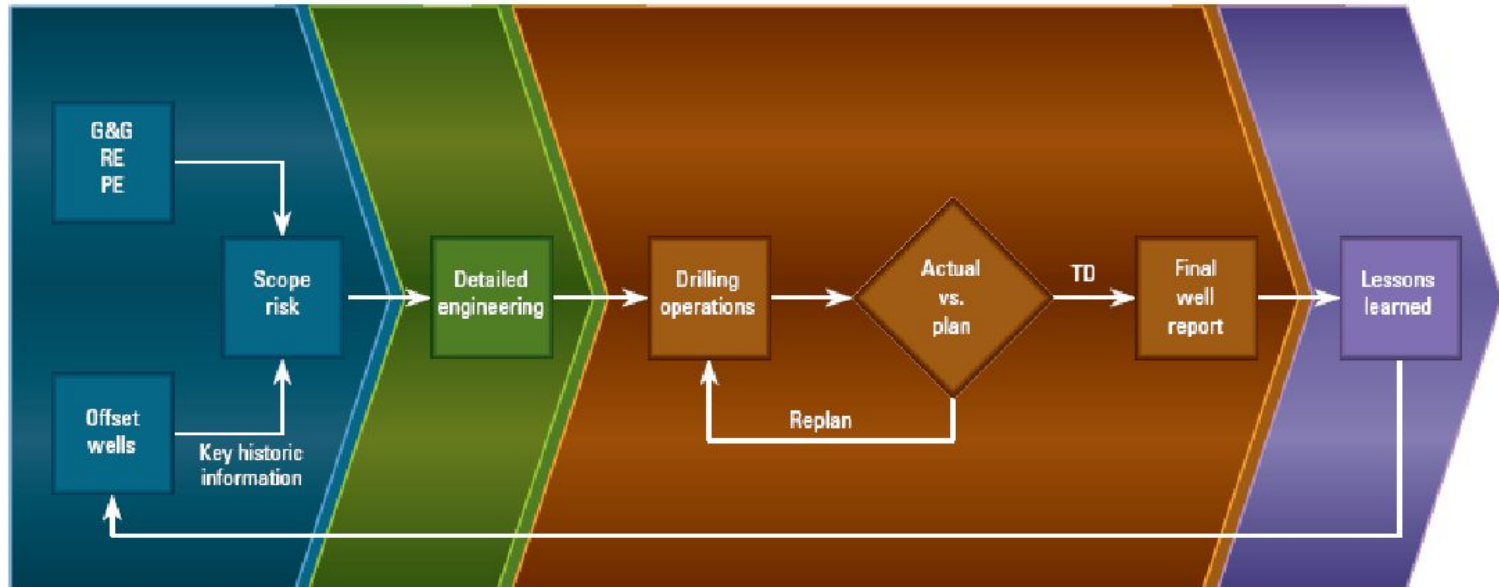


# СТРУКТУРА ПРОЕКТИРОВАНИЯ БУРЕНИЯ СКВАЖИН

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

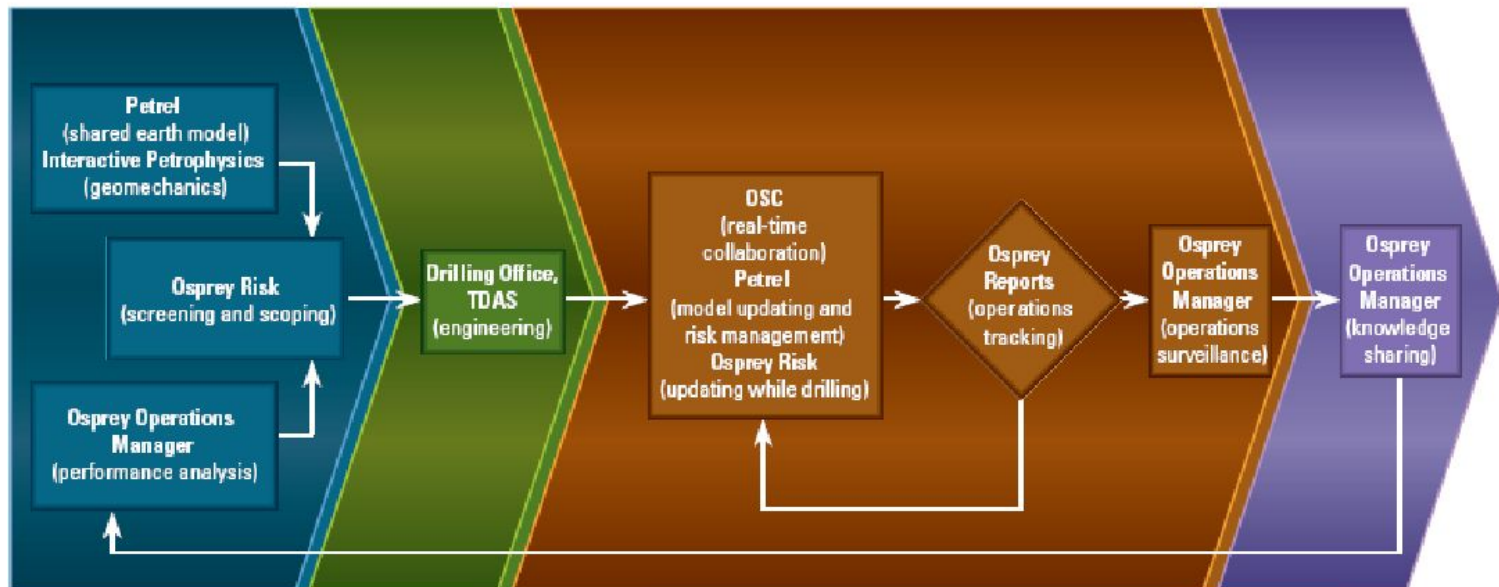


Shared Earth Model

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

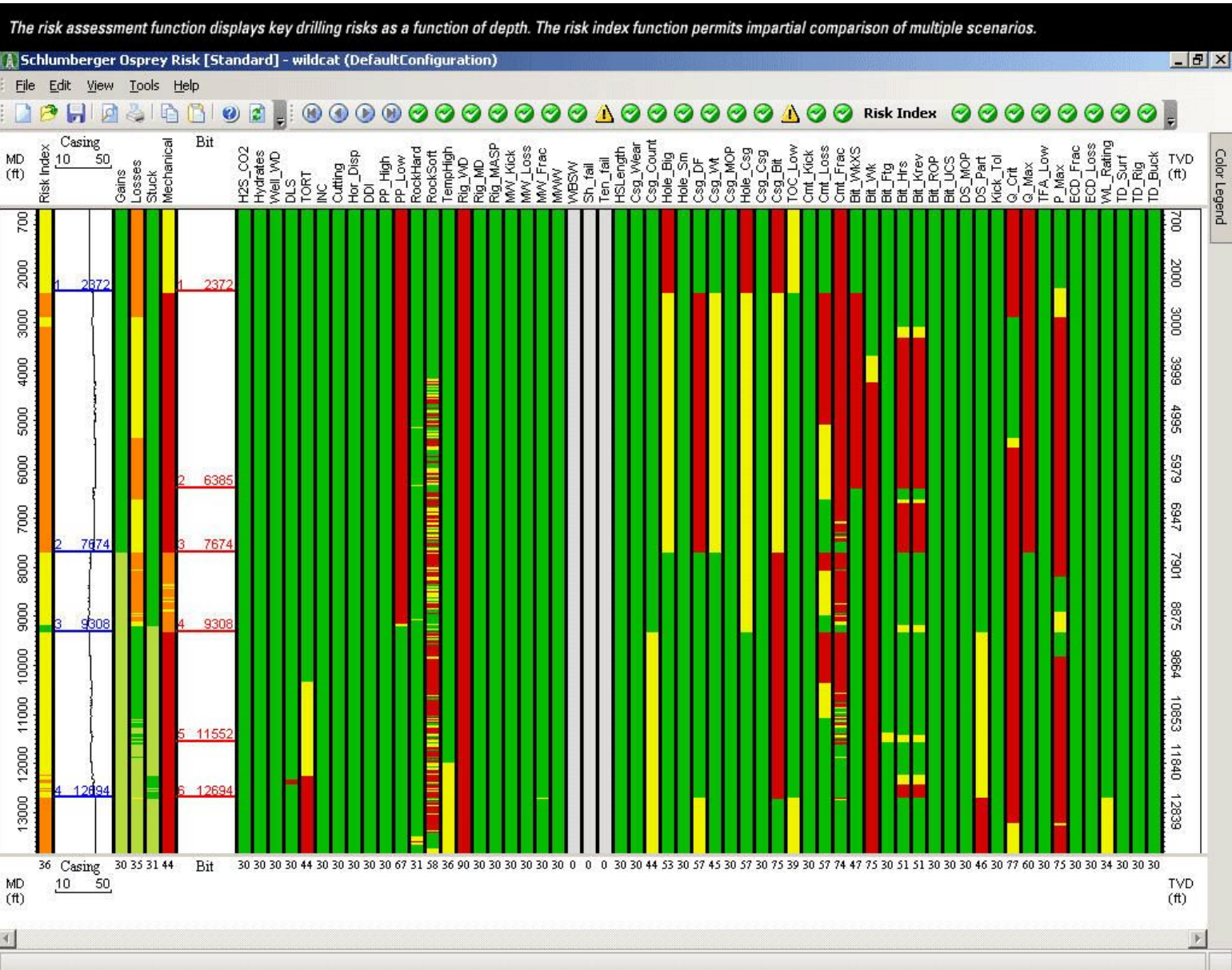
3, Intermediate, 13 3/8, 11.907 in, 0.0 ft, 9308.2 ft

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

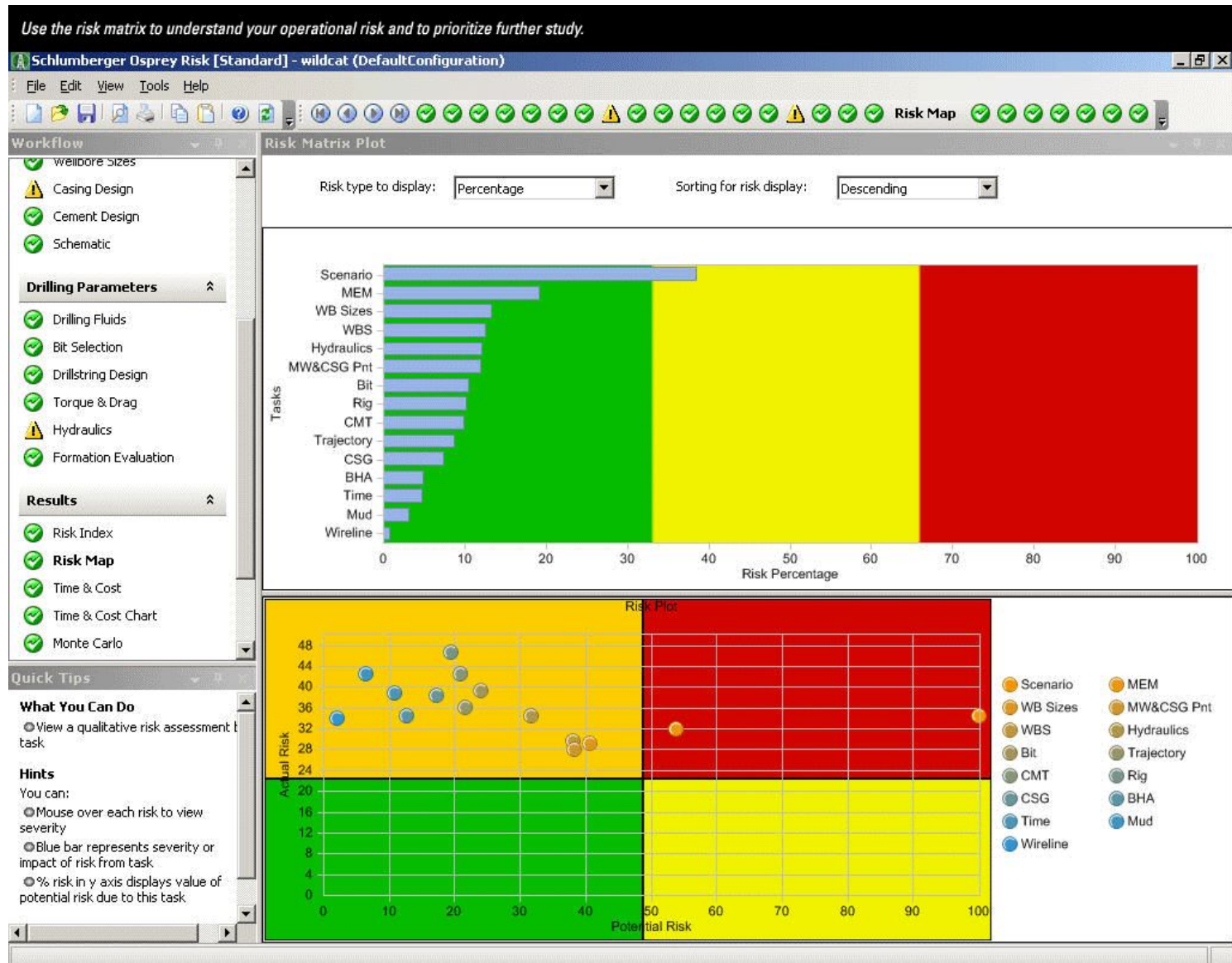
5, Production Liner, 6 5/8, 5.675 in, 12394.0 ft, 1832.2 ft

MD BHA CLSM 0FC18 1R0P01 0 0644 0P 0581 9V  
ft 3684 0 FG18 496001 0Q 2344 0 B319 ft  
0 PP18 1R0P42 0Q 0644  
0 MM18 0Q 0644

# РЕЗУЛЬТАТЫ РАСЧЕТА ИНДЕКСА РИСКА В ПРОГРАММЕ OSPRAY RISK

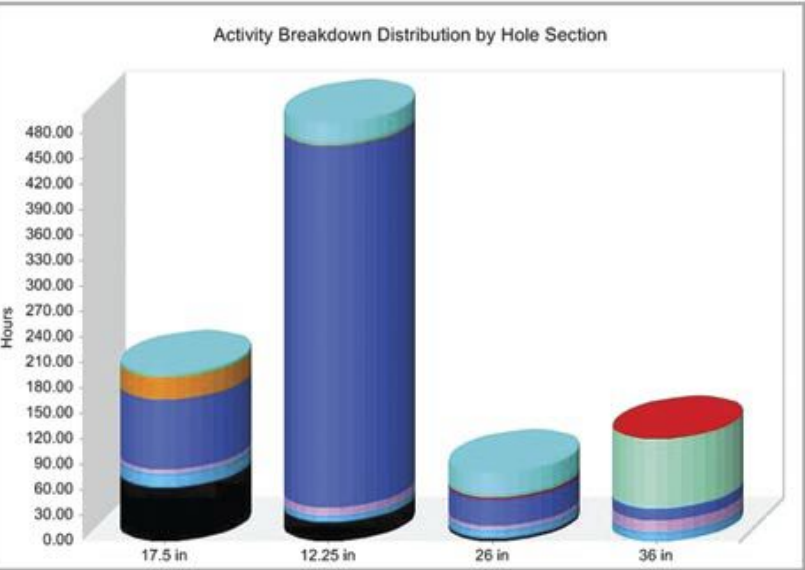
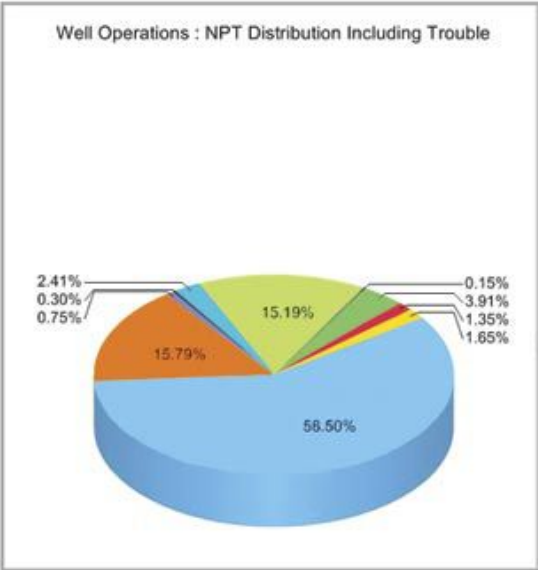
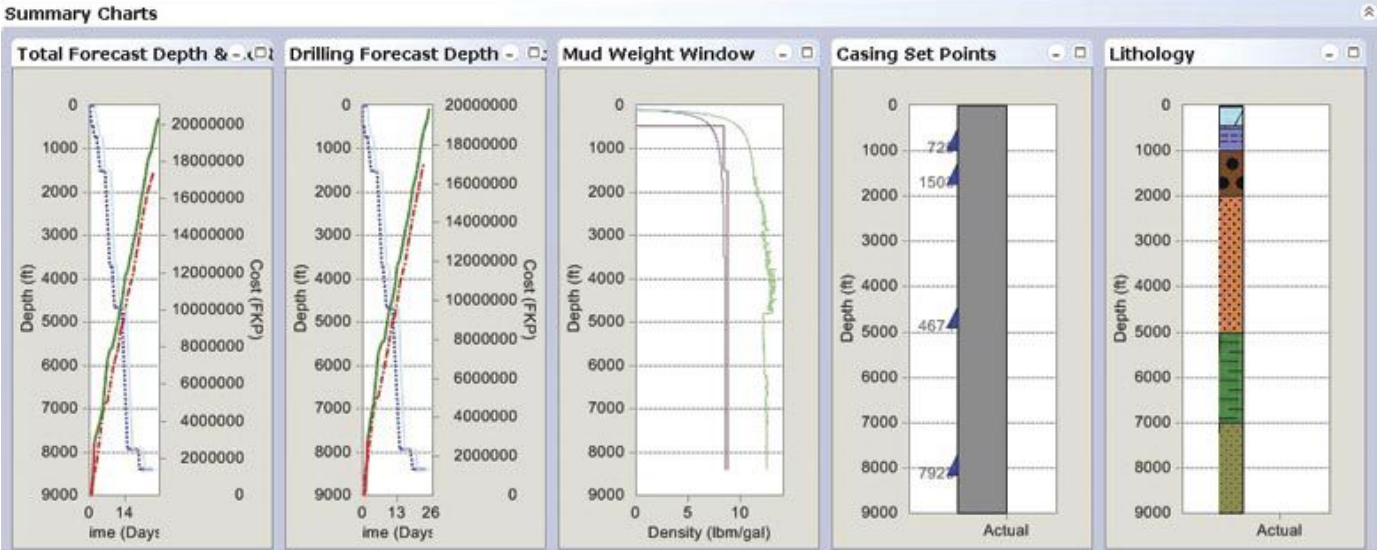


# КАРТА РИСКОВ, СПРОГНОЗИРОВАННАЯ В ПРОГРАММЕ OSPRAY RISK



# 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

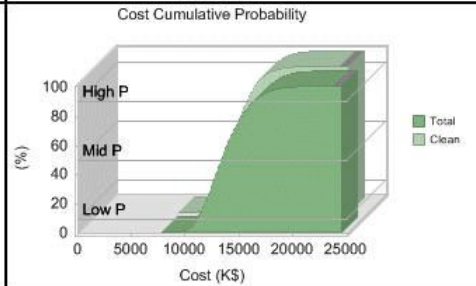
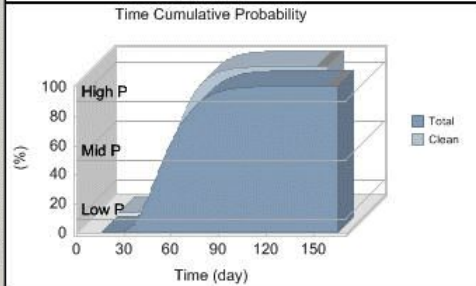
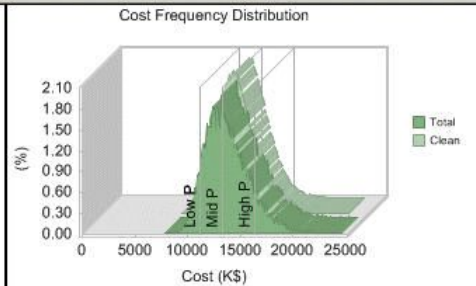
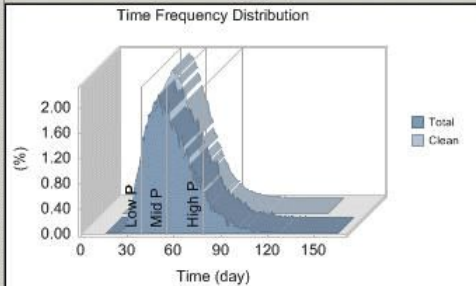
Number Of Iterations: 12000    Low P% Time: 10    Mid P% Time: 50    High P% Time: 90     Show Clean   

Monte Carlo Detailed Grid

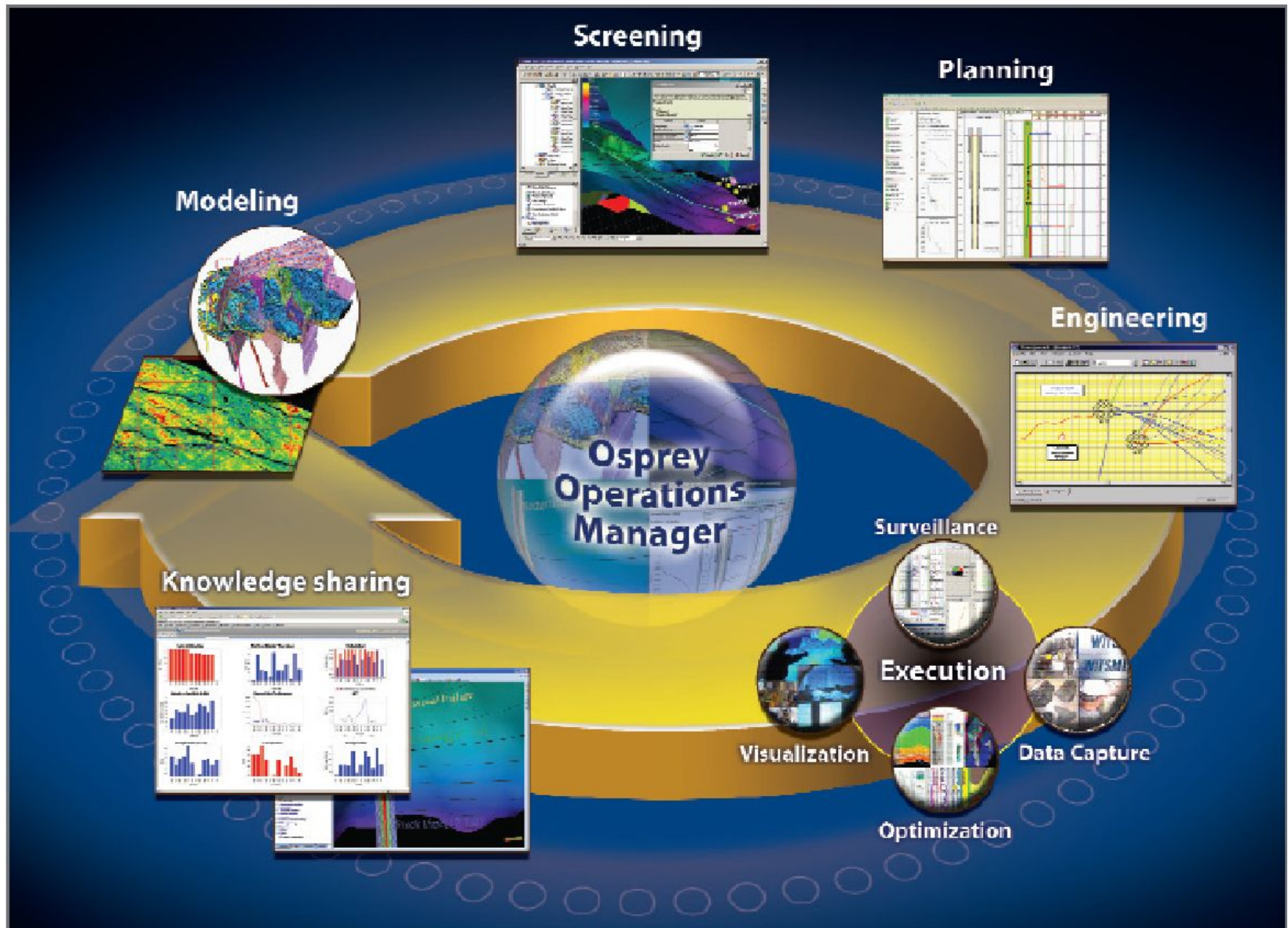
	Task Name	Low P% Time
		h
1	Total	861.11
2	Mobilize Rig Job	35.81
3	Tow Rig	18.19
4	Inspect Area	0.76
5	Safety Meeting	0.33
6	Position Rig	3.03
7	Extend Leg	5.26
8	Jack Up Rig	5.26
9	Skid Drilling Tower	0.76
10	Pick Up And Make Up Tub	2.23
11	Drill Wellbore Job	766.19
12	Surface	140.01
13	Drill Surface	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

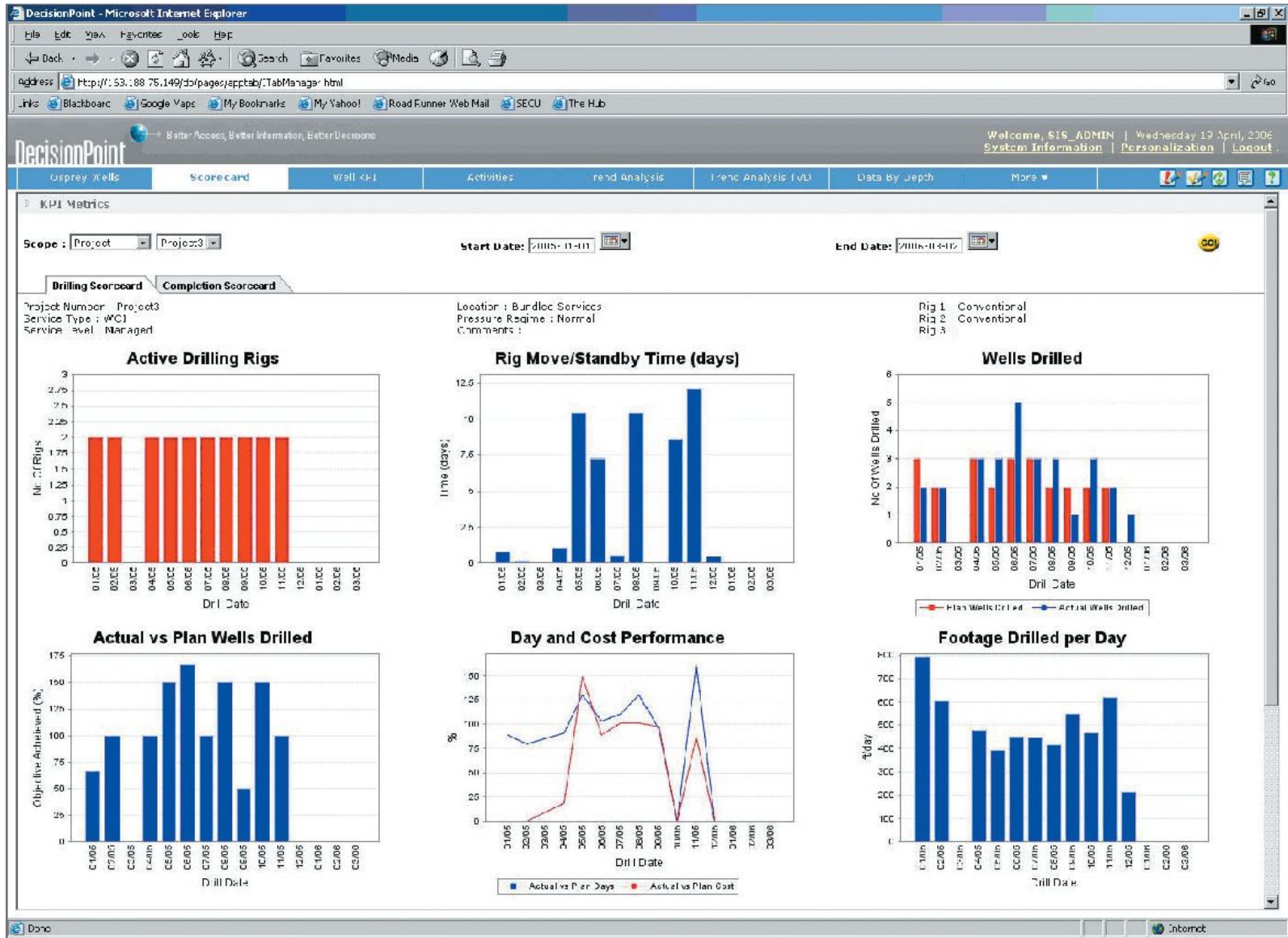
	Task Name	Low P% Time	Mid P% Time	High P% Time	Low P% Cost	Mid P% Cost	High P% Cost
		day	day	day	K\$	K\$	K\$
1	Total	38.78	54.69	78.67	11,076	13,253	16,483
2	Mobilize Rig Job	1.68	2.39	3.51	151	215	316
3	Drill Wellbore Job	34.33	48.34	69.36	10,506	12,508	15,466
4	Well Completion Job	0.55	0.79	1.16	219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



# ДИНАМИЧЕСКОЕ УПРАВЛЕНИЕ БУРЕНИЕМ СКВАЖИНЫ НА БАЗЕ OSPREY OPERATIONS MANAGER

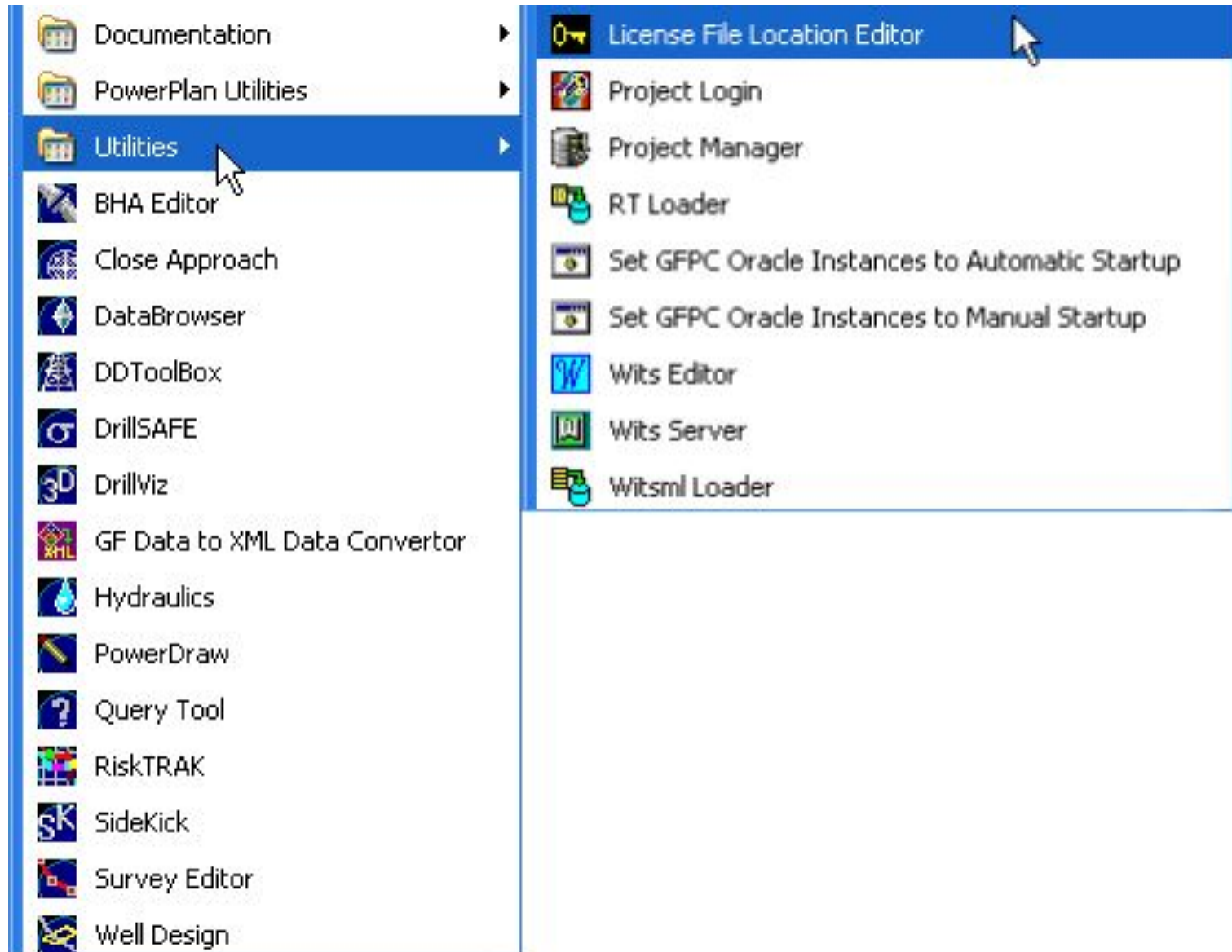


# ДАННЫЕ, ОТСЛЕЖИВАЕМЫЕ OSPRAY OPERATIONS MANAGER

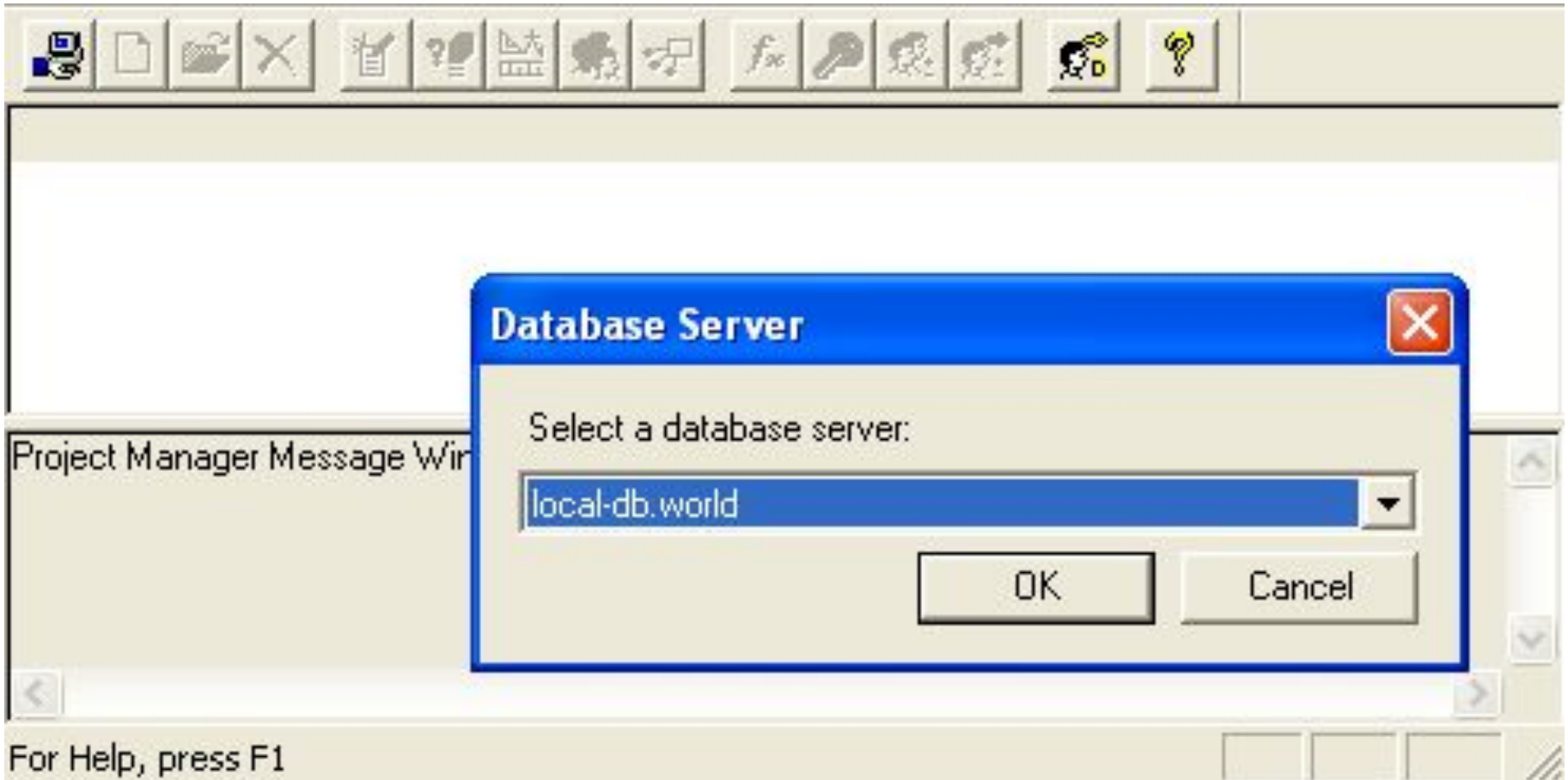




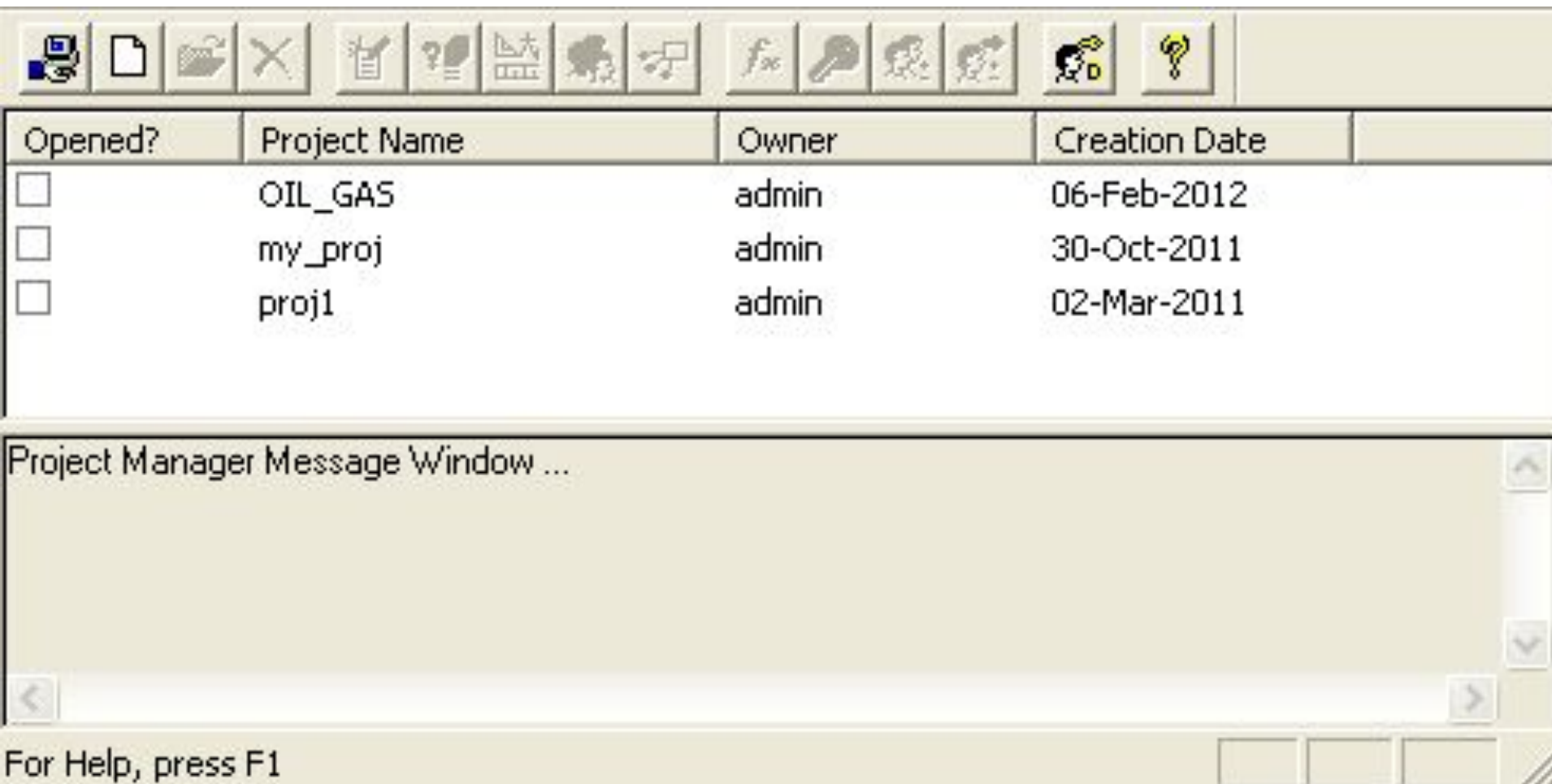
# СТРУКТУРА ИНЖЕНЕРНОГО ПАКЕТА DRILLING OFFICE



# 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 data:

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		

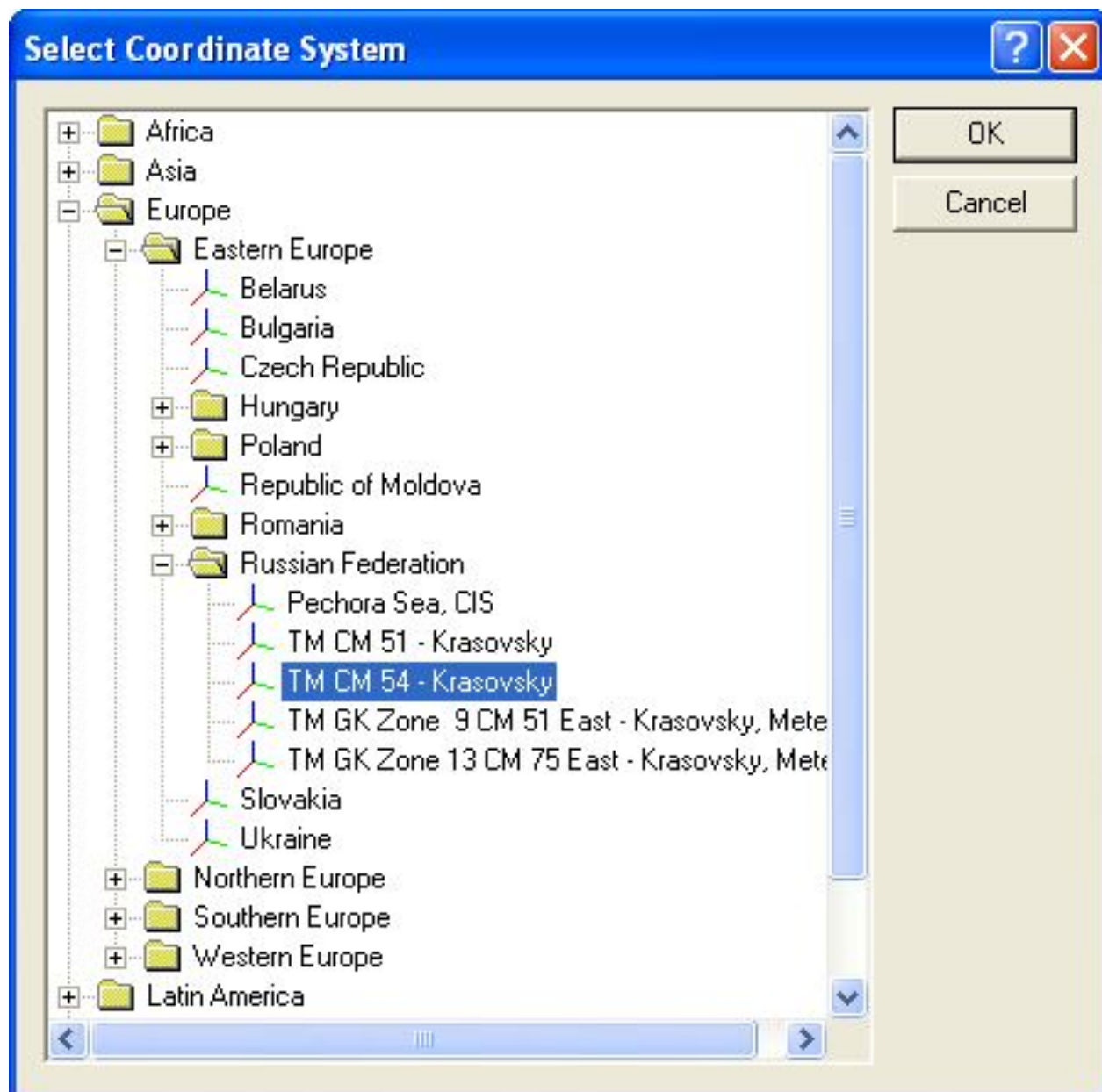
Below the table, there is a text area with the following content:

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

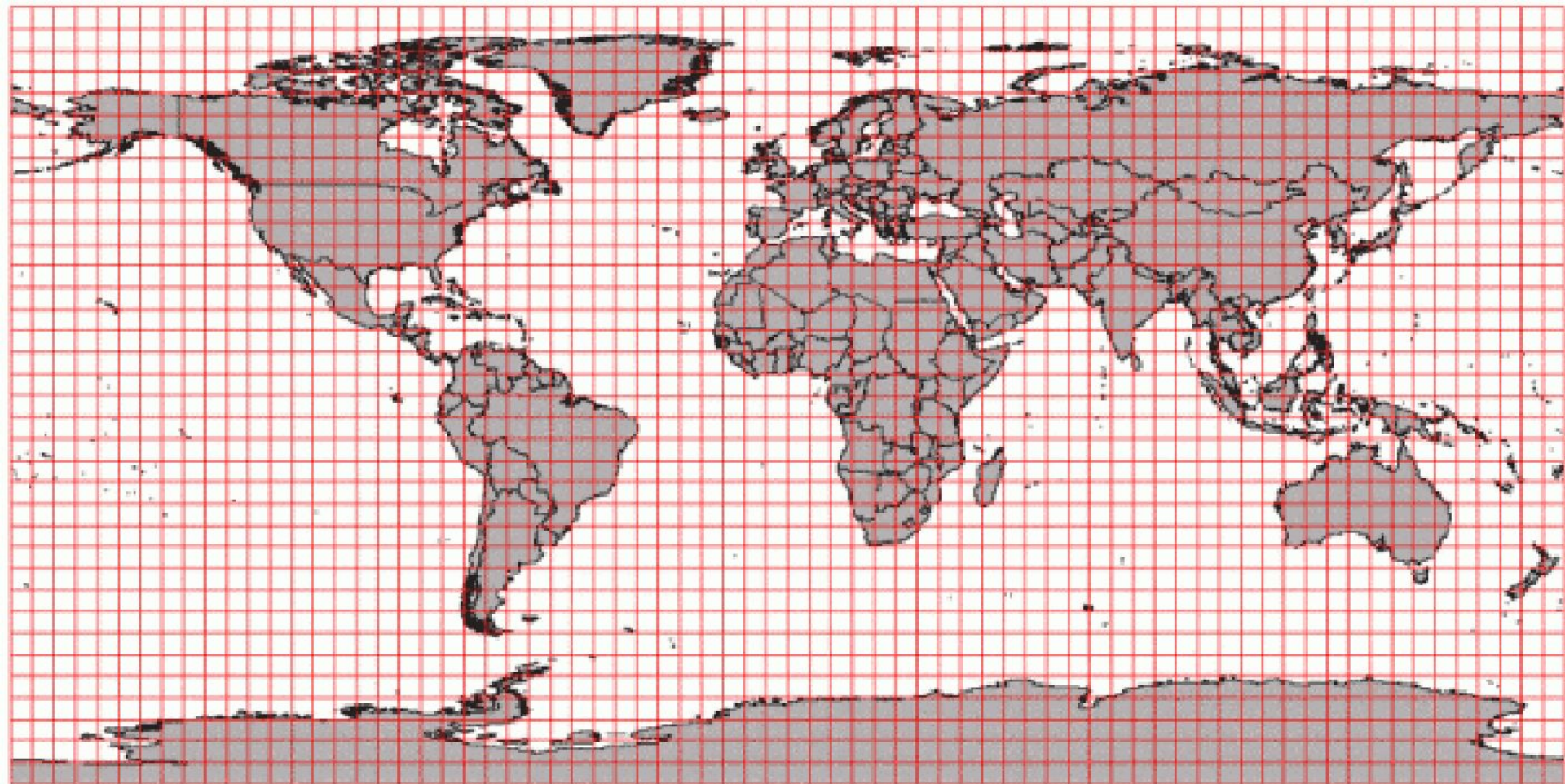
Overlaid on the bottom right of the Project Manager window is a dialog box titled 'Project Coordinate Systems'. The dialog box has two input fields: 'Display' and 'Storage', each followed by a browse button (three dots). At the bottom of the dialog box are 'OK' and 'Cancel' buttons.

At the bottom left of the Project Manager window, there is a status bar that says 'For Help, press F1'. At the bottom right, there is a 'CAP' label.

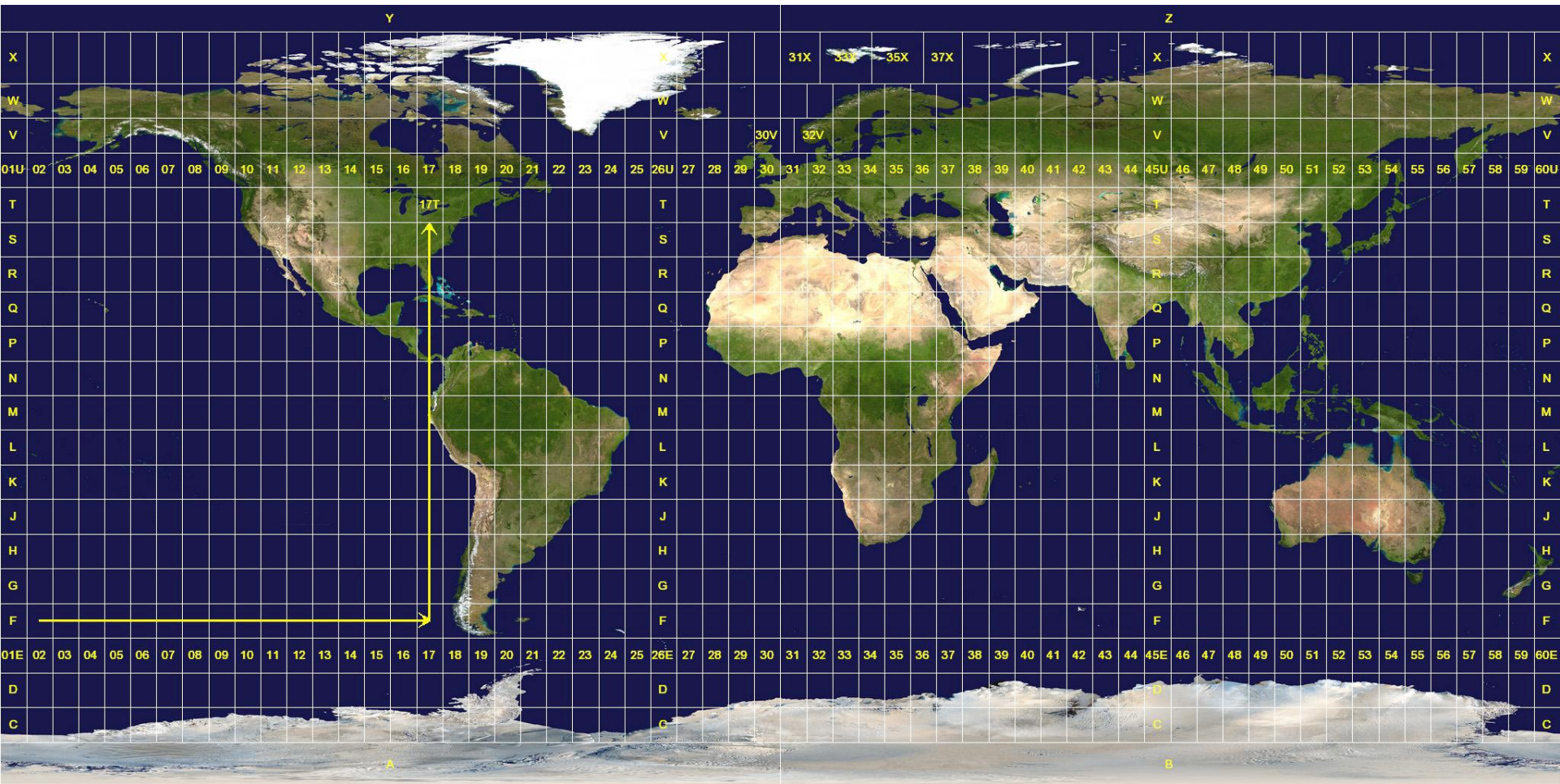
# PROJECT MANAGER – ЗАДАНИЕ СИСТЕМЫ КООРДИНАТ ДЛЯ НОВОГО ПРОЕКТА



# PROJECT MANAGER – ЗАДАНИЕ СИСТЕМЫ КООРДИНАТ ДЛЯ НОВОГО ПРОЕКТА

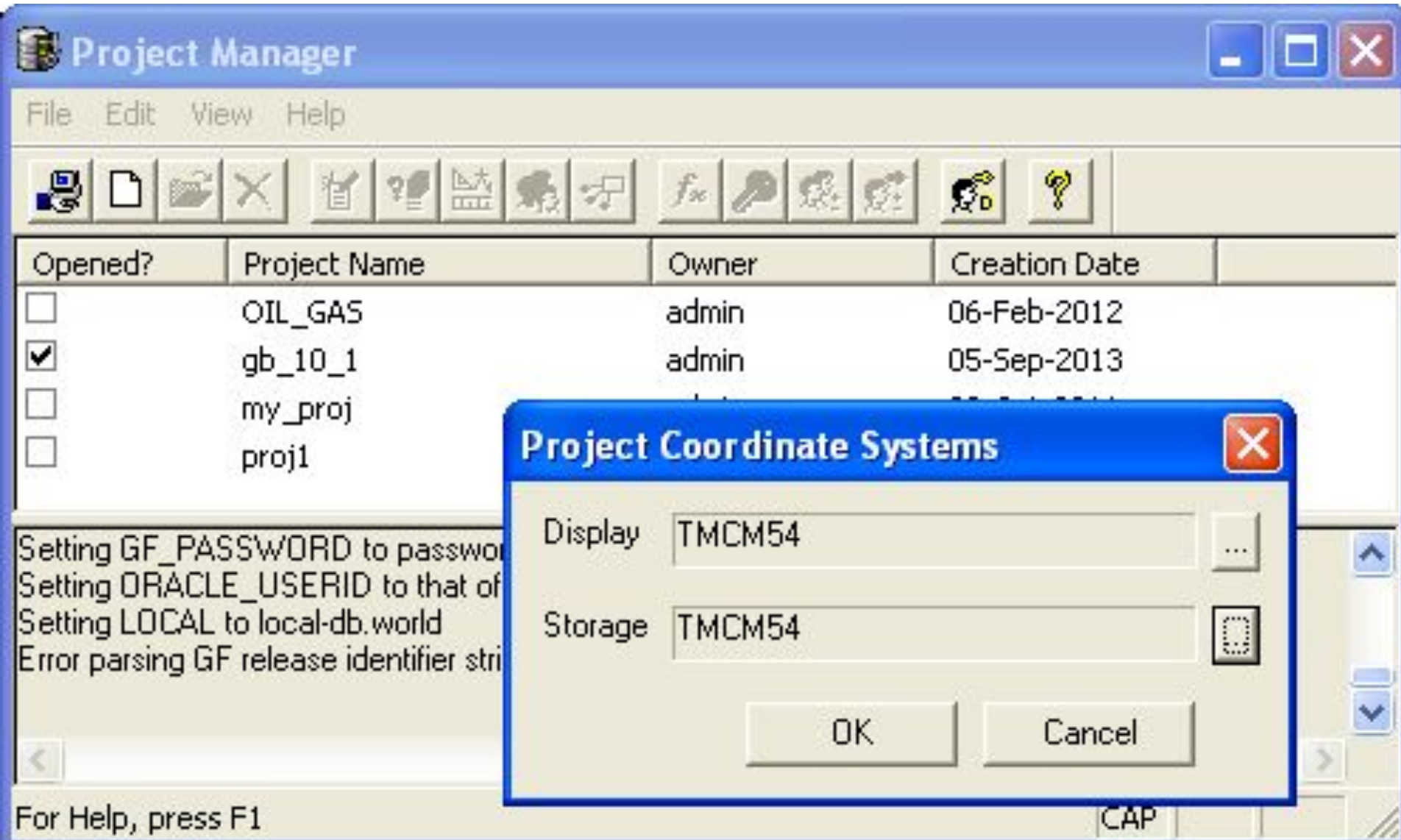


# PROJECT MANAGER – СИСТЕМА КООРДИНАТ UTM





# PROJECT MANAGER – ЗАДАНИЕ СИСТЕМЫ КООРДИНАТ ДЛЯ НОВОГО ПРОЕКТА



The screenshot shows 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 open in the foreground, showing input fields for 'Display' and 'Storage', both set to 'TMCM54'. The dialog has 'OK' and 'Cancel' buttons. The background window shows a status bar with the text 'For Help, press F1' and 'CAP'.

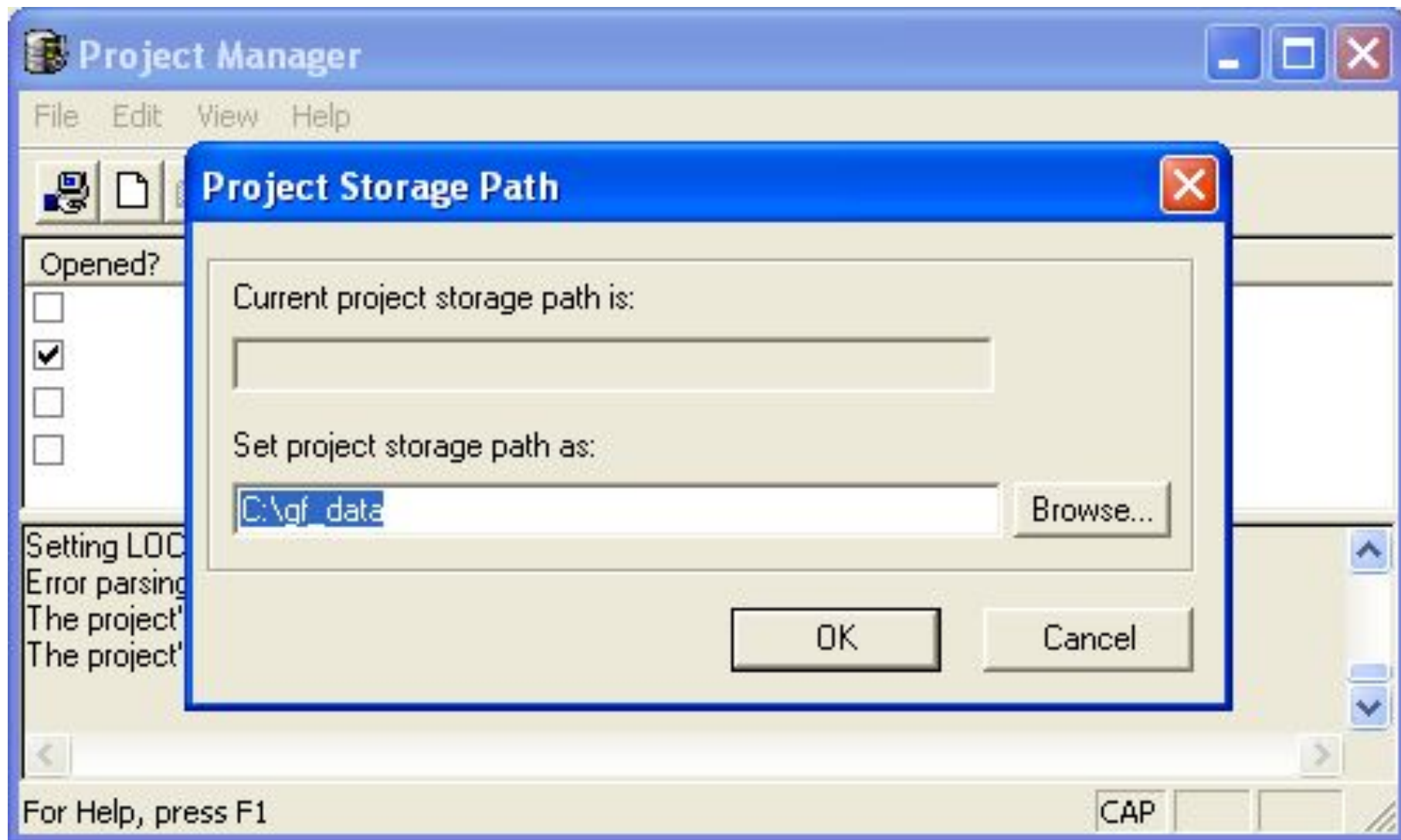
Opened?	Project Name	Owner	Creation Date
<input type="checkbox"/>	OIL_GAS	admin	06-Feb-2012
<input checked="" type="checkbox"/>	gb_10_1	admin	05-Sep-2013
<input type="checkbox"/>	my_proj		
<input type="checkbox"/>	proj1		

Setting GF\_PASSWORD to password  
Setting ORACLE\_USERID to that of  
Setting LOCAL to local-db.world  
Error parsing GF release identifier stri

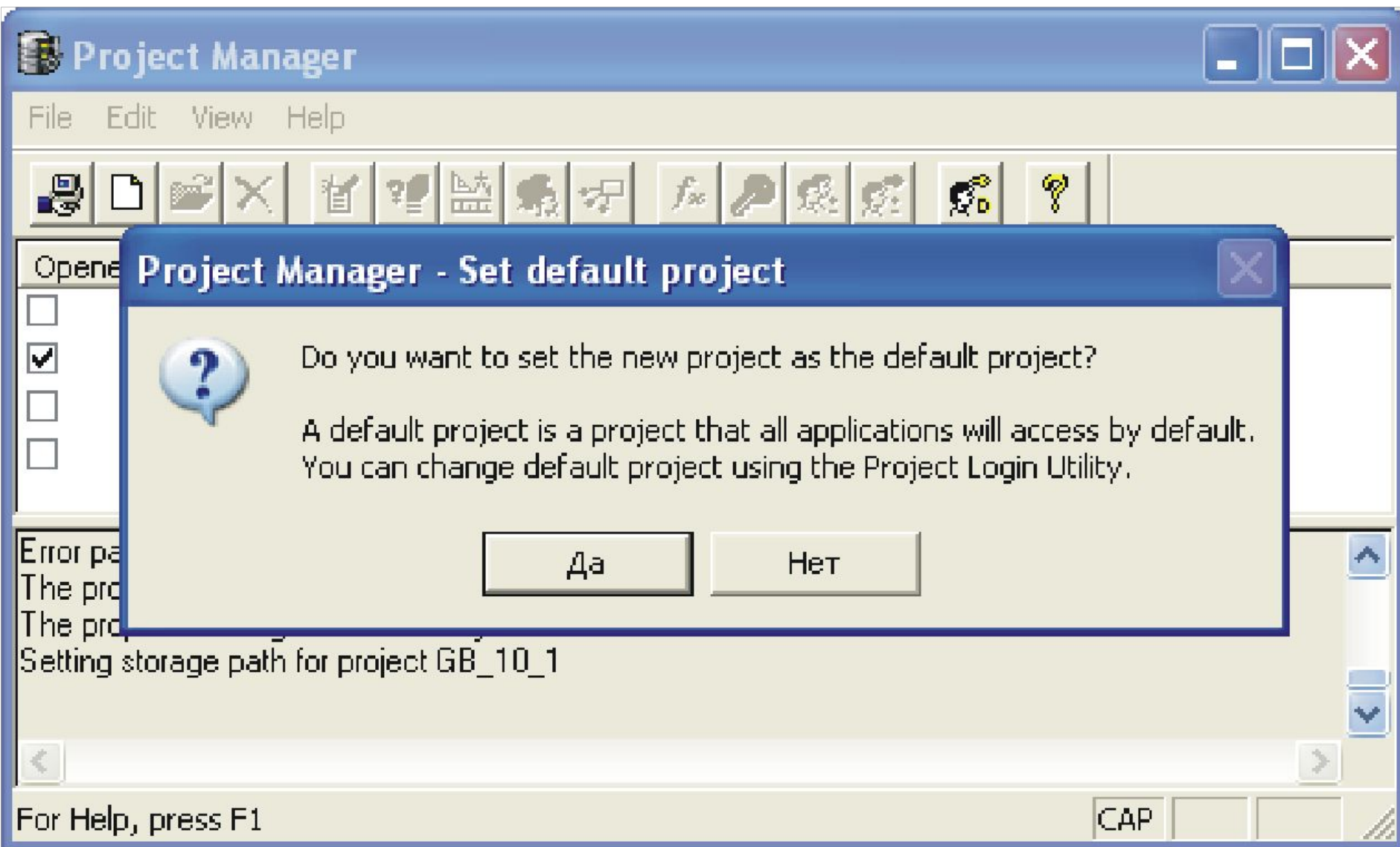
For Help, press F1

CAP

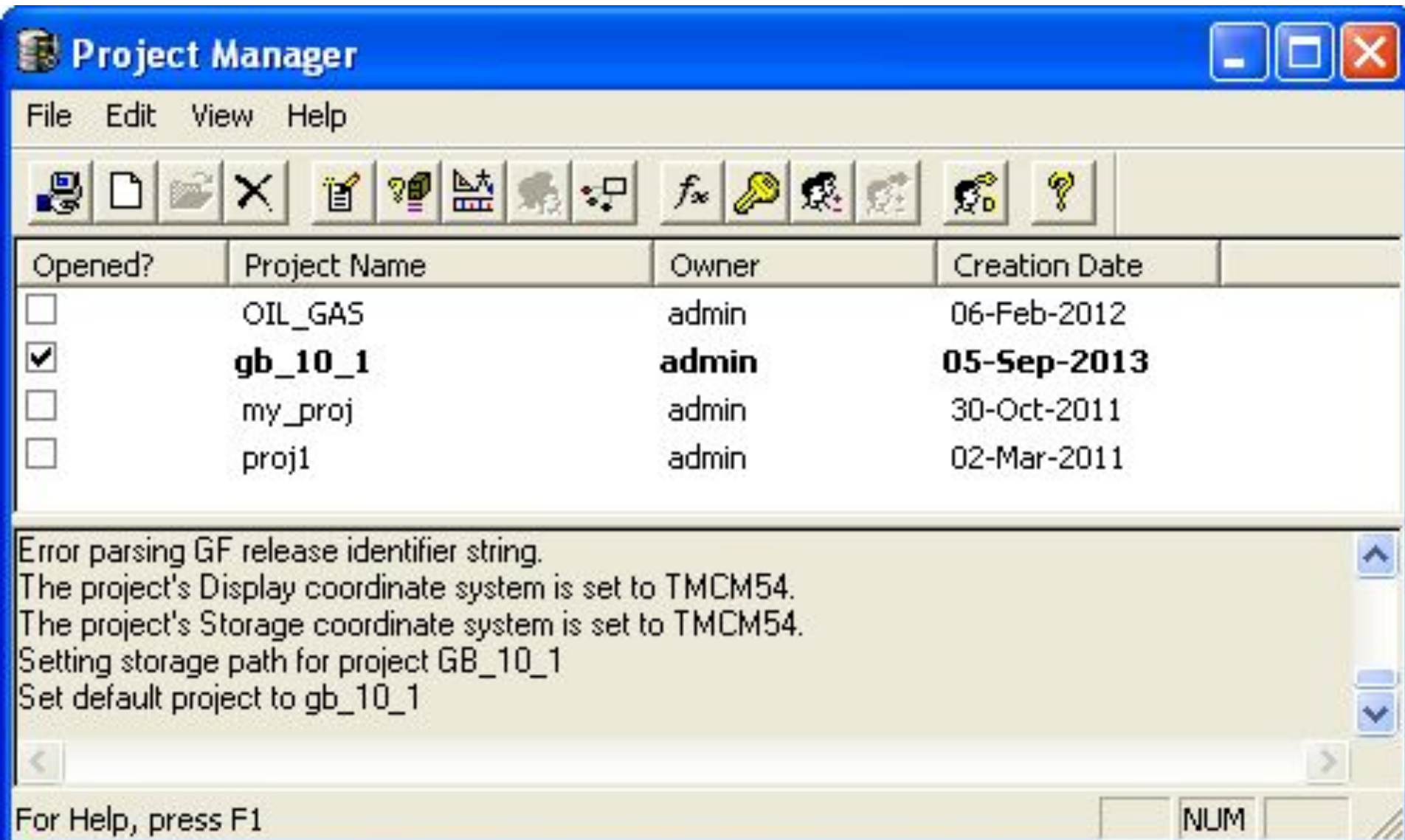
# PROJECT MANAGER – ЗАДАНИЕ КАТАЛОГА ХРАНЕНИЯ ДАННЫХ ДЛЯ НОВОГО ПРОЕКТА



# 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"/>	<b>gb_10_1</b>	<b>admin</b>	<b>05-Sep-2013</b>
<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

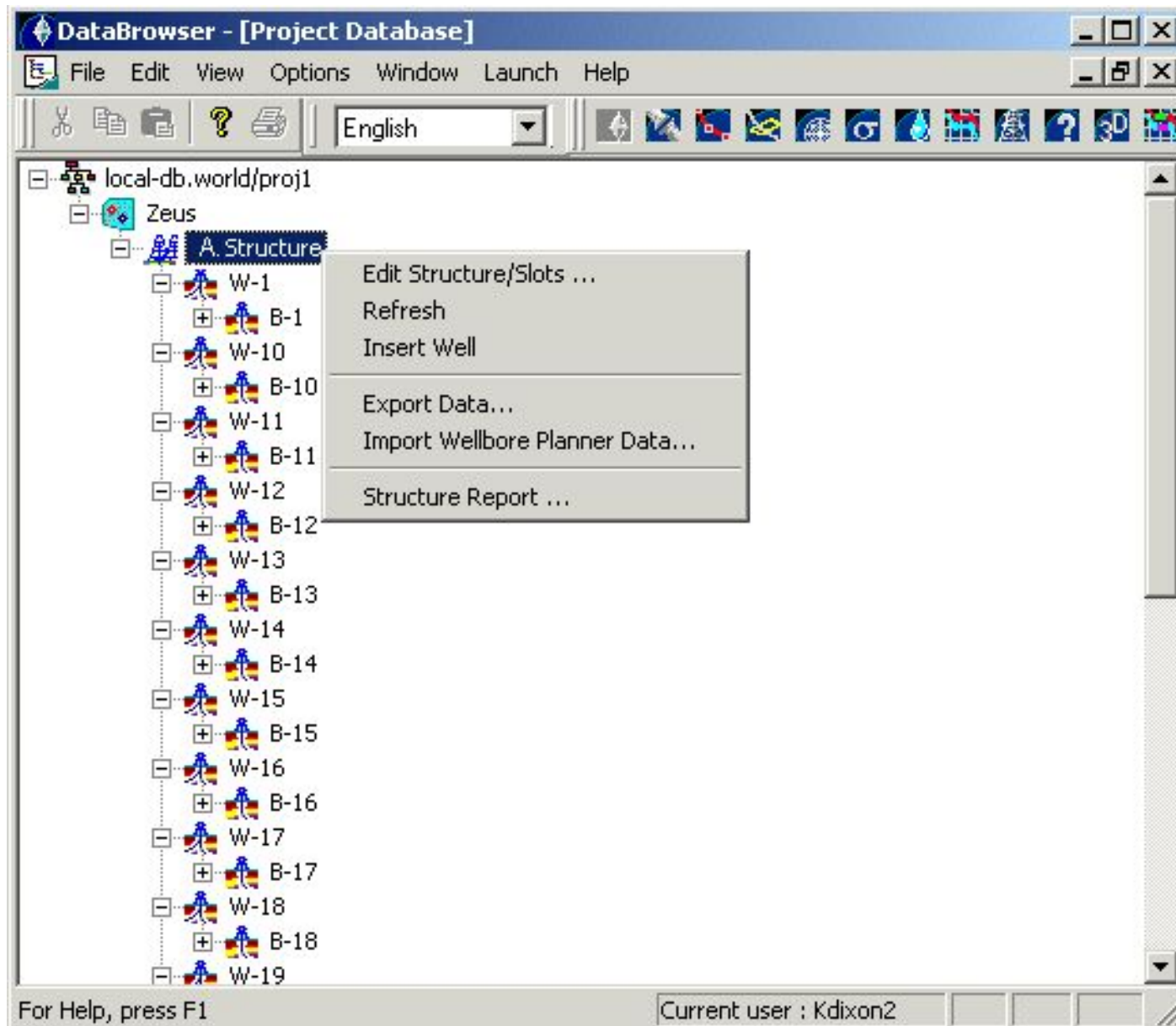
TVD:  ft      Below MSL

Geometry

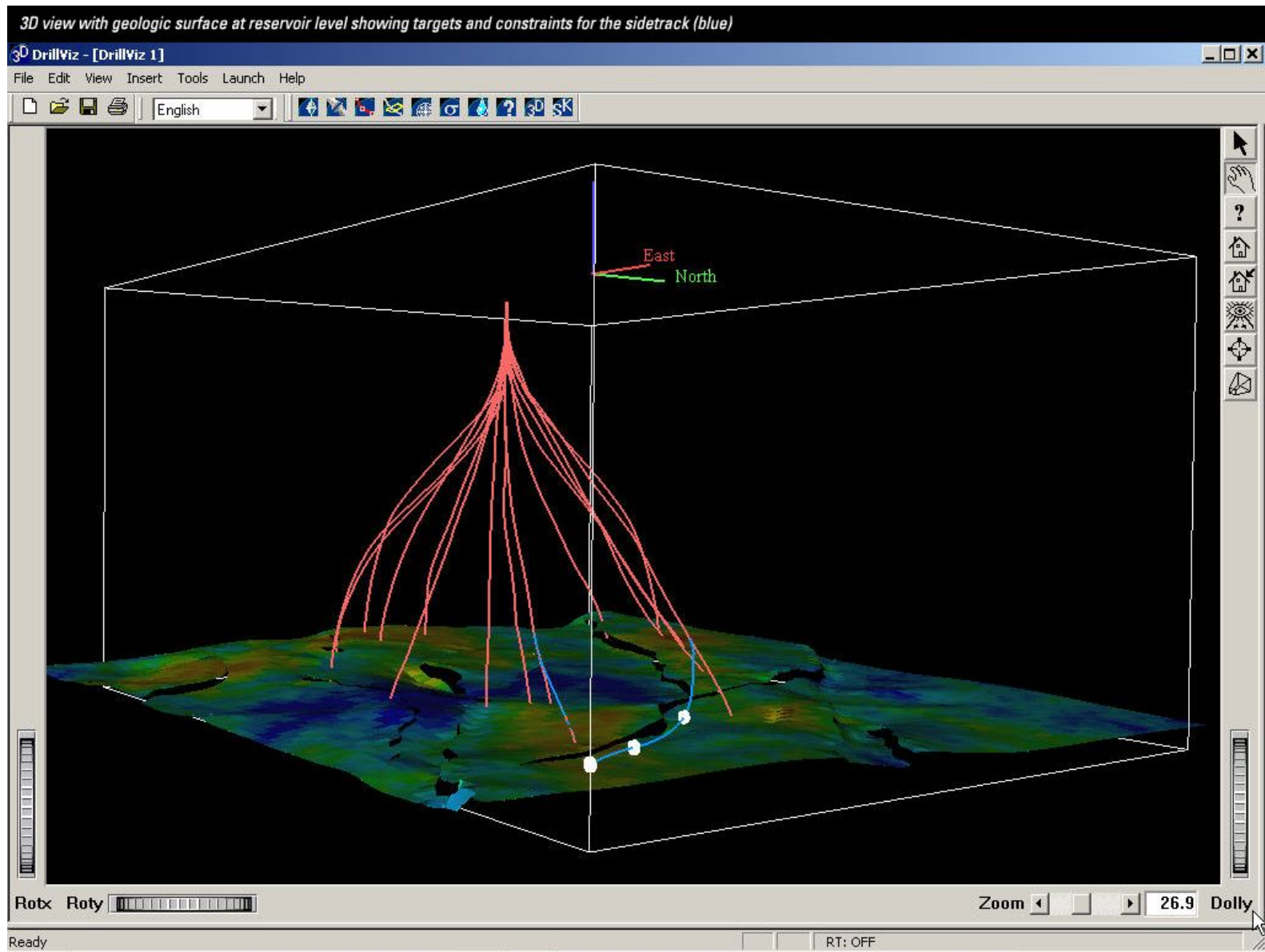
Shape:

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 title is 'Hydro - Hydraulics Inputs' and it contains a menu bar (File, Edit, View, Options, Window, Launch, Help) and a toolbar. Below the toolbar is a smaller window titled 'Hydraulics Inputs' which contains 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 contains 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/100ft<sup>2</sup>
- Fann 300: 0 lbf/100ft<sup>2</sup>
- Fann 600: 0 lbf/100ft<sup>2</sup>

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

# ВВОД ДАННЫХ ПО РЕОЛОГИИ В МОДУЛЬ HYDRAULICS

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

Settings  
Model: Herschel-Bulkley Use: PV-YP P-T: Off

Properties

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

# 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  in<sup>2</sup>

**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

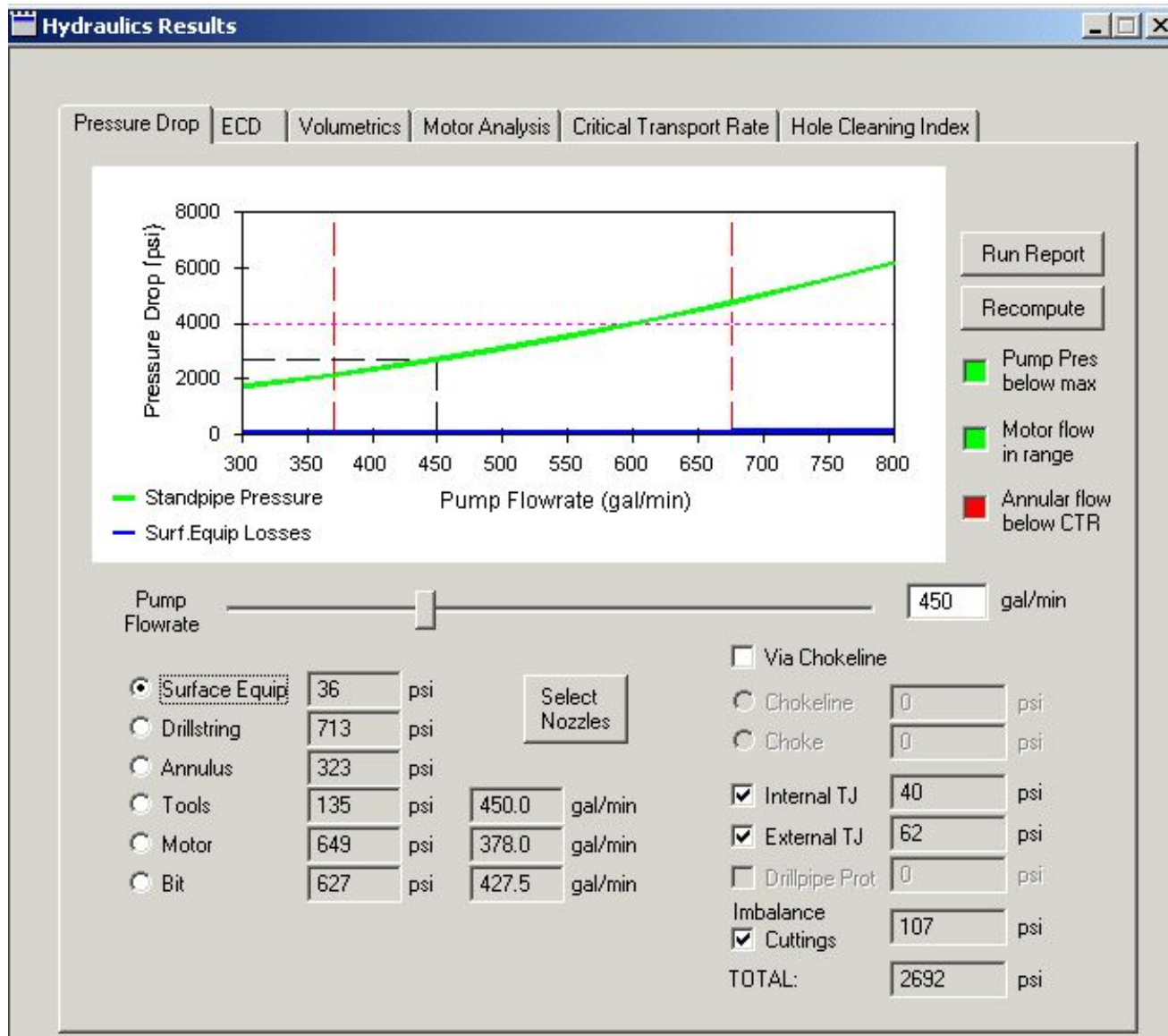
Rheology | Bit/Flow | Rig | Tools/Misc | Motor | **Cuttings** | Swab/Surge

Hole Cleaning       Cuttings corrected ECD

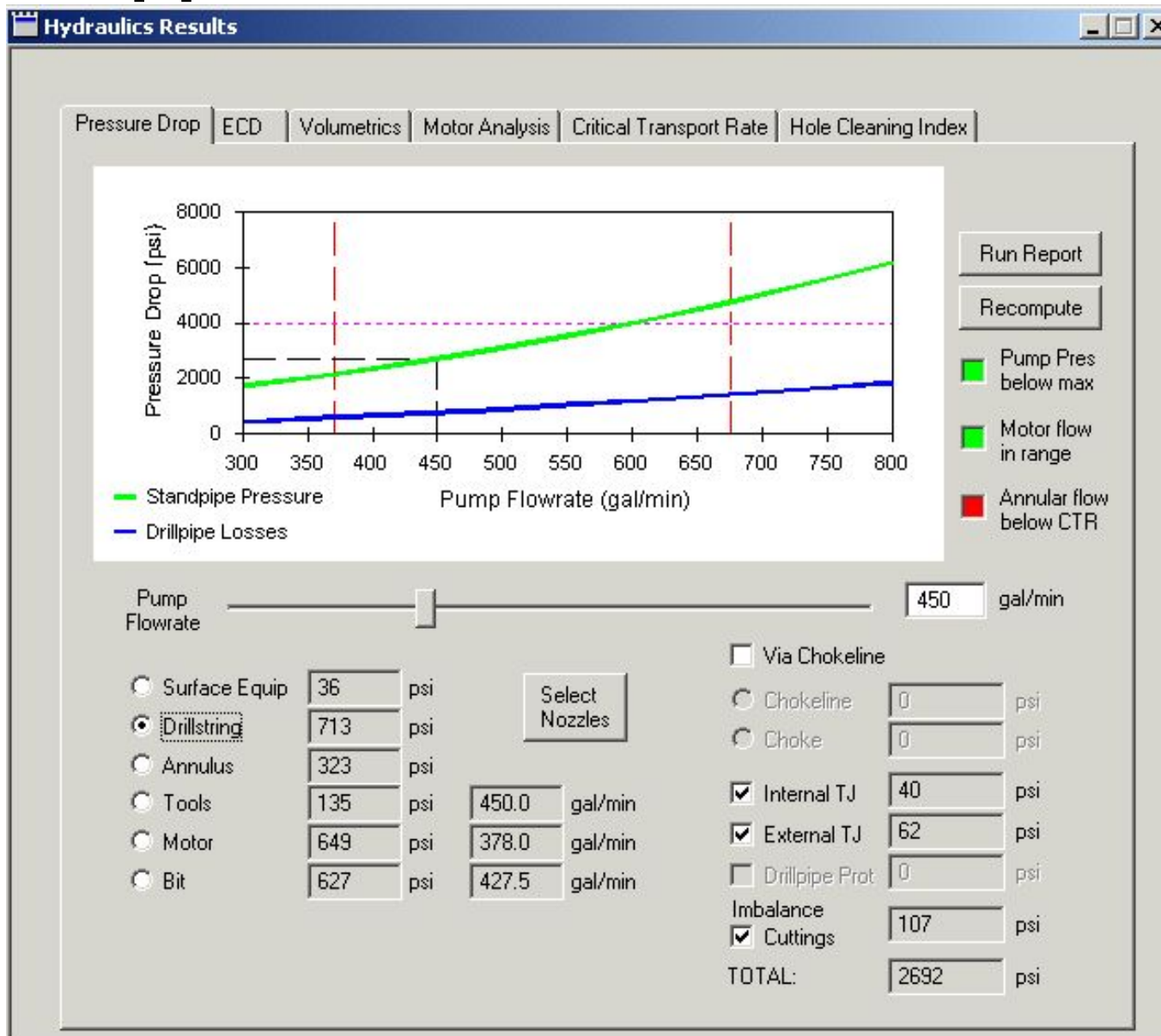
Parameters

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

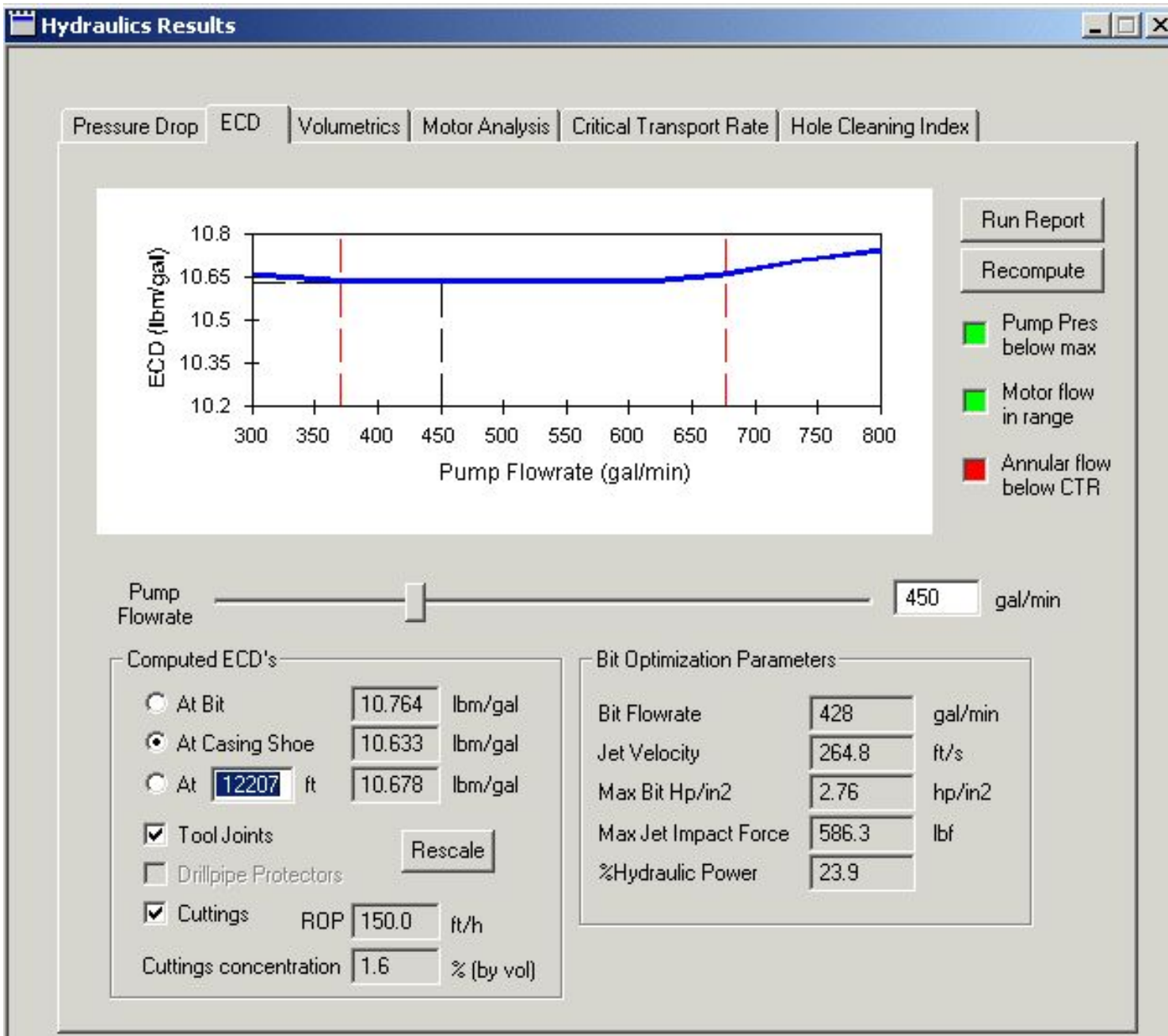
# РЕЗУЛЬТАТЫ РАСЧЕТА ПОТЕРЬ ДАВЛЕНИЯ В ОБВЯЗКЕ



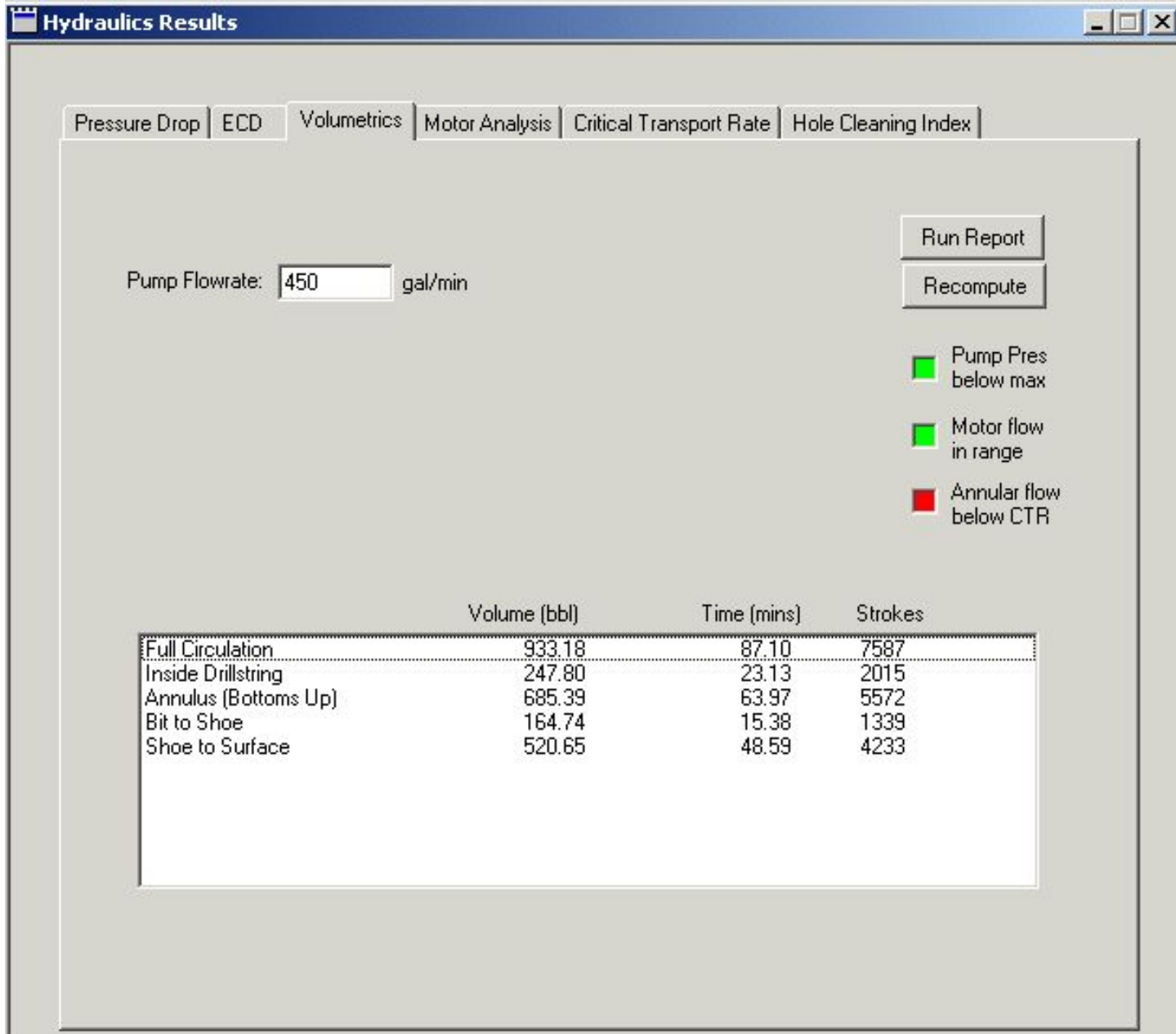
# РЕЗУЛЬТАТЫ РАСЧЕТА ПОТЕРЬ ДАВЛЕНИЯ В ТРУБАХ



# РЕЗУЛЬТАТЫ РАСЧЕТА ECD

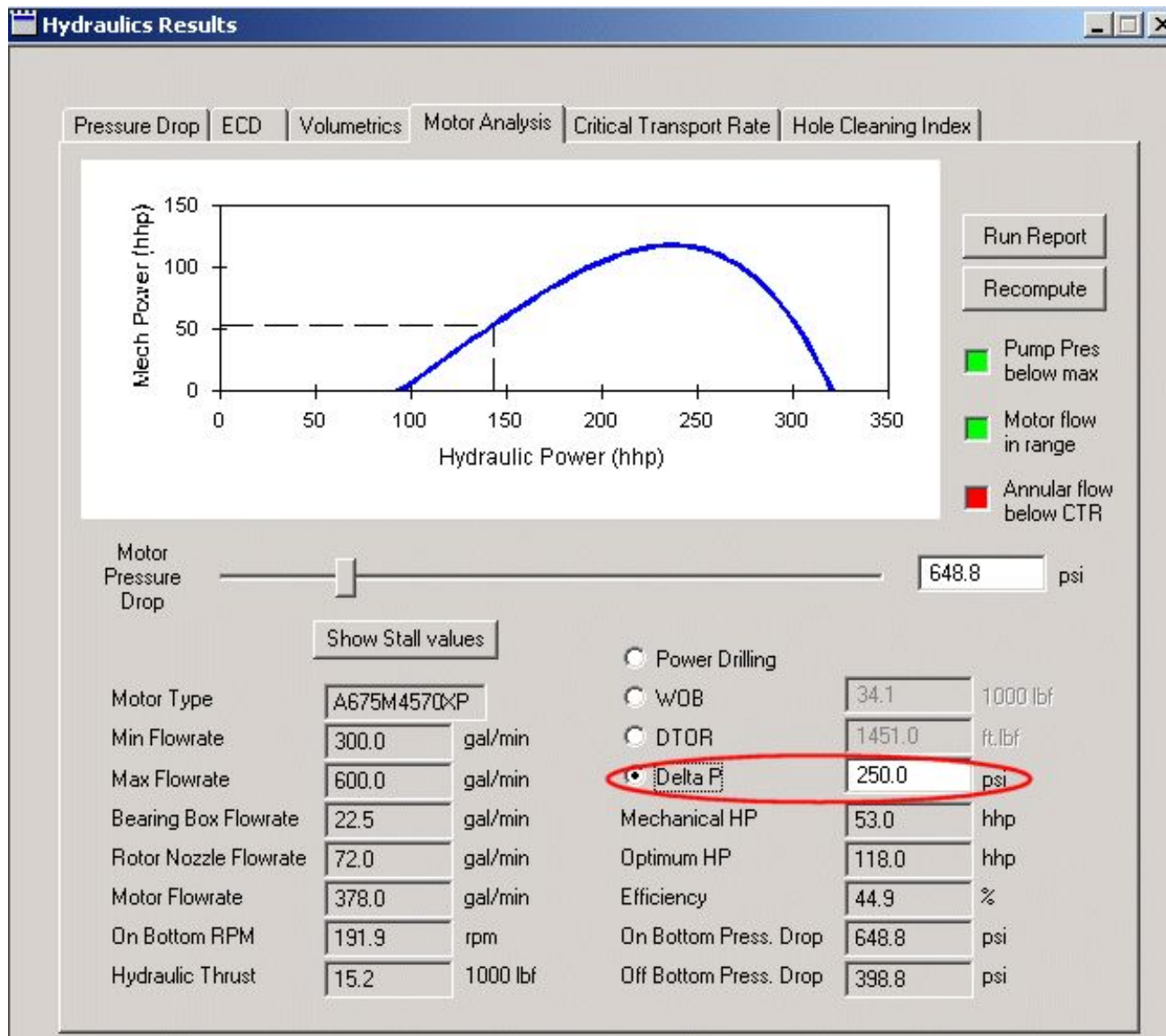


# РЕЗУЛЬТАТЫ РАСЧЕТА ОБЪЕМОВ

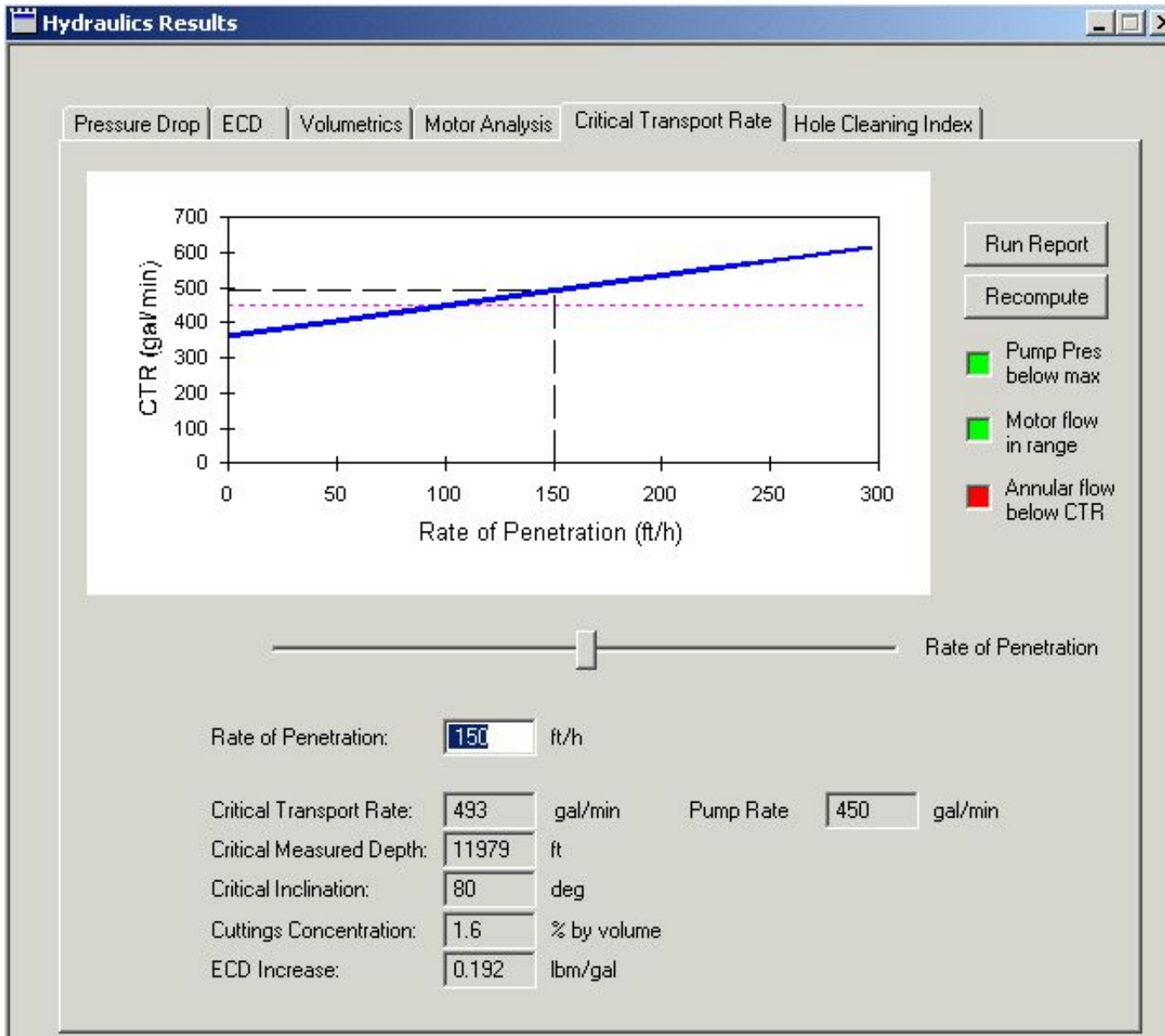




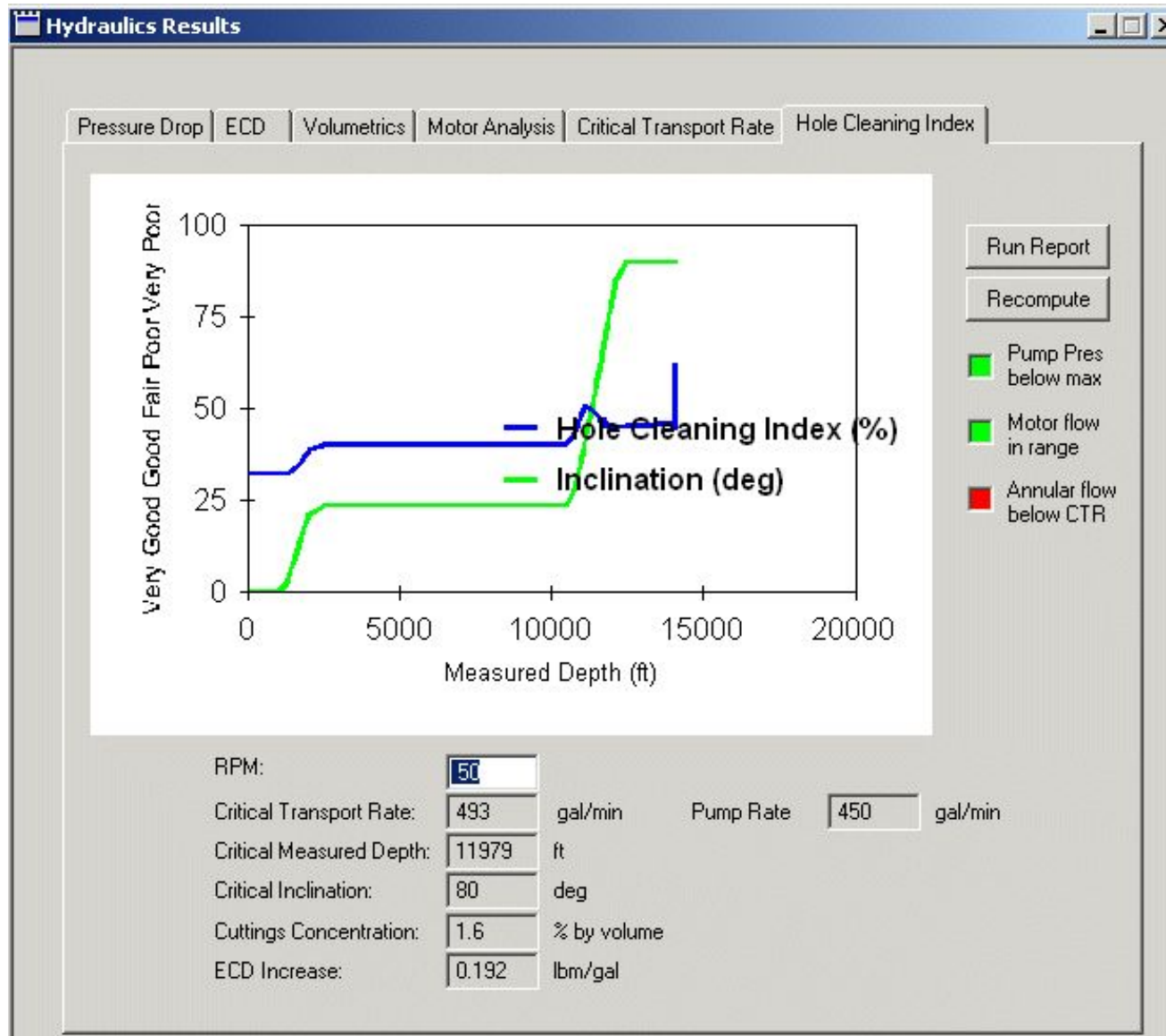
# РЕЗУЛЬТАТЫ АНАЛИЗА РАБОТЫ ВЗД



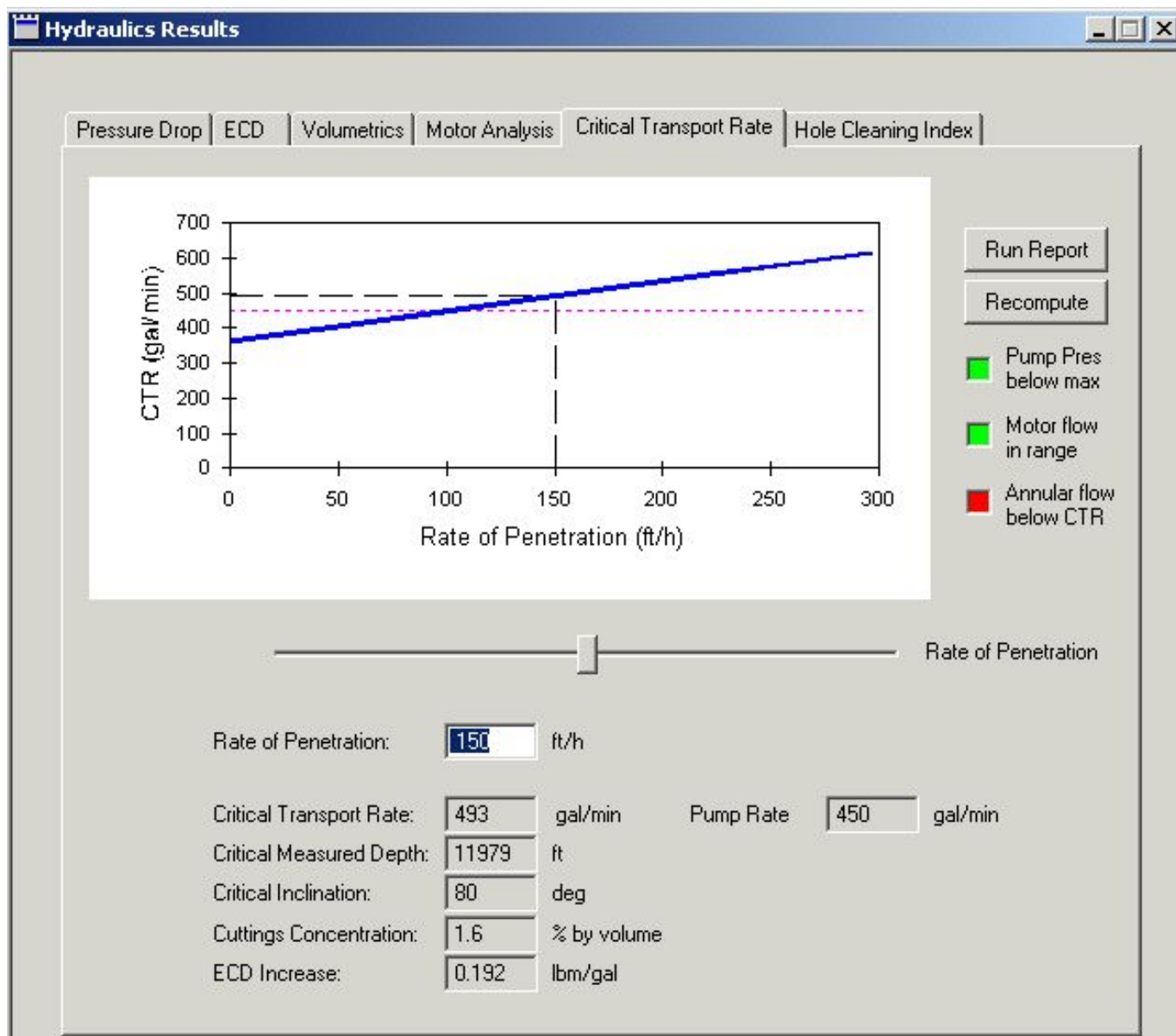
# РЕЗУЛЬТАТЫ АНАЛИЗА ТРАНСПОРТА ШЛАМА



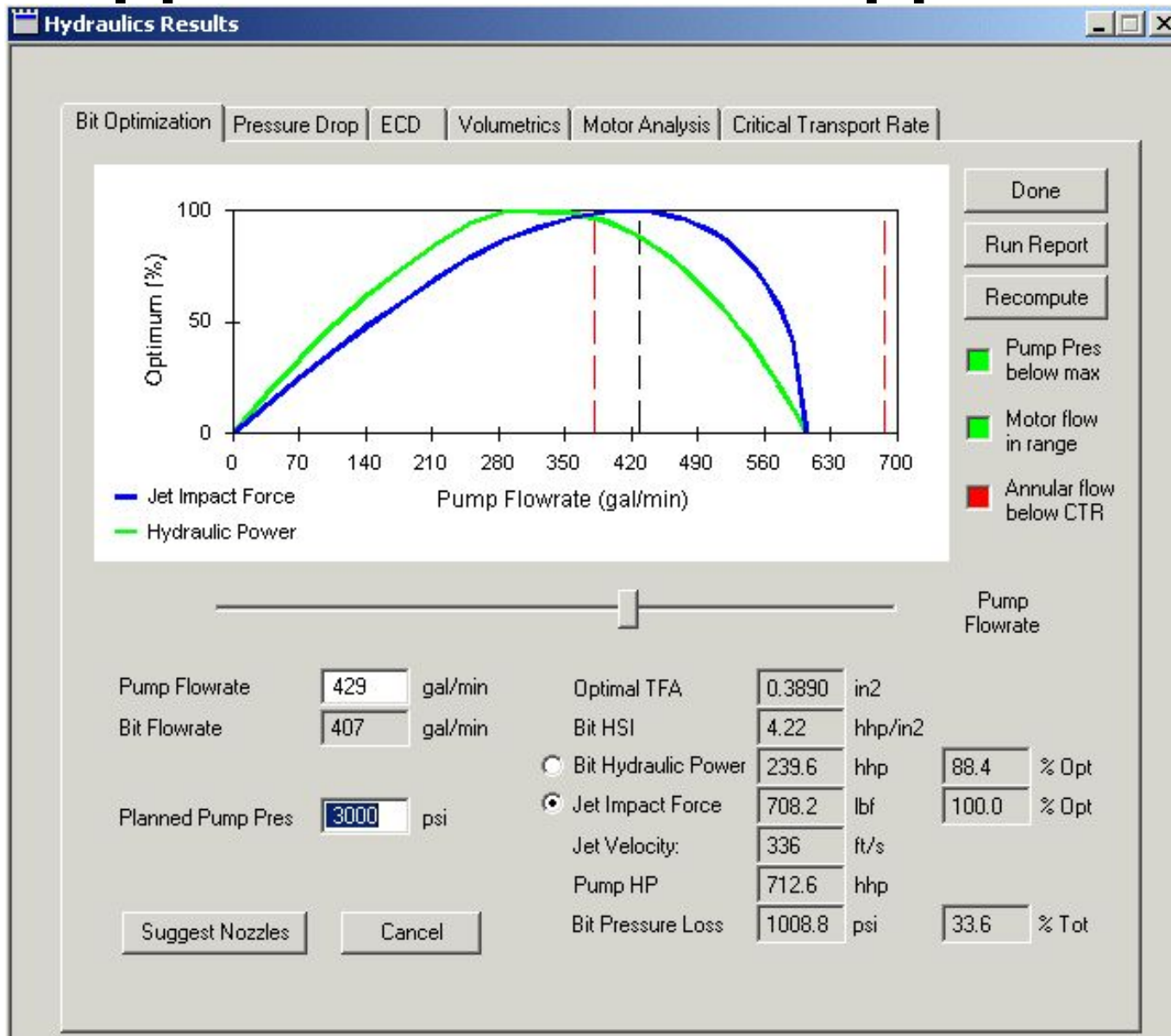
# РЕЗУЛЬТАТЫ РАСЧЕТА ИНДЕКСА ОЧИСТКИ СТВОЛА



# 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 Filter  
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

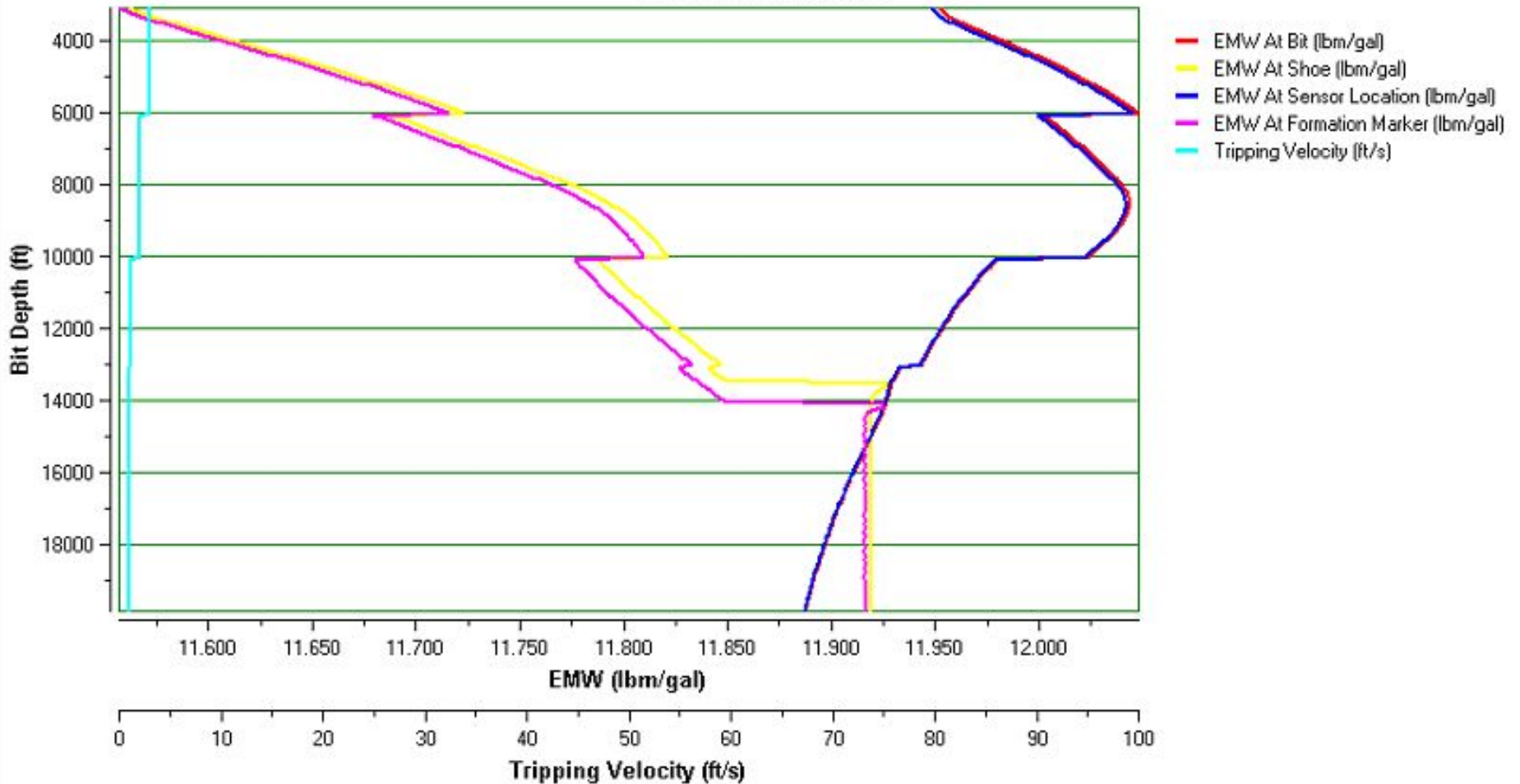
Parameters  
Open-Ended Pipe Pumps On  
Acceleration/Deceleration 0.6 ft/s<sup>2</sup>  
Stand Length 90 ft  
Connection Time 60 s  
Gel Strength (10 s/10 min) 25 lbf/100ft<sup>2</sup>

	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

Hydro - [Swab/Surge Report]							
File Edit View Window Launch Help							
English							
	A	B	C	D	E	F	G
74	<b>SWAB/SURGE PARAMETERS</b>						
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/s<sup>2</sup>):</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/100ft<sup>2</sup>):</i>			25.0			
86							
87	<b>SWAB/SURGE OUTPUT</b>						
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	P
90							
91	3209.9	3.0	11.95	11.95	11.57	11.61	0
92	3299.9	3.0	11.96	11.95	11.57	11.62	0
93	3389.9	3.0	11.96	11.95	11.57	11.62	0
94	3479.9	3.0	11.96	11.96	11.58	11.63	0
95	3569.9	3.0	11.96	11.96	11.58	11.63	0
96	3659.9	3.0	11.97	11.96	11.59	11.64	0
97	3749.9	3.0	11.97	11.97	11.60	11.64	0
98	3839.9	3.0	11.97	11.97	11.60	11.65	0
99	3929.9	3.0	11.98	11.97	11.61	11.65	0
100	4019.9	3.0	11.98	11.98	11.61	11.66	0
101	4109.9	3.0	11.99	11.98	11.62	11.66	0
102	4199.9	3.0	11.99	11.99	11.62	11.67	0



# 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

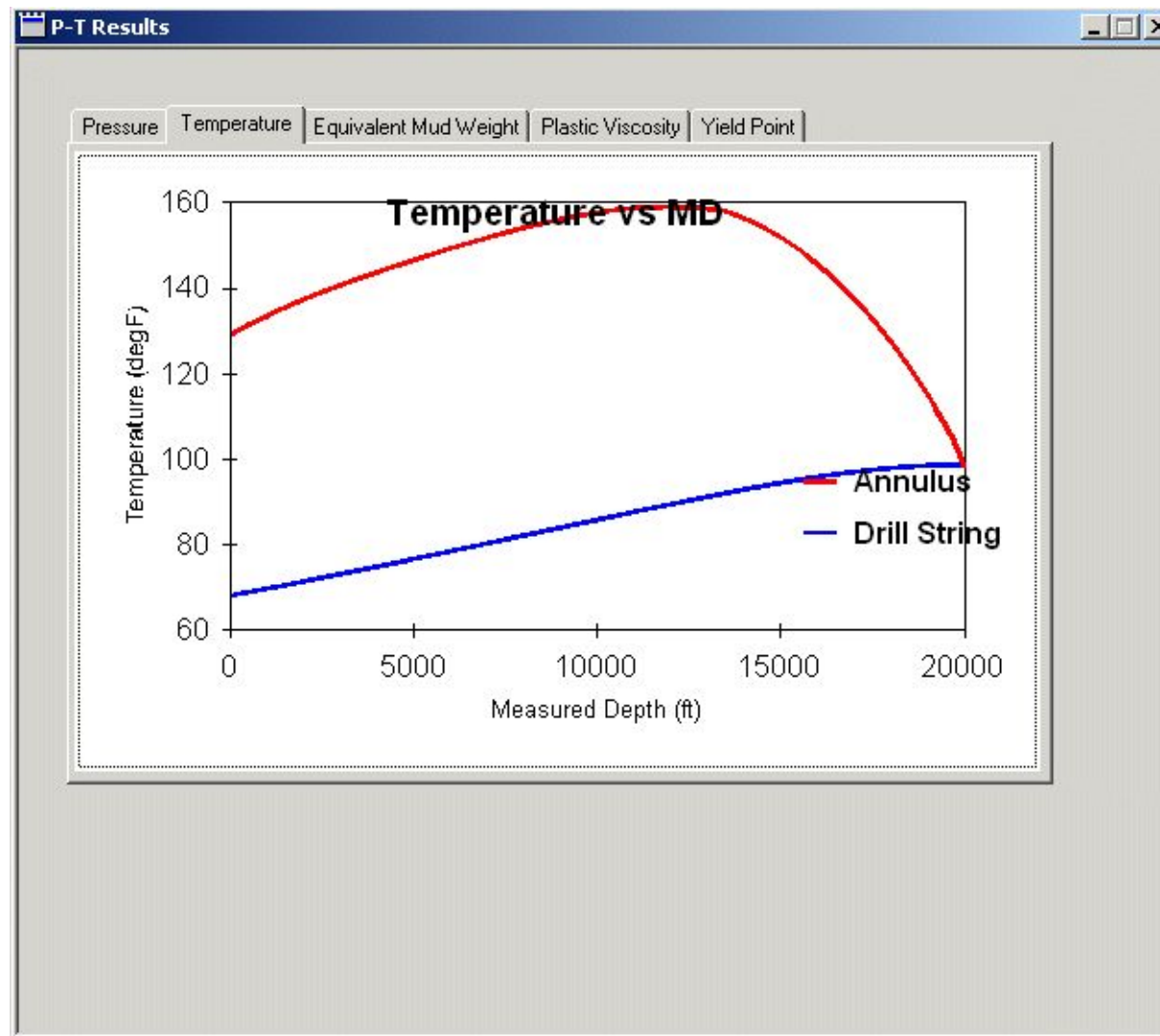
Input  
 Simulator  Manual/WEST

Circulation  
Mud Temperature In 68 degF

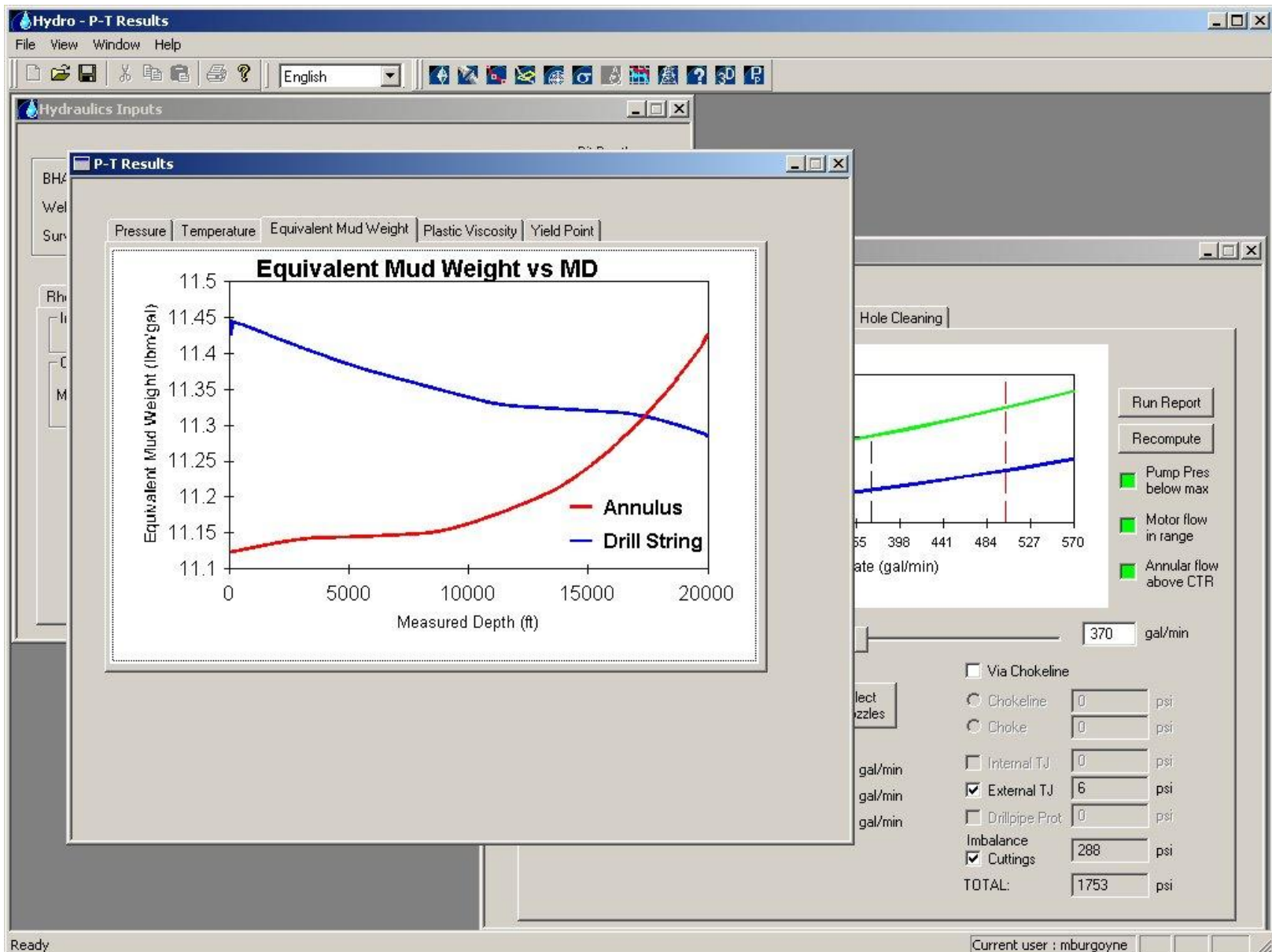
Undisturbed Temperature Profile

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 <sup>2</sup> )	Fann6 (lbf/100ft <sup>2</sup> )	Fann100 (lbf/100ft <sup>2</sup> )	Fann200 (lbf/100ft <sup>2</sup> )	Fann300 (lbf/100ft <sup>2</sup> )	Fann600 (lbf/100ft <sup>2</sup> )
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

0 ft

Yellow cells are mandatory. White cells are optional.

ROP:  ft/hr

RPM:

Compute Friction Factors

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

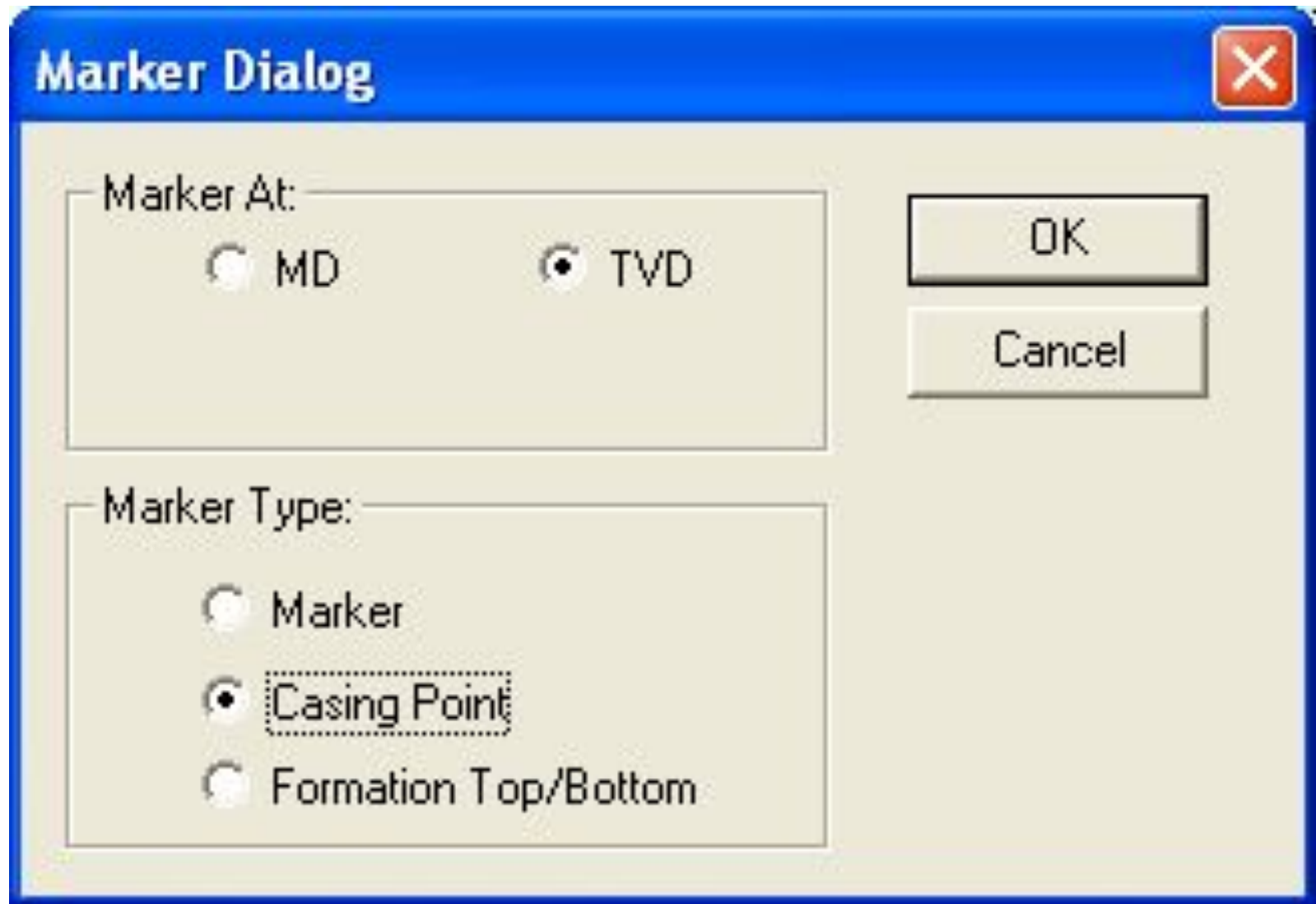
- MD
- TVD
- for a Course (Delta MD)
- Inclination
- Azimuth

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 contains two main sections for configuration:

- Marker At:** A section with two radio button options: "MD" (unselected) and "TVD" (selected).
- Marker Type:** A section with three radio button options: "Marker" (unselected), "Casing Point" (selected and highlighted with a dashed border), and "Formation Top/Bottom" (unselected).

On the right side of the dialog, there are two buttons: "OK" and "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'.

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

	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

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

# 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 at the bottom 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 catalog of bits with the following list:

- 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
- 11 5/8" Max OD
- 11 3/4" Max OD
- 12" Max OD
- 12 1/4" Max OD
- 12 19/32" Max OD
- 13 1/2" Max OD
- 13 3/4" Max OD

The middle pane shows a 3D model of the bit assembly with the following labels:

- <No Name>
- BHA
- 8 1/2" Bit

The right pane shows the configuration parameters for the bit:

General | More | Bit

Type: Milled Tooth Bit  Non-Magnetic

Name: 8 1/2" Bit

Manufacturer: Generic

Model: SN#

Dimensions:

Inner Diameter	2.25 in	Length	0.3048 m
Bit Shank OD	6 in	Bit Diameter	8.5 in

Weight:

Linear: 0 kg/m Total: 0 kg

Total Weight Below Item: 0 kg

Total Length Below Item: 0 m

Connection:

Size	Connection Type
Top 4.5 in	Regular

Catalog -> Bit -> 8 1/2" Max OD -> 6" Body OD

Current user : ADMIN NUM

# 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 mm<sup>2</sup>

**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:

- Left Panel (Component List):** A tree view showing a list of components. The selected component is "A675M4570XP". The list includes various bit types and sizes, such as "6 3/4\" OD", "A675M1240SP", "A675M2380XP", "A675M4548SP", "A675M4548SP-AIM", "A675M4548SP-GST", "A675M4570XP", "4 1/2\" H90 (Up)", "4 1/2\" NC46 (4 IF) (Up)", "4 1/2\" NC50 (4 1/2 IF) (Up)", "4 1/2\" Regular (Down)", "6 5/8\" Regular (Down)", "4 1/2\" Regular (Up)", "A675M4570XP-AIM", "A675M4570XP-GST", "A675M7820AD", "A675M7820AD-AIM", "A675M7830SP", "A675M7830SP-AIM", "A675M7830SP-GST", "A675M7850XP", "A675M7850XP-AIM", "A675M7850XP-GST", and "A675S1240SP".
- Center Panel (3D Model):** A 3D model of the selected component, "A675M4570XP", which is an 8 1/2" Bit. The model is shown in a perspective view with a "Metric" unit selector.
- Right Panel (Parameter Configuration):** A detailed configuration panel for the selected component. It includes tabs for "General", "More", and "Motor". The "General" tab is active, showing the following parameters:
  - Type: PDM (dropdown menu)
  - Name: A675M4570XP
  - Manufacturer: Schlumberger (dropdown menu)
  - Model: A675M4570XP
  - SN#: (text input)
  - 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:
    - Top: Size 4.5 in, Connection Type NC50 (4 1/2 IF), BSR Pin (radio button), Box (radio button, selected), N.A.
    - Bottom: Size 4.5 in, Connection Type Regular, BSR Pin (radio button), Box (radio button, selected), N.A.

# РЕДАКТИРОВАНИЕ ПАРАМЕТРОВ ОТКЛОНИТЕЛЯ В МОДУЛЕ BHA EDITOR

The screenshot displays the BHA Editor software interface for editing the parameters of a motor in 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 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, the status bar shows "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 the parameters of a stabilizer. The window title is "BHA Editor - bha\_3133". The interface is divided into several sections:

- Equipment Database:** A tree view on the left showing various drilling equipment categories like Bent Sub, Bit, Collar, Drill Pipe, etc.
- Assembly Diagram:** A central diagram showing the components of the BHA (Bottom Hole Assembly) for "bha\_3133". The components listed from top to bottom 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. A blue box labeled "Stabilizer #1" is highlighted around the stabilizer component.
- 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. is 0.5334 m.
  - Blade Mid-Point to the Bit:** 0.8382 m.
  - Dimensions:** Body Length is 0.356616 m; Max. Outer Diameter is 8.375 in.
  - Blade Info:** Blade Length is 0.356616 m; Blade Width is 0 in; Blade Spiral is 0.000000 deg.
  - Remark:** A text area for additional notes.

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

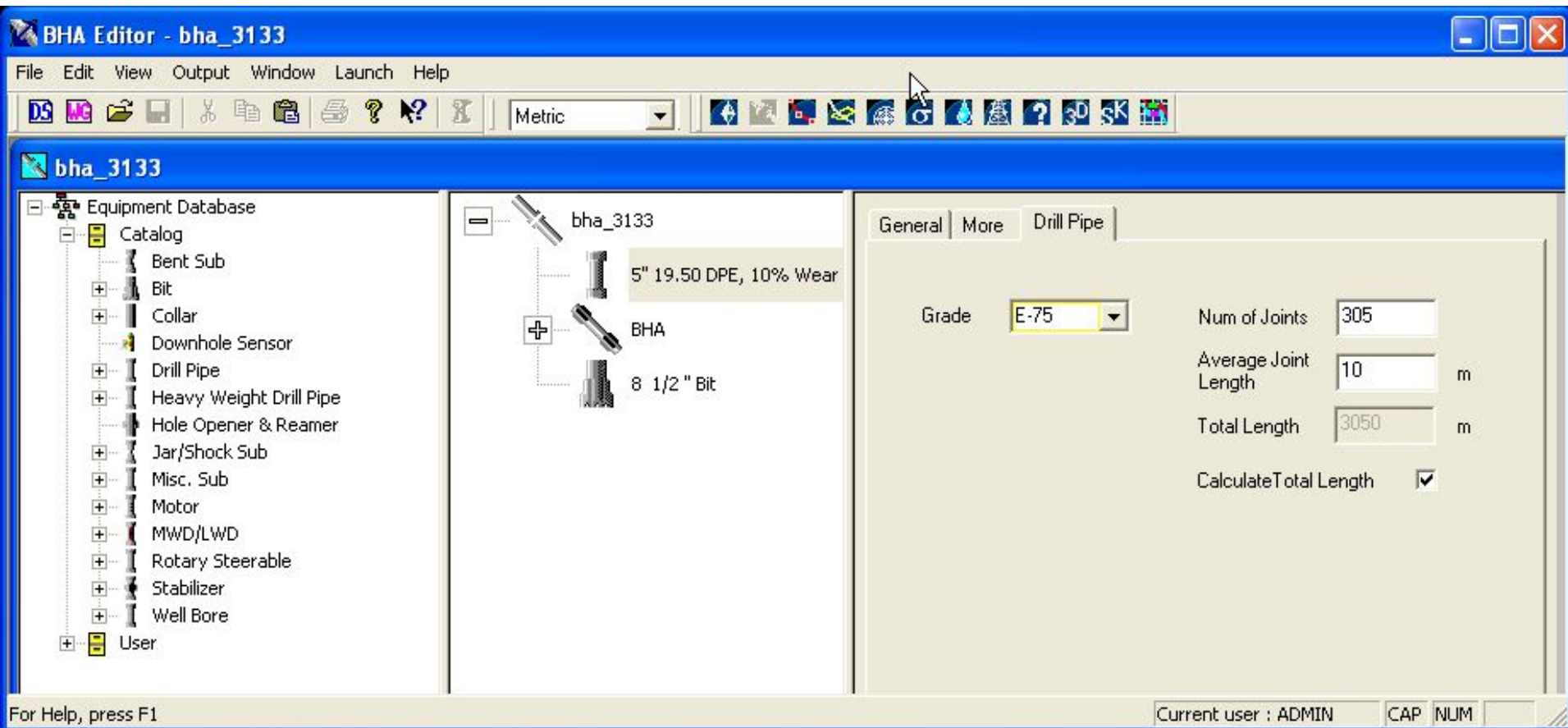
# РЕДАКТИРОВАНИЕ ПАРАМЕТРОВ БУРИЛЬНЫХ ТРУБ В МОДУЛЕ BHA EDITOR

The screenshot displays the BHA Editor software interface. On the left is the Equipment Database tree, showing a hierarchy of components like Bent Sub, Bit, Collar, Downhole Sensor, and Drill Pipe. The central workspace shows a 3D assembly of a drill pipe with components labeled: 5" 19.50 DPE, 10% Wear, BHA, Crossover, 5" HWDP, Monel 6 3/4" Collar, PowerPulse, CDR, Stabilizer, A675M4570XP, and 8 1/2" Bit. On the right, the General tab of the properties panel is active, showing the following data:

Property	Value
Type	Drill Pipe
Name	5" 19.50 DPE, 10% Wear
Manufacturer	
Model	SN#
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
Linear Weight	31.0877 kg/m
Total Weight	94816 kg
Total Weight Below Item	8474.87 kg
Total Length Below Item	84.7716 m
Top Connection Size	5 in
Top Connection Type	NC50 (4 1/2 IF)
Bottom Connection Size	5 in
Bottom Connection Type	NC50 (4 1/2 IF)

At the bottom of the window, the status bar shows "Current user : ADMIN" and "NUM".

# РЕДАКТИРОВАНИЕ ПАРАМЕТРОВ БУРИЛЬНЫХ ТРУБ В МОДУЛЕ BHA EDITOR












# 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 Panel):** A hierarchical tree view showing various equipment categories and their specifications. The 'Drill Pipe' section is expanded, listing different diameters (2 3/8" OD to 6 5/8" OD) and weights (19.5 lbm/ft and 25.6 lbm/ft). Under the 19.5 lbm/ft 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', and 'X-95'.
- Assembly Diagram (Center Panel):** 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 (Cable Driven Roller)
  - Stabilizer
  - A675M4570XP
  - 8 1/2" Bit
- General Properties (Right Panel):** A form for entering key assembly data:
  - 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'.

# СХЕМА КОМПОНОВКИ БК, СОЗДАННАЯ В МОДУЛЕ ВНА EDITOR

	Cum. Len. (m)	
	5" 19.50 DPE, 10% Wear (305)	3134.77
	Crossover	84.77
	5" HWDP (5 joints)	83.77
	Monel 6 3/4" Collar	33.77
	PowerPulse	23.77
	CDR	16.24
	Stabilizer	9.39
	A675M4570XP (0.5 deg)	8.39
	8 1/2 " Bit	0.30

**BNGS**  
**1024**  
**Sosnovaya**  
**Malobalykscoe**  
**B-1**  
**bha\_3133**

**BHA DESCRIPTION**

ELEMENT	LENGTH (m)	OD (in)	ID (in)	MAX OD (in)
8 1/2 " Bit	0.30	8.50	2.25	8.50
A675M4570XP (0.5 deg)	8.08	6.75	5.50	8.38
Stabilizer	1.00	6.75	3.00	8.25
CDR	6.86	6.75	4.87	6.75
PowerPulse	7.53	6.75	5.11	6.89
Monel 6 3/4" Collar	10.00	6.75	3.00	6.75
5" HWDP (5 joints)	50.00	5.00	3.00	6.50
Crossover	1.00	6.75	2.25	6.75
5" 19.50 DPE, 10% Wear (305)	3050.00	4.93	4.28	6.63

Bit to Gamma Ray Sensor = 14.4904 m  
Bit to Resistivity Sensor = 11.1376 m  
Bit to Direction & Inclination Sensor = 19.8468 m

**DRILLING OVERVIEW**

Depth in:	1598.00 m	Depth out:	3133.00 m
Inclination in:		To:	
Direction in:		To:	
Total Drilled:	1535.00 m	Dogleg:	

**Schlumberger**

Quality Control	
Created by: ADMIN	Date: 2011-10-17
Checked by:	Date:

# 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 (DS, MG, save, print, help), a "Metric" dropdown, and various tool icons.
- Hole Section / Error List / Inside Diameter Profile:** Contains a table with columns "From (m)", "To (m)", and "ID (in)". The "To" and "ID" columns for the second and third rows are highlighted in yellow.
- 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", and 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 form for the selected casing string. It includes fields for Name, Type, MD Range (Top, Bottom), Total Length, Weight, and Diameters (Min Drift, Max OD). The "Length" and "Bottom" fields are highlighted in yellow.
- 9 5/8" Casing String Properties:** A form for the specific casing string, including Name, Type, Fix options (Top, Length, Bottom), Adjust/Shift options, OD, ID, Drift, Weight (Linear, Total), Grade, Connection Type, Num Jts, and Avg Jt Length.

The status bar at the bottom shows the current user as "ADMIN" and the current wellbore geometry as "Wellbore Geometry -> 9 5/8" Casing String -> 9 5/8" Casing".

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		

**Casing String Properties:**

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 Properties:**

Name: 9 5/8" Casing Type: Casing

Fix:  Top: 0 m  Length: 795.92 m  Bottom: 795.92 m

Adjust/Shift:  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



# ОКНО МОДУЛЯ DRILLSAFE ПОСЛЕ ВВОДА ДАННЫХ ПО СКВАЖИНЕ

**DrillSAFE - Analysis 1**

File Edit View Output Options Window Launch Help

English

---

**Analysis 1**

BHA: BHA (Horizontal) 2442.91 ft Run Report

Well Geom: Well Geometry #1 14089 ft Filter

Survey: Tutorial #1 14089.3 ft Tortuosity

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: 0 1000 lbf  
 Downhole ToB: 0 1000 ft.lbf  
 Block Weight: 0 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

Yellow cells are mandatory. White cells are optional.

RDP: 0 ft/hr  
 RPM: 0

Compute Friction Factors

---

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 Filter

Survey: Tutorial #1 14089.3 ft Tortuosity

Run Report

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

Yellow cells are mandatory. White cells are optional.

ROP: 0 ft/hr

RPM: 0

Compute Friction Factors

Ready

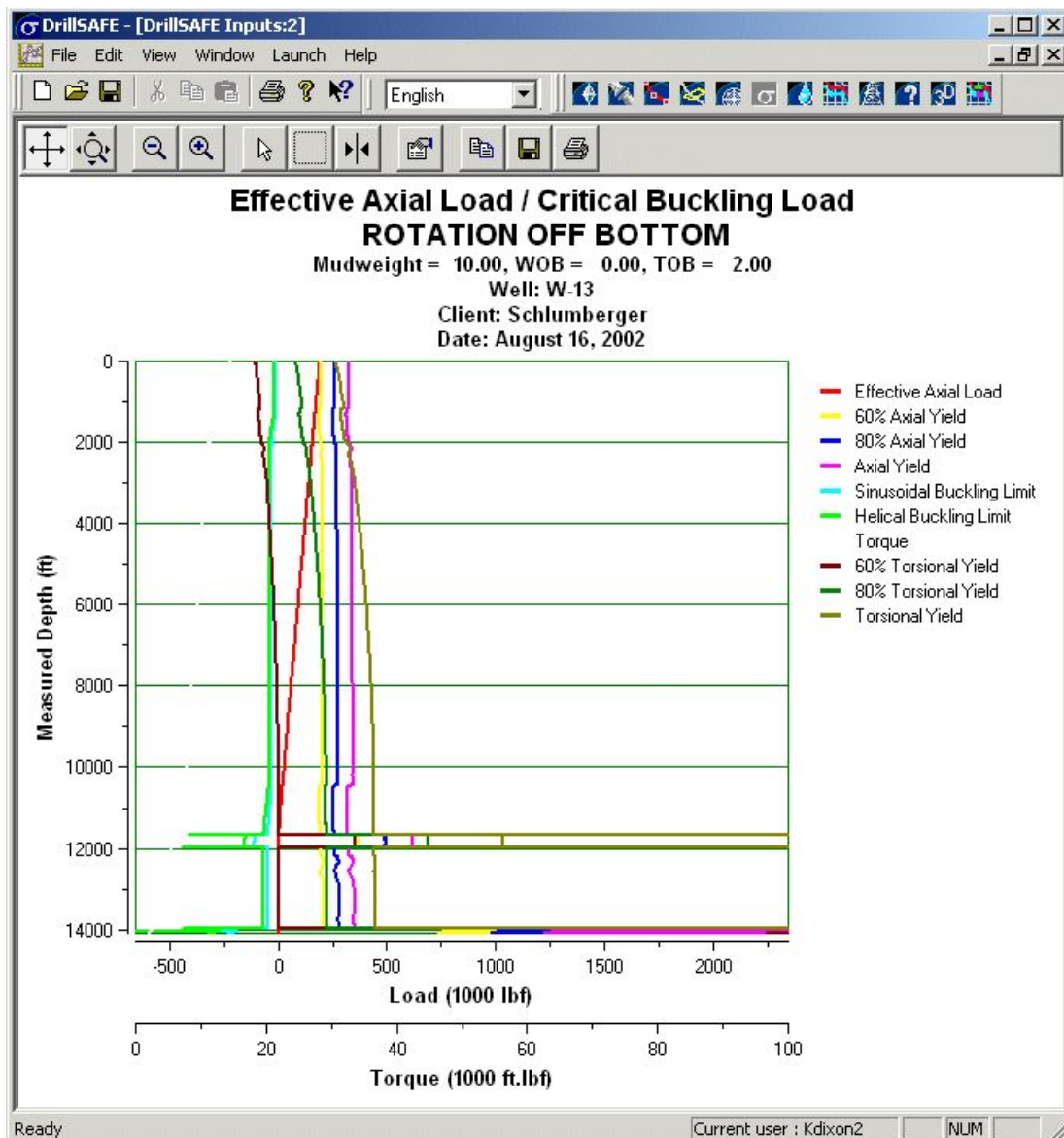
Current user : kdixon2

# РЕЗУЛЬТАТЫ РАСЧЕТОВ МОДУЛЕМ DRILLSAFE ПРИ РАБОТЕ В РЕЖИМЕ SINGLE POINT

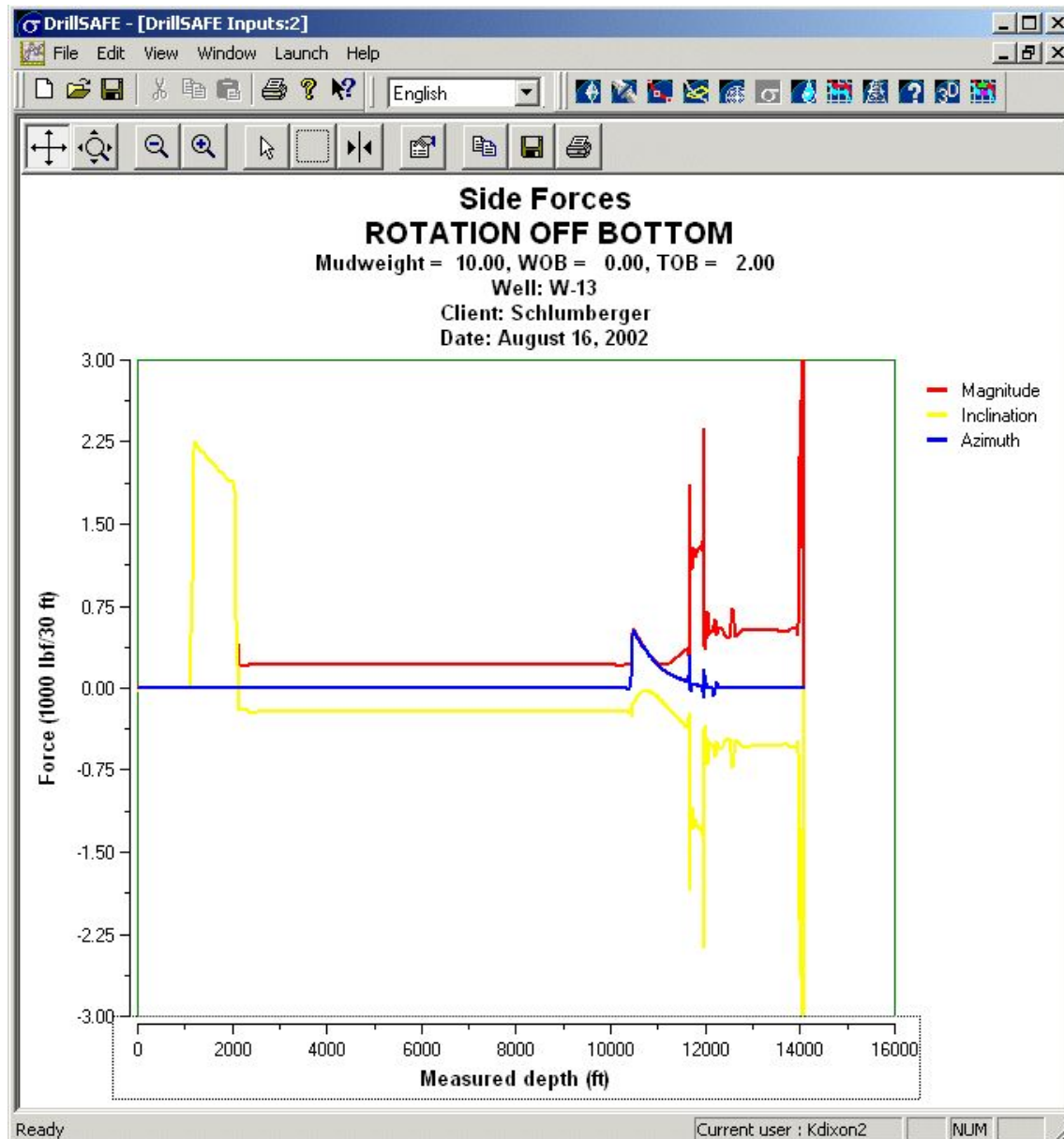
Running Single Point Torque and Drag Analysis...Done

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

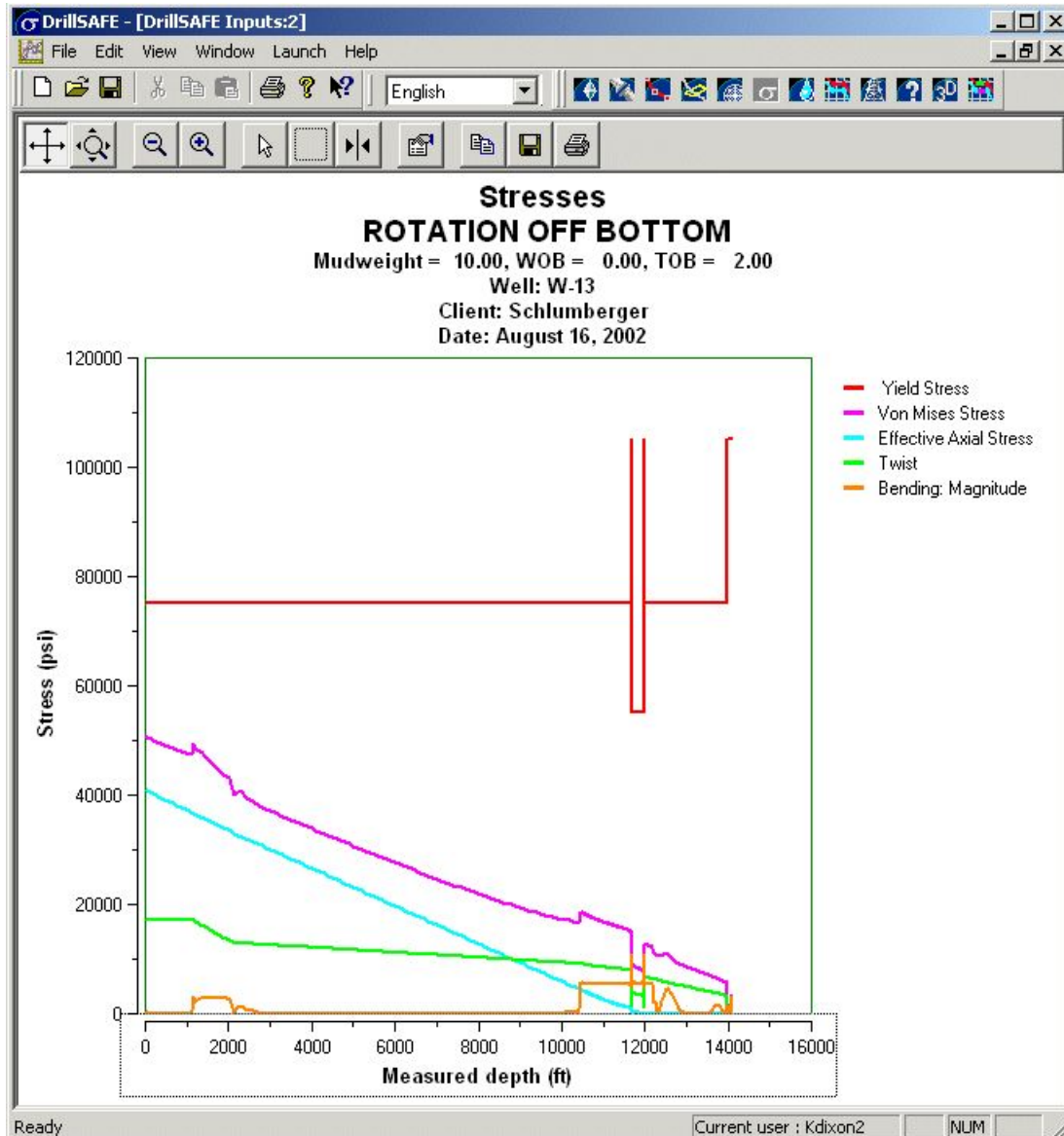
# РЕЗУЛЬТАТЫ АНАЛИЗА ОСЕВЫХ УСИЛИЙ ПРИ ВРАЩЕНИИ НАД ЗАБОЕМ



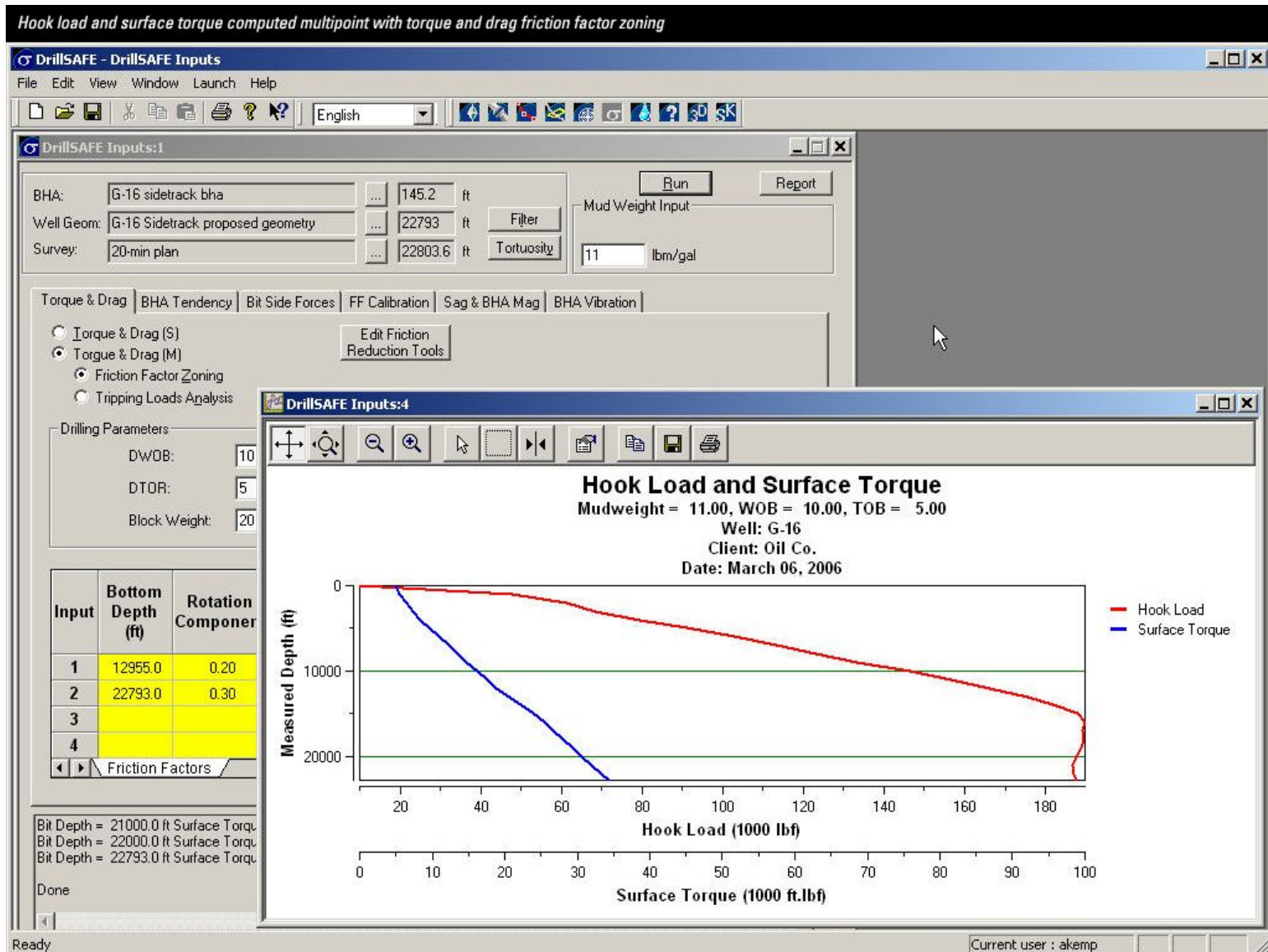
# РЕЗУЛЬТАТЫ АНАЛИЗА ПРИЖИМАЮЩИХ УСИЛИЙ ПРИ ВРАЩЕНИИ НАД ЗАБОЕМ



# РЕЗУЛЬТАТЫ АНАЛИЗА НАПРЯЖЕНИЙ ПРИ ВРАЩЕНИИ НАД ЗАБОЕМ



# РЕЗУЛЬТАТЫ РАСЧЕТА НАГРУЗКИ НА КРЮКЕ И МОМЕНТА НА РОТОРЕ



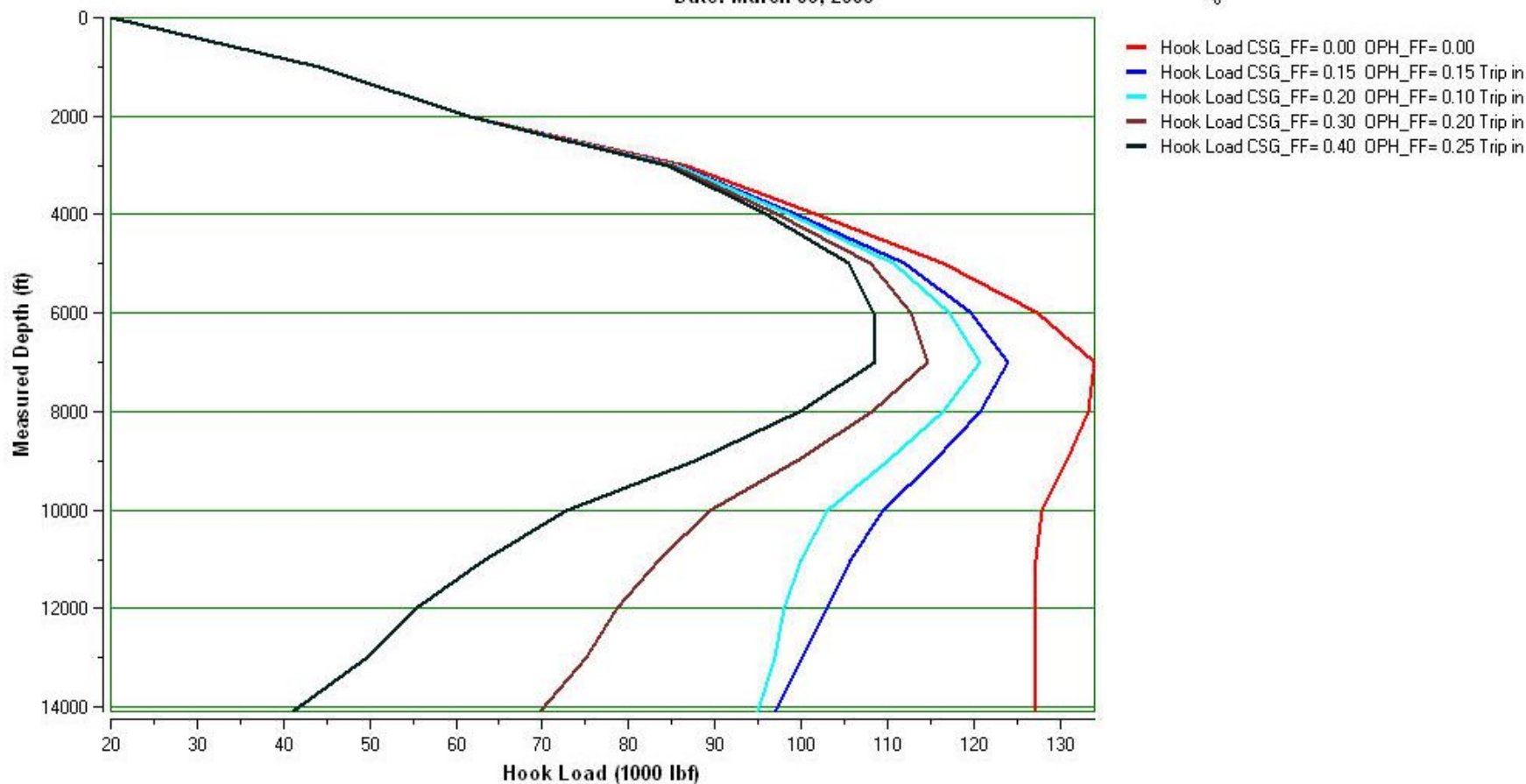
# РЕЗУЛЬТАТЫ РАСЧЕТА НАГРУЗКИ НА КРЮКЕ ПРИ ПОДЪЕМЕ

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:

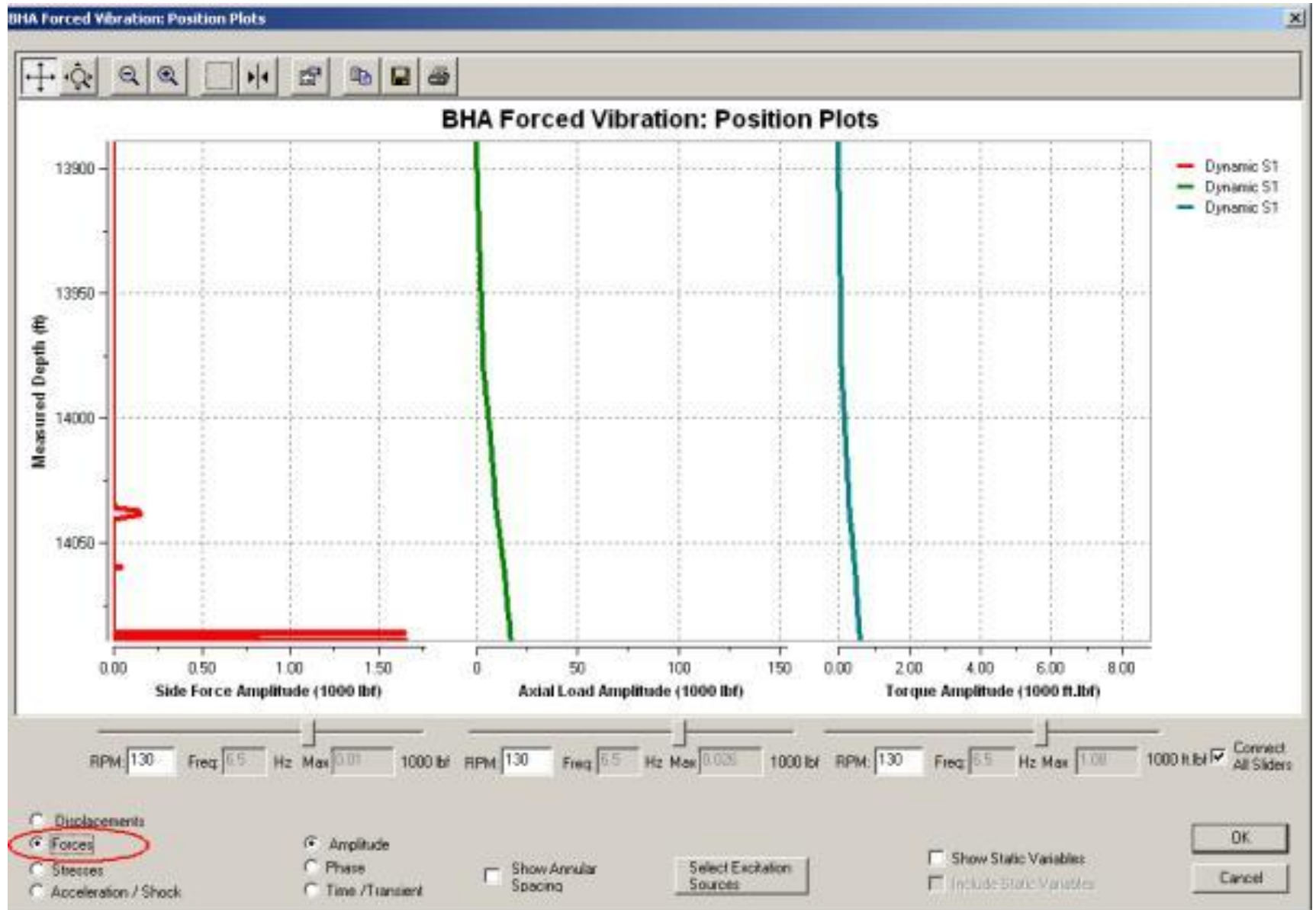
Dynamic Damping

Manual Input  Use Default Value

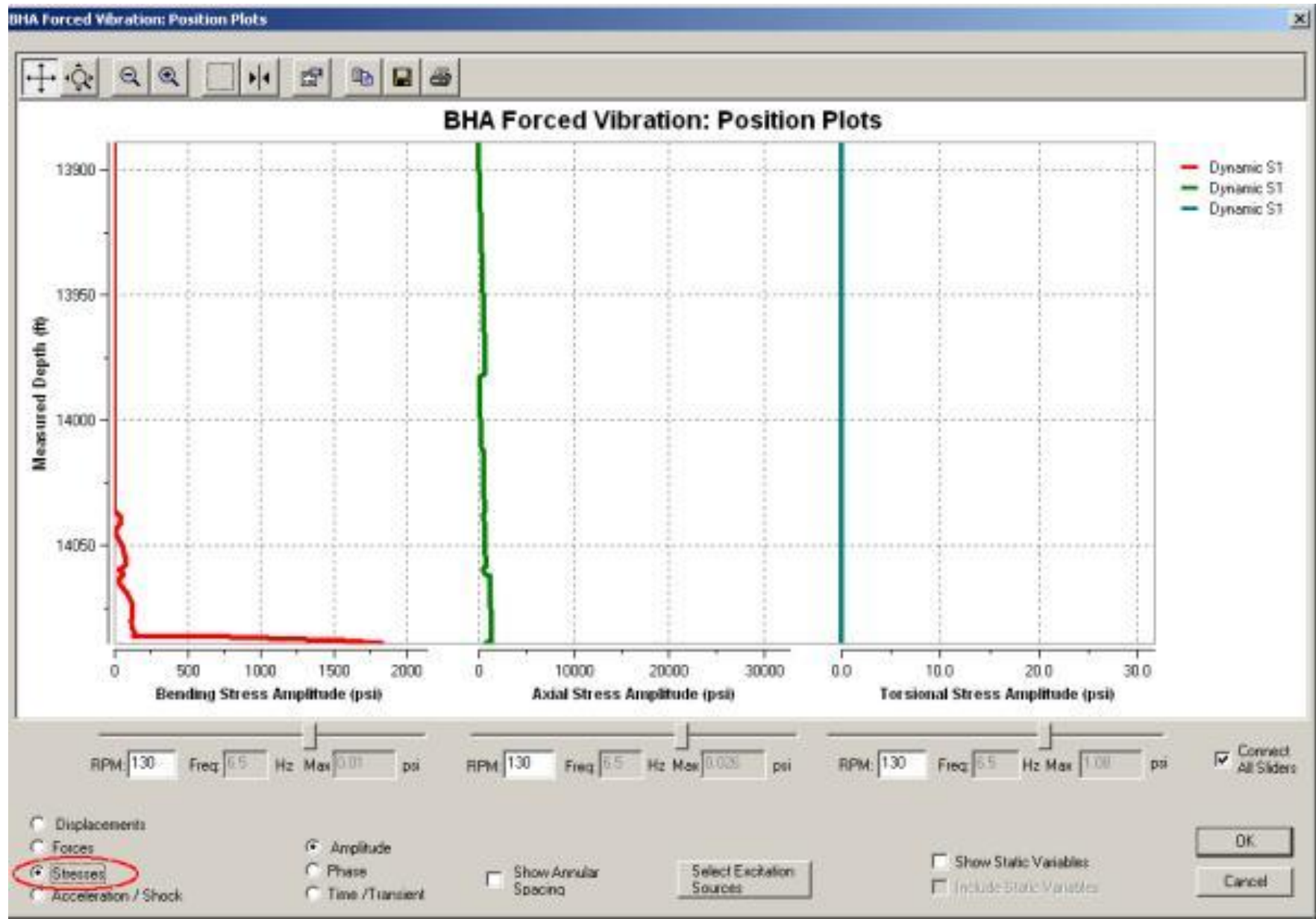
Oil Based Mud  Water Based Mud

Viscous Damping Coefficient:

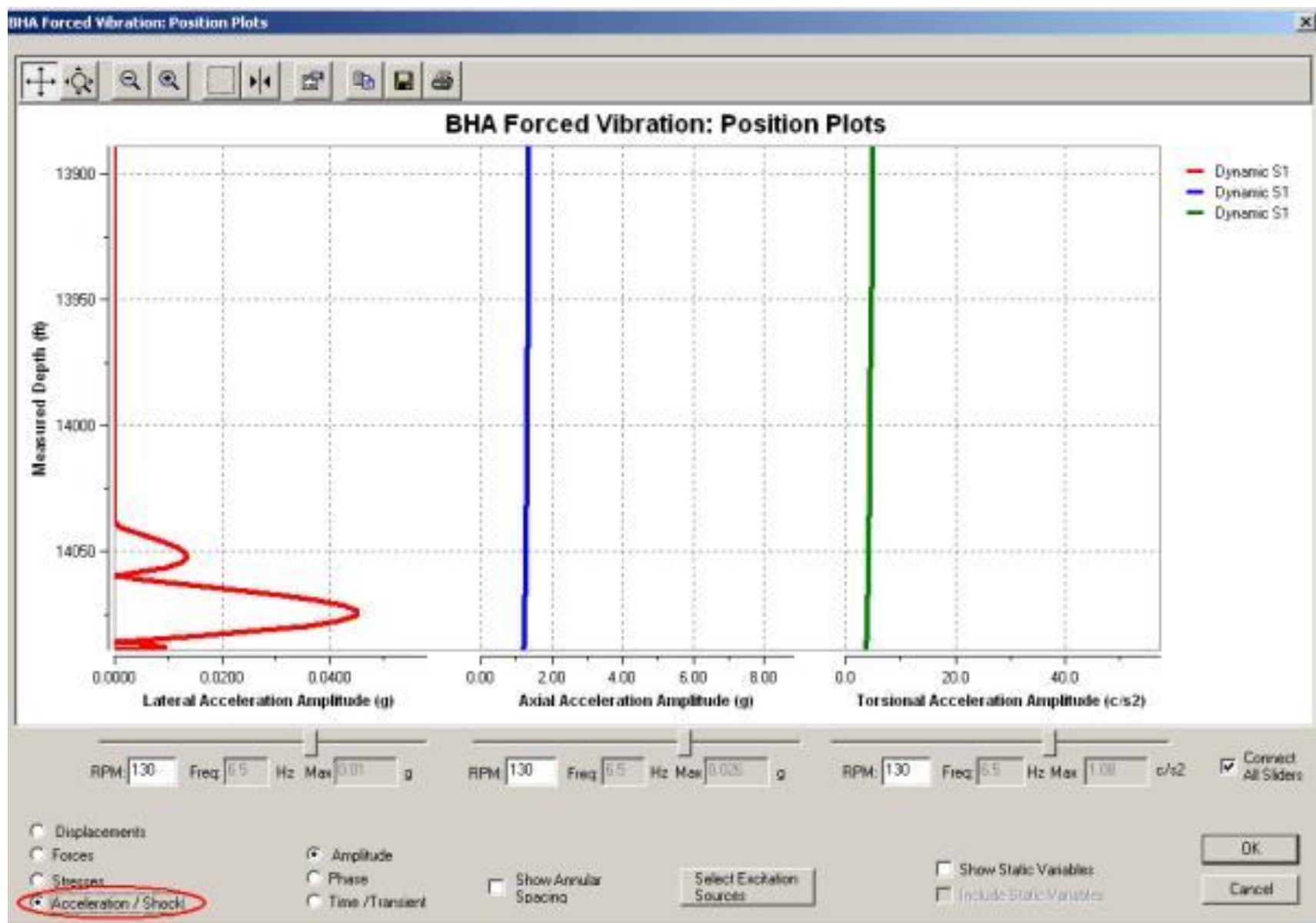
# РЕЗУЛЬТАТЫ АНАЛИЗА УСИЛИЙ ПРИ КРИТИЧЕСКОЙ ЧАСТОТЕ



# РЕЗУЛЬТАТЫ АНАЛИЗА НАПРЯЖЕНИЙ ПРИ КРИТИЧЕСКОЙ ЧАСТОТЕ



# РЕЗУЛЬТАТЫ АНАЛИЗА УСКОРЕНИЙ ПРИ КРИТИЧЕСКОЙ ЧАСТОТЕ



# РЕЗУЛЬТАТЫ АНАЛИЗА КРИТИЧЕСКИХ ЧАСТОТ ВРАЩЕНИЯ

