 1000 lbf

DTOR: 0 ft.lbf

Delta P: 250 psi

On Bottom Press: 0 psi

ВВОД ДАННЫХ ПО ШЛАМУ В МОДУЛЬ HYDRAULICS

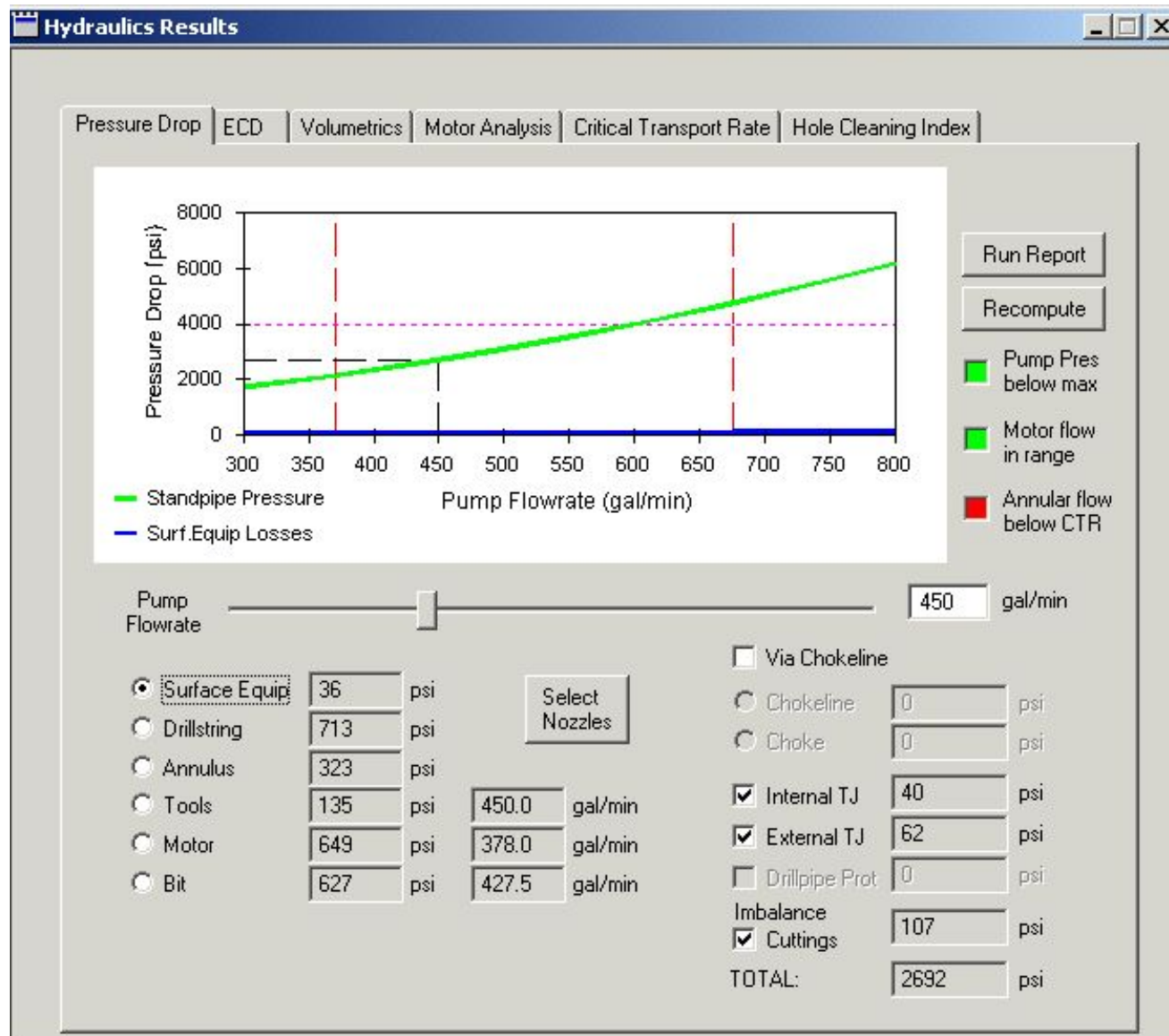
Rheology | Bit/Flow | Rig | Tools/Misc | Motor | **Cuttings** | Swab/Surge

Hole Cleaning Cuttings corrected ECD

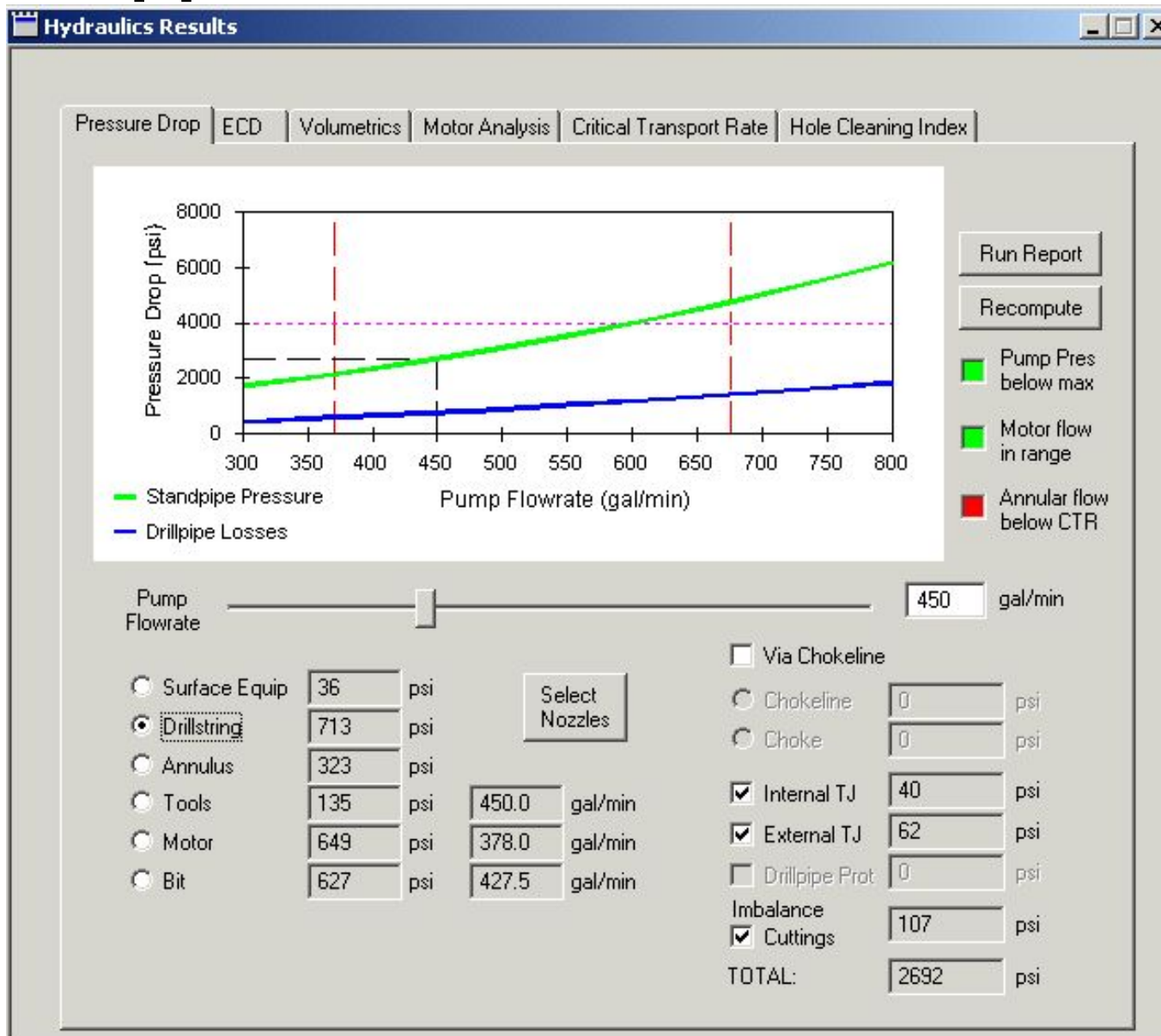
Parameters

Cuttings Type	Sand	
Mud Type	Synthetic/OBM	
RPM	50	
Rate of Penetration	150	ft/h
Cuttings Density	2.6	g/cm ³
Cuttings Size	Medium	
Boostline Rate:	0	gal/min

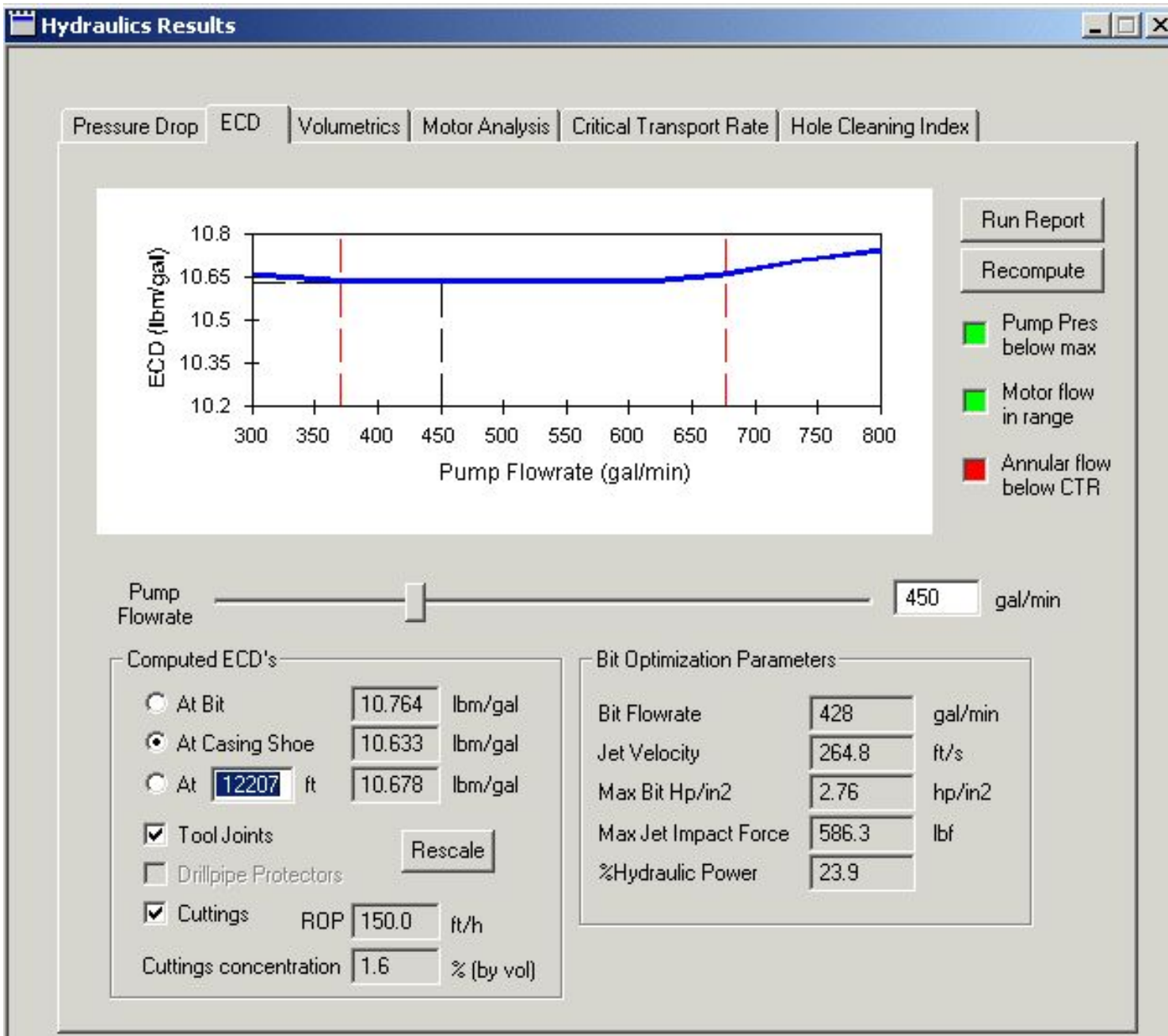
РЕЗУЛЬТАТЫ РАСЧЕТА ПОТЕРЬ ДАВЛЕНИЯ В ОБВЯЗКЕ



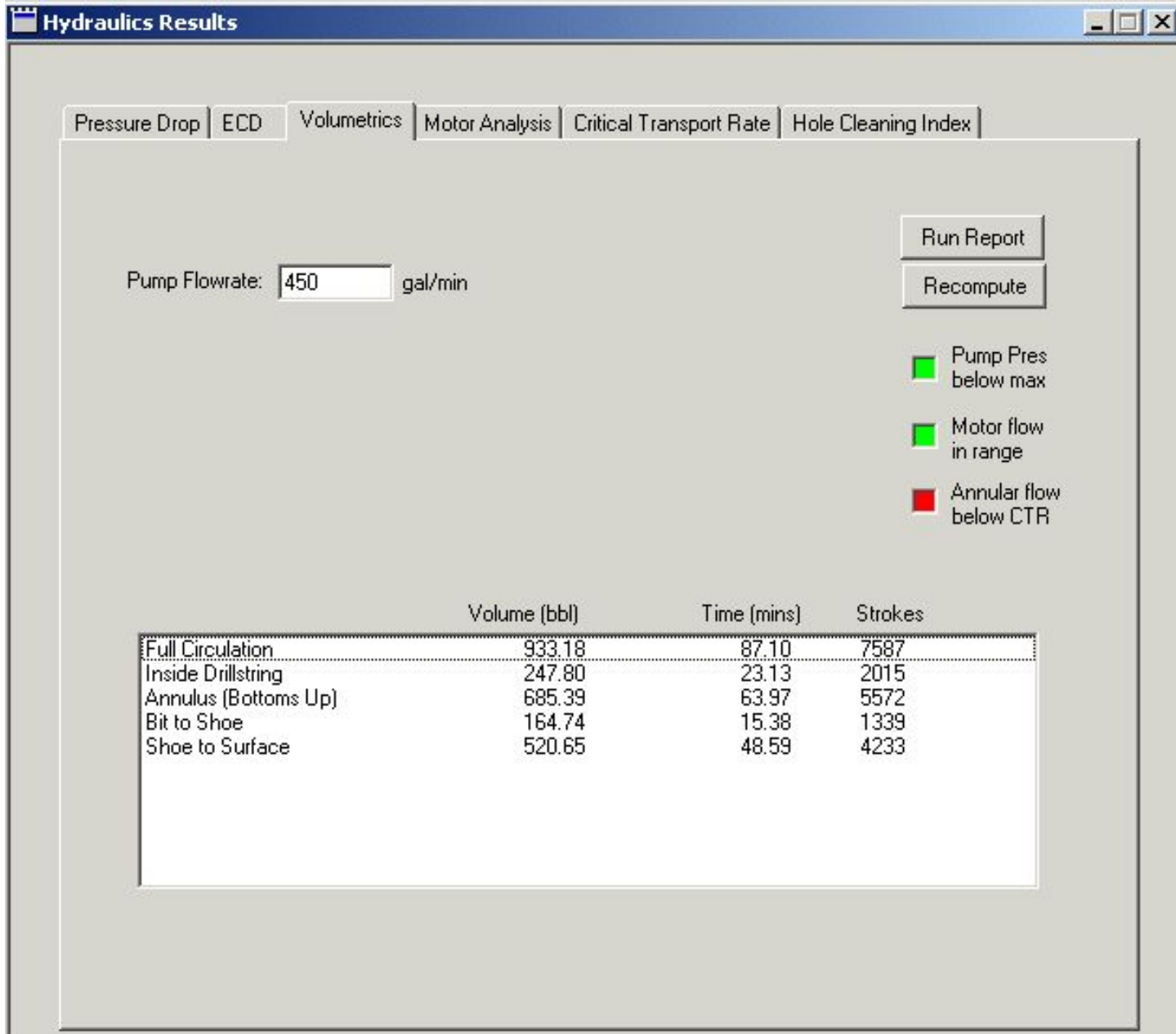
РЕЗУЛЬТАТЫ РАСЧЕТА ПОТЕРЬ ДАВЛЕНИЯ В ТРУБАХ



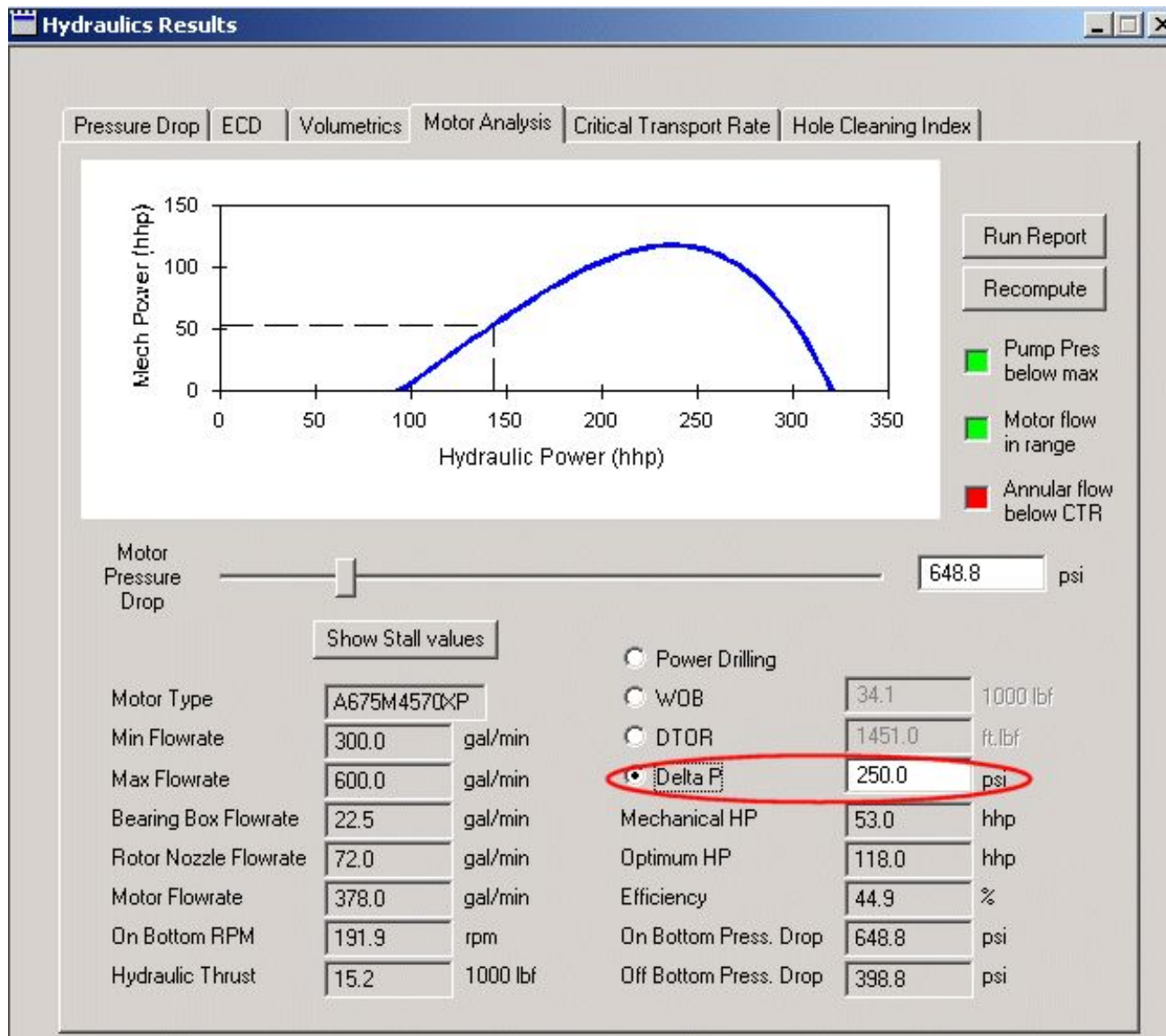
РЕЗУЛЬТАТЫ РАСЧЕТА ECD



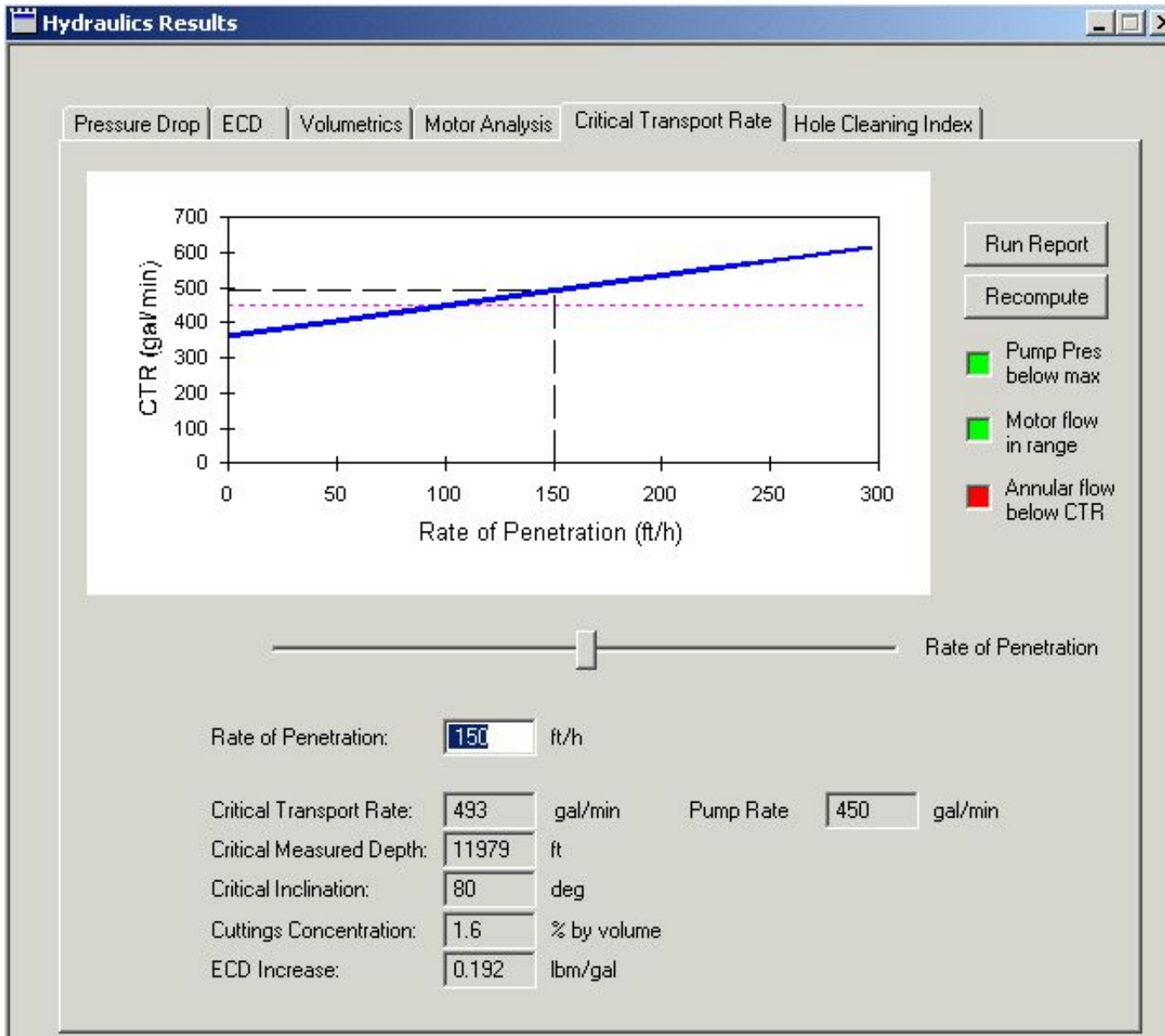
РЕЗУЛЬТАТЫ РАСЧЕТА ОБЪЕМОВ



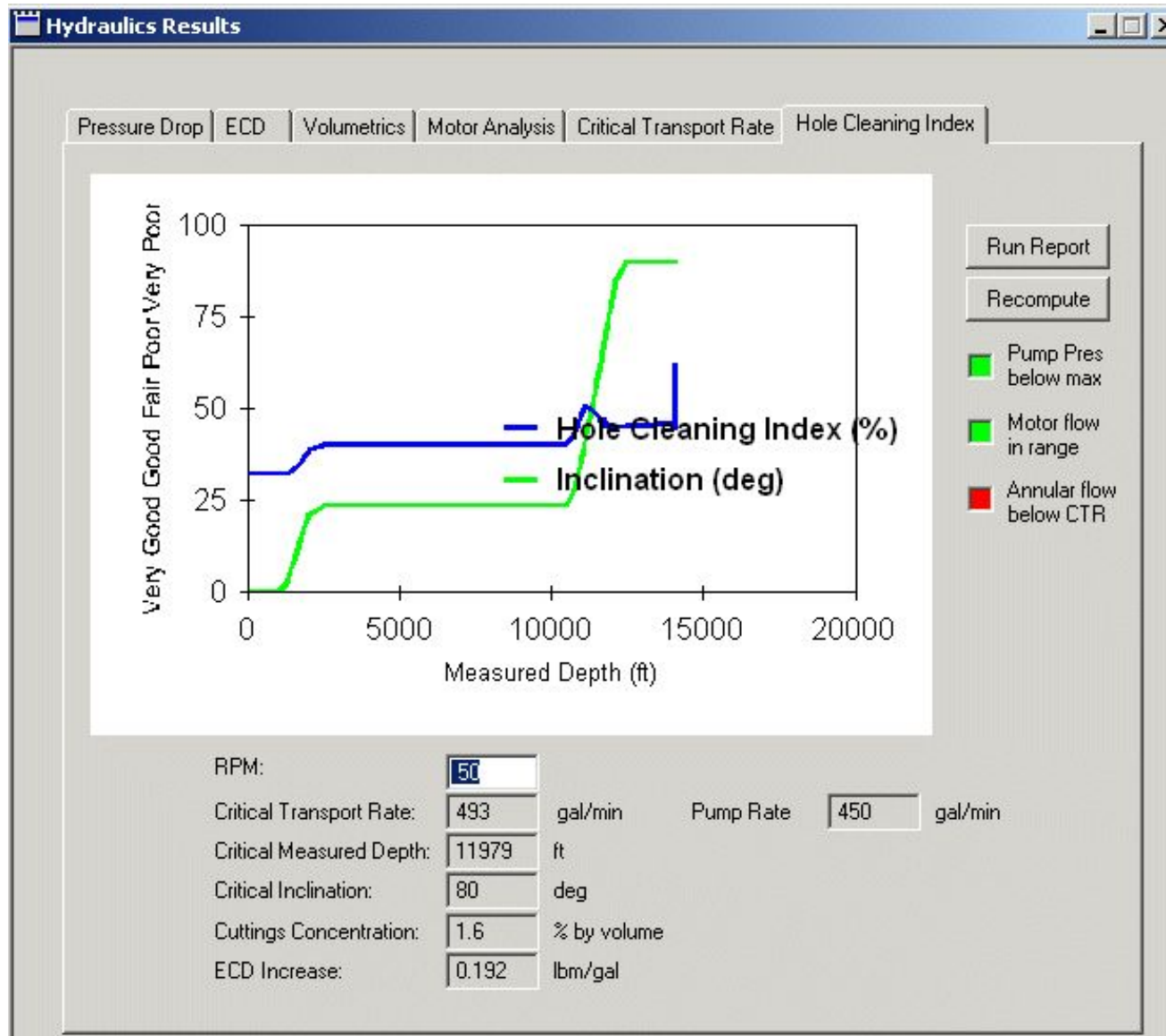
РЕЗУЛЬТАТЫ АНАЛИЗА РАБОТЫ ВЗД



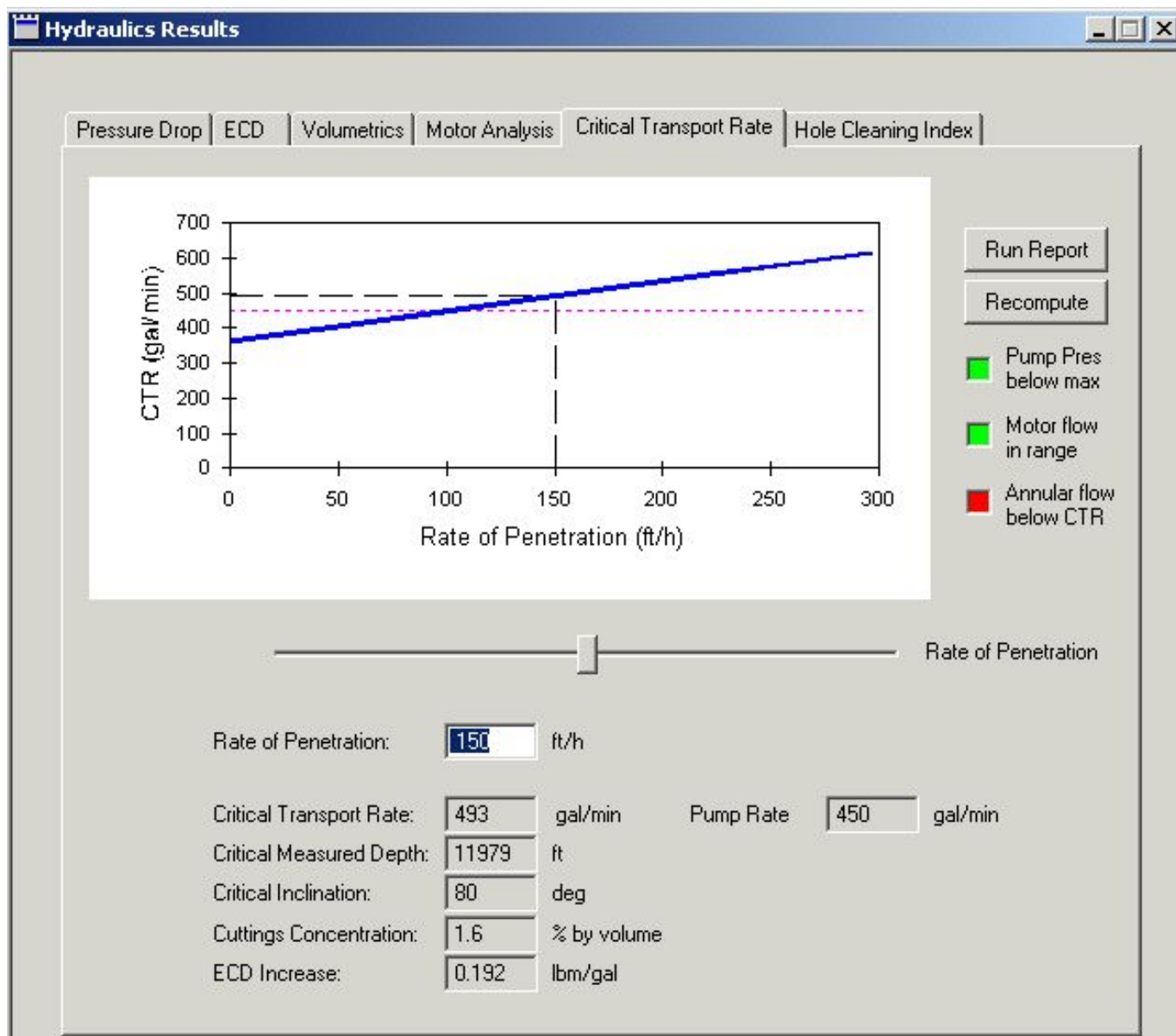
РЕЗУЛЬТАТЫ АНАЛИЗА ТРАНСПОРТА ШЛАМА



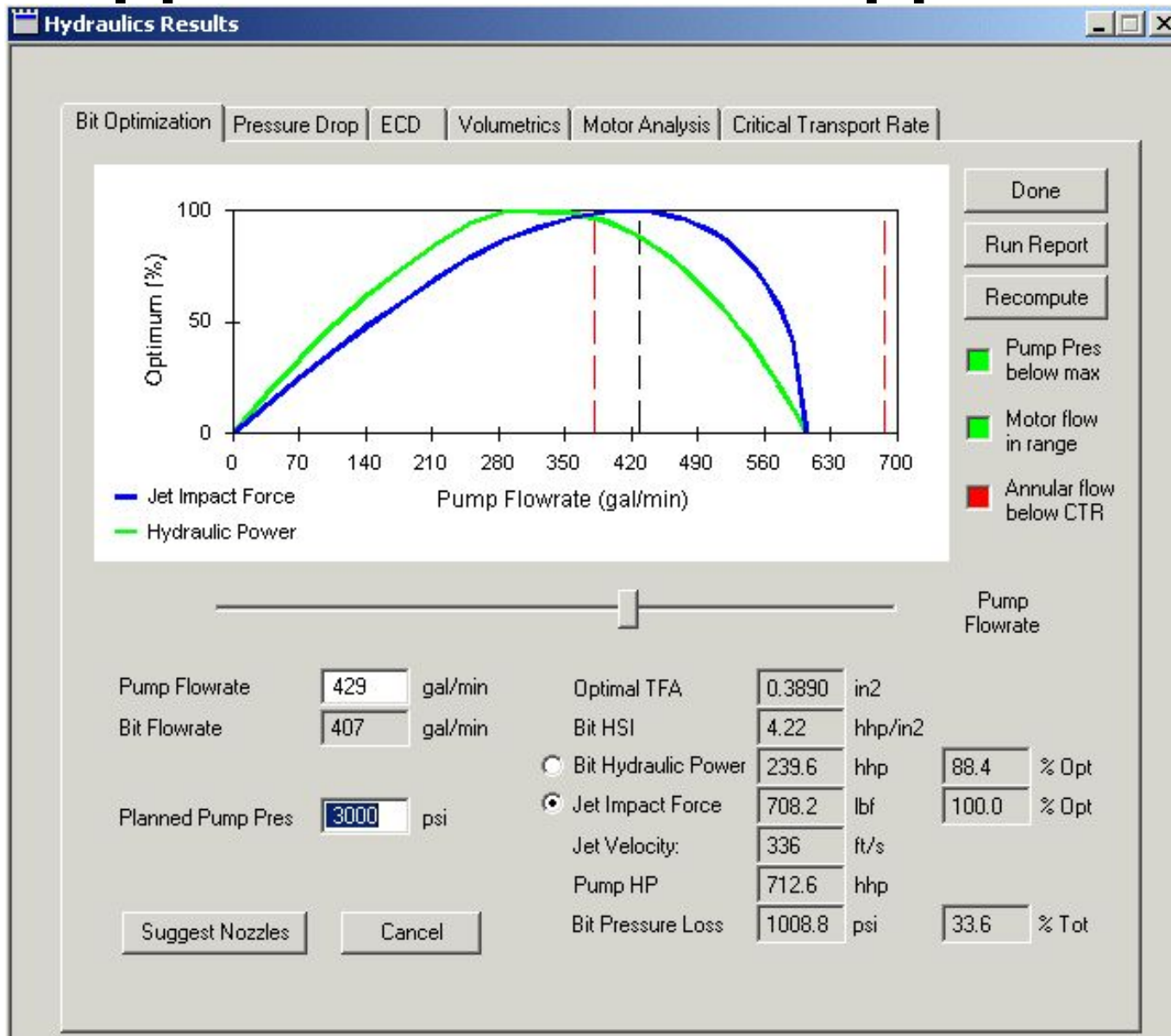
РЕЗУЛЬТАТЫ РАСЧЕТА ИНДЕКСА ОЧИСТКИ СТВОЛА



ОЦЕНКА ВЛИЯНИЯ РАСХОДА НА СКОРОСТЬ БУРЕНИЯ



РЕЗУЛЬТАТЫ ОПТИМИЗАЦИИ ДОЛОТНЫХ НАСАДОК



ЗАДАНИЕ ОПЦИЙ РАСЧЕТА ДАВЛЕНИЙ ПРИ СПО

Hydraulics Inputs - SwabSurge

Bit Depth: 20000 ft

BHA: demo 3031.0 ft
Well Geom: demo 20000.0 ft
Survey: demo 20000.0 ft

Rheology Bit/Flow Rig Tools/Misc Motor Cuttings Swab/Surge

Analysis Type
 User-Defined Tripping Schedule
 Margin-Based Tripping Schedule

Direction
 POOH
 RIH

Run
Report

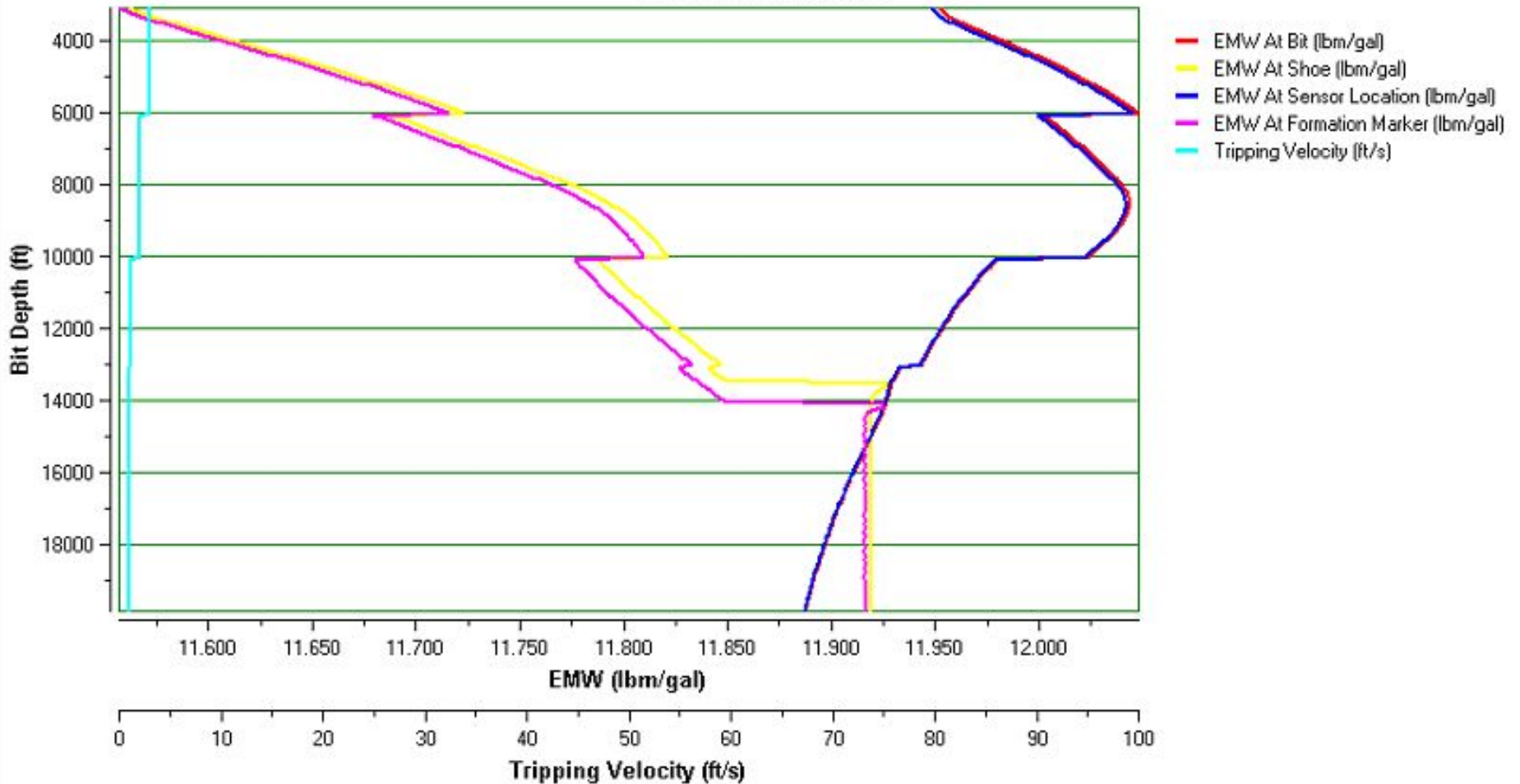
Parameters
Open-Ended Pipe Pumps On
Acceleration/Deceleration 0.6 ft/s²
Stand Length 90 ft
Connection Time 60 s
Gel Strength (10 s/10 min) 25 lbf/100ft²

	Bit Depth (ft)	RIH Speed (ft/s)
1	6000	3
2	10000	2
3	13000	1.2
4	20000	1
5		

Gauges
Sensor Location (From Bit) 40.25 ft
Formation Marker (MD) 14000 ft

РЕЗУЛЬТАТЫ РАСЧЕТА ДАВЛЕНИЙ ПРИ СПО

Swab/Surge
Mud Weight = 11.55
Well: W-13
Client: Schlumberger
Date: January 13, 2005



РЕЗУЛЬТАТЫ РАСЧЕТА ДАВЛЕНИЙ ПРИ СПО

	A	B	C	D	E	F	G
74	SWAB/SURGE PARAMETERS						
75	<i>Tripping Schedule:</i>			User defined			
76	<i>Direction:</i>			RIH			
77				Open-Ended Pipe/Pumps On			
78	<i>Pump Flowrate (gal/min):</i>			400.0			
79	<i>Acceleration (ft/s²):</i>			0.6			
80	<i>Stand Length (ft):</i>			90.0			
81	<i>Connection Time (s):</i>			60.0			
82	<i>Sensor Location-From Bit (ft):</i>			40.25			
83	<i>Formation Marker-MD (ft):</i>			14000.0			
84	<i>Surge Margin (lbm/gal):</i>			1.0			
85	<i>Gel Strength (lbf/100ft²):</i>			25.0			
86							
87	SWAB/SURGE OUTPUT						
88			EMW At	EMW At	EMW At	EMW At	
	Bit Depth	Tripping Speed	Bit	Sensor	Shoe	Formation	Total Trip Ti
89	ft	ft/s	lbm/gal	lbm/gal	lbm/gal	lbm/gal	
90							
91	3209.9	3.0	11.95	11.95	11.57	11.61	
92	3299.9	3.0	11.96	11.95	11.57	11.62	
93	3389.9	3.0	11.96	11.95	11.57	11.62	
94	3479.9	3.0	11.96	11.96	11.58	11.63	
95	3569.9	3.0	11.96	11.96	11.58	11.63	
96	3659.9	3.0	11.97	11.96	11.59	11.64	
97	3749.9	3.0	11.97	11.97	11.60	11.64	
98	3839.9	3.0	11.97	11.97	11.60	11.65	
99	3929.9	3.0	11.98	11.97	11.61	11.65	
100	4019.9	3.0	11.98	11.98	11.61	11.66	
101	4109.9	3.0	11.99	11.98	11.62	11.66	
102	4199.9	3.0	11.99	11.99	11.62	11.67	

ВКЛЮЧЕНИЕ ОПЦИИ РАСЧЕТА С УЧЕТОМ ПОЛЯ ТЕМПЕРАТУР

Hydraulics Inputs - PTRheology

Bit Depth: 20000 ft

BHA: demo 3031.0 ft
Well Geom: demo 20000.0 ft
Survey: demo 20000.0 ft

Rheology Bit/Flow Rig Tools/Misc Motor Cuttings Swab/Surge Temperature

Settings
Model Bingham Use PV-YP P-T On/Theoretical

Properties

Oil/Water Ratio	0 %	Reference Pressure	14.7 psi
Mud Weight	11.55 lbm/gal	Reference Temperature	68 degF
Consistency Index (K)	542.2 eq. cP		
Flow Behavior Index (n)	0.659		
Plastic Viscosity	40 cP		
Yield Point	29 lbf/100ft2	Fann 300	69 lbf/100ft2
		Fann 600	109 lbf/100ft2

ЗАДАНИЕ ТЕМПЕРАТУРНОГО ГРАДИЕНТА

Hydraulics Inputs - PTRheology

Bit Depth: 20000 ft

BHA: demo 3031.0 ft
Well Geom: demo 20000.0 ft
Survey: demo 20000.0 ft

Filter Run Plots Run Report

Rheology Bit/Flow Rig Tools/Misc Motor Cuttings Swab/Surge Temperature

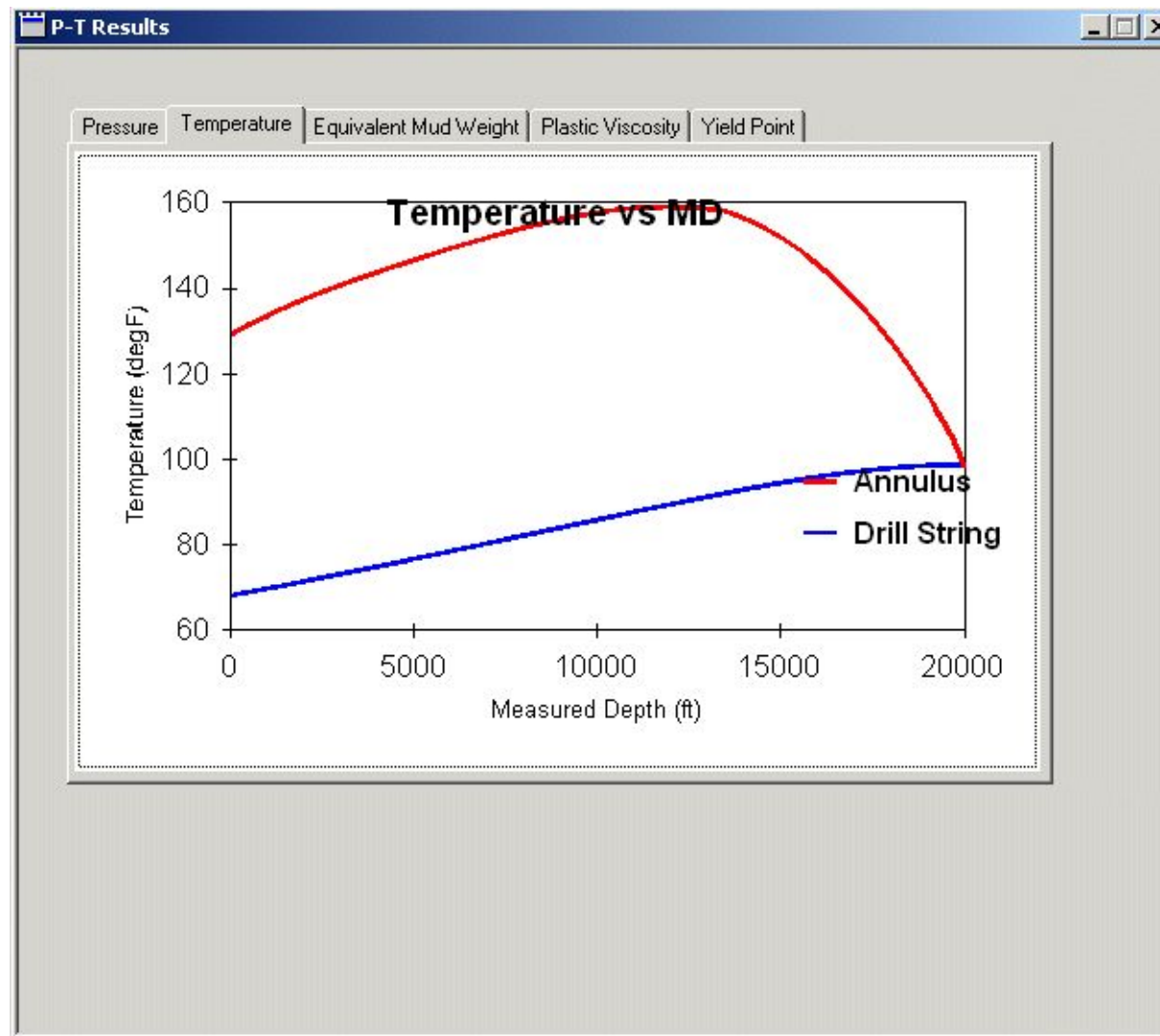
Input
 Simulator Manual/WEST

Circulation
Mud Temperature In 68 degF

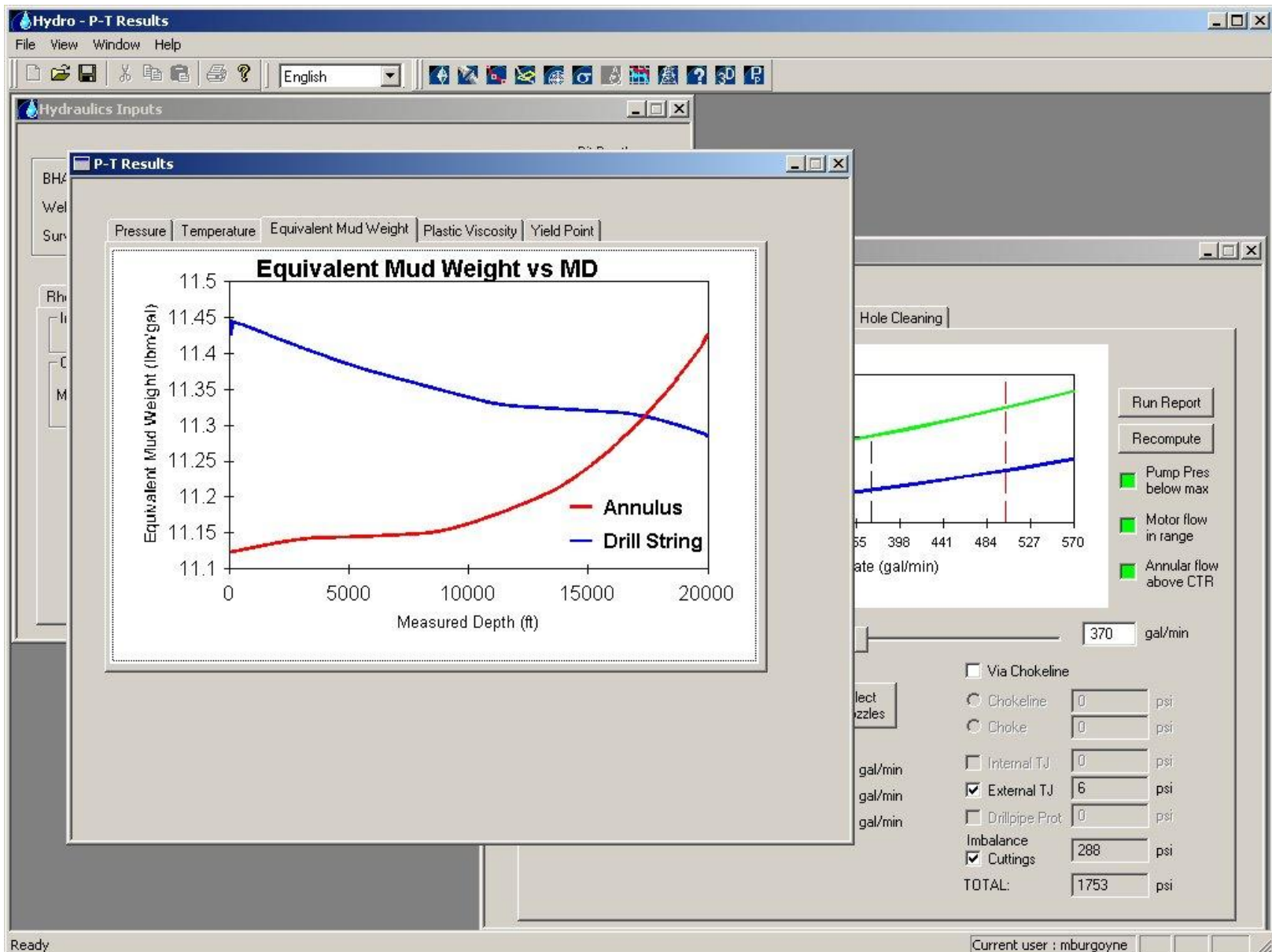
Undisturbed Temperature Profile

Water Depth 0 ft
Surface Ambient 68 degF
Sea Floor Temperature 35 degF
Thermocline Temperature 35 degF
Thermocline Depth 0 ft
Geothermal Gradient 1.8 degF/100ft

РЕЗУЛЬТАТЫ МОДЕЛИРОВАНИЯ ТЕМПЕРАТУРЫ РАСТВОРА ПРИ ЦИРКУЛЯЦИИ В СКВАЖИНЕ



РЕЗУЛЬТАТЫ РАСЧЕТА ЭКВИВАЛЕНТНОЙ ПЛОТНОСТИ



ВКЛЮЧЕНИЕ ОПЦИИ ПОЛУЭМПИРИЧЕСКОГО МОДЕЛИРОВАНИЯ РАСПРЕДЕЛЕНИЯ ТЕМПЕРАТУР И ДАВЛЕНИЙ

Hydraulics Inputs - SwabSurge

Bit Depth: 20000 ft

BHA: demo 3031.0 ft
Well Geom: demo 20000.0 ft
Survey: demo 20000.0 ft

Run Plots
Run Report

Rheology Bit/Flow Rig Tools/Misc Motor Cuttings Swab/Surge Temperature

Settings
Model Power Law Use PV-YP P-T On/Semi-Empirical

Fann Fit Type Exponential

Oil/Water Ratio 0 % Reference Pressure 14.7 psi
Mud Weight 11.55 lbm/gal Reference Temperature 68 degF

	Pressure (psi)	Temperature (degF)		Fann3 (lbf/100ft ²)	Fann6 (lbf/100ft ²)	Fann100 (lbf/100ft ²)	Fann200 (lbf/100ft ²)	Fann300 (lbf/100ft ²)	Fann600 (lbf/100ft ²)
1	2500	120	✓	3	3	27.2	48.9	69.8	127.9
2	2500	150	✓	2	3	20.5	33	46.1	85.8
3	2500	200	✓	2	3	12.3	20.5	28.2	55.2
4	2500	250	✓	1	2	8.2	15.3	19.2	37.8
5	2500	300	✓	1	1	6.1	10.2	15.5	30.9
6	5000	120	✓	3	4.1	33.9	55.2	78.6	143.7
7	5000	150	✓	2	3	21.4	37.8	53.4	98.7
8	5000	200	✓	2	3	13.3	22.4	31.1	58.9

ИСХОДНЫЙ ВИД ОКНА МОДУЛЯ DRILLSAFE

DrillSAFE - Analysis 1

File Edit View Output Options Window Launch Help

English

Analysis 1

BHA: [] ft

Well Geom: [] ft

Survey: [] ft

Run Report

Mud Weight Input

8.345 lbm/gal

Torque & Drag | BHA Tendency | Bit Side Forces | FF Calibration | Sag & BHA Mag

Torque & Drag (S)

Torque & Drag (M)

Drilling Parameters

Downhole WoB: [] 1000 lbf

Downhole ToB: [] 1000 ft.lbf

Block Weight: [] 1000 lbf

Operating Mode

Rotating Sliding Reaming

Input	Bottom Depth (ft)	Rotation Component	Translation Component	Friction Factor
1				
2				
3				
4				

Bit Depth

[] ft

Yellow cells are mandatory. White cells are optional.

ROP: [] ft/hr

RPM: []

Compute Friction Factors

Ready

Current user : Kdixon2

NUM

СОЗДАНИЕ ТРАЕКТОРИИ СКВАЖИНЫ В МОДУЛЕ WELL DESIGN

Well Design - [Tutorial#1]

File Edit View Output Format Add Options Window Launch Help

Metric

Horizontal Ref: Structure: Sosnovaya Elevation Ref: Borehole: Rotary Table

B1 0.00

	Comment	MD (m)	INCL (°)	Azim (°)	TVD (m)	VSEC (m)	NS (m)	EW (m)	DLS (°/30m)	TF (°)	BR (°/30m)	TR (°/30m)	?MD (m)
1	Tie-In	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.0			
2	KOP	200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	200.00
3	End of Build	391.86	25.58	0.00	385.55	42.13	42.13	0.00	4.00	0.0	4.00	0.00	191.86
4	Casing Point 9 5/8"	795.92	25.58	0.00	750.00	216.60	216.60	0.00	0.00	0.0	0.00	0.00	404.06
5	Begin of Drop	1598.15	25.58	0.00	1473.59	563.00	563.00	0.00	0.00	180.0	0.00	0.00	1206.29
6	Target#1	3133.05	0.00	0.00	2958.00	900.00	900.00	0.00	0.50		-0.50	0.00	1534.91

Ready Current user : ADMIN VSEC Origin: (0.00 N, 0.00 E) VSEC Azim: 0.00

СТАНДАРТНЫЕ ТРАЕКТОРИИ ДОСТУПНЫЕ В МОДУЛЕ WELL DESIGN

Standard Profiles

Select Profile

- Hold, Curve (2D) to fixed Target (compute KOP, DLS)
- Curve, Hold (J-2D) from fixed KOP (compute EOC, DLS)
- Hold, Curve, Hold (J) (given DLS, compute KOP)
- Curve, Hold (J 2D or 3D) (given DLS)
- Curve, Hold, Curve (S-2D)
- Curve, Hold, Curve (S-3D)
- Hold or Curve to Target
- Curve-Curve (2D)
- Porpoise to a Plane (2D) - Build then Drop
- Land on Formation Plane (3D)

OK

Cancel

S-2D or S-3D (hold before target)

End Curve Before Target

ЗАДАНИЕ ПАРАМЕТРОВ ИСКРИВЛЕННОГО УЧАСТКА В МОДУЛЕ WELL DESIGN

End of Curve Conditions

Constant DLS | Build Rate/Turn Rate | DLS - TF

Maintain

- Build Rate
- Turn rate

To

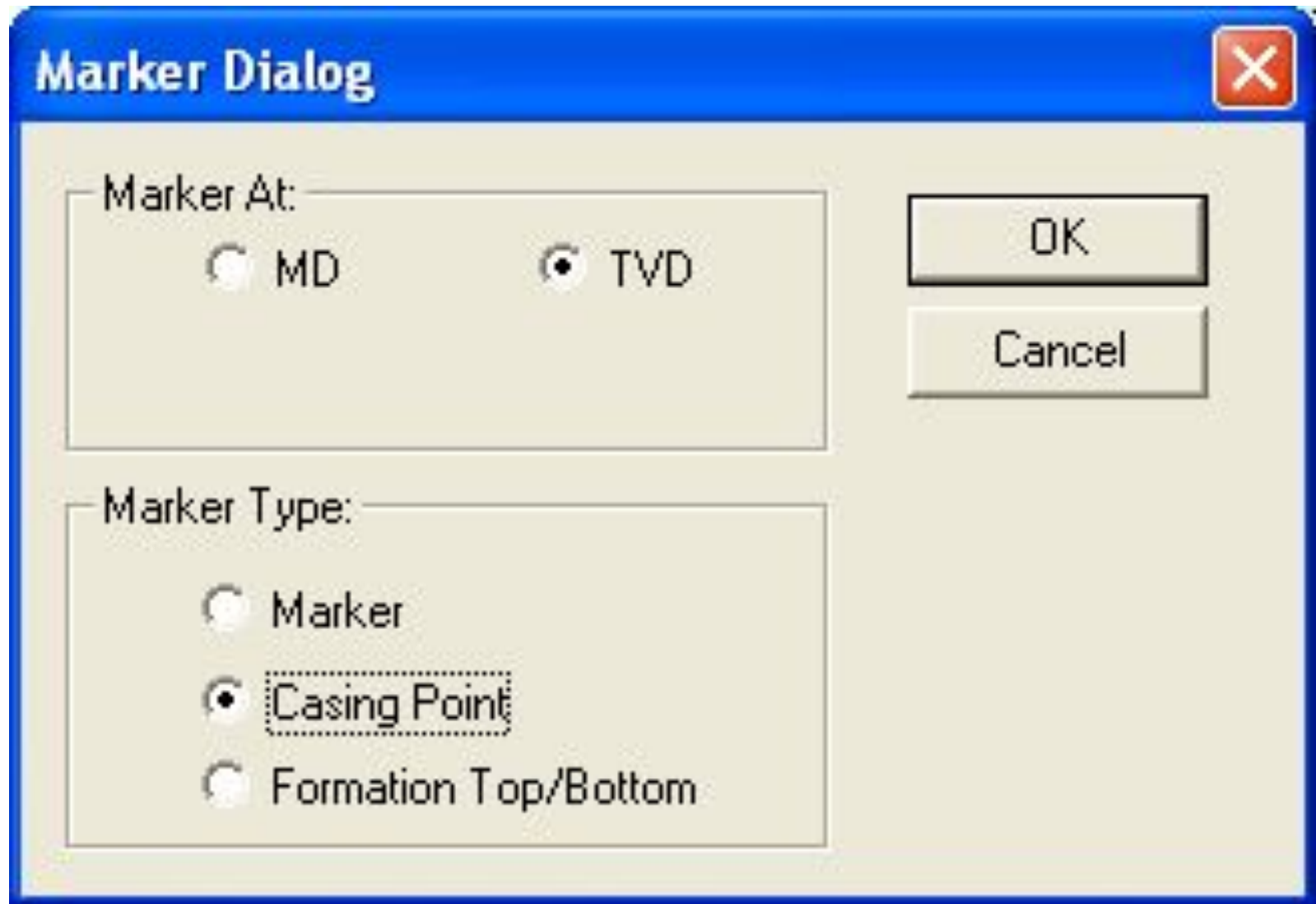
- MD
- TVD
- for a Course (Delta MD)
- Inclination
- Azimuth

Note:

1. Station will be computed using Radius of Curvature.
2. Build and Turn to a TVD is an iterative solution.

OK | Отмена | Применить | Справка

ДОБАВЛЕНИЕ МАРКЕРОВ НА ТРАЕКТОРИЮ В МОДУЛЕ WELL DESIGN



The image shows a dialog box titled "Marker Dialog" with a blue title bar and a red close button in the top right corner. The dialog is divided into two main sections. The first section, labeled "Marker At:", contains two radio button options: "MD" and "TVD". The "TVD" option is selected. The second section, labeled "Marker Type:", contains three radio button options: "Marker", "Casing Point", and "Formation Top/Bottom". The "Casing Point" option is selected and highlighted with a dashed border. To the right of these sections are two buttons: "OK" and "Cancel".

Marker Dialog

Marker At:

MD TVD

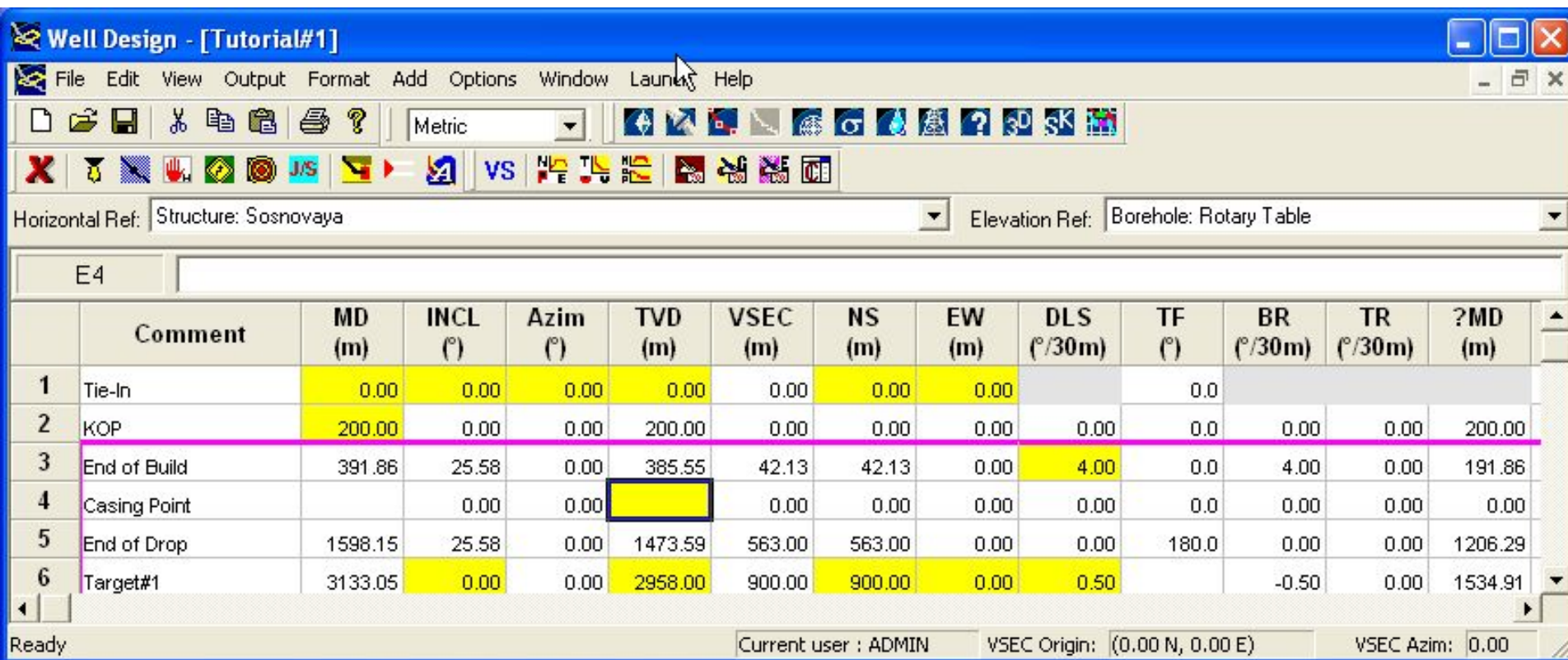
Marker Type:

Marker
 Casing Point
 Formation Top/Bottom

OK

Cancel

ДОБАВЛЕНИЕ МАРКЕРОВ НА ТРАЕКТОРИЮ В МОДУЛЕ WELL DESIGN



The screenshot displays the 'Well Design - [Tutorial#1]' software window. The interface includes a menu bar (File, Edit, View, Output, Format, Add, Options, Window, Launch, Help), a toolbar with various icons, and a status bar at the bottom. The main area shows a data table with columns for well parameters. The table is titled 'E4' and contains 6 rows of data. The 'TVD (m)' column for row 4 is highlighted with a yellow box. The status bar at the bottom indicates 'Ready', 'Current user : ADMIN', 'VSEC Origin: (0.00 N, 0.00 E)', and 'VSEC Azim: 0.00'.

	Comment	MD (m)	INCL (°)	Azim (°)	TVD (m)	VSEC (m)	NS (m)	EW (m)	DLS (°/30m)	TF (°)	BR (°/30m)	TR (°/30m)	?MD (m)
1	Tie-In	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.0			
2	KOP	200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	200.00
3	End of Build	391.86	25.58	0.00	385.55	42.13	42.13	0.00	4.00	0.0	4.00	0.00	191.86
4	Casing Point		0.00	0.00		0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00
5	End of Drop	1598.15	25.58	0.00	1473.59	563.00	563.00	0.00	0.00	180.0	0.00	0.00	1206.29
6	Target#1	3133.05	0.00	0.00	2958.00	900.00	900.00	0.00	0.50		-0.50	0.00	1534.91

ДОБАВЛЕНИЕ МАРКЕРОВ НА ТРАЕКТОРИЮ В МОДУЛЕ WELL DESIGN

The screenshot displays the 'Well Design - [Tutorial#1]' software window. The interface includes a menu bar (File, Edit, View, Output, Format, Add, Options, Window, Launch, Help), a toolbar with various icons, and a status bar at the bottom. The main area shows a well trajectory table with columns for MD (m), INCL (°), Azim (°), TVD (m), VSEC (m), NS (m), EW (m), DLS (°/30m), TF (°), BR (°/30m), TR (°/30m), and ?MD (m). The table contains 6 rows of data, with the 4th row highlighted in yellow. The status bar indicates 'Ready', 'Current user : ADMIN', 'VSEC Origin: (0.00 N, 0.00 E)', and 'VSEC Azim: 0.00'.

Horizontal Ref: Structure: Sosnovaya Elevation Ref: Borehole: Rotary Table

E4 750.00

	Comment	MD (m)	INCL (°)	Azim (°)	TVD (m)	VSEC (m)	NS (m)	EW (m)	DLS (°/30m)	TF (°)	BR (°/30m)	TR (°/30m)	?MD (m)
1	Tie-In	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.0			
2	KOP	200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	200.00
3	End of Build	391.86	25.58	0.00	385.55	42.13	42.13	0.00	4.00	0.0	4.00	0.00	191.86
4	Casing Point 9 5/8"	795.92	25.58	0.00	750.00	216.60	216.60	0.00	0.00	0.0	0.00	0.00	404.06
5	End of Drop	1598.15	25.58	0.00	1473.59	563.00	563.00	0.00	0.00	180.0	0.00	0.00	1206.29
6	Target#1	3133.05	0.00	0.00	2958.00	900.00	900.00	0.00	0.50		-0.50	0.00	1534.91

Ready Current user : ADMIN VSEC Origin: (0.00 N, 0.00 E) VSEC Azim: 0.00

СОЗДАНИЕ ОТЧЕТА ПО ТРАЕКТОРИИ В МОДУЛЕ WELL DESIGN

Plot Manager [X]

Template Selection

Template:

Create Excel Plots

Plan View Interpolations | VSEC View Interpolations | Critical Points | Slots | Targets

	Bottom MD Depth(m)	MD Interp Interval (m)
1	2010	2
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		

Enter the depth range and the interpolation interval for that range.

Don't Use

Hold Section Interpolations

- Curves Only
- Incl and Azim Constant
- Inclination Changes Azimuth Constant
- Azimuth Changes Inclination Constant

Use Last Interval To TD

СОЗДАНИЕ ОТЧЕТА ПО ТРАЕКТОРИИ В МОДУЛЕ WELL DESIGN

РЕДАКТИРОВАНИЕ ПАРАМЕТРОВ ДОЛОТА В МОДУЛЕ BHA EDITOR

The screenshot displays the BHA Editor software interface. The window title is "BHA Editor - [-No Name >]". The menu bar includes File, Edit, View, Output, Window, Launch, and Help. The toolbar contains various icons for file operations and editing. The left pane shows a tree view of bit sizes, with "8 1/2" Max OD" selected. The middle pane shows a 3D model of the bit assembly, labeled "BHA" and "8 1/2" Bit". The right pane shows the "General" tab of the bit's properties, with the following parameters:

Parameter	Value
Type	Milled Tooth Bit
Name	8 1/2" Bit
Manufacturer	Generic
Model	
SN#	
Inner Diameter	2.25 in
Length	0.3048 m
Bit Shank OD	6 in
Bit Diameter	8.5 in
Linear Weight	0 kg/m
Total Weight	0 kg
Total Weight Below Item	0 kg
Total Length Below Item	0 m
Connection Size	4.5 in
Connection Type	Regular

At the bottom of the window, the status bar shows "Catalog -> Bit -> 8 1/2" Max OD -> 6" Body OD" and "Current user : ADMIN".

РЕДАКТИРОВАНИЕ ПАРАМЕТРОВ ДОЛОТА В МОДУЛЕ BHA EDITOR

BHA Editor - [<No Name>]

File Edit View Output Window Launch Help

Metric

6 3/8" Max OD
6 1/2" Max OD
6 3/4" Max OD
7 1/2" Max OD
7 5/8" Max OD
7 7/8" Max OD
8 1/8" Max OD
8 1/4" Max OD
8 3/8" Max OD
8 1/2" Max OD
5 3/4" Body OD
6" Body OD
8 3/4" Max OD
9 1/4" Max OD
9 3/8" Max OD
9 1/2" Max OD
9 5/8" Max OD
9 7/8" Max OD
10 1/2" Max OD
10 5/8" Max OD
11" Max OD
11 1/2" Max OD

<No Name>
BHA
8 1/2" Bit

General | More | Bit

Nozzles

Count	Size (1/32")
3	14

Gauge Length: 5.8 cm
TFA: 290.961 mm²

IADC Code

Hardness	Type	Feature
2 - Medium Formati	3 - Medium in its gr	1 - Standard, non-s

Grading Type

IADC
 Percentage

IADC Dull Bit Grading

Inner	Outer	Dull	Location
0 - N	0 - N	NO - N	A - All

Wear

Percentage: -1

Bearing Seals: 0 - N
Gauge: I - in
Other Dull: NO - N
Reason Pulled: BHA - C

For Help, press F1

Current user : ADMIN NUM

РЕДАКТИРОВАНИЕ ПАРАМЕТРОВ ОТКЛОНИТЕЛЯ В МОДУЛЕ BHA EDITOR

The screenshot displays the BHA Editor software interface. The window title is "BHA Editor - [<No Name>]". The menu bar includes File, Edit, View, Output, Window, Launch, and Help. The toolbar contains various icons for file operations and editing. The main interface is divided into three main sections:

- Tree View (Left):** A hierarchical list of components. The selected path is: 6 3/4" OD -> A675M4570XP -> 4 1/2" Regular (Down).
- 3D Model (Center):** A 3D assembly view showing a BHA (Bottom Hole Assembly) with a bit. The bit is labeled "8 1/2" Bit".
- Parameter Panel (Right):** A detailed configuration panel for the selected component, A675M4570XP. It includes tabs for General, More, and Motor. The General tab is active, showing the following parameters:
 - Type: PDM (dropdown), Non-Magnetic (checkbox)
 - Name: A675M4570XP
 - Manufacturer: Schlumberger (dropdown)
 - Model: A675M4570XP, SN#: (text field)
 - Dimensions:
 - Inner Diameter: 5.5 in, Length: 8.08025 m
 - Outer Diameter: 6.75 in, Maximum OD: 8.375 in
 - Fish-Neck OD: 0 in, Fish-Neck Length: 0 m
 - Weight:
 - Linear: 121.821 kg/m, Total: 984.329 kg
 - Total Weight Below Item: 24.9996 kg
 - Total Length Below Item: 0.3048 m
 - Connection:

	Size	Connection Type	BSR
Top	4.5 in	NC50 (4 1/2 IF)	Pin: N.A., Box: N.A.
Bottom	4.5 in	Regular	Pin: N.A., Box: N.A.

At the bottom of the window, there is a status bar with the following text: "Catalog -> Motor -> Schlumberger -> 6 3/4" OD -> A675M4570XP -> 4 1/2" NC50 (4 1/2 IF) (Up) -> 4 1/2" Regular (Down)". The current user is identified as "ADMIN".

РЕДАКТИРОВАНИЕ ПАРАМЕТРОВ ОТКЛОНИТЕЛЯ В МОДУЛЕ BHA EDITOR

The screenshot displays the BHA Editor software interface for editing parameters of a wellbore assembly. The window title is "BHA Editor - bha_3133". The menu bar includes File, Edit, View, Output, Window, Launch, and Help. The toolbar contains various icons for file operations and editing, with a "Metric" dropdown menu.

The main workspace is divided into three sections:

- Equipment Database:** A tree view on the left showing categories like Catalog, Bent Sub, Bit, Collar, Downhole Sensor, Drill Pipe, Heavy Weight Drill Pipe, Hole Opener & Reamer, Jar/Shock Sub, Misc. Sub, Motor, MWD/LWD, Rotary Steerable, Stabilizer, Well Bore, and User.
- Assembly Diagram:** A central diagram showing the wellbore assembly for "bha_3133". Components from top to bottom are: 5" 19.50 DPE, 10% Wear; BHA; Crossover; 5" HWDP; Monel 6 3/4" Collar; PowerPulse; CDR; Stabilizer; A675M4570XP; Stabilizer #1; and 8 1/2" Bit.
- Parameter Settings:** A panel on the right with tabs for General, More, and Motor. The Motor tab is active, showing the following parameters:
 - Bend #1:** Angle is 0.5 deg; Bend to Bottom Connection is 1.83794 m.
 - Bend #2:** Angle is 0 deg; Bend to Bottom Connection is 0 m.
 - Tool Read-out Port Distance:** Read-out Port To Bottom Connection is 0 m.
 - Flow Range:** 1135.6 to 2271.25 L/min.

At the bottom of the window, there is a status bar with the text "For Help, press F1" on the left and "Current user : ADMIN" followed by "CAP NUM" on the right.

РЕДАКТИРОВАНИЕ ПАРАМЕТРОВ ОТКЛОНИТЕЛЯ В МОДУЛЕ BHA EDITOR

The screenshot displays the BHA Editor software interface for editing a component named 'bha_3133'. The interface is divided into several main sections:

- Equipment Database:** A tree view on the left showing a hierarchy of components including Bent Sub, Bit, Collar, Downhole Sensor, Drill Pipe, Heavy Weight Drill Pipe, Hole Opener & Reamer, Jar/Shock Sub, Misc. Sub, Motor, MWD/LWD, Rotary Steerable, Stabilizer, Well Bore, and User.
- Assembly Diagram:** A central vertical diagram showing the assembly of components. From top to bottom, the components are: 5" 19.50 DPE, 10% Wear; BHA; Crossover; 5" HWDP; Monel 6 3/4" Collar; PowerPulse; CDR; Stabilizer; A675M4570XP; and 8 1/2" Bit. The 'Stabilizer' component is highlighted with a blue box and labeled 'Stabilizer #1'.
- General Properties Panel:** A panel on the right showing the configuration for the selected 'Stabilizer #1'.
 - Type:** Stabilizer
 - Name:** Stabilizer #1
 - Blade Distances:**
 - Blade Mid-Point To PDM's Bottom Conn.: 0.5334 m
 - Blade Mid-Point to the Bit: 0.8382 m
 - Dimensions:**
 - Body Length: 0.356616 m
 - Max. Outer Diameter: 8.375 in
 - Blade Info:**
 - Blade Length: 0.356616 m
 - Blade Width: 0 in
 - Blade Spiral: 0.000000 deg
 - Remark:** A text area for additional notes.

At the bottom of the window, the status bar indicates 'Current user : ADMIN' and 'CAP NUM'.

РЕДАКТИРОВАНИЕ ПАРАМЕТРОВ БУРИЛЬНЫХ ТРУБ В МОДУЛЕ BHA EDITOR

The screenshot displays the BHA Editor software interface. The main window is titled "BHA Editor - [<No Name>"] and features a menu bar (File, Edit, View, Output, Window, Launch, Help) and a toolbar with various icons. The interface is divided into several panels:

- Equipment Database:** A tree view on the left showing a hierarchy of equipment types: Catalog, Bent Sub, Bit, Collar, Downhole Sensor, Drill Pipe, and various pipe sizes (e.g., 2 3/8" OD, 5" OD) and weights (e.g., 19.5 lbm/ft, 25.6 lbm/ft).
- Assembly Diagram:** A central diagram showing a vertical assembly of components. From top to bottom, the components are: a drill pipe (5" 19.50 DPE, 10% Wear), a BHA, a Crossover, 5" HWDP, Monel 6 3/4" Collar, PowerPulse, CDR, Stabilizer, A675M4570XP, and an 8 1/2" Bit.
- Parameter Editor:** A panel on the right with tabs for "General", "More", and "Drill Pipe". The "Drill Pipe" tab is active, showing the following parameters:
 - Type: Drill Pipe (dropdown), Non-Magnetic (checkbox)
 - Name: 5" 19.50 DPE, 10% Wear
 - Manufacturer: (dropdown)
 - Model: (dropdown), SN#: (text field)
 - Dimensions:
 - Inner Diameter: 4.276 in
 - Length: 3050 m
 - Outer Diameter: 4.928 in
 - Maximum OD: 6.625 in
 - Tool Joint ID: 3.75 in
 - Tool Joint OD: 6.625 in
 - Weight:
 - Linear: 31.0877 kg/m
 - Total: 94816 kg
 - Total Weight Below Item: 8474.87 kg
 - Total Length Below Item: 84.7716 m
 - Connection:
 - Top: Size 5 in, Connection Type NC50 (4 1/2 IF), Pin/Box (radio buttons)
 - Bottom: Size 5 in, Connection Type NC50 (4 1/2 IF), Pin/Box (radio buttons)

At the bottom of the window, there is a status bar with the text "For Help, press F1" and "Current user : ADMIN NUM".

РЕДАКТИРОВАНИЕ ПАРАМЕТРОВ БУРИЛЬНЫХ ТРУБ В МОДУЛЕ BHA EDITOR

The screenshot displays the BHA Editor software interface for editing parameters of a drill pipe assembly. The window title is "BHA Editor - bha_3133". The menu bar includes File, Edit, View, Output, Window, Launch, and Help. The toolbar contains various icons for file operations and editing, with a "Metric" dropdown menu. The main workspace is divided into three panels:

- Equipment Database:** A tree view showing a hierarchy of equipment types: Catalog, Bent Sub, Bit, Collar, Downhole Sensor, Drill Pipe, Heavy Weight Drill Pipe, Hole Opener & Reamer, Jar/Shock Sub, Misc. Sub, Motor, MWD/LWD, Rotary Steerable, Stabilizer, Well Bore, and User.
- Assembly Tree:** A diagram showing the components of the assembly "bha_3133":
 - 5" 19.50 DPE, 10% Wear
 - BHA
 - 8 1/2 " Bit
- Parameter Editing Panel:** The "Drill Pipe" tab is active, showing the following parameters:
 - Grade: E-75 (dropdown menu)
 - Num of Joints: 305 (text input)
 - Average Joint Length: 10 m (text input)
 - Total Length: 3050 m (text input)
 - Calculate Total Length:

At the bottom of the window, the status bar displays "For Help, press F1" on the left and "Current user : ADMIN CAP NUM" on the right.

КОМПОНОВКА БК, СОЗДАННАЯ В МОДУЛЕ ВНА EDITOR

The screenshot displays the BHA Editor software interface for a wellbore assembly named 'bha_3133'. The interface is divided into three main sections:

- Equipment Database (Left):** A hierarchical tree view showing various equipment categories and their specifications. The 'Drill Pipe' section is expanded, listing different diameters (from 2 3/8" to 6 5/8" OD) and weights (19.5 and 25.6 lbm/ft). Under the 5" OD section, there are sub-categories for 'E-75' (FH, HT50, NC50 (4 1/2 IF), 10% Wear, Class 2, New, Premium), 'G-105', 'S-135', 'X-95', and another weight category (25.6 lbm/ft).
- Assembly Diagram (Center):** A vertical schematic of the wellbore assembly. From top to bottom, the components are:
 - 5" 19.50 DPE, 10% Wear
 - BHA (Borehole Assembly)
 - Crossover
 - 5" HWDP (Heavy Weight Drill Pipe)
 - Monel 6 3/4" Collar
 - PowerPulse
 - CDR (Circumferential Drilling Rod)
 - Stabilizer
 - A675M4570XP
 - 8 1/2" Bit
- General Properties (Right):** A panel with the following fields:
 - Name: bha_3133
 - Total Length: 3134.77 m
 - Total Weight: 103291 kg
 - Remark: (Empty text area)

At the bottom of the window, the status bar shows 'Current user : ADMIN' and 'NUM'. A footer note reads 'For Help, press F1'.

ВВОД ДАННЫХ ПО ОБСАДНОЙ КОЛОННЕ В МОДУЛЕ ВНА EDITOR

The screenshot displays the BHA Editor software interface for wellbore geometry. The main window is titled "BHA Editor - [Wellbore Geometry]". The interface is divided into several sections:

- Top Menu:** File, Edit, View, Output, Window, Launch, Help.
- Toolbar:** Includes icons for file operations, navigation, and a "Metric" dropdown menu.
- Hole Section / Error List / Inside Diameter Profile:** A tabbed interface with "Hole Section" selected. It contains an "Air Gap" input field (set to 0) and a table with columns "From (m)", "To (m)", and "ID (in)".
- Table Data:**

From (m)	To (m)	ID (in)
0.0	0.0	Air Gap
0.0	795.9	11.626
795.9	3133.1	8.500
3133.1		
- Equipment Database:** A tree view showing the hierarchy: Equipment Database > Catalog > Well Bore > Casing. A list of casing diameters is shown: 1 3/64", 1 5/16", 1 21/32", 1 29/32", 2 1/16", 2 3/8", 2 7/8", 3 1/2", 4", 4 1/2".
- Wellbore Geometry:** A tree view showing the selected wellbore: Wellbore Geometry > 9 5/8" Casing String > 9 5/8" Casing.
- Casing String Properties:** A detailed configuration panel for the "9 5/8" Casing String".
 - Name: 9 5/8" Casing String, Type: Conductor, Casing
 - MD Range: Top: 0 m, Bottom: 795.92 m
 - Total Length: 795.92 m, Weight: 47378.4 kg
 - Diameters: Min Drift: 8.75 in, Max OD: 10.625 in
 - 9 5/8" Casing String 9 5/8" Casing
 - Name: 9 5/8" Casing, Type: Casing
 - Fix options: Top (0 m), Length (795.92 m), Bottom (795.92 m). Adjustment options: Adjust Above, Shift Above, Adjust Below, Shift Below.
 - OD: 9.625 in, Max OD: 10.625 in, ID: 8.835 in, Drift: 8.75 in
 - Weight: Linear: 59.5266 kg/m, Total: 47378.4 kg
 - Grade: C-75, Connection Type: BTC
 - Num Jts: 61, Avg Jt Length: 13 m

At the bottom of the window, the status bar shows "Wellbore Geometry -> 9 5/8" Casing String -> 9 5/8" Casing" and "Current user : ADMIN NUM".

ОКНО МОДУЛЯ DRILLSAFE ПОСЛЕ ВВОДА ДАННЫХ ПО СКВАЖИНЕ

The screenshot displays the 'Drillsafe - Analysis 1' software window. The interface includes a menu bar (File, Edit, View, Output, Options, Window, Launch, Help) and a toolbar with various icons. The main window is titled 'Analysis 1' and contains several input fields and controls:

- Input Fields:** BHA: BHA (Horizontal) [2442.91 ft], Well Geom: Well Geometry #1 [14089 ft], Survey: Tutorial #1 [14089.3 ft].
- Mud Weight Input:** 8.345 lbm/gal.
- Torque & Drag:** Radio buttons for Torque & Drag (S) (selected) and Torque & Drag (M).
- Drilling Parameters:** Downhole WoB: 0 (1000 lbf), Downhole ToB: 0 (1000 ft.lbf), Block Weight: 0 (1000 lbf).
- Operating Mode:** Radio buttons for Rotating (selected), Sliding, and Reaming.
- Bit Depth:** 14089 ft.
- Friction Factors Table:** A table with 5 columns: Input, Bottom Depth (ft), Rotation Component, Translation Component, and Friction Factor. The first two rows have yellow cells for the Rotation Component.
- Other Controls:** ROP: 0 ft/hr, RPM: 0, and a checkbox for 'Compute Friction Factors'.

Input	Bottom Depth (ft)	Rotation Component	Translation Component	Friction Factor
1	10500.0	0.20	0.00	
2	14089.0	0.30	0.00	
3				
4				

Yellow cells are mandatory. White cells are optional.

Zeus -> A. Structure -> Slot #13 -> W-13 -> B-13 -> Plan -> Tutorial #1

Current user : Kdixon2

NUM

ВВОД ДАННЫХ В МОДУЛЬ DRILLSAFE ПРИ РАБОТЕ В РЕЖИМЕ SINGLE POINT

Drillsafe - Drillsafe Inputs

File Edit View Output Options Window Launch Help

English

Drillsafe Inputs

BHA: BHA (Horizontal) 2442.91 ft

Well Geom: Well Geometry #1 14089 ft

Survey: Tutorial #1 14089.3 ft

Mud Weight Input: 10 lbm/gal

Torque & Drag | BHA Tendency | Bit Side Forces | FF Calibration | Sag & BHA Mag

Torque & Drag (S)
 Torque & Drag (M)

Drilling Parameters

Downhole WoB: 0 1000 lbf
Downhole ToB: 2 1000 ft.lbf
Block Weight: 70 1000 lbf

Operating Mode

Rotating Sliding Reaming

Input	Bottom Depth (ft)	Rotation Component	Translation Component	Friction Factor
1	10500.0	0.20	0.00	
2	14089.0	0.30	0.00	
3				
4				

Bit Depth: 14089 ft

ROP: 0 ft/hr
RPM: 0

Compute Friction Factors

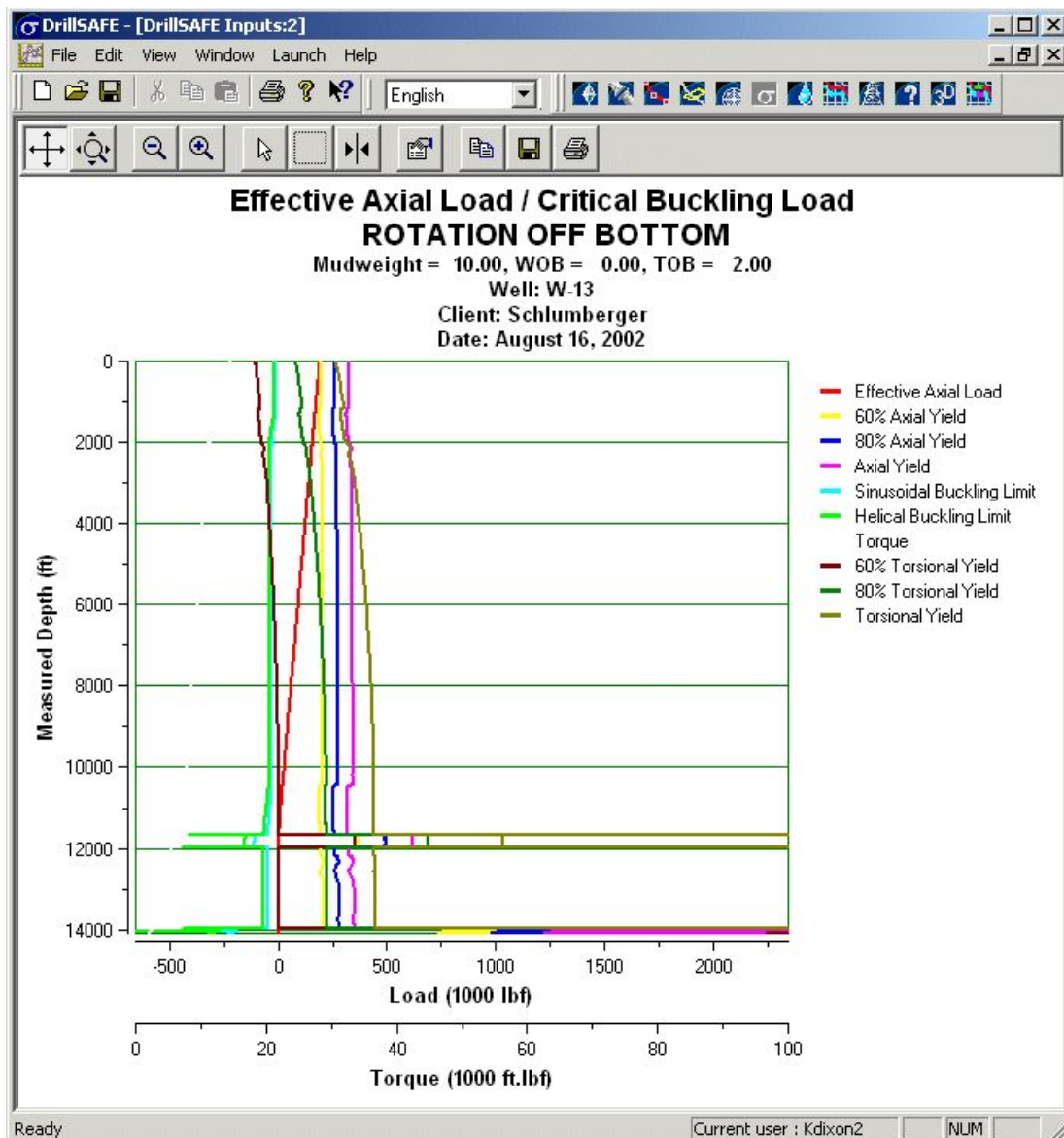
Ready Current user : kdixon2

РЕЗУЛЬТАТЫ РАСЧЕТОВ МОДУЛЕМ DRILLSAFE ПРИ РАБОТЕ В РЕЖИМЕ SINGLE POINT

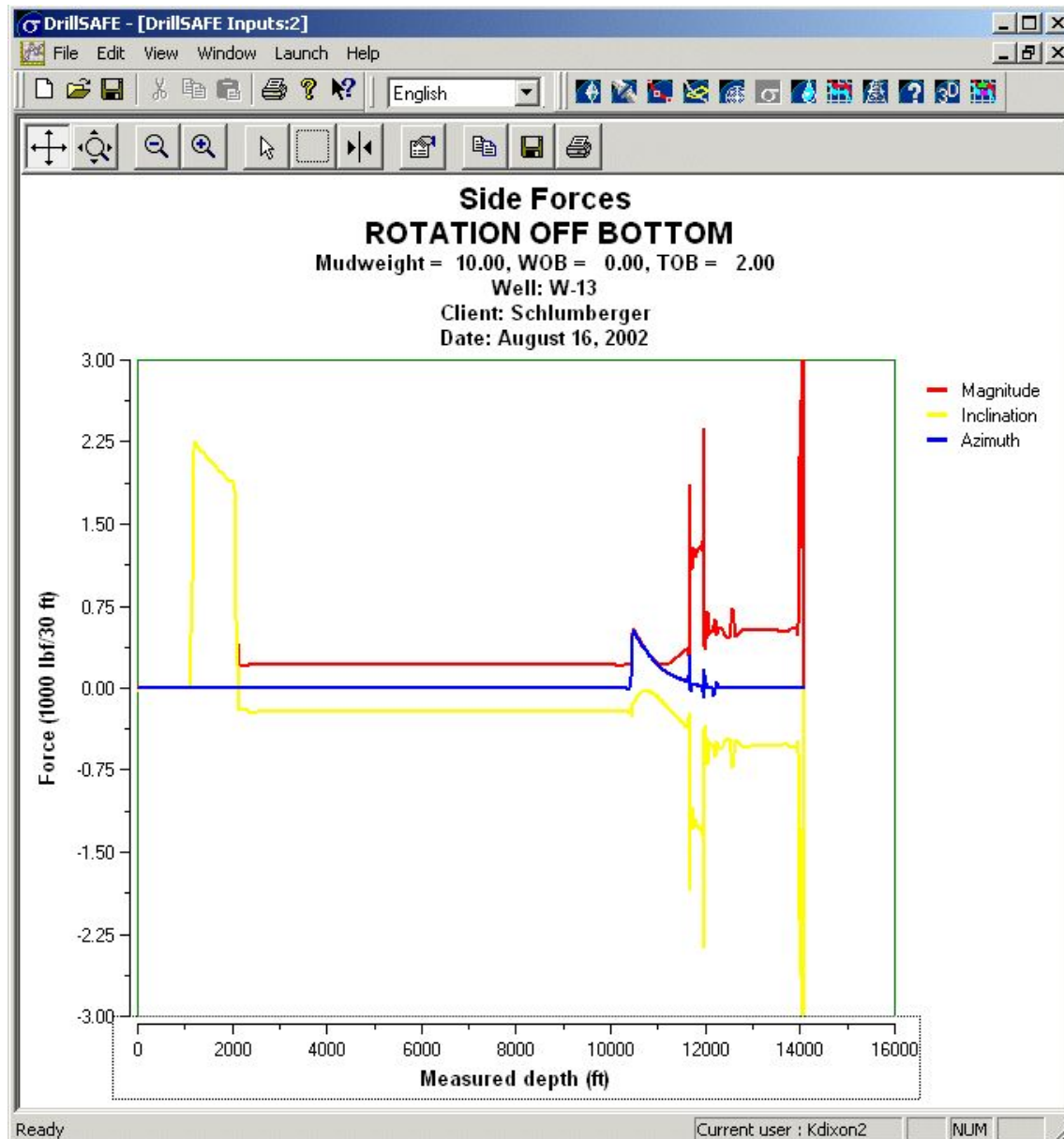
Running Single Point Torque and Drag Analysis...Done

Surface Torque = 14.5 1000 ft.lbf Hook Load = 262.8 1000 lbf

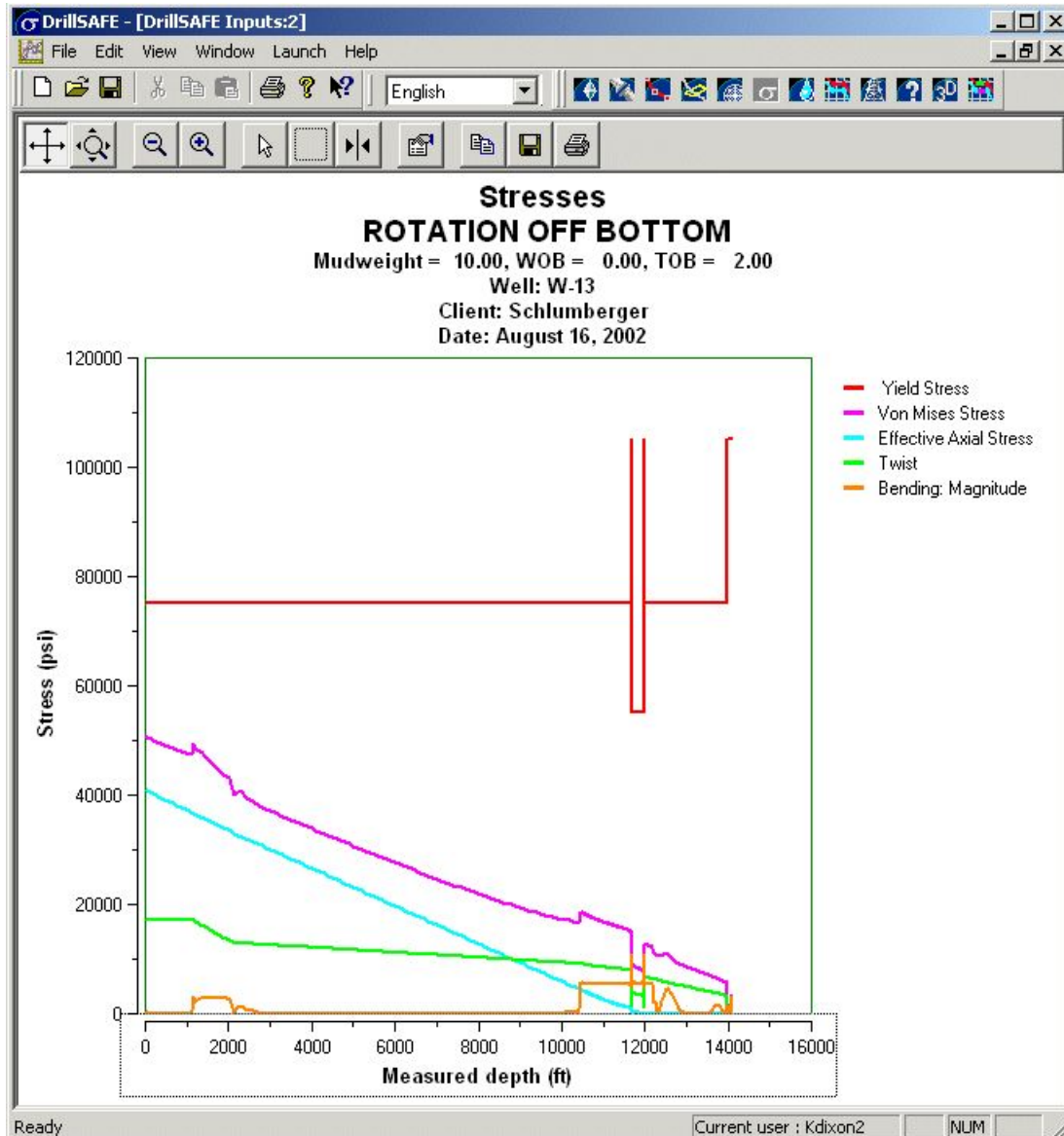
РЕЗУЛЬТАТЫ АНАЛИЗА ОСЕВЫХ УСИЛИЙ ПРИ ВРАЩЕНИИ НАД ЗАБОЕМ



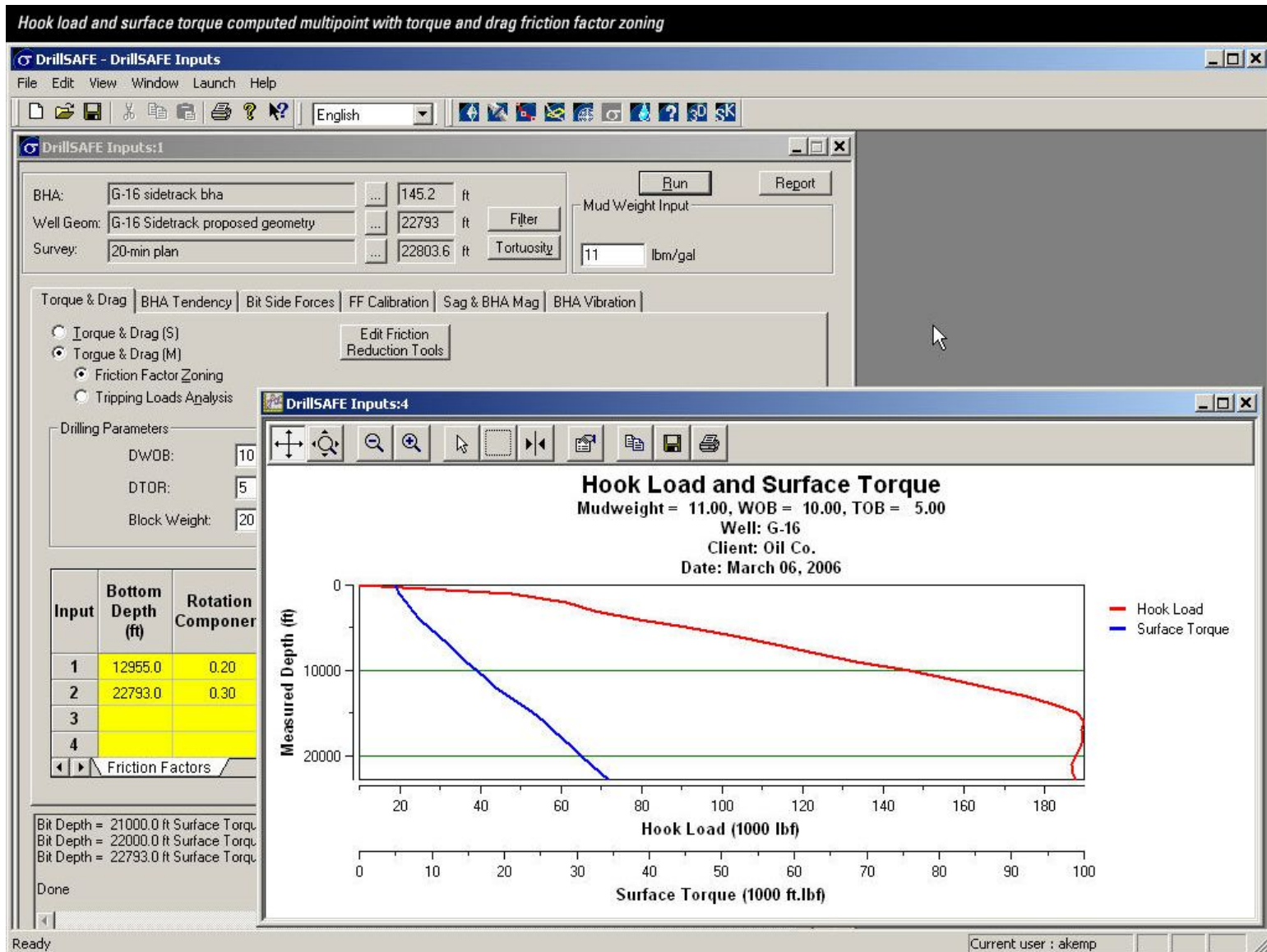
РЕЗУЛЬТАТЫ АНАЛИЗА ПРИЖИМАЮЩИХ УСИЛИЙ ПРИ ВРАЩЕНИИ НАД ЗАБОЕМ



РЕЗУЛЬТАТЫ АНАЛИЗА НАПРЯЖЕНИЙ ПРИ ВРАЩЕНИИ НАД ЗАБОЕМ



РЕЗУЛЬТАТЫ РАСЧЕТА НАГРУЗКИ НА КРЮКЕ И МОМЕНТА НА РОТОРЕ



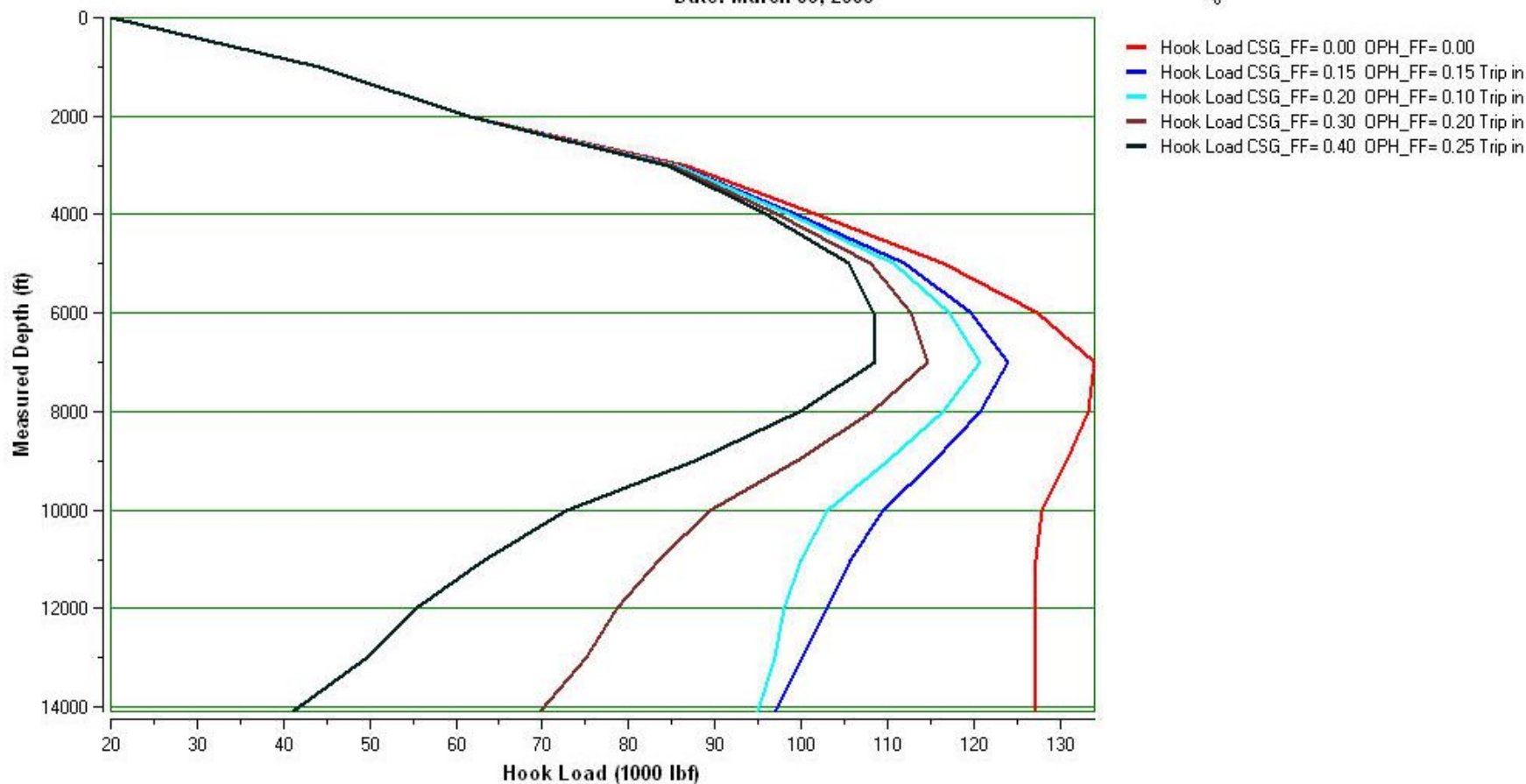
РЕЗУЛЬТАТЫ РАСЧЕТА НАГРУЗКИ НА КРЮКЕ ПРИ ПОДЪЕМЕ

Tripping in hook loads analysis for deviated well for spread of torque and drag friction factors.



TRIPPING LOADS ANALYSIS

Mudweight = 11.00
Well: New Well
Client:
Date: March 06, 2006



РЕЗУЛЬТАТЫ АНАЛИЗА РАБОТЫ КНБК

DrillSAFE Inputs

BHA: BHA (Horizontal) ... 2442.91 ft

Run Report

Mud Weight Input

10 lbm/gal

Torque & Drag | BHA Tendency | Bit Side Forces | FF Calibration | Sag & BHA Mag

Well Parameters

Formation Stiffness: 0.5 Bit Inclination: 90 deg

Diam Enlarg: 0 in

Drilling Parameters

Downhole WoB: 10 1000 lbf

Tool Face: 0 deg

Sensitivity Analysis

Single Point

Multi-Point

Rotary Build Rate = 0.214 deg/100 ft
DLS in sliding = 12.071 deg/100 ft
Effective Toolface in sliding = 0.000 deg
Build rate in sliding = 12.071 deg/100 ft
Turn rate in sliding = 0.000 deg/100 ft

УСТАНОВКА ОПЦИЙ АНАЛИЗА КРИТИЧЕСКИХ ЧАСТОТ ВРАЩЕНИЯ

Torque & Drag | BHA Tendency | Bit Side Forces | FF Calibration | Sag & BHA Mag | BHA Vibration

Forced Vibration Analysis Free Vibration Analysis

Set / Review Boundary Conditions

Operating Mode
 Rotating Sliding

Position Plots
Critical RPM Plots

Bit Depth: ft BHA Length: ft

Static Bit Forces
Downhole WOB: 1000 lbf

Excitation Sources

Bit Forces Bit Displacements

Excitation Factor:

Manual Input Calculate

Bit Efficiency Coefficient:

Bit Axial Force: 1000 lbf

Bit Bending Moment: 1000 ft.lbf

Bit Torque: 1000 ft.lbf

Bit Bounce

Axial Displacement: ft

Excitation Factor:

Bit Whirl

Hole Enlargement: in

Excitation Factor:

Other Sources

Excitation Frequency / RPM Range

Frequency Input RPM Input

Frequency BHA RPM

Min: Max: Hz Min: Max:

Number of Calculation Intervals:

Excitation Factor:

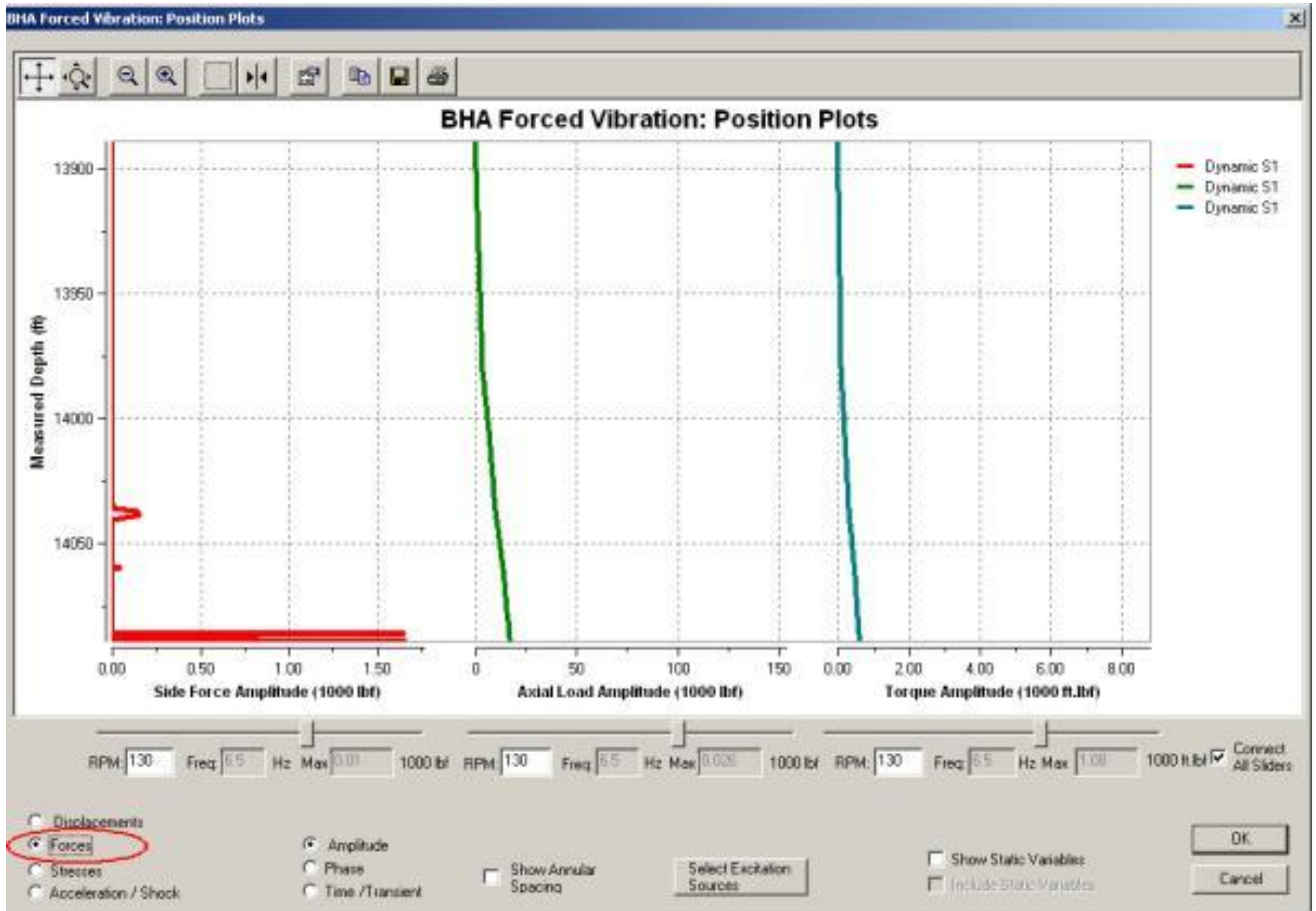
Dynamic Damping

Manual Input Use Default Value

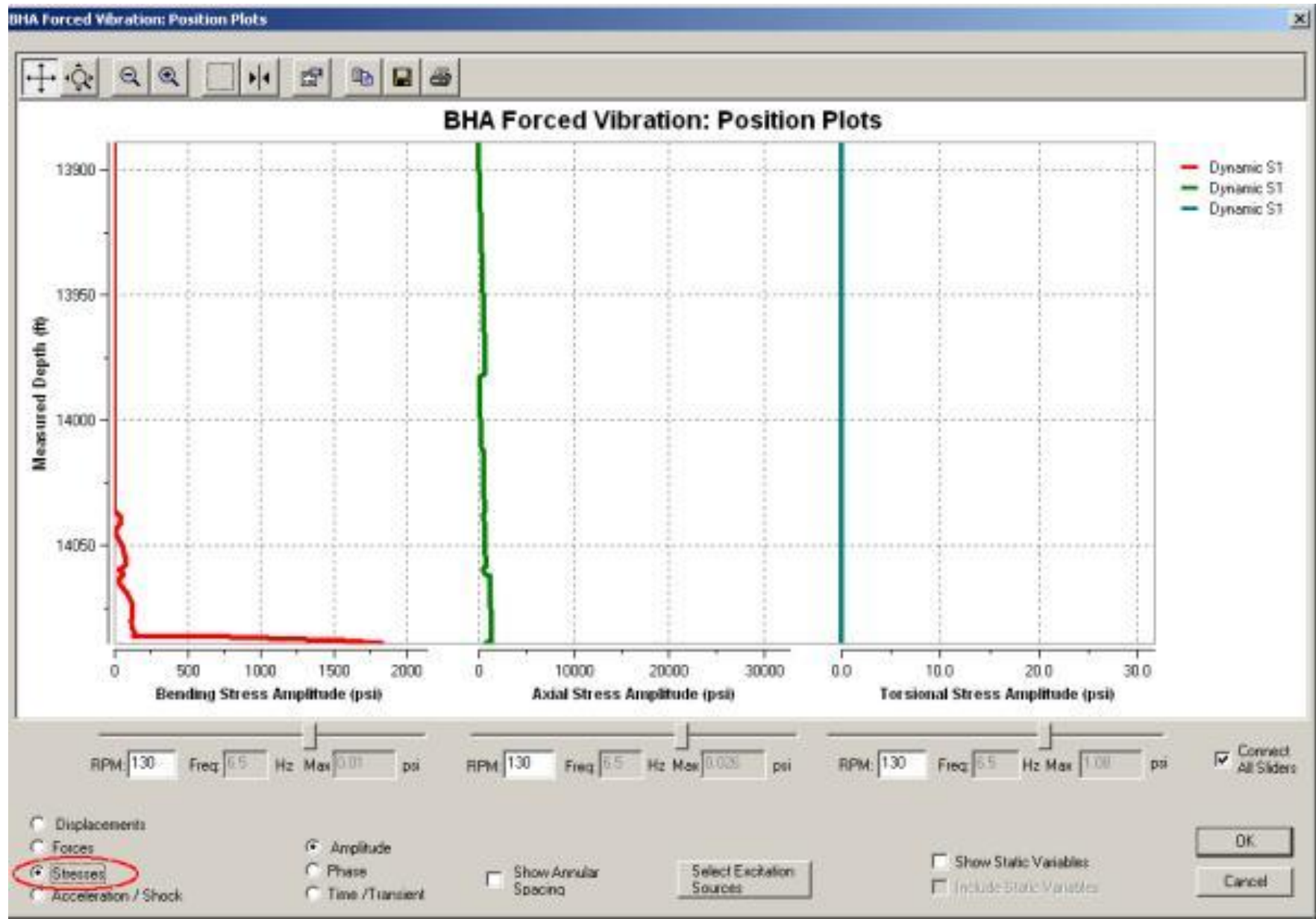
Oil Based Mud Water Based Mud

Viscous Damping Coefficient:

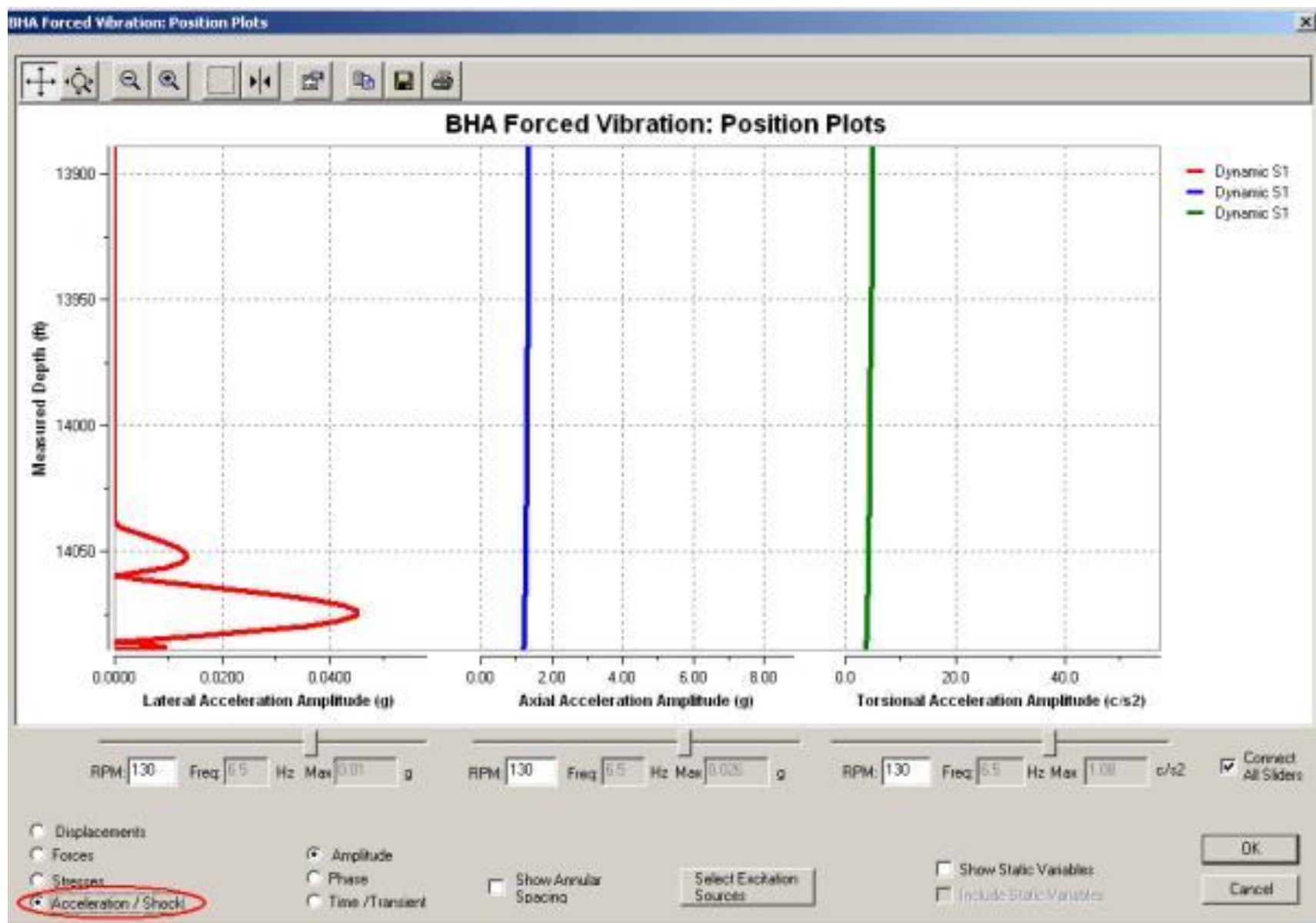
РЕЗУЛЬТАТЫ АНАЛИЗА УСИЛИЙ ПРИ КРИТИЧЕСКОЙ ЧАСТОТЕ



РЕЗУЛЬТАТЫ АНАЛИЗА НАПРЯЖЕНИЙ ПРИ КРИТИЧЕСКОЙ ЧАСТОТЕ



РЕЗУЛЬТАТЫ АНАЛИЗА УСКОРЕНИЙ ПРИ КРИТИЧЕСКОЙ ЧАСТОТЕ



РЕЗУЛЬТАТЫ АНАЛИЗА КРИТИЧЕСКИХ ЧАСТОТ ВРАЩЕНИЯ

