

## WDSS Report

Date: 19/09/96

PB/SKR

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Well no:	Operator:
<b>25/04-06 S</b>	<b>ELF</b>

### Well

Coordinates :	59° 42' 35.43" N 02° 19' 04.45" E	UTM coord. :	6619449.04 N 461620.07 E
License no :	36	Permit no :	678
Rig :	WEST VANGUARD	Rig type :	SEMI-SUB.
Contractor :	A/S SMEDVIG DRILLING CO.		
Bottom hole temp:	130 °C	Elev. KB :	22 M
Spud. date :	91.04.15	Water depth :	114 M
Compl. date :	91.08.24	Total depth :	4170 M
Spud. class :	WILDCAT	Form. at TD :	
Compl. class :	SUSPENDED. OIL/GAS	Prod.form. :	
Seisloca :	EL8802 - 110 SP 205		

### Licenseses

6.920000 NORSK HYDRO PRODUKSJON AS  
 46.904000 MARATHON PETROLEUM NORGE AS  
 6.611000 SAGA PETROLEUM ASA  
 5.541000 TOTAL NORGE AS  
 .322000 UGLAND CONSTRUCTION COMPANY AS  
 33.702000 ELF PETROLEUM NORGE AS

### Casing and Leak-off Tests

Type	Casing diam	Depth below KB	Hole diam.	Hole depth below KB	Lot mud eqv. g/cm3
CONDUCTOR	30	197.0	36	200.0	
INTERM.	20	1207.0	26	1210.0	1.75
INTERM.	13 3/8	2493.0	17 1/2	2495.0	1.84
INTERM.	9 5/8	3578.0	12 1/4	3580.0	1.98
LINER	7	4021.0	8 1/2	4170.0	2.15

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### Conventional Cores

Core no.	Intervals cored meters	Recovery m	%
1	3712.0 - 3714.2	2.2	100.0
2	3715.0 - 3733.2	18.2	100.0
3	3734.0 - 3746.0	12.0	100.0
4	3746.0 - 3774.0	28.0	100.0
5	3774.0 - 3790.4	16.4	100.0
6	3791.0 - 3819.0	28.0	100.0
7	3819.0 - 3846.2	27.2	100.0
8	3846.5 - 3873.5	27.0	100.0
9	3874.0 - 3902.2	28.2	100.0
10	4061.0 - 4070.0	9.0	100.0
11	4124.0 - 4131.1	7.1	100.0
12	4131.5 - 4134.2	2.7	100.0

### Mud

Depth	Mud weight	Visc.	Mud type
313.0	1.05	7.0	WATER BASED
717.0	1.08	8.0	WATER BASED
973.0	1.08	9.0	WATER BASED
1215.0	1.09	7.0	WATER BASED
1240.0	1.25	25.0	WATER BASED
1503.0	1.25	21.0	WATER BASED
2000.0	1.25	28.0	WATER BASED
2066.0	1.30	29.0	WATER BASED
2303.0	1.30	31.0	WATER BASED
2433.0	1.30	29.0	WATER BASED
2446.0	1.38	23.0	WATER BASED
2503.0	1.38	23.0	WATER BASED
2535.0	1.36	29.0	WATER BASED
2609.0	1.36	33.0	WATER BASED
2695.0	1.36	28.0	WATER BASED
2712.0	1.36	26.0	WATER BASED
2738.0	1.36	24.0	WATER BASED
2761.0	1.36	26.0	WATER BASED
2788.0	1.42	28.0	WATER BASED
2820.0	1.42	31.0	WATER BASED
2871.0	1.42	31.0	WATER BASED
3080.0	1.42	32.0	WATER BASED

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3184.0	1.42	32.0	WATER BASED
3376.0	1.42	28.0	WATER BASED
3414.0	1.42	22.0	WATER BASED
3429.0	1.75	45.0	WATER BASED
3470.0	1.42	24.0	WATER BASED
3591.0	1.57	27.0	WATER BASED
3608.0	1.75	23.0	WATER BASED
3650.0	1.75	31.0	WATER BASED
3700.0	1.75	31.0	WATER BASED
3712.0	1.75	25.0	WATER BASED
3733.0	1.75	28.0	WATER BASED
3746.0	1.75	29.0	WATER BASED
3774.0	1.75	28.0	WATER BASED
3782.0	1.75	29.0	WATER BASED
3817.0	1.75	32.0	WATER BASED
3854.0	1.75	32.0	WATER BASED
3886.0	1.75	35.0	WATER BASED
3902.0	1.75	32.0	WATER BASED
3930.0	1.75	34.0	WATER BASED
3976.0	1.75	40.0	WATER BASED
3999.0	1.75	34.0	WATER BASED
4022.0	1.75	43.0	WATER BASED
4039.0	1.75	40.0	WATER BASED
4062.0	1.75	44.0	WATER BASED
4072.0	1.75	44.0	WATER BASED
4112.0	1.75	41.0	WATER BASED
4131.0	1.75	40.0	WATER BASED
4147.0	1.75	38.0	WATER BASED
4170.0	1.75	35.0	WATER BASED

**Drill Stem Test (intervals and pressures)**

Test no.	Test interval meter	Choke size	Pressure (psi) WHP	BTHP	FFP
1.0	3802.0 - 3819.0	20.6	1885	5366	

**Drill Stem Test (recovery)**

Test no.	Oil Sm3/d	Gas Sm3/d	Oil grav. g/cm3	Gas grav. rel. air	GOR m3/m3
1.0	688	461700	0.82	0.73	671

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### Drill Bit Cuttings and Wet Samples

Sample type	Interval below KB	Number of samples
WET SAMPLES	210 - 4020	450

### Shallow Gas

Interval below KB	Remarks

### Available Logs

Log type	Intervals logged	1/200	1/500
ACBL VDL GR	2706.0 - 3580.0		
BHC AC DIFL CALI GR	1910.0 - 2497.0		
BHC AC DIFL GR	1207.0 - 2003.0		
BHC AC DIFL CAL GR	2496.0 - 3591.0		
CBL VDL GR	1100.0 - 2497.0		
CDM AP/4-ARM	3599.0 - 3972.0		
CDM AP/SHDT	3599.0 - 3972.0		
DIFL BHC AC GR	4030.0 - 4180.0		
DLL CAL GR	3582.0 - 4027.0		
FMT	2205.0 - 2225.0		
FMT	4131.0 - 4172.0		
FMT GR	3773.0 - 3836.0		
LS AC DIFL GR	4030.0 - 4150.0		
LS ACL DIFL GR	3582.0 - 4032.0		
RWD MD+TVD	197.0 - 4022.0		
RWD. TILH:END OF WEL	198.0 - 4022.0		

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SBT CCL VDL GR	3430.0 - 4030.0			
SYNTHETIC SEISMOGRAM				
TWO-WAY TRAVELTIME	100.0 - 4100.0			
VELOCITY LOG	1200.0 - 4175.0			
VERTICAL SEISMIC				
VSP				
VSP FIXED OFFSET				
ZCDL GR	1910.0 - 3591.0			
ZDL CN CAL GR	3582.0 - 3870.0			
ZDL CN CAL GR	4030.0 - 4180.0			

**Main operations for well: 25/4-6 S****Main operation: DRILLING**

Sub operation:	Minutes:	Hours:	% of total:
BOP ACTIVITIES	4530	75,5	4,75
BOP/WELLHEAD EQ	2520	42,0	2,64
CASING	19440	324,0	20,36
CIRC/COND	2430	40,5	2,55
DRILL	33660	561,0	35,26
HOLE OPEN	8550	142,5	8,96
OTHER	510	8,5	0,53
REAM	4110	68,5	4,31
SURVEY	240	4,0	0,25
TRIP	19470	324,5	20,40
<b>Total</b>	<b>95460</b>	<b>1591,0</b>	<b>100,00</b>

**Main operation: FORMATION EVAL**

Sub operation:	Minutes:	Hours:	% of total:
CIRC/COND	4650	77,5	9,20
CORE	5250	87,5	10,39
DST	6600	110,0	13,06
LOG	9540	159,0	18,87
OTHER	660	11,0	1,31
PROD TEST	1140	19,0	2,26
RFT/FIT	1440	24,0	2,85
TRIP	21270	354,5	42,08
<b>Total</b>	<b>50550</b>	<b>842,5</b>	<b>100,00</b>

**Main operation: INTERRUPTION**

Sub operation:	Minutes:	Hours:	% of total:
FISH	12430	207,2	43,07
MAINTAIN/REP	8550	142,5	29,63
OTHER	180	3,0	0,62
SIDETRACK	5850	97,5	20,27
WAIT	1850	30,8	6,41
<b>Total</b>	<b>28860</b>	<b>481,0</b>	<b>100,00</b>

**Main operation: MOVING**

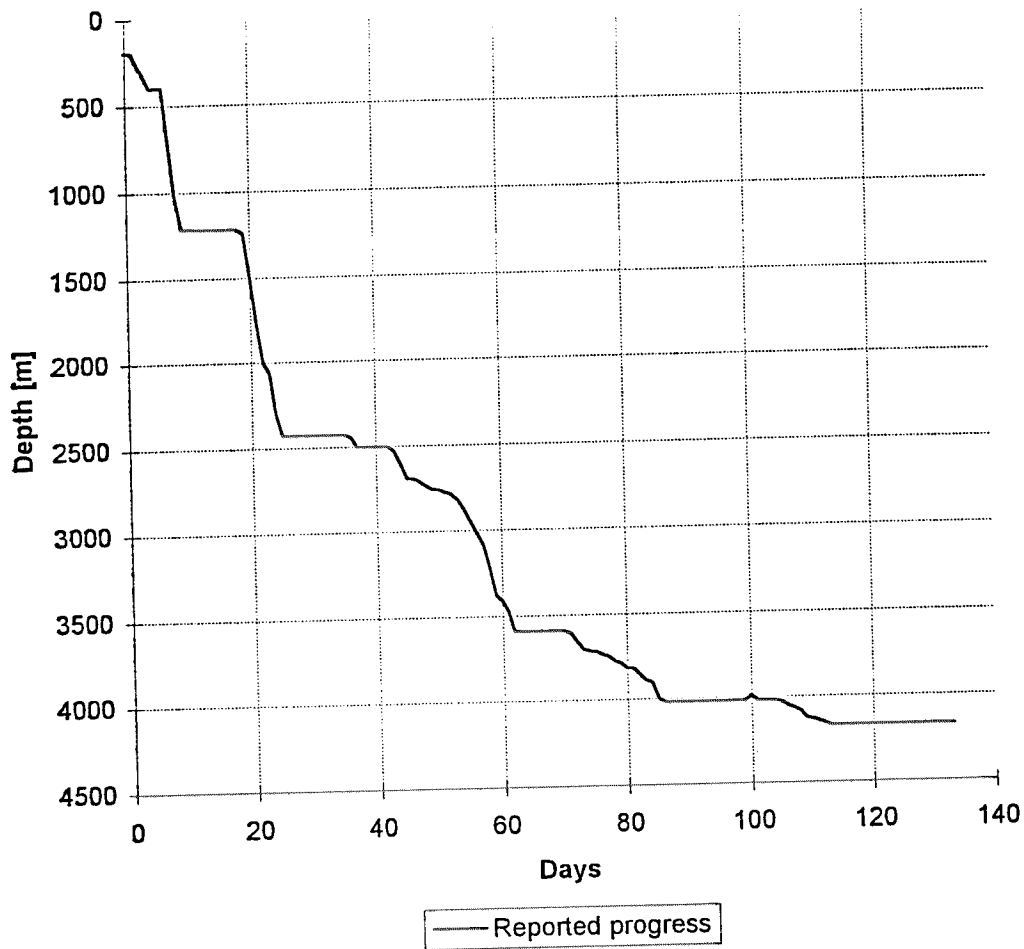
Sub operation:	Minutes:	Hours:	% of total:
ANCHOR	1590	26,5	39,26
POSITION	150	2,5	3,70
TRANSIT	2310	38,5	57,04
<b>Total</b>	<b>4050</b>	<b>67,5</b>	<b>100,00</b>

**Main operation: PLUG & ABANDON**

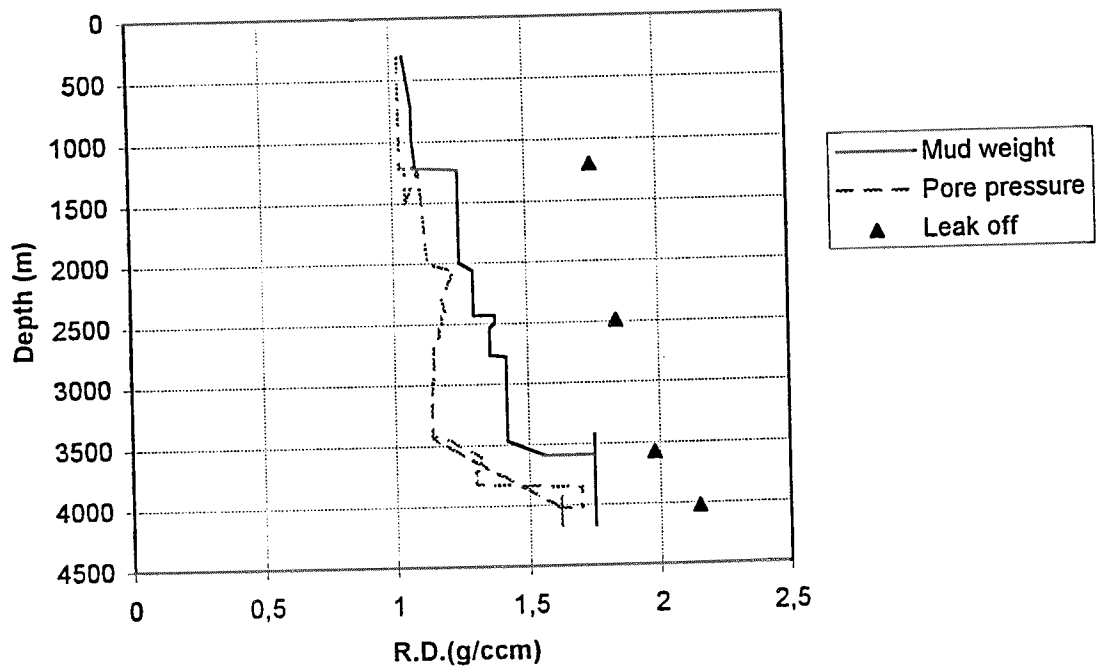
Sub operation:	Minutes:	Hours:	% of total:
CEMENT PLUG	420	7,0	6,45
CIRC/COND	90	1,5	1,38
EQUIP RECOVERY	1020	17,0	15,67
MECHANICAL PLUG	840	14,0	12,90
OTHER	540	9,0	8,29
TRIP	3390	56,5	52,07
WAIT	210	3,5	3,23
<b>Total</b>	<b>6510</b>	<b>108,5</b>	<b>100,00</b>

Total time used:  Hours

Depth vs time for well: 25/4-6 S



Composite plot for well: 25/4-6 S



# Well History 25/4-6 S

## General:

Well 25/4-6 S was planned to prove the hydrocarbon potential in a separate structure located on the northern extension of the Heimdal Ridge. The structure is located in the north-eastern corner of block 25/4 fairly close to the Heimdal, Froy and Frigg Fields. Four-way closures were mapped on all levels from the "Near top Frigg sequence" marker to the Base Brent Marker. The structure above the Base Cretaceous Unconformity consists of a fairly simple dome/ mounded feature, while the Brent Gr. and deeper sections consist of an antithetic tilted block. Structural configuration is fairly complex and controlled by at least 4 older prominent fault systems, which have been activated and/ or reactivated during three major tectonic episodes.

The main objectives of the well were:

- 1) to explore the Lower Eocene/ Palaeocene Frigg and the Heimdal Formations as secondary targets.
- 2) to explore the Brent Group as the main target
- 3) to explore the Statfjord Formation ( as a optional possible target).

Based on data from surrounding wells, no abnormal pressure was expected. To achieve an optimal position in reaching the targets the well was planned deviated. The trace was vertical through the Frigg and Heimdal prospects, and kicked off below 2600 m with a maximum angle of deviation of 22.5°.

## Operations:

Exploration well 25/4-6 S was spudded 15 April 1991, by the semi-submersible rig West Vanguard, and completed 26 August 1991 at a total depth of 4170 m RKB within Statfjord Formation. Problems during the drilling operation were: one hole opener cone were lost at 266 m RKB with junk fishing unsuccessful; at 2695 m RKB the radial bearing retainer on mud motor was lost and fishing was successful; and the FMT tool got stuck at 3836 m RKB with fishing unsuccessful. Thus, it was decided to set a cement plug on top of the tool and perform a side-track. The Lower Eocene Frigg reservoir was not found, and the Palaeocene Heimdal reservoir was water bearing. The Brent was 222 m thick and hydrocarbon-bearing over the uppermost 120 m (oil water contact at 3836 m RKB-MD). Top Brent came in at a depth of 3687 m RKB MD (37 m lower than predicted). The well was bottomed within a water bearing Statfjord Formation, 50 m below the top. A total of 12 conventional cores were cut. A total of 25 sidewall cores were attempted, and 19 were recovered. The well was temporary plugged and abandoned with a gas/ condensate discovery in the Brent Group.

## Testing:

1 DST tests was performed in the interval 3802-3819 m RKB and flowed at a rate of 461700 Sm<sup>3</sup>/d gas and 688 Sm<sup>3</sup>/d oil through a 20,64 mm choke.



# Geological Tops.

## Well: 25/4-6S.

	Depth m (RKB).
Nordland Group	197.0
Hordaland Group	976.0
Frigg Fm	2033.0
Rogaland Group	2121.0
Balder Fm	2121.0
Hermod Fm	2136.0
Sele Fm	2200.0
Lista Fm	2322.0
Heimdal Fm	2350.0
Våle Fm	2705.0
Shetland Group	2759.0
Viking Group	3571.0
Draupne Fm	3571.0
Brent Group	3716.0
Dunlin Group	3940.0
Statfjord Fm	4129.0
T.D.	4170.0