



General information





Wellbore name	1/6-3
Type	EXPLORATION
Purpose	APPRAISAL
Status	P&A
Factmaps in new window	link to map
Main area	NORTH SEA
Field	ALBUSKJELL
Discovery	1/6-1 Albuskjell
Well name	1/6-3
Seismic location	LINE SI-6 ABs SP.70-7
Production licence	011
Drilling operator	A/S Norske Shell
Drill permit	105-L
Drilling facility	ZAPATA NORDIC
Drilling days	143
Entered date	12.04.1974
Completed date	11.09.1974
Release date	11.09.1976
Publication date	02.04.2007
Purpose - planned	APPRAISAL
Reentry	NO
Content	GAS/CONDENSATE
Discovery wellbore	NO
1st level with HC, age	PALEOCENE
1st level with HC, formation	EKOFISK FM
2nd level with HC, age	LATE CRETACEOUS
2nd level with HC, formation	TOR FM
Kelly bushing elevation [m]	34.0
Water depth [m]	69.0
Total depth (MD) [m RKB]	3343.0
Bottom hole temperature [°C]	140
Oldest penetrated age	LATE CRETACEOUS
Oldest penetrated formation	TOR FM
Geodetic datum	ED50
NS degrees	56° 38' 36.4" N
EW degrees	2° 55' 49.7" E
NS UTM [m]	6277839.03
EW UTM [m]	495735.82
UTM zone	31
NPDID wellbore	241



Wellbore history

**General**

Well 1/6-3 is located on the Albuskjell Field in the southern Norwegian North Sea. The primary objective was appraisal of reservoir development in the western part of the Albuskjell field. A Danian - Maastrichtian gas condensate field had previously been confirmed by two wells (A/S Norske Shell 1/6-1 and Phillips 2/4-9) drilled farther east along the WNW - ESE trending structure. Secondary objectives were to investigate Danian Chalk prospect and possible deeper prospects.

Operations and results

Appraisal well 1/6-3 was spudded with the jack-up installation Zapata Nordic on 12 April 1974. Three sidetracks had finally to be drilled, of which the second and deepest reached 3343 m in the Late Cretaceous Tor Formation. The first sidetrack was kicked off at 314 m after unsuccessful fishing (lost hole opener). The second sidetrack was kicked off at 3022 m when it was realised that a core point had been missed so that a Danian porous zone and 37 m of Maastrichtian had not been cored. Lost circulation and stuck pipe led to the third side track, which was kicked off at 2995 m. Further lost circulation problems and the discovery that there was a break in the casing at 3140 m finally led to abandonment of the well without investigating the deeper prospects. The well was drilled with seawater down to 417 m, with shale-trol/lignosulphonate from 417 m to 1221 m, with shale-trol/lignosulphonate and lime from 1221 m to 2500 m, and with lignosulphonate and lime from 2500 m to TD. A diesel/pipe lax pill was spotted at 314 m.

As prognosed, gas was encountered both in the Danian and Late Maastrichtian Chalk. Hydrocarbons were present from Top Ekofisk at 3110 m down to an OWC at 3289.7 m in the Tor Formation. The net thicknesses were respectively 91 and 45 m. The great thickness of the Danian reservoir was in contrast to the findings from wells 1/6-1 and 2/4-9, where only a thin hydrocarbon-bearing zone was present in an otherwise tight Danian.

Eleven conventional cores were cut over the interval 3123.3 to 3343.0 m. Of these, the first core was cut from 3123.3 to 3141.5 m in the first sidetrack, cores 2 to 9 were cut from 3162.3 to 3343 m in the second sidetrack, and cores 10 and 11 were cut from 3136.4 to 3163.8 m in the third sidetrack. No fluid samples were taken on wire line.

The well was permanently abandoned on 11 September 1974 as a gas/condensate appraisal.

Testing

Two thin zones in the Maastrichtian chalk (Tor Formation) were Drill Stem Tested to obtain water samples. DST 1 tested the interval 3298 to 3299.5 m and started to produce gas, which had flown down the 7" / 8 1/2" annulus in preference to water from the formation opposite the perforations. The well was killed immediately for safety reasons. DST 2 was then attempted from the interval 3302.5 to 3304 m after a cement squeeze to shut of the annulus gas stream. The Formation proved tight and only gas cut mud was obtained. No water sample was obtained.

The hydrocarbon bearing zones were Production Tested in two intervals: PT 1 from 3227.8 to 3265.9 m in the Maastrichtian chalk (Tor Formation) and PT 2 from 3125.7 to 3166.9 m in the Danian chalk (Ekofisk Formation). PT 1 produced after acid treatment on a 28/64" choke 541000 Sm³ gas and 409 Sm³ oil /day The GOR was 1325 Sm³/Sm³, the oil gravity was 47 deg API, and the gas gravity was 0.67 (air = 1). Maximum reservoir temperature (from build up period between 1. and 2. flow period) was 137.2 deg C. Unfortunately, no successful test was made of the Danian reservoir in Test 2, from the interval 3125.7 to 3166.9 m. This was due to plugging by formation and lost circulation material from the tested interval. In this zone, the Danian consisted of very friable, fractured chalk. The well slugged badly and gave unstable measurements. Average rates were 325000 Sm³ gas and 318Sm³ oil /day, with similar fluid characteristics as in Test 1.

**Cuttings at the Norwegian Offshore Directorate**

Cutting sample, top depth [m]	Cutting samples, bottom depth [m]
405.38	3322.32

Cuttings available for sampling?	YES
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Cores at the Norwegian Offshore Directorate

Core sample number	Core sample - top depth	Core sample - bottom depth	Core sample depth - uom
1	10247.0	10307.0	[ft]
2	10357.0	10435.0	[ft]
3	10435.0	10495.0	[ft]
4	10495.0	10581.0	[ft]
5	10581.0	10665.0	[ft]
6	10665.0	10709.0	[ft]
7	10709.0	10793.0	[ft]
8	10793.0	10883.0	[ft]
9	10883.0	10968.0	[ft]
10	10290.0	10332.0	[ft]
11	10336.0	10373.0	[ft]

Total core sample length [m]	228.6
Cores available for sampling?	YES

Oil samples at the Norwegian Offshore Directorate

Test type	Bottle number	Top depth MD [m]	Bottom depth MD [m]	Fluid type	Test time	Samples available
DST	TEST1	3228.00	3266.00		20.07.1974 - 00:00	YES
DST	TEST1,1	0.00	0.00		23.07.1974 - 00:00	YES

Lithostratigraphy



Top depth [mMD RKB]	Lithostrat. unit
103	NORDLAND GP
1792	HORDALAND GP
2907	ROGALAND GP
2907	BALDER FM
2916	SELE FM
2947	LISTA FM
3110	SHETLAND GP
3110	EKOFISK FM
3229	TOR FM

Documents - older Norwegian Offshore Directorate WDSS reports and other related documents

Document name	Document format	Document size [MB]
241_01_WDSS_General_Information	pdf	0.26

Documents - reported by the production licence (period for duty of secrecy expired)

Document name	Document format	Document size [MB]
241_01_1_6_3_Completion_log	pdf	1.64
241_01_1_6_3_Completion_Report	pdf	3.27

Logs

Log type	Log top depth [m]	Log bottom depth [m]
BHC	418	1229
BHC-C	1221	3341
CBL	2134	3300
CCL	3271	3296
CDM	1221	3192
FDC CNL	2449	3342
FDC CNL	2896	3193
GR	100	418
IES	417	3341
TEMP	640	1829





TEMP	2316	3277
VELOCITY	91	3324

Casing and leak-off tests

Casing type	Casing diam. [inch]	Casing depth [m]	Hole diam. [inch]	Hole depth [m]	LOT/FIT mud eqv. [g/cm3]	Formation test type
CONDUCTOR	30	175.0	36	175.0	0.00	LOT
SURF.COND.	20	417.0	26	425.0	0.00	LOT
INTERM.	13 3/8	1220.0	17 1/2	1230.0	0.00	LOT
INTERM.	9 5/8	2446.0	12 1/4	2452.0	0.00	LOT
LINER	7	3320.0	8 1/2	3325.0	0.00	LOT

Drilling mud

Depth MD [m]	Mud weight [g/cm3]	Visc. [mPa.s]	Yield point [Pa]	Mud type	Date measured
178	1.04			seawater	
355	1.20			viscous mud	
1230	1.43			waterbased	
2452	1.73			waterbased	
3062	1.79			waterbased	
3261	1.74			waterbased	
3325	1.75			waterbased	