STATOIL

FINAL WELL REPORT
Drilling and Completion
Licence no: PL050 7 PL120 ,
Well: NO 34/10-48 S, NO 34/10-48 A,
NO 34/10-48 A T2

GF RES UHF 06 000xx

STATOIL

Title:
FINAL WELL REPORT **Drilling and Completion** **Licence no: PL050 / PL120,** **Well: NO 34/10-48 S, NO 34/10-48 A, NO 34/10-48 A T2**

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1 General well data

1.1 Well data record

The well location is illustrated in fig 1.1

34/10-48 S

Licence number:	PL050		
Licences:		Statoil (operator):	61 %
		Petoro:	30 %
		Norsk Hydro:	9 %
Licence Number:	PL120		
Licences:		Statoil (operator):	30.065 %
		Petoro:	16.935 %
		Norsk Hydro	29 %
		Conoco	13 %
		TotalFinaElf	11 %
Block number:	34/10 and 34/7		
Well designation:	34/10-48 S		
Classification:	Exploration (optional production)		
Prospect:	Topas		
Country:	Norway		
Area:	Tampen Spur		
Structure center coordinates:		Latitude:	N 61º 12' 53,802"
(at wellhead level)		Longitude:	E 02º 16' 25,925"
		UTM:	N 6 787 107,30m
			E 460 990,80m
	ED50, UTM Zone 31, CM 03º E		
Slot number:	29		
Slot center coordinates:		Latitude:	N 61º 12' 53,782"
(at wellhead level)		Longitude:	E 02º 16' 27,788"
		UTM:	N 6 787 106,37m
			E 460 018,59m
Distances:	Approx. 195 km NW of Bergen		
Drilling Unit:	Gullfaks C platform		
Drilling Contractor:	Prosafe Drilling Services / Smedvig (from 02.11.2004)		
Type:	Condeep		
RKB-MSL:	84,1 m		
Water Depth:	216,9 m		
Low riser return:	40 m RKB		
Well Path:	Deviated		
TD:	7393 m MD/2932.7 m TVD RKB		

34/10-48 A/AT2

Sidetrack from well 34/10-48 S at the 9 5/8" casing shoe.

Licence number:	PL050		
Licences:		Statoil (operator):	61 %
		Petoro:	30 %
		Norsk Hydro:	9 %
Licence Number:	PL120		
Licences:		Statoil (operator):	30.065 %
		Petoro:	16.935 %
		Norsk Hydro	29 %
		Conoco	13 %
		TotalFinaElf	11 %
Block number:	34/10 and 34/7		
Well designation:	34/10-48 A/AT2 (Sidetrack from 34/10-48 S)		
Classification:	Appraisal (optimize production)		
Prospect:	Topas		
Country:	Norway		
Area:	Tampen Spur		
Structure center coordinates:		Latitude:	N 61º 12' 53,802"
(at wellhead level)		Longitude:	E 02º 16' 25,925"
		UTM:	N 6 787 107,30m
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Distances:	Approximately. 195 km NW of Bergen		
Drilling Unit:	Gullfaks C platform		
Drilling Contractor:	Smedvig		
Type:	Condeep		
RKB-MSL:	84,1 m		
Water Depth:	216,9 m		
Low riser return:	40 m RKB		
Well Path:	Deviated		
TD 34/10-48 A:	6221 m MD/2870 m TVD RKB		
TD 34/10-48 AT2:	5878 m MD/2876 m TVD RKB		

All depths in this programme are related to m MD RKB, unless otherwise stated.

AFE # (optional)	
Drilling rig:	GFC
Licence number:	PL050 / PL120
Well name:	NO 34/10-48 S, NO 34/10-48 A NO 34/10-48 AT2
Slot:	29 (South shaft)
Type of well:	Exploration
Water depth / airgap:	216,90 m MSL / 84,10 m RT
Distance RT - LRR: (optional)	84,1 m
Wellhead / PGB: (optional)	43,1 m
Primary objective:	Primary objective is to test the hydrocarbon potential of the Brent Group in the Topas prospect,
Completion type:	Diacs with perforated liner

Section	Start time	End time	Rig name
NO 34/10-48 S 24"	09.03.2004 02:30	27.03.2004 06:00	GULLFAKS C
NO 34/10-48 S 24"	19.04.2004 05:30	21.04.2004 10:00	GULLFAKS C
NO 34/10-48 S 17 1/2"	21.04.2004 10:00	06.05.2004 20:30	GULLFAKS C
NO 34/10-48 S 12 1/4"	06.05.2004 20:30	30.05.2004 17:30	GULLFAKS C
NO 34/10-48 S 12 1/4"	02.11.2004 06:00	08.11.2004 20:00	GULLFAKS C
NO 34/10-48 S 8 1/2"	08.11.2004 20:00	22.12.2004 16:00	GULLFAKS C
NO 34/10-48 A 8 1/2"	22.12.2004 16:00	11.01.2005 12:00	GULLFAKS C
NO 34/10-48 AT2 8 1/2"	11.01.2005 12:00	21.01.2005 02:30	GULLFAKS C
NO 34/10-48 AT2 COMPL_LINER	21.01.2005 02:30	15.02.2005 06:00	GULLFAKS C
NO 34/10-48 AT2 WIREL	16.02.2005 06:00	22.02.2005 04:00	GULLFAKS C

1.2 Well objectives

The objectives of the well were to explore the Topas prospect and 3 leads. The Topas prospect is located northeast and downflank of the Gullfaks structure, in both the PL050 and PL120 licences.

1.2.1 Primary objective

The main objective of the well 34/10-48 S was to test the hydrocarbon potential of the Brent Group in the Topas prospect.

1.2.2 Secondary objectives

The secondary objectives were to test the hydrocarbon potential in 3 leads; the Nesle lead east of the Topas prospect, the U2 lead in the slope of the Gullfaks Horst and upper Jurassic at the base of the main bounding fault limiting the Gullfaks Structure to the east.

1.3 Result of the well

The well drilled into hydrocarbon filled sandstones of the Lunde Formation (the U2 lead) at 4272 m MD/2470 m TVD, while the sandstone layer at the base of the main bounding fault, at 4891 m MD/ 2800m TVD, was water filled.

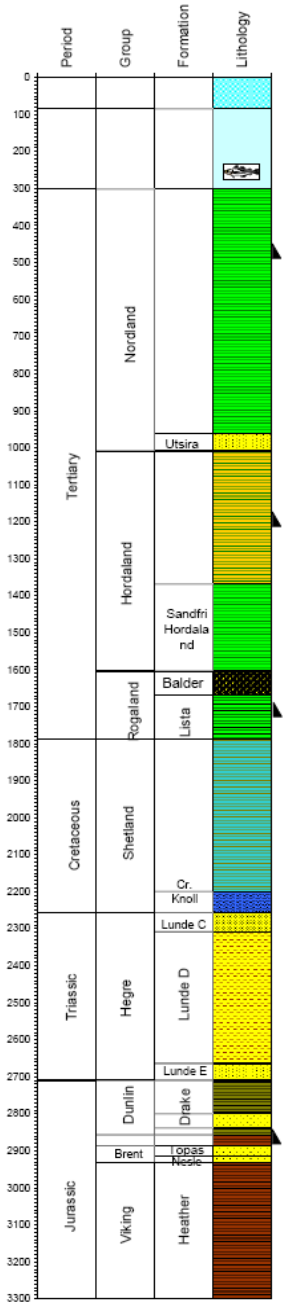
The Topas prospect was penetrated some 7.5 m shallow. The well drilled through hydrocarbon filled Tarbert Formation and into water filled Ness Formation. Since the well drilled water filled Ness, Etive and Rannoch Formations the well path was revised and the Nesle lead was drilled higher on the structure. The well drilled through some hydrocarbon filled upper Jurassic sands before entering hydrocarbon filled sands of the Ness and Tarbert Formations of the Topas prospect in the PL120 licence. The wellpath was steered down and the oil water contact was found at 7133m MD/2929m TVD RKB in the Tarbert Formation.

The preliminary results of the well 34/10-48 S indicated that the wellpath had penetrated low on the Topas structure and that the wellpath was not ideal for production. It was therefore decided to drill a sidetrack and aim as high on the re-interpreted structure as possible.

The well 34/10-48 A drilled through hydrocarbon filled sands of both Tarbert and Ness Formations before entering the upper Jurassic sequence. The well was abandoned before re-entering the Topas structure in the north, due to severe hole problems after a bit trip to change a failed drilling assembly. An open hole sidetrack was performed with kick-off in the Ness Formation at 5608 m MD. TD for the well was set at 5878 m MD/2846 m TVD in the upper Jurassic sequence.

1.4 Data acquisition summary

Licence: PL050/PL120	Data Acquisition	STATOIL
RT-MSL: 84,1 m	Gullfaks C	Made by: Magnar Saltnes
Water depth: 216,9 m	34/10-48 S/A/AT2 TOPAS	Date: 16.08.2005



	Coring	Geological Sampling	MWD/LWD and Electrical Logging
24" section	No Coring	Cutting samples were only collected in order to produce a Formation Evaluation Log	MWD: GR/Dir
17 1/2" section	No Coring	Cutting samples were only collected in order to produce a Formation Evaluation Log	MWD: GR/Res/APWD/Dir
12 1/4" section	No Coring	One set of bulk samples (5 l buckets) and one set of washed and dried samples (100 g) were collected at each interval starting from 3600m MD to TD of the well. The sample interval down to 4370m MD was 10m MD, while the sample interval from 4370m to 4700m and from 4910m to 5040m MD was 3m MD. The sample interval was 10m MD between 4700m and 4910m and between 5040m and section TD at 5105m MD RKB.	MWD/LWD: Vision Res/ADN/ISONIC/ APWD/Dir Electrical logging: GR/MDT was run due to the discovery in the U2 lead (Lunde Fm) 37 successful tests out of a total of 53 tests. 4 successful fluid samples out of 5 attempts
8 1/2" section	One core, 33m MD, was cut in Tarbert. (48 S)	One set of bulk samples and one set of dried samples were collected at 3m intervals throughout the 8 1/2" sections (48 S/A/AT2)	MWD/LWD: Vision Res/ADN/APWD/Dir (+TST6 in 48 A) Electical Logging: GR/MDT/ECS/CMR+ 32 successful tests out of 37. 3 fluid samples were collected in 48 S

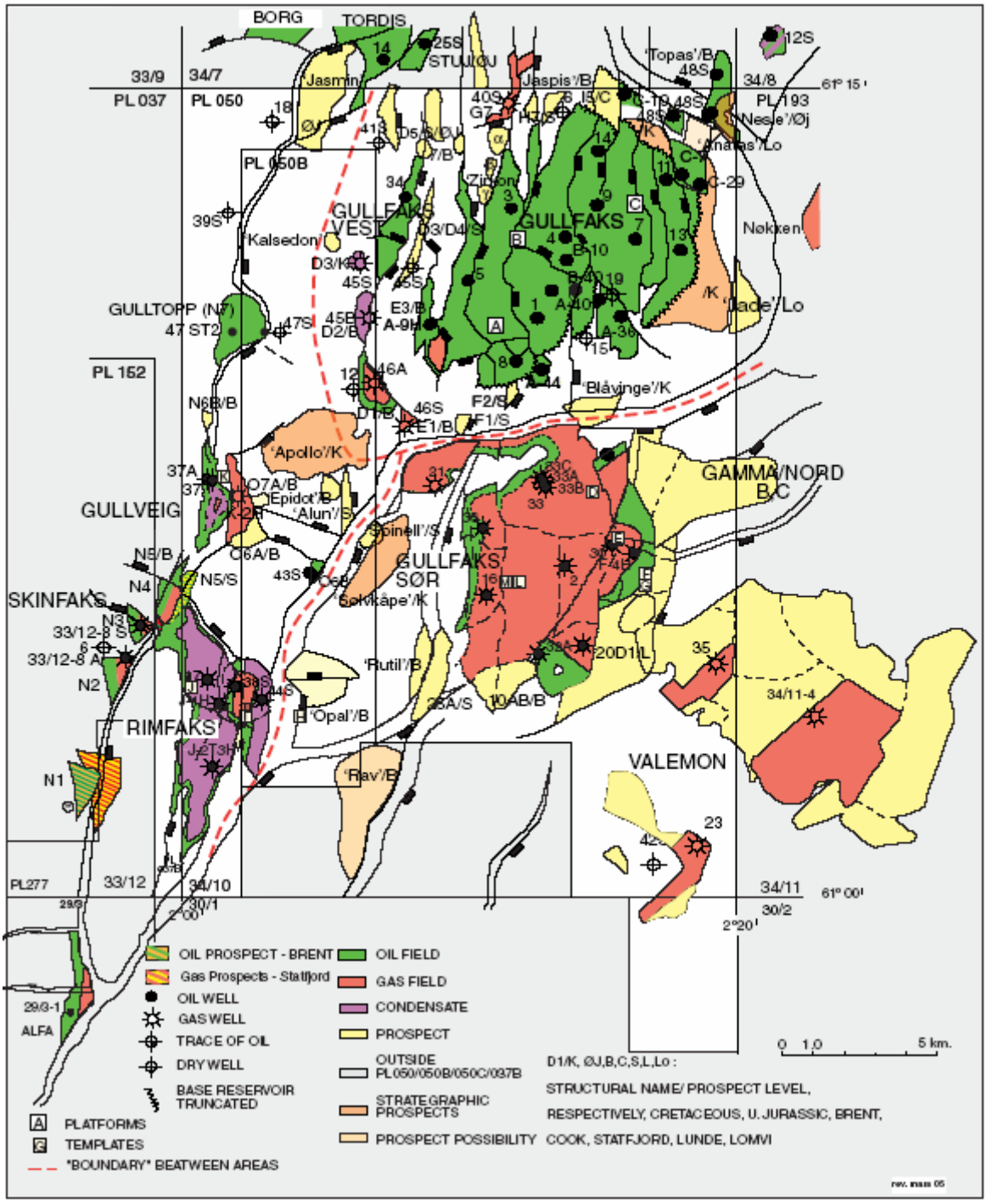


Figure 1.1: Overview map of the Gullfaks area.

2 Exemption data

Exception from	Report no	Date	Title
WR0436			Waver from BOP test interval
WR0436			Waver from BOP test interval

3 Health, environment, safety and quality (HES&Q)

3.1 RUH

Type (colour code)	Synergi code	Number of
Red	2	1
Yellow	3	1
Green	4	35
Green	5	320
Undefined		38
Sum		395

3.1.1 RUH details

WELLBORE: NO 34/10-48 A

Synergi no	Hazard	Description
290516	4	Synergi 290516 (Closed) - 26.01.2004 - Other non-conformities - 68 timer nedtid defekt lager på drive end DDM ac motor Under boring av 8 1/2" seksjon C 48A kom det ulyder fra DDM og kort etter økte momentet og den stoppet opp.Samtidig gikk det alarm på høy temperatur på drive end AC motor DDM
291446	4	Synergi 291446 (Closed) - 03.01.2005 - Other non-conformities - BOR GFC: Xceed RSS tool (CRS 34596) experienced dowhole failure During drilling of hard limestone stringers (1-2 m/hr) the Xceed RSS tool stopped working. Drilling was continued from 6075 m to 6221 m with no communication with the tool. Finally POOH at 6221 m due to lack of directional control.
291448	4	Synergi 291448 (Closed) - 05.01.2005 - Other non-conformities - GFC-BOR: Under overflatetest av MWD/Xceed tool ble de pumpet med dobbel så høy rate som planlagt. Under testing av MWD/Xceed tool ble det bedt om en pumperate på 1500 lpm. Raten viste seg å være 3200 lpm siden en pumpe ikke lå aktivt inne i boresystemet med pumpet likevel.
291675	4	Synergi 291675 (Closed) - 29.12.2004 - Other non-conformities - MWD tool failed at 5755 m. On trip in hole after changing the DDM motor, all comminication was lost during working tight hole in interval 5752 m to 5755.
289501	5	Synergi 289501 (Closed) - 22.12.2004 - Other non-conformities - BOR-GFC Dør M21 var ikke mulig å få opp. Ikke mulig å få opp dør ut fra MPA M21. Dør var kilt fast av en plast sperrekjetting . Jeg fikk ikke opp døren.

Synergi no	Hazard	Description
289511	5	Synergi 289511 (Closed) - 23.12.2004 - Other non-conformities - BOR/GFC Sen leveranse av slamkjemikalier Det ble 13/12-04 bestillt slamkjemikalier for levering med fredagsbåt 17/12-04. Pga dårlig vær har båter måttet ligge å vente på været i land, men når båttrafikken startet opp igjen uteble leveransen. Det er per dags dato ennå ikke levert. Båtene ligger nå på nytt i land å venter på været. Antatt levering er nå søndag 2/1-04. Dette er over to uker etter bestillt leveringstidspunk. Ved så store forsinkelser i kjemikalieleveransen kan det få konsekvenser for tapt rigtid og brønnsikkring.
289569	5	Synergi 289569 (Closed) - 24.12.2004 - Condition - Frosset øyeskyllestasjon Øyestasjon var frosset og kunne ikke brukes. Stasjonen står mellom M25 lager og metanoltank A. Utetemperatur var -0.5C, men stasjonen står midt i vinden.
289571	5	Synergi 289571 (Closed) - 24.12.2004 - Other non-conformities - Utladet batteri på gassmåler mpa Pga av shut down av hvac anlegget skulle MPA operatør måle gassnivå i området med manuell måler. Det viste seg at batteriet var utladet.
289573	5	Synergi 289573 (Closed) - 24.12.2004 - Other non-conformities - Shut down av hvac anlegg i D 21 mpa området Ved boring av 8 1/2" hull C 48 ble det shut down på hvac anlegget til D 21MPA området. Det var ca 15 % gassavlesning i boreslammet på samme tidspunkt. Hendelsen førte til ca 40 % lel gassavlesning i området på kontrollrommets sensorer i løpet av ti minutter.
289762	5	Synergi 289762 (Closed) - 25.12.2004 - Other non-conformities - Dårlig ventilasjon i borehytten Ventilasjonsanlegget fungerer ikke tilfredstillende i borehytta. Det er problemer med å justere til korrekt arbeidstempratur og i tillegg er det for liten sirkulasjon av luft. Dette medfører at opratørene i kontrollbuen blir trette og uoppmerksomme
289769	5	Synergi 289769 (Closed) - 26.12.2004 - Other non-conformities - BOR-GFC Feillevert 7" liner 7" liner levert som skulle leveres til GFC ble levert til GFA. På GFA ble liner som skulle til GFC levert.
290013	5	Synergi 290013 (Closed) - 27.12.2004 - Other non-conformities - Demontering av AC motor DDM Under demontering av AC motor mistet elektriker en 13 mm pipe. Pipen falt ned i området mellom motor og driveshaft på DDM. PGA mye oljemudsøl i området var det ikke mulig å lokalisere pipen
290014	5	Synergi 290014 (Closed) - 27.12.2004 - Other non-conformities - Transportskade på kobligsboks AC motor DDM Det ble registrert en transportskade på koblingsboks til AC motor da den ble pakket ut på boredekk
290092	5	Synergi 290092 (Closed) - 26.12.2004 - Other non-conformities - Merking av kalibreringsvæske til slamvekter Ved kalibrering av Halliburton mud balance tok jeg i bruk en ny/uåpnet kalibreringsvæske (brine) merket med 1.58 sg. Ved dobbeltsjekk av brinen målte denne 1.577 sg. Pga små marginer mellom loss/gain på mange av brønnene som bores bør kalibreringsvæsken merkes med 3 desimaler.
290108	5	Synergi 290108 (Closed) - 28.12.2004 - Other non-conformities - Malingsflak i miksevann i tank #29 Malingsflak ble obeservert i drill vann som har vært sirkulert gjennom hopper til tank #29.
290337	5	Synergi 290337 (Closed) - 28.12.2004 - Other non-conformities - Løse screen plugger Observerte trykkvariasjoner på mudpumpe. Det viste seg å være en screen plugg i bag-filter foran pumpen. Pluggen var hel & uskadet. Det er ikke mulig å fjerne plugg fra screen uten å ødelegge det. Det tyder derfor på at pluggen ikke var satt ordentlig inn i screenet.
290400	5	Synergi 290400 (Closed) - 26.12.2004 - Other non-conformities - Tykt boreslam i retur Den 25/12 tok Viking Energy 100 m3 viskøst boreslam i backload til CCB basen. Slammet var så tykt at rørledninger i land ble plugget.
290409	5	Synergi 290409 (Closed) - 29.12.2004 - Near miss - Slampumpe nr. 2 økte til maks hastighet av seg selv Under sirkulelering i brønnen økte plutselig pumpeslag og trykk. Slo ned pumpene på keypad. Det viste seg at pumpe nr 2 hadde økt hastigheten fra 60 slag/min til 127 slag/min av seg selv. Trykket steg fra 202 bar til 283 bar.
290436	5	Synergi 290436 (Closed) - 30.12.2004 - Other non-conformities - Skadet vaier 5 tons vinsj boredekk Det ble oppdaget defekte kordelere på vaier til 5 tons vinsj. Skaden var ca 13 meter fra kroken
290505	5	Synergi 290505 (Closed) - 31.12.2004 - Near miss - 5" NM HW dp sklei i slips 5" NMHW dp sklei i slipset, (manuelt 5" dp.slips), ved trip i hullet. 2 låsebolter for dies knakk. Boltene lå på dekk.
290595	5	Synergi 290595 (Closed) - 02.01.2005 - Other non-conformities - Reingjering av retorte Retortekammer fullt av støv/skitt

Synergi no	Hazard	Description
290693	5	Synergi 290693 (Approved) - 31.12.2004 - Other non-conformities - Drenerte oljemud til brønnhode dekk drainsystem Etter BOP test ble slange som går fra tripptank til C seksjon (C48) drenert til drain på M 17 hoved-dekk
290695	5	Synergi 290695 (Closed) - 02.01.2005 - Condition - Overlasting rørdekk Pga paralelle operasjoner brønn & bor er det lagret uforholdsmessig mye utstyr på dekksarealene GFC.Til tider kan det være vanskelig for dekksmannskapet å utføre en sikker jobb pga tilgjengelighet og oversikt
290709	5	Synergi 290709 (Closed) - 03.01.2005 - Other non-conformities - Treg ventil Ventil nr 86 på to fase line lot seg nesten ikke operere da den skulle lukkes. Lokasjon utenfor heisdør i sekkelager.
290719	5	Synergi 290719 (Closed) - 03.01.2005 - Other non-conformities - Lekkasje skilleventil 11-203MH std pipe /tofaseline pumperom Det ble registrert trykkoppbygging på linen til inj. pumpe uten at den var i bruk. Det viste seg å være lekkasj/utvasking i skilleventil 11-203MH mellom std pipe man. og tofase linen i pumperom.
291310	5	Synergi 291310 (Closed) - 03.01.2005 - Other non-conformities - Sliteplate i rotor til knuser sprakk Ved oppstart av nyinnstallert rotor i knuseren på SMACCC anlegget hørte operatør ulyder. Stoppet knuseren. Det viste seg at sliteplaten var sprukket. Noen av bruddene var "gamle".
291332	5	Synergi 291332 (Closed) - 04.01.2005 - Other non-conformities - Søl av slop på dørk, pumperom Uneder injesering av slop med injeseringspumpe, randt slop utover dørken rundt injeksjonspumpen. Det lakk ut en kuleventil på sugesiden. Mulig at den har åpnet seg pga vibrasjoner i slange som lå inntil ventilhendel.
291447	5	Synergi 291447 (Closed) - 05.01.2005 - Other non-conformities - Skade på bit breaker tang. Under utbrekking av borekrone ble spesial tang for dette benyttet, Under brekkingen skled denne tanga ut av sporet og kilt fast inn mot Xceed toolet (motoren).
291449	5	Synergi 291449 (Closed) - 01.01.2005 - Other non-conformities - Raportert feil dyser i Borekrone. Det ble raportert feil størrelse på dyse i borekrone som gikk i hullet, dette ble oppdaget ved neste tripp ut av hullet.
291676	5	Synergi 291676 (Closed) - 05.01.2005 - Other non-conformities - Injisering av Versavert OBM Måtte injisere boreslam pga plassproblem i slamtankane
291684	5	Synergi 291684 (Closed) - 07.01.2005 - Other non-conformities - dør til slamlaboratorium Går ikkje å lukke dør til slamlaboratorium. Fører til mykje støy frå miksing av slam i sekkelager, samt meir støv.
291969	5	Synergi 291969 (Closed) - 06.01.2005 - Other non-conformities - Harddisk på Geoservices server havarerte Harddisk på Geoservices server havarerte. Serveren var nede fra 06.01.05, kl. 18:45 til 07.01.05, kl. 16:00. Dette medførte at ingen tidsdata ble lagret. Data kunne heller ikke sendes til Geoservices sine arbeidsstasjoner. Data ble sendt mellom Geoservices og "Cyberbase".
292085	5	Synergi 292085 (Closed) - 09.01.2005 - Other non-conformities - Føning av krympestrømpe. Service representant fra Halliburton skulle føne en krympe strømpe på kabel. Det ble brukt så sterk varme at brannmelder ble utløst.
292089	5	Synergi 292089 (Closed) - 09.01.2005 - Other non-conformities - Løst dekksel til Draw Work Ved slip and cut ble det oppdaget at dekkselet på draw work bare var festet med tau. Det var ikke bolter der som det skal vere for å feste dekkselet
292092	5	Synergi 292092 (Closed) - 09.01.2005 - Other non-conformities - Defekt bolt på BX-elevator Ved sjekk av bx-elevator ble det oppdaget at låse mekanismen på bolten som holder bøylene på plass var defekt. Denne ble skiftet umidelbart
292530	5	Synergi 292530 (Closed) - 11.01.2005 - Other non-conformities - Ødelagt lysarmatur på D-11 topp Da kran 4 skulle sette ned en kjemikalie tank på D-11 topp ble lysarmatur truffet og knuste (litt sleng på tanken).

WELLBORE: NO 34/10-48 AT2

Synergi no	Hazard	Description
293374	4	Synergi 293374 (Closed) - 16.01.2005 - Near miss - Oljesøl i Brannpumperom, D 11 Oljesøl fra en flyttbar pumpeenhet rent ut på dørken / gangvei.

Synergi no	Hazard	Description
295068	4	Synergi 295068 (Closed) - 23.01.2005 - Other non-conformities - OD vaskeassy' større enn ID til 7" linerhanger OD til 7" vaske assy'et ble i siste liten endret fra 6,00" til 6,10" pga at største OD til kompletteringstrengen viste seg å være 6,019". Minste ID i brønnen er 6,079" i linerhanger. Vaskestrengen kunne derfor ikke kjøres til ønsket dyp. Måtte trekke vaskestrengen ut av hullet for for å bytte drift fra 6,1" OD til 6,024".
297370	4	Synergi 297370 (Closed) - 03.02.2005 - Condition - Manglende volum av tungt slam etter perforering av brønn 34/10-C48AT2. Manglet tilstrekkelig reservevolum av tungt boreslam til bruk som drepevæske. Stanset operasjonen i sikker posisjon og avventet mottak av rekvirert slam fra land.
298976	4	Synergi 298976 (Closed) - 11.02.2004 - Other non-conformities - BOR-GFC C-46 Komplettering. Lekkasje i DIACS ventil Under installering av komplettering i brønn GF C-46 holdt ikke øvre DIACS ventil lekkasjetest. Det var observert samme trykket i annulus som i tubing siden av ventilen med Roxar gauge som er installert i ventilen. Ved pumping ved 345 bar lakk DIACS ventilen 50-75 liter per minutt. Opprigging på boredekk var ikke forberedt for lekk komplettering. WL BOP måtte rigges opp for å kompansere for tap av barriære.
299026	4	Synergi 299026 (Closed) - 14.02.2005 - Accident - Klemt finger Fikk finger i klem mellom kontainerdør og verktøyskapets dør da vinden tok tak og lukket kontainerdøren.
292754	5	Synergi 292754 (Closed) - 12.01.2005 - Other non-conformities - Feilmerking av procon Oppdaget at innhold i procon tank 9122 var merket som både lime og versatrol. På manifestet var denne procon sendt ut som versatrol.
293000	5	Synergi 293000 (Closed) - 13.01.2005 - Other non-conformities - Geoservices Profibus pc havarerte. Profibus computeren til Geoservices stoppet plutselig kl. 03.42. Fikk start på den igjen kl. 03.57, men kort tid etter (kl. 04.05)stoppet den igjen. Computeren var nede frem til kl. 04.45. Dette medførte at ingen data ble registrert eller lagret i disse tidsintervallene. Data kunne følgelig heller ikke sendes til Geoservices sine arbeidsstasjoner.
293002	5	Synergi 293002 (Closed) - 13.01.2005 - Other non-conformities - Geoservices Cutting flow meter (CFM) stoppet. En av Geoservices sine fem CFMèr stoppet å virke kl. 01.00. I Mpa ble det umiddelbart startet en ny shaker med ny CFM som var ledig. Ca. tre timer senere, stoppet enda en CFM å fungere, med den følge at det kun ble målt cuttings fra en av to shakere i tidsintervallet 04.05 til 08.30. Som følge av at profibuscomputeren til Geoservices havarerte omtrent samtidig, ble det ikke anledning til å arbeide med reparasjoner av CFMène før dagskift kom på vakt. Reparasjon av utstyret ble så utført fortløpende. At en CFM ikke virker har ingen praktiske konsekvenser så lenge man har "Back up" shakere ledig.
293173	5	Synergi 293173 (Closed) - 06.01.2004 - Other non-conformities - Schlumberger ADN logging tool failed to give real time information while drilling. After running in on well 34/10-48AT2 only constant values were received from ADN. Normal values were later received for 29 hours, but then the same problem occured again. Memory data may be effected. Had no rela time ADN data.
293174	5	Synergi 293174 (Closed) - 14.01.2005 - Other non-conformities - Procon tank labelling Procon tanks are stacked very tightly on board. The tanks are labelled on one or two sides only. It is therefore many times very difficult to identify the contents of a tank.
293190	5	Synergi 293190 (Closed) - 15.01.2005 - Other non-conformities - Damaged screens 12 out of 19 new 230TRSF screens found damaged by MPA operator
293652	5	Synergi 293652 (Closed) - 17.01.2005 - Other non-conformities - Gfc/Smedvig- Utstyrs stopp. Ved make up av 7" liner jnt., sluttet torque turn computer å virke. Software problem. Nedetid 0,5 time
293659	5	Synergi 293659 (Closed) - 17.01.2005 - Other non-conformities - Bor/Gfc. Utstyrsfeil; Arbeide på DDM hindret testing. Nedetid; 1t. En paralell operasjon, overhaling av hydr. blokk til torque wrench, stoppet planlagt drift som i dette tilfellet var sammenskruing/testing av div. sikkerhetsventiler. Arbeide på to nivåer, samt kjøring av personell i tugger etc.

Synergi no	Hazard	Description
293660	5	Synergi 293660 (Closed) - 16.01.2005 - Other non-conformities - Bor/Gfc. Utstyrsfeil; IR sviktet. Nedetid; 1,5t. Ved brekking av 5" streng på vei ut av hullet, klarte ikke IR å brekke valgte connection. Under forsøk på brekking ble dies så deformert at de måtte skiftes. Tekniske vanskeligheter ved kontrollenhet av tang ga under denne operasjonen delvis stopp. Det viste seg at tidligere forsøk på reparasjon av fjernstyrings enheten til IR ikke var utført korrekt. Test av reparasjon var tidligere ikke gjennomført.
293662	5	Synergi 293662 (Closed) - 16.01.2005 - Near miss - Person gikk gjennom dører på matebord for gantry kran. BOR/GFC Person gikk gjennom barriere på matebord. Denne barrieren er merket med gjenomgang forbudt. Svingdørene (barrieren) er laget slik at gantry kran kan gå gjennom matebordet. Matebordet er fjernoperert og går over passasjen for gantrykranen. Matebordet var i drift da dette skjedde ifm tripping ut av hullet og nedlegging av BHA.
294182	5	Synergi 294182 (Closed) - 18.01.2005 - Other non-conformities - Bor/Gfc. Utstyrsfeil; Eagle stoppet. Nedetid; 0,5t. Under kjøring av Eagle falt PLS ut. Denne ble resatt.
294186	5	Synergi 294186 (Closed) - 19.01.2005 - Other non-conformities - Bor/Gfc. Ufullstendig ventil sekvens. Under operering av ventiler til TT. og flowlineventil, slo ikke ventil helt over når denne ble/blir operert fra Cyberbase. Dette medførte at det sto og lekket imellom ventilene på Shaffer unit. Unødvendig gange av nevnte unit følger. Det viser seg og at denne funksjon i perioder delvis faller ut slik at man må kjøre denne funksjon fra Bop panel.
294620	5	Synergi 294620 (Closed) - 21.01.2005 - Other non-conformities - Bor/Gfc. Nedtid 1 time. Byttet diesholdere på IR. På grunn av problemer med å gjøre opp 3 1/2" dp måtte vi bytte til mindre diesholdere.
294620	5	Synergi 294620 (Closed) - 21.01.2005 - Other non-conformities - Bor/Gfc. Nedtid 1 time. Byttet diesholdere på IR. På grunn av problemer med å gjøre opp 3 1/2" dp måtte vi bytte til mindre diesholdere.
294730	5	Synergi 294730 (Closed) - 22.01.2005 - Other non-conformities - Bor/Gfc. Utstyrsfeil; Slangebrudd PRS. Nedetid; 1t. Slangebrudd på Pipe racking arm, medførte stopp.
296033	5	Synergi 296033 (Closed) - 28.01.2005 - Other non-conformities - Kollisjon med eagle arm og åpning V door Eagle arm ble kjørt inn på boredekk i brønnsenter modus for å legge ut 6 5/8" borerør.Under utkjøring av jnt ble alarm på høy last aktivisert og eagle arm stoppet.Det viste seg at hydr. sylinder til eagle arm kom i konflikt med øvre åpning til V door
296038	5	Synergi 296038 (Closed) - 28.01.2005 - Other non-conformities - 1 time nedetid pga stopp av BOP krane sør under niplejobb Under nipleling av 13 5/8" bop stoppet bop kran sør.
296045	5	Synergi 296045 (Closed) - 28.01.2005 - Other non-conformities - Skadet festebrakett til prox DDM Ved inspeksjon av DDM ble det oppdaget skade på festebrakett til prox ifm link rotasjonass. DDM. I tillegg ble det oppdaget to knekte 6 mm bolter på ett deksel som den defekte festebrakketten hadde utløst
296054	5	Synergi 296054 (Closed) - 28.01.2005 - Other non-conformities - Brukte lang til på Slip & Cut Brukte lang til på Slip & Cut
296074	5	Synergi 296074 (Closed) - 29.01.2005 - Other non-conformities - Elektroinspeksjon Gullfaks C 2004 Gfc/Bor. For få stikkontakter i loggeunit. Altfor få stikkontakter i loggeunit. Mye dataledninger som "henger og slenger" Utstyrsrom bør utbedres
296130	5	Synergi 296130 (Closed) - 29.01.2005 - Condition - Sperringer ikke fjernet etter bruk På brønnhode dekket var det delvis sperret med rød hvit sperrekjetting. Sperringen var merket med Dalseid og Fløysand høytrykkspyling pågår.arbeidet var avsluttet tidligere på kvelden uten at sperringer var fjernet
296131	5	Synergi 296131 (Closed) - 29.01.2005 - Other non-conformities - Fallende gjenstand under nipling av 13 5/8" overshot mandrill Da klemmen til 13 5/8" overshot mandrill skulle teites opp med lufhammer ble mutter skrudd feil vei (venstre). Det resulterte i at mutter ble skrudd ut oramlet ned på lavere nivå. fallhøde ca 3 meter vekt 200 - 300 gram. Området under var sperret.

Synergi no	Hazard	Description
296224	5	Synergi 296224 (Closed) - 29.01.2005 - Other non-conformities - For sent annkommet TSR-extension. Ved mobilisering av TSR ble TSR-extension stående igjen på kaien på CCB. Denne kom først ut over 2 døgn senere, som førte til at klargjøringen av den ble gjort på rigtid. Estimert tapt tid: 14 timer
296230	5	Synergi 296230 (Closed) - 30.01.2005 - Other non-conformities - feilmontering av gun i slamtank under rengjøring av slamtank 21 ble det oppdaget at skjæreline var orientert mot skott. Det hadde resultert i begynnende utvasking av skott.
296269	5	Synergi 296269 (Closed) - 30.01.2005 - Other non-conformities - Gfc/Bor. Nedtid 2.5 timer Ned tid på PRS Øvre arm.
296630	5	Synergi 296630 (Closed) - 31.01.2005 - Other non-conformities - Gfc/Bor. Skade på kabel til blinklys utenfor boredekk. Kabel til blinklys som brukes ved wirelinekjøring var kappet i to. Skade har sikkert skjedd ifm.plasseriing av basket på utsiden av V-dør.
297012	5	Synergi 297012 (Closed) - 31.01.2005 - Other non-conformities - Utvasking bleed off ventil cmt unit Under testing av chokemanifold ble aut bleed off utvasket på cmt unit.
297127	5	Synergi 297127 (Closed) - 02.02.2005 - Other non-conformities - Gfc/Bor Sikkerhetsmelding MH.Bulletin no.SB-PH-019 Drillfloor manipulator arm. Utføre pålegg iht bulletine. no.SB-PH-019
297130	5	Synergi 297130 (Closed) - 02.02.2005 - Other non-conformities - Gfc/Bor. Sikkerhetsmelding. MH. Bulletin no.PB-PH-004 HTV/VPH Horizontal to vertical pipehandling system Utføre pålegg iht. bulletine no.PB-PH-004
297138	5	Synergi 297138 (Closed) - 02.02.2005 - Other non-conformities - Gfc/Bor. Sikkerhetsmelding. MH. Bulletine no.SB-PTD-008 Hydraulics PTD and DDM with MH Pipe handler and Torque wrench. Denne er ikke aktuell for GFC.
297218	5	Synergi 297218 (Closed) - 03.02.2005 - Other non-conformities - Løs grating matebord Det ble registrert flere delvis løse gratinger på eagle matebord.
297389	5	Synergi 297389 (Closed) - 29.01.2005 - Accident - Feil pakking av utstyr Det var pakket 6 paller med 3 karmhøyder i kontainer AMB 605 og AMC 163 fra land. Dette førte til masse ekstra arbeid for å skjekke ut utstyret. (Det var ikke skikkelig skille mellom pallene)
297630	5	Synergi 297630 (Closed) - 03.02.2005 - Other non-conformities - Std hengende i PRS 3 meter over rkb med opratør stol i modus 1 Det ble prøvekjørt med 6 5/8" kick std for å se om det var nok høyde for innskruing i stick up RKB.Jaw til nedre gripehode ble brukt for å få nok høyde.Std ble løftet ca 3 meter over RKB og deretter ble stolen lagt i modus 1(av) pga crewskifte
297742	5	Synergi 297742 (Closed) - 05.02.2005 - Other non-conformities - Saksesplint i bolt Under daglig inspeksjon av skiver til kontroll liner, fant man en saksesplint som var meget dårlig. Splint var jevnt med bolt på en side, mens litt stod igjen på andre siden. Skiftet splint.
297775	5	Synergi 297775 (Closed) - 07.02.2005 - Other non-conformities - Sjakkel uten sikring i boretårn Det ble funnet en opphengsvaier i bjelke over Prs arm (tårnstruktur) der det manglet sikring i sjakkel
297776	5	Synergi 297776 (Closed) - 03.02.2005 - Other non-conformities - Feil Jaws i nedre prs hode 6 5/8" dp std ble løftet frem vha aktivisert jaws i nedre prs hode. Jaws ble brukt for å få nok høyde til stick up i rkb.Ved nærmere ettersyn ble det oppdaget at hodet var dresset f/2 7/8" t/ 4 1/2"
297778	5	Synergi 297778 (Closed) - 07.02.2005 - Other non-conformities - Avslitt kontroll-line under tbg kjøring Da DDM ble kjørt opp i tårnet for å hente en ny jnt har sannsynlivis kontroll - line for trykk/tempratur (Roxar) hengt seg opp i DDM og blitt slitt av. Åstedsbefaring ga ingen klar indikasjon på årsaken.
298119	5	Synergi 298119 (Closed) - 07.02.2005 - Other non-conformities - 6 timer nedtid Defekte fjærer i eagle gripehode Da eagle arm sto i parkert stilling ble det observert at den ene kloen ikke lukket seg.I hver gripeklo er det en fjærpakke som hindrerat klørne åpner seg ved bortfall av hydraulikk. 10 av 18 fjærer var defekt
298191	5	Synergi 298191 (Closed) - 07.02.2005 - Near miss - Taking av mudvekt - sprut av brine i ansiktet Skulle hjelpe Halliburton finne ut hvilken væske som lakk ned i tanken deres. Fylte opp mudvekten nesten full - dette fungerer bra med slam fordi man slipper å pumpe så mye - men fordi brine er tyntflytende sprutet det ut toppen på ventilen i lokket på mudvekten. Hadde vernebriller på, men fikk brine i ansiktet.

Synergi no	Hazard	Description
298339	5	Synergi 298339 (Closed) - 08.02.2005 - Other non-conformities - Dårlige lysforhold i boretårn HMS møte for bor 8. febr. ble det tatt opp at det var for dårlige lysfohold i boretårnet. Ved nattestider kan det være vanskelig å se elevator både i kamera og fra eaglebu. Generellt er dagens lysforhold i tårnet for dårlig.
298909	5	Synergi 298909 (Closed) - 14.02.2005 - Other non-conformities - Screen i pappemballasje Nye toppscreen stod innpakka i pappemballasje i vifterom, D21 MPA
299014	5	Synergi 299014 (Closed) - 11.02.2005 - Near miss - Sikringswire. Det ble oppdaget en feilmontert sikrings wire som var lagret i skap for verktøy som skal brukes i høyden på boredekk. Det var benyttet skrustikke over presshylsen ikke presshylsetang.

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Synergi no	Hazard	Description
288576	2	Synergi 288576 (Approved) - 17.12.2004 - Near miss - Bor/Gfc. Styretau hang seg fast i anhuker ved løft av hiv. Arbeidssituasjon; Man skulle løfte en aksling (ca. 5 m. lang) fra M21T til pipedekk. Det var valgt å bruke styretau på hiv, grunnet trang/smal passasje i området. Da hiv ble løftet festet styretauet seg til anhukers ene ben. Anhuker registrerte dette og grep fatt i tauet med begge hendene, for å oppnå kontroll over situasjonen. Han fulgte således med hivet opp, til signalgiver varslet kranfører over radio om uønsket last. Antatt høyde på mann i tau; 6 -7m. Kranfører satte umiddelbart mann i tau kontrollert ned på dekk. Ingen skade på personell. Vindstyrke: 38 knop fra nord. Plattformsjef og SHL bler varslet like etter og det ble tatt en enkel gjennomgang av hendelses forløp. Den involverte følte ingen skade eller behov for å oppsøke sykepleier. Hendelsen er varslet, i eget system og til "Petil" (petroleumtilsyneti systemet) iht rutine. Hendelsen vil bli gransket SHL Rene 18.12.04 Sammendrag / Konklusjon fra granskningsrapport Den 17.12.2004 om kveld skulle en 6 m lang drivaksling forflyttes fra sveiseverksted M21topp til rørdekk D31. I den forbindelse monterte dekksarbeider1/anhuker styretau på akslingen for deretter å beordre løfting av hivet. Værforholdene tilsa at det utvistes ekstra forsiktighet på grunn av sterk vind. I det løftet var klar av hindringer, overtok kranfører kontroll og økte hastigheten, samtidig som anhuker trakk seg tilbake. I samme øyeblikk festet styretau seg rundt foten til anhuker slik at han fulgte med kranhiv 7 meter opp over dekk. Løftet ble stoppet av signalmann og person ble låret ned til dekk uten fysiske skader. Umiddelbart etter hendelsen ble det avholdt møte mellom ledelsen og involvert personell. De vurderinger som er gjort med henhold til bruk av styretau er anerkjent som god praksis i bransjen. Statoils Beste Praksis 3.6.11og Norsok Standard understøtter valg av løsning. Imidlertid viste det seg at rollene som anhuker og signalmann ikke er trent godt nok inn iht Statoil Beste Praksis. I denne hendelsen har både anhuker og signalgiver fokus på hivet, og er ikke tilstrekkelig oppmerksom på enden av styreline. Anbefalte tiltak på kort sikt er å styrke systematikken i kommunikasjon mellom personell som jobber med løfteoperasjoner ombord på installasjonen, og opprettholde / øke kunnskapen om regelkrav og retningslinjer. Temamøter / inndrilling bør gjennomføres planmessig uavhengig av aktivitetsnivå for å opprettholde fokus på løfteoperasjoner og den enkeltes ansvar og roller. Der ble ingen skadet under situasjonen. Personen hang godt fast i styretauet oppe i luften ref ham selv og rekonstruksjon. Dersom personen ikke hadde klart og tatt rundt styretauet med hendene, ville han blitt dradd i bakken, og mulig blitt dradd med bortover noe langs dekk. Mest sannsynlig ville styretauet ha løsnet fra foten pga større åpen vinkel på tauet i den stillingen han ville være med å ligge på bakken. Se pkt 3.3 vekting av hendelsen. Anhuker = Anhukeren skal være ansvarlig for huking og avhuking av stropper til og fra lasten og til og fra krankrok eller løftekomponenter, samt for melding til signalmann når lasten er klargjort for løfting med kranen. Signalmann = Signalmannen skal være ansvarlig for overføring av signaler fra anhuker til kranfører, og for å igangsette og dirigere sikker bevegelse av kranen og kroklasten. Signaler skal være standardisert og i henhold til Bilag C til denne standard. Før starten av en løfteoperasjon skal signalmannen forsikre seg om at lasten(e) kan håndteres sikkert. Signalmannen skal til alle tider være i visuell- eller radiokontakt med kranfører, og med anhukeren ved begynnelsen og sluttfasen av løftet.

Synergi no	Hazard	Description
286157	3	Synergi 286157 (Closed) - 04.12.2004 - Near miss - Elektrisk kortslutning av avkappet kabel til lysarmatur i MPA på grunn av vann fra sprinklerhode Det ble observert ett kraftig lysglimt og smell ifra kabelgaten til lysarmatur "EA-AA-19" 16-EL 10-07. Denne ligger like utenfor MPA operatør bua. Kabelen var kappet, men ikke frakoplet slik at den lå med spenning på. En defekt sprinklerdyse var under reparasjon. Dette førte til vannsprut som førte til kortslutningen.
91893	4	Synergi 91893 (Closed) - 12.05.2004 - Other non-conformities - BOR-GFC / PowerDrive failure no.1 / Schlumberger D&M The PowerDrive CU996 was picked up, tested and run in hole to drill out of 13 3/8" casing and down to TD in one run. At 3679 meters, the PowerDrive showed no response to 45°/40% setting. Took check survey at D&I depth 3695 meters, bit depth 3710 meters in order to verify the continuous readings. At 3710 meters the PowerDrive was set to 39°/80%, still no visible response. At D&I depth 3703 meters, bit depth 3717 meters, the survey showed no change in direction. Another 6 meters was drilled in 39°/80% setting, before at 3723 meters the PowerDrive was set to 53°/100%. Still no visible response. New survey was obtained at D&I depth 3731 meters, bit depth 3745 meters. Discussed problem with both DD's, both geologists, both client reps. and the FSM. Decision was taken to drill another 10-15 meters and take a check survey. This survey showed no/negligible change in direction. Decision was made to pull out of hole.
93063	4	Synergi 93063 (Closed) - 15.05.2004 - Other non-conformities - BOR-GFC / PowerDrive failure no.2 / Schlumbeger D&M The PowerDrive CU331 was picked up as a back-up tool for the previous CU996, which had failed at 3759 meters after 101 hours of drilling on previous run. As per procedure, the tool was surface tested by pumping mud through and it was visually confirmed that the pads was being forced out one-by-one in a counter-clockwise manner by the mud pushing on the pistons located behind the pads. When starting drilling, after having set the PowerDrive, the tool did not steer the well in the desired direction. As a part of the setting procedure, one receives coded data sent back from the tool for confirmation of setting. This confirmation was received and found to be correct before starting to drill. However, when monitoring the behaviour of the PowerDrive/BHA for the first 15 to 20 meters, one found the well continuing straight ahead and not turning as planned.
93078	4	Synergi 93078 (Closed) - 18.05.2004 - Condition - BOR-GFC / Høyt støynivå ifm. SMACCC / Prosafe Det er meget høyt støynivå i nedre MPA under reinjisering av borekaks. Det er mulig å kjøre tilsvarende anlegg uten et så høyt støynivå.
117257	4	Synergi 117257 (Closed) - 27.05.2004 - Other non-conformities - BOR-GFC / Overflødig preservering på 9 5/8" forlengelsesrør / Statoil Ved undersøkelse av 9 5/8" liner, ble det oppdaget at det var mye overflødig preservering inni rørene - mest sannsynlig lagringspreservering fra base. Dette er ikke heldig, det kunne medført problemer dersom en skulle gått i brønnen med traktor e.l. i etterkant.
264307	4	Synergi 264307 (Closed) - 05.05.2004 - Condition - GFC-BOR / Broken doorcloser on door / Schlumberger The door closing hinge om door at the bottom of the stairwell in D11 module, giving access between bulk powder room and stairwell is broken. The door does not auto close when shot, and can be left open.
264353	4	Synergi 264353 (Closed) - 06.05.2004 - Condition - BOR-GFC / Inspeksjon i matebordåpning uten nødstopp aktivert/ MH Kontrollør utførte inspeksjon av matebordåpning uten at nødstopp / elektrisk utstyr var aktivisert/avlåst

Synergi no	Hazard	Description
264639	4	Synergi 264639 (Closed) - 08.05.2004 - Near miss - BOR-GFC / Fallende gjenstand: Bolt til klammer på standpipe / Prosafe Det ble funnet 2 stk avbrukkete bolter med mutter: Den ene ble funnet på boredekk like foran borehytte, den andre på grating ved inngang til boredekk. Boltdelene stammer fra klammer til standpipe. At den ene ble funnet ved inngang til boredekk indikerer at den har truffet bjelke o.l i fallet og forandret retning slik at den landet på utsiden av boretårn. De avbrukkete boltene stammer fra klammer som fester standpipe til konstruksjon. Klammer fester standpipe med fire bolter; to bolter på hver side av standpipe, hvor to av boltene også er festet til konstruksjon. Klammer kunne ikke falt ned med mindre det oppsto brudd av alle 4 boltene. Befant seg ikke personell i umiddelbar nærhet av området når avbrukkete boltdeler falt ned på og utenfor boredekk da ingen har observert fallet. Data: Fallhøyde: ca 13,00 m (14,80 meter minus 1,70 m) Vekt boltdel nr 1: 130 gram Vekt boltdel nr 2: 92 gram Boredekk ble sperret av når avbrukkete bolter med muttere ble funnet, og holdt sperret inntil det ble oppklart hvor de kom ifra og nye bolter montert. Det ble montert to nye bolter da en av de andre boltene var løs og ble skiftet ut.
264976	4	Synergi 264976 (Closed) - 10.05.2004 - Near miss - BOR-GFC / Kran kolliderte med rekkverk utenfor Smaccc / Statoil I forbindelse med at tom tobbe for big bags skulle landes på plattform utenfor smaccc sørside, hadde kran for lav høyde ved innsving til plattform. Dette medførte at tobbe kolliderte med rekkverk. Kranfører løftet tobbe lengre opp og landet inne på plattform. Kranfører informerte Prosafe personell om hendelsen. Ved inspeksjon viste det seg at ett bein var knekt og brist i de to andre. Vindhastighet ca. 40 knop.
283128	4	Synergi 283128 (Closed) - 19.11.2004 - Other non-conformities - Kontrollmåling av 5" dp Ved kontrollmåling av 5 " rør som hadde vært i hullet ble det oppdaget at en jnt var skrevet inn med lengde 15,52, men realiteten var 13,62 meter. Etter endelig kontrollmåling av var avviket på 2.03 m.
284225	4	Synergi 284225 (Closed) - 22.11.2004 - Other non-conformities - Power Drive Xceed failed w/drilling Power Drive Xceed stopped sending data to MWD tool while drilling at 5995 m. Drilled ahead until MWD survey confirmed Xceed had stopped steering. POOH at 6057 m.
286215	4	Synergi 286215 (Closed) - 06.12.2004 - Accident - Kutt i langfinger høyre hand Ved olje telling i MPA. Skulle det snues en 10L. Oljekanne for å kunnne se etikett. Ved denne operasjon forskjøv en annen seg, da dennne skulle rettes på kom hand borti en skarp kant.
287326	4	Synergi 287326 (Closed) - 04.12.2004 - Other non-conformities - Bor/Gfc. Utstyrsfeil; Nedihullspumpe feilet. Nedetid; 67,5 t. Nedihullspumpe feilet under bruk på formasjonsprøve; 5165m. Pumpet fra formasjonen i ca. 5 min; Fikk elektrisk kortslutning i pumpe.
287328	4	Synergi 287328 (Closed) - 08.12.2004 - Other non-conformities - Bor/Gfc. Utstyrsfeil; Lokomotiv latchet ikke på. Nedetid; 52,5t. Lokomotiv under TLC run ville ikke latche på docking head i streng. Etter flere forsøk ble det bestemt at man trakk ut av hullet og sjekket tool. Det viste seg at docking head var bøyd, slik at lokomotiv ikke entret docking stasjonen.
287440	4	Synergi 287440 (Closed) - 12.12.2004 - Other non-conformities - Bor/Gfc. Lekkasje gjennom ventil II-HV 754. Vi lager premix i 27A (pit). Når denne skjæres oppstår der en lekkasje fra pit 27A til pit 21/22. Ventil II - HV 754 holder ikke tett. Pga av denne lekkasjen er det begrenset i hvilken grad man benytte seg av pit 27.
46528	5	Synergi 46528 (Closed) - 26.05.2004 - Other non-conformities - BOR-GFC / Vinsj problemer / Schlumberger Ved logging av 34/10-48S, ble det observert at Schlumbergers kabeltrommel svingte sideveis - ukontrollert ved kabeldrag over 2000 lbf. Dette ved ytterkant på hvert lag.

Synergi no	Hazard	Description
70796	5	Synergi 70796 (Closed) - 13.05.2004 - Other non-conformities - BOR-GFC / Nedetid grunnet feilsøking PLS system for SCR tavle / Prosafe Foretok feilsøking pga. feil med kommunikasjon på PLS-system til SCR-tavle for hovedstyring av krafttilførsel.
91311	5	Synergi 91311 (Closed) - 14.05.2004 - Other non-conformities - BOR-GFC / Dårlig forebyggende vedlikehold / Prosafe Da stand skulle brekkes og settes tilbake , var det problemer med brekking i DDM. Årsaken til dette var at det ble backreamet ut av hullet etter at forrige seksjon var ferdig boret med KCl-slam. Røret har stått i tårn og ikke blitt rengjort og dopet etter backreamingen.
92782	5	Synergi 92782 (Closed) - 14.05.2004 - Other non-conformities - BOR-GFC / Isonic + tool checked on rigfloor / Schlumberger D&M The Isonic tool was programmed to power and memory save mode prior to PU. A timer device was set to turn on the tool after 8 hrs when RIH. After MUof BHA with the MWD and LWD tools, the tools were tested. It was noted that the Isonic tool behaved differently from previous experience. No sound emission was noted from the tool. The tool was plugged into to verify its programming. The power and memory saving mode was turned off. Tool was tested. Everything was found correct. Tool was set in power and memory saving mode. The tool was run into hole.
93035	5	Synergi 93035 (Closed) - 16.05.2004 - Other non-conformities - BOR-GFC / Vision 825 Resistivity tool failed shallow hole test / Schlumberger D&M After making up the BHA, a shallow hole test was performed. The tool failed this test. It was attempted to reinitialize the tool. Everything looked ok, but again the tool failed on its shallow hole test. A new tool was then picked up.
93071	5	Synergi 93071 (Closed) - 18.05.2004 - Condition - BOR-GFC / Tobber på rømningsvei / Prosafe Backupsystemet på SMACCC består av tobber med big bags oppi. Disse er plassert på rømningsvei i mangel på annet egnet sted.
93077	5	Synergi 93077 (Closed) - 18.05.2004 - Condition - BOR-GFC / Skrue på dørk i MPA / Prosafe Skrue som i sin tid ble montert ifm. backupsystemet på SMACCC-anlegget er ikke lenger i bruk. Unødvendig at personellet til stadighet må tråkke over denne når den ikke lenger er en del av systemet.
93085	5	Synergi 93085 (Closed) - 12.05.2004 - Other non-conformities - BOR-GFC / Problemer med BOP testeplugg / Statoil I forbindelse med installering av testeplugg oppstod det problemer med å sette pluggen skikkelig. Det lakk forbi testeplugg og denne ble trukket igjen for inspeksjon. Ble funnet ok. Gikk i hullet igjen. Fikk da problemer med å passere annular med pluggen. Måtte fjerne masterbushing, legge på ekstra vekt m.m. for å klare å passere og lande plugg skikkelig. Antas at dette skyldes skjevt brønnhode på denne slissen.
93652	5	Synergi 93652 (Closed) - 18.05.2004 - Other non-conformities - BOR-GFC / Lekk wash pipe / Prosafe Under boring av 12 1/4" seksjon oppstod det lekkasje i "wash pipe". Stopp for å skifte denne medførte 0,5 time nedtid.
96150	5	Synergi 96150 (Closed) - 20.05.2004 - Other non-conformities - BOR-GFC / Lekkasje på "wash pipe" / Prosafe Under boring av 12 1/4" seksjon oppstod det lekkasje i "wash pipe" etter 31 timer bruk. Stopp for å skifte denne medførte 0,5 time nedtid.
96499	5	Synergi 96499 (Closed) - 19.05.2004 - Near miss - BOR-GFC / Operatør tråkket over / Prosafe Under arbeid på pumpe i D21, tråkket en operatør over. Fikk senere på kvelden noe smerter i foten, og gikk derfor til sykepleier for å få sjekket foten. Foten ble iset ned, og smertene forsvant dagen etter.

Synergi no	Hazard	Description
97441	5	Synergi 97441 (Closed) - 22.05.2004 - Near miss - BOR-GFC / Mangel på kjeledresser / Prosafe Det er fortsatt et problem med for lite kjeldresser i forhold til bruk. Det har blitt skrevet flere RUH'er på dette i den senere tid, uten at dette har nyttet. Det ser ut til at dette problemet er størst i perioder med mange helligdager. I perioden 08.05 - 20.05.04 ble det sendt inn 5 forsendelser med skitne kjeledresser, mens det i samme periode bare ble motatt 2 forsendelse fra vaskeriet. Sendt: 20.05.04: AMB 578 / Shipment 68497 15.05.04: MD162 / Shipment 68117 13.05.04: S-3188 / Shipment 67948 11.05.04: AMB2226 / Shipment 67809 08.05.04: AMB963 / Shipment 67599 Motatt: 14.05.04: AMB 578 / Shipment 68116 12.05.04: MD162 / Shipment 67598
97466	5	Synergi 97466 (Closed) - 22.05.2004 - Near miss - BOR-GFC / Løs gjenstand funnet i boretårn / Prosafe Under kontroll av utstyr i boretårn ble det oppdaget en løs sjakkeldel hengende rundt wire i "motvektsbøtte" over sylinder for riggtang over fingerbordnivå. Sjakkelen manglet bolt, det var kun selve bøylen igjen. Denne sjakkelen stammer fra en gammel kasteblokk. Når en har fjernet denne, har en ikke gjort jobben skikkelig. Det var ikke fare for at sjekkel kunne ha falt ned på boredekk, ettersom den var avhengt på innsiden av bøtten. Den hang i wire, ca 30 cm over bunn inni bøtten.
97486	5	Synergi 97486 (Closed) - 21.05.2004 - Other non-conformities - BOR-GFC / PowerDrive failure no.3 / Schlumberger D&M At 5105 meters, one had to terminate the drilling in order not to miss target T1 due to this lack of build. At surface the PD was tested with 2500 lpm and 2 of the 3 pads had failure.
99221	5	Synergi 99221 (Closed) - 23.05.2004 - Other non-conformities - BOR-GFC / Usikkerthet rundt forbruk av baseolje / M-I Swaco Norge Avlest forbruk av baseolje fra kontollrom samsvarer ikke med forbruk registrert av slamingeniør.
99227	5	Synergi 99227 (Closed) - 23.05.2004 - Other non-conformities - BOR-GFC / Plugging av pit / M-I Swaco Pit 26 ble plugget pga sølevann blir blandet med kakse slurry. Dette medførte forbruk av 10 m3 med versavert OBM høg viskositets mud til pit 26.
107273	5	Synergi 107273 (Closed) - 26.05.2004 - Condition - BOR-GFC / Nødlykt funnet / Prosafe Det ble funnet en ødelagt nødlykt liggende i en pose i kafferom. Uvisst hvor denne hører hjemme.
113384	5	Synergi 113384 (Closed) - 22.05.2004 - Other non-conformities - BOR-GFC / Trouble shooting on logging equipment / Schlumberger WL Trouble shooting on power to logging string resulted in 2,5 hrs operational downtime. Found problem to be moist in bulk head connection.
116591	5	Synergi 116591 (Closed) - 26.05.2004 - Condition - BOR-GFC / MWD basket / Schlumberger Schlumberger MWD utstyr kom ut i 16 meter lang basket (S8B1501) . Lengste del som skal oppi denne er 10 m. Det er unødvengig å sende ut en så overdimensjonert basket. Det er såvidt plass til denne på rørdekket.
116619	5	Synergi 116619 (Closed) - 26.05.2004 - Condition - BOR-GFC / Opereringshåndtak til ventil funnet / Prosafe Håndtak for operering av ventil på brannvannssystem ble funnet på D-11T, nordside.
116641	5	Synergi 116641 (Closed) - 27.05.2004 - Near miss - BOR-GFC / Lekkasje på hydr. slange / Prosafe Det oppstod en liten lekkasje på en hydraulisk slange til stabbing arm på boredekk.
116646	5	Synergi 116646 (Closed) - 26.05.2004 - Near miss - BOR-GFC / Person ble svært tilgriset med slam / Prosafe Ved uttrekking av borerør, stod boredekksarbeider klar til å 'dope' da det plutselig kom en stor sprut med oljebasert boreslam ut av strengen (selv om det hadde blitt pumpet slug). Boredekksarbeider ble tilgriset med slam.

Synergi no	Hazard	Description
117261	5	Synergi 117261 (Closed) - 27.05.2004 - Accident - BOR-GFC / Trykkoppbygging på stand pipe / Prosafe Etter fylling av 9 5/8" foringsrør (ca 10 min. etter siste fylling) ble det oppdaget trykkoppbygging på stand pipe nr 1 av slamlogger. Boredekk ble varslet når trykket var rundt 230 bar og en fikk stoppet mudpumpe #3 som stod på skjæring ettersom en trodde det var den som forårsaket trykket. Omtrent på samme tidspunkt fikk en alarm på mudpumpe #2 og denne slo seg ut på overstrøm. Trykket var på det meste 383 bar. I ettertid viser det seg at det var MP#2 som mest sannsynlig har forårsaket trykket - pumpen har ikke stoppet helt etter siste fylling selv om indikator på Cyberbase på boredekk viste 0 slag/min.
121656	5	Synergi 121656 (Closed) - 28.05.2004 - Other non-conformities - BOR-GFC / Problemer med å tømme trip tank / Prosafe Under kjøring i hull med liner, oppstod det problemer med å tømme trip tank. MPA opratør fikk etter å ha kjent på ventil ut fra tanken mistanke om at gummi e.l. sperret. Det ble besluttet å tømme tanken helt og entre denne for å finne årsaken. Det ble funnet 2 gummideler fra annular preventer.
123925	5	Synergi 123925 (Closed) - 28.05.2004 - Accident - BOR-GFC / Løst lager på casing tang / OWS Under nedrigging av casing tang skulle hjul settes i parkeringsstilling, falt hjulet av. Grunnen var at bolt på stopp-ringen for lageret manglet. En vet ikke hvor lenge denne bolten har manglet.
146177	5	Synergi 146177 (Closed) - 20.05.2004 - Other non-conformities - BOR-GFC / Lekkasje på slangestasjon / Statoil Terasse ved trappeleider som fører til M21, dvs terasse som er over utgangen til dekk fra 7 etg boligmodul: Slangestasjon på terasse/balkong står å lekker vann. Slangekoplinger er kraftig korrodert og stengekran er nesten korrodert i stykker.
146352	5	Synergi 146352 (Closed) - 30.05.2004 - Other non-conformities - BOR-GFC / Problemer med gantry kran / Prosafe Ved uttrekking/nedlegging av 6 5/8" borerør, røk en hydr. kobling på trolley til gantry krane. Reperasjon av denne medførte 1 time nedtid.
147265	5	Synergi 147265 (Closed) - 30.05.2004 - Other non-conformities - BOR-GFC / Cut & slip av boreline / Prosafe Under cut'n slip av boreline / sjekk av bremser på heisespill, brukte en noe lengre tid enn vanlig. 0,5 time nedtid.
257180	5	Synergi 257180 (Closed) - 05.03.2004 - Other non-conformities - BOR- GFC/ Løs nødstoppbryter på matebord/ Prosafe Det ble observert at nødstopp bryter på matebord var løs. Denne var slått løs fra innfestningen.
257187	5	Synergi 257187 (Closed) - 06.03.2004 - Condition - BOR- GFC/ Skiftenøkkel funnet i Mud Bucket/ Prosafe Under flytting av mud bucket, ble det observert en fastnøkkel inne i mud bucket.
257197	5	Synergi 257197 (Closed) - 07.03.2004 - Condition - BOR- GFC/ Radio batteri funnet i Eagle bua/ Prosafe Det ble funnet et løst radio batteri i Eagle bua.
257198	5	Synergi 257198 (Closed) - 07.03.2004 - Condition - BOR- GFC/ Defekt telefon Mud lab/ MI-Norge Fikk beskjed på radio om å ringe boreleder når jeg var i mud lab. Pga. mye støy/ skurring i telefon, var denne ikke mulig å bruke.
257203	5	Synergi 257203 (Closed) - 08.03.2004 - Condition - BOR- GFC/ Brannmelder manglet lokk/ Prosafe Lokk til brannmelder på D-31(sør) ved heis, manglet. Dette lå på grating. Lokket ble midlertidig festet med streng.
257338	5	Synergi 257338 (Closed) - 07.03.2004 - Near miss - BOR- GFC/ Tett rør fra LHS til skrue 3/ Prosafe Startet lav hastighet sentrifuge for å få ut barytt av boreslammet. Etter kort tid begynnte det å renne over med mud til dørk. Det viste seg at rør fra sentrifugen og til skrue 3 var tett.
257346	5	Synergi 257346 (Closed) - 08.03.2004 - Condition - BOR- GFC/ For lange plank (4x4") til strø/ Prosafe Det var ankommet GFC plank (4x4") til strø med lengder opp til 5,7 meter. Dette er alt for langt. Bedrifts helse tjenesten har for flere år siden bestemt at max lengde skal være 3 meter.
257351	5	Synergi 257351 (Closed) - 08.03.2004 - Other non-conformities - BOR- GFC/ Feil olje på injiseringspumpe/ Prosafe Pack boxene på stempelstang ble varme. Dette pga. at oljeutløpene til pack boxene ble tette. Årsaken til dette var en for seig olje. Olje som skal benyttes er Rockway EP 46.

Synergi no	Hazard	Description
257356	5	Synergi 257356 (Closed) - 08.03.2004 - Other non-conformities - BOR- GFC/ Deformert mutter på plugg for styring av matebord/ Prosafe Mutter på kontakt/ plugg for styringen til matebord, er deformert. Dette ble oppdaget ved inspeksjon av kabel etter skidding fra nord til sør.
257375	5	Synergi 257375 (Closed) - 08.03.2004 - Other non-conformities - BOR- GFC/ Hull i sjøvannslinje/ Prosafe Det ble observert en lekkasje på sjøvannslinjen på drag chain sør (mini skid).
257378	5	Synergi 257378 (Closed) - 09.03.2004 - Condition - BOR- GFC/ 2 muttre funnet på drag chain/ Prosafe Under inspeksjon på drag chain (hoved skidd N-S), ble det funnet 2 stk. muttre.
257450	5	Synergi 257450 (Closed) - 09.03.2004 - Near miss - BOR- GFC/ Kun en sikringskrok var montert på klatresele/ Prosafe To personer ble observert klatrende med kun en sikringskrok festet til klatreselen. Det skal benyttes to sikringskroker, slik at man til enhver tid er sikret.
257454	5	Synergi 257454 (Closed) - 10.03.2004 - Condition - BOR- GFC/ Flatstropp holder på å ryke på Eagle loop/ Prosafe Flatstropp som holder hydraulisk slange på Eagle loop, på tårn siden, holder på å ryke.
257481	5	Synergi 257481 (Closed) - 10.03.2004 - Condition - BOR- GFC/ Løs mutter på avhengningsbolt på Eagle/ Prosafe Eagle skulle kjøres helt ned for parkerin, men kom ikke ned. Det viste seg at to bolter var montert på hver sin guide rail. Før disse ble fjernet ble det utført en SJA. Årsaken til at disse var monterte, var at Eagle måtte henges av når sylinder på jibb skulle skiftes. Under demontering av bolten ble det oppdaget at mutter var for stor for bolten. Mutter hadde ikke bevegd seg, men over en lengre tidsperiode kunne mutter skrudd seg ut. Da ville mutter kunne fallt ned på gangvei mellom rørdekk og boretårn. Mutter var 8 cm. inn på bolt. Mutter veier 550 gram. Potensiell fallhøyde ca. 3,5 meter.
257609	5	Synergi 257609 (Closed) - 11.03.2004 - Other non-conformities - BOR- GFC/ Oppgjøring av 3 delt klemme på A seksjon på slot 28/ Statoil Under oppgjøring med moment på boltene på A seksjonen klemmen, ble det påført et for høyt moment. Boltene ble oppgjordt med 12700 Nm, men dette skulle ha vært 3500 Nm. Årsaken til at dette var at det var benyttet feil trykk til hydraulisk trekkeverktøy. I et forsøk på å oppnå 7000 Nm ble hydraulisk trykk øket til maks 620 bar. Med dette verktøy tilsvarte det 16350 Nm.
257723	5	Synergi 257723 (Closed) - 12.03.2004 - Other non-conformities - BOR- GFC/ Feilplasserte Multitube styringskabler/ Statoil Produksjon På grunn av Multitube styringskabler for brønner er feilplassert over slisse 29, er det ikke mulig å få montert styrekasse for nippling. Dette medfører nedstengning av produksjon ifm. nipling. Ved boring av 48 S vil dette medføre ca. 14 nedstengninger av produksjon i nærliggende brønner.
257728	5	Synergi 257728 (Closed) - 07.03.2004 - Condition - BOR- GFC/ Vertøyslogg for BOP dekk var ikke utfyllt/ Prosafe Under inspeksjon ble det observert verktøy oppå stillas på BOP dekk. Dette verktøyet var ikke skrevet inn i verktøysloggen som ligger i vertøyskap på BOP dekk. Når det skal arbeides i høyden på BOP dekk, skal verktøysloggen benyttes.
257744	5	Synergi 257744 (Closed) - 12.03.2004 - Other non-conformities - BOR- GFC/ Truck kom borti klemmelist på branndør/ Prosafe Under tømming av konteiner på M25 TOP, kom truck borti klemsikringsaktivator på branndør (droppsone M25 Nord) og skadet denne.
257757	5	Synergi 257757 (Closed) - 13.03.2004 - Other non-conformities - BOR- GFC/ Innfestning til Eagle loop bøyd/ Prosafe Stag til innfestning til Eagle loop oppe ved siden av Eagle hytte er bøyd kraftig. Dette skjedde fordi wire til Eagle loop ikke ble løsnet før skidding.
258048	5	Synergi 258048 (Closed) - 14.03.2004 - Condition - BOR- GFC/ Mulig å kjøre tugger utilsiktet/ Prosafe Det er pr. i dag mulig å kjøre de hydrauliske tuggere utilsiktet (nord og sør) fra de lokale styrepanel. Dette kan unngås ved at det monteres mekanisk hindring på betjeningspanelene.
258050	5	Synergi 258050 (Closed) - 14.03.2004 - Condition - BOR- GFC/ Defekte sikringer på bolter på top drive/ Prosafe Det ble oppdaget 2 stk. bolter på top drive som ikke var sikret (torque wrench), pga. defekt sikring.

Synergi no	Hazard	Description
258050	5	Synergi 258050 (Closed) - 14.03.2004 - Condition - BOR- GFC/ Defekte sikringer på bolter på top drive/ Prosafe Det ble oppdaget 2 stk. bolter på top drive som ikke var sikret (torque wrench), pga. defekt sikring.
258156	5	Synergi 258156 (Closed) - 15.03.2004 - Near miss - BOR- GFC/ Knakk bolt på slangeoppheng til jernroughneck/ Prosafe Ved kjøring av manipulatorarm, kom bakre del av armen borti slange opphengsblokk til jernroughneck. Dette medførte at opphenget løsnet og ble hengende i sikringswire. Potensiell fallhøyde 2 meter.
258161	5	Synergi 258161 (Closed) - 15.03.2004 - Condition - BOR- GFC/ Dårlig gjennomføring av kildesortering/ Statoil Ved dør ut til miljøstasjon i 2 etg landing henger en kasse på veggen som skal inneholde søppelposer, strips og merkelapper, samt at det over denne kassen henger en prosedyre på hvordan søppel skal pakkes og merkes. Kassen på veggen mangler strips og merkelapper. Prosedyre på veggen refererer til gul kontainer for papiravfall. Gul container finnes ikke på miljøstasjonen. Måtte legge hvitt papir inn i orange container.
258186	5	Synergi 258186 (Closed) - 14.03.2004 - Condition - BOR- GFC/ Defekt nøddusj og øyeskyllestasjon nr.15/ MI- Norge Dusj / øyeskyllestasjon ved metanoltank A består av fastmontert dusj, fastmontert øyeskyller og løs slange med handholdt dushandtak.. Hendelse: Slange med dusjhandtak lå på dekk i deler. Vannsprederen er gått i stykker (sprukket i gjengene) og beskyttelseshetten for dusjhandtaket er blitt borte.
258303	5	Synergi 258303 (Closed) - 17.03.2004 - Other non-conformities - BOR- GFC/ Slange sprakk på Torque Wrench/ Prosafe Under opperering av torque wrench, sprakk en hydraulikkslange. Dette medførte noe hydraulikkoljesøl, ca 5 liter, på dørken.
258304	5	Synergi 258304 (Closed) - 17.03.2004 - Accident - BOR- GFC/ Snublet og fikk Rig Wash/ Prosafe Under rengjøring på boredekk, snublet en BDA i en wire strop som lå på dørken ved såpefat. BDA hadde en bøtte med Rig Wash i hånden idet han fallt og fikk noe i ansiktet og øye. BDA skyllte øyet i nødskyllestasjon på boredekk og oppsøkte så sykepleier.
258315	5	Synergi 258315 (Closed) - 16.03.2004 - Near miss - BOR- GFC/ Person fikk oljekanne i nakken/ Prosafe Under rydding i skap for oppbevaring av 10 liters oljekanner, fikk person en oljekanne i nakken. Personen holdt på å rydde nederst i skapet og stod fremoverbøyd idet oljekannen traff han. Person iste ned nakke og oppsøkte sykepleier.
258316	5	Synergi 258316 (Closed) - 17.03.2004 - Condition - BOR- GFC/ Stige plassert oppå telefonboks/ Dalseid og Fløysand Det ble observert en stige som lå oppå telefonboks i nedre MPA (mot Nord). Denne ble fjernet.
258435	5	Synergi 258435 (Closed) - 16.03.2004 - Other non-conformities - BOR- GFC/ Demonterte wellhead sensor fra C-43/ Prosafe Etter ha demontert well head sensor fra C43, ble det oppdaget at hydraulikkslangen som går fra riser til trykksensor var tett. Slangen var fyllt med mud, men skulle vært fyllt med hydraulikkolje.
258520	5	Synergi 258520 (Closed) - 18.03.2004 - Condition - BOR- GFC/ ikke mulig å høre PA annonsering i MPA/ Statoil Når en er ute på dekk, spesielt i støyområder i bore moduler slik som MPA er det ikke mulig å få med seg vanlige PA annonseringer. Mulig at det er for få PA høytalere eller for lite lydvolum i høytaler?
258529	5	Synergi 258529 (Closed) - 18.03.2004 - Condition - BOR- GFC/ Gjenglemt verktøy/ Prosafe Ved low riser return pumpe ble det funnet en 24" rørtang.
258558	5	Synergi 258558 (Closed) - 19.03.2004 - Other non-conformities - BOR- GFC/ Hydeaulikkslange røk på sentreringsplattformen/ Prosafe Under kjøring av armen ut til top drive for å grease wash pipe, røk en hydr. slange på sving funksjonen.
262604	5	Synergi 262604 (Closed) - 18.04.2004 - Condition - BOR-GFC/ Avklipt hengelås funnet på toppen av TSR-extension./Prosafe Avklipt hengelås funnet på toppen av TSR extension, rett under kobling mellom XMT og TSR-extension.
262609	5	Synergi 262609 (Closed) - 19.04.2004 - Other non-conformities - BOR-GFC/Unormale sensor målinger./M-I Sensor i tank 28A og 24 viser unormale målinger

Synergi no	Hazard	Description
262901	5	Synergi 262901 (Closed) - 20.04.2004 - Accident - BOR- GFC/ Snublet i kant på dekket da vedkommende skulle gå opp trappeleider/ MI-Norge Ved entring av trappeleider bak loggeunit kom person fra sør og gikk mot nord. Rett før vedkommende skulle entre trappeleider tråkket han på en 3 cm kant/forhøyning i dekk. Vrikket foten og fikk et ukontrollert fall rett mot trappeleider. Fikk vondt i fot og slo arm mot leider. Hjelm og papirer "flakset" avsted. Det er tre adkomster til leider pga at boretårnet er skiddet og den veien personen valgte var den mest "naturlige" ut fra hvor han befant seg.
262941	5	Synergi 262941 (Closed) - 20.04.2004 - Other non-conformities - BOR- GFC/ Nedetid ifm. justering av Eagle/ Prosafe Under utlegging av 8" DC, måtte Eagle gripeklør justeres. Pga. manglende DC på rørdekk, måtte justeringen foretas på boredekk. Gripeklørene ble justert til 8", men klørene grep ikke 100% rundt DC. DC ble så målt til 7 3/4". Til slutt måtte man opp i "stabbing basketen" på boredekk for å justere Eagle.
263011	5	Synergi 263011 (Closed) - 20.04.2004 - Condition - BOR- GFC/ Avvik på antall screens/ MI-Norge Ved opptelling av screens, ble det oppdaget et stort avvik mellom MI og Prosafe.
263015	5	Synergi 263015 (Closed) - 21.04.2004 - Other non-conformities - BOR- GFC/ Lekkasje i ventil/ Prosafe Det ble observert en lekkasje i ventil til tank 21 fra overføringslinen. Dette medførte 1,1 m^3 forurensning i ferdig mikset mud.
264316	5	Synergi 264316 (Closed) - 04.05.2004 - Condition - BOR-GFC / Container inneholder avfall av ukjent karakter / Prosafe Container inneholder tomme kanner og fat med avfall. Avfallet i fatene er av ukjent karakter.Container var plassert på landing utenfor sekkerom før den ble transportert til rørdekk. Ingen vil vedkjenne seg tilhørighet av innholdet i fatene.
264337	5	Synergi 264337 (Closed) - 04.05.2004 - Condition - BOR-GFC / Isolasjonsmateriale / Prosafe Bit av endekappe for isolering av rør ble funnet kilt mellom isolert rør og vegg ved rapo før boredekk på vestsiden av boretårn på nivå 3 meter lavere hvor endekappe har vært montert. Data: Vekt (tørr tilstand): 0,378 kg Fallhøyde: 3 meter Diameter x lengde: 0,10 m x 0,10 m Materiale: Plast og isolasjonsmateriale
264343	5	Synergi 264343 (Closed) - 06.05.2004 - Condition - BOR-GFC / Utslipp av barytt ved transfering / Prosafe I forbindelse med transfering av barytt, ble det sluppet ut ca. 0,6m^3 barytt i modul M15. Hendelsen er oppstått mest sannsynlig pga. lekk blindeventil. I forkant av hendelsen var det blitt demontert og levert verksted en ventil på transfersystemet med utvasking. I denne forbindelse var blindeventil blitt stengt for å hindre at barytt kom ut åpning ved demontert ventil.
264349	5	Synergi 264349 (Closed) - 06.05.2004 - Other non-conformities - BOR-GFC / Feilmåling av borerør / Prosafe I forbindelse med utlegging av borerør på rørdekk, er det blitt utført feilmåling på enkelte borerør. Dette ble oppdaget ved kontrollmåing av borerør før innkjøring til boredekk.
264351	5	Synergi 264351 (Closed) - 27.04.2004 - Other non-conformities - BOR-GFC / Feilmåling fra Florø på 13 3/8" foringsrør / Florø Base I forbindelse med kontrollmåling av 13 3/8" foringsrør, ble det oppdaget at lengde notert på enkelte foringsrør ikke stemte med faktisk lengde.
264354	5	Synergi 264354 (Closed) - 05.05.2004 - Condition - BOR-GFC / Person brøt sperring / Prosafe Person brøt sperring inn til mpa som var satt opp i forbindelse med arbeid med radioaktive kilder.
264594	5	Synergi 264594 (Closed) - 04.05.2004 - Other non-conformities - BOR-GFC / Feilmerking av container / MI Under kontroll av last ombord hadde ein lastebærar to forskjellige merkingar. På toppen stod det AMB 1309 og på sida S 1309. Det medførte ekstra tid for å finne lastebæraren for Prosafe og muding.
264595	5	Synergi 264595 (Closed) - 05.05.2004 - Other non-conformities - BOR-GFC / feilmerking av Procontank/ MI Procontank 20188 var merka med 2 typer kjemikaliar, VG plus og Versatrol. Etter sjekk av innhaldet viste det seg å være Versatrol som manifestet sa.

Synergi no	Hazard	Description
264711	5	Synergi 264711 (Closed) - 07.05.2004 - Other non-conformities - BOR-GFC / Nedetid pga reimene på smaccc-anlegg røk / Prosafe For store mengder av leire i knuser - grunnet for mye underspyling med slurry og kaks -medførte overbelastning av rotor til knuser på smaccc-anlegg. Dette resulterte i brudd av reimene som driver knuser. Etter at reimene var skiftet, oppsto det problemer med å få startet knuseren. Inspeksjonsluke ble åpnet og det ble oppdaget at det fremdeles var leire og cuttings rundt rotor. Spylte inn gjennom inspeksjonsluke - men pga design til luke - er området man kommer til med spyling begrenset. Besluttet derfor å rigge til med taljer for demontering av knuser for grundigere rengjøring.
264737	5	Synergi 264737 (Closed) - 07.05.2004 - Other non-conformities - BOR-GFC / Nedetid pga. gummielementer i agitator til smaccc / Prosafe På grunn av gummielementer i knusertank til smaccc satte seg fast i agitator, resulterte dette i stopp av smaccc-operasjon og tapt fremdrift i boreprosess for 4,5 timer. Ble liggende endel kuttings i bunn av knusertank.
264972	5	Synergi 264972 (Closed) - 10.05.2004 - Condition - BOR-GFC / Slange fra Wellhead sensor i spenn / Prosafe Slange ifra wellhead sensor var koblet opp slik at den lå i spenn mot flowline. Dette medførte at vibrasjon fra riser/bop - pga rotasjon av borestreng - ble forplantet til flowline.
264977	5	Synergi 264977 (Closed) - 09.05.2004 - Condition - BOR-GFC / Støvsky i slamlaboratoriet / MI Ved blanding av nytt slam stod det en støvsky fra rør mellom conveyor og hopper. Det var ikke mulig å teste slam på mudlab eller ta slamvekt uten å bruke friskluftsmaske.
265321	5	Synergi 265321 (Closed) - 11.05.2004 - Other non-conformities - BOR-GFC / Rust på gjenger til 6 5/8" borerør / Prosafe Ved boring av 17 ½¿ seksjon ble det bruk KCL- slam. Etter uttrekking av borestrengen ble ca 50 stand 6 5/8¿ dp satt tilbake i derrick uten at de ble rengjort og preservert i gjengepartiene; hverken i box eller pin ende. Dette har resultert i overflaterust på gjengepartiene.
265329	5	Synergi 265329 (Closed) - 12.05.2004 - Condition - BOR-GFC / Flakrust løsnet fra leidersupport / Prosafe Da person skulle opp på "galleriet" på rørdekk fra sørside (Schlumberger container), løsnet det flak av rust fra support til leider. Potensiell fallhøyde: ca. 10 meter Mål og vekt: 1. 10 cm x 6 cm x 0,7 cm, 164 gram 2. 6 cm x 4 cm x 0,7 cm, 50 gram 3. 4 cm x 3 cm x 0,7 cm, 38 gram
280051	5	Synergi 280051 (Closed) - 04.11.2004 - Other non-conformities - GFC/Smedvig. Hull i dørk. Det er åpninger under DW ved elmago brake. Disse åpningene leder ned mot underliggende gangveier i MPA området.
280053	5	Synergi 280053 (Closed) - 04.11.2004 - Other non-conformities - GFC/Smedvig. Åpning i vindvegg. Det er en åpning i vindvegg bak/under chokemanifold på boredekk. Størrelse ca. 40x20 cm., knappe 10 cm. over dørk.
280054	5	Synergi 280054 (Closed) - 04.11.2004 - Other non-conformities - GFC/Smedvig. Dårlig sikt ved Eagle kjøring. Ved kjøring av Eagle ned til matebord, er det svært vanskelig å se nøyaktig hvor nært kloens er i forhold til matebord eller annen last på matebord.
280056	5	Synergi 280056 (Closed) - 04.11.2004 - Other non-conformities - GFC/Smedvig. Hydraulikk lekkasje. En av sylinderene på overshot under MPA, lekker.
280488	5	Synergi 280488 (Closed) - 06.11.2004 - Other non-conformities - GFC/Smedvig. Hull i vindvegg. Det er manglende tildekking av vegg rundt rør i dørk, bak drill line--trommel. Ca. 15 x 30 cm. åpning.
280503	5	Synergi 280503 (Closed) - 07.11.2004 - Other non-conformities - GFC/Smedvig. Streng glapp i slips. Under kjøring av 6 5/8" FH streng i C-46, glapp streng i Ps-21 slips. Streng var forut for dette vanskelig å sette i slips, så rengjøring og inspeksjon ble foretatt. Alt ble funnet i orden og streng lot seg sette i slips. Under connection, glapp midlertidig streng, da nytt stand ble satt i boksen (Stick-up). Streng gled da ned, slik at tool joint presset begge topplokk til side og derigjennom kappet boltene på nevnte lokk. Nytt stand ble låret og skrudd i streng og denne ble trukket ut av slips. Slips ble fjernet og man kjørte med manuelt slips til back-up Ps-21 slips var klart.

Synergi no	Hazard	Description
280505	5	Synergi 280505 (Closed) - 06.11.2004 - Other non-conformities - GFC/Smedvig. Tap av slam. Under sirkulering skulle slamreturventil til 27B stenges. I stedet for å stenge denne ventil, ble slam-retur line til 27A åpnet. Det førte til overfylling av både 27A og 27B. Dette resulterte i noe søl på tank-topp.
280598	5	Synergi 280598 (Closed) - 06.11.2004 - Other non-conformities - Utilsikted avblødning på trykksatt ventil på standpipemanifold. Under trykktesting av standpipemanifold ble det bestemt at det skulle pumpes for å vaske seg ned i hullet med borestreng.I denne fasen ble det åpnet en ventil på standpipe som var trykksatt. Dette medførte at sementer observerte et trykkfall på unit på 200 bar.
280612	5	Synergi 280612 (Closed) - 07.11.2004 - Other non-conformities - Renhold i MPA/manglende opplæring i MPA Generelt er det mye rot og skitt i MPA. Screen har ved flere anledninger blitt stående med mud på etter at det har blitt sirkulert over shakere. Manglende opplæring av personell som skal steppe inn som MPA operatør kan lett føre til feil.
280614	5	Synergi 280614 (Closed) - 07.11.2004 - Other non-conformities - Mangel på personell Kun er derrickmann pr. skift fører til at miksing av slam tar lang tid og ikke optimale egenskaper.
281171	5	Synergi 281171 (Closed) - 09.11.2004 - Near miss - Stilasplank lagret foran brannmelder bop dekk sør M 17 Stilasplank lagret foran brannmelder bop dekk sør M 17 og sperret adkomst
281180	5	Synergi 281180 (Closed) - 08.11.2004 - Other non-conformities - Powerdrive Xceed did not recieve downlink command. Powerdrive Xceed did not recieve downlink command. Trouble shoot to find optimal downlink parameters.
281300	5	Synergi 281300 (Closed) - 10.11.2004 - Condition - Ingen merking av nivåendring på grating. Det er to plasser med nivåendring på grating på gangvei utenfor boreleder/boresjefs kontor mot kaffrbar.
281349	5	Synergi 281349 (Closed) - 10.11.2004 - Other non-conformities - Manglende sikring på elevator inserts Da 6 5/8" elevator inserts skulle tas i bruk, ble det oppdaget at to av fire inserts manglet sikring
281494	5	Synergi 281494 (Closed) - 11.11.2004 - Other non-conformities - Oljesøl Ventil på tappekran til oljefat var i ustand. Dette resulterte i at oljen lakk sakte men sikkert fra fatet. Det ble observert oljesøl rundt fatet og i etasjen under
281495	5	Synergi 281495 (Closed) - 11.11.2004 - Other non-conformities - Sikring av slagnøkler De nye slagnøklene som kom ombord manglet hull til å feste tau i
281822	5	Synergi 281822 (Closed) - 12.11.2004 - Near miss - Tomme spann blåste rundt på dekk Skap ved malerbu blåste opp pga høy vind (ca 60 knop) . det resulterte at tomme spann blåste rundt på dekk
281905	5	Synergi 281905 (Approved) - 13.11.2004 - Condition - Mangelfull belysning Dårlig belysning på elevator når pipe blir kjørt inn med Eagle. Vanskelig å se nøyaktig høyde og at elevator er skikkelig lukket.
281950	5	Synergi 281950 (Closed) - 12.11.2004 - Other non-conformities - Jording til container var ikke frakoblet før forsendelse Cont NB 5676T var meldt inn til retur . Strømkabler var koblet fra, men ikke jordingskabel
282068	5	Synergi 282068 (Closed) - 14.11.2004 - Other non-conformities - Ukentlig kvalitetsjekk 46 Ukentlig kvalitetsjekk. Kontroll av magnetåk gantrykran. Anmerkning maling/SWL merking
282069	5	Synergi 282069 (Closed) - 12.11.2004 - Near miss - Pa annonsering bare på norsk Det ble kun annonsert på norsk at det ble installert rad. kilde på boredekk (SKR)
282285	5	Synergi 282285 (Closed) - 15.11.2004 - Near miss - Bruk av 9" vinkelsliper I sveiseverkstedet kom det inn en person som brukte en 9" vinkelsliper med slipeskive til å kutte en hengelås. Gnistregnet fra denne operasjonen havnet i ansiktet til en arbeidende person i nærheten.
282496	5	Synergi 282496 (Closed) - 17.11.2004 - Other non-conformities - Defekte vanger på lager reol M25 De nederste vangene på lager reol var ødelagt/defekt (2stk) M 25
282710	5	Synergi 282710 (Closed) - 17.11.2004 - Other non-conformities - Ødelagt sealflate på 6 5/8" borerør Under connection ble kjeftene på iron roughneck satt på feil plass. Dette med forårsaket delvis ødelagt seal flate på borerøret
282711	5	Synergi 282711 (Closed) - 15.11.2004 - Other non-conformities - Oppretting av BOP Vaier og strekkfisk ble festet i "handling øye" for klemme under 13 5/8" bag. Dette øyet er kun designet for "handling" av klemme
282956	5	Synergi 282956 (Closed) - 18.11.2004 - Other non-conformities - Person uten radio Statoil service personell beveget seg på rørdekk og boredekk uten radio.Han kontaktet ikke dekksbas før entring av rørdekk.

Synergi no	Hazard	Description
282957	5	Synergi 282957 (Closed) - 18.11.2004 - Condition - Løs stilasplank i høyden Ved områdesjekk ble det oppdaget en løs stilasplank på kabelbro oppunder taket i slamtank området.Stilasplanken var usikret og lå på vippen. Den bar preg av å ha ligget der en stund. Fallhøyde ca 4 meter
283130	5	Synergi 283130 (Closed) - 19.11.2004 - Other non-conformities - 1/2 nedetid Feil utspacesing med eagle åk Ved utlegging av pipe fra boredekk grep opratør for lavt nede på jnt. Dette resulterte i at den kom feil ned på matebord. Elektriker måtte legge over i manuell for å åpne gripeklørne.
283148	5	Synergi 283148 (Closed) - 20.11.2004 - Other non-conformities - Lav tempratur i dekkskontainer D 31 Dekkskonteiner for dekksbas/DVO ble det målt 6 grader. Utetempraturen var 4 grader / vindhastighet ca 32 knop. Det er montert en ovn på 2 kw
283218	5	Synergi 283218 (Closed) - 19.11.2004 - Other non-conformities - Magnetic crane used on ADN tool Magnetic crane used on nomag tool (ADN)
283377	5	Synergi 283377 (Closed) - 20.11.2004 - Other non-conformities - Trykksensor tom for olje ved trykktesting av choke/std pipe manifold var trykksensor tom for oje. Dette medførte at manometer viste 330bar, men trykket var i realiteten 360 bar
283479	5	Synergi 283479 (Closed) - 22.11.2004 - Condition - Dårlig skilting på BOP dekk I forbindelse med arbeid som skulle utføres på M17 BOP dekk, ble det avdekket dårlige skiltingsrutiner. Fra 18. nov. til 22- nov. ble det benyttet sperringer med teksten "pga. arbeid med Eagle 18-19 nov." Sperringen stod også oppe 20, 21 og 22 nov. Etter forespørsel om tilkomst ble sperringen tatt ned 21. nov. da det ikke foregikk noe arbeid som berørte M17 BOP . Sperringen var imidlertid satt opp igjen 22.nov med samme tekst.Dekket over var ikke sperret. Ved flere anledninger ble området inspisert for eventuell tilkomst. Det ble ikke ved noen av disse anledningene observert aktivitet som skulle tilsi nødvendigheten av sperringen. Pga. av dette måtte arbeid med frostsikring av rør utsettes flere ganger.
284031	5	Synergi 284031 (Closed) - 21.11.2004 - Other non-conformities - Rystelser i injeksjonslinen Under injeksjon av sjøvann med sementpumpen i C-04, ble det oppdaget kraftige rystelser i injeksjonsline i D11. Pumpet med 1000 liter/min.
284034	5	Synergi 284034 (Closed) - 22.11.2004 - Other non-conformities - TIW brekt på feil sted Etter trykktesting av 6 5/8" løse ventiler ble de skrudd fra hverandre. IR ble satt på feil plass slik at TIW ventiler ble brekt på feil plass.
284035	5	Synergi 284035 (Closed) - 23.11.2004 - Other non-conformities - MWD tool ubeskyttet på dekk MWD tool ble liggende ubeskyttet på rørdekk unødvendig lenge.
284270	5	Synergi 284270 (Closed) - 23.11.2004 - Other non-conformities - Skifte av wash-pipe Under backreaming ble det oppdaget lekasje i wash-pipe på DDM.
284271	5	Synergi 284271 (Closed) - 24.11.2004 - Other non-conformities - Lekasje på overshot. Lavtrykks riser Det ble oppdaget lekasje av Shaffer fluid fra overshot på lavtrykks riser. På grunn av lekasjens omfang ble linen fra Shaffer unit frakoblet og så koblet en seg inn på sjøvanns uttaket fra platformen.
284274	5	Synergi 284274 (Closed) - 24.11.2004 - Other non-conformities - Avstiving av lavtrykks riser På grunn av stor bevegelse i BOP & riser under boring ble det montert på wire for avstiving av riser.
284426	5	Synergi 284426 (Closed) - 26.11.2004 - Near miss - Flytting av kjemikalie tanker i sekkerommet Under tømming av kontainere utenfor sekkelageret skulle tank med calsium cloride fraktes inn med gaffel truck, under denne operasjonen falt tanken av gaflene på trucken. høyde 10 cm.
284556	5	Synergi 284556 (Closed) - 26.11.2004 - Other non-conformities - Skiftet gearolje på DDM Skiftet gearolje på gearkasse en uke etter forrige skifte. Dette pga alarm på høy temperatur og mye forurensninger i oljen. 0,5 t nedetid.
284591	5	Synergi 284591 (Closed) - 26.11.2004 - Near miss - Kjemikalier som ikke var sikret. Under sjekk av kjemikalier ombord ble det oppdaget i konteiner CBT 389 manglet sikrings presenning over toppen av 3 stk. 1000 liters transport tanker, det var heller ikke montert felter for montering av presenning/sikring.
284613	5	Synergi 284613 (Closed) - 28.11.2004 - Other non-conformities - Skifte av wash-pipe Etter conection ble det oppdaget lekasje i wash-pipe, stand ble satt tilbake i boretårnet og wash-pipen ble skiftet.
284767	5	Synergi 284767 (Closed) - 28.11.2004 - Other non-conformities - Flow padle failet under boring. Under boring feilet flow padle, den viste full retur selv om pumpene var stoppet.

Synergi no	Hazard	Description
284768	5	Synergi 284768 (Closed) - 29.11.2004 - Other non-conformities - Kildesortering Skulle kaste noe restavfall og fant at det var kastet matavfall i samme dunken, matavfallet ble fjernet og kastet i riktig avfalls dunk.
285149	5	Synergi 285149 (Closed) - 29.11.2004 - Other non-conformities - Defekt matemekanisme på Procon tank Ved miksing av Lime ble det oppdaget defekt på matemekanismen til Procon tank. Tappene på drivhjulet kunne ikke komme i ingrep på grunn av skaden på tanken.
285648	5	Synergi 285648 (Closed) - 01.12.2004 - Other non-conformities - Forskjellig skrap i sump tank MPA Under rengjøring av sump tank i nedre MPA ble det funnet filler & hansker & plast poser og lange taustumper.
285660	5	Synergi 285660 (Closed) - 02.12.2004 - Condition - Mangelfullt verneutstyr ved arb.med oljemud Det finnes ikke egnede gummihansker om bord
285662	5	Synergi 285662 (Closed) - 01.12.2004 - Other non-conformities - Splint på Dogcoller på sikkerhetsklemme var defekt Ved arb.Med BHA. PÅ boredekk ble det oppdaget at en splint på Dogcoller var defekkt
285870	5	Synergi 285870 (Closed) - 02.12.2004 - Other non-conformities - Kildesortering. Skulle tømme matavfall, det ble oppdaget en mineralvanns boks i bunn av posen og den ble fjernet i kastet i riktig dunk.
285999	5	Synergi 285999 (Closed) - 03.12.2004 - Near miss - Logge hjul på Gul stripe. Det ble oppdaget at wireline personell hadde plasert loggehjul på/ved Gul stripe (rømningsvei) og folatt stedet.
286001	5	Synergi 286001 (Closed) - 03.12.2004 - Other non-conformities - For høyt nivå med mud i shaker boks. Det ble opservert for høyt nivå med mud i shaker boks etter at en var ferdig med sirkulering.
286075	5	Synergi 286075 (Closed) - 01.12.2004 - Other non-conformities - Miksing av OBM Det ble brukt ca 2 skift for miksing av 45 m3 OBM.Det er vanskelig å holde rett kjørehastighet mht tilsetting av kjemikalier samt å lese trendkurver for tilsetting. Veieceller på 2 miksestasjoner mangler.
286081	5	Synergi 286081 (Closed) - 04.12.2004 - Near miss - Port for varselskilt. Svingarmen som varslings skiltet opp til rørdekk Nordside er festet på er montert så lavt at det er en fare for at personell kan få armen i skrittet hvis man er uheldig og gå på den.
286193	5	Synergi 286193 (Closed) - 05.12.2004 - Near miss - Shaker-screen Under inspeksjon av shaker-screen ble det funnet hull på alle sreeenene som var i bruk.
286195	5	Synergi 286195 (Closed) - 05.12.2004 - Near miss - Knekt beskyttelse på Brannmelder. Under arbeid i sementrommet i ble det oppdaget at lokket på manuell brann melder manglet. Tag no DM-D11M-09-1A
286390	5	Synergi 286390 (Closed) - 06.12.2004 - Condition - Vibrerende prosessrør pga sement- eller kompleteringspumpene Når sement- eller kompletteringspumpene går med en spesiell høy rate, settes en rekke rør i store svingninger. Dette er et problem fra 1989 som kun er delvis løst. Vibrasjonene er spesiellt sterke i et 3" blindrør Olje-prosess på M17D der tunge ventiler,dens support og et 3" og et 6" sjøvannsrørsvinger. På M17M midtgang svinger alle brønnprosessrørene, deres supporter samt andre rør uakseptabelt mye
286390	5	Synergi 286390 (Closed) - 06.12.2004 - Condition - Vibrerende prosessrør pga sement- eller kompleteringspumpene Når sement- eller kompletteringspumpene går med en spesiell høy rate, settes en rekke rør i store svingninger. Dette er et problem fra 1989 som kun er delvis løst. Vibrasjonene er spesiellt sterke i et 3" blindrør Olje-prosess på M17D der tunge ventiler,dens support og et 3" og et 6" sjøvannsrørsvinger. På M17M midtgang svinger alle brønnprosessrørene, deres supporter samt andre rør uakseptabelt mye
286551	5	Synergi 286551 (Closed) - 05.12.2004 - Condition - Pre-jobb inspeksjon av MDT / Schlumber utstyr før bruk Ventiltr til drenering av MDT prøveflasker manglet merking (work pressure) & dato for siste trykktest). P.O.M. 01.12.2001 (pressure operasjons manual)
286553	5	Synergi 286553 (Closed) - 06.12.2004 - Near miss - Ødelagt slange til høytrykksspyler Wirekordeler på høytrykksspyler slangen stikker ut slik at jeg fikk en kordel igjennom hansken og inn i fingen
286802	5	Synergi 286802 (Closed) - 08.12.2004 - Other non-conformities - Setebryter til gaffeltruck ute av drift Setebryter til gaffeltruck er ute av drift, og er nå "lasket". Venter på ny bryter som er bestilt.

Synergi no	Hazard	Description
286862	5	Synergi 286862 (Closed) - 07.12.2004 - Other non-conformities - GFC/Smedvig. Dumping av shakerboks. Shakerboks skulle tømmes til sloptank 26 før sirkulering. Boksen ble tømt til sloptank via slamrenne istedenfor via sumptank i MPA. Dette medførte mye arbeide med å spa/spyle viskøst slam under shaker. Urensket slam med cuttings/fremmedlegemer i slamrenne kan medføre pumpeproblemer.
286863	5	Synergi 286863 (Closed) - 08.12.2004 - Other non-conformities - GFC/Smedvig. Utstyrsfeil; Lekk hydr.slange. Nedetid; 0,5t. Byttet hydraulikkslange på BX elevator grunnet lekkasje på samme. Slangen var montert med for liten radius på sving.
287052	5	Synergi 287052 (Approved) - 07.12.2004 - Near miss - Tilstopping av fakkelsystem Under drenering/avblødnig av ringrom i forbindelse med boreoperasjoner er det observert mud i avblødningsslanger. Slangene blir montert inn på et lavpunkt sånn at mud kan bli liggend å blokere for aen avblødnig som går inn på samme manifold
287222	5	Synergi 287222 (Closed) - 10.12.2004 - Condition - Løs stillas på gangvei nordøst D11 (M-16-skid-nord) Bygget for D&F for maling av skiddbeam Stillas står løst på gangvei, lett bevegelig. Det er mulig for at det kan flytte på seg ved dårlig vær.
287308	5	Synergi 287308 (Closed) - 10.12.2004 - Other non-conformities - Bor/Gfc. Løse bolter på spinner/ IR. Det ble observert løse, noen skadde og på hjulene til spinner tang/ IR.manglende bolter. Disse ble festet, skiftet og erstattet.
287309	5	Synergi 287309 (Closed) - 10.12.2004 - Other non-conformities - Bor/Gfc. Påstand om mangelfull opplæring i MPA. Screen på shaker ble satt på feil vei. Oppdaget midt under sirkulering. Det var og hull på flere screen.
287312	5	Synergi 287312 (Closed) - 09.12.2004 - Other non-conformities - Bor/Gfc. Påstand om manglende opplæring ved bruk av shakere i Mpa. På vei inn i hullet skulle sirkulasjon brekkes hvert 10. stnd. Flere ganger ved pumping rant det mud over shaker screenène og rett ned i chute. Ved ett av tilfellene var loss ca. 1 m3. Påstand om mangelfull kontroll av shakers, dvs operatør feil grunnet mangelfull opplæring.
287331	5	Synergi 287331 (Closed) - 10.12.2004 - Other non-conformities - Bor/Gfc. Uregelmessigheter ved Smacc/Cri anlegg. Ved feil bruk ac shaker/screen, rant det mud rett ned i chuten til Cri. Tank ble fyllt helt opp med mud; ca. 5m3. Når dette skjer må operatør be borer stoppe pumping samt kontakte CRI operatør slik at det ikke renner over på Cri nivå.
287361	5	Synergi 287361 (Closed) - 11.12.2004 - Other non-conformities - Øvre arm på PRS. Etter å ha satt tilbake 5" borerør i derrick skulle operatør frigjøre øvre arm på PRS. Det viste seg at latch på venstre side var løsnet(kile var løsnet)
287376	5	Synergi 287376 (Closed) - 11.12.2004 - Other non-conformities - Boreslam med for høy viskositet Boreslam som vi har ombord fører til at vi får mye ekstra arbeid i MPA. Ved oppstart sirkulering må boreslammet skrapes ned i MPA tanken, da denne ikke flyter av seg sjøl. Boreslammet må svabbes videre i rennene under shaker, og p.g.a. boreslammet har så høy viskositet renner det over og rett ned til CRI. anlegget. Dette medfører ekstra arbeid som i sin tur fører med til at det går ut over annet arbeid som skal gjøres. Dette gjelder også på boredekk etter endt tripping i hullet da vanlg spyling ikke lar seg gjøre. Her må vi spa boreslammet opp ifra setback og ned i lukket drain. Dette fører til at vi må sette ekstra resurser på åpning av disse.

Synergi no	Hazard	Description
287778	5	Synergi 287778 (Closed) - 12.12.2004 - Other non-conformities - Bor/Gfc. Utstyrsfeil Schlumberger WL; Tapt komm. m. MDT-QR. Nedetid; 0,5t. Det oppstod feil på intern spenningsregulering i MDT toolet under logging på ca. 7145 m. En fikk tatt trykkpunktet. Under pumping for å få reine vannprøver sviktet MDT toolet. Mistet kommunikasjon med MDT tool. Ikke mulig å fortsette prøvetagning dvs trykkpunkter og væskeprøver. Dette resulterte i at en kun fikk tatt oljeprøve fra et punkt. Resterende oljeprøver i dypere lag og en viktig vannprøve fikk en dermed ikke. Det ble tatt en rekke trykkpunkter på veien inn, slik at en hadde god trykkpunkt dekning. Det var også planlagt med trykkpunkter dypere i brønnen og på vei ut. Dette lot seg heller ikke gjennomføre. Etter at kommunikasjonen med MDT toolet sviktet lukket Probe PS1 (som var satt mot formasjonen) seg automatisk fra akkumulatortrykk. Dette er en nødløsning ifm med problemer som dette. Øvre del av strengen (dvs GR, ACTS,TCC) virket etter at en mistet kommunikasjonen med MDT toolet. Signaler og strømregulering var ustabil/fallt ut i nedre del (MDT). POOH med signal fra ACB (Head tension). Test på overflaten avdekket kun at årsaken til feilen ligger i MDT toolet. Ytterligere tester på land må gjennomføres for å avdekke direkte årsak til feilen. Under første TLC run på denne brønnen sviktet pumpen i MDT toolet.
287943	5	Synergi 287943 (Closed) - 14.12.2004 - Other non-conformities - Bor/Gfc. Utstyrsfeil; IR gjorde ikke opp. Nedetid; 0,5t. Under tripping i hull med 3 1/2" dp, klarte ikke IR å få tilstrekkelig tak på tool jnt til å gjøre denne opp. Shimsing etc ble foretatt. No Go. Løsning ble bruk av manuelle rigtenger. Tool joints undergauge.
287945	5	Synergi 287945 (Closed) - 14.12.2004 - Other non-conformities - Bor/Gfc. Utstyrsfeil; Gantry kran stoppet. Nedetid; 1 t. Under opp-plukking av dp fra pipe dekk stoppet Gantry kran. Etter feilsøking ble sikringsbrudd konstatert. Dette ble reparert. Operasjon gjenopptatt.
287947	5	Synergi 287947 (Closed) - 14.12.2004 - Other non-conformities - Bor/Gfc. Utstyrsfeil; Hydr. lekkasje i PS21. Nedetid; 0,5 t. Man fant en lekkasje i PS21 slipset. Slangebrudd.
288148	5	Synergi 288148 (Approved) - 14.12.2004 - Other non-conformities - Nedtid 6.5 timer. Problemer med å få resatt crown-o-matic etter aktivering. Blokk ble kjørt så høyt at COM ble aktivert. COM override ble aktivisert for å løsne park brems og slakke ned blokk. Dette ble gjort iht operasjonsmanual ST-4333-OPM-0200. Brems lot seg allikevel ikke løsne. Det ble deretter foretatt manuell nødlåring for å få reastt COM. Etter at COM var resatt lot park brems seg ikke løsne på vanlig måte. Etter feilsøking på systemet ble det avdekket at en ventil på nødlåringssystem sto i feil posisjon. Posisjonen til denne ventilen hadde ikke noe å gjøre med det første problemet med å få av brems og resatt COM. Merking på panelet for nødlåring hadde misvisende tekst for betjeningsprosedyre slik at det ikke var logisk hvordan ventil skulle betjenes.
288187	5	Synergi 288187 (Closed) - 15.12.2004 - Other non-conformities - Bor/Gfc. Nedre arm engasjert over tool jnt. Ved kjøring av star rack under tripping, ble nedre arm latched på under tool joint. Påfølgende nedsenkning førte til at man traff tool joint og kilte latchene i spaden.
288371	5	Synergi 288371 (Closed) - 16.12.2004 - Other non-conformities - Bor/Gfc. Poor Boy "tett". Ved åpning av Poor Boy viste seg at denne var "plugget" med stivnet mud. Viser her til Synergi 287376.
288567	5	Synergi 288567 (Closed) - 16.12.2004 - Other non-conformities - Bor/Gfc. Gjenglemte bolter på dekk ved trappenedgang. 7-8 bolter lå spredt utover dørk ved trappenedgang til rørdekk. Ved normal ferdsel i området kunne man komme til å sparke borti boltene slik at du kunne ha fallt ned til underliggende område.
288577	5	Synergi 288577 (Closed) - 17.12.2004 - Other non-conformities - Bor/Gfc. Avstengning av sjøvann til boredekk mm. Ved ønsket reparasjon av sjøvannsline i D21, stengte man av vannet etter klarering av mulig behov for sjøvann. Dette medførte at imidlertidig tetning av overshot på riser blødde av. Denne var trykt opp ved sjøvannstrykk/line. Noe søl fulgte.

Synergi no	Hazard	Description
288779	5	Synergi 288779 (Closed) - 19.12.2004 - Other non-conformities - Bor/Gfc. Tett drain i motor rom, cmt. unit. Vasket motor rom ved cmt. unit. Oppdaget da at drain ikke tok unna. Fikk låne krypedyse av D&F samt brukte egen stakefjær. Dette til tross, det rant over dørterskel og ut på landing utenfor. Det ble noe søl på dette dekket.
288806	5	Synergi 288806 (Closed) - 20.12.2004 - Other non-conformities - Bor/Gfc. Isolasjon på kabel var "krympet" Man oppdaget at kabel til Eagle manglet isolasjon nede mot innfesting utenfor operatør bu. Ca. en halv meter. Ved nærmere undersøkelse var det flere uregelmessigheter i samme område.
289236	5	Synergi 289236 (Closed) - 21.12.2004 - Other non-conformities - manglende plank på beamer rørdekk. Denne jobben kan ikke gjøres nå p.g.a. manglende tilkomst og stor aktivitet. Utsatt fristen til 17.05.2005 Rørdekk sør mangler det plank på beamer. Dette gjør det vanskelig å flytte/rulle på tools.
		2) 21/04-04 AG 5 Prosafe. Retur mud lekket/rant ned på tanktopp pga feil opplining av ventiler på flowline
		5) 23/04-04 AG 5 Prosafe. Ved tripping inn i hull, mistet vi signal for lukking av "latch" på nedre arm på PRS.
		6) 24/04-04 AG 5 MI Swaco. Procon tanker plugget, ikke mulig å tømme tanker. Måtte sette 3 av 4 tanker tilbake til retur.
		1) 21/04-04 AG 5 Prosafe. Ved rutine inspeksjon av elevator ble det observert at låsebolt for sikring av bailer var defekt. Kule i låsebolt var ikke aktivert pga korrosjon. Dårlig design med henblikk på korrosjon.
		3) 22/04-04 AG 5 Halliburton.Ein katong med Ramløsa bokser var plassert ute på landingområde til sementunit, D11. Kartongen inneholdt både fulle og tomme bokser. De sistnevnte kunne ha blåst bort ved sterk vind.
		4) 23/04-04 AG 5 Prosafe. Forurensing funnet inne i frekvensomformer, 11-EC22, til mateskrue på Procon anlegg. Omformer defekt og sendes til land for reparasjon.
		7) 25/04-04. AG 5. Prosafe. Lekkasje på ventil på lastestasjon nord. Barytt blåst ut.
		8) 24/04-04. AG 5. Schlumberger D&M. Mistet kontakt med CDR tool (GR, RES og APWD) under boring av 17 1/2" seksjon.
		9) 25/4-04. AG ?. Prosafe. Lekkasje på discharge ventil på mud pumpe 1, D11.
		10) 24/4-04. AG 5. Prosafe. Bortfall av kraft på 2 av 3 DC motorer på heisespill.
		11) 27.04.04. AG 5. Prosafe T&P. Brannmelder M16, manglende vedlikehold.
		12) 27.04.04 AG 5. Elmago brems til heisespillet koblet seg ved tripping ut av 17 1/2" seksjon. Låsing ute av funksjon.
		13) 29.04.04 Prosafe Medisinsk behandling. Person skled på dørken i midtgangen mellom M16 og M17. Personen bar på en "BOP ram block carrier", ca. 15 kg. Da person falt, tok han seg for med hånden og carrier landet på høyre hånd og skadet langfinger. Finger ble iset ned før behandling på hospitalet. Måtte sy 2 sting. Det var olje på dørken fra wireline arbeid i C-12 der person falt.
		18) 29.04.04 AG 5 Prosafe. Det ble oppdaget en bit av et gummielement i sil på topp av MWD. Biten kommer fra Pulsation Damper på en av mud pumpene.
		14) 29.04.04 AG 5 Prosafe. Nedetid pga for korte bailer brukt ifm opprigging av Wepco pakning for 13 3/8" casing job.
		15) 27.04.04 AG 5 Prosafe. Lekkasje på shale shute BOP dekk sør.
		16) 27.04.04 AG 5. Prosafe. Lekkasje på brine/kerosene slange i dragchain øst ved topp D11.
		17) 27.04.04 AG 5. Prosafe. Lekkasje på rørstykke på sugesiden på miksepumpe B.

3.2 Experience listing

24" section

3.2.1 Leakage on A-section

Prior to start of this project the hub on the A-section on slot 28 had been machined due to corrosion. A special (oversized) seal-ring had been made prior to start of operation.

During the test off the "new" seal ring, a leak in the connection between the A-section and the LRR Spool were experienced. A new special seal-ring had to be manufactured while the rig was on downtime. The new seal ring also fails to seal off the connection. To avoid more downtime the decision were made to move to slot 29.

Lessons learned: Preserve all remaining A-section with better preservative.
Check the remaining A-section well in advance before future well project is coming up.
If the hub has to be machined, and a new oversized seal-ring had to be made, this should be tested on the rig. This should be done well in advance before start of the operation.

Recommandations:
Have this sorted out long before the well project starts.

3.2.2 Discrepancy between Gyro survey and MWD surveys.

The planned wellpath had little clearance issues and the closest well had a separation of 10 m and a separation factor of 5.18. The reason for running gyro surveys was that some discrepancy between MWD direction and Gyro was expected in the start of the section. The plan was to just run a few gyro surveys to confirm the MWD measurements.

However a constant deviation between gyro readings and MWD azimuth was experienced, even after the separation/distance from adjacent wells should be great enough to not interfere with the MWD azimuth reading. These unexpected measurements created uncertainty regarding the placement of the wellbore. As a result the actual wellpath deviated from the planned wellpath. This brought us into a worse situation regarding clearance issues. To compensate for this the wellpath in the 24" section was revised to increase the separation from the nearby wells. Still at 1153 m the uncertainty caused a complete stop due to lack of confidence to the survey measurements (this was the closet point to C-34). New surveys were ran to verify the placement of the wellbore. After this was done, no more directional problems were encounter, but all together this delayed the progress in this section severely. Another result of this was that the complexity of the 17 ½" section was increased compared to the planned. The 24" section ended up with an inclination of 48 instead of 63 as planned at section TD. Apart from wellpath related problems related to Gyro survey error in the start of this section, the drilling went OK.

For more detailed information read App 7. ***"48S kick off steering / survey report"*** Page xx.

Lessons learned: The main reason for the confusion regarding the directional surveys in this section was that it took to long time to recognize that the survey tool had failed.
After five gyro shots the gyro tool was change out at 536 m to eliminate that the iled Gyro survey tool was failed. However the second tool also gave unexpected measurements while comparing them to MWD and to the result of steering intervals, at some occasions the measurements showed opposite response after steering than the toolface indicated.
After investigating this job it turned out that the main reason for the confusion over the gyro measurements were that the gyro operators didn't follow their company's procedure. There was not used a defined benchmark survey station that the tools were checked against during in/out run for drifting. These checks were taken against different survey stations and even against MWD surveys and this actually masked that both gyro survey tool used had failed.

3.2.3 Experience from DBR

Subject: Setting of 20" seal assembly in wellhead A-section
Section: NO 34/10-48 S, 24"
Rep date: 26.03.2004 00:00:00
Keywords: WELLHEAD/ASA
Downtime: **Pot time improvements:**
Comp inv: Prosafe Drilling Services
References:
Synergi no: **Cost:**
Description:
Background: The conductor/A-section on slot 29 has an angle of approx. 1.5 degrees at wellhead deck level, ie the top of the A-section has a corresponding deviation from horisontal plane. This angle was a concern when installing the 20" seal assembly due to tight tolerances.

Immediate solution:
Operation: In order to allow the seal assembly to "flex" enough to alllow entry into A-section, two compensating measures were implemented during operation:
1) A 5 1/2" pup joint was placed directly above the RT in the running string
2) The master bushing was removed to facilitate lateral movement of the running string.

Result: The 20" sealassembly was installed and tested to 69 bar without problems.
Future recommended solution:
1) Check angle of A-section in due to prior to RU on a new slot
2) Include a "flex joint" in the running string above the running tool; 5" or 5 1/2" DP pup joint.
3) Remove the master bushing prior to landing seal assembly to facilitate lateral movement of the running string.

Subject: Handling heavy assemblies
Section: NO 34/10-48 S, 24"

Rep date: 21.04.2004 00:00:00
Keywords: BHA
Downtime: **Pot time improvements:**
Comp inv: Prosafe Drilling Services
References:
Synergi no: **Cost:**
Description:
Eagle pipe handling machine has 3.5 ton max lifting capacity.
Pre made assemblies for 24" and 17 ½" sections is often more than 3.5 tons. To lift the assemblies to drill floor requires use of deck crane. For well 48S (slot # 29, row 4) the Eagle can be parked between the rig and pipe deck. The rig has to be skidded for wells closer to pipe deck than row #3 in order to park the Eagle. For this section 2 assemblies had to be lifted in with deck crane.

The need for deck crane makes the operation more vulnerable due to weather limitations on crane operations.

Future recommended solution:
The assemblies should not be pre made when drilling in periods with storms (winter time). Also have in mind the position of the slot compared to pipe deck.

Comments: Having assemblies premade is a great advantege and it has to be pendigng on the dimensions.
The smaller assem can easily be picked up by Eagel if the weight stays below 3,5 MT.

Subject: Wear bushing unintentially retrieved when pulling 20" RTTS
Section: NO 34/10-48 S, 24"
Rep date: 21.04.2004 00:00:00
Keywords: BOP/WB/BP
Downtime: **Pot time improvements:**
Comp inv: Halliburton
References:
Synergi no: **Cost:**
Description:
Ifm trekking av 20" RTTS så ble wear bushing som var montert i B-seksjon trukket med ut av hullet.

Wear bushing ID (målt / nominell= 18,125"/ 18"), RTTS drag block maks/min OD = 19.2" / 17.77"
Foranledning var at wear bushing ble låret ned og satt på plass i B-seksjon før høytrykk riser ble NU. Dette for å spare et "run" med kjøring av wear bushing.

When pulling 20" RTTS the wear bushing preinstalled in the B-section was pulled OOH.

Wear bushing ID measured to 18,125" Ø. RTTS drag block OD fully extended/collapsed =19.2" / 17.77"

The wear bushing had been preinstalled to save rig time.

Immediate solution:
Kjørte inn med og satte wear bushing på ny. Benyttet 4 andre dogger i B-seksjon.

Had to reinstall wear bushing. Used 4 different locking dogs.
Future recommended solution:
Wear bushing må ikke settes før trekking av RTTS i denne størrelse.

In this size of RTTS the wear bushing should not be set prior to pulling the RTTS. The same should also be evaluated on smaller dimensions.

17 ½" section

3.2.4 DrillingBHA used in this section:

Lessons learned: This BHA included a Baker 12 3/4" Extreme Series NaviDrill. This 'Metal' stator motor has 845 hp. And 37k ftlbs of torque and can be rotated with 180rpm.
Drilling out was completed in 1.5hrs @ 20m/hr at 80 rpm.
This assembly gave between 3 - 4deg DL. A DL severity rate of 3deg/30m was easily achieved and sliding ROP did not fall much below rotary ROP. (About 10% less only) Stringers did not interfere with ROP greatly and only a slight increase in motor pressure was noted whilst penetrating. In Rotary mode this assembly was very well balanced and gave very good drilling performance showing good directional stability.
An almost perfect assembly for this application.

This BHA was rotated at 180 RPM whilst drilling, also when back-reaming for 100hrs whilst tripping.

Total 'on bottom' bit revolutions @ TD = 694krev. Completed this 17 1/2" section in one run.

3.2.5 Leak on discharge valve on mud pump no 1.

During drilling of the 17 ½" section at 2232 m a 27 bar pressure loss was observed during a period off 10 minutes. The surface system was checked for leaks, no finds. The RPM on the downhole turbine on the MWD tool was checked and it was found that the turbine rpm had dropped from 3945 to 3600 in the same time period. This was interpreted as a most likely downhole washout. A pressure test was conducted with MP 1 up to 100 bars against the IBOP – OK test. Started to POOH. Conducted a new test with the cement pump into the standpipe to 240 bar – OK test. Continue to POOH. Started to pump with MP2 and MP3 with 300 lpm, then a stable pressure and flow was observed. Rechecked MP1 and found a leak in the discharge valve. Had at that time POOH with 415 m. RIH again and resume the drilling operation.

Lessons learned: Test one mud-pump at a time against the discharge valve. This will make it possible to compare the pressure test on all three mud-pumps. This should be done before concluding on any downhole washouts in the future in similar situations.

3.2.6 Experience from DBR

Subject: Landing string stick up above RKB, 13 3/8" casing
Section: NO 34/10-48 S, 17 1/2"
Rep date: 29.04.2004 00:00:00
Keywords: CASING/LINER
Downtime: **Pot time improvements:**
Comp inv: Statoil
References:
Synergi no: **Cost:**
Description:
The landing string sendt out for the 13 3/8" casing has to short stick up above the RKB.
Immediate solution:
Ordered new landing string pup joint from shore.
Future recommended solution:
The "stick up" above RKB should be approximately 0,9 m, exclusive of box length. This is to allow space for PS-21slips and unlatching of elevator. Typical box length is 0,34 m.

Subject: Difficulties to MU 13 3/8" Float collar casing joint.
Section: NO 34/10-48 S, 17 1/2"
Rep date: 29.04.2004 00:00:00
Keywords: CASING/LINER
Downtime: **Pot time improvements:**
Comp inv: Odfjell Well Services
References:
Synergi no: **Cost:**
Description:
The OWS 13 3/8" casing tong used when running the 13 3/8" casing can not bite around and MU the Float-/Landing collar joint as normally done with casing. This is due to that the Float/Landing collar sub, installed at the pin end of a 13 3/8" joint, has bigger OD than the 13 3/8" tong is designed for.
Immediate solution:
Lifted casing tong with tugger to make up over float.
Future recommended solution:
1) Install a short handling pup joint below the Float-/Landing collar sub to allow casing tong to bite at the "normal" 13 3/8" casing OD. This should be done prior to the 13 3/8" casing being shipped out.
2) Use 20" tong instead of 17 1/2" tong.
3) Float in box end.

12 ¼" section

3.2.7 Experience from DBR

Subject: Plugged cutting crusher
Section: NO 34/10-48 S, 12 1/4"
Rep date: 09.05.2004 00:00:00
Keywords: CUTTINGS INJECTION
Downtime: **Pot time improvements:**
Comp inv: Prosafe Drilling Services
References:
Synergi no: **Cost:**
Description:
For store mengder av leire i knuser - grunnet for mye underspyling med slurry og kaks - medførte overbelastning av rotor til knuser på smaccc-anlegg. Dette resulterte i brudd av reimene som driver knuser. Etter at reimene var skiftet, oppsto det problemer med å få startet knuseren. Inspeksjonsluke ble åpnet og det ble oppdaget at det fremdeles var leire og cuttings rundt rotor. Spylte inn gjennom inspeksjonsluke - men pga design til luke - er området man kommer til med spyling begrenset. Besluttet derfor å rigge til med taljer for demontering av knuser for grundigere rengjøring.

Hendelsen ble tatt opp med involvert personell, hvor det ble presisert viktigheten av kommunikasjon mellom smaccc-operatører, mpa-operatører og borer / ass. borer mhp. borehastighet og tilførsel av kaks fra mpa til smaccc.
Smaccc-anlegget er underdimensjonert i forhold til de mengder kaks som kommer til overflaten ved boring av 12 1/4" seksjon. Boring foregår med redusert rate og mer reaming enn nødvendig for å gi smaccc-anlegget mulighet til å behandle kaksemengder. Dette er ikke en ønskelig situasjon når det bores i Shetland som er en myk formasjon hvor det er ønskelig med høyest mulig penetrasjonsrate for å opprettholde tilfredsstillende hullvinkel og minst mulig setting av Powerdrive.

Subject: SMACCC
Section: NO 34/10-48 S, 12 1/4"
Rep date: 10.05.2004 00:00:00
Keywords: CUTTINGS INJECTION
Downtime: **Pot time improvements:**
Comp inv: Prosafe Drilling Services
References:
Synergi no: **Cost:**
Description:
Problems with SMACCC unit:
7/5 Cuttings chrusher in SMACCC is plugged and and transmission belts are worn out.
8/5 Isolation valve between MP 3 and cuttings injection pump is leaking.
9/5 Circulation pump on SMACCC is sheared from impeller housing.
9/5 Changed transmission belt to chrucher knife twice.

10/5 Plugged cuttings screws.
10/5 Problems with circulation pump and washout in cuttings chrusher tank.

Observations:

Cuttings comming out of the well is very large. This could be due to a aggressive bit with 19 mm cutters Reed-Hycalog RSX 130DF.
Immediate solution:
Send cuttings in big bags while repairing SMACCC. When screws are plugged the hole process stops.
Future recommended solution:
If a new 12 1/4" section is to be drilled with this SMACCC unit installed, there must be looked into bit selection for the section (less aggressive bit with smaller cutters). This to get smaller, more grinded pieces of cuttings coming out of the hole.
There must be installed more screws so the cuttings can be screwed all the way to the skid deck and into big bags directly in cutting tubs.

Here the big bags are in transportation baskets which are manually pulled out to the landing in the MPA. From there the transportation baskets are lifted with crane to pipe deck where the big bags are put into cutting tubes.

Subject: Hole cleaning
Section: NO 34/10-48 S, 12 1/4"
Rep date: 28.05.2004 00:00:00
Keywords: DRILLING
Downtime: **Pot time improvements:**
Comp inv:
References:
Synergi no: **Cost:**
Description:
Drilled to 5105 m and circulated 5 x BU before pulling out.
Pulled out from 5105 m without overpull.
Immediate solution:

Future recommended solution:
Factors that made it possible to be able to POOH:
1. Drilled with restricted ROP
2. Circulated 5 x BU. Did not see a "second wave" but the cuttings flowmeter showed a decreasing trend.
3. Trip margin (MW 1,65 / expected pore pressure 1,58 sg)
4. Drilled section with 3600 lpm / 188 RPM.

Subject: Torque wrench DDM
Section: NO 34/10-48 S, 12 1/4"

Rep date: 06.11.2004 00:00:00
Keywords: RIG EQUIPMENT
Downtime: **Pot time improvements:**
Comp inv: Smedvig
References:
Synergi no: 280391 **Cost:** 3000
Description:
Synergi 280391 (Closed) - 05.11.2004 - Proposed improvements - GFC/Smedvig. Torque Wrench DDM.
I forbindelse med skifting av Saver sub på DDM fra 4 1/2" IF gjengeparti til 6 5/8" FH, den 5/11 på C-46, ble behovet for torque wrench med større torque kapasitet fremsatt.
Behovet for å kunne brekke saver sub`s 6 5/8" R connection er ca. 7000 daNm (52000 ft/lbs). Den nåværende max torque er i området 4500 - 5000 daNm. Dette vil i praksis si at nedlegging av torque wrench samt bruk av rig-tenger må til hver gang skifte av saver sub skal finne sted. Dette gir følgende negative resultater;
Ekstra bruk av tid, gjennom prejobbmøte, Sja for bruk av manuelle tenger, opprigging og ned/opp montering av torque wrench.
Bruken av rig-tenger i seg selv representerer en betydelig negativ HMS faktor, sammenlignet med en DDM som selv utfører ønsket handling.

Subject: Used 2 hrs to drill cement plug in 9 5/8" landing collar.
Section: NO 34/10-48 S, 12 1/4"
Rep date: 09.11.2004 11:30:00
Keywords: CASING/LINER
Downtime: **Pot time improvements:**
Comp inv: Weatherford Norge AS
References:
Synergi no: **Cost:**
Description:
Earlier experience with Halliburton plugs: 15 min to drill plug.

Future recommended solution:
Always use non-rotating cement plugs from Halliburton.

8 ½"section

3.2.8 BOP testing med versavert OBM

When testing the BOP with the Versavert OBM used in this well, the experience was that this was very time consuming. The reason was that the mud became very thick when not circulated on

Lessons learned: Problem solved by changing composition of mud.

3.2.9 PowerDrive Xcced

This was the first time PowerDrive Xceed was used on GFC.
The reason for choosing the PD Xceed was the complexity of the wellpath - directional wise.

Lessons learned: Although the wellpath was quit demanding, having DLS ranging from 3,5° to 4,5° more or less throughout the entire section. Experience showed that this was achieved with 40 to 60% setting. The only time the planned DLS was not achieved was in the transition zones between softer shale formations and hard calcite cemented stringer. Here the bit got pushed up or down all dependent on relative angle between wellbore and "string surface".

3.2.10 Gyro Tie in

A Gyro survey was run inside DP before drilling out 9 5/8" shoe. It is important to consider were this survey has to be tied in to the old wellpath. In this well the last conductor survey was used as the tie-in survey station. Since this original survey is ran inside the 32" conductor and the new survey is ran inside DP there could be a considerable difference between the tie-in station and the first "new" survey station. This again could result in a high "unrealistic" local dogleg which creates problem when casing wear is calculated. The casing wear calculation will come up with high wear in the area. This again could create uncertainty regarding how to deal with this.

Lessons learned: Consider to tie-in to seabed instead of last conductor survey, if the inclination is as high as on this well, approx 11°.

3.2.11 Drilling alternating layers of hard calcite cemented formations and softer shale

During all three 8 ½" section in this project hard stringers and softer zones were encounter. In 48 S they did not give any other problems than reduced ROP while drilling through them. On 48 A and 48 AT2 the amount and length of these stringer increased and in addition to this cap-rock (the Mime Fm.) were drilled. During the drilling of these hard formations extreme slow ROP and occasionally high stick-slip were experienced. Tripping out of the hole went without problems, but when tripping in the hole created severe problems and finally at 6221 m after a roundtrip it was not possible to reach bottom due to hole conditions causing pack-offs. Circulation was established but on each occasion when an attempt was made to move the string up or down with or without rotation, then the string packed off again. Pulled back to 5585 m and performed an open hole sidetrack – 48 A T2.

Lessons learned: After the drilling was finished an azimuthal calliper log was created from LWD memory data.
The calliper analysis showed:

- In general the hole was enlarged in the shale formations and gauge in the calcite cemented sandstones.

- The calliper log also showed that shoulders are produced in the transition zone between over gauge shale and gauge calcite cemented sandstone.
- Hole enlargement in soft shale in front of hard stringers increases with increased exposure time due to hydraulic and mechanical wear from bit and BHA.

While tripping in hole three depths intervals created problems.

- 5757 +/-
- 5970 +/-
- 6144 +/-

All these depths are within shale formations with adjacent hard formations on both sides.

One theory is that this enlarged intervals acts as cutting traps. When tripping in hole the bit comes from a gauge hole to an over gauge hole witch also seems ho have ledges, the bit/BHA could easily hang up here, and as a result of that start of rotation and/or circulation to continue RIH lifts the cuttings from the cutting trap. If at the same time some of the large OD components are within the gauge hole, erratic torque, stick-slip and pack-offs could be the result.

Recommendations: If alternating soft hard formations are expected, a special focus on drilling praxis should be planned.

- A detailed plan for drilling this should be made up before the drilling starts. More information's can be found in the report ***"Gullfaks, Technical sidetrack analysis, Topas 34/10-48 A and 34/10-48 AT2"*** Technical sidetrack project 01.10.2005.
- Avoid washing out / damaging the shale sections.
- Tripping into the hole is very difficult and hence it is important to avoid downhole tool failures.
- A log showing hard/soft formations should be produced before any trips are conducted.
- If possible a "stringers and calliper map" should be available as soon as possible.
- Following the LEDO Principe should also be considered.

3.2.12 Open hole sidetrack - 48 A T2

After giving up the 48 A wellbore the BHA was pulled back to 5585 m and an open hole sidetrack was performed.
The Xceed was set to 100% and 180° TF. The string was reciprocated over a 5 meter interval from 5588 – 5593 m. Several attempts were made to kick off from the old wellpath but the near bit inclination showed that the bit followed the old wellpath. It was decided to increase the reamed interval to approx. 10 m. After creating a groove on the lowside, timedrilled with ROP between 0,1 to 0,6 m/hrs and closely watch the nearbit inclination. When a drop was confirmed it was drilled ahead rather by applying weigh instead of time drilling.

Lessons learned: The Xceed BHA is so stiff that by creating a short groove on the lowside, it is easy to lift the nose of the BHA up over the edge and follow the old wellpath. In this case the reciprocated area was increased and an open sidetrack was performed.

3.2.13 Centralizers on the 7" liner

Prior to this job the running of the 7" liner was considering to be a challenge, with regards to run the liner to TD without rotation, and to be able to rotate the liner during the cement job. To meet these challenges special Low-Torque - Low Friction centralizers were used According to the plan the liner should have been approx 2350 m. Since the wellpath was changed and the liner just became 837 m the foreseen challenges was not valid any more. However the centralizers were tested out and while rotation at bottom they indicated low friction.

3.2.14 Experience from DBR

Subject: Viscous mud
Section: NO 34/10-48 S, 8 1/2"
Rep date: 18.12.2004 00:00:00
Keywords: DRILLING FLUID
Downtime: 3 **Pot time improvements:**
Comp inv: M-I Drilling Fluids
References:
Synergi no: **Cost:**
Description:
At surface the mud was extremly viscous and had to be suffeled in the flow channels in the MPA

Ref synergi no. 289419.
Immediate solution:
Shoveled mud. Prepare new drilling fluid.
Future recommended solution:
Possible causes:
Use of VG supreme and Versavert F. High LGS. Possible water leakage from overshot packer can have caused water in the mud system.

Actions:
Mobilized drilling fluid with Bentone 128 instead of VG supreme.
Built new drilling fluid.
Displaced to new drilling fluid before side tracking 48A (20% old, 40% new and 40% used with Bendtone128.
Stopped using Versavert F (using Versatrol instead)
New drilling fluid contributes to low LGS.
Viscous mud at surface
The mud was extremely viscous at the surface and had to be shuffeled in the flow channels in the MPA.

Possible causes: Use of VG supreme and Versavert F, high LGS and possible leakage from overshot packer the last could have caused water in the mud system.

Lessons learned: After a new drilling fluid was buildt using Bentone 128 instead of VG supreme the problem was solved.

Subject:	Liner shipped out in wrong order.
Section:	NO 34/10-48 A, 8 1/2"
Rep date:	30.12.2004 00:00:00
Keywords:	CASING/LINER
Downtime:	**Pot time improvements:**
Comp inv:	Statoil
References:	
Synergi no:	**Cost:**

Description:
The 7" liner recieved from shore came onboard in wrong order. This caused extra and unneccessary work for roustabouts.

Future recommended solution:
Drilling engineer makes sure that the liner is shipped out in correct order.

Other experience not tied up to one specific section.

3.2.15 Pressure test

Be aware of when the calculations for casing design is di\one if the timeframe is normal the take for granted the liquid behind the 13 3/82 casing is mud.

Like on this well when testing the 7” liner this was done more then 6 months after the 13 3/8” casing was ran. It probably takes 3 to 6 months before the barite settles out of the mud and after this it has to be considered that the annulus behind the 13 3/8” is water filled. This is not giving the same support as the originally mud, this could therefore lead to that the originally planned pressure test is above the burst pressure of the casing.

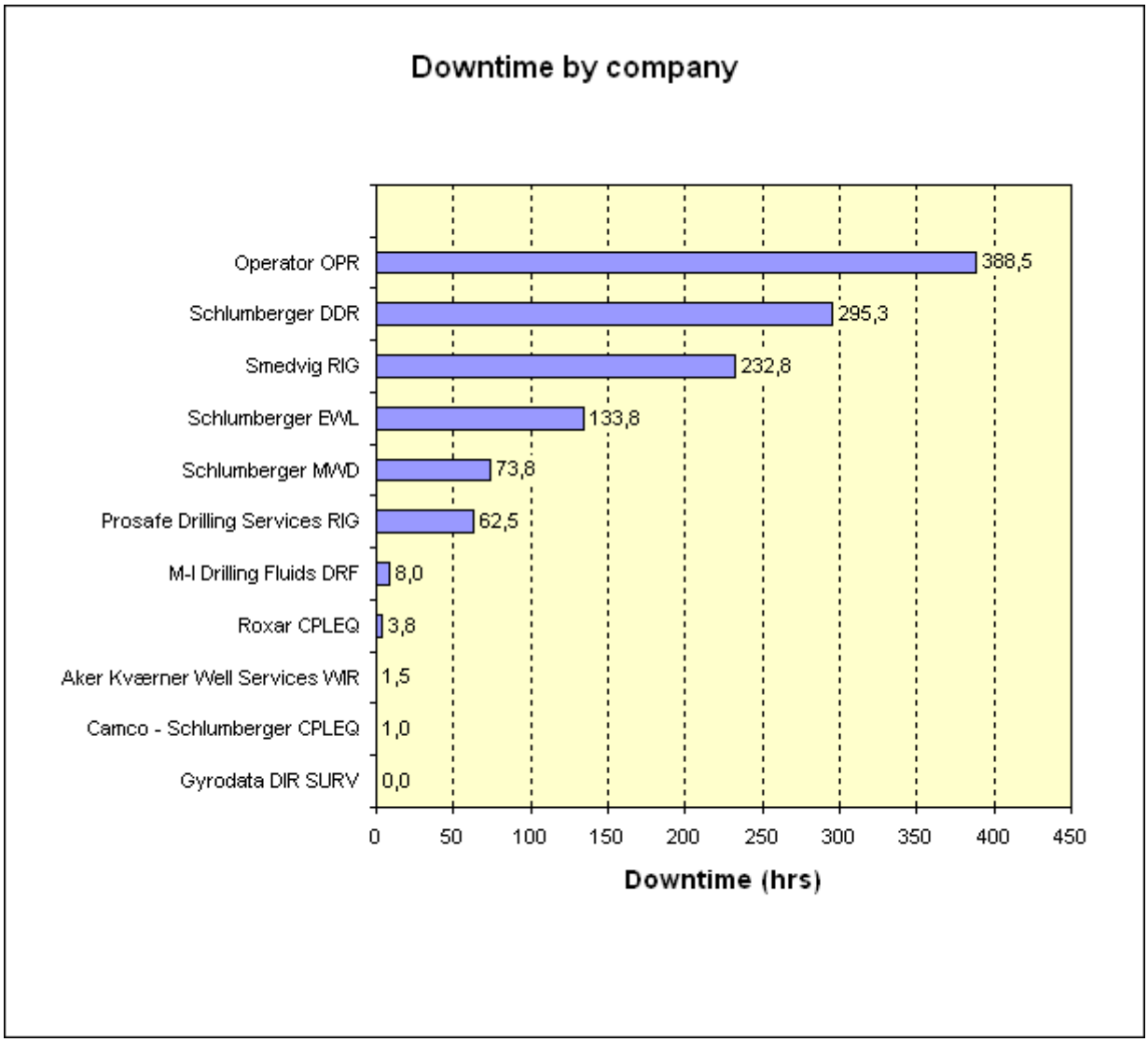
Lessons learned: Recalculate the casing design for this pressure test if the time since 13 3/8” casing is ran is more than 3 – 6 months.

3.2.16 Reamer shoe:

Reamer shoe were ran on 13 3/8” casing and 9 5/8” and 7” liner in this well.

Lessons learned: On all three jobs the feedback from the rig was that this helped while passing tights zones.

3.3 Incidents by service and company



SERVICE COMPANY:
WELLBORE: NO 34/10-48 S

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs

SERVICE COMPANY: Compl/sand contr. equip. CPLEQ Camco - Schlumberger
WELLBORE: NO 34/10-48 AT2

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
05.02.2005 09:00:00	CPLEQ-E01 Surface equipment	297791	Feil på teste tool	30000	720000	1	100	1
			Total	30000				1

SERVICE COMPANY: Compl/sand contr. equip. CPLEQ Roxar
WELLBORE: NO 34/10-48 AT2

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
06.02.2005 09:30:00	RIG-03 Procedure not followed	297785	Retesting av gauge	20000	480000	1	100	1
07.02.2005 01:00:00	RIG-08 Unsceduled maintenance	297778	Avslitt kontroll-line under tbg kjøring	125000	1090909	2,75	100	2,75
			Total	145000				3,75

SERVICE COMPANY: Directional Drilling DDR Schlumberger
WELLBORE: NO 34/10-48 A

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
04.01.2005 06:00:00	DDR-E10 3D Communication/transmission	291446	BOR GFC: Xceed RSS tool (CRS 34596) experienced dowhole failure	825000	203599	97,25	100	97,25

WELLBORE: NO 34/10-48 S

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
08.05.2004 06:00:00	DDR-E11 3D Steering/DLS/performance	265335	BOR-GFC / Powerdrive / Schlumberger D&M	12500	600000	0,50	100	0,50
11.05.2004 06:00:00	DDR-E11 3D Steering/DLS/performance	91893	BOR-GFC / PowerDrive failure no.1 / Schlumberger D&M	1512500	620513	58,50	100	58,50
14.05.2004 15:30:00	DDR-E11 3D Steering/DLS/performance	93063	BOR-GFC / PowerDrive failure no.2 / Schlumbeger D&M	937500	576923	39	100	39

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
08.11.2004 19:00:00	RIG-01 Procedure	281180	Powerdrive Xceed did not recieve downlink command.	25000	600000	1	100	1
17.11.2004 06:00:00	RIG-E30 Other Equipment					99	100	99
			Total	3312500				295,25

SERVICE COMPANY: Directional survey DIR SURV Gyrodata
WELLBORE: NO 34/10-48 S

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
20.03.2004 14:30:00	RIG-02 Doc./Spec.	259040	BOR-GFC / Downtime associated with evaluation of gyro survey / Gyrodata	200000	0	0	100	0
			Total	200000				0

SERVICE COMPANY: Drilling Fluids DRF M-I Drilling Fluids
WELLBORE: NO 34/10-48 S

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
07.05.2004 01:30:00	RIG-E14 Mud pumps	264543	BOR-GFC / Nedetid pga problemer med å "suction" til slampumpene / Prosafe	100000	600000	4	50	2
20.12.2004 19:30:00	DRF-20 Other failures	289419	BOR-GFC: Viskøst slam	342500	1370000	6	100	6
			Total	442500				8

SERVICE COMPANY: Electric Wireline Logging EWL Schlumberger
WELLBORE: NO 34/10-48 AT2

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
27.01.2005 18:00:00	EWL-E05 Downhole electronic	295931	Toolfeil ifm. VSP logging	50000	4800000	0,25	100	0,25

WELLBORE: NO 34/10-48 S

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
22.05.2004 19:00:00	EWL-E05 Downhole electronic	113384	BOR-GFC / Trouble shooting on logging equipment / Schlumberger WL	62500	600000	2,50	100	2,50
04.12.2004 08:00:00	EWL-E05 Downhole electronic	287326	Bor/Gfc. Utstyrsfeil; Nedihullspumpe feilet. Nedetid; 67,5 t.	1690500	520154	78	100	78
08.12.2004 12:00:00	EWL-E04 Cables/Heads & Assoc..	287328	Bor/Gfc. Utstyrsfeil; Lokomotiv latchet ikke på. Nedetid; 52,5t.	965482	441363	52,50	100	52,50
12.12.2004 02:00:00	EWL-E05 Downhole electronic	287778	Bor/Gfc. Utstyrsfeil Schlumberger WL; Tapt komm. m. MDT-QR. Nedetid; 0,5t.	12166	583968	0,50	100	0,50
			Total	2780648				133,75

SERVICE COMPANY: Measurement While Drilling MWD Schlumberger
WELLBORE: NO 34/10-48 A

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
29.12.2004 16:00:00	MWD-E01 Transmission	291675	MWD tool failed at 5755 m.	1687500	602230	67,25	100	67,25

WELLBORE: NO 34/10-48 S

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
24.04.2004 09:30:00	MWD-E08 Pressure While Drilling (ECD)					0,50	100	0,50
15.05.2004 20:00:00	MWD-E12 Sonic	92782	BOR-GFC / Isonic + tool checked on rigfloor / Schlumberger D&M	25000	600000	1	100	1

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
15.05.2004 21:00:00	DDR-E23 MWD/LWD *	93035	BOR-GFC / Vision 825 Resistivity tool failed shallow hole test / Schlumberger D&M	50000	300000	4	100	4
20.12.2004 18:30:00	DIR SURV-01 Procedure	289421	BOR-GFC: Reprogrammed MWD	36000	864000	1	100	1
			Total	1798500				73,75

SERVICE COMPANY: Operator OPR Operator
WELLBORE: NO 34/10-48 A

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
08.01.2005 11:15:00	DRF-01 Hole cleaning/pack off					165,25	100	165,25

WELLBORE: NO 34/10-48 AT2

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
22.01.2005 03:00:00	COMPFL-01 Procedure/program	295068	OD vaskeassy' større enn ID til 7" linerhanger	100000	65753	36,50	100	36,50
30.01.2005 04:30:00	RIG-E05 Pipe handling	296269	Gfc/Bor. Nedtid 2.5 timer	62500	600000	2,50	100	2,50
03.02.2005 10:15:00	CPLEQ-03 Procedure not followed	297370	Manglende volum av tungt slam etter perforering av brønn 34/10-C48AT2.			5,50	100	5,50
11.02.2005 08:00:00	CPLEQ-E03 Permanent DH well equipment					18,25	100	18,25

WELLBORE: NO 34/10-48 S

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
09.03.2004 04:00:00	RIG-E30 Other Equipment	258072	BOR-GFC / Korrodert tetningsflate på A-seksjon slisse 28 / Statoil	3575000	626277	137	100	137
11.03.2004 06:00:00	RIG-E03 BOP stack/valves					0	100	0
12.03.2004 06:00:00	RIG-E03 BOP stack/valves					2	100	2
24.03.2004 02:00:00	RIG-E30 Other Equipment	259462	BOR-GFC / Casing hanger / Statoil	50000	600000	2	100	2
20.04.2004 13:30:00	CEM-20 Other failures	262813	BOR- GFC/ Wear Bushing fulgte RTTS ut av hullet/ Prosafe	40500	648000	1,50	100	1,50
24.04.2004 00:00:00	DRF-01 Hole cleaning/pack off					1,50	100	1,50
26.04.2004 00:00:00	RIG-E14 Mud pumps	264979	BOR-GFC / Mistet pumpetrykk ved boring av 17 1/2" seksjon på2547 mMD / Statoil	62500	600000	2,50	100	2,50
12.05.2004 17:00:00	RIG-E30 Other Equipment	93085	BOR-GFC / Problemer med BOP testeplugg / Statoil	50000	600000	2	100	2
18.11.2004 23:30:00	RIG-01 Procedure					1,50	100	1,50
21.11.2004 11:00:00	RIG-01 Procedure					9,50	100	9,50
28.11.2004 00:00:00	RIG-E07 Top drive	284613	Skifte av wash-pipe	3000	72000	1	100	1
			Total	3943500				388,50

SERVICE COMPANY: Rig Operations RIG Prosafe Drilling Services
WELLBORE: NO 34/10-48 S

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
15.03.2004 16:00:00	RIG-E03 BOP stack/valves	258439	BOR-GFC/ Nedetid pga. lekkasje på automatventil på LRR pumpe/ Prosafe	100000	600000	4	100	4
22.03.2004 21:00:00	RIG-E05 Pipe handling	259156	BOR-GFC/Feil med BX elevator/Prosafe	37500	600000	1,50	100	1,50
23.03.2004 21:00:00	RIG-E30 Other Equipment	259454	BOR-GFC / Problemer med å få hanger gjennom slips / Prosafe	25000	600000	1	100	1

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
24.03.2004 06:00:00	RIG-E30 Other Equipment	259443	BOR-GFC / Kort landestreng / Prosafe	50000	600000	2	100	2
24.03.2004 12:30:00	RIG-E30 Other Equipment	259435	BOR-GFC / Lekkasje på sementline / Prosafe	25000	600000	1	100	1
24.03.2004 23:00:00	RIG-E30 Other Equipment					1	100	1
20.04.2004 10:00:00	RIG-E05 Pipe handling	262941	BOR- GFC/ Nedetid ifm. justering av Eagle/ Prosafe	25000	600000	1	100	1
23.04.2004 06:00:00	RIG-E05 Pipe handling					0,50	100	0,50
24.04.2004 10:30:00	RIG-E07 Top drive	263902	BOR-GFC / Bortfall på 2 av 3 DC-motorer til heisespill / Prosafe	12500	600000	0,50	100	0,50
25.04.2004 00:00:00	RIG-E14 Mud pumps	263926	BOR-GFC / Nedetid ifm. lekkasje på discharge ventil på slampumpe #1 / Prosafe	400000	600000	16	100	16
29.04.2004 20:00:00	RIG-E30 Other Equipment	263863	BOR-GFC / Nedetid pga. for korte bailer / Prosafe	25000	600000	1	100	1
30.04.2004 10:30:00	RIG-E30 Other Equipment	93786	BOR-GFC / Problemer med csg tang / OWS	12500	600000	0,50	100	0,50
03.05.2004 22:00:00	RIG-E30 Other Equipment	264475	BOR-GFC / B-krok på BOP-kran nord ute av drift / Prosafe	25000	600000	1	100	1
07.05.2004 01:30:00	RIG-E14 Mud pumps	264543	BOR-GFC / Nedetid pga problemer med å "suction" til slampumpene / Prosafe	100000	600000	4	50	2
07.05.2004 06:30:00	RIG-E16 Cuttings reinjection system	264711	BOR-GFC / Nedetid pga reimene på smaccc-anlegg røk / Prosafe	112863	300968	9	100	9
08.05.2004 08:00:00	RIG-E14 Mud pumps	265110	BOR-GFC / Nedetid grunnet vibasjoner MP#3 / Prosafe	7961	95532	2	100	2
09.05.2004 00:00:00	RIG-E16 Cuttings reinjection system	265113	BOR-GFC / Nedetid: Lekkasje i sirkulasjons pumpe - Smaccc / Prosafe	51375	1233000	1	100	1

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
09.05.2004 08:30:00	RIG-E16 Cuttings reinjection system	265122	BOR-GFC / Nedetid pga. lekkasje i suction ventil på MP#1 / Prosafe	50700	608400	2	100	2
10.05.2004 02:00:00	RIG-E16 Cuttings reinjection system	265128	BOR-GFC / Nedetid grunnet defekt sirk pumpe og hull i knusertank - Smaccc / Prosafe	176375	705500	6	100	6
12.05.2004 20:00:00	RIG-E10 Drawwork	70796	BOR-GFC / Nedetid grunnet feilsøking PLS system for SCR tavle / Prosafe	125000	1200000	2,50	100	2,50
13.05.2004 05:30:00	RIG-E09 Electric power system	70796	BOR-GFC / Nedetid grunnet feilsøking PLS system for SCR tavle / Prosafe	125000	1200000	2,50	100	2,50
14.05.2004 21:30:00	RIG-E30 Other Equipment	91311	BOR-GFC / Dårlig forebyggende vedlikehold / Prosafe	25000	600000	1	100	1
18.05.2004 06:00:00	RIG-E07 Top drive	93652	BOR-GFC / Lekk wash pipe / Prosafe	12500	600000	0,50	100	0,50
20.05.2004 06:00:00	RIG-E30 Other Equipment	96150	BOR-GFC / Lekkasje på "wash pipe" / Prosafe	12500	600000	0,50	100	0,50
30.05.2004 00:00:00	RIG-E05 Pipe handling	146352	BOR-GFC / Problemer med gantry kran / Prosafe	25000	600000	1	100	1
30.05.2004 01:30:00	RIG-08 Unsceduled maintenance	147265	BOR-GFC / Cut & slip av boreline / Prosafe	12500	600000	0,50	100	0,50
30.05.2004 06:00:00	RIG-E05 Pipe handling	190130	BOR-GFC/ Nedetid pga. problemer med matebord og Eagle/ Prosafe	450000	10800000	1	100	1
			Total	2024274				62,50

SERVICE COMPANY: Rig Operations RIG Smedvig
WELLBORE: NO 34/10-48 A

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
26.12.2004 00:00:00	RIG-E07 Top drive					80,50	100	80,50
26.12.2004 12:00:00	DDR-03 Procedure not followed	290011	1 time nedtid pga 17 m3 premix i aktiv	25000	600000	1	100	1
09.01.2005 00:15:00	RIG-08 Unsceduled maintenance					1	100	1

WELLBORE: NO 34/10-48 AT2

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
16.01.2005 01:30:00	RIG-E04 Iron roughneck	293660	Bor/Gfc. Utstyrsfeil; IR sviktet. Nedetid; 1,5t.	40500	486000	2	100	2
17.01.2005 00:00:00	RIG-E07 Top drive	293659	Bor/Gfc. Utstyrsfeil; Arbeide på DDM hindret testing. Nedetid; 1t.	28000	672000	1	100	1
17.01.2005 13:45:00	RIG-E30 Other Equipment	293652	Gfc/Smedvig-Utstyrs stopp.	3000	144000	0,50	100	0,50
18.01.2005 06:00:00	RIG-E05 Pipe handling	294182	Bor/Gfc. Utstyrsfeil; Eagle stoppet. Nedetid; 0,5t.	15500	744000	0,50	100	0,50
21.01.2005 06:00:00	RIG-E04 Iron roughneck	294620	Bor/Gfc. Nedtid 1 time. Byttet diesholdere på IR.	25000	600000	1	100	1
22.01.2005 13:00:00	RIG-E05 Pipe handling	294730	Bor/Gfc. Utstyrsfeil; Slangebrudd PRS. Nedetid; 1t.	28000	448000	1,50	100	1,50
23.01.2005 13:30:00	RIG-E05 Pipe handling					2,50	100	2,50
28.01.2005 06:00:00	RIG-01 Procedure	296054	Brukte lang til på Slip & Cut	25000	600000	1	100	1
07.02.2005 06:00:00	RIG-E05 Pipe handling	298119	6 timer nedtid Defekte fjærer i eagle gripehode	153000	587520	6,25	100	6,25

WELLBORE: NO 34/10-48 S

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
04.11.2004 22:00:00	RIG-E05 Pipe handling	280495	GFC/Smedvig.Utstyrsfeil; Spader i PRS "Stuck". Nedetid 9,5t.	240500	607579	9,50	100	9,50
06.11.2004 12:30:00	RIG-E05 Pipe handling	280651	GFC/Smedvig. Operasjonsfeil; PRS arm fast. Nedetid: 1t.	28000	672000	1	100	1
10.11.2004 02:00:00	RIG-E05 Pipe handling	281356	Inspeksjon av torque wrench og måling av driveshaft aksling DDM. 1/2 time nedetid	12500	600000	0,50	100	0,50
10.11.2004 09:30:00	RIG-E05 Pipe handling	281298	Nedtid 1 time. Slangebrudd på PRS	25000	600000	1	100	1
13.11.2004 06:00:00	RIG-E05 Pipe handling	281943	1 time nedetid bøyd hengslebolt til latch på PRS	25000	600000	1	100	1
13.11.2004 21:30:00	DRF-07 Procedure not followed	282071	1/2 time nedetid For mye vekt ved innskrueing av DDM	12500	600000	0,50	100	0,50
14.11.2004 06:00:00	RIG-E19 Drill pipe					5	100	5
19.11.2004 06:00:00	RIG-E05 Pipe handling	283130	1/2 nedetid Feil utspacesing med eagle åk	3000	144000	0,50	100	0,50
22.11.2004 12:30:00	RIG-E07 Top drive					5	100	5
24.11.2004 00:00:00	RIG-E07 Top drive	284270	Skifte av wash-pipe	3000	144000	0,50	100	0,50
26.11.2004 09:00:00	RIG-E07 Top drive	284556	Skiftet gearolje på DDM	14000	672000	0,50	100	0,50
30.11.2004 10:00:00	RIG-E05 Pipe handling					1	100	1
06.12.2004 09:15:00	RIG-E07 Top drive					0,50	100	0,50
14.12.2004 00:00:00	RIG-E04 Iron roughneck	287943	Bor/Gfc. Utstyrsfeil; IR gjorde ikke opp. Nedetid; 0,5t.	15500	744000	0,50	100	0,50
14.12.2004 03:00:00	RIG-E06 Deck crane	287945	Bor/Gfc. Utstyrsfeil; Gantry kran stoppet. Nedetid; 1 t.	28000	672000	1	100	1
14.12.2004 09:00:00	RIG-E30 Other Equipment	287947	Bor/Gfc. Utstyrsfeil; Hydr. lekkasje i PS21. Nedetid; 0,5 t.	15500	744000	0,50	100	0,50
14.12.2004 10:00:00	RIG-E10 Drawwork	288148	Nedtid 6.5 timer. Problemer med å få resatt crown-o-matic etter aktivering.	162500	600000	6,50	100	6,50

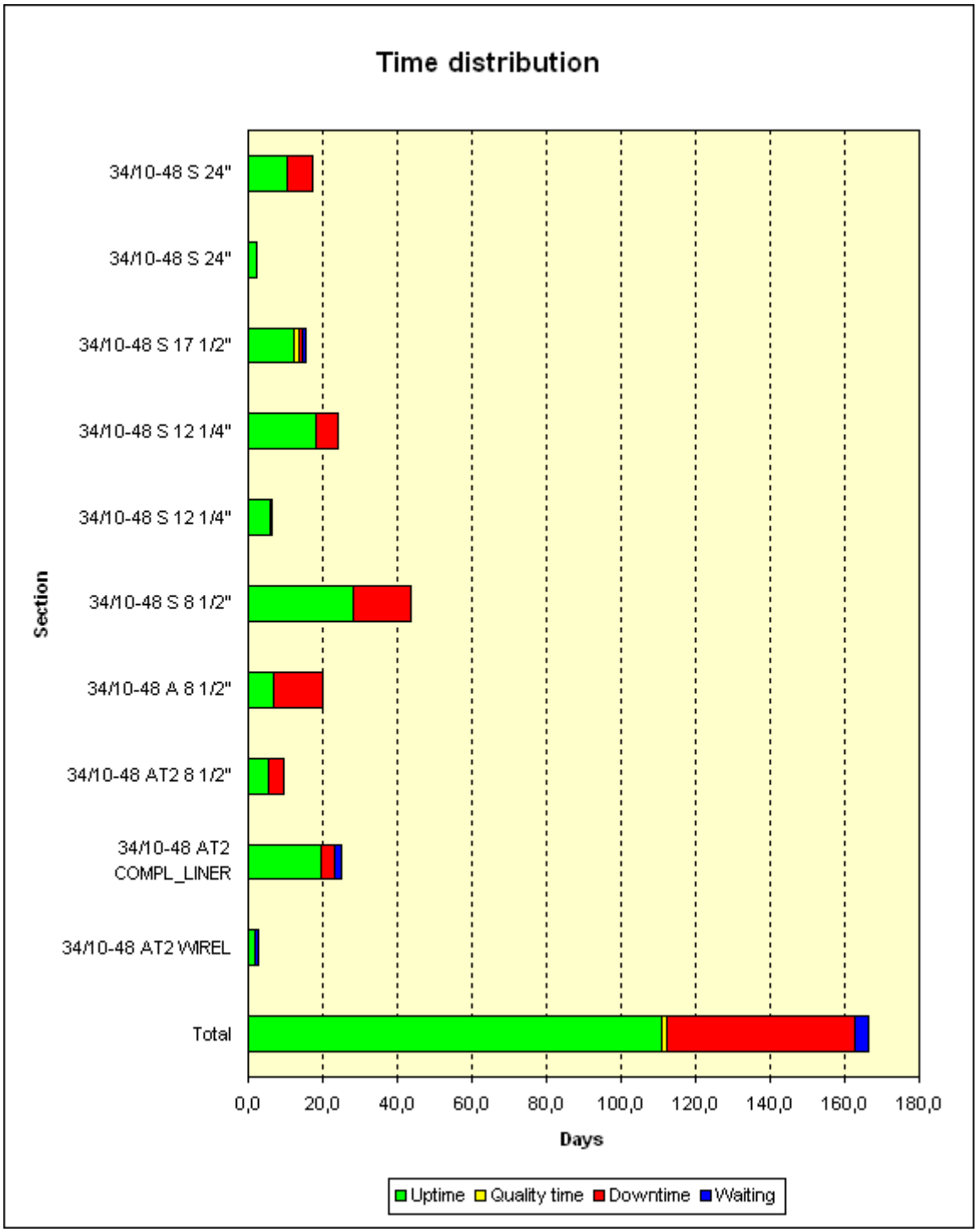
Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
16.12.2004 02:00:00	RIG-E04 Iron roughneck	288370	Bor/Gfc. Utstyrsfeil; Skiftet inserts IR. Nedetid; 0,5t.	15500	744000	0,50	100	0,50
16.12.2004 07:00:00	RIG-E07 Top drive	289097	Nedtid 97 timer. Byttet main shaft på DDM	2425000	600000	97	100	97
20.12.2004 23:00:00	RIG-E05 Pipe handling	289076	1/2 time nedetid løs hurtigkobling til BX elevator	15500	744000	0,50	100	0,50
21.12.2004 00:30:00	RIG-E05 Pipe handling	289228	1/2 time nedetid problemer med latch nedre PRS hode	15500	744000	0,50	100	0,50
21.12.2004 06:00:00	RIG-E05 Pipe handling	289228	1/2 time nedetid problemer med latch nedre PRS hode	15500	744000	0,50	100	0,50
			Total	3415000				232,75

SERVICE COMPANY: Wireline WIR Aker Kværner Well Services
WELLBORE: NO 34/10-48 AT2

Incident start time	Failure code	Synergi no	Title	Quality cost		Downtime		
				NOK	NOK/d	Total hrs	Comp share %	Comp share hrs
13.02.2005 00:00:00	RIG-E30 Other Equipment					1,50	100	1,50
			Total	0				1,50

3.4 Time distribution

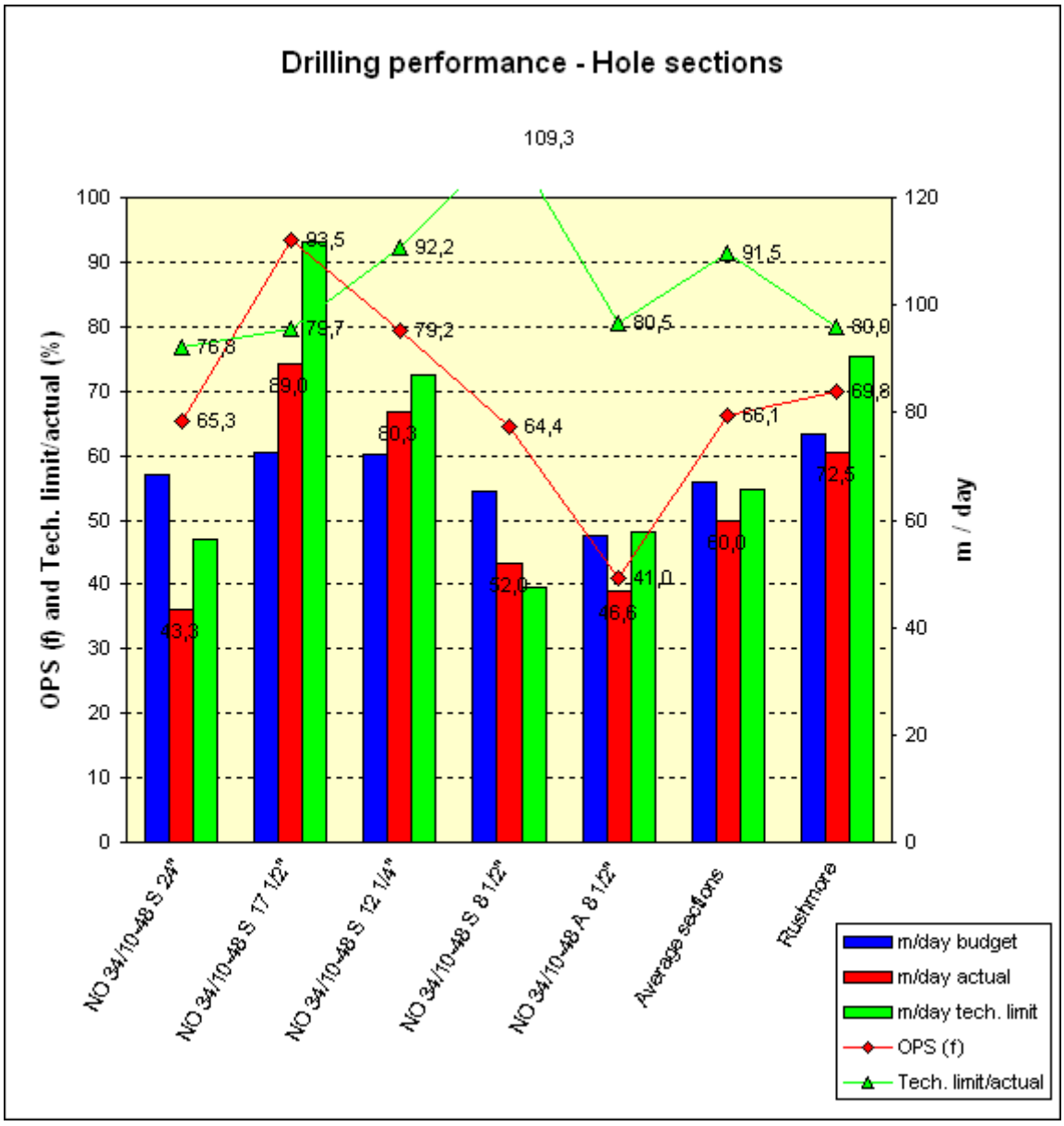
		Length	Budget		TL		Actual		Opf
Section	Start time	m	hrs	days	hrs	days	hrs	days	(f)
NO 34/10-48 S 24"	09.03.2004 02:30	844,0	265,0	11,0	322,0	13,4	415,0	17,3	61,6
NO 34/10-48 S 24"	19.04.2004 05:30	0,0	31,0	1,3	37,0	1,5	52,5	2,2	95,2
NO 34/10-48 S 17 1/2"	21.04.2004 10:00	1377,0	456,0	19,0	296,0	12,3	371,5	15,5	93,5
NO 34/10-48 S 12 1/4"	06.05.2004 20:30	2435,0	718,0	29,9	562,0	23,4	573,0	23,9	75,4
NO 34/10-48 S 12 1/4"	02.11.2004 06:00	5,0	92,0	3,8	110,3	4,6	156,5	6,5	93,3
NO 34/10-48 S 8 1/2"	08.11.2004 20:00	2281,0	836,0	34,8	1149,9	47,9	1052,0	43,8	64,4
NO 34/10-48 A 8 1/2"	22.12.2004 16:00	1101,0	410,0	17,1	399,0	16,6	475,5	19,8	33,8
NO 34/10-48 AT2 8 1/2"	11.01.2005 12:00	270,0	168,0	7,0	169,0	7,0	230,5	9,6	56,0
NO 34/10-48 AT2 COMPL_LINER	21.01.2005 02:30	0,0	545,0	22,7	360,0	15,0	603,5	25,1	86,1
NO 34/10-48 AT2 WIREL	16.02.2005 06:00		83,0	3,5	49,0	2,0	64,0	2,7	100,0
Sum			3604,0	150,1	3454,2	143,7	3994,0	166,4	



The graph above is based on the following details:

Section	Downtime	Uptime	Quality time	Waiting time	Total time
34/10-48 S 24"	6,64	10,64	0	0	17,29

Section	Downtime	Uptime	Quality time	Waiting time	Total time
34/10-48 S 24"	0,10	2,08	0	0	2,18
34/10-48 S 17 1/2"	1	12,47	1,06	0,93	15,47
34/10-48 S 12 1/4"	5,87	18	0	0	23,87
34/10-48 S 12 1/4"	0,43	6,08	0	0	6,52
34/10-48 S 8 1/2"	15,60	28,15	0	0,07	43,83
34/10-48 A 8 1/2"	13,11	6,69	0	0	19,81
34/10-48 AT2 8 1/2"	4,22	5,37	0	0	9,60
34/10-48 AT2 COMPL_LINER	3,39	19,75	0	2	25,14
34/10-48 AT2 WIREL	0	1,83	0	0,83	2,66
Total	50,40	111,10	1,06	3,84	166,41



3.5 Total cost and budget 48 S, 48 A and 48 A T2

Budget, drilling 48 S/completion : 150 mill NOK
Budget drilling 48 A: 17, 1 mill NOK

48 S was drilled 550 m further than planned, to get the information required

A planned sidetrack 48 A was drilled to optimize the wellpath through the Brent Gr. in the Topas prospect.
Budget 48 A:17,1 mill NOK

This extra budget was approved by the partners during operations.

Actual cost drilling 24" and 17 ½" section:	**40,3 mill NOK**
Actual cost drilling 12 ¼" and 8 ½" section:	**108,9 mill NOK**
Actual cost for completion:	**52,8 mill NOK**

3.6 Documents written in advance of the well

3.6.1 "Risikovurdering 34/10-48 S", "Risikovurdering 34/10-48 A" (GF RESU U-04 000XXX)

Based on the standard risk evaluation for GF HF, a document going through the different operations containing risks were made. Risk reducing actions were listed for critical events.

3.6.2 Peer Review

A peer review meeting were held prior to start drilling of the well.

3.7 Workshops and Project plan

A two days workshop were held prior to drilling this well. The participants were Statoil onshore/offshore personnel and personnel from Prosafe and all the service companies involved. The operations was planned in detail, and parallel activities and checkpoints were discussed

The risk document was also discussed on the workshop

4 Geology and formation data report

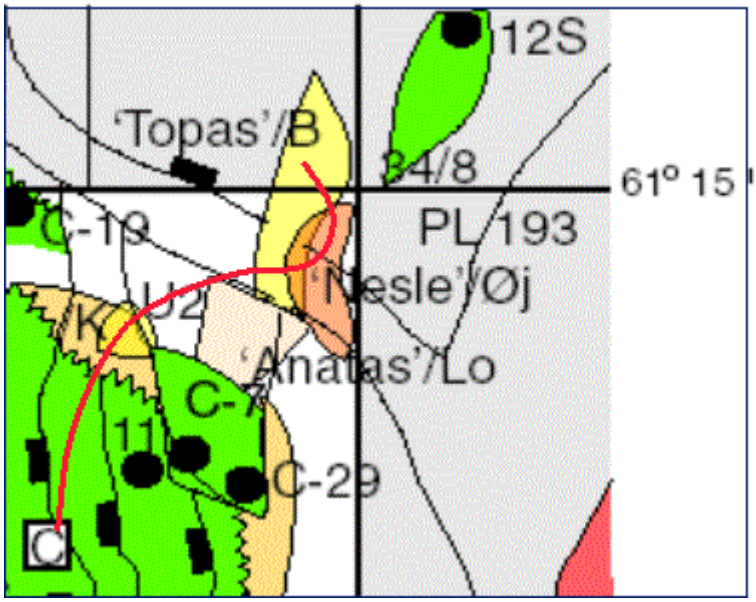


Fig 4.1.1 Showing the position of the Topas prospect and the leads

4.1 Geological setting and results

Well 34/10-48 S was drilled from the Gullfaks C platform into the licence area PL120. The main objective was to test the hydrocarbon potential in undisturbed Brent Group sedimentary rocks of middle Jurassic age, situated in a rotated segment, down-faulted, by the "Inner Snorre Fault", from the north-eastern part of the Gullfaks structure, figure 4.1.1 and 4.1.2. The prospect, named Topas, has a boundary to an intra-Heather Formation erosional surface to the east, overlain by deposits from the Viking Group below BCU. West of the erosional line the Brent Group dips towards west-north-west and overlain by the Viking Group.

The well penetrated the U2 prospect north on the Gullfaks structure and encountered several thin sandstones with hydrocarbon shows. The last couple of hundred meters before crossing the "Inner Snorre Fault" an oil bearing section of Lunde reservoir was penetrated.

The lead in the upper Jurassic, situated on the down-faulted side of the "Inner Snorre Fault", was not encountered. This was due to the fact that the fault is located further to the north-east than indicated and interpreted from the seismic, in which location the well penetrated the fault below the top BCU. Consequently, neither the BCU nor the Draupne Fm was observed.

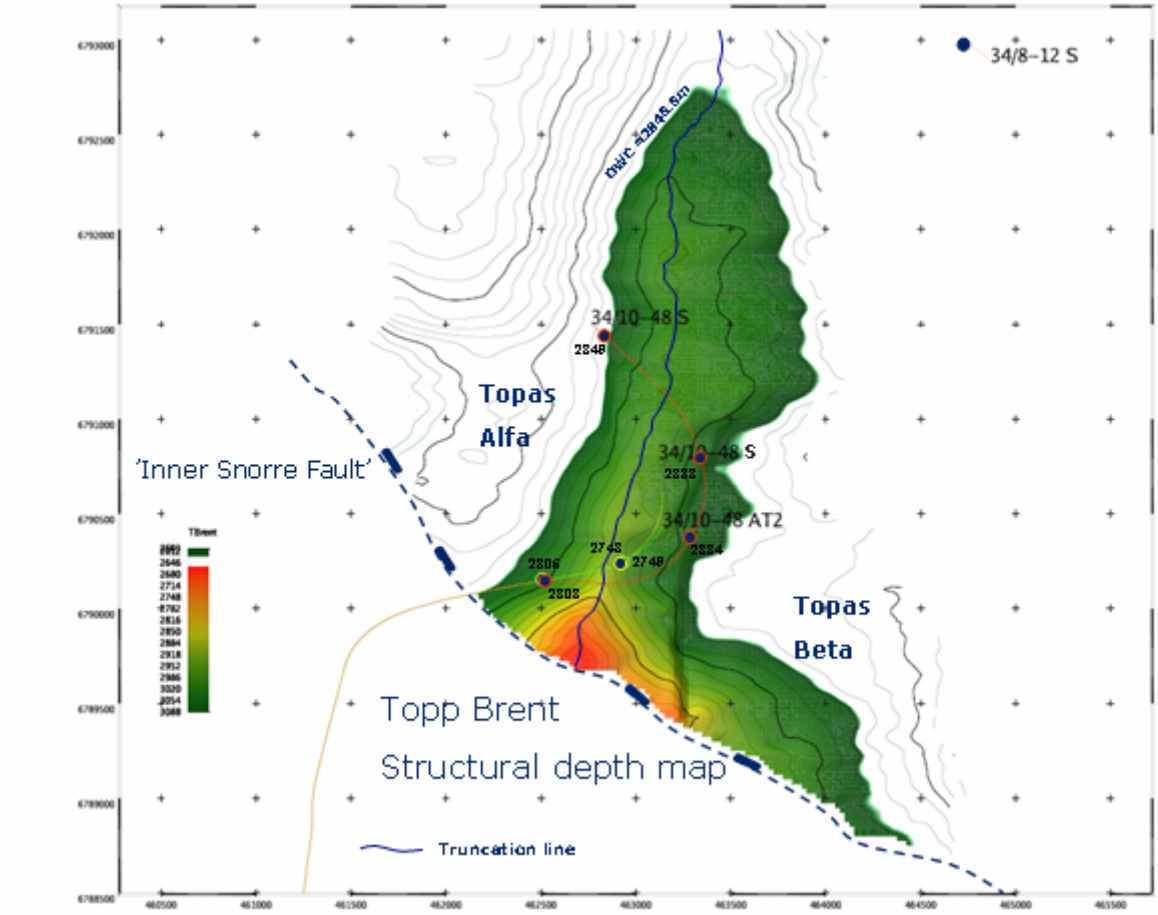


Fig 4.1.2 Structural depth map showing the Topas discovery

Water filled sandstone was encountered just above (4890-5009 m MD RT/2719-2758 m TVD MSL) the Topas discovery. The biostratigraphy from the shales below and above the sandstone gave ages of lower Jurassic, indicating material from the Dunlin Group. This area is very close to the Inner Snorre Fault and is expected to be a depot-center for material from gravitational processes; rock-falls/scree and debris flows. The water filled sandstone within the Dunlin shale may be of early Jurassic age (indicated by biostratigraphy) and interpreted as a single block deposited by rock-fall into the Heather Formation with an overprint of early Jurassic shales.

The well penetrated the top Brent Group at 5161 m MD RT/2802,5 m TVD MSL, 7,4 metres TVD shallower than prognosticated. The Tarbert Formation and the uppermost part of the Ness Formation were oil bearing, while the middle and lower part of the Ness Formation and the Etive/Rannoch Formations were water filled. Where the well drilled out of the oil filled interval and into the water filled section it is interpreted as an oil-down-to 5362 m MD RKB/ 2825,5 m TVD MSL. This interpretation is in addition supported by dynamic data and results from the test production phase.

At 5999 m MD RKB / 2834 m TVD MSL, after crossing a fault, an oil bearing Tarbert Formation section was again encountered. The well path is horizontal at this stage and this unit lasted for nearly 150m, (Tarbert Formation until 6143 m MD RKB/ 2831 m TVD MSL).

Further, the well penetrated a prognosticated upper Jurassic succession (6143-6455 m MD RKB) consisting of Heather Formation shales and an oil-filled intra-Heather Formation sandstone. This sandstone was observed twice because of a stratigraphic turning point inside the upper Jurassic section.

At 6455 m RKB the well re-entered the Brent Group to the north. Even though the well-path is 8m TVD deeper than the oil down-to situation observed further south (at 5362m MD) it was expected to find the upper part of the Brent Group oil-filled to the north. This was confirmed. In this area/segment the oil-water contact was drilled through at 7130 m MD RT/2845.5 m TVD MSL, which is 64 m TVD shallower than prognosticated. At corresponding position top Tarbert was about 45 m shallower than prognosticated.

The stratigraphy penetrated by 34/10-48 S was basically in accordance with the prognosis. The well drilled a complete Tarbert-to-Rannoch-2 succession before it started to drill stratigraphically upwards again (stratigraphic turning point at 5640 m MD RKB/ 2840,5 m TVD MSL). The stratigraphic completeness of the Brent Group between 5161 and 5640 m MD RKB is inferred from correlation to offset wells in the north-eastern part of the Gullfaks Field (B-35, B-15 and B-14 A) and the Nøkken Field (34/11-2 S). The offset wells show the same log patterns and lithologies; and from correlation to the reversed section in 34/10-48 S itself (5460-5940 m MD RKB) the lower Brent Group/Ness Formation interval has been correlated to the 34/10-48 A well as far as the Tarbert Formation section is concerned. In the lower part of the Tarbert Formation there is a discrepancy between the two wells, and this is interpreted to be due to several minor faults in the 48 A well.

As prognosticated the 34/10-48 S well also drilled through an upper Jurassic section consisting of both Heather Formation shales and intra-Heather Formation sandstones (6143-6455 m MD RKB), Figure 4.2.3. The interpretation is based on log responses and seismic interpretation, and further supported by biostratigraphic dating.

In the toe of the well (6455-7304 m MD RKB) an inverse Tarbert Formation section was penetrated before it finally drilled into the upper Jurassic where the TD for the well was set. Based on correlation to other wells and dipmeter logs, several minor faults are inferred in this section.

The isochores within the Brent Group is very challenging to calculate as the well has been drilled semi-horizontally or horizontally through it. It is also difficult to get reliable data from offset wells as they are located far away (several kilometres) and are found at different depths. The Gullfaks Field to the west and south-west is located 1000 m TVD shallower whereas the Nøkken discovery to the east is located 1000 m TVD deeper. Neighbouring wells to the north, (34/8-12 S and 34/8-5) which are found at comparable burial depths are stratigraphically incomplete, uncertain (-12 S) and difficult to use.

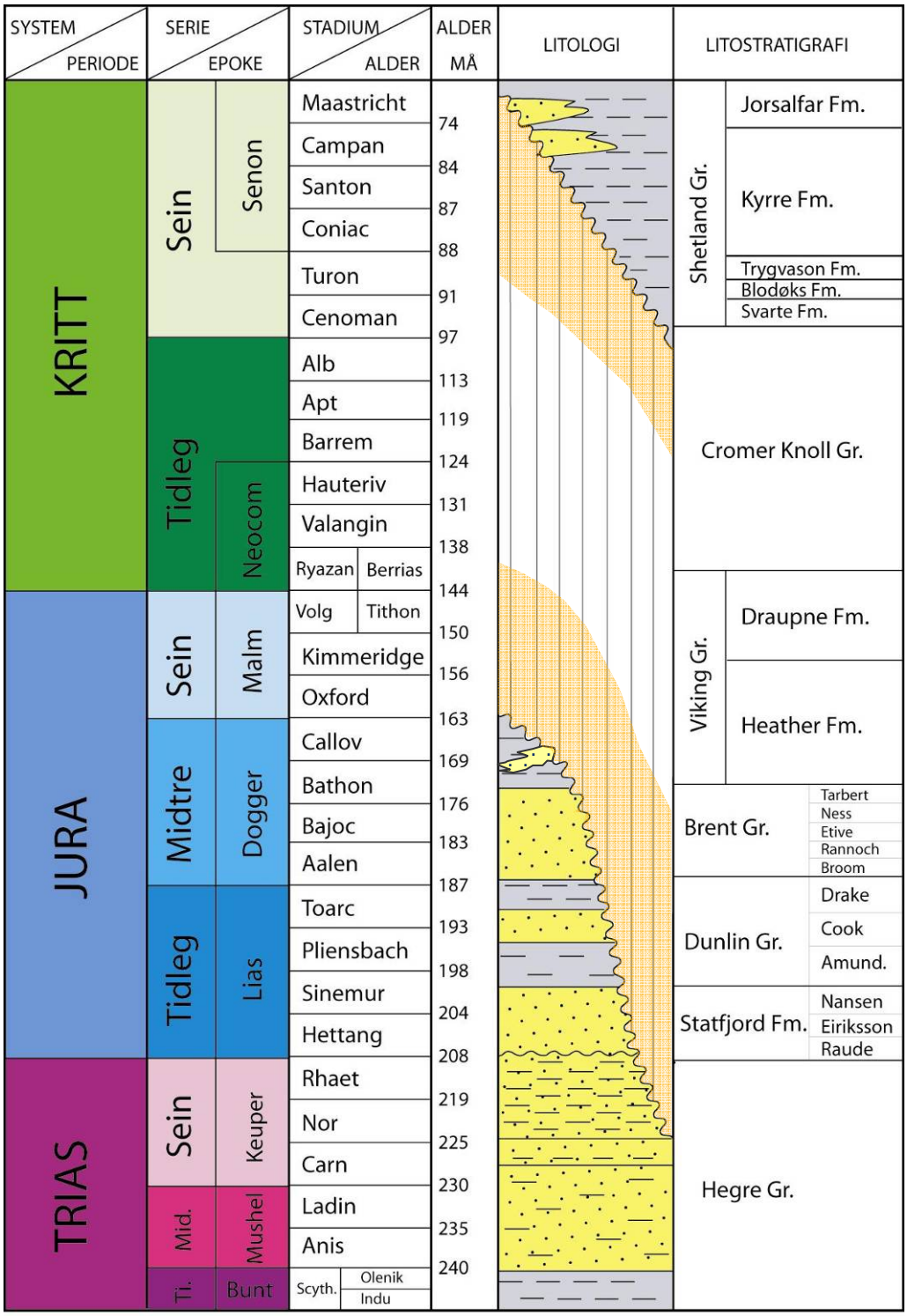


Figure 4.1.2: A generalized stratigraphy for the Gullfaks and Topas area. Note the light orange colour which indicates potential sediment accumulation in the Topas area.

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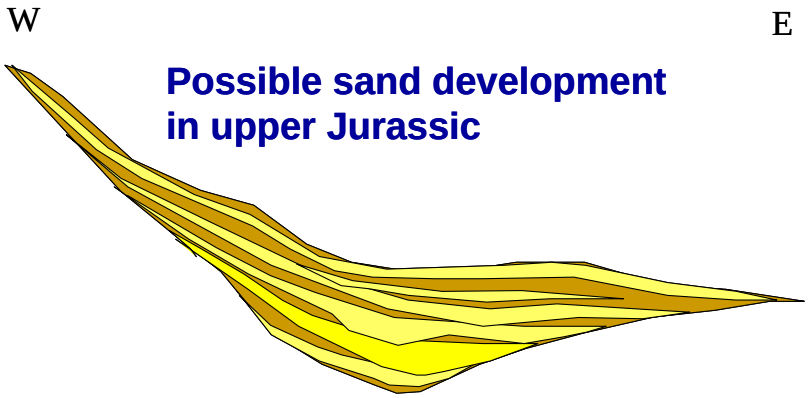


Figure 4.1.3, generalised development of sand deposits in late Jurassic/Heater Formation in Topas area

Dipmeter data, the upper Brent Group seismic isochore, and local and regional knowledge of the Brent Group development have been utilised in calculating isochores/isopachs. However, it should be stressed that thicknesses are very sensitive to both dip and azimuth of the layers. Furthermore, there are uncertainties in seismic picks and velocity. As for the lowermost Brent Group sections (parts of Rannoch-2 and Rannoch-1) which were not penetrated in the well, thickness data from neighbouring 34/10-6 well in the Gullfaks Field was used. The thicknesses were reduced by 5% as that well is 1000 m TVD shallower.

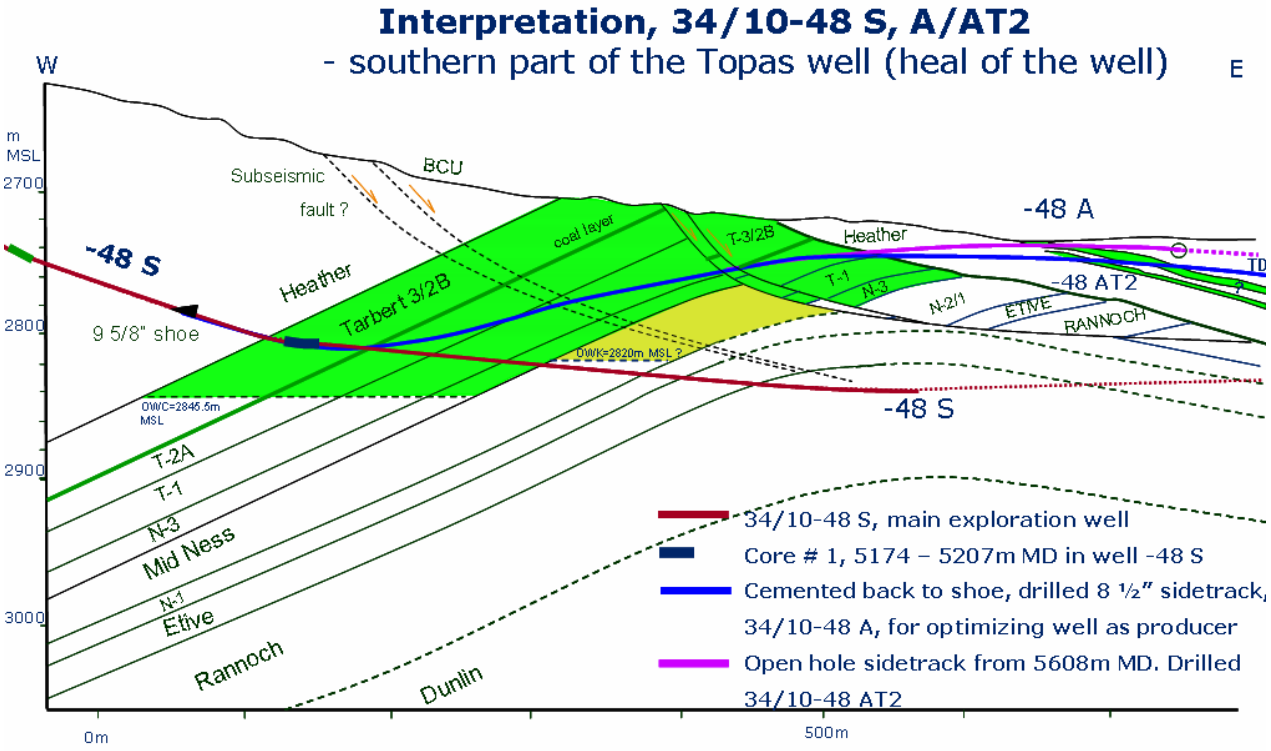


Figure 4.1.4: Cross section of southern part of the Topas structure.

The reservoir and the OWC were encountered shallower than prognosticated. The use of too high velocities in the depth conversion is the most likely the reason for this. Approximately 20 meters of the expected oil column is “lost”, which implies that the hydrocarbon volume has not been reduced dramatically. Correlated with the new interpretation on the near trace seismic, the area of the Topas discovery above the contact has been reduced from 4,3 km^2 to 3,8 km^2, a reduction of approximately 15 %. Correlated with the maps that have been used for the official volume estimations (in RTD) the area has increased from 2.8 km^2 to 3,8 km^2. The well is close to the OWC (10-20m) and most of the reserves are believed to be situated up flank.

It was therefore decided to drill a sidetrack to optimize the well as a producer. The sidetrack, 34/10-48 A was performed from the 9 5/8” shoe, only about 50m measured depth above top Brent. The objectives were to get as high as possible on the southern part of the Topas structure on Tarbert/Ness level. The plan was to turn the well northwards. This performed very well until equipment failed and it was no longer possible to steer the well path. This event occurred immediately before drilling into the Brent Group to the north.

Another sidetrack, this time an open hole Brent sidetrack, was performed at 5600m MD at the end of the reservoir unit in the southern area of Topas. The drilling was slow and went to a final stop as penetration of less than 1m pr hour was achieved. The last 50m of well 34/10-48AT2 drilled once more through intra Heather sandstones with apparently good reservoir quality and hydrocarbon saturation, figure 4.1.5.

The final sidetrack, 34/10-48 AT2 was thereafter completed with one manual sleeve in Lunde, three diacs sleeves in Brent and finally another manual sleeve in the upper Jurassic interval.

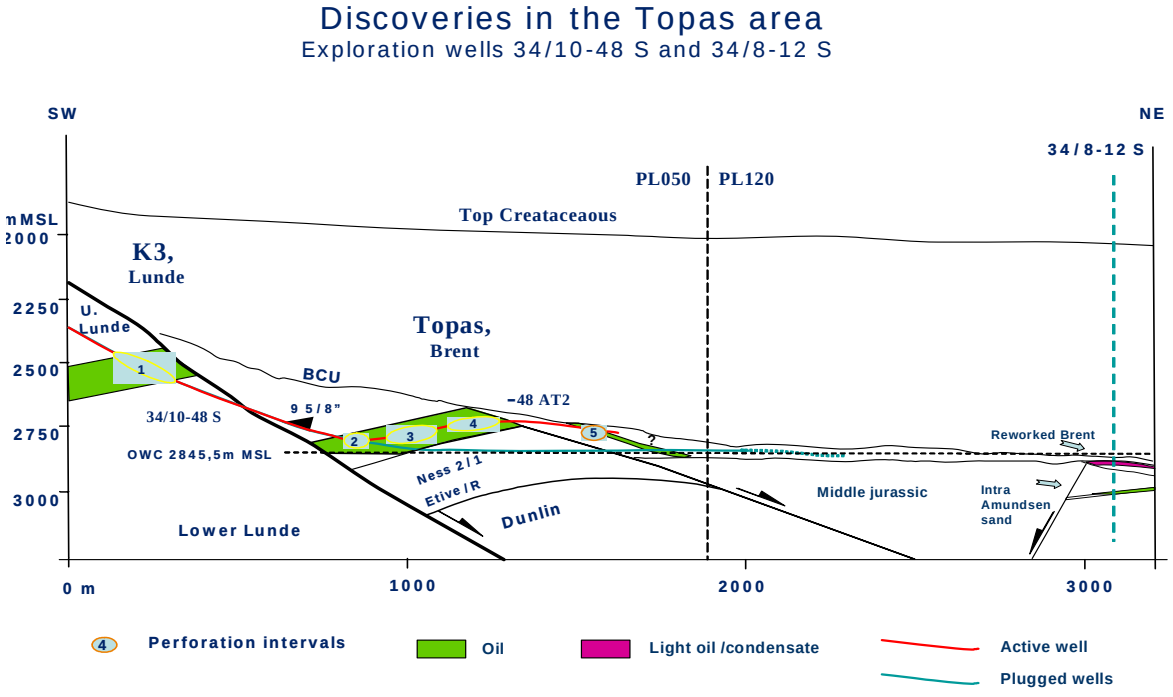


Figure 4.1.5: Discoveries in the Topas area.

4.2 Shallow gas results

Shallow gas has been registered in several wells from the Gullfaks C platform. Shallow gas appears in intervals between 441 to 443m, 484 to 485m and 504 to 514m TVD RKB and is penetrated from both shafts. All wells drilled from GFC are therefore considered to contain shallow gas and are handled accordingly. This well was not logged for shallow gas.

4.3 Stratigraphy

The stratigraphic zonation is based on previous logs from near-situated wells and Statoil's own interpretation.

4.3.1 Table of stratigraphy

Table 4.3.1.1: 34/10-48 S, Formation tops in the top hole sections

Stratigraphic Tops	DEPTH MD (m RKB)	DEPTH TVD (m RKB)	DEPTH TVD (m MSL)	Deviation from prognosis (m +/-)
Nordland Group	301	301	217	-
Utsira Formation	1008	962	878	-3
Hordaland Group	1072	1009	925	-1
Rogaland Group	2357	1602	1518	2
Balder Formation	2357	1602	1518	2
Lista Formation	2528	1667	1583	2
Shetland Group	2851	1787	1703	-42
Cromer Knoll Group	3612	2199	2115	-
Base Cretaceous	3657	2226	2173	3
Hegre Group	3657	2226	2173	-
Lunde C	3657	2226	2173	-
Lunde D	3804	2310	2226	-
Lunde E	4530	2666	2582	-
Fault/**Dunlin Group**	4644	2712	2628	-
Drake Formation	4644	2712	2628	-
Cook Formation	4891	2803	2719	-
Fault/**Viking Group**	5008	2842	2758	-
Heather Formation	5008	2842	2758	-
TD of the 12 ¼" hole section	5106	2872	2788	-

Table 4.3.1.2: 34/10-48 S, Formation tops

Group/ Formation	Encntr depth m MD RKB	Encntr depth m TVD RKB	UTM E	UTM N
9 5/8" casing shoe	5105	2871		
Heather Fm.*	5008	2841,8	462 374,9	6 790 123,3
Brent Group	5161	2886,6	462 518,8	6 790 144,0
Tarbert 3	5161	2886,6		
Tarbert 2	5200	2892.5	462 559,3	6 790 146,9
Tarbert 1	5267	2900,5	462 624,1	6 790 148,5
Ness 3	5311	2904,7	462 668,3	6 790 146,6
Ness 2	5368	2909,6	462 724,1	6 790 141,5
Ness 1	5444	2915,7	462 800,0	6 790 134,6
Etive Formation	5456	2916,5	462 811,4	6 790 133,6
Rannoch Formation	5500	2919,5	462 855,3	6 790 131,8
Stratigraphic turning point in Rannoch Formation	5640	2924,6	462 993,9	6 790 148,0
Top Rannoch Formation	5775	2920,6	463 119,8	6 790 194,7
Top Eitve Formation	5843	2919,9	463 176,1	6 790 233,6
Ness 1 Top	5856	2919,8	463 185,6	6 790 241,7
Ness 2 Top	5925	2919,0	463 233,7	6 790 291,6
Ness 3 Top	5998	2918,3	463 274,8	6 790 351,9
Top Tarbert /Fault	6143	2914,9	463 339,7	6 790 480,6
Fault/**Viking Group**/Heather	6143	2914,9	463 339,7	6 790 480,6
Top Heather Formation	6233	2915,1	463 361,7	6 790 567,8
Intra Heather Sand	6270	2915,7	463 366,1	6 790 604,5
Stratigraphic turning point in Heather Formation	6298	2916,3	463 367,5	6 790 632,4
Intra Heather Sand	6337	2917,5	463 366,7	6 790 671,3
Heather Formation	6393	2918,9	463357,4	6 790 726,5
Fault/**Brent Group**	6455	2918,6	463 341,5	6 790 786,4
Ness Formation	6455	2918,6	463 341,5	6 790 786,4
Stratigraphic turning point	6544	2916,8	463 314,8	6 790 871,3
Top Ness/Base Tarbert Fm	6640	2915,3	463 279,2	6 790 960,9
Tarbert 1 Top	6900	2918,4	463 125,8	6 791 168,2
OWC	7130	2929,5		
Tarbert 2 Top	7195	2934,9	462 911,8	6 791 370,1
Tarbert 3 Top	7304	2933,2	462 830,3	6 791 442,4
Viking Group	7304	2933,2	462 830,3	6 791 442,4
Base Heather Formation	7304	2933,2	462 830,3	6 791 442,4
TD	7393	2932,6	462 763,5	6 791 501,2

* Formation top penetrated in the 12 ¼" section

Table 4.3.1.3: 34/10-48 A, Formation tops

Group/ Formation	Encntr depth m MD RKB	Encntr depth m TVD RKB	UTM E	UTM N
9 5/8" casing shoe	5105	2871		
Heather Formation	5008	2841,8	462 374,9	6 790 123,3
Brent Group	5158	2889,2	462 514,4	6 790 147,8
Tarbert 3	5158	2889,2	462 514,4	6 790 147,8
Tarbert 2	5198	2894,8	462 553,6	6 790 154,3
Tarbert 1	5351	2871,6	462 701,8	6 790 182,4
Ness 3	5460	2848,3	462 806,4	6 790 203,4
Fault/Tarbert 1	5461	2848,2	462 806,6	6 790 203,4
Fault/Tarbert 2	5531	2837,0	462 873,2	6 790 221,0
Viking Group	5611	2832,4	462 945,2	6 790 254,9
Base Heather Formation	5611	2832,4	462 945,2	6 790 254,9
Base Intra Heather Sand	5710	2823,2	463 023,2	6 790 315,0
Top Intra Heather Sand	5750	2821,9	463 051,4	6 790 343,9
Top Heather Fm/BCU	5988	2844,5	463 139,7	6 790 558,6
Shetland Group	5988	2844,5	463 139,7	6 790 558,6
Base Shetland Group	6067	2852,5	463 139,2	6 790 637,1
Top Cromer Knoll Group	6067	2852,5	463 139,2	6 790 637,1
Viking Group/Heather Fm	6136	2859,4	463 131,1	6 790 705,2
TD	6221	2870,2	463 119,4	6 790 788,7

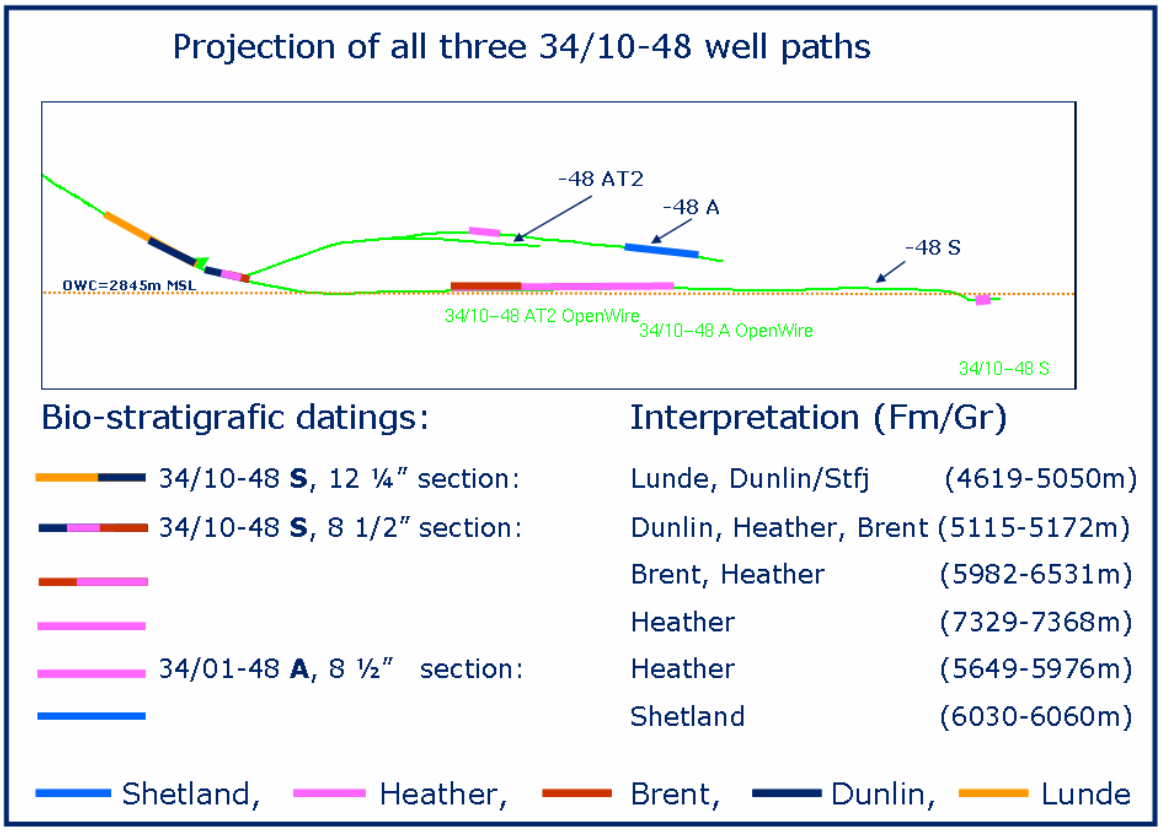
Table 4.3.1.4: 34/10-48 AT2, Formation tops

Group/ Formation	Encntr depth m MD RKB	Encntr depth m TVD RKB	UTM E	UTM N
9 5/8" casing shoe	5105	2871		
Heather Formation	5008	2841,8	462 374,9	6 790 123,3
Brent Group/Tarbert 3	5158	2889,2	462 514,4	6 790 147,8
Tarbert 2	5198	2894,8	462 553,6	6 790 154,3
Tarbert 1	5351	2871,6	462 701,8	6 790 182,4
Ness 3	5460	2848,3	462 806,4	6 790 203,4
Fault/Tarbert 1	5461	2848,2	462 806,6	6 790 203,4
Fault/Tarbert 2	5531	2837,0	462 873,2	6 790 221,0
Viking Gp/Base Heather Fm	5611	2833,4	462 945,5	6 790 254,5
Base Intra Heather Sand	5709	2834,3	463 028,9	6 790 306,8
Top Intra Heather Sand	5749	2836,3	463 059,7	6 790 332,2
Top Heather Fm	5749	2836,3	463 059,7	6 790 332,2
TD	5880	2845,9	463 141,4	6 790 432,8

4.4 Biostratigraphy

The primary well (-48 S) and sidetracks (-48 A and -48 AT2) are not ideal for making good biostratigraphic logs. Only ditch cutting was available for biostratigraphic work in these wells, except one short core section in the uppermost part of the Brent Group. 'Hot shot' samples were however collected and analyzed in the most uncertain intervals.

The well drilled through typical Shetland Group deposits of late Cretaceous (Campanian), and Triassic (Lunde Fm) in 12 ¼" section. At the end of this section early Jurassic assemblages (Dunlin Gr ?) were reported, presumably after the main 'Inner Snorre Fault' was passed. In the beginning of the 8 ½" section early Jurassic was still reported for 20m before middle Jurassic (Heather and Tarbert Fms.) was reported. The Brent Group correlate very well with offset wells on the northern part of the Gullfaks Field, especially 34/10-40 S (B-35). Therefore only a few samples were collected and analyzed from the intervals within the Brent Group. Figure 4.3.1 shows the analyzed intervals for the different well tracks.



4.5 Lithostratigraphic description

General Information

System, Series and Stage: Based on log interpretation and correlation.

Lithology: The lithological description is based on cuttings description.

The well 34/10-48 S with its sidetracks 34/10-48 A and AT2 was drilled sub-horizontally through the reservoir section. Thus, both the Viking Group and the Brent Group were penetrated several times, ref. table 4.3.1.2. The depth intervals for each group and formation are summed up below, but the lithological description is, however, only presented once for each formation.

Well 34/10-48 S

NORDLAND GROUP **Seabed – 1072 m MD (Seabed - 1009,5 m TVD)**

The upper part of the Nordland Group down to the 30" conductor setting depth at 424 m, was drilled with returns to seafloor**.** The sediments are clays with occasional layers of sand**.** The clay is soft, silty and sandy.

Utsira Formation **1008 – 1072 m MD (962 – 1009,5 m TVD)**

The formation consists of sand/sandstone, predominantly loose quartz grains, clear to translucent, fine to medium, occasionally very fine, moderately to poor sorted, sub-angular to sub-rounded, occasional rounded.

HORDALAND GROUP **1072 – 2357 m MD (1009,5 – 1602 m TVD)**

The Hordaland Group consists of claystone with beds of sandstone. The sandstone/sand consists predominantly of clear to translucent quartz grains, very fine to fine, occasionally medium, sub-angular to sub-rounded, occasionally well rounded, well sorted and dominantly loose. The claystones are greenish grey, occasionally dark grey, generally firm to hard, blocky and non calcareous.

ROGALAND GROUP **2357 – 2851 m MD (1602 – 1787 m TVD)**

Balder Formation **2357 – 2528 m MD (1602 – 1667 m TVD)**

The Balder Formation is recognized on the MWD logs by the characteristic gamma ray and resistivity curves.

The Balder Formation consists of interbedded claystones and tuff.

The claystone varies in colour from medium grey, olive grey to greenish grey and dark greenish grey. It is firm to hard, sub-blocky to blocky, micropyritic in parts and non calcareous.

The claystone is tuffaceous in parts, and grades from dark greenish grey to medium bluish grey tuff. The tuffaceous claystone is firm and sub-blocky.

Lista Formation **2528 – 2851 m MD (1667 – 1787 m TVD)**

The Lista Formation consists of claystone with layers of limestone and minor sandstone.

The claystone is dominantly medium grey to medium dark grey and greenish grey, firm, blocky and occasionally silty. The claystone is in places very calcareous, grading to marl.

The limestone is milky white to very light grey, soft-firm, occasionally hard, sub-blocky.

SHETLAND GROUP **2851 – 3612 m MD (1787 – 2199 m TVD)**

The Shetland Group consists of claystone with stringers of limestone and marl.

The claystone is generally medium grey to olive black, soft to firm, mod hard in part, non to very calcareous.

The limestone is light grey, tan to white, firm to moderately hard and microcrystalline.

The marl is white to light grey, soft to firm and silty in places.

CROMER KNOLL GROUP **3612 – 3657 m MD (2199 – 2226 m TVD)**

The Cromer Knoll Group consists of claystone/marl with limestone and sandstone stringers**.**

The claystone is grading to marl and is medium light grey to medium dark grey, soft to firm, silty micromicaceous and non calcareous.

The limestone is light grey to off white, firm and blocky.

The sandstone is clear to translucent, fine to very coarse, poorly sorted, sub-angular to sub-rounded quartz. It is generally loose, occasionally kaolin cemented, occasionally argillaceous with traces of pyrite.

HEGRE GROUP **3657 – 4645 m MD (2226 – 2712 m TVD)**

Lunde Formation **3657 – 4645 m MD (2226 - 2712 m TVD)**

The Lunde Formation consists of interbedded shale and sandstone layers.

The shales are reddish brown, firm, blocky, occasionally silty and slightly calcareous.

The sandstones are predominantly light grey, very fine to fine, friable to calcareous cemented and occasionally grading to siltstone.

DUNLIN GROUP **4645 – 5008 m MD (2712 – 2841 m TVD)**

Drake Formation **4645 – 4891 m MD (2712 – 2802 m TVD)**

The Drake Formation consists of shales with occasional limestone stringers.

The shale is generally dark grey to olive black, firm and blocky, slightly to very calcareous, occasionally grading to argillaceous limestone.

The limestone stringers are light grey to off white, firm and blocky.

Cook Formation **4891 – 5008 m MD (2802 – 2841 m TVD)**

The Cook Formation consists of sandstones with occasional limestone and shale beds.

The sandstone is generally clear to translucent, loose quartz. It is dominantly fine to medium but coarse in parts, moderately sorted, sub-rounded and grading to siltstone in places.

VIKING GROUP **5008 – 5161 m MD (2841 – 2886 m TVD),**
6143 – 6455 m MD (2915 – 2918 m TVD)
and 7394 – TD (2933 – TD)

Heather Formation **5008 – 5161 m MD (2841 – 2886 m TVD),**
6143 – 6455 m MD (2915 – 2918 m TVD)
and 7394 – TD (2933 – TD)

The Heather Formation consists of claystones with limestone beds. An intra Heather sandstone was penetrated in all three tracks.

The claystone is generally brownish black to olive black, firm to moderately hard, blocky and occasionally silty. It is non to slight calcareous and contain micropyrite and micromica in places.

The limestone is pale orange or yellow white to light yellow brown. It is firm and blocky, locally micropyritic.

“Intra Heather Sand” **6233 – 6270 m MD (2915 – 2916 m TVD),**
and 6337 – 6393 m MD (2917 – 2919 m TVD)

The “Intra Heather Sand” consists of clear to translucent, fine to medium, occasionally coarse loose quartz grains. The grains are poorly sorted and angular to sub-angular.

BRENT GROUP **5161 – 6143 m MD (2886 – 2915 m TVD)**
and 6455 – 7304 m MD (2918 – 2933 m TVD)

Tarbert Formation **5161 – 5330 m MD (2886 – 2906 m TVD),**
5998 – 6143 m MD (2918 – 2914 m TVD)

and 6640 – 7304 m MD (2915 – 2933 m TVD)

The Tarbert Formation is composed of sandstone interbedded with shale and siltstone and stringers of limestone and seams of coal.

The sandstone is yellowish brown to yellowish white and is composed of fine to medium grained, well sorted, well rounded loose quartz grains. The sandstone is occasionally weakly cemented with calcite cement.

The shale is medium dark grey to olive black, firm to moderately hard, sub-blocky, grading to siltstone in places. The coal beds are black, brittle and blocky.

Ness Formation **5311 – 5456 m MD (2904 – 2916 m TVD),**
5843 – 5998 m MD (2919 – 2918 m TVD)
and 6455 – 6640 m MD (2918 – 2915 m TVD)

The Ness Formation is composed of sandstone, claystone and coal.

The sandstone is fine to medium, clear to translucent quartz. The grains are well rounded and moderately sorted.

The claystone are dark grey to brownish black, firm to moderately hard, blocky with traces of pyrite and mica.

The coal is black, brittle and blocky.

Etive Formation **5456 – 5500 m MD (2916 – 2924 m TVD)**
and 5775 – 5843 m MD (2920 – 2919 m TVD)

The Etive Formation is composed of sandstone and silt.

The sandstone is composed of fine to very fine, clear to translucent quartz grains. The grains are well rounded, well sorted and friable.

The silt/siltstone is light to medium dark grey, soft to moderate hard, generally friable.

Rannoch Formation **5500 – 5843 m MD (2924 – 2919 m TVD)**

The Rannoch Formation is composed of sandstone grading to siltstone with depth and claystone and minor limestone layers.

The sandstone is pale yellowish brown, very fine to fine, grading to siltstone with depth. The grains are clear to translucent, sub-rounded to rounded, moderately sorted, generally loose but occasionally calcite cemented with traces of clay and micaceous matrix.

The siltstone is light grey to medium grey, amorphous, soft to firm and with clay matrix.

The claystone is medium grey, olive black to black, firm to moderate hard, blocky with traces of micropyrite.

The limestone is light milky white, soft to firm and blocky.

WELL 34/10-48 A

The well 34/10-48 S was plugged back and the sidetrack 34/10-48 A was kicked off from the 9 5/8" casing shoe at 5105m MD/2871 m TVD.

VIKING GROUP		**5105 – 5158 m MD (2871 – 2889 m TVD),**
		5611 – 5988 m MD (2832 – 2844 m TVD)
	and	**6136 – 6221 m MD/TD of the well (2859 – 2870 m TVD)**
Heather Formation		**5105 – 5158 m MD (2871 – 2889 m TVD),**
		5611 – 5988 m MD (2832 – 2844 m TVD)
	and	**6136 - 6221 m MD (2859 – 2870 m TVD)**

The Heather Formation in this track consists of claystones, sandstones and limestone beds.

The claystone is generally brownish black to olive black, firm to moderately hard, blocky and occasionally silty. It is non to slight calcareous and contain micropyrite and micromica in places.

The limestone is pale orange or yellow white to light yellow brown. It is firm and blocky, locally micropyritic. The limestone layer at 5710 to 5750m MD contains very fine quartz grains and might represent the base Cretaceous unconformity.

The sequence from 5750 to 5988 m MD consists of interbedded claystone, sandstone and limestone layers. The sandstone contains clear to translucent, fine to medium, occasionally coarse quartz grains. The grains are poorly sorted and angular to sub-angular. The sandstone is generally calcite cemented and grades to sandy limestone with depth.

BRENT GROUP	**5158 – 5611 m MD (2889 – 2832 m TVD)**
Tarbert Formation	**5158 – 5611 m MD (2889 – 2832 m TVD)**

The Tarbert Formation is composed of sandstone interbedded with shale and siltstone and stringers of limestone and seams of coal.

The sandstone is yellowish brown to yellowish white and is composed of fine to medium grained, well sorted, well rounded loose quartz grains. The sandstone is occasionally weakly cemented with calcite cement.

The shale is medium dark grey to olive black, firm to moderately hard, sub-blocky, grading to siltstone in places. The coal beds are black, brittle and blocky.

SHETLAND GROUP **5988 – 6067 m MD (2844 – 2852 m TVD)**

The Shetland Group consists of claystone with stringers of limestone and marl.

The claystone is generally medium grey to olive black, soft to firm, mod hard in part, non to very calcareous.

The limestone is light grey, tan to white, firm to moderately hard and microcrystalline.

The marl is white to light grey, soft to firm and silty in places.

CROMER KNOLL GROUP **6067 – 6136 m MD (2852 – 2859 m TVD)**

The Cromer Knoll Group consists of limestone and claystone/marly stringers**.**

The limestone is light grey to off white, firm and blocky.

The claystone is grading to marl and is medium light grey to medium dark grey, soft to firm, silty micromicaceous and non calcareous.

WELL 34/10-48 AT2

The well 34/10-48 AT2 was sidetracked from 34/10-48 A by an open hole sidetrack method at 5608m MD/2832 m TVD. The well path is common for the two tracks down to the kick off point (5608m MD). Thus, the lithology is also common down to this point.

BRENT GROUP **5608 – 5611 m MD (2832 – 2832 m TVD)**

Tarbert Formation **5608 – 5611 m MD (2832 – 2832 m TVD)**

The Tarbert Formation is composed of sandstone interbedded with shale and siltstone and stringers of limestone and seams of coal.

The sandstone is yellowish brown to yellowish white and is composed of fine to medium grained, well sorted, well rounded loose quartz grains. The sandstone is occasionally weakly cemented with calcite cement.

The shale is medium dark grey to olive black, firm to moderately hard, sub-blocky, grading to siltstone in places. The coal beds are black, brittle and blocky.

VIKING GROUP **5611 – 5880 m MD (2832 – 2846 m TVD)**

Heather Formation **5611 – 5880 m MD (2832 – 2846 m TVD)**

The Heather Formation in this track consists of claystones, sandstones and limestone beds..

The claystone is generally brownish black to olive black, firm to moderately hard, blocky and occasionally silty. It is non to slight calcareous and contain micropyrite and micromica in places.

The limestone is pale orange or yellow white to light yellow brown. It is firm and blocky, locally micropyritic

"Intra Heather Sand" 5765 – 5880 m MD (28 – 2846 m TVD)

This sequence consists of interbedded claystone, sandstone and limestone layers. The sandstone contains clear to translucent, fine to medium, occasionally coarse quartz grains. The grains are poorly sorted and angular to sub-angular. The sandstone is generally calcite cemented and grades to sandy limestone with depth.

4.6 Hydrocarbon indications in well 34/10-48 S

The well was drilled with oil based mud. Thus, the fluorescence was biased by the mud. The MWD logs indicated calcite cemented sand at 3612 – 2623 m MD (Cromer Knoll Group) whilst the logs indicated possible hydrocarbon content (5 ohmm) in the upper part of the sand layer at 3667 – 3673 m MD in the Lunde C Formation. However, the gas measurements did not register any change. The sand layers further down in the Lunde C Formation were water filled.

The MWD logs showed increased resistivity in the sands of the Lunde D Formation followed by increasing total gas peaks. A definite increase in resistivity and gas was observed from 4272m to 4644 m MD. The hydrocarbon content and reservoir quality was unusually high to be Lunde Formation. MDT samples were collected at 4372m, 4455m, 4492 m and 4533 m MD. All samples contained oil with relatively high gas/oil ratio.

The Cook Formation (4891 - 5008 m MD) was water filled according to the MWD logs, and the gas values through this interval were low.

The resistivity responds in the sands of the Tarbert Formation (5161 – 5311 m MD) was up to 90 ohmm and the total gas values were from 3 to 11 %. The breakdown gases according to the gas chromatograph were comparable to the ones from oil filled Lunde Formation. Core ships from the core (5174 – 5207 m MD) were oil stained with a distinct hydrocarbon smell.

An oil down to situation was encountered at 5376m MD/2910m TVD in the uppermost Ness Formation. The sands of the deeper Ness, Etive and Rannoch Formations were all waterfilled, and the decision was taken to turn the wellpath and drill upwards in order to examine the hydrocarbon potential further north on the structure.

At 5998 m MD/2918 m TVD, after crossing a fault, oil bearing Tarbert Formation was again encountered. Resistivities between 20 and 60 ohmm and gas peaks between 3 and 12 % were seen.

The Upper Jurassic Heather Formation contained some sandy layers. MWD logs indicated hydrocarbon content and gas peaks of up to 5 % were seen. The best sand layer was found between 6337 and 6393m MD / 2917-19m TVD.

The Brent Group (Ness Formation) was again encountered at 6455 m MD/2918 m TVD. The MWD logs indicated hydrocarbon content and sandy layers was followed by gas peaks. The well was drilled sub-horizontally, but stratigraphically upwards to Tarbert 2 where the well path was dropped in order to try to find a hydrocarbon/water contact. The contact was found based on the sudden drop in MWD – resistivity at 7130m MD/2930 m TVD. High gas readings were recorded through the whole interval from 6455 to 7130 m MD. The gas values dropped quickly below this point.

Gas peaks in the 12 ¼" section

Depth m MD	Depth m TVD	Gas peak %	BG	C1	C2	C3	IC4	nC4	Type gas
2290	1849	7,88	2,00	62012	1097	154			FG
3064	1888	15,02	4,00	133291	2077	327			FG
3213	1973	1,86	0,90	13844	445	16			FG
3336	2043	1,97	1,10	15575	604	21			FG
3397	2077	1,89	0,90	15025	544	21			FG
3664	2228	1,10	0.30	8858	268	11			FG
3742	2272	1,53	0,20	12000	378	16			FG
3841	2329	1,61	0,3	15003	485	20			FG
3917	2373	6.53	0,2	63919	2189	518	10	13	FG
3952	2394	4.09	0,5	38758	1394	258			FG
3974	2408	2.54	0,8	23811	616	21			FG
4041	2445	2.18	0,3	20569	640	22			FG
4070	2462	2.23	0,3	21119	769	53			FG
4082	2468	2.0	0,3	18783	355	19			FG
4126	2492	2.61	0.2	24865	777	24			FG
4207	2531	2.4	0.5	23217	678	23			FG
4282	2564	3.60	0.5	35195	971	80			FG
4330	2585	4.98	0.5	49708	1468	216			FG
4344	2590	6.92	0.3	70775	1919	315			FG
4370	2601	16.0	0.3	152273	4523	1030	11	19	FG
4394	2611	19.97	0.5	169049	4825	969	10	20	FG
4404	2615	8.96	1.2	67410	3361	1109	14	98	FG
4425	2623	25.4	1.5	206140	7699	1921	20	196	FG
4447	2632	33.2	1.2	266105	9422	2350	35	321	FG
4464	2639	10.86	0.4	84127	2883	624	0	15	FG
4487	2648	7.83	0.2	60494	1999	379	0	11	FG

4495	2650	16.44	0.5	130043	4888	1434	16	121	FG
4504	2653	5.98	0.5	43636	1861	563	0	19	FG
4538	2668	6.08	0.5	45479	1877	483	0	15	FG
4546	2671	7.11	0.5	53020	1682	549	0	14	FG
4551	2673	5.52	0.6	40461	1616	327	0	10	FG
4561	2677	7.51	1.0	53624	2061	467	0	12	FG
Depth m MD	Depth m TVD	Gas peak %	BG	C1	C2	C3	IC4	nC4	Type gas
4573	2682	8.92	0.3	69422	2192	425	0	11	FG
4587	2687	2.61	0.5	18019	609	20			FG
4684	2725	1.15	0.3	7801	48				FG
4763	2754	1.44	0.1	10500	99				FG
4821	2775	0.99	0.2	6766	22				FG
4904	2804	1.51	1.0	9928	644	16			FG

Gas peaks in the 8 ½" section of the well 34/10-48 S

Depth m MD	Depth m TVD	Gas peak %	BG	C1	C2	C3	IC4	nC4	Type gas
5166	2888,1	2,94	0,4	22484	989	144		13	FG
5172	2888,9	10,62	1,0	90655	3327	781	10	21	FG
5208	2893	1,46		12458	240				FG
5202	2892	4,47		39533	1442	261			FG
5228	2896	10,31	6,41	78244	2472	535		17	FG
5250	2898,6	10,58	3,26	88214	4558	1203	13	91	FG
5268	2900,6	6,86	2,45	55676	2916	925	11	39	FG
5290	2902,7	8,74	3,51	72697	3258	903	11	34	FG
5305	2904	8,47	4,22	73411	3076	817	10	24	FG
5343	2907,4	5,40	2,36	39074	1640	384		15	FG
5372	2909,9	3,34		27175	930	136		13	FG
5388	2911,3	3,44		28502	1178	243		15	FG
5410	2913	3,1		25059	1050	235		15	FG
5441	2915,4	3,44		28398	1106	220		14	FG
5457	2916,5	3,54		29574	1016	183		13	FG
5486	2918,6	3,33		26370	1198	262		14	FG
5524	2921,5	4,57		36634	1449	332		16	FG
5553	2922,8	4,09		32557	1251	274		14	FG
5581	2924	3,22		25648	1251	384			FG
5603	2924,8	3,4		22980	1026	190		10	FG
5717	2921,7	4,17	2	39349	1597	384		15	FG
5727	2921,4	3,60	1,9	29538	1348	317		14	FG
5747	2921	4,25	2,3	34229	1575	382		15	FG
5755	2920,9	3,98	2,2	32726	1201	336		12	FG

5777	2920,5	3,63	2,1	28969	1327	308		14	FG
5792	2920,4	3,03	1,8	23917	1085	208		12	FG
5808	2920,3	3,72	2,3	29784	1272	287		14	FG
5828	2920,2	3,34	2	26109	1173	285		14	FG
5849	2919,8	5,59	2	47335	1903	400		15	FG
5874	2919,4	2,98	0,71	20221	852	158		10	FG
Depth m MD	Depth m TVD	Gas peak %	BG	C1	C2	C3	IC4	nC4	Type gas
5920	2918,9	3,28	0,54	25025	1121	227		12	FG
5949	2918,8	3,37	0,67	25802	1222	284		13	FG
5954	2918,8	3,02	0,63	23188	959	190		11	FG
6000	2918,3	2,26	0,67	18243	808	71		11	FG
6007	2918,2	3,9	0,83	31765	1535	320		14	FG
6016	2918	11,07	5,61	96379	3749	995	12	33	FG
6026	2917,9	10,09	4,96	78434	3168	751	10	21	FG
6048	2917,6	11,13	3,24	94386	4059	1046	14	67	FG
6057	2917,4	10,36	1,34	87152	3743	908	12	23	FG
6057	2917,4	12,2	1	119986	3488	652	0	12	FG
6067	2917,2	6,38	0,3	58505	3325	948	10	31	FG
6073	2917,1	9,22	0,6	87886	4013	1122	12	78	FG
6092	2916,8	4,72	0,6	43350	2014	513	0	20	FG
6102	2915,6	6,9	0,8	64555	2879	814	10	31	FG
6113	2915	8,08	1,1	73817	3791	1137	13	141	FG
6122	2914,4	7,74	1,5	64467	2153	506	0	20	FG
6262	2915,0	2,47	0,8	19347	874	147		15	FG
6289	2916,3	1,25	0,3	10406	216	11		12	FG
6357	2917,6	3,91	1,10	34709	1602	449		20	FG
6384	2920,0	5,22	1,50	47721	2117	629		23	FG
6480	2917,4	2,76	1,30	22900	1000	139		19	FG
6508,0	2916,8	2,85	1,70	23657	1062	148		17	FG
6525,0	2917,7	1,25	0,90	9311	302	13		14	FG
6548	2917,1	3,19	1,80	24474	1260	279		20	FG
6552	2916,9	1,87	1,80	13577	568	23		16	FG
6558	2916,3	2,40	1,70	15790	732	98		19	FG
6595	2914,1	1,94	1,0	13298	539	23		17	FG
6603	2915,4	2,89	2,0	21852	1048	137		19	FG
6639	2916,4	2,65	2,0	20235	791	169		19	FG
6669	2915	9,6	4,70	81242	3650	998		12	FG
6686	2915	3,28	1,40	26510	1234	272		19	FG
6747	2917,6	6,75	3,5	53957	2499	762	10	100	FG
6752	2917,3	7,52	3,5	64337	3000	853	11	102	FG
6757	2917,1	5,87	3,1	46949	2222	629		62	FG
6775	2916,7	6,47	3,10	54705	2670	741	11	114	FG

6785	2916,5	8,08	3,5	70157	3221	944	13	206	FG
6812	2915,6	4,79	1,5	41337	1679	430		110	FG
6818	2915,3	7,05	2,0	62938	2397	746	11	194	FG
6829	2917,5	6,04	3,2	51162	2564	702	11	158	FG
6860	2919,4	7,69	3,5	65788	3085	923	13	254	FG
6874	2919,4	8,14	2,2	68230	2964	871	11	173	FG
Depth m MD	Depth m TVD	Gas peak %	BG	C1	C2	C3	IC4	nC4	Type gas
6883	2918,2	6,54	2,0	53982	2498	681	10	110	FG
6895	2918,4	7,27	3,1	60509	2829	745	10	106	FG
6911	2918,6	5,16	2,1	40834	1930	511		34	FG
6942	2918,9	6,62	1,0	53046	2209	565		41	FG
6966	2919,3	6,76	3,0	59424	2791	776	11	128	FG
6973	2919,3	5,01	2,0	45026	2115	603	10	96	FG
6984	2919,5	6,05	2,4	50887	2522	757	12	139	FG
7011	2920,1	4,29	2,0	38003	1872	578	10	107	FG
7051	2921,3	9,62	3,2	90365	3975	1116	14	218	FG
7062	2921,9	11,10	3,2	103013	4610	1330	17	261	FG
7075	2924.1	10.61	4.0	95263	4442	1291	16	263	FG
7114	2930.2	13.23	3.5	127146	4853	1399	17	292	FG
7121	2931.3	13.13	3.5	124532	4994	1612	19	336	FG
7132	2932.0	9.17	3.5	85224	3886	1148	14	195	FG

4.7 Hydrocarbon indications in well 34/10-48 A and AT2

The MWD logs indicated that the whole Brent sequence was drilled above the hydrocarbon-water contact. The resistivity measurements indicated that the sand layers in the Heather Formation were either calcite cemented or contained hydrocarbons. Since there were no density/neutron logs in the well 34/10-48 AT2 it is difficult to decide. However, the sandy interval from 5765 to 5813m MD was drilled fast and gave up to 60 ohmm in resistivity responds.

The background gas was high while drilling in the Brent Group, and it was relatively low through the Heather Formation.

Gas peaks in the 8 ½" section of the wells 34/10-48 A

Depth m MD	Depth m TVD	Gas peak %	BG	C1	C2	C3	iC4	nC4	Type of gas
5170	2894.8	3.83	0.11	37398	1842	389		10	FG
5179	2897.6	10.19	0.64	102268	4354	1036	11	20	FG
5193	2895.2	11.85	0.65	99732	3915	942	10	19	FG
5210	2896.5	12.16	0.7	101284	3304	744		15	FG

5229	2896.9	3.17	0.32	28459	1392	335		12	FG
5244	2894.2	8.14	0.56	77511	3003	834	11	22	FG
5248	2893.7	3.43	0.96	28803	1569	470		17	FG
5264	2891.3	11.54	3.2	107317	3903	953	11	22	FG
5303	2883.2	13.97	5.1	121023	4328	1042	12	24	FG
5396	2861.9	15.75	6.3	152751	5232	1422	16	122	FG
Depth m MD	Depth m TVD	Gas peak %	BG	C1	C2	C3	iC4	nC4	Type of gas
5485	2842.6	13.52	5.4	112706	5900	1870	21	283	FG
5508	2838.8	15.09	5.5	137835	1739	1739	19	235	FG
5576	2834.8	10.8	3.7	105255	4268	927	10	22	FG
5606	2832.7	12.5	5.2	114824	5765	1698	18	241	FG
5685	2824.8	2.4	1	16019	622	20			FG
5795	2823.8	3.04	1.4	28364	1310	231	0	14	FG
5819	2826.8	2.05	0.8	18962	702	31	0	13	FG
5230	2895.2	31.4		304590	12911	2542	18	190	STG
5230	2895.2	31.5		306334	10867	2506	235	18	TG
5875	2833.0	2.24	0.5	17955	718	23			FG

Gas peaks in the 8 ½" section of the wells 34/10-48 AT2

Depth m MD	Depth m TVD	Gas peak %	BG	C1	C2	C3	iC4	nC4	Type of gas
5630	2832,6	1.18	0.5	9088	240	10			FG
5734	2835,5	0.7	0.4	4879	51	0			FG
5746	2836,0	0.75	0.4	5213	74	0			FG
5753	2836,4	0.85	0.4	6111	92	0			FG
5772	2837,4	3.39	0.5	26965	1128	126			FG
5786	2838,2	2.79	0.3	21758	909	84			FG
5810	2839,8	5.91	1	47131	1979	415			FG
5835	2841,9	5.14	0.5	40838	1537	317			FG
5847	2842,9	4.98	1	38643	1606	351			FG

4.8 Geophysical results

The results from wells 34/10-48 S, 34/10-48 A and 34/10-48 AT2, confirmed the seismic interpretation of the ST9607 survey. The results from the three well paths show that the choices of reflectors were correct, and that the Topas structure is represented by the Brent Group.

The stratigraphic tops were encountered considerably shallower than prognosticated, approximately 40m. This was mainly due to the depth conversion and the assumption that Topas had the same OWC as the calculated contact in well 34/8-12 ST2 at 2910m TVD MSL/2670 ms. The OWC is visible on the full stack and far offset cube in the upper Brent Group within most of the Topas at about 2660 ms with an uncertainty of +/- 10 ms.

The contact coincided very well with the contact in well 34/8-12 ST2. However, in Topas it is 64 m shallower than that calculated in 34/8-12 ST2. In Topas the OWC has been adjusted up by 15 ms, from 2670 ms to 2655 ms, which accounts for about 25 m of the total of 64 m out of prognosis for the contact. This implies that the hydrocarbon column also has been reduced by 25 m/ 15 ms.

The well 24/10-48 S proved that the western part of the Nesle lead is a part of the Topas discovery. This was also expected from the near offset seismic and interpreted as an alternative possibility ahead of drilling.

An oil discovery was also done in the Viking Group, intra Heather Formation, in two of the well paths, 34/10-48 S and 34/10-48 AT2. These sandstones which were encountered above the eastern part of Topas, are very thin and situated very close to BCU. They are not easy to map, and below resolution of the seismic and also within the follow cycle from the BCU reflector. For further details reference is made to the “Discovery Evaluation Report”.

4.9 Data acquisition

4.9.1 Cuttings and mud samples

The well was classified as an exploration well from 3600m MD/2200m TVD RKB. Good sample coverage of the formations above this depth have been achieved in nearby wells and no sampling other than spot sampling in order to produce a formation evaluation log was performed.

One set of bulk sample (in 5 litre buckets) and one set of washed and dried sample (100 g) were collected at each sample interval. The samples were collected at 10m intervals from 3600 to 4370m MD, between 4700 and 4910m MD and from 5040 m MD to the TD of the 12 ¼” section. Samples were collected at 3m intervals from 4370 to 4700 m MD and from 4910 to 5040m MD. Samples were also collected at 3m intervals in the 8 ½” sections of all three wells; 34/10-48 S, 34/10-48 A and 34/10-48 AT2.

One mud sample (1 litre) was collected from the active pits every 100m from 3600m MD/ 2200m TVD to TD. Extra mud samples were collected while drilling through hydrocarbon filled intervals.

4.9.2 Conventional coring

One core was cut in the interval 5174 – 5207 m MD of the Tarbert Formation with 100% recovery.

4.9.3 MWD/LWD in well 34/10-48 S

The LWD logging contractor for the entire well was Schlumberger D&M.

The 24" section was logged with CDR-Gr/Res/Pwd and D&I. The logs were fairly good even though the ROP was very high at times and the fact that it is a 9 ½" tool in a 26" hole.

The 17 ½" section was logged with CDR-Gr/Res/Pwd and D&I. The resistivity sensor failed at 2231 m MD, 430m MD from section TD
The 12 ¼" was logged with ARC-GR/RES/PWD-ISONIC-ADN8 and D&I. The logs were of good quality.

The 8 ½" section was logged with ARC6/ADN6/APWD.

LWD Run Summary

LWD Run Summary						
Section: 24" Contractor: Schlumberger D&M						
Run	**Logging Service** (Tool combination)	**Pass**	**Pass direct.**	**Log speed**	**Interval [m MD]**	**Pass remark**
1	CDR	Drilling	Down	ROP	224-725	Very high ROP at times
Section: 17 ½" Contractor: Schlumberger D&M						
Run	**Logging Service** (tool combination)	**Pass**	**Pass direct.**	**Log speed**	**Interval [m MD]**	**Pass remark**
2	CDR	Drilling	Down	ROP	1287-2667	Very high ROP at times
Run remark: Resistivity failed at 2231m.						
Section: 12 ¼" Contractor: Schlumberger D&M						
Run	**Logging Service** (tool combination)	**Pass**	**Pass direct.**	**Log speed**	**Interval [m MD]**	**Pass remark**
3	ARC/ISONIC/ADN8	Drilling	Down	ROP	2667-3759	
4	ARC/ISONIC/ADN8	Drilling	Down	ROP	3759-3825	
5	ARC/ISONIC/ADN8	Drilling	Down	ROP	3825-5106	
Section: 8 ½" Contractor: Schlumberger D&M						
Run	**Logging Service** (tool combination)	**Pass**	**Pass direct.**	**Log speed**	**Interval [m MD]**	**Pass remark**
7	ARC6/ADN6	Drilling	Down	ROP	5106 - 5173	Core point
8					5174 – 5208	Coring
9	ARC6/ADN6	Drilling	Down	ROP	5208 – 6057	PowerDrive failure. POOH
10	ARC6/ADN6	Drilling	Down	ROP	6057 – 7393	Good log quality

4.9.4 Wireline logging in the 12 ¼" section

The optional program was EMS/PEX/MDT/DSI if a discovery was made. The actual programme was EMS/MDT, and one run to acquire formation pressures and fluid samples was conducted. The option to run PEX/DSI was not utilized in the 12 ¼" section since ISONIC and ADN6 had been run while drilling.

VSP was logged in the 9 5/8" casing after drilling and running of the 7" liner in the sidetracked 34/10-48 AT2.

Wireline Logging Summary

Section: 12 ¼" Contractor: Schlumberger					
Run	**Logging Service** (tool combination)	**Pass**	**Pass direct.**	**Log speed**	**Interval [m MD]**
1A	EMS/GR/MDT sample	Main	Down	N.A.	3670-5005
1A	EMS/GR/MDT sample	Main	Up	N.A	5005-2600
Run remark: The probes became plugged while attempting to take water sample at 4009m MD, and the sampling was aborted.					

Time Distribution			
Run	**Operation time [Hours]**	**Lost Time [Hours]**	**Comments**
1A, MDT-GR	110.0	0	Computer problems. Two shutdowns.

4.9.5 Formation Pressures 12 ¼" section

Run no.: 1A	Well: 34/10-48 S Date: 22-26.05.2004 Rig: Gullfaks C RKB: 84,1 m. INITIAL PRESSURE = 675.5 +0.035 x (DEPTH m TVD MSL – 3724)										PORE PRESSURE (s.g ref. RKB) = 10.195*FORM. PRESSURE / mTVD RKB				
ZONE NAME	Log Run No.	Test No.	DEPTH m MD RKB	DEPTH m TVD MSL	FORM. PRESS. (bar)	HYDROSTATIC PRESS. (bar) BEFORE	HYDROSTATIC PRESS. (bar) AFTER	TEMP (°C)	GOOD SEAL (Y/N)	REMARKS (Pressure gauge id.)	MOB-ILITY mD/cP	PORE PRESS. s.g ref. RKB (g/cm3)	HYDROST. PRESS. s.g ref. RKB (g/cm3)	INITIAL PRESS. (bar)	DEPLE-TION (bar)
Lunde	1A	1	3670.0	2147.6	335.26	360.7	360.3	86.6	3	Q2, Good	35.5	1.53	1.65	336.9*	1.6*
Lunde	1A	2	3795.0	2218.5	353.28	372.4	372.0	89.4	3	Q2, Good	15.4	1.56	1.65	354.0	0.8
Lunde	1A	3	3913.5	2287.2	361.02	383.5	383.1	92.0	3	Q2, Good	23.4	1.55	1.65	361.6	0.6
Lunde	1A	4	3960.0	2314.8		388.1	387.4	92.8		Q2,			1.65		
Lunde	1A	5	4000.0	2338.1	364.87	392.0	391.4	93.7	3	Q2, Good	11.8	1.54	1.65	367.2	2.3
Lunde	1A	6	4036.5	2358.9	368.36	395.5	394.9	94.4	4	Q2, Very Good	104.1	1.54	1.65	369.5	1.1
Lunde	1A	7	4099.0	2393.7	371.65	401.1	400.6	95.6	4	Q2, Very Good	451.0	1.53	1.65	373.3	1.7
Lunde	1A	8	4158.0	2424.1	374.79	406.1	405.6	96.3	3	Q2, Good	22.1	1.52	1.65	376.7	1.9
Lunde	1A	9	4256.0	2469.2	380.60	413.3	412.8	97.8	3	Q2, Good	79.6	1.52	1.65	381.6	1.0
Lunde	1A	10	4364.0	2514.9		420.7	420.3	96.4		Q2,			1.65		
Lunde	1A	11	4372.0	2518.2	386.88	421.4	419.0	90.6	4	Q1, Very Good	463.8	1.52	1.65	387.0	0.1
Lunde	1A	12	4382.0	2522.3	386.83	421.4	420.8	100.5	4	Q2, Very Good	525.2	1.51	1.65	387.5	0.6
Lunde	1A	13	4397.5	2528.6	387.24	422.5	421.9	100.8	2	Q2, Poor	7.9	1.51	1.65	388.1	0.9
Lunde	1A	14	4414.0	2535.1		423.9	423.8	100.9		Q2,			1.65		
Lunde	1A	15	4422.0	2538.2	388.79	424.4	423.5	101.2	4	Q2, Very Good	144.2	1.51	1.65	389.2	0.4
Lunde	1A	16	4430.0	2541.4						Q2,					
Lunde	1A	17	4441.5	2545.8	390.15	425.5	424.8	101.3	4	Q2, Very Good	210.0	1.51	1.65	390.0	-0.1
Lunde	1A	18	4455.0	2551.1	390.68	426.4	425.6	101.8	4	Q1, Very Good	390.0	1.51	1.65	390.6	-0.1

Run no.: 1A	**Well: 34/10-48 S Date: 22-26.05.2004 Rig: Gullfaks C RKB: 84,1 m. INITIAL PRESSURE = 675.5 +0.035 x (DEPTH m TVD MSL – 3724)**										**PORE PRESSURE (s.g ref. RKB) = 10.195*FORM. PRESSURE / mTVD RKB**				
						HYDROSTATIC PRESS. (bar)									
Lunde	1A	19	4464.0	2555.0	390.64	426.1	425.5	101.2	3	Q2, Good	23.2	1.51	1.65	391.1	0.4
Lunde	1A	20	4471.5	2557.5	390.84	427.4	426.1	101.4	3	Q2, Good	48.3	1.51	1.65	391.3	0.5
Lunde	1A	21	4478.0	2560.1	391.50	427.1	427.1	101.4	2	Q2, Poor	0.2	1.51	1.65	391.6	0.1
Lunde	1A	22	4486.0	2563.2						Q1, No seal	0.0				
Lunde	1A	23	4492.0	2565.5	391.83	428.0	427.2	101.3	4	Q2, Very Good	289.1	1.51	1.65	392.2	0.4
Lunde	1A	24	4500.0	2568.6		428.0	427.2	102.0		Q2, No seal			1.65		
Lunde	1A	25	4516.0	2574.9		429.0	428.3	102.0		Q2, no seal			1.64		
Lunde	1A	26	4533.5	2581.4	393.81	430.1	428.9	102.6	3	Q2, Poor	10.7	1.51	1.65	394.0	0.1
Lunde	1A	27	4545.0	2586.4		431.2	430.1	102.0		Q2, Tight			1.65		
Lunde	1A	28	4553.0	2589.5	394.96	432.1	430.4	101.8	3	Q2, good	30.7	1.51	1.65	394.8	-0.1
Lunde	1A	29	4559.0	2591.9	395.45	431.5	430.4	101.7	2	Q2, very poor	1.1	1.51	1.64	395.1	-0.3
Lunde	1A	30	4565.0	2594.3	395.65	432.3	431.0	101.8	2	Q2, poor	4.1	1.51	1.65	395.4	-0.3
Lunde	1A	31	4583.0	2601.5		433.1	432.3	101.8		Q2, Tight			1.64		
Lunde	1A	32	4604.0	2609.8		434.0	433.6	102.2		Q2, Tight			1.64		
Lunde	1A	33	4609.0	2611.8		435.8	434.7	101.5		Q2, Tight			1.65		
Lunde	1A	34	4627.0	2618.8		437.0	435.7	101.9		Q2, Tight			1.65		
Lunde	1A	35	4634.0	2621.6		437.3	436.3	102.6		Q2, Tight			1.65		
Lunde	1A	36	4643.0	2625.1		437.7	436.3	102.3		Q2, Tight			1.65		
Cook	1A	37	4900.0	2719.1	407.25	452.8	451.9	104.4	3	Q2, good	43.3	1.48	1.65	409.1	1.9
Cook	1A	38	4950.0	2735.6	408.94	455.0	454.3	104.9	2	Q2, poor	6.7	1.48	1.65	410.9	2.0
Cook	1A	39	5005.0	2753.8	410.64	458.7	457.9	105.3	3	Q2, good	20.0	1.48	1.65	412.9	2.3
Lunde	1A	40	4642.0	2624.7		436.1				Q2, No seal			1.64		
Lunde	1A	41	4561.5	2592.9		430.4				Q2, No seal			1.64		
Lunde	1A	42	4533.0	2581.6	394.14	429.0		100.6	3	Q2, Good	17.4	1.51	1.64	394.0	-0.2

Run no.: 1A	**Well: 34/10-48 S Date: 22-26.05.2004 Rig: Gullfaks C RKB: 84,1 m. INITIAL PRESSURE = 675.5 +0.035 x (DEPTH m TVD MSL – 3724)**										**PORE PRESSURE (s.g ref. RKB) = 10.195*FORM. PRESSURE / mTVD RKB**				
						HYDROSTATIC PRESS. (bar)									
Lunde	1A	43	4365.0	2515.4	386.47	415.9	416.65	99.5	4	Q2, very good	344.5	1.52	1.63	386.7	0.2
Lunde	1A	44	4339.0	2504.5	384.88	414.1	414.8	99.3	3	Q2, good	50.3	1.52	1.63	385.5	0.6
Lunde	1A	45	4327.5	2499.6	384.57	413.0	413.9	99.1	4	Q2, very good	259.6	1.52	1.63	385.0	0.4
Lunde	1A	46	4309.0	2491.8	384.08	411.5	412.6	98.9	2	Q2, poor	3.7	1.52	1.63	384.1	0.0
Lunde	1A	47	4277.0	2478.2	381.89	409.4	410.3	98.7	2	Q2, poor	7.9	1.52	1.63	382.6	0.7
Lunde	1A	48	4199.6	2443.7	376.95	403.9	404.7	97.6	4	Q1, good	125.5	1.52	1.63	378.8	1.9
Lunde	1A	49	4128.0	2409.0	373.22	399.1	399.2	96.9	4	Q2, very good	301.6	1.53	1.63	375.0	1.8
Lunde	1A	50	4041.0	2361.5	368.73	389.5	390.1	94.8	2	Q2, poor	0.9	1.54	1.62	369.8	1.0
Lunde	1A	51	4009.0	2343.2	365.54	385.3	385.7	92.9	3	Q1, poor	11.3	1.54	1.62	367.8	2.2
Lunde	1A	52	3974.0	2323.0	363.34	383.2	384.0	94.2	4	Q2, very good	238.5	1.54	1.62	365.5	2.2
Lunde	1A	53	3709.0	2169.7	336.35	359.2	360.0	91.0	2	Q2, poor	8.8	1.52	1.62	348.7	12.3
Total number of tests: 53									**No. Successful tests: 37**			**No. Fluid samples: 4**			
Hydrostatic gradient to surface: 1,65 g/cm3 decreasing to 1.63 g/cm3 after finished sampling															
Hydrostatic gradient in logged interval: 1,65 g/cm3 – Minimum/Maximum measured pore pressure (ref RKB): 1,48 / 1,56 g/cm3															
Datum (Initial Pressure): 0,11 x mTVDMSL + 110															
Formation pressure test Quality in OW "PRES_QUAL" 0:Lost Seal, 1:Tight, 2:Poor (<10 mD/cP), 3:Good (10-100 mD/cP), 4:Very Good (>100 mD/cP)															

The depths are from wire line run GR/MDT.
* Initial pressure 346.2 bar if Lunde, initial pressure 336.9 bar if Brent, and thus indication of initial pressure.

4.9.6 Formation Fluid Sampling – 12.25" section

Sample depth Zone name	Pre-test		Clean-up				Sampling						Comments
	Formation pressure (bars)	Mobility (mD/cP)	Date	Start	Stop	Pump volume (litre)	Start	Stop	Draw-down (bars)	MDT Sample number	MDT Chamber (Id. no.)	Transferred to bottle (Id. no.)	
4372m MD Lunde Fm Oil/Condensate	386,88	163,8	24.05.04	7:20	8:20	31	8:22	8:25	384,3	1	SPMC-3 #127		App. 3% cont.
				8:25	11:05	141,5	11:08	11:11	384,3	2	SPMC-2 #123		App. 0.5% cont.
						150,9	11:19	11:22	384,8	3	SPMC-6 #152		App. 0.5% cont.
4455m MD Lunde Fm Oil/Condensate	390,68	390,6	24.05.04	13:40	15:03	59 68	15:05	15:08	380	4	SPMC-1 #95		App. 2%
							15:11	15:13	380	5	SPMC-5 #151		
							15:17	15:19	380	6	SPMC-4 #150		
4492m MD Lunde Fm Oil/Condensate	391,83	290	24.05.04	18:00	19:28	28	19:29	19:31	382	7	SPMC-5#188		App. 0.4% cont
							19:41	19:43	381	8	SPMC-4#149		
4533m MD Lunde Fm Oil/Condensate	394,14	17,4	25.05.04	09:20	14:55	107	14:58	15:00	335	9	SPMC-6#191		40/60 bar Drawdown, pumprate 400/600rpm App. 1,2%cont.
							15:05	15:09	335	10	SPMC-1#145		
4009m MD Lunde Fm Water sample										11			3 attempts to sample, but due to problems with the pumps, this sample were cancelled.
										12			

4.9.7 Lab Analyses of Fluid Samples offshore by Oilphase

MDT Chamber serial no.	Depth	Sample Size	Oilphase Opening press@ 10deg.C	Oilphase Transferred to bottle (Id. no.)
SPMC-3 #127	4372m	250cc	125 bar	PT-1081
SPMC-2 #123	4372m	250cc	125 bar	PT-1045
SPMC-6 #152	4372m	250cc	115 bar	PT-1048
SPMC-1 #95	4455m	250cc	124 bar	PT-1040
SPMC-5 #151	4455m	250cc	110 bar	PT-1020
SPMC-4 #150	4455m	250cc	120 bar	PT-1065
SPMC-5#188	4492m	250cc	140 bar	PT-5606
SPMC-4#149	4492m	250cc	110 bar	PT-1015
SPMC-6#191	4533m	250cc	110 bar	PT-1023
SPMC-1#145	4533m	250cc	40 bar	TS-47402

4.9.8 Electrical Wireline Logging in the 8 ½" section

The optional program was GR/MDT/ECS/DSI/VSP/CMR.
The actual programme was MDT/ECS/CMR.
The option to run DSI/VSP was not utilized in 8.5" section.

Wireline summary

Section: 8 ½" Contractor: Schlumberger					
Run	**Logging Service** (tool combination)	**Pass**	**Pass direct.**	**Log speed**	**Interval [m MD]**
2A	MDT/ECS/CMR+	1	Down	N.A.	5140-6413
2A	MDT/ECS/CMR+	1	Up	N.A	6413-5149
2B	MDT	-	-	-	
2C	MDT	2	Down	N.A.	5140-7145
Run remark: Run 2A: MDT failed after one pressure point. Logged ECS/CMR+. Run 2B: MDT. Failed to connect due to bent male pin in wet connector. POOH without logging. Run 2C: MDT tool failed while attempting to take water sample at 7145m MD. Took 32 successful pressure tests and 3 samples.					

Time Distribution			
Run	**Operation time [Hours]**	**Lost Time [Hours]**	**Comments**
2A/2B, MDT/ECS/CMR+		23.5	MDT failures.

4.9.9 Formation Pressures 8 1/2" section

Run no.: 2C	Well: 34/10-48 S	Date: 04.12.2004	Rig: Gullfaks C	RKB: 84,1 m.						PORE PRESSURE (s.g ref. RKB) = 10.195*FORM. PRESSURE / mTVD RKB				
ZONE NAME	Log Run No.	Test No.	DEPTH m MD RKB	DEPTH m TVD MSL	FORM. PRESS. (bar)	HYDROSTATIC PRESS. (bar) BEFORE	HYDROSTATIC PRESS. (bar) AFTER	TEMP (°C)	GOOD SEAL (Y/N)	REMARKS (Pressure gauge id.)	MOB-ILITY mD/cP	PORE PRESS. s.g ref. RKB (g/cm3)	HYDROST. PRESS. s.g ref. RKB (g/cm3)	INITIAL PRESS. (bar)	DEPLE-TION (bar)
Tarbert	2A	1	5165,0	2803,4	421,19	449,49	449,45	106,8	Y	QG2, Very good pretests	977,2	1,49	1,59		
Tarbert	2C	1	5165,0	2887,5	421,19	449,49	449,20	106,8	Y	QG1, Very Good	977,2	1,49	1,59		
Tarbert	2C	2	5266,0	2900,4	421,93	459,10	458,90	107,6	Y	QG1, Very Good	2560	1,48	1,61		
Tarbert	2C	3	5252,0	2898,9	421,84	457,52	457,60	107,7	Y	QG1, Very Good	572,6	1,48	1,61		
Tarbert	2C	4	5232,5	2896,7	421,70	456,60	458,90	107	Y	QG1, Very Good	2902,6	1,48	1,61		
Tarbert	2C	5	5197,0	2892,1	421,43	455,20	455,60	107,8	Y	QG1, Very Good	3570	1,49	1,60		
Tarbert	2C	6	5165,0	2887,5	421,17	454,10	455,00	107,5	Y	QG1, Very Good	811,9	1,49	1,60		
Tarbert	2C	7	5266,0	2900,4	421,92	461,60	460,90	107,6	Y	QG1, Fluid scan		1,48	1,62		
Tarbert	2C	8	5278,0	2901,6	421,99	461,30	460,70	107,8	Y	QG1, Very Good	596,2	1,48	1,62		
Ness	2C	9	5312,5	2904,7		461,20	460,60		N	QG1, No Seal			1,62		
Ness	2C	10	5313,5	2904,8	422,93	462,20	461,50	108,2	Y	QG1, Supercharged ?	4,5	1,48	1,62		
Ness	2C	11	5339,0	2907,1	420,94	463,40	462,50	108,2	Y	QG1, Good	27,7	1,48	1,63		
Ness	2C	12	5380,0	2910,7	420,38	464,60	463,60	108,4	Y	QG1, Very Good	958,9	1,47	1,63		
Ness	2C	13	5405,0	2912,7	420,56	465,20	464,20	108,5	Y	QG1, Very Good	210,5	1,47	1,63		
Ness	2C	14	5438,0	2915,0	420,69	465,50	464,90	108,7	Y	QG1, Very Good	458,3	1,47	1,63		
Etive	2C	15	5467,0	2917,3	421,02	466,80	465,80	108,9	Y	QG1, Good	58,1	1,47	1,63		
Rannoch	2C	16	5550,0	2922,7	421,63	465,10	465,12	109,2	Y	QG1, Good	72,3	1,47	1,62		
Rannoch	2C	17	5577,0	2923,9	421,77	468,80	468,80	109,2	Y	QG1, Good	44,5	1,47	1,63		
Rannoch	2C	18	5622,0	2925,5					N	QG1, No Seal					
Rannoch	2C	19	5618,0	2925,1					N	QG1, No Seal					
Rannoch	2C	20	5702,0	2922,2	421,69	472,23	471,20	109,3	Y	QG1, Good	13,2	1,47	1,65		
Rannoch	2C	21	5723,0	2921,6	421,57	473,69	471,85	109,3	Y	QG1, Good	32,7	1,47	1,65		
Etive	2C	22	5785,0	2920,5					N	QG1, Tight					

Run no.: 2C	**Well: 34/10-48 S**		**Date: 04.12.2004**		**Rig: Gullfaks C**			**RKB: 84,1 m.**			**PORE PRESSURE (s.g ref. RKB) = 10.195*FORM. PRESSURE / mTVD RKB**				
						HYDROSTATIC PRESS. (bar)									
Etive	2C	23	5800,0	2920,4	421,33	465,65	473,90	108,4	Y	QG1, Very Good	278,1	1,47	1,63		
Tarbert	2C	24	6012,0	2918,1	423,00	478,23	476,44	109,1	Y	QG1, Very Good	271,1	1,48	1,67		
Tarbert	2C	25	6142,5	2914,9	422,78	478,67	476,84	109,2	Y	QG1, Very Good	275,3	1,48	1,67		
Øvre jura	2C	26	6261,5	2915,4	422,64	478,68	475,82	109,3	Y	QG1, Poor	1,9	1,48	1,67		
Øvre jura	2C	27	6357,0	2918,2	422,81	480,11	477,24	109,1	Y	QG1, Good	188	1,48	1,68		
Øvre jura	2C	28	6388,0	2918,9	422,86	480,75	477,48	109,2	Y	QG1, Poor	2,1	1,48	1,68		
Ness	2C	29	6582,0	2915,5	426,36	486,27	485,14	109,5	Y	QG1, Supercharged ?	2,5	1,49	1,70		
Ness	2C	30	6587,0	2915,4						QG1, Tight					
Tarbert	2C	31	6663,0	2915,6	422,70	484,90	483,93	109,4	Y	QG1, Very Good	461,4	1,48	1,70		
Tarbert	2C	32	6695,0	2915,9	422,73	482,90	482,60	109,2	Y	QG1, Very Good	678,7	1,48	1,69		
Tarbert	2C	33	6782,0	2916,2	422,87	483,90	482,90	108,1	Y	QG1, Good	98,6	1,48	1,69		
Tarbert	2C	34	6817,0	2916,8	422,91	484,50	482,90	108,2	Y	QG1, Good	53,2	1,48	1,69		
Tarbert	2C	35	6975,0	2919,3	423,07	484,50	483,00	108,8	Y	QG1, Very Good	100,8	1,48	1,69		
Tarbert	2C	36	7072,0	2922,7	423,26	484,10	483,00	108,8	Y	QG1, Very Good	1896,1	1,48	1,69		
Tarbert	2C	37	7145,0	2931,3	423,91	485,00	485,00	108,9	Y	QG1, Very Good	185,5	1,47	1,69		
Total number of tests: 37									**No. Successful tests: 32**			**No. Fluid samples: 3**			
Hydrostatic gradient to surface: 1,63 g/cm3 before mud circulating at 6000 m.															
Minimum/ Maximum measured pore pressure (ref RKB): 1,47 / 1,49 g/cm^3															
Formation pressure test Quality in OW "PRES_QUAL" 0:Lost Seal, 1:Tight, 2:Poor (<10 mD/cP), 3:Good (10-100 mD/cP), 4:Very Good (>100 mD/cP)															

4.9.10 Formation Fluid Sampling – 8.5" section

Sample depth Zone name	Pre-test		Clean-up				Sampling						Comments
	Formation pressure (bars)	Mobility (mD/cP)	Date	Start	Stop	Pump volume (litre)	Start	Stop	Draw-down (bars)	MDT Sample number	MDT Chamber (Id. no.)	Transferred to bottle (Id. no.)	
5165m MD Tarbert Fm Oil	421.17	812	10 Dec 2004	21:30	23:00	16				1	MPSR # 788	TS 11515	Used 20 cc for on-site analysis
										2	MPSR # 677	TS 4010	
										3	MPSR # 644	PT 2024	

4.9.11 Lab Analyses of Fluid Samples offshore by Petrotech

MDT Chamber serial no.	Depth	Sample Size	Petrotech Opening press@ 10deg.C	Petrotech Transferred to bottle (Id. no.)
MPSR # 788	5165m MD	335	185	TS 11515
MPSR # 677	5165m MD	350	250	TS 4010
MPSR # 644	5165m MD	350	250	PT 2024

4.9.12 MWD/LWD in well 34/10-48 A/AT2

The wells 34/10-48 A / AT2 were drilled to discoveries in the Upper Jurassic sandstone and the Brent Group Topas/Nesle made by well 34/10-48 S.
The open-hole logging program was designed to provide logs for evaluation of formation properties and to measure formation pressures in all reservoir zones.

The 8 ½" section of 34/10-48 A is logged with Arc6/ADN6/APWD/TST6 down to 5850m MD-RKB. From 5850m to 6221m MD RKB the well was drilled without the TST6-tool (the formation pressure tester while drilling).

34/10-48 AT2 drilled 5608-5878 m MD with ARC6 / ADN6. The ADN6 failed while "time-drilling" at the kick-off point.

LWD Run Summary

LWD Run Summary						
Section: 8 ½" **Contractor: Schlumberger D&M**						
Run	**Logging Service** (tool combination)	**Pass**	**Pass direct.**	**Log speed**	**Interval [m MD]**	**Pass remark**
1	ARC6 /ADN6/TST6	Drilling	Down	ROP	5106 - 5850	
2	ARC6 /ADN6	Drilling	Down	ROP	5850- 6221	
AT2 1	ARC6 / ADN6	Drilling	Down	ROP	5608 - 5878	ADN6 failed
Run Remark: Real time transmitted curves: ARC_GR, ROBB, DRHB_DH, ROBU, TNPH, ,P16, P40, ROP5.						
Run Remark.						

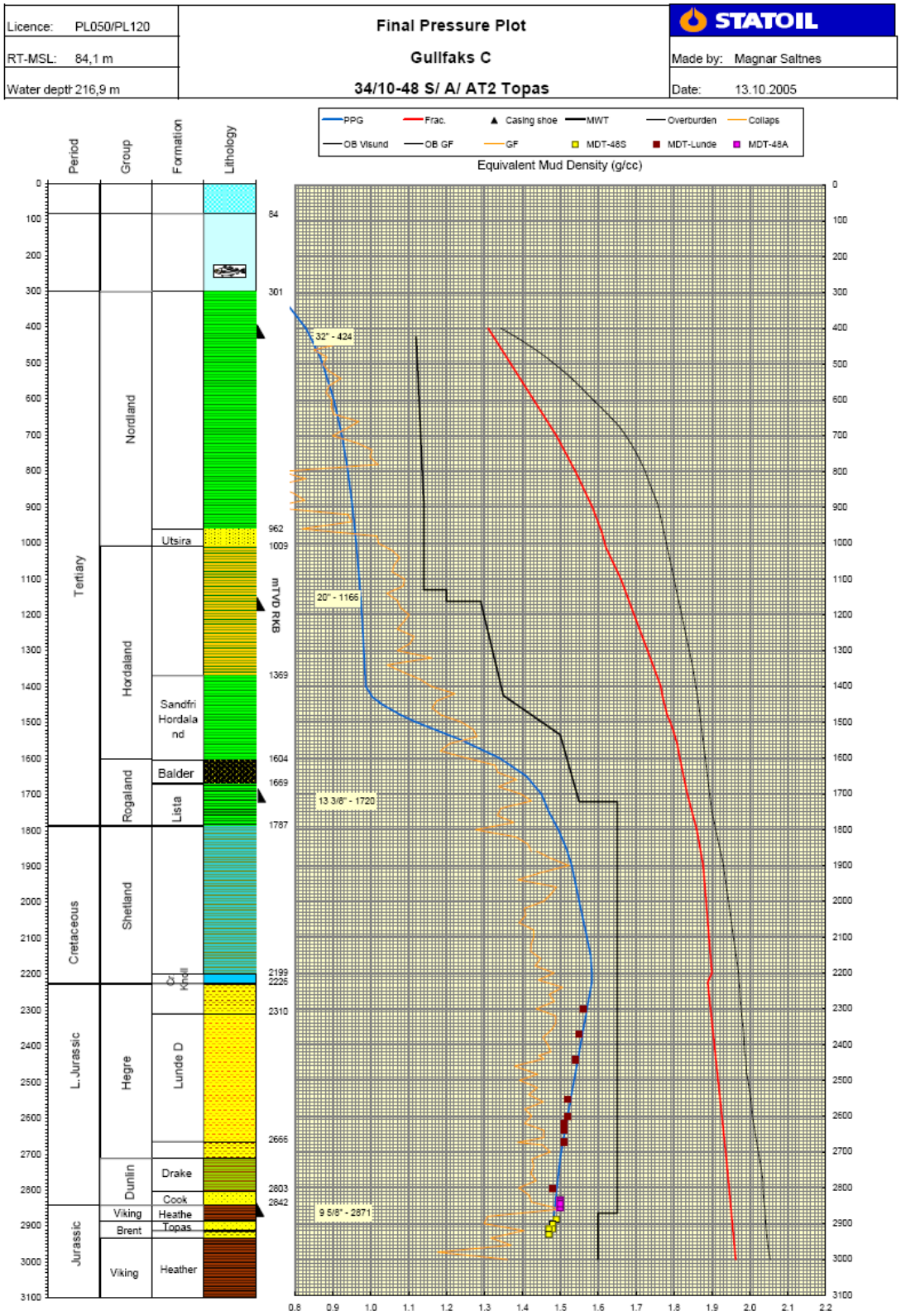
4.9.13 Electrical Wire line Logging - 8 ½" section

No open hole Wire line logging was performed in the 8 ½" section. VSP was later on logged in 9 5/8" casing after drilling 34/10-48 A / AT2.

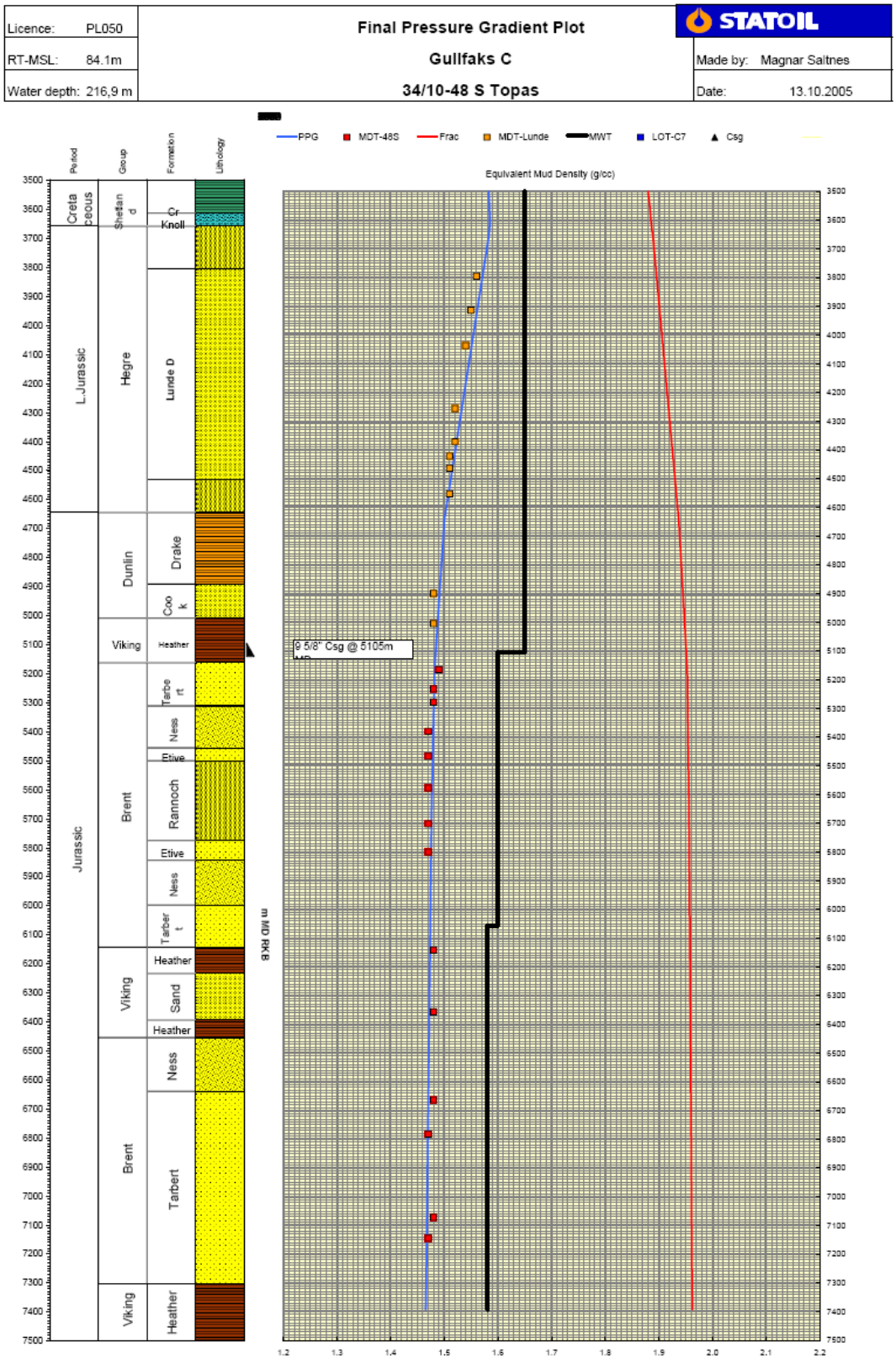
4.9.14 LWD Formation Pressure tests 34/10-48 A

Run no.: 1A	Well: 34/10-48 A	Date: 23.12.2004	Rig: Gullfaks C	RKB: 84,1 m.						PORE PRESSURE (s.g ref. RKB) = 10.195*FORM. PRESSURE / mTVD RKB				
ZONE NAME	Log Run No.	Test No.	DEPTH m MD RKB	DEPTH m TVD MSL	FORM. PRESS. (bar)	HYDROSTATIC PRESS. (bar) BEFORE	HYDROSTATIC PRESS. (bar) AFTER	TEMP (°C)	GOOD SEAL (Y/N)	REMARKS (Pressure gauge id.)	MOB-ILITY mD/cP	PORE PRESS. s.g ref. RKB (g/cm3)	HYDROST. PRESS. s.g ref. RKB (g/cm3)	INITIAL PRESS. (bar)	DEPLE-TION (bar)
Tarbert	1A	1	5428,7	2855,6		458,5	455,5		N	TST6, No seal			1,63		
Tarbert	1A	2	5429,2	2855,4	419,15	459,2	456	107	Y	TST6, veryGood	455,4	1,50	1,64		
Tarbert	1A	3	5600	2833,2	417,96	458,8	454,5	96	Y	TST6, veryGood	2841	1,50	1,63		
Tarbert	1A	4	5505	2839,2	418,38	455,2	454,8	96	Y	TST6, veryGood	596	1,50	1,63		
Tarbert	1A	5	5475	2844,8	418,72	455,8	455,8	96	Y	TST6, veryGood	325	1,50	1,63		
Total number of tests: 5									**No. Successful tests: 4**			**No. Fluid samples: 0**			
Hydrostatic gradient to surface: 1,63 g/cm3 while circulating at 1200 lpm. (i.e. dynamic reading, MW = 1,57 sg)															
Minimum/ Maximum measured pore pressure (ref RKB): 1,50 g/cm^3															
Formation pressure test Quality in OW "PRES_QUAL" 0:Lost Seal, 1:Tight, 2:Poor (<10 mD/cP), 3:Good (10-100 mD/cP), 4:Very Good (>100 mD/cP)															

4.10 Formation pressure plot, true vertical depth



4.11 Formation pressure plot, measured depth



5 Activity highlights

5.1 General information

5.1.1 Well 48 S

The planned well was a very challenging well. The well was drilled from a preset 32" conductor at slot 29. It was planned drilled in 4 sections, 24", 17 ½", 12 ¼" and 8 ½". The planned TD of the well was 6848 m MD. Information gathered while drilling the 8 ½" section led to a change in plans and the wellpath in the reservoir was changed and extended with 550 m. The well 48 S was drilled to 7393 m MD.

5.1.2 Well 48 A

After analyzing the data from the 8 ½" section of 48 S, it was decided to plug back the open hole section and drill a new 8 ½" section – 48 A. The wellpath was raised with between 50 and 100 m TVD. This was done to increase the distance from the OWC, and then get a better production potential. After a roundtrip at 6221 m MD it was impossible to continue drilling the 48 A well. Drilled several hard intervals witch led to very low progress. The change from hard stringers to softer adjacent formations caused problems while tripping in hole. Had several trips due to equipment failures. Lost the wellpath due to severe hole problems when tripping in hole after a round trip.

5.1.3 Well 48 A T2

Performed an open hole sidetrack at 5608 m MD. The new wellpath was planned to avoid the hard formations experienced in 48 A. Did not manage to do that and after experience ROP around 0,5 m/hrs TD was set at 5878 m MD. Informations from previous 8 ½" sections showed that this should be enough to set the well on production.

5.2 24" section DBR summary included.

5.2.1 Section overview

Interval	437,5 m MD to 1287,5 m MD
Casing	20" casing
Section length	850 m
Inclination	Build from 11° to 49°
Azimuth	Turn from 77°- 3°

Mud	1.03 – 1.20 sg, Seawater/CMC WBM

Budget time for section: Planned: 10,8 days / Actual: 18,1 days / +7,3 days

After NU the LRR spool and the HP riser on slot 28, experienced leakage on the A-section when the riser was filled with water. The hub had been machined due to corrosion and a special (oversized) seal ring had been made. Did not manage to cure this leakage, and new seal-rings were ordered, but still no satisfactory test was achieved. To avoid more down-time a decision was made to change slot for this well from slot 28 to slot 29.

The 24" section was drilled in one run with a motor BHA and a rockbit. The BHA behaved as expected with maybe a slightly higher DLS capacity than expected.

Experienced severe problems with the gyro survey measurements in the start of this section. This created uncertainty regarding surveys and well position. The consequence of this was that we deviated from the planned wellpath and a new plan had to be made to avoid getting into a clearance problem. All together this delayed the progress in this section severely. Another result of this was that the complexity of the 17 ½" section was increased compared to the planned. The 24" section ended up with an inclination of 49 instead of 63 as planned at section TD. Apart from wellpath related problems related to Gyro survey error in the start of this section, the drilling went OK.
See more informations in chapter 3.12

The 20" casing was run and cemented without any problems reported.

5.2.2 DBR summary

INTERVAL: 24"
START TIME: 09.03.2004 02:30
END TIME: 27.03.2004 06:00

Report date	Description
10.03.2004	Lifted BOP and inspected A-section and seal ring. Performed general maintenance while waiting on new special seal ring to be manufactured.
11.03.2004	Performed general maintenance while waiting on new special seal ring to be manufactured. Changed LP riser.
12.03.2004	Waiting for new special size seal ring for A-section. While waiting, PU one stand 6 5/8" HWDP. Installed new seal ring in A-section and MU clamp. Filled riser with seawater. Still minor leak in connection. MU 2 stands 6 5/8" HWDP and 2 stands 9" NMDC/8 DC/Jar
13.03.2004	ND 30" BOP and riser on slot 28. Skidded rig from slot 28 to slot 29. Started NU on slot 29.
14.03.2004	NU LRR spool with hose, HP riser and 30" BOP.
15.03.2004	NU 30 1/2" BOP and diverter system on slot 29.
16.03.2004	Finished NU 30 1/2" BOP and diverter system on slot 29. Tested 30 1/2" BOP to 69 bar. Installed wearbushing. Prepared for PU 24" BHA components.
17.03.2004	PU 24" BHA and RIH to 422 m. Displaced conductor to seawater. Tested conductor to 25 bar. Displaced hole to CMC mud while drilling 32" cnductor shoe. Drilled 3 m new formation. Took an FIT to 1.29 sg EMW. Drilled 24" hole from 441 m to 507 m.

Report date	Description
18.03.2004	Drilled 24" hole in oriented and rotary mode from 507 m to 670 m. Reamed intervals 566 - 648 m, 616 - 670 m and 600 - 643 m and attempted to reduce dog leg severity in same.
19.03.2004	Drilled 24" hole in oriented and rotary mode from 670 m to 955 m.
20.03.2004	Drilled 24" hole in oriented and rotary mode from 955 m to 1106 m. Circulated well to reduce sand content in mud. Drilled 24" hole in oriented and rotary mode from 1106 m to 1153 m.
21.03.2004	Circulated well. RU and took gyro check survey. Evaluated survey data and planned forward programme. While evaluating survey data circulated well, reciprocated and POOH from bottom at 1153 m to 942 m. RIH. Drilled 24" hole in oriented mode from 1153 m to 1175 m.
22.03.2004	Drilled 24" hole in oriented mode from 1175 m to 1287,5 m (TD). Circulated and conditioned mud. Flow checked. POOH from TD to 617 m. Pumped OOH through potential shallow gas interval into 32" conductor shoe to 436 m. Circulated bottoms up. Flow checked. POOH to 60 m.
23.03.2004	POOH. LD BHA. Rigged up for running casing. Ran 20" casing to 160 m.
24.03.2004	RIH with 20" casing from 160 m to 1282,5 m.
25.03.2004	Landed 20" casing hanger with shoe at 1282.5 m. Cemented 20" casing. Tested casing and plug to 120 bar. Pulled landing string. Rigged down casing equipment.
26.03.2004	Washed riser and BOP. Washed area for seal assy. Installed seal assy. Tested same. Ran and installed RTTS packer. Tested same from above to 69 bar.
27.03.2004	ND LP risers and BOP. Installed 13 5/8" riser. Skidded rig from slot 29 and well 34/10-48S and to mid position. Moved equipment from south to north shaft. ND HP riser and LRR system. Skidded rig to slot 15 and well 34/10 C-43 T2. NU 13 5/8" BOP on well C-43 T2. End of operation on well 34/10- 48 S.

After the 20” casing was cemented the well was P&A and the rig was skidded over to slot 15 – well 34/10-C-43 T2.
During this stop in operation on 48 S well GFC was completing the C-43 T2 well. Operation commenced again the 19.04.2004.

START TIME: 19.04.2004 05:30
END TIME: 21.04.2004 10:00

Report date	Description
20.04.2004	NU HP riser and 20 3/4" BOP. NU LP riser. Body tested BOP to 185 bar. MU BHA for pulling RTTS. RIH to 98 m and tagged RTTS. Rotated string to release RTTS.
21.04.2004	Released and POOH with 20" RTTS from 98 m. Tested 20" casing to 185 bar. MU and RIH with 17 1/2" motor drilling assy to 1254 m.

5.3 17 ½" section

5.3.1 Section overview

Interval	1287,5 m MD to 2667,0 m MD
Casing	13 3/8" casing
Section length	1379,5 m
Inclination	Build from 49° to 66°, tangent at 66°
Azimuth	Turn from 3° to7°
Mud	1,28 – 1,55 sg, Glydril WBM

Budget time for section: Planned: 19,0 days / actual: 15,2 days / -3,8 days

The section was drilled with a 12 ¾" motor BHA and a rockbit in one run.

The plan was to drill this section as a tangent with sailing angle of 63°. Since the 24" section was revised and ended up with a inclination of 49°. The wellpath was changed, starting with a build from 48 to 66° inclination with 3° DLS. Then a tangent with 66° sailing angle. No change was made to the planned BHA.
The main focus in this section was to secure proper primary hole cleaning. The 3 main parameters to achieve this were:

- ROP
- RPM
- Flowrate.

ROP was restricted to 30 - 40 m/hrs down to the Balder, and in Balder and Lista Fm. max 20 m/hrs. It was difficult to keep the planned ROP in the Balder and Lista Fm. Because the BHA showed a dropping tendency if the WOB was cut back to much, ended up with 20 m/hrs +.

In all operations the string RPM was kept to 180 rpm, this was done throughout the entire section.

Flow-rate was kept to 5000 lpm throughout the whole section.

Circulated BU 10 times before all cuttings were away. The plan was to POOH without backreaming.

Came out of hole with a combination of pulling, lubricating and backreaming out of the hole. It was not possible to POOH without rotation or circulation, several intervals had to be backreamed. But there were no problems coming out.

The 13 3/8" casing was runned and cemented according to plan. Had to work a few tight spots.

5.3.2 DBR summary

INTERVAL: 17 1/2"
START TIME: 21.04.2004 10:00
END TIME: 06.05.2004 20:30

Report date	Description
22.04.2004	Drilled shoe track and 3 m new formation to 1290 m. Performed FIT to 1.65 sg. Drilled 17 1/2" hole 1523 m.
23.04.2004	Drilled 17 1/2" hole in rotary mode from 1523 m to 1905 m.
24.04.2004	Drilled 17 1/2" hole from 1905 m to 2231 m. Hole packed off during reaming stand down. Worked pipe and regain circulation. Circulated well clean.
25.04.2004	Drilled 17 1/2" hole in rotary mode from 2231 m to 2504 m.
26.04.2004	Observed 25 bar pressure drop. Checked surface equipment. Pulled and lubricated OOH from 2504 m to 2089 m. Detected leak on surface. RIH to bottom. Established circulation and drilled 17 1/2" hole from 2504 m to 2583 m.
27.04.2004	Drilled 17 1/2" hole in rotary mode from 2583 m to 2667 m, section TD. Circulated hole clean with 5000 lpm/180 RPM, total of 9 x BU while slowly reaming from 2667 m to 2532 m. POOH from 2532 m to 2293 m. Experienced overpull. RIH to 2332 m.
28.04.2004	POOH from 2314 m to 2068 m. RIH to 2096 m and circulated hole due to tight hole during tripping. Backreamed OOH from 2042 m to 1578 m. Attempted to POOH several times. Pulled without backreaming short intervals before taking overpull.
29.04.2004	Backreamed from 1579 m to 1279 m, into 20" casing shoe. Circulated hole clean. POOH and LD MWD and PDM. Retrieved wear bushing.
30.04.2004	Retrieved wearbushing and washed wellhead. RU for running 13 3/8" casing. PU and ran reamer shoe and shoetrack joints. Ran 13 3/8" casing from 46 m to 697 m.
01.05.2004	Ran 13 3/8" casing from 697 m to 2616 m.
02.05.2004	Landed 13 3/8" casing in wellhead. Broke circulation and circulated casing prior to cement job, max. rate 3000 lpm. Cemented 13 3/8" casing. Pressure tested casing to 345 bar/10 min. POOH and LD landing string. Washed wellhead/BOP and riser prior to installing 13 3/8" seal assembly.
03.05.2004	Installed 13 3/8" seal assembly. Tested same to 210 bar/15 min. ND 30" LP riser, 20 3/4" BOP and HP riser. Installed C-section. NU 13 5/8" HP riser.
04.05.2004	Installed HP riser. Tested C-section to 210 bar/15 min. ND 30 1/2" LP riser and NU 13 5/8" LP riser. Installed 13 5/8" BOP. Function tested BOP. NU 13 5/8" mandril.
05.05.2004	MU 13 5/8" BOP and overshot mandril. Tested BOP to 345 bar/10 min. Closed off drill floor to allow Falling Objects Team to perform derric inspection. Waited on well operations in well C-28. LD 6 5/8" HWDP and 5" DP from derric. MU 12 1/4" RSS BHA.
06.05.2004	PU 12 1/4" Powerdrive BHA and MWD tools. RIH from 205 m to 2000 m while PU 5 1/2" DP from deck.

5.4 12 ¼" section

5.4.1 Section overview

Interval	2667,0 m MD to 5106,0 m MD
Casing	9 5/8" liner
Section length	2439 m
Inclination	Drop from 65° to 54° build from 54° to 71°
Azimuth	Turn from 8,6° to 82°
Mud	1.65 sg, Versavert OBM

Budget time for section: Planned: 33,7 days / Actual: 30,5 days / -3,2 days

Drilled this section in three runs utilizing a PowerDrive Extra BHA.

ROP was held back to between 20 and 40 m/hrs throughout the whole section due to SMACCC unit capacity.

The directional planned was followed in this section, and there were not experienced any major problems following the plan.

Did not experience any problems while tripping in or out of the hole. This indicates that the holecleaning was good throughout the whole section.

Had some problems that the mud was very viscous before it was warmed up or circulated on.

9 5/8" liner was ran and cemented according to plan. A few tight spots were experienced.

After this section was finished, skidded the rig to slot 50 and drilled the well 34/10-C-5 A / C-5 B.

Had a stop in operation on this well from 01.06.04 to 02.11.04.

5.4.2 DBR summary

INTERVAL: 12 1/4"
START TIME: 06.05.2004 20:30
END TIME: 30.05.2004 17:30

Report date	Description

Report date	Description
07.05.2004	RIH from 2000 m to 2628 m while PU DP from pipe deck. Drilled out shoetrack and reamer shoe. Cleaned rathole. Drilled 3 m new formation to 2680 m. Performed LOT to 1.83 SG EMW. Started to drill 12 1/4" hole. Suction filters in mudpumps plugged off. Troubleshoot problem. Changed damaged valves and seats on MP1.
08.05.2004	Drilled 12 1/4" hole from 2680 m to 2764 m. Maintained SMACCC equipment. Drilled 12 1/4" hole from 2764 m to 2900 m.
09.05.2004	Drilled 12 1/4" hole from 2900 m to 3173 m
10.05.2004	Drilled 12 1/4" hole from 3173 m to 3509 m.
11.05.2004	Maintained SMACCC system. Drilled 12 1/4" hole from 3509 m to 3745 m.
12.05.2004	Drilled 12 1/4" hole from 3745 m to 3759 m. Steered 100 % right. No response to setting. POOH to 803 m due to failure on Powerdrive 3D RSS.
13.05.2004	POOH. LD BHA. Tested BOP. Trouble shoot on PLS system for SCR. Attempted to assign SCR to draw work.
14.05.2004	Solved problem with assigning SCR/ power supply to DDM. MU BHA. RIH to 2628 m. Slip and cut drill line. Condition mud while slip and cut.
15.05.2004	RIH to 3759 m. Conditioned mud. Drilled 12 1/4" hole from 3759 m to 3825 m. Unable to steer Powerdrive. Conditioned mud. POOH from 3825 m to 3444 m.
16.05.2004	POOH. Tested defect Powerdrive. Changed Powerdrive. Tested new Powerdrive. MU BHA. No communication with ARC tool. Changed ARC tool. RIH to 500 m.
17.05.2004	RIH to 3825 m. Conditioned mud. Drilled 12 1/4" hole from 3825 m to 4017 m.
18.05.2004	Drilled 12 1/4" hole from 4017 m to 4370 m.
19.05.2004	Drilled 12 1/4" hole from 4370 m to 4632 m. Changed wash pipe.
20.05.2004	Drilled 12 1/4" hole from 4632 m to 4900 m.
21.05.2004	Drilled 12 1/4" hole from 4900 to 5051 m. Changed wash pipe. Drilled 12 1/4" hole from 5051 m to TD of section at 5105 m. Not able to build inclination. Circulated hole clean while POOH slowly to 5008 m.
22.05.2004	Circulated hole clean. Flow checked and POOH. Removed RA source and LD LWD and MWD tools. Tested and LD powerdrive with bit.
23.05.2004	Tested BOP to 345 bar while preparing logging tools. PU logging string. Had problem with power to MDT. Found moisture in bulk head connection. Tested logging tools. RIH with logging tools to 1566 m.
24.05.2004	RIH with logging string from 1566 m to 2464 m. Circulated BU. RIH to 2602 m. MU stabilizer, SES and 5" DP single. Pumped down locomotive and latch in docking head. RIH with logging string to 3684 m. Performed sticky test. Performed MTD logging from 3670 m to 4283 m.
25.05.2004	Performed MDT pressure points and fluid sampling from 4283 m to 5005 m. Pumped slug. Logged caliper from 5005 m to 4882 m.
26.05.2004	Logged with caliper and MDT pressure points and fluid samples from 4882 m to 3575 m. No water sample due to plugging of probes and pumpes.
27.05.2004	Logged with caliper from 3575 m to 2623 m. POOH with locomotive. RD logging equipment. POOH and LD logging tools. PU and installed casing tong and casing equipment. PU shoe joint and checked for back flow. PU and MU shoe track. RIH with 9 5/8" liner to 49 m.
28.05.2004	RIH with 9 5/8" liner from 49 m to 2489 m.
29.05.2004	PU and MU 9 5/8" liner hanger. RIH with 9 5/8" liner on 6 5/8" DP from 2498 m to 5046 m. Worked string and circulated through thight areas. Circulated and resiprocated string due to high gas readings. Max gas 25%.
30.05.2004	RIH with 9 5/8" liner on 6 5/8" DP from 5046 m to 5105,5 m. Spaced out and MU cement head. Circulated BU prior to cementing. Pumped 5 " premix and 20 m3 1,77 sg spacer. Mix and pumped 62 m3 cement. Displaced cement and bumped plug. Pressure tested liner to 180 bar. Set packer and pressure tsted to 150 bar. Circulated BU. LD cement head and circulated to treat mud. POOH from 2607 m to 2273 m while LD 6 5/8" DP. Gantry crane stopped. Repaired gantry crane while cut and slip drill line. POOH from 2273 m to 1875 m while LD 6 5/8" DP.

After the 13 3/8”casing was cemented and tested, the well was P&A and the rig was skidded over to slot 50.
During this stop in operation on 48 S well GFC was drilling the well C-05 A, and B. Operation commenced again the 02.11.2004.

START TIME: 02.11.2004 06:00
END TIME: 08.11.2004 20:00

Report date	Description
03.11.2004	Skidded rig to mid position. Moved equipment between north and south BOP deck with cranes. Skidded rig to south shaft slot 29/well C-46. NU HP riser and BOP. Connected kill and choke lines.
04.11.2004	Installed LP riser. Tested BOP. Retrieved RTTS.
05.11.2004	POOH with RTTS. LD 10 x 8" DC. Dismantled torque wrench. Rearranged stands in derrick. PU and RIH with 6 5/8" DP to 898 m. Dismantled frames in PRS arms to change spades.
06.11.2004	Changed spade in upper PRS arm. POOH with 6 5/8" DP from 898 m. Changed saver sub. PU and MU BHA. Tested tools. RIH with 8 1/2" BHA to 916 m. Displaced out SW. RIH with 8 1/2" BHA on 5" DP to 1889 m.
07.11.2004	RIH with 8 1/2" BHA from 1889 to 3333 m on 5" DP. RIH from 3333 m to 3989 m while PU 6 5/8" DP. Took weight. Washed down from 3989 m to 4844 m.
08.11.2004	Washed down from 4858 m to 5078 m. POOH to 4723 m. RIH to 5078 m while PU 6 5/8" DP. RU and ran gyro. POOH with gyro and RD. POOH from 5078 m to 4351 m. RIH to 4364 m while PU 6 5/8" DP.

5.5 8 ½" section

5.5.1 Section overview 48 S

Interval	5106,0 m MD to 7393,0 m MD
Casing	N/A
Section length	2287 m
Inclination	Build from 72° to 92° hold 90 - 92° drop to 82° finally build to 91°
Azimuth	82° - 311°
Mud	1.58 – 1,60 sg, Versavert OBM

Budget time for section: Planned: 34,8 days / Actual: 43,8 days / +9,0 days

The section was drilled in four runs, including one core run. The drilling BHA consists of a PowerDrive Xceed 3D RSS tool.

The planned wellpath was very complex, requiring doglegs ranging from 3,5° to 4,5° throughout the entire section.

Top reservoir was entered at 5160 m MD and at 5173 m it was decided to POOH to cut a core. One core run was conducted in the top of the Brent Gr. The core was cut from 5173 to 5208 m.

Drilling commenced at 5208 m and the well was drilled as per proposal until the OWC was encountered (shallower than expected). It was then decided to follow the proposal in view while maintaining an inclination of approx 90° instead of following the planned inclination. The plan required doglegs around 4°/30 m and these were achieved without any problems. No drilling problems were encountered until 5995 m where communication with the Xceed tool was lost. Drilling continued to 6057 m to evaluate whether or not the tool was functioning, but the MWD showed it was not. POOH to change Xceed tool.

Continue drilling from 6057 m according to the revised wellplan. Drilled ahead horizontally until 7044 m. At this depth adjustments were made according to geologist request. TD was set in the Heather Fm. at 7393 mMD.

Due to these changes the wellpath was extended from 6848 m to 7393 m MD.

Extensive circulation was performed prior to POOH at TD. No special problems were reported from this trip.

After evaluating the result from this section it was decided to plug back the open hole and drill a new 8 ½" section.- 48 A. The 48 A wellpath was lifted approximately 100 m higher TVD than 48 S well. This was done to increase the distance from the OWC.

5.5.2 DBR summary 48 S

INTERVAL: 8 1/2"
START TIME: 08.11.2004 20:00
END TIME: 22.12.2004 16:00

Report date	Description
09.11.2004	RIH from 4364 m to 5077 m while PU 6 5/8" DP. Tagged LC at 5083 m. Perofrmed kick drill. Drilled shoetrack, shoe and 3 m new formation to 5112 m. Performed FIT to 1,85 sg. Drilled 8 1/2" hole from 5112 m to 5173 m. Circulated BU for sample. Circulated while evaluating situation.
10.11.2004	Circulated hole clean while evaluating situation. POOH wet from 5173 m to 5035 m. Flow checked well. Pumped slug and POOH. LD BHA. RIH with outer core barrel to 58 m. RIH with inner core barrel.
11.11.2004	MU 8 1/2" x 4" core assembly. RIH with coring asembly to 377 m. Changed hydraulic hose on PRS. RIH with coreing assembly to 4012 m. Performed choke drill. RIH with coring assembly to 5091 m. Washed down and tagged TD at 5174 m. Cut 4" core from 5174 m to 5178 m.
12.11.2004	Cut core from 5178 m to 5208 m. JAmmed off. Pumped OOH to 5091 m. Flow checked. Pumped slug and POOH to 87 m.
13.11.2004	POOH with coring assembly from 87 m to 59 m. LD 33 m 4" core. Cut and slip drill line while evaluating cores. POOH and LD outer core barrel. MU 8 1/2" drilling BHA. RIH to 1100 m while PU 5" DP.
14.11.2004	RIH with 8 1/2" BHA to 1334 m while PU 5" DP. RIH with 8 1/2" BHA to 2464 m. Circulated BU. TIH with 8 1/2" BHA to 5091 m. Circulated BU. Logged open hole to 5121 m.
15.11.2004	RIH while logging fm to TD. POOH to casing shoe due to wrong DP tally. Correlated depth and RIH while logging fm to TD. Drill 8 1/2" hole from 5208 m to 5392 m.
16.11.2004	Drilled 8 1/2" hole from 5392 m to 5591 m. Changed wash pipe. Drilled 8 1/2" hole to 5654 m.
17.11.2004	Drilled 8 1/2" hole from 5654 m to 5920 m.
18.11.2004	Drilled 8 1/2" hole from 5920 m to 5998 m. Lost communication with Power Drive Xceed tool. Drilled 8 1/2" hole to 6057 m and confirmed no steering respons. Circulated hole clean and treated mud. Pulled wet from 6001 m to 5839 m. Pumped slug and POOH to 5758 m.
19.11.2004	POOH with 8 1/2" BHA from 5758 m to 1336 m. POOH from 1336 m to 575 m while LD 5" DP singles to pipe deck.
20.11.2004	POOH from 575 m to 110 m while LD 5" DP to pipe deck. POOH and LD BHA. Test 13 5/8" BOP. Prepared for MU new 8 1/2" BHA.
21.11.2004	MU new BHA with Powerdrive Exceed and MWD tools. RIH from 112 m to 1334 m while PU 90 joints DP from deck. RIH from 1334 m to 2100 m.
22.11.2004	Continued RIH from 2100 m to 3505 m. Got indication of mud losses. POOH 2 stands. Circulated, reduced MWD from 1.60 sg to 1.58 sg and reduced reology. RIH from 3447 m to 4420 m.
23.11.2004	RIH with 8 1/2" drilling BHA from 4420 m to 5078 m. Changed IBOP's and saversub on DDM. Logged shoe, had problems with weak MWD signals. RIH from 5104 m to 5940 m. Washed down from 5940 m to 5976 m.
24.11.2004	RIH to TD at 6057 m. Drilled 8 1/2" hole from 6057 m to 6242 m.
25.11.2004	Drilled 8 1/2" hole from 6242 m to 6510 m.
26.11.2004	Drilled 8 1/2" hole from 6510 to 6724 m.
27.11.2004	Drilled 8 1/2" hole from 6724 m to 6901 m.
28.11.2004	Drilled 8 1/2" hole from 6901 m to 7147 m.
29.11.2004	Drilled 8 1/2" hole from 7147 m to 7393 m, well TD. Circulated well clean while slowly reaming out from 7393 m to 7330 m.
30.11.2004	Circulated well clean. POOH from 7330 m to 5104 m. Worked through some tight spots. Circulated in 9 5/8" liner shoe prior to POOH.
01.12.2004	Circulated and conditioned mud in 9 5/8" shoe. Flow checked. POOH from 5090 m, LD BHA. RU for pulling wear bushing.
02.12.2004	Tested BOP. PU logging tools from deck and build tool string. Connected wire and tested logging tools at surface.
03.12.2004	MU logging string. RIH with logging string on 5" DP to 3610 m. Broke circulation every 10 stand.
04.12.2004	RIH with logging string from 3610 m to 4938 m with 5" DP. Cut and slip drill line. Circulated while slip and cut. Install SES. Run locomotive. RIH to 5106 m.
05.12.2004	RIH from 5106 m to 5166 m. Took one pressure point in Tarbert fm at 5165 m and attempted to take HC fluid sample at 5165 m. Short circut in MDT tool. Decided to perform CMR and ECS log down to 6412 m. Logged CMR and ECS from 5109 m to 6412 m. Logged CMR and ECS from 6412 m to 6060 m. Had to tune CMR tool at frequent interval to find optimal frequency for CMR tool. Could be linked to short circut problems in MDT tool.

Report date	Description
06.12.2004	Logged well with CMR and ECS from 6060 m to 5079 m. POOH from 5079 m to 4940 m. Unlatched locomotive. Megged cable. Cable OK. Tetsted MDT tool. Not working. Circulated BU. Flow checked well. POOH from 4940m to 4600 m.
07.12.2004	POOH from 4600 m with TLC logging string. Rebuilt cable head. MU new toolstring. Tested same.
08.12.2004	RIH with TLC logging string (MDT) from 39 m to 4840 m.
09.12.2004	RIH with logging string from 4840 m to 4922 m. Pumped down locomotive. Attempted to connect to docking head. POOH to 1745 m.
10.12.2004	POOH with logging tools from 1745 m to 39 m. Found male member on docking head bent. Replaced same. RIH to 3300 m with logging string on DP.
11.12.2004	RIH to 4925 m. Installed SES. Pumped down locomotive. Took pressure points and fluid samples in reservoir from 5165 m to 5577 m.
12.12.2004	RIH from 5577 m to 7143m while taking pressure points and fluid samples. Tool failed while pumping formation water. POOH from 7143 m to 6777 m.
13.12.2004	POOH with TLC from 6777 m to 4952 m. Circualted out gas cut and heavy mud while POOH with locomotive and cable. LD SES. POOH with logging string to 900 m.
14.12.2004	POOH with logging assy. MU cement assy and RIH to 620 m.
15.12.2004	RIH with cement stinger from 620 m to 1224 m. DDM was locked in upper position by emergency brakes. Had prolems releasing emergency brakes. RIH with cement stinger from 1124 m to 4504 m. POOH to 4998 m. Circulated BU. Circulated out gas and to condition mud.
16.12.2004	Circulated out gas and condition mud prior to cement job. Performed pre job meeting. Pumped 8 m3 spacer. Mix and pump 18 m3 2.0 SG slurry. Pumped 1 m3 spacer. Set plug from 5400 m to 5060 m with pump and pull method. Circulated BU from 5060 m. POOH. LD 5" and 3 1/2" DP.
17.12.2004	ND torque wrench. Measured main shaft on DDM. Pulled wear bushing. Sat test plug. Dismanteled DDM. Built scaffolding around DDM. Prepared to pull main shaft. Meanwhile tested choke manifold and cleaned MPA area for viscous drilling fluid.
18.12.2004	Pulled main shaft and worked on main shaft in workshop. Prepared to install new main shaft. Meanwhile performed general maintenance and tested BOP and choke manifold. Observed well on TT and well head gauge.
19.12.2004	Prepared and installed new main shaft. Installed parts on DDM. Adjusted main shaft. Meanwhile worked on iron roughneck and performed PM routines.
20.12.2004	Adjusted main shaft. Connected travelling block. Installed link tilt cylinders, S pipe and thrust nut. Removed scaffolding. Checked main shaft and tested power swivel. Tested crownomatic. Installed washpipe and mud hose. Checked DDM.
21.12.2004	Checked DDM. Installed IBOP, saver sub, torque wrench and elevator. Pull test plug and installed WB. MU 8 1/2" BHA. Not able to surface test MWD/LWD due to viscous mud. RIH to 310 m. Displaced to new drilling fluid. Tested MWD, LWD and TST.
22.12.2004	RIH with 8 1/2" BHA from 310 m to 900 m. Circualted BU. RIH to 1805 m. Circualted BU. RIH to 3207 m. RIH to 3438 m while PU 5" DP. RIH to 4597 m on 5" DP. RIH to 5001 m on 6 5/8" DP. Filled string every 300 m. Performed pre job meeting. Started to wash down from 5001 m.

5.5.3 Section overview 48 A

Interval	5120,0 m MD to 6221,0 m MD
Casing	N/A
Section length	1101 m
Inclination	Build from 70° to 103°, hold at 103°, drop to 81° at TD
Azimuth	Turn from 78° to 352°
Mud	1.57 – 1,61 sg, Versavert OBM

Budget time for section: Planned: 17,1 days / Actual: 19,8 days / +2,7 days

This section was drilled in three run utilizing a PowerDrive Xceed BHA.

Kicked off from 48 S at 5120 m. Build inclination to 103° in order to avoid the OWC found in 48 S. The wellpath was liftet approximately 100 m TVD on the most compared to 48 S.

Stringers had an adverse effect on inclination from approx 5390 m, this showed that it was difficult to achieve the planned doglegs while drilling these hard stringers, and this had to be catch up in the adjacent softer shale. A slight deviation from the planned wellpath occured. Resulting in that the wellpath passing over the line and turning wide to the left of the line.

Drilled to 5845 m MD. At this depth the AC motor on the DDM had to be changed. BHA was pulled back into the 9 5/8" shoe while repairing the DDM.

On tripping back to bottom, tight hole were seen from 5755 to 5764 m and at 5824 m. Pack-off tendencies were seen when trying to wash through these tight spots and the BHA was partly stuck at 5755 m. After working free and regaining circulation the MWD tool was found to have stopped transmitting. Continue to wash down to bottom. Attempts were made to restart MWD-no go. POOH to change MWD at 5850 m.

No problems were reported from the trip out.

PU a new MWD and RIH, only minor problems were encounter at 5760 m during this trip, with circulation and rotation this area could easily be passed.

Drilled ahead from 5850 mMD. From 5932 m a series of longer hard stringers where drilled and from 6068 to 6133 m a massive hard formation was drilled with an average ROP of 2 m/hr. During these stringers a combination of weight and RPM was used in order to reduce stick-slip, but at 6075 m the Xceed tool stopped transmitting. The inclination and azimuth achieved at this depth was sufficient to drill ahead, and still hit the prognoses reservoir. Due to several stringers in this area the BHA dropped and further drilling could not continue after 6221m.

POOH to change Xceed tool.

PU a new PD Xceed tool and RIH. On tripping back to bottom the borehole was found to be in poor condition. From 5970 m several pack-offs occurred while reaming the area. Eventually the BHA was worked to bottom but it was not possible to establish drilling parameters without hole packing off. The BHA was pulled back and an open sidetrack was performed from 5608 m.

5.5.4 DBR summary 48 A

WELLBORE ID: NO 34/10-48 A
INTERVAL: 8 1/2"
START TIME: 22.12.2004 16:00
END TIME: 11.01.2005 12:00

Report date	Description
23.12.2004	Kicked off well 34/10-48A. Drilled 8 1/2" section from 5120 m to 5306 m.
24.12.2004	Drilled 8 1/2" hole from 5306 m to 5537 m. Took pressure point at 5453 m. Ventilation fans in D21 stopped. Had gas alarm with 40% LEL in MPA area. Drilled 8 1/2" hole from 5537 m to 5578 m.
25.12.2004	Drilled 8 1/2" hole from 5578 m to 5720 m.
26.12.2004	Drilled 8 1/2" hole from 5720 m to 5845 m. Rotation stopped. Observed noise from DDM. Trouble shoot on PS AC motor.
27.12.2004	Circulated and treated mud. Lubricated OOH from 5823 m to 5087 m. Took pressure points at 5600 m, 5505 m and 5475 m. Built scaffolding around DDM. Started dismantling old AC motor.
28.12.2004	Dismantled old AC motor. Prepared and installed new AC motor. Adjusted and started connecting of new motor. Meanwhile circulated. Function tested HCR valves.
29.12.2004	Installed new AC motor and tested DDM. Flow checked well. Gained 150 litres in 1,5 hrs. RIH on elevator to 5764 m. Not able to pass 5764 m. Pulled out to 5746 m and established circulation and rotation. Not able to pass 5752 m. Had pack off tendencies. String stalled out. Regained circulation and rotation. Pumped out to 5746 m. Started circulating BU. Max gas 31,4%.
30.12.2004	Circulated hole clean. Washed down to 5845 m. Increased MW to 1,59 sg. Drilled 8 1/2" hole from 5845 m to 5850 m. Circulated hole clean and treated mud. POOH from 5850 m to 3110 m.
31.12.2004	POOH from 3110 m to 300 m. LD 14 joints 5" DP to deck. POOH and LD BHA. Tested BOP. Start PU new BHA from deck.
01.01.2005	Made up 8 1/2" drilling BHA. RIH on 5" DP to 4396 m. RIH to 4777 m while picking up 28 joints 5" DP from deck. RIH on 6 5/8" DP to 5078 m.
02.01.2005	Circulated in 9 5/8" shoe. RIH to 5676 m. Logged/backreamed from 5676 m to 5595 m. RIH to TD, washed down last 3 stands. Drilled 8 1/2" hole from 5850 m to 5940 m.
03.01.2005	Drilled 8 1/2" hole from 5940 m to 6076 m. Occasionally hard stringers. Extremely hard from 6068 m.
04.01.2005	Drilled 8 ½ hole with RSS from 6076 m to 6138 m.
05.01.2005	Drilled 8 1/2" hole with RSS from 6138 m to 6221 m. No communication with Xceed tool, angle dropping too much. Circulated hole clean. POOH to 1908 m.
06.01.2005	POOH with 8 1/2" RSS BHA. LD BHA. PU new Xceed tool. PU BHA. RIH with 8 1/2" RSS BHA to 4533 m.
07.01.2005	RIH with 8 1/2" RSS BHA from 4533 m to 5970 m. Hit restriction at 5970 m. Worked through restriction from 5970 m to 5972 m. RIH to 6144 m. Took weight. Reamed down to 6217 m. Experienced pack off problems, not able to establish stable flowrate above 500 lpm. POOH to 6112 m. Increased flowrate from 250 lpm to 750 lpm.
08.01.2005	Established circulation and rotation up to drilling parametres at 6112 m. Reamed slowly down from 6112 m to 6217 m. Experienced pack off and string stalled out. Worked pipe free and pulled back to 6199 m, experienced frequent pack offs.
09.01.2005	Establish circulation at 6194 m. Reamed down to 6221 m with 1800 lpm. Attempted to increase pumprate to 2100 lpm, hole packed of. Pulled back to 6202 m and circulated bottoms up. Lubricated out to 9 5/8" casing shoe. Slip & cut drill line. RIH to kick off depth of 5585 m.
10.01.2005	Sat Xceed tool and start time drilling at 5584 m to perform open hole sidetrack. Time drilled in interval from 5584 m to 5597 m. Kick off not verified.
11.01.2005	Timed drilled in order to perform opeh hole sidetrack from 5597 m to 5604.

5.5.5 Section overview 48 A T2

Interval	5608 m MD to 5878 m MD
Casing	7” liner
Section length	270 m
Inclination	Drop from 89° to 84°
Azimuth	Turn from 56° 34°
Mud	1,61 sg, Versavert OBM

Budget time for section: Planned: 7,0 days / Actual: 9,6 days / +2,6 days

This section was drilled with one run utilizing a PD Xceed BHA.

An open hole sidetrack was performed at 5608 m.

Plan new wellpath was planned to avoid the hard formations seen in the 48 A well.

Frequent stringers caused the turn to be slower than planned. At 5865 m hit a massive hard formation, reducing the ROP to less than 10 m/day.
Due to this low ROP, TD for the well was set at 5878 m MD.

Run and cemented the 7” liner without any problems reported.

5.5.6 DBR summary 48 A T2

WELLBORE ID: NO 34/10-48 AT2
INTERVAL: 8 1/2"
START TIME: 11.01.2005 12:00
END TIME: 21.01.2005 02:30

Report date	Description
12.01.2005	Drilled from 5608 m to 5632 m. Hard stringers.
13.01.2005	Drilled 8 1/2" hole with RSS from 5632 m to 5778 m.
14.01.2005	Drilled 8 1/2" hole with RSS from 5778 m to 5868 m.
15.01.2005	Drilled 8 1/2" hole with RSS from 5868 m to 5876 m.
16.01.2005	Drilled 8 1/2" hole with RSS from 5876 m to 5878 m. Circulated to clean hole and conditioned mud prior to POOH. POOH to 3431 m.
17.01.2005	POOH. LD BHA. Tested BOP.
18.01.2005	RIH with 7" liner to 878 m.
19.01.2005	RIH with 7" liner on DP from 878 m to 5580 m.
20.01.2005	RIH with liner and set same at 5877 m. Circulated to condition mud. Set hanger. Cemented liner. Set packer. Circulated out excess cement. POOH to 3600 m.
21.01.2005	POOH with running tool for liner. Pressure tested well to 275 bar. MU wash assy and RIH with 3 1/2" DP to 100 m.

5.6 Completion, DBR summary

INTERVAL: COMPL_LINER
START TIME: 21.01.2005 02:30
END TIME: 15.02.2005 06:00

Report date	Description
22.01.2005	RIH with wash assy from 100 m to 5072 m. Unable to get past 5072 m bit depth. Poslished possible restriction in top of liner between 5056 m to 5060 m.
23.01.2005	POOH with wash assy. Checked 7" liner wash assy. Changed to 6.024" drift sub. RIH with wash assy on 3 1/2" DP to 581 m.
24.01.2005	RIH with wash assy. Scraped prod packer and isolation packer setting areas. RIH to 5835 m. Started to condition mud.
25.01.2005	Conditioned mud. Displaced well to seawater. Pressure tested well to 345 bar. Inflow tested well. Washed pits, MPA and MP. Backloaded mud. Started to clean well.
26.01.2005	Cleaned well with soap pills and SW. Cleaned pits and surface equipment. Displaced well to 1,61 SG brine and kill pill. Pumped and pulled out of kill pill to 4100 m.
27.01.2005	Pumped/ pulled out of kill pill from 4100 m to 3897 m. Continued POOH with washstring. Racked 6 5/8" Dp & 5" Dp in derrick. LD 3 1/2" Dp on pipedeck while POOH. Rigged up and RIH with VIVSP log.
28.01.2005	Performed VIVSP logging from 5035m to 2695m with 15m spacing. POOH with logging tool. Performed check shots with 150m spacing while POOH up to 1085m. RD logging equipment. RIH with 8 std 6 5/8" DP to drain riser & POOH with same. Commenced ND BOP.
29.01.2005	Slipped and cut 33 m drill line while trouble shooting on BOP crane. ND 13 5/8" BOP. Pulled wear bushing. Installed 10 3/4" dummy hanger. Shut in production on nearby wells while pulling HP riser. Installed and tested seal assy for 10 3/4" dummy hanger in C-section. Prepared to install & installed TSR-ext on TSR. Laid down 6 5/8" DP.
30.01.2005	NU TSR & TSR-extention on WH. Installed HP riser and BOP. Performed connection test on BOP to 345bar. Prepared for handling of TCP guns.
31.01.2005	PU and RIH with 4 1/2" perforation guns to 1536m
01.02.2005	RIH with perforation guns to TD at 5835m . Pressure up the well to to 250 bar and perforated the well. POOH and LD 6 5/8" Dp.
02.02.2005	POOH with perforation guns while LD 6 5/8" Dp from 4450m to 1535m. POOH and LD perforation guns from 1535m to 1315m. Observed that all guns pulled had fired.
03.02.2005	Continued to POOH with 4 1/2" perforation guns. LD 5" Dp and 3 1/2" Dp while POOH. Retrieved lower and upper wear bushings. RU and prepared for running of DIACS completion. Spotted control line reels and rigged up sheaves.
04.02.2005	Installed Control line sheaves in derrick. Ran completions to 302m. Installed swedge and kelly cock. Secured well prior to running joints with control lines. Waiting on kill mud. Modified kill stand and performed well control exercises while waiting.
05.02.2005	Waited on kill mud. Continued to RIH with DIACS completions. RIH with assy 7 & 8. MU assy 9 single gauge carrier and QMP packer. Terminated and pressure tested control lines, and control lines feed through. Connected and pressure tested pressure gauge. RIH with 3 1/2" tbg to 514m. Performed well control exercise.
06.02.2005	Completed well control drill. Continued to RIH with 3 1/2" tubing. MU mechanical sliding sleeve assembly. RIH with 2 joints of 3 1/2" tubing. MU upper DIACS assembly. Connected and fed through control lines. Pressure tested same. RIH with 3 1/2" tubing from 586m to 671m. Installed 3 1/2" x 5 1/2" X-O. RIH with 5 1/2" tubing to 1302m.
07.02.2005	RIH with 5 1/2" tubing to 1416m. Installed XMP production packer. Pressure tested the completion string to 50 bar. RD control line reels from drillfloor. Retested the completion string to 30 bar. Stripped control lines through production packer. Reterminated control lines and pressure tested same to 690 bar. Continued to RIH with 7" tubing to 1953m. Electrical control line for gauges snatched off. Prepared to splice the control line.
08.02.2005	Repaired Eagle lower gripper head. RIH with 7" tbg from 1953 m to 2244 m. Stopped RIH due to heavy wind. Controle umbilical for Eagle catched by the wind, and in conflict with the service envelope for the arm. WOW.
09.02.2005	Continued waiting on weather. Held prejob meeting and charged batteries on gantry crane. Continued RIH with 7" tubing with control lines from 2244 m to 3836 m. Installed control lines clamp on each connection
10.02.2005	Ran 7" tubing with control lines from 3836 m to 5135 m. Installed DHSV. Ran 7" tubing with control lines to 5528 m.

Report date	Description
11.02.2005	RIH with 7" tubing and control lines to 5666 m. PU and MU tubing hangers. Land tubing/tubing hanger in wellhead. Displaced well to packer fluid.
12.02.2005	Displaced well to 1.10 sg packer fluid. Sat production packer. Not able to maintain 405 bar on tubing. Inflow tested DHSV. Tested annulus to 345 bar. Cycled DIACS valves and attempted to test tubing to 405 bar, neg. Waited on wireline.
13.02.2005	Waited on wireline. Observed well. RU for running wireline through rig. MU 7" XO plug. Tested lubricator to 345 bar.
14.02.2005	Sat 7" XO plug on wireline at 2000 m. Tested plug to 345 bar. Inflow tested DHSV. RD wireline equipment. Sat 7" XO plug on 3 1/2" DP at 50 m. Tested plug to 345 bar. RD completion equipment.
15.02.2005	Nipple down riser and BOP. Installed X-mas tree. Completed operations on 48-AT2 and continued on well 34/10-C-12.

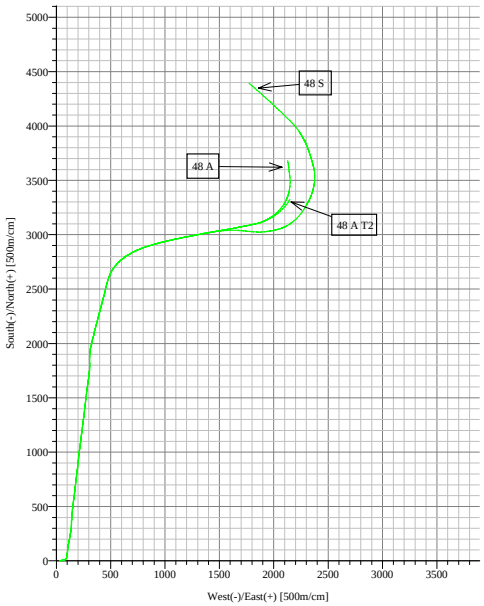
5.7 Wireline, DBR summary

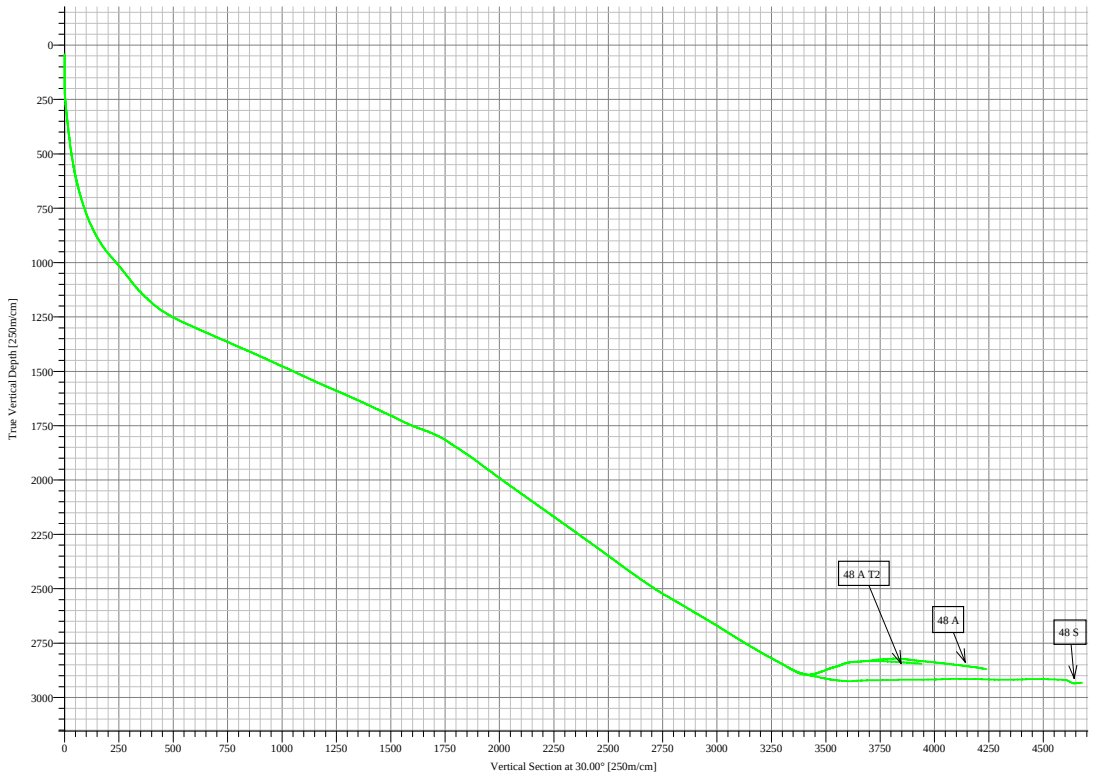
INTERVAL: WIREL
START TIME: 16.02.2005 06:00
END TIME: 22.02.2005 04:00

Report date	Description
17.02.2005	Waited on access to M17. Moved lubricator from M16 to M17. Lifted down WL equipment down to BOP deck (M17). Changed out WL skid. Changed out 5/16" cable with 7/32" cable drum.
18.02.2005	Spotted W/L equipment on BOP deck. Prepared for RU. Moved W/L crane in position. Performed pre job meeting.
19.02.2005	Waited for x-mas tree instrumentation to be completed. Decided to start operation on well C-41.
21.02.2005	Rearranged equipment on BOP deck. Assisted production with leak testing of flowline and instrumetation.
22.02.2005	RU 0,125" W/L equipment and pulled 7" PI XO plugs at 50 and 2000 m. RD and handed well to production.

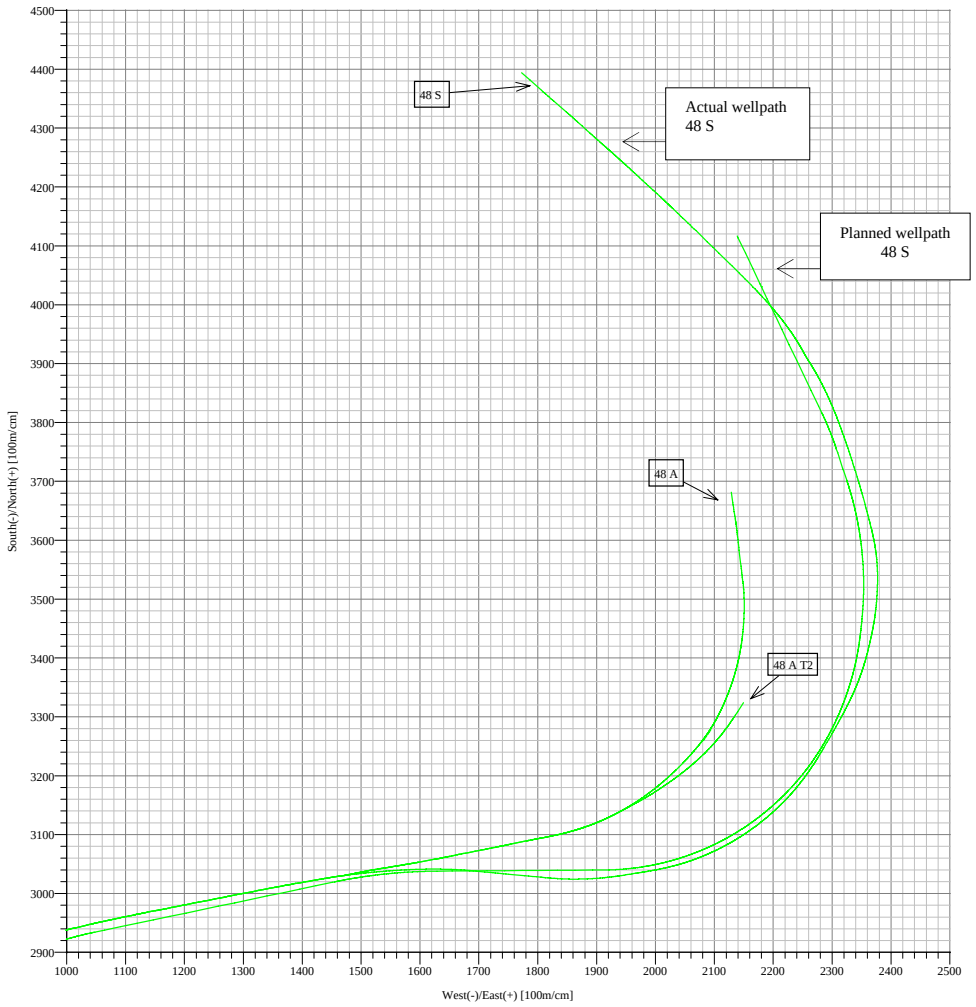
6 Appendix 1: Directional data

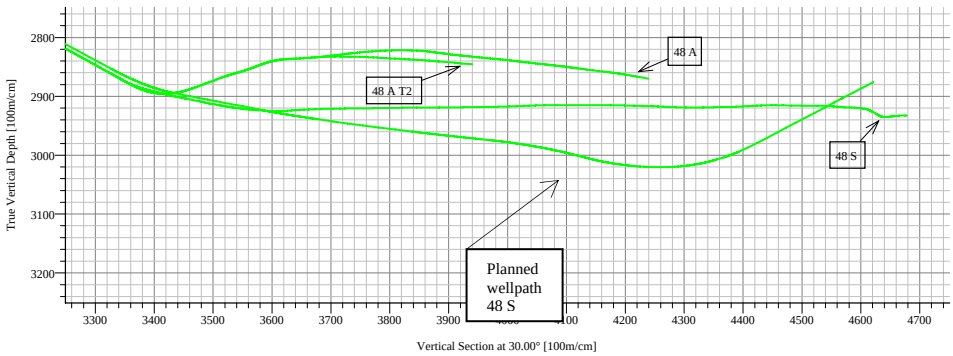
Field: GULLFAKS
Site: Gullfaks C
Well: 34/10-48 S
Wellpath: 34/10-48 A T2





Field: GULLFAKS
Site: Gullfaks C
Well: 34/10-48 S
Wellpath: 34/10-48 S Topas





Directional plot and survey listing

De ti neste sidene vil inneholde Directional Data. Legger disse inn når resten av rapporten er OK.

7 Appendix 2: Operational experience

Halliburton cementing

24" Section/ 20" Casing:

Støping av 20 " casing:

Ved støping av 20 " csg krever det en god planlegging i fra første stund.Vi skulle i dette tilfelle støpe 20 " csg og pumpe 130 m3 slurry.
Ved slike volum krever det enormt mye kjemikalier og dette tar veldig stor plass.Vi fikk god hjelp i fra Prosafe dekk til å rydde D 11 topp , slik at vi fikk plass til de kjemikaliene vi trengte. Var tidlig ute med å få pitter til miksevann. Vi brukte i dette tilfelle pitt # 28 C og # 28 B. Det ble pumpet kontinuerlig miksevann ifra 28 B til 28 C under jobben. Dette pga av plass mangel når vi fikk retur. Det ble også pumpet 30 SW i fra pitt # 44.
Selve jobben:
Vi mikset og pumpet slurry i henhold til program.Miksevann og sement forbruk stemte meget godt. Vi opplevde og få en plugg i den ene dysen. Dette førte til at vi måtte støpe med 100 % åpning på backup dyser. Da Lead slurry var ferdig pumpet , slo vi av mikseren og renset dysene. Startet deretter opp igjen og støpte tail slurryen uten problemer.
Da bunn pluggen bumpet , trykket vi opp csg til 50 bar over sirkulasjonstrykk ved bumping. Dvs 120 bar.

Ved henting av 20" RTTS/S.V. var wear bushing installert i well head, denne vart slått laus då RTTS vart trekt ut av brønnen, og fulgte med RTTS til overflata. Det viste seg at wear bushing hang igjen på drag block fjærer nederst på RTTS. Disse bygger i avslappa tilstand:19,3" og fullt kollapsa bygger dei 17,77" .
Erfaringa viser at vi **ikkje kan ha wear bushing innstallert i brønnen ved køyring og henting av 20" RTTS.**

17 1/2" Section/ 13 3/8" Casing:

Støping av 13 3/8" casing:

Planlagt TOC på 1650 m MD med slurry volum på 83,4 m3 @ 1,9 sg. Mixet mixvann i pit 28 C da 29 var for lite til 50 m3 mix vann. Startet å mixe da casing lander. Mixet spacer på 1.73 sg ca 8 timer før jobben. Tilsatte kjemikalier ret i pit (ikke via hopper) - ok. Brukte vel 2 timer på mixing. Hadde prejob møte og lilsatte HR 4 ret før jobben. Brukte 2 tugger til å installere cmt hode. Tror det var bedre å bruke elevator på selve hodet og en tug på manifolden da vi slet lidt med å få hodet på casingen. Hadde en lite og en stor dyse på mikseren og to små på bypassen. Kun åpen på miksedyserne og hadde kniven åpen ca 4 - 5 cm. Mikset og pumpet da med ca 950 lpm uten problemer. Kørte disp tanker ned til 200 ltr for ikke å miste suction på miksevanns pumpe. Cmt hode - ventiler, ret og flag fungerte planmessigt (sjekket på forhånd)
Hadde u- tubing effekt under jobben men gik ikke på tab. Bumped pluggen ved ca 208 m3 pumped = 97 % eff og testet casingen til 345 bar/ 10 min - ok.

Jobben gikk helt etter planen.

12 1/4" seksjonen

Injisering for smacc under boring:

Halliburton har injisert mykje av den produserte kaksslurry/slop som er produsert i denne seksjonen, tank 26 vert brukt som lagertank før slurry vert pumpa i C-04, 20"-13 3/8" ringrom. tank 26 vert også brukt som lagertank for all slop somvert produsert på riggen. Dette fører til at det vert ein særdeles ugunstig blanding av slurry og slop i tanken, og sjølvsagt vil mykje solids falle til botnen i lagertanken då viskositeten vil være for låg når slop/vaskevatn kjem inn i blandinga. Dette fører til problemer for både smacc pumpe og sementpumpe. Sand og solids feller ut i overføringslinjer til pumpene og også i sjølve pumpene. Vi har også sett plutselig økning i trykk som kan sjå ut som pluggtendens i brønnen. Dette har skjedd kun som "trykkpeaks" . Det kan være stor fare for plugging i brønnen når vi pumper slurry med for låg viskositet og høgt solidsinnhald.

Forslag til endring av praksis: Det må nyttast separate tanker for kaksslurry og slop, slik at vi kan kontrollere viskositet på slurry med solids. Evnt. tilføre Flowsan direkte i tank dersom slop/slurrytank er felles, men dette må då kontrollerast jamnleg, slik at vi har god kontroll på slurrykvaliteten.

8 1/2" seksjonen

Plugg sementering

Planlagt TOC på 5060 m MD med slurry volum på 18 m3 @ 2,0 sg. Mixet mixvann i pit 29 .12 m3 mixevann. Mixet spacer på 1.8 sg ca 10 timer før jobben. Tilsatte kjemikalier via via hopper - ok. Brukte vel 1 timer på mixing. Hadde prejob møte og lilsatte HR 4 ret før jobben. Hadde en lite og en stor dyse på mikseren og to små på bypassen.Etter at spacer var pumpet kjørte vi perigon tool. Kun åpen på miksedyserne og hadde kniven åpen ca 4 - 5 cm. Mikset og pumpet da med ca 950 lpm uten problemer. Kjørte disp tanker ned til 200 ltr for ikke å miste suction på miksevanns pumpe. Under jobben fikk vi en liten plugg i kniven.Grunnen til dette var nok at vi brukte SSA1 sement og at vi skulle ha 2.0 Sg(mye sement til lite mixevann).Ellers så gikk alt meget godt under jobben.

7 " liner

Dette var en 7 " liner jobb.Alt mixevann ble laget i pitt # 29 .Pit # 29 var vasket og flushet godt som vi altid gjør før en cmt.jobb.Kloridinholdet i vannet var på ca 350 ppm.mudvekten var kalibrert, og veltcellen til dagtanken var sjekket. Denne liner jobben var planlagt som Foamjobb ,men pga ekstremt dårlig vær ble det kjørt en konvensjonell cmt jobb. Høy sjø og fikk ikke utstyr fra GFB.
Når det skal være foam jobb er det mye planlegging i forkant.Dette pga nitrogen tanker, foamgenerator og utstyrskontainer må stå nede på skiddekk.nitrogentankene må settes i vannbad,mens defoaming manifold må opp på pipedekk. Denne manifolden må opp på pipedekk når vi er på TD og det er tomt med pipe på boredekk.ellers kommer vi ikke inn med denne.Siden det er to forskjellige slurrytyper når vi har foamjobb, er den veldig mye kjemikalier ute .Med en god planlegging går det bra.
Det ble en vanlig konvensjonell jobb som gikk meget godt.

MI Mud engineer

Prosafe rigcontractors until 12 ¼" section finnished

12 1/4" seksjonen

> BORING

Ikke uventet opplevde en mest problemer og nedtid knyttet til SMACCC-anleggget, måtte begrense ROP til max 35 m/t for å klare å ta hånd om kakset. Likevel sto problemene nærmest i kø:

For store mengder av leire i knuser - grunnet for mye underspyling med slurry og kaks -medførte overbelastning av rotor til knuser på SMACCC-anlegg. Dette resulterte i brudd av reimene som driver knuser. Måtte å rigge til med taljer for demontering av knuser for grundigere rengjøring.
Viktig at kommunikasjon mellom smaccc-operatører, MPA-operatører og borer / ass. borer mhp. borehastighet og tilførsel av kaks fra mpa til SMACCC er god.
På grunn av gummielementer i knusertank til SMACCC satte seg fast i agitator, resulterte dette i stopp av SMACCC-operasjon og tapt fremdrift i boreprosessen.
Oppsto lekkasje mellom pumpehus og knusertank på SMACCC-unit under boring. Dette medførte forsinkelse i boreoperasjon da borekaks måtte taes i bigbags.
Sirkulasjons pumpen til SMACCC-unit stoppet opp. Feilsøking viste at splaine i hub var utslitt og splaine på pumpe var skadet. Det var også utvasking i bunn av knusertank. Dette resulterte i 6 timer forsinkelse i boreoperasjon. Skiftet sirkulasjonspumpe på knusertank. Lappet sammen tankbunnen.
Begrensning av borerate er ikke heldig mtp. boring i myke formasjoner i Shetland, der det er ønskelig med stor ROP for minst mulig setting av PowerDrive.
Backupsystemet på SMACCC bestående av tobber med big bags er plassert på rømningsvei i mangel på annet egnet sted.
Støynivået ved SMACCC'ing er heller ikke blitt lavere i denne seksjonen, støymåling viste 99 dB på det meste.

Andre erfaringer:

I forbindelse med transfering av barytt, ble det sluppet ut ca. 0,6m^3 barytt i modul M15. Hendelsen er oppstått mest sannsynlig pga. lekk blindeventil. I forkant av hendelsen var det blitt demontert og levert verksted en ventil på transfersystemet med utvasking. I denne forbindelse var blindeventil blitt stengt for å hindre at barytt kom ut åpning ved demontert ventil. I etterkant av denne episoden har Produksjon stilt opp på sikkerhetsmøter for å informere om hvordan de bruker ventil- og blindingspakker ifm. jobbing på sine systemer.
Det ble funnet 2 stk avbrukkete bolter med mutter: Den ene ble funnet på boredekk like foran borehytte, den andre på grating ved inngang til boredekk. Boltdelene stammer fra klammer til standpipe. At den ene ble funnet ved inngang til boredekk indikerer at den har truffet bjelke o.l i fallet og forandret retning slik at den landet på utsiden av boretårn. De avbrukkete boltene stammer fra klammer som fester standpipe til konstruksjon. Klammer fester standpipe med fire bolter; to bolter på hver side av standpipe, hvor to av boltene også er festet til konstruksjon. Klammer kunne ikke falt ned med mindre det oppsto brudd av alle 4 boltene. Det befant seg ikke personell i

umiddelbar nærhet av området når avbrukkete boltdeler falt ned på og utenfor boredekk da ingen har observert fallet. Har sendt bilder til land av samtlige eksisterende klammer / support. Prosafe T&P jobber med et tilbud på utskifting av rørklammere.
Da stand skulle brekkes og settes tilbake , var det problemer med brekking i DDM. Årsaken til dette var at det ble backreamet ut av hullet etter at forrige seksjon var ferdig boret med KCl-slam. Røret har stått i tårn og ikke blitt rengjort og dopet etter backreamingen. Dette er unødvendig nedetid.

Geoservices

12 ¼" Section 2667mMD – 5105mMD

Experience report holecleaning

The section was drilled with 2 bits in 3 runs using a PowerDrive for directional purposes.
Average ROP for the section was 27m/hr and RPM stayed mainly between 170 to 180.
The flowrate varied from 3500 l/mn – 3600 l/mn and MW was 1.65sg.

The Cutting Flow Meters (CFM) generally showed a rather poor hole cleaning throughout the section, and particularly during the last 500m towards TD.

For the first run, from 2667m – 3759m, the CFM's indicated 17m3 of cuttings left in the hole at the most, but approx 3m3 were recovered while circulating 4xBU.
No real trends were established during the second run as only 66m were drilled.
For the final run from 3825m – 5105m holecleaning gradually got worse and at TD the readings from the CFM's showed that 43m3 was left in hole. Only 1m3 was recovered when circulating 5xBU.

No problems were experienced when pulling OOH, and focus was put on the results from the Cuttings Flow Meters.

One CFM was not operational, but this had very little effect as that shaker was only in use for a very short period, and it was also compensated for in the offline calculations. The other CFM's were working fine. Calibrations were checked again and no errors were found.
Discussions with MI mudingeneer resulted in the percentage of cuttings being dissolved in the mud was increased by 3%, and the amount of barite coming over the shakers was reduced. This "improved" the readings from 43m3 to 37m3 for the whole section, but still quite a lot left in hole.

The CFM's measure the weight of the cuttings, which is then converted to a volume (m3). For that the density of the formation and the density of the mixture of cuttings and mud coming over the shakers are used. Formation density was taken from Schlumberger real time logs, and should be fairly accurate. The density of the mixture coming over the shakers is measured by the mudlogger 4-5 times pr. shift and when changes in lithology is observed. Focus was put on these measurements as they seemed to vary more than expected. The following example should give some indication on the influence these density figures will have: By increasing the density with only 0.05sg for this section the holecleaning improved by 20m3. So these density measurements seems to be the main source of error.

The CFM coordinator onshore has also been informed and actions will be taken to make sure the measurements will be as accurate as possible.

Schlumberger MWD

Schlumberger DD

STATOIL

Directional drilling 48S 24” Section:

BHA#1 – 24” Observations:

Please read the reports below: "48S Kick-off steering and surveying report" and "48S Uncertainty regarding well position at 1153mMD". These reports explain the uncertainties regarding surveys and well position and also the actions taken to increase confidence of same so that drilling could be continued according to plan.
The BHA behaved as expected with slightly higher dogleg capacity than anticipated. Toolface control was no problem, the motor drilled nicely with 5 to 20 bars differential pressure depending on WOB.

48S Kick-off Steering / Surveying Report

Introduction:

In the 24” section kick-off of Well 34/10-48S, the accuracy of the survey data was questioned. The reason being as one saw less magnetic interference on the MWD magnetic azimuth surveys, the expected convergence of difference between the gyro azimuth and the MWD azimuth did not occur. Initially, this was thought to be due to the fact that one drilled somewhat along the path for the well 34/10-C6. However, after having passed under the well C6 and drilling away from it, differences of as much as 9° azimuth between the two survey instruments were still recorded.

Summary of events:

Drilled out of the conductor and new formation down to 480 meters in rotary mode. The first slide of 10m, 50° Left was carried out before rotating another 17 meters. This would normally be expected to yield a drop and then left turn-and-build from the casing shoe down to the survey point at 499m. However, the gyro showed the drop and the build, but no left turn (The “flagged” MWD survey at 509m showed the well to have turned left at this point).

With the bit at 562 meters, the next gyro survey at 527m showed a build and turn. However, a dogleg of 1.32 recorded was significantly less than what was expected from the 20 meters of steering 65° Left from 507m to 527m(the assembly should be capable of 3.5°/30meters in a medium formation).

Keeping in mind that the steering interval from 534m to 557m (23 meters of 80° Left) was already finished, by relying on the given survey one expected to be behind the plan and it was decided to steer a full stand to catch up to the plan. The next gyro at 555m showed the previously steered 23m interval to

yield a DLS of 1.68 only. Based on this information it was decided to steer full stands at lower flow rates to turn and build as much as possible.

The new plan seemed to work when the next survey (583m) gave a DLS of 2.66, and a third stand was steered 75° Left. At this point the bit was at 643 meters and a gyro survey at 609m showed the well having been turned 14° from 583m to 609m, yielding a DLS of 3.5°. This was above the accepted 3.0° from the drilling program and the well was attempted "reamed smooth" in an attempt to lower the DLS values. The next stand was then drilled 5m rotary mode and steering 25 meters, 45° Left. The gyro survey at 634,5 meters showed a DLS of 5.5° and the drilling was stopped.
From this point on, simultaneous operations were carried out:

The well was reamed through the "high-DLS" areas.
Check shots were taken with the gyro.
MWD interference was investigated with respect to confidence level of the azimuth measurements.
The result of these simultaneous actions, combined with the fact that for the last two survey stations indications were that the MWD showed acceptable and "trustworthy" numbers, the decision was made to drill ahead with surveys from the MWD.

COMPARISON TABLE:

DEPTH: (m)	GYRO, Seated: Azm.	Tool S/N:	GYRO Out 1: Azm.	Tool S/N:	GYRO Out 2: Azm.	Tool S/N:	MWD: Azm.	MWD Tool H
444.5	79.55	536						
471.5	77.42	536			82.72	536		
499.0	77.52	536	75.04	536	73.52	536		
509.0							64.26	1065.30
527.0	71.36	536			72.78	536		
536.0			66.12	949			60.07	1047.10
555.0	64.03	949			56.44	536		
564.0			56.08	949			53.47	1041.00
582.0	52.41	949	55.88	949	47.96	536		
592.0			43.6	949			40.79	1038.10
609.0	38.55, 37.73	949	37.57	536	30.45, 29.81,	536		
618.0							29.28	1027.70
634.5	18.55	949						
634.5	18.48	536						
634.5	18.89	536						

Note: Azimuth in RED numbers suggested used in official survey file.
MWD Tool H values – maximum optimum range value: 1014.0 (+ 6.7)

Tool S/N and depth/azimuth data supplied by Gyro/Data. All data informed to be within Gyro/Data survey specifications.

Conclusions:

In summary, it is important to note that the location of the well 34/10-48S at depth 634.5m is UNCERTAIN. Thus, the location and well path for the entire section is not accurate. It is therefore strongly recommended the well being re-surveyed before drilling the 17 ½" section.

Also, by recognizing this as a problem, for future reference and drilling / surveying procedures, a thorough investigation should be carried out to find a solution / survey procedure which eliminates possible azimuth errors in these critical sections with anti-collision issues, tight clearances, and possible unsafe situations occurring.

48S Uncertainty regarding well position at 1153mMD

Introduction:

Drilling was stopped at 1153mMD due to uncertainties regarding the position of the wellbore and the clearance to well C-34. This was a result of several different co-incidental things happening at the same time.

- In the 24" section kick-off of Well 34/10-48S, the accuracy of the survey data was questioned.
- The PDM stalled, high shocks readings, increased and erratic surface torque, overpull and tight hole occurred, and a negative drilling break was seen at approx 1132mMD. This depth was calculated to be lowest clearance to well C-34.
- A negative drilling break, increased an erratic surface torque was seen at 1153mMD. This point was projected to be the crossing point between C-34 and 48 S.

Summary of events:

Drilled ahead according to plan. Decision had been made to stay slightly left and low of plan to increase separation to C-34 (Survey uncertainties kept in mind). Drilled to 1132mMD with 30m/hr average ROP, saw a sudden reduction to 1m/hr ROP. Rotation was stopped due to motor stallings and decision to slide 90° Left past this point was made. Slided 90° Left approximately 1m and ROP picked up. Started rotation and reamed area, continued rotary drilling to 1153m with an average of 30m/hr ROP. Experienced a new negative drilling break.

At this point with regards to all the survey/Gyro uncertainties and the two negative drilling breaks exactly at the two calculated/ projected closest points to the nearby well C-34, the change in drilling parameters, and evaluated anti collision data, the decision to pick off bottom was made. Picked of bottom and circulated while evaluating the situation with extra DD, drilling supervisors and town.

Several solutions and contingencies was discussed and the decision to make a new gyro multi-shot check-run was made. The result from this run was first rejected due to obvious errors in the data

supplied (Sliding left gave right turns etc), raw-data reprocessed and accepted due to high similarity with MWD surveys.

Situation re-evaluated and well-position uncertainties considered to be within acceptance and drilling continued in sliding mode with no reaming until the uppermost part of the BHA had passed 1153mMD.

Conclusions:

In summary, it is important to note that the location of the well 34/10-48S was and is UNCERTAIN with regards to clearance to the nearby wells for the entire section down to 1287,5mMD.

Comment: After this report the section was resurveyed first at 1153 m and then the wellpath was confirmed when ran Gyro surveying befor drilling 8 ½" section.

Directional drilling 48S 17 1/2" Section:

BHA#2 – 17 ½" Observations:

This BHA included a Baker 12 3/4" Extreme Series NaviDrill. This 'Metal' stator motor has 845 hp. And 37k ftlbs of torque and can be rotated with 180rpm.
Drilling out was completed in 1.5hrs @ 20m/hr at 80 rpm.
This assembly gave between 3 - 4deg DL. A DL severity rate of 3deg/30m was easily achieved and sliding ROP did not fall much below rotary ROP. (About 10% less only) Stringers did not interfere with ROP greatly and only a slight increase in motor pressure was noted whilst penetrating. In Rotary mode this assembly was very well balanced and gave very good drilling performance showing good directional stability.
An almost perfect assembly for this application.

This BHA was rotated at 180 RPM whilst drilling, also when back-reaming for 100hrs whilst tripping.

Total 'on bottom' bit revolutions @ TD = 694krev. Completed this 17 1/2" section in one run.

Directional drilling 48S 12 1/4" Section:

BHA#3 – 12 ¼" Observations:

Drilled cement plugs, Reamer shoe and 3m new formation. Performed LOT. The first survey showed 2° azimuth jump from 7 to 9 degrees (planned azimuth 5). Steered left and up to line up against line at 5 degrees azimuth. Lined up at start of tangent left and high on line. From 3014mMD the formation was soft, drilled with no WOB and ROP of 30 m/hr. To maintain 3 degrees dogleg we had to chase it up to 65m/hr then stop and circulate cuttings out. ROP was held back thru gout the section to everything between 20 and 40 m/hr. Due to the SMACCC unit's capacity.
It was not possible to pump the planned flow at 3600 litres due to 3rd pump had to be lined up to shear mud in pit. (Only a few short intervals of 3600 L/M)
At the end of tangent there was no response from PowerDrive in 100 % setting.

Pulled out of hole without problems after circulating 5 bottoms up 3500 L/M at 175 RPM. (Powerdrive-gunbarrel)
Bit was decided not to be rerun because 19mm cutters was blamed for bigger size cuttings to be handled in SMACCC unit, same bit with 13mm cutters was chopper carried to rig.
At surface mud was flowing from all 3 pads simultaneous when pumping 2300 - 3000 L/M.

BHA#4 – 12 ¼" Observations:

Surface test was carried out before RIH. When reaching bottom, the PD was set to 60° Tool Face, 80% force, the setting was confirmed, and drilling started. To avoid high dogleg in the initial setting, the performance of the assembly was closely monitored. Check survey (D&I package) at 14m into new hole showed no dogleg. Stand was drilled down; resurvey and no response were confirmed. The PowerDrive was then re-set to neutral before programming it to 71°/100%. In both cases, a confirmation was received from the tool that the programming was good. Nevertheless, one was not able to detect any right turn after drilled another 21m and drilling was stopped at 3825m to POOH and change out the PowerDrive. At surface, one found mud coming out from all three pads when pumping through the tool. Before drilling the last 21m Statoil confirmed that they accepted the change in trajectory if negative result. However when attempt to POOH driller was not abele to break connection on top drive, it was decided to drill the stand down (5m) to break the connection.

Bit with 13mm cutters, too short section to judge performance of bit or SMACC behaviour.

BHA#5 – 12 ¼" Observations:

Extended surface test was carried out before RIH,. This included setting tool from neutral into drilling mode of 60° / 80% before tripping in hole. Confirmation of both 81and 139 was received the on toolface display. Initially, the 80% setting yielded approximately. 3.4° DLS and the assembly behaved as expected. Later, throughout the run, the dog leg capabilities of the BHA gradually decreased until, at 5106 meters bit depth, one had to terminate the run in order to be able to hit the target T1 at approximately. 5250 meters.

The BHA was pulled due to down-hole tool failure - behaviour observed from the two previously failed tools was recognized. These were confirmed at surface where mud was flowing continuously from two of the three pads; the third pad was in working condition. Also, two pads were totally worn out while one was partially worn out. This explained the gradual decrease of dogleg capability observed.

Directional drilling 48S 8½" Section:

experience report written offshore

8 Appendix 3: Figures and tables

8.1 Wellbore Schematic

Well: 34/10-48 A T2
Field: Gullfaks
Rig: Gullfaks C

WELL SCHEMATIC

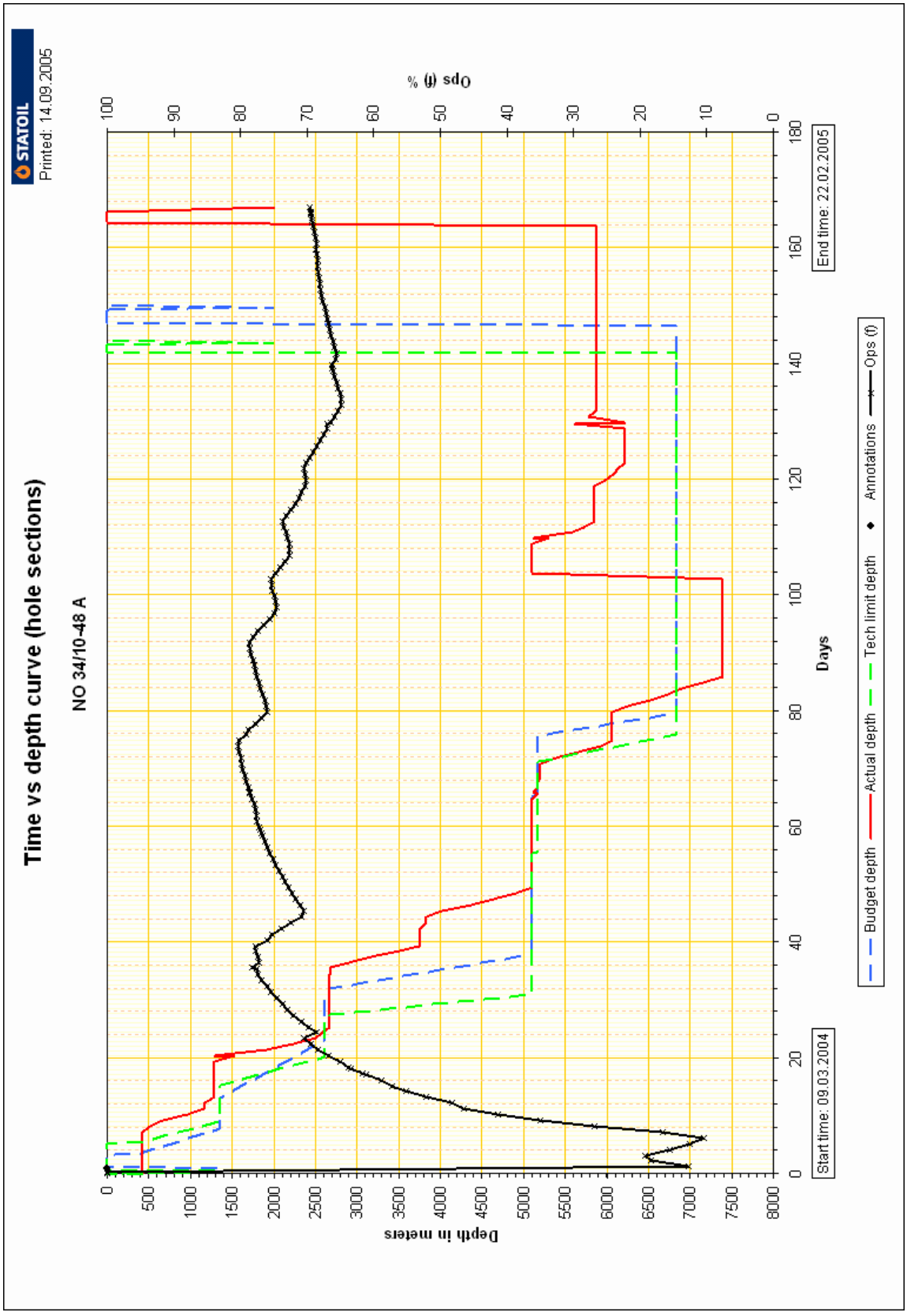
HOLE SIZE ["]	HOLE TVD MD [m]	CASING SIZE ["]	CASING TYPE / PUPS & RAD. MARKERS	CASING CENTRALIZERS / SHOE TRACK	CASING TEST PRESS [BAR]	LOT FIT [SG]	TOC / TOL MD	TOC / TOL TVD	CSG. SHOE TVD	CSG. SHOE MD	WL LOGS	LWD LOGS	SURV CSG/ OH
SB	216,9												
36"	443,5	32"	Preinstalled							424			
24"	1150 1355	20"	20" csg 133 lb/ft, N-80 ANTARES ER		185 bar m/1.20 sg slam	FIT 1.3			1150	1355		GR RES	Gyro as backup
17 1/2"	1710 2667	13 3/8"	13 3/8" csg, 72 lb/ft, Q-125, VAM TOP 13 3/8" csg, 72 lb/ft, SM140, New Vam		345 bar med 1.5 or 1.6 sg mud	FIT 1.65	1650 2510	1281 1846	1708	2607		GR RES PWD	
12 1/4"	2856 5104,5	9 5/8" Liner	9 5/8" liner, 53.50 lb/ft, P-110, VAM TOP SM140/New Vam		345 bar m/ 1.65 sg slam	FIT 1.78	3277 5040	2050 2872	2885	5097	See Chapter 5.6 in drilling program	GR RES DEN NEU PWD	
8 1/2"	2876 5878	7" Liner	7" liner, 29.00 lb/ft, CrS 13-110, VAM TOP		275 bar m/ 1.61 sg slam	FIT 1.85	-	-	5877		See Chapter 5.6 in drilling program	GR RES DEN NEU PWD	Run Gyro inside DP befor drill out of 9 5/8" shoe

RKB

7" Liner

Comments:

8.2 Time/depth curve



8.3 Project planner

PROJECT NAME: TOPAS 48 S
PROJECT NUMBER: T.O050C.DH.C0460

Start time	End time	Budget time hrs	Acc budget days	Tech limit hrs	Acc tech days	Plan time hrs	Act time hrs	Acc actual days	Description	Companies
09.03.2004 02:30	27.03.2004 06:00	296	12,3	359	15,0	345,0	488,0	20,3	24" [NO 34/10-48 S]	
09.03.2004 02:30	09.03.2004 03:00	1	0	1	0	1	0,50	0	1 Start operations	MI,Prosafe,Smed,Schlum
09.03.2004 02:59	09.03.2004 03:00	10	0,50	8	0,40	0,01	0	0	24 ND 30" diverter.	MI,Prosafe,Smed,Schlum
09.03.2004 02:59	09.03.2004 03:00	6	0,70	5	0,60	0,01	0	0	25 Install B-section.	MI,Prosafe,Smed,Schlum
09.03.2004 02:59	09.03.2004 03:00	5	0,90	2	0,70	2	0	0	Just testing	MI,Smed,Schlum
09.03.2004 03:00	09.03.2004 04:00	6	1,20	1	0,70	4	1	0,10	2 Skid rig	MI,Prosafe,Smed,Schlum
09.03.2004 04:00	09.03.2004 06:00	0	1,20	0	0,70	4	2	0,10	3 Verify wash pipe alignment (adjust if out of center)	MI,Prosafe,Smed,Schlum
09.03.2004 06:00	12.03.2004 07:00	14	1,80	2	0,80	11	73	3,20	4 NU 30 1/2" diverter and BOP stack	MI,Prosafe,Smed,Schlum
12.03.2004 07:00	15.03.2004 06:00	0	1,80	80	4,10	80	71	6,10	5 ND on slot 28 and NU on slot 29.	MI,Prosafe,Smed,Schlum
15.03.2004 06:00	16.03.2004 08:00	15	2,40	8	4,50	12	26	7,20	6 Test BOP, diverter system, chokes, i-BOP's and kelly cock	MI,Prosafe,Smed,Hall,Schlum
16.03.2004 08:00	16.03.2004 13:00	12	2,90	10	4,90	10	5	7,40	7 PU & MU 24" BHA	MI,Prosafe,Smed,Schlum,Schlum,Schlum
16.03.2004 13:00	16.03.2004 16:30	5	3,10	5	5,10	4	3,50	7,60	8 Perform prejob meeting, Displace hole to seawater. Displace hole to 1,03 sg mud	MI,Prosafe,Smed,Schlum
16.03.2004 16:30	16.03.2004 17:30	5	3,30	4	5,30	4	1	7,60	9 Test 32" conductor to 25 bar	MI,Prosafe,Smed,Schlum
16.03.2004 17:30	16.03.2004 20:30	6	3,50	4	5,40	5	3	7,80	10 Drill out / Drill 3 m new formation	MI,Prosafe,Smed,Schlum
16.03.2004 20:30	16.03.2004 21:30	3	3,70	2	5,50	2	1	7,80	11 Circ hole clean	MI,Prosafe,Smed,Schlum
16.03.2004 21:30	16.03.2004 22:30	2	3,70	1	5,50	1	1	7,80	12 Perform FIT to 1.30 sg	MI,Prosafe,Smed,Schlum
16.03.2004 22:30	21.03.2004 13:00	96	7,70	80	8,90	80	110,50	12,40	13 Drill 24" hole to 1355 m	MI,Smed,Schlum,Schlum,Schlum
21.03.2004 13:00	22.03.2004 01:00	15	8,40	12	9,40	12	12	12,90	14 Circulate clean, POOH to conductor shoe. Pump through shallow gas zone.	MI,Prosafe,Smed,Schlum,Schlum,Schlum
22.03.2004 01:00	22.03.2004 09:00	10	8,80	8	9,70	8	8	13,30	15 Circulate hole clean at conductor shoe, flowcheck. Rack back BHA	MI,Prosafe,Smed,Schlum,Schlum,Schlum
22.03.2004 09:00	22.03.2004 16:00	4	9	4	9,90	3	7	13,60	16 Retrieve wear bushing, wash riser, BOP and WH area	MI,Prosafe,Smed,Schlum
22.03.2004 16:00	23.03.2004 02:00	6	9,20	5	10,10	5	10	14	17 R/U casing equipment	MI,Prosafe,Smed,Schlum

Start time	End time	Budget time hrs	Acc budget days	Tech limit hrs	Acc tech days	Plan time hrs	Act time hrs	Acc actual days	Description	Companies
23.03.2004 02:00	24.03.2004 08:30	26	10,30	30	11,30	22	30,50	15,30	18 Run 20" casing	MI,Prosafe,Smed,Schlum
24.03.2004 08:30	25.03.2004 01:00	8	10,60	15	12	6	16,50	15,90	19 Circ. Cement 20" casing. Test plug and casing to 120 bar.	MI,Prosafe,Smed,Hall,Schlum
25.03.2004 01:00	25.03.2004 18:30	10	11	12	12,50	12	17,50	16,70	20 Pull landing string. R/D csg eq., wash WH, Install seal assy.	MI,Prosafe,Smed,Schlum
25.03.2004 18:30	26.03.2004 04:00	0	11	13	13	13	9,50	17,10	21 A RIH with 6 of 8" DC (BO & LD jar), 9 joints of 6 5/8" HWDP and 20" RTTS to 100m. Install and test RTTS to 69 bar. POOH. Meanwhile:Clean surface system, MPA, lines, tanks and TT.	MI,Prosafe,Smed,Schlum
26.03.2004 04:00	26.03.2004 09:30	0	11	4	13,20	4	5,50	17,30	22 B Prepare to skid rig, PU LPR.	MI,Prosafe,Smed,Schlum
26.03.2004 09:30	27.03.2004 06:00	0	11	6	13,40	6	20,50	18,10	23 C LD LPR. PU 13 3/8" LPR. Skid rig to mid position. Move choke and kill lines. Skid rig to slot 15.	MI,Prosafe,Smed,Schlum
19.04.2004 05:30	21.04.2004 10:00	296	12,3	359	15,0	345,0	488,0	20,3	24" [NO 34/10-48 S]	
19.04.2004 05:30	19.04.2004 08:00	0	11	3	13,50	3	2,50	18,30	26 Skid rig from mid postion to slot #29 (48S).	Prosafe,Smed
19.04.2004 08:00	20.04.2004 04:30	10	11,50	10	14	8	20,50	19,10	27 NU 20 3/4" BOP and riser. Install wear bushing. Test csg	Prosafe,Smed,Hall
20.04.2004 04:30	20.04.2004 16:30	0	11,50	6	14,20	6	12	19,60	28 MU BHA, RIH and pull RTTS, LD same.	Prosafe,Smed,Hall
20.04.2004 16:30	21.04.2004 01:00	8	11,80	6	14,50	6	8,50	20	29 MU 17 1/2" BHA. Test csg.	MI,Prosafe,Smed,Hall,Schlum,Schlum
21.04.2004 01:00	21.04.2004 06:00	6	12	6	14,70	5	5	20,20	30 RIH	MI,Prosafe,Smed,Schlum
21.04.2004 06:00	21.04.2004 09:00	6	12,30	5	14,90	5	3	20,30	31 Drill out plug, csg shoe and 3 m new formation. Circ hole clean.	MI,Prosafe,Smed,Schlum,Schlum
21.04.2004 09:00	21.04.2004 10:00	1	12,30	1	15	1	1	20,30	32 Perform FIT to 1.65 sg	MI,Prosafe,Smed,Hall,Schlum
21.04.2004 10:00	06.05.2004 20:30	456	19	296	12,3	398	364,5	15,2	17 1/2" [NO 34/10-48 S]	
21.04.2004 10:00	21.04.2004 13:00	8	12,70	1	15	7	3	20,50	33 Displ. to 1.30 sg mud	MI,Prosafe,Smed,Schlum,Schlum,Schlum
21.04.2004 13:00	21.04.2004 15:00	6	12,90	5	15,20	5	2	20,50	34 RIH	MI,Prosafe,Smed,Schlum,Schlum,Schlum
21.04.2004 15:00	26.04.2004 12:30	240	22,90	120	20,20	200	117,50	25,40	35 Drill from 1355 m to 2610 m	MI,Prosafe,Smed,Schlum,Schlum,Schlum
26.04.2004 12:30	27.04.2004 00:00	34	24,30	10	20,60	28	11,50	25,90	36 Circ hole clean	Prosafe,Smed,Schlum,Schlum,Schlum
27.04.2004 06:00	29.04.2004 04:30	12	24,80	12	21,10	10	46,50	27,90	37 POOH	Prosafe,Smed,Schlum,Schlum,Schlum
29.04.2004 04:30	29.04.2004 08:30	6	25,10	5	21,30	5	4	28	38 Retrieve wear bushing, wash riser, BOP and WH area.	Prosafe,Smed,Schlum,Schlum,Schlum
29.04.2004 08:30	01.05.2004 07:30	50	27,20	40	23	40	47	30	39 R/U and run 13 3/8" csg.	Prosafe,Smed,Schlum,Schlum,Schlum

Start time	End time	Budget time hrs	Acc budget days	Tech limit hrs	Acc tech days	Plan time hrs	Act time hrs	Acc actual days	Description	Companies
01.05.2004 07:30	01.05.2004 21:30	20	28	15	23,60	15	14	30,60	40 Circ. Cement 13 3/8" csg.	Prosafe,Smed,Schlum,Schlum, Schlum
01.05.2004 21:30	02.05.2004 00:00	18	28,70	8	24	12	2,50	30,70	41 Pull and LD landing string	Prosafe,Smed,Schlum,Schlum, Schlum
02.05.2004 00:00	02.05.2004 12:00	12	29,20	8	24,30	8	12	31,20	42 Wash WH and install seal assy.	Prosafe,Smed,Schlum,Schlum, Schlum
02.05.2004 12:00	03.05.2004 04:00	12	29,70	9	24,70	9	16	31,80	43 ND BOP. Install C-section	Prosafe,Smed,Schlum,Schlum, Schlum
03.05.2004 04:00	03.05.2004 15:30	12	30,20	10	25,10	6	11,50	32,30	44 N/U riser and 13 5/8" BOP. Test BOP.	Prosafe,Smed,Schlum,Schlum, Schlum
03.05.2004 15:30	05.05.2004 04:30	0	30,20	16	25,80	32	37	33,90	45 Derrick inspection. Falling objects.	Prosafe,Smed,Schlum,Schlum, Schlum
05.05.2004 04:30	05.05.2004 17:30	5	30,50	12	26,30	5	13	34,40	46 MU 12 1/4" Powerdrive assy.	Prosafe,Smed,Schlum,Schlum, Schlum
05.05.2004 17:30	06.05.2004 12:00	11	30,90	17	27	8	18,50	35,20	47 PU and RIH with 5 1/2" DP.	Prosafe,Smed,Schlum,Schlum, Schlum
06.05.2004 12:00	06.05.2004 20:30	10	31,30	8	27,30	8	8,50	35,50	48 Drill out cement and approx 3 m new formation. Perf. FIT to 1.78 sg	Prosafe,Smed,Schlum,Schlum, Schlum
06.05.2004 20:30	30.05.2004 17:30	810	33,8	672,3	28,0	735	731,0	30,5	12 1/4" [NO 34/10-48 S]	
06.05.2004 20:30	07.05.2004 01:30	12	31,80	2	27,40	8	5	35,70	49 Displace to 1.65 sg Versavert OBM	MI,Prosafe,Smed,Hall,Schlum, Schlum,Gyrodata,Weath,Schlu m,Prosafe,Schlum
07.05.2004 01:30	11.05.2004 08:00	143	37,80	83	30,80	123	102,5 0	40	50 Drill 12 1/4" section	MI,Prosafe,Smed,Hall,Schlum, Schlum,Gyrodata,Weath,Schlu m,Prosafe,Schlum
11.05.2004 08:00	12.05.2004 14:00	0	37,80	30	32,10	30	30	41,30	51 POOH with defect Powerdrive.	MI,Prosafe,Smed,Hall,Schlum, Schlum,Gyrodata,Weath,Schlu m,Prosafe,Schlum
12.05.2004 14:00	13.05.2004 02:30	6	38	6	32,30	6	12,50	41,80	52 BOP test	MI,Prosafe,Smed,Hall,Schlum, Schlum,Gyrodata,Weath,Schlu m,Prosafe,Schlum
13.05.2004 02:30	14.05.2004 15:30	0	38	30	33,60	30	37	43,30	53 RIH with new BHA. (Changed Powerdrive and Bit). Condition mud.	MI,Prosafe,Smed,Hall,Schlum, Schlum,Gyrodata,Weath,Schlu m,Prosafe,Schlum

Start time	End time	Budget time hrs	Acc budget days	Tech limit hrs	Acc tech days	Plan time hrs	Act time hrs	Acc actual days	Description	Companies
14.05.2004 15:30	15.05.2004 18:00	0	38	30	34,80	30	26,50	44,40	54 Drilled to 3825 m. No steering response. Cond, mud. POOH.	MI,Prosafe,Smed,Hall,Schlum, Schlum,Gyrodata,Weath,Schlu m,Prosafe,Schlum
15.05.2004 18:00	16.05.2004 16:30	0	38	30	36,10	30	22,50	45,40	55 MU new Powerdrive. RIH to 3825 m. Cond. mud.	MI,Prosafe,Smed,Hall,Schlum, Schlum,Gyrodata,Weath,Schlu m,Prosafe,Schlum
16.05.2004 16:30	22.05.2004 06:00	191	46	111	40,70	168	133,5 0	50,90	56 Drill 12 1/4" section to 5105 m. Circulate well clean. POOH.	MI,Prosafe,Smed,Hall,Schlum, Schlum,Gyrodata,Weath,Schlu m,Prosafe,Schlum
22.05.2004 06:00	27.05.2004 00:00	96	50	80	44	96	114	55,70	57 TLC logging	MI,Prosafe,Smed,Hall,Schlum, Schlum,Gyrodata,Weath,Schlu m,Prosafe,Schlum
27.05.2004 00:00	27.05.2004 03:30	3	50,10	3	44,20	3	3,50	55,80	58 R/U 9 5/8" liner.	MI,Prosafe,Smed,Hall,Schlum, Schlum,Gyrodata,Weath,Schlu m,Prosafe,Schlum
27.05.2004 03:30	28.05.2004 08:30	35	51,60	25	45,20	25	29	57	59 Run 9 5/8" liner to 2600 m.	MI,Prosafe,Smed,Hall,Schlum, Schlum,Gyrodata,Weath,Schlu m,Prosafe,Schlum
28.05.2004 08:30	29.05.2004 09:00	72	54,60	52	47,40	20	24,50	58	60 Cont run 9 5/8" liner on DP to 5105 m.	MI,Prosafe,Smed,Hall,Schlum, Schlum,Gyrodata,Weath,Schlu m,Prosafe,Schlum
29.05.2004 09:00	29.05.2004 18:00	80	57,90	10	47,80	15	9	58,40	61 Circulate, set hanger, cement liner and set packer.	MI,Prosafe,Smed,Hall,Schlum, Schlum,Gyrodata,Weath,Schlu m,Prosafe,Schlum
29.05.2004 18:00	29.05.2004 22:00	40	59,60	30	49	12	4	58,60	62 Circ. clean min 3 x BU.	MI,Prosafe,Smed,Hall,Schlum, Schlum,Gyrodata,Weath,Schlu m,Prosafe,Schlum
29.05.2004 21:59	29.05.2004 22:00	0	59,60	20	49,90	12	0	58,60	63 RIH. Set RTTS in 13 3/8" casing at 500 m. Pressure test to 345 bar.	MI,Prosafe,Smed,Hall,Schlum, Schlum,Gyrodata,Weath,Schlu m,Prosafe,Schlum
29.05.2004 21:59	29.05.2004 22:00	0	59,60	2	50	10	0	58,60	64 RIH and displace well to SW. POOH and LD DP.	MI,Prosafe,Smed,Hall,Schlum, Schlum,Gyrodata,Weath,Schlu m,Prosafe,Schlum
29.05.2004 22:00	30.05.2004 17:30	40	61,20	18	50,70	24	19,50	59,40	65 Flowcheck, L/D cement head and POOH with running string.	Prosafe,Smed

Start time	End time	Budget time hrs	Acc budget days	Tech limit hrs	Acc tech days	Plan time hrs	Act time hrs	Acc actual days	Description	Companies
02.11.2004 06:00	08.11.2004 20:00	810	33,8	672,3	28,0	735	731,0	30,5	12 1/4" [NO 34/10-48 S]	
02.11.2004 06:00	02.11.2004 12:30	4	61,40	30	52	4	6,50	59,70	66 Skid rig from slot 15 to slot 29	MI,Smed,Hall,Schlum,Schlum,Gyrodata,Weath,Schlum,Schlum
02.11.2004 12:30	03.11.2004 13:00	10	61,80	8,50	52,30	9	24,50	60,70	67 NU 13 5/8" BOP, Riser	MI,Smed,Hall,Schlum,Schlum,Gyrodata,Weath,Schlum,Prosafe,Schlum
03.11.2004 13:00	03.11.2004 19:00	7	62,10	5,50	52,50	6	6	60,90	68 Test BOP	Smed
03.11.2004 19:00	04.11.2004 05:00	6	62,40	6	52,80	6	10	61,40	69 Prepare startup. Set WB. RIH and retrieve RTTS	Smed
04.11.2004 05:00	04.11.2004 10:30	2	62,50	1	52,80	4	5,50	61,60	70 POOH with RTTS	Smed
04.11.2004 10:30	04.11.2004 15:30	1	62,50	6	53,10	6	5	61,80	71 Prepare for 8 1/2" section. Move 5" DP in derrick.	Smed
04.11.2004 15:30	05.11.2004 09:30	4	62,70	2,80	53,20	5	18	62,50	72 PU 6 5/8" DP (66 jnts). Problems to change spade in PRS.	Smed
05.11.2004 09:30	05.11.2004 14:30	4	62,80	3	53,30	2	5	62,80	73 POOH and rack in derrick	Smed
05.11.2004 14:30	05.11.2004 20:30	6	63,10	4	53,50	4	6	63	74 MU 8 1/2" BHA	Smed
05.11.2004 20:30	06.11.2004 12:00	8	63,40	5,50	53,70	7	15,50	63,60	75 RIH with 8 1/2" BHA on 5" DP stands to 3250 m.	Smed
06.11.2004 12:00	06.11.2004 12:30	1	63,50	1	53,80	1	0,50	63,70	76 Change elevator, slips and prs	Smed
06.11.2004 12:30	07.11.2004 12:30	12	64	10,50	54,20	12	24	64,70	77 PU 6 5/8" DP (126 jnts) while RIH. Had to wash down due to settled barite.	Smed
07.11.2004 12:30	07.11.2004 14:30	4	64,10	3	54,30	3	2	64,80	78 Rig up to run Gyro inside DP	Smed
07.11.2004 14:30	07.11.2004 21:00	6	64,40	4	54,50	4	6,50	65	79 Run gyro to 5000 m, with survey station every 10 m	MI,Smed,Hall,Schlum,Schlum,Gyrodata,Weath,Schlum,Prosafe,Schlum
07.11.2004 21:00	08.11.2004 00:00	4	64,50	3	54,60	3	3	65,10	80 POOH with gyro equipment	MI,Smed,Hall,Schlum,Schlum,Gyrodata,Weath,Schlum,Prosafe,Schlum
08.11.2004 00:00	08.11.2004 02:00	2	64,60	2	54,70	2	2	65,20	81 RD Gyro equipment	Smed
08.11.2004 02:00	08.11.2004 05:30	0	64,60	1,50	54,80	2	3,50	65,40	82 POOH with 28 stand 6 5/8" DP.	Smed
08.11.2004 05:30	08.11.2004 11:30	0	64,60	4	54,90	4	6	65,60	83 RIH while PU 56 singles 6 5/8" DP.	Smed
08.11.2004 11:30	08.11.2004 19:00	6	64,90	5	55,10	5	7,50	65,90	84 Treat mud, drill out shoe and ratholeand 3 m new formation	MI,Smed,Hall,Schlum,Schlum,Gyrodata,Weath,Schlum,Prosafe,Schlum
08.11.2004 19:00	08.11.2004 20:00	1	64,90	1	55,20	1	1	66	85 Perform FIT to 1.85 sg	Smed,Schlum
08.11.2004 19:59	08.11.2004 20:00	4	65,10	3	55,30	3	0	66	86 Displace to 1,60 sg mud	Smed
08.11.2004 20:00	22.12.2004 16:00	836	34,8	1149,9	47,9	1049,0	1052,0	43,8	8 1/2" [NO 34/10-48 S]	

Start time	End time	Budget time hrs	Acc budget days	Tech limit hrs	Acc tech days	Plan time hrs	Act time hrs	Acc actual days	Description	Companies
08.11.2004 20:00	09.11.2004 08:00	12	65,60	5	55,50	10	12	66,50	87 Drill 8 1/2" hole to top Brent at app. 5170 m.Circulate clean	MI,Smed,Schlum,Schlum,Schlum
09.11.2004 08:00	10.11.2004 02:00	16	66,30	10	55,90	12	18	67,20	88 POOH	MI,Smed
10.11.2004 02:00	10.11.2004 02:30	6	66,50	4	56,10	5	0,50	67,30	89 RU coring equipment	MI,Smed
10.11.2004 02:30	11.11.2004 05:00	18	67,30	200	64,40	12	26,50	68,40	90 MU 180' core barrel BHA and RIH	MI,Smed
11.11.2004 05:00	11.11.2004 08:00	20	68,10	80	67,80	80	3	68,50	91 Cut core	MI,Smed
11.11.2004 08:00	11.11.2004 09:00	12	68,60	10	68,20	10	1	68,50	92 Circ	MI,Smed
11.11.2004 09:00	12.11.2004 07:00	36	70,10	30	69,40	30	22	69,40	93 POOH with coring assembly 1	MI,Smed
12.11.2004 07:00	12.11.2004 15:30	12	70,60	10	69,80	10	8,50	69,80	94 LD core BHA	MI,Smed
12.11.2004 15:30	12.11.2004 21:00	18	71,30	15	70,50	15	5,50	70	95 MU 8 1/2" drilling BHA	MI,Smed,Schlum,Schlum,Schlum
12.11.2004 20:59	12.11.2004 21:00	80	74,70	0	70,50	0,01	0	70	96 Option: second core run	MI,Smed
12.11.2004 20:59	12.11.2004 21:00	0	74,70	0	70,50	0,01	0	70	97 Option POOH	MI,Smed
12.11.2004 21:00	13.11.2004 08:00	12	75,20	8	70,80	10	11	70,50	98 PU 5" DP (87 jnts) while RIH	MI,Smed
13.11.2004 08:00	13.11.2004 21:00	8	75,50	5,50	71	6	13	71	99 RIH on 5" DP (3250 m)	MI,Smed
13.11.2004 21:00	13.11.2004 21:30	1	75,50	1	71,10	1	0,50	71	100 Change elevator, slips and prs	MI,Smed
13.11.2004 21:30	14.11.2004 04:00	2	75,60	1	71,10	2	6,50	71,30	101 RIH on 6 5/8" DP inside 9 5/8" liner	MI,Smed
14.11.2004 04:00	14.11.2004 13:30	1	75,70	1	71,20	1	9,50	71,70	102 Cont. RIH on 6 5/8" DP	MI,Smed
14.11.2004 13:30	17.11.2004 22:00	92	79,50	115	76	115	80,50	75,10	103 Drill ahead to TD at 6930 m MD.	MI,Smed,Schlum,Schlum,Schlum
17.11.2004 22:00	18.11.2004 03:30	0	79,50	5	76,20	5	5,50	75,30	104 Circulate clean min 3 x BU.	MI,Smed,Schlum,Schlum,Schlum
18.11.2004 03:30	18.11.2004 23:30	0	79,50	15	76,80	15	20	76,10	105 POOH with drilling BHA.	MI,Smed,Schlum,Schlum,Schlum
18.11.2004 23:30	19.11.2004 10:00	0	79,50	6	77	10	10,50	76,60	106 LD 5" DP (90 jnts)	Smed
19.11.2004 10:00	19.11.2004 17:00	0	79,50	5	77,20	10	7	76,90	107 LD BHA.	MI,Smed,Schlum,Schlum,Schlum
19.11.2004 17:00	20.11.2004 05:00	0	79,50	6	77,50	7	12	77,40	108 Test BOP	Smed
20.11.2004 05:00	20.11.2004 14:00	0	79,50	6	77,70	6	9	77,70	109 PU and MU new BHA.	MI,Smed,Schlum,Schlum,Schlum
20.11.2004 14:00	21.11.2004 01:30	0	79,50	7	78	12	11,50	78,20	110 PU 5" DP (90 jnts + 200 m from GFA) while RIH.	Smed
21.11.2004 01:30	22.11.2004 13:00	0	79,50	8,40	78,40	9	35,50	79,70	111 RIH on 5" DP in cased hole. Fill pipe every 300 m.	Smed
22.11.2004 13:00	22.11.2004 18:00	0	79,50	0,50	78,40	1	5	79,90	112 Change elevator, slips and PRS.	Smed
22.11.2004 18:00	23.11.2004 00:00	0	79,50	1	78,40	1	6	80,10	113 RIH on 6 5/8" DP in cased hole.	Smed
23.11.2004 00:00	23.11.2004 09:00	0	79,50	3,50	78,60	4	9	80,50	114 Continue RIH on 6 5/8" in OH.	Smed

Start time	End time	Budget time hrs	Acc budget days	Tech limit hrs	Acc tech days	Plan time hrs	Act time hrs	Acc actual days	Description	Companies
23.11.2004 08:59	23.11.2004 09:00	0	79,50	2	78,70	2	0	80,50	115 Circ. BU	Smed
23.11.2004 09:00	29.11.2004 04:00	154	85,90	90	82,40	132	139	86,30	116 Continue to drill to TD at appr. 7430 m MD.	MI,Smed,Schlum,Schlum
29.11.2004 04:00	29.11.2004 17:00	9	86,30	6	82,70	6	13	86,90	117 Circ. clean min 3 x BU POOH	MI,Smed
29.11.2004 17:00	01.12.2004 05:30	20	87,10	15	83,30	35	36,50	88,40	118 POOH with drilling BHA	MI,Smed
01.12.2004 05:30	02.12.2004 02:00		87,10	7	83,60	7	20,50	89,20	118 a Test BOP	MI,Smed
02.12.2004 02:00	02.12.2004 08:00	6	87,40	5	83,80	5	6	89,50	119 RU TLC logging equipment	MI,Smed,Schlum
02.12.2004 08:00	04.12.2004 08:00	25	88,40	18	84,60	18	48	91,50	120 RIH with TLC	MI,Smed,Schlum
04.12.2004 08:00	05.12.2004 20:00	120	93,40	72	87,60	60	36	93	121 Run/log reservoir logs WL logging	MI,Smed,Schlum
05.12.2004 20:00	06.12.2004 21:00	25	94,50	20	88,40	20	25	94	122 POOH with TLC	MI,Smed,Schlum
06.12.2004 21:00	08.12.2004 15:30	0	94,50	24	89,40	35	42,50	95,80	122a RIH with TLC. Unable to connect locomotive and dockinghead.	MI,Smed,Schlum
08.12.2004 15:30	09.12.2004 15:00	0	94,50	35	90,80	20	23,50	96,80	122a1 POOH to check docking head.	MI,Smed,Schlum
09.12.2004 15:00	10.12.2004 20:00	0	94,50	35	92,30	30	29	98	122a2 RIH with TLC assy after checking docking head.	MI,Smed,Schlum
10.12.2004 20:00	12.12.2004 03:30	0	94,50	60	94,80	70	31,50	99,30	122b TLC log reservoir with MDT. MDT tool failed on inrun while watersampling at 7143 m.	MI,Smed,Schlum
12.12.2004 03:30	13.12.2004 10:30	0	94,50	24	95,80	35	31	100,60	122c POOH with TLC. LD 5" DP.	MI,Smed,Schlum
13.12.2004 10:30	13.12.2004 14:30	5	94,70	4	96	4	4	100,80	124 RD TLC equipment.	MI,Smed,Schlum
13.12.2004 14:30	15.12.2004 07:30	30	95,90	14	96,60	24	41	102,50	124a PU and MU cement stinger and 3 1/2" DP. PU 5" DP. RIH.	MI,Smed,Hall,Schlum
15.12.2004 07:30	15.12.2004 14:30	18	96,70	5	96,80	8	7	102,80	124b Set cement plug from 5060 m to 5400 m for sidetrack.	MI,Smed,Hall,Schlum
15.12.2004 14:30	16.12.2004 07:00	30	97,90	12	97,30	24	16,50	103,40	124c1 POOH with cement stinger. LD 5" and 3 1/2" DP. Clean drill floor.	MI,Smed,Hall,Schlum
16.12.2004 07:00	16.12.2004 09:00	0	97,90	3	97,40	2	2	103,50	124c2 Pull wearbushing. Install test plug and pipe for BOP testing.	Smed
16.12.2004 09:00	16.12.2004 14:00	0	97,90	24	98,40	12	5	103,70	124d1 Check shaft in DDM. Shims shaft to centre same.	Smed
16.12.2004 14:00	20.12.2004 11:00	0	97,90	75	101,50	60	93	107,60	124d2 Change main shaft in DDM.	Smed
20.12.2004 11:00	20.12.2004 15:00	0	97,90	5	101,70	5	4	107,80	124e Pull test plug. Run wear bushing. Slip and cut. Test kelly cock.	Smed,Hall
20.12.2004 15:00	22.12.2004 16:00	48	99,90	36	103,20	36	49	109,80	124f RIH w/sidetrack assembly, drill cement and displace to new mud.	MI,Smed,Schlum,Schlum,Schlum
22.12.2004 16:00	29.12.2004 16:30	200	108,30	170	110,30	170	168,50	116,80	124g Drill side track to app 6600 m.	MI,Smed,Schlum,Schlum,Schlum
22.12.2004 16:00	11.01.2005 12:00	410	17,1	399	16,6	377	476,2	19,8	8 1/2" [NO 34/10-48 A]	

Start time	End time	Budget time hrs	Acc budget days	Tech limit hrs	Acc tech days	Plan time hrs	Act time hrs	Acc actual days	Description	Companies
29.12.2004 16:30	29.12.2004 20:30	0	108,30	8	110,60	8	4	117	124h Circulate hole clean.	MI,Smed,Schlum,Schlum,Schlum
29.12.2004 20:30	30.12.2004 20:00	0	108,30	18	111,40	15	23,50	118	124i POOH wet. Flow check well. Pump slug and POOH. LD/rack BHA.	MI,Smed,Schlum,Schlum,Schlum
30.12.2004 20:00	31.12.2004 05:45	0	108,30	0	111,40	6	9,80	118,40	124j Test BOP.	MI,Smed,Schlum,Schlum,Schlum
31.12.2004 05:45	01.01.2005 22:15	0	108,30	18	112,10	24	40,50	120,10	124k PU new BHA and RIH to TD. Fill pipe every 300 m.	MI,Smed,Schlum,Schlum,Schlum
01.01.2005 22:15	04.01.2005 12:00	100	112,40	70	115	67	61,80	122,60	124l Drill 8 1/2" hole to 6221 m.	MI,Smed,Schlum,Schlum,Schlum
04.01.2005 12:00	04.01.2005 17:30	0	112,40	5	115,30	5	5,50	122,90	124 la Circulate hole clean	MI,Smed,Schlum,Schlum,Schlum
04.01.2005 17:30	05.01.2005 14:15	0	112,40	24	116,30	24	20,80	123,70	124 lb Pull 5 stands wet. Pump slug and POOH.	MI,Smed,Schlum,Schlum,Schlum
05.01.2005 14:15	05.01.2005 18:45	0	112,40	5	116,50	5	4,50	123,90	124 lc MU new BHA	MI,Smed,Schlum,Schlum,Schlum
05.01.2005 18:45	08.01.2005 13:15	0	112,40	33	117,80	33	66,50	126,70	124 ld RIH to TD	MI,Smed,Schlum,Schlum,Schlum
08.01.2005 13:15	09.01.2005 00:00	110	117	48	119,80	11	10,80	127,10	124 le Ream back to 9 5/8" shoe	MI,Smed,Schlum,Schlum,Schlum
09.01.2005 00:00	09.01.2005 03:00	0	117	0	119,80	3	3	127,30	124m Slip & Cut and check brakes.	MI,Smed,Schlum,Schlum,Schlum
09.01.2005 03:00	11.01.2005 12:00	0	117	0	119,80	6	57	129,60	124n RIH to 5885 m and perform open hole kick off.	MI,Smed,Schlum,Schlum,Schlum
11.01.2005 12:00	15.01.2005 13:30	2	117,10	1	119,90	92	97,50	133,70	125 Drill 48 AT2 to approx 6650 m.	MI,Smed,Hall,Schlum,Schlum,Schlum
11.01.2005 12:00	21.01.2005 02:30	168	7	169	7,0	191,0	230,7	9,6	8 1/2" [NO 34/10-48 AT2]	
15.01.2005 13:30	15.01.2005 18:30	0	117,10	8	120,20	8	5	133,90	125a Circulate well clean	MI,Smed,Hall,Schlum,Schlum,Schlum
15.01.2005 18:30	16.01.2005 16:45	0	117,10	20	121	24	22,30	134,80	125b POOH wet 5 std. Flow check. Pump slug and POOH	MI,Smed,Hall,Schlum,Schlum,Schlum
16.01.2005 16:45	16.01.2005 21:00	8	117,40	6	121,30	0,01	4,30	135	131 LD 8 1/2" BHA	MI,Smed,Hall,Schlum,Schlum,Schlum
16.01.2005 21:00	17.01.2005 08:45	0	117,40	6	121,50	6	11,80	135,50	126c Test BOP	MI,Smed,Hall,Schlum,Schlum,Schlum

Start time	End time	Budget time hrs	Acc budget days	Tech limit hrs	Acc tech days	Plan time hrs	Act time hrs	Acc actual days	Description	Companies
17.01.2005 08:45	17.01.2005 11:00	0	117,40	2	121,60	2	2,30	135,60	126d Prepare for running 7" liner	MI,Smed,Hall,Schlum,Schlum, Weath,Schlum
17.01.2005 11:00	17.01.2005 15:00	10	117,80	6	121,90	6	4	135,80	126 MU float + shoetrack + landing collar	MI,Smed,Hall,Schlum,Schlum, Weath,Schlum
17.01.2005 15:00	18.01.2005 04:00	40	119,50	30	123,10	10	13	136,30	127 RIH with 7" liner. PU LH and MU same.	MI,Smed,Hall,Schlum,Schlum, Weath,Schlum
18.01.2005 04:00	19.01.2005 10:00	18	120,30	15	123,80	14	30	137,60	128 RIH 7" liner on landing string	MI,Smed,Hall,Schlum,Schlum, Weath,Schlum
19.01.2005 10:00	20.01.2005 01:30	48	122,30	40	125,40	12	15,50	138,20	129 Circulate, set hanger, cement liner and set packer.	MI,Smed,Hall,Schlum,Schlum, Weath,Schlum
20.01.2005 01:30	21.01.2005 01:30	36	123,80	30	126,70	14	24	139,20	130 Flowcheck, L/D cement head and POOH with running string.	MI,Smed,Hall,Schlum,Schlum, Weath,Schlum
21.01.2005 01:30	21.01.2005 02:30	6	124	5	126,90	3	1	139,30	132 Pressure test well	MI,Smed,Hall,Schlum,Schlum, Schlum
21.01.2005 02:30	21.01.2005 04:30	8	124,30	2	127	6	2	139,30	135 Prepare for wash run	BJ,MI,Smed
21.01.2005 02:30	15.02.2005 06:00	545	22,7	360	15	378,0	603,9	25,2	COMPL_LINER [NO 34/10-48 AT2]	
21.01.2005 04:30	22.01.2005 09:30	35	125,80	24	128	24	29	140,50	136 RIH with wash string	BJ,MI,Smed
22.01.2005 09:30	23.01.2005 21:30		125,80	50	130	0,01	36	142	136a POOH to change drift. RIH.	Smed
23.01.2005 21:30	24.01.2005 04:30	5	126	4	130,20	5	7	142,30	136b RIH with wash string.	Smed
24.01.2005 04:30	24.01.2005 10:00	15	126,60	8	130,50	6	5,50	142,60	137 Condition mud. Wash BOP, riser etc.	BJ,MI,Smed
24.01.2005 10:00	24.01.2005 15:00	8	127	4	130,70	6	5	142,80	138 Displace well to SW	BJ,MI,Smed
24.01.2005 15:00	25.01.2005 04:00	15	127,60	8	131	10	13	143,30	139 Inflowtest well, wash MPA, MP. Backload mud.	BJ,MI,Smed
25.01.2005 04:00	25.01.2005 16:00	15	128,20	8	131,40	12	12	143,80	140 Wash well	BJ,MI,Smed
25.01.2005 16:00	26.01.2005 07:30	10	128,60	4	131,50	7	15,50	144,50	141 Displace to brine and spot kill pill	BJ,MI,Smed
26.01.2005 07:30	26.01.2005 23:00	36	130,10	18	132,30	15	15,50	145,10	142 POOH and LD assy and some DP	BJ,Smed
26.01.2005 23:00	27.01.2005 22:30	24	131,10	24	133,30	24	23,50	146,10	142A VSP logging with geophones on electric WL in 9 5/8" casing.	Smed,Schlum
27.01.2005 22:30	28.01.2005 00:45		131,10	2	133,40	0,01	2,30	146,20	142B Draining riser by RIH and POOH with 8 stands of 6 5/8" DP	Smed

Start time	End time	Budget time hrs	Acc budget days	Tech limit hrs	Acc tech days	Plan time hrs	Act time hrs	Acc actual days	Description	Companies
28.01.2005 00:45	28.01.2005 10:00	8	131,50	4	133,50	6	9,30	146,60	143 ND BOP	Smed
28.01.2005 10:00	28.01.2005 13:00	8	131,80	4	133,70	6	3	146,70	144 Run 10 3/4" dummy hanger. Test.	Smed
28.01.2005 13:00	28.01.2005 15:15		131,80	1	133,80	0,01	2,30	146,80	144A ND HP riser (Tungløft)	Smed
28.01.2005 15:15	29.01.2005 17:30	15	132,40	8	134,10	12	26,30	147,90	145 Install TSR and TSR ext.	Smed
29.01.2005 17:30	30.01.2005 04:30	12	132,90	4	134,30	8	11	148,30	146 NU BOP and test same.	Smed
30.01.2005 04:30	30.01.2005 10:00	11	133,40	2	134,30	6	5,50	148,60	148 Prepare for perforating run	Schlum,Smed
30.01.2005 10:00	31.01.2005 06:00	15	134	8	134,70	12	20	149,40	149 MU guns, blank pipe and DP	Schlum,Smed
31.01.2005 06:00	31.01.2005 18:45	15	134,60	8	135	12	12,80	149,90	150 RIH on DP	Schlum,Smed
31.01.2005 18:45	02.02.2005 19:30	36	136,10	18	135,80	24	48,80	152	151 Fire and POOH. LD guns and DP	Schlum,Smed
02.02.2005 19:30	02.02.2005 23:00	12	136,60	6	136	9	3,50	152,10	152 Pull wear bushing, wash hanger area and prepare for completion	Roxar,Smed,Camco
02.02.2005 23:00	10.02.2005 10:00	144	142,60	72	139	96	179	159,60	153 Run completion	Roxar,Smed,Camco
10.02.2005 10:00	10.02.2005 22:00	24	143,60	12	139,50	18	12	160,10	154 Install TH, terminate lines and land and test TH	Roxar,Smed,Camco
10.02.2005 22:00	11.02.2005 10:45	18	144,40	10	139,90	15	12,80	160,60	155 Displace well to packerfluid	BJ,Roxar,Smed,Camco
11.02.2005 10:45	12.02.2005 15:30	12	144,90	6	140,20	9	28,80	161,80	156 Set packers and test tubing and annulus	BJ,Roxar,Smed,Camco
12.02.2005 15:30	13.02.2005 15:00		144,90	19	141	0,01	23,50	162,80	156a Set deep plug on wireline	BJ,Roxar,PI,Smed,Hall,Camco ,AKWS
13.02.2005 15:00	13.02.2005 22:45	8	145,20	4	141,10	6	7,80	163,10	157 Set plug on DP	PI,Smed
13.02.2005 22:45	15.02.2005 06:00	36	146,70	18	141,90	24	31,20	164,40	158 ND BOP and NU XMT	Smed
16.02.2005 06:00	22.02.2005 04:00	83	3,5	49	2,0	62	78,0	3,2	WIREL [NO 34/10-48 AT2]	
16.02.2005 06:00	18.02.2005 10:00	6	147	4	142	8	52	166,60	200 Spot WL equipment	Smed

Start time	End time	Budget time hrs	Acc budget days	Tech limit hrs	Acc tech days	Plan time hrs	Act time hrs	Acc actual days	Description	Companies
18.02.2005 09:59	18.02.2005 10:00	36	148,50	18	142,80	18	0	166,60	200A Installation of X-mas tre	Smed
18.02.2005 09:59	18.02.2005 10:00	9	148,80	6	143	8	0	166,60	206 Demob	Smed
21.02.2005 02:00	21.02.2005 12:30	9	149,20	6	143,30	8	10,50	167	201 RU WL equipment and pressuretest	Smed
21.02.2005 12:30	21.02.2005 13:30	2	149,30	1	143,30	1	1	167	202 Retrieve shallow plug	Smed
21.02.2005 13:30	21.02.2005 15:30	3	149,40	2	143,40	3	2	167,10	203 Change BHA	Smed
21.02.2005 15:30	21.02.2005 21:00	9	149,80	6	143,70	8	5,50	167,40	204 Retrieve deep set plug	Smed
21.02.2005 21:00	22.02.2005 04:00	9	150,20	6	143,90	8	7	167,60	205 RD WL equipment	Smed

8.4 Borehole stability figure with MW and final pressure/fracture gradients

Updated figure from drilling programme.

8.5 Bit record

WELL: NO 34/10-48 A

Run no	Bit size	Bit no	BHA no	Bit type	IADC code	Bit manufacturer
1	8 1/2"	1	1	MGR741BPX	M222	Smith Bits
2	8 1/2"	1rr1	2	MGR741BPX	M222	Smith Bits

					Nozzles (n/32")				
Run no	Bit size	Bit no	BHA no	Serial no	no x n	no x n	no x n	no x n	Flow area in
1	8 1/2"	1	1	JT 7045	3 x 14	3 x 15	x	x	0,9690
2	8 1/2"	1rr1	2	JT 7045	3 x 14	3 x 15	x	x	0,9690

Run no	Bit size	Pump rate l/min	Pump press bar	Depth in mMD	Depth out mMD	Form drld m	Total drld m	Drld hrs	Circ hrs	ROP m/hrs
1	8 1/2"	2100	267	5120	5850	730	725	47,80	173,40	15,30
2	8 1/2"	2100	276	5850	6221	371	371	41,50	76,50	8,90

Run no	Bit size	Min WOB ton	Max WOB ton	Min RPM	Max RPM	Torque Min Nm	Torque Max Nm	Con drag Min 1000 daN	Con drag Max 1000 daN

Run no	Bit size	Min WOB ton	Max WOB ton	Min RPM	Max RPM	Torque Min Nm	Torque Max Nm	Con drag Min 1000 daN	Con drag Max 1000 daN
1	8 1/2"	1	11	180	180	27	34		
2	8 1/2"	3	11	90	180	24	32		

Run no	Bit size	I	O	DC	L	B	G	OC	RP
1	8 1/2"	0	1	WT	T	X	IN	NO	DTF
2	8 1/2"	1	1	WT	T	X	0	NO	DTF

Run no	Bit size	Remarks
1	8 1/2"	Drilled cement from 5080m to 5115m, 2.1hours drill time. Initiated sidetrack from 34/10-48 S at 5115m, sidetracked at 5120m.
2	8 1/2"	

WELL: NO 34/10-48 AT2

Run no	Bit size	Bit no	BHA no	Bit type	IADC code	Bit manufacturer
1	8 1/2"			MGR741BPX	M222	Smith Bits

					Nozzles (n/32")				
Run no	Bit size	Bit no	BHA no	Serial no	no x n	no x n	no x n	no x n	Flow area in
1	8 1/2"			JT7045	3 x 14	3 x 15	x	x	0,9690

Run no	Bit size	Pump rate l/min	Pump press bar	Depth in mMD	Depth out mMD	Form drld m	Total drld m	Drld hrs	Circ hrs	ROP m/hrs
1	8 1/2"	2044	245	5608	5878	270	270	78,40	100,30	3,40

Run no	Bit size	Min WOB ton	Max WOB ton	Min RPM	Max RPM	Torque Min Nm	Torque Max Nm	Con drag Min 1000 daN	Con drag Max 1000 daN
1	8 1/2"	4	11	80	180	23	30		

Run no	Bit size	I	O	DC	L	B	G	OC	RP
1	8 1/2"	1	1	WT	T	X	I	NO	TD

Run no	Bit size	Remarks
1	8 1/2"	Worn on top of blades. See pictures in Arena Database.

WELL: NO 34/10-48 S

Run no	Bit size	Bit no	BHA no	Bit type	IADC code	Bit manufacturer
1	24"	1	1	XT02DLC	415G	Security DBS
10	8 1/2"	5	10	MGR741BPX	M222	Smith Bits
11	8 1/2"	6	11	BHC606		Baker Hughes Inteq
12	8 1/2"	5RR1	11	MGR741BPX	M222	Smith Bits
13	8 1/2"	5RR2	13	MGR741BPX	M222	Smith Bits
4	17 1/2"	2	4	MXT303DDT	415	Hughes Christensen
5	12 1/4"	3	5	RSX130DF+GSVW	S422	Reed-Hycalog
6	12 1/4"	4RR	6	RSX130DF+GNSV	S432	Hycalog

					Nozzles (n/32")				
Run no	Bit size	Bit no	BHA no	Serial no	no x n	no x n	no x n	no x n	Flow area in
1	24"	1	1	10418600	1 x 20	3 x 22	x	x	1,4210
10	8 1/2"	5	10	JT 7044	6 x 13	x	x	x	0,7780
11	8 1/2"	6	11	7105780	x	x	x	x	
12	8 1/2"	5RR1	11	JT 7044	6 x 13	x	x	x	0,7780

					Nozzles (n/32")				
Run no	**Bit size**	**Bit no**	**BHA no**	**Serial no**	**no x n**	**no x n**	**no x n**	**no x n**	**Flow area in**
13	8 1/2"	5RR2	13	JT 7044	3 x 14	2 x 15	1 x 16	x	0,9930
4	17 1/2"	2	4	6021502	1 x 24	2 x 22	1 x 20	x	1,4920
5	12 1/4"	3	5	206415	2 x 13	6 x 14	x	x	1,1620
6	12 1/4"	4RR	6	206030	6 x 14	2 x 13	x	x	1,1620

Run no	**Bit size**	**Pump rate l/min**	**Pump press bar**	**Depth in mMD**	**Depth out mMD**	**Form drld m**	**Total drld m**	**Drld hrs**	**Circ hrs**	**ROP m/hrs**
1	24"	5200	137	437,50	1287,50	850		33,70		25,20
10	8 1/2"	2100	257	5108	5173	65	65	3,60	43	18,10
11	8 1/2"			5173	5208	35	35	2,40	5,60	14,60
12	8 1/2"	2100	285	5208	6057	849	849	44,20	97,60	19,20
13	8 1/2"	2100	290	6057	7393	1336	1336	85,60	172,50	15,60
4	17 1/2"	5000	153	1287,50	2667	1379,50	0	44,60	154,50	30,90
5	12 1/4"	3519	271	2667	3759	1092	1123	40	101,20	27,30
6	12 1/4"	3560	282	4017	5106	1089	1089	48,40	106,40	22,50

Run no	**Bit size**	**Min WOB ton**	**Max WOB ton**	**Min RPM**	**Max RPM**	**Torque Min Nm**	**Torque Max Nm**	**Con drag Min 1000 daN**	**Con drag Max 1000 daN**
1	24"	3	20	136	266	5	18		
10	8 1/2"	5	9	120	180	24	28		
11	8 1/2"	0	3	70	100	25	27		
12	8 1/2"	3	10	160	190	24000	30000		
13	8 1/2"	3	10	130	190	28000	39000	110	140
4	17 1/2"	6	25	150	180	18	32		
5	12 1/4"	2	6	160	180	16	34		
6	12 1/4"	3	17	120	190	22	40	145	170

Run no	**Bit size**	**I**	**O**	**DC**	**L**	**B**	**G**	**OC**	**RP**
1	24"	1	1	NO	A	F		NO	TD

Run no	Bit size	I	O	DC	L	B	G	OC	RP
10	8 1/2"	0	0	NO	A	X	IN	WT	CP
11	8 1/2"								
12	8 1/2"	1	1	WT	A	X	0	NO	DTF
13	8 1/2"	1	1	WT	S	X	IN	NO	TD
4	17 1/2"	2	4	BT	H	F	3	WT	TD
5	12 1/4"	0	1	CT	G	X	I	NO	DTF
6	12 1/4"	0	0	ER	G	X	0	NO	DTF

Run no	Bit size	Remarks
1	24"	Bearings/ seals had failed on cone no 2 and no 3.
10	8 1/2"	WT / CT on back-reamer cutters. Metal from reamer shoe jammed in bit.
11	8 1/2"	
12	8 1/2"	re-runnable
13	8 1/2"	
4	17 1/2"	Bit revolutions pr. 06:00 HRS:694krev
5	12 1/4"	31 meters of cement drilled in 3,18 hours. 3 of 8 cutters were chipped in the transition zone between gauge and sholder.
6	12 1/4"	

WELLBORE: NO 34/10-48 A
BHA NO: 1
BHA KIND: Drilling
DESCRIPTION: RSS (Xceed) Assembly
BHA NAME: 1

String component	OD in	ID in	Length m	Acc length m
BIT	8,50		0,26	0,26
POWERDRIVE, XCEED	6,8130		7,66	7,92
VISION675	6,8750		5,70	13,62
POWER PULSE MWD	6,75		8,36	21,98
FPWD	6,75		10,20	32,18
ADN-6 W/8 1/4" STABILIZER	6,8750		6,48	38,66
FLOAT SUB	6,5630	2,8130	1,21	39,87
NM HW DRILL PIPE	5	2,8130	27,78	67,65
HYDRAULIC JAR	6,50	2,50	9,52	77,17
HWDP 5"	5	3	44,28	121,45
DRIFT SUB	6,6250	2,25	1	122,45
DP 5"	5	4,2750	4475,10	4597,55
X-OVER	8	3	0,83	4598,38
DP 6 5/8"	6,6250	5,9650		4598,38

BHA NO: 2
BHA KIND: Drilling
DESCRIPTION: RSS (Xceed) Assembly
BHA NAME: 2

String component	OD in	ID in	Length m	Acc length m
BIT	8,50		0,26	0,26
POWERDRIVE, XCEED	6,8750		7,58	7,84
VISION675	6,75		5,70	13,54

String component	OD in	ID in	Length m	Acc length m
POWER PULSE MWD	6,8750		8,30	21,84
ADN-6 W/8 1/4" STABILIZER	6,8750		6,14	27,98
FLOAT SUB	6,5630	2,8130	1,21	29,19
NM HW DRILL PIPE	5	2,8130	27,78	56,97
HYDRAULIC JAR	6,50	2,50	9,52	66,49
HWDP 5"	5	3	44,28	110,77
DRIFT SUB	6,6250	2,25	1	111,77
DP 5"	5	4,2750	4666	4777,77
X-OVER	8	3	0,85	4778,62
DP 6 5/8"	6,6250	5,9650		4778,62

BHA NO: 3
BHA KIND: Drilling
DESCRIPTION: RSS (Xceed) Assembly
BHA NAME: 3

String component	OD in	ID in	Length m	Acc length m
BIT	8,50		0,26	0,26
POWERDRIVE, XCEED	6,8750		7,66	7,92
VISION675	6,75		5,66	13,58
POWER PULSE MWD	6,8750		8,30	21,88
ADN-6 W/8 1/4" STABILIZER	6,8750		6,14	28,02
FLOAT SUB	6,5630	2,8130	1,21	29,23
NM HW DRILL PIPE	5	2,8130	27,78	57,01
HYDRAULIC JAR	6,50	2,50	9,52	66,53
HWDP 5"	5	3	44,28	110,81
DRIFT SUB	6,6250	2,25	1	111,81
DP 5"	5	4,2750	4148,87	4260,68
X-OVER	8	3	0,85	4261,53
DP 6 5/8"	6,6250	5,9650		4261,53

WELLBORE: NO 34/10-48 AT2

BHA NO: 1
BHA KIND:
DESCRIPTION:
BHA NAME:

String component	OD in	ID in	Length m	Acc length m
BIT	8,50		0,26	0,26
POWERDRIVE, XCEED	6,8750		7,66	7,92
VISION675	6,75		5,66	13,58
POWER PULSE MWD	6,8750		8,30	21,88
ADN-6 W/8 1/4" STABILIZER	6,8750		6,14	28,02
FLOAT SUB	6,5630	2,8130	1,21	29,23
H W DRILL PIPE	5	2,8130	27,78	57,01
HYDRAULIC JAR	6,50	2,50	9,52	66,53
HWDP 5"	5	3	44,28	110,81
DRIFT SUB	6,6250	2,25	1	111,81
DP 5"	5	4,2750	4148,87	4260,68
X-OVER	8	3	0,85	4261,53
DP 6 5/8"	6,6250	5,9650		4261,53

BHA NO: 2
BHA KIND:
DESCRIPTION:
BHA NAME:

String component	OD in	ID in	Length m	Acc length m
LINER JOINT			825,68	825,68
RUNNING TOOL			2,92	828,60
HWDP 5"			44,90	873,50
PUP JOINT			4,58	878,08
DP 5"			2603,57	3481,65
XO SUB				3481,65
DP 6 5/8"				3481,65

BHA NO: 3
BHA KIND:
DESCRIPTION:
BHA NAME:

String component	OD in	ID in	Length m	Acc length m
OTHER			11,80	11,80
GAUGE	6,10		0,71	12,51
SCRAPER			10,91	23,42
DP 3 1/2"			758,18	781,60
OTHER			12,04	793,64
SCRAPER			7,57	801,21
DP 5"			2459,99	3261,20
SCRAPER			9,57	3270,77
DP 6 5/8"				3270,77

BHA NO: 4
BHA KIND:
DESCRIPTION:
BHA NAME:

String component	OD in	ID in	Length m	Acc length m
BIT	6		0,22	0,22
SCRAPER	6		11,59	11,81
GAUGE	6,10		0,71	12,52
MAGNO BACK	5,95		10,91	23,43
DP 3 1/2"			758,18	781,61
SCRAPER	8,50		12,04	793,65
MAGNET	8,3740		7,57	801,22
DP 5"			2459,99	3261,21
SCRAPER	12,1860		9,57	3270,78
DP 6 5/8"				3270,78

BHA NO: 5
BHA KIND:
DESCRIPTION:
BHA NAME:

String component	OD in	ID in	Length m	Acc length m
RUNNING TOOL	11,75		0,21	0,21
X-OVER	11,31	3,06	0,55	0,76
X-OVER	7,50	3,06	1,18	1,94
5" DRILL PIPE				1,94

BHA NO: 6
BHA KIND:
DESCRIPTION:
BHA NAME:

String component	OD in	ID in	Length m	Acc length m
JUNK BASKET	5,72		2,71	2,71
XO PLUG	5,72		1,39	4,10
ADAPTER KIT	5,50		0,70	4,80
RUNNING TOOL	3,60		2,21	7,01
X-OVER,	1,8750		0,18	7,19
JAR	1,8750		2,10	9,29
WELL EQUIP. JAR	1,8750		0,31	9,60
STEM	1,8750		1,52	11,12

BHA NO: 7
BHA KIND: Wireline
DESCRIPTION: For pulling 7 "XO plug
BHA NAME: 1

String component	OD in	ID in	Length m	Acc length m
EQUALIZING PRONG	1,3750		1,39	1,39
GS PULLING TOOL	5,5430		0,76	2,15
X-OVER	2,50		0,13	2,28
MECHANICAL JAR	1,8750		2,20	4,48
X-OVER	2,50		0,13	4,61
HYDRAULIC JAR	2,50		2,80	7,41
X-OVER	2,50		0,13	7,54
ROLLER WEIGHT	2,50		1,52	9,06
X-OVER	2,50		0,20	9,26
ACCELERATOR	2,50		2,80	12,06
X-OVER	2,50		0,31	12,37
ROPE SOCKET	1,8750		0,20	12,57
SLICKLINE 0,125"	0,1250			12,57

BHA NO: 8
BHA KIND: Wireline
DESCRIPTION: For pulling 7 "XO plug
BHA NAME: 2

String component	OD in	ID in	Length m	Acc length m
EQUALIZING PRONG	1,3750		1,39	1,39
GS PULLING TOOL	5,5430		0,76	2,15
X-OVER	2,50		0,13	2,28
MECHANICAL JAR	1,8750		2,20	4,48
X-OVER	2,50		0,13	4,61
HYDRAULIC JAR	2,50		2,80	7,41
X-OVER	2,50		0,13	7,54
ROLLER WEIGHT	2,50		1,52	9,06
X-OVER	2,50		0,20	9,26
ACCELERATOR	2,50		2,80	12,06
X-OVER	2,50		0,31	12,37
ROPE SOCKET	1,8750		0,20	12,57

String component	OD in	ID in	Length m	Acc length m
SLICKLINE 0,125"	0,1250			12,57

WELLBORE: NO 34/10-48 S
BHA NO: 4
BHA KIND: Drilling
DESCRIPTION: 12 3/4" Extreme motor assy
BHA NAME: 4

String component	OD in	ID in	Length m	Acc length m
BIT, TRI CONE	17,50		0,40	0,40
MOTOR	12,75		10,40	10,80
STABILIZER, NM	16,75	3	2,24	13,04
PONY COLLAR	9,6250	3	3	16,04
MWD, POWER PULSE	9,0630	0	8,21	24,25
MWD CDR	9,6250		7,06	31,31
STABILIZER, NM	12	3	2,19	33,50
NM DRILL COLLAR	9,4380	3	9,23	42,73
NM DRILL COLLAR	9,50	3	8,81	51,54
X-OVER	9,50	3	0,93	52,47
DRIL COL	8	2,9380	18,31	70,78
JAR	8	3	9,83	80,61
DRIL COL	8	2,9380	26,74	107,35
X-OVER	8,1880	3,50	1,23	108,58
HW DRILL PIPE	6,6250		82,47	191,05
DRILL PIPE	6,6250			191,05

BHA NO: 5
BHA KIND: Drilling
DESCRIPTION: RSS Assembly
BHA NAME: 5

String component	OD in	ID in	Length m	Acc length m
BIT	12,25		0,23	0,23
POWERDRIVE 900 X-TRA	9,25		4,44	4,67
STRING STAB, NM	12,1250	2,50	1,87	6,54
FLEX COLLAR, NM	6,50	3	2,95	9,49
POWER PULSE MWD	8,38	5,90	8,23	17,72
ARC	8,38	2,81	5,92	23,64
ISONIC TOOL	8,44	4,87	7,21	30,85
ADN8	8,38	2,81	6,50	37,35
NM DRILL COLLAR	8	2,50	8,87	46,22
DRILL COLLAR STEEL,	8	2,50	9,11	55,33
JAR,	8	2,13	9,67	65
DRILL COLLAR STEEL,	8	2,50	26,74	91,74
X-OVER,	8	2,50	1,09	92,83
HWDP 5 1/2"	7,25	3,25	111,65	204,48
5 1/2" DRILL PIPE	7	4,89	2423,77	2628,25
X-OVER	8,25	3	1,07	2629,32
DP 6 5/8"	8,25	4	0	2629,32

BHA NO: 6
BHA KIND: Drilling
DESCRIPTION: RSS Assembly
BHA NAME: 6

String component	OD in	ID in	Length m	Acc length m
BIT	12,25		0,24	0,24
POWERDRIVE 900 X-TRA	9,25		4,47	4,71
STRING STAB, NM	12,1250	2,50	1,87	6,58
FLEX COLLAR, NM	6,50	3	2,85	9,43
POWER PULSE MWD	8,38	5,90	8,21	17,64
ARC	8,38	2,81	5,92	23,56
ISONIC TOOL	8,44	4,87	7,21	30,77
ADN8	8,38	2,81	6,50	37,27
NM DRILL COLLAR	8	2,50	8,87	46,14

String component	OD in	ID in	Length m	Acc length m
DRILL COLLAR STEEL,	8	2,50	9,11	55,25
JAR,	8	2,13	9,57	64,82
DRILL COLLAR STEEL,	8	2,50	26,74	91,56
X-OVER,	8	2,50	1,09	92,65
HWDP 5 1/2"	7,25	3,25	111,65	204,30
5 1/2" DRILL PIPE	7	4,89	2423,77	2628,07
X-OVER	8,25	3	1,07	2629,14
DP 6 5/8"	8,25	4	0	2629,14

BHA NO: 7
BHA KIND: Drilling
DESCRIPTION: RSS Assembly
BHA NAME: 7

String component	OD in	ID in	Length m	Acc length m
BIT	12,25		0,24	0,24
POWERDRIVE 900 X-TRA	9,25		4,46	4,70
STRING STAB, NM	12,1250	2,50	1,87	6,57
FLEX COLLAR, NM	6,50	3	2,85	9,42
POWER PULSE MWD	8,38	5,90	8,21	17,63
ARC	8,38	2,81	6,02	23,65
ISONIC TOOL	8,44	4,87	7,21	30,86
ADN8	8,38	2,81	6,50	37,36
NM DRILL COLLAR	8	2,50	8,87	46,23
DRILL COLLAR STEEL,	8	2,50	9,11	55,34
JAR,	8	2,13	9,57	64,91
DRILL COLLAR STEEL,	8	2,50	26,74	91,65
X-OVER,	8	2,50	1,09	92,74
HWDP 5 1/2"	7,25	3,25	111,65	204,39
5 1/2" DRILL PIPE	7	4,89	2423,77	2628,16
X-OVER	8,25	3	1,07	2629,23
DP 6 5/8"	8,25	4	0	2629,23

BHA NO: 8
BHA KIND: Drilling
DESCRIPTION: TLC logging
BHA NAME: 8

String component	OD in	ID in	Length m	Acc length m
MDT			27,60	27,60
GR			1,68	29,28
TELEMETRY TOOL			1,83	31,11
CALIPER			3,57	34,68
TELEMETRY TOOL			5,19	39,87
X-OVER	6,25	2,75	0,92	40,79
X-OVER	7,25	3	1,11	41,90
DP 5 1/2"			2423,77	2465,67
X-OVER	8,25	3	1,08	2466,75
DP 6 5/8"			136,11	2602,86
X-OVER	8,25	3	0,82	2603,68
STAB STRING	12,25	2,8750	1,84	2605,52
X-OVER	7,6250	3,25	0,75	2606,27
SIDE ENTRY SUB	6,0630		1,67	2607,94
DP 5"		3,25	13,58	2621,52
FLOAT SUB	6,3750	3	0,58	2622,10
X-OVER	8	3	0,91	2623,01
DP 6 5/8"				2623,01

BHA NO: 9
BHA KIND:
DESCRIPTION:
BHA NAME:

String component	OD in	ID in	Length m	Acc length m
PULLING TOOL	6,25		1,12	1,12
PUP JOINT	6,75		2,21	3,33

String component	OD in	ID in	Length m	Acc length m
XO SUB	8		0,28	3,61
XO SUB	8		1,20	4,81
STAB STRING	12,25		0,92	5,73
PUP JOINT			2,23	7,96
XO SUB	8		1,22	9,18
DP 5"				9,18

BHA NO: 10
BHA KIND: Drilling
DESCRIPTION: RSS (Xceed9) Assembly
BHA NAME: 10

String component	OD in	ID in	Length m	Acc length m
BIT, PDC	8,50		0,26	0,26
POWERDRIVE, XCEED	6,8130		7,66	7,92
VISION675	6,8750		5,68	13,60
POWER PULSE MWD	6,75		8,44	22,04
ADN-6 W/8 1/4" STABILIZER	6,8750		6,11	28,15
FLOAT SUB	6,75		1,21	29,36
NM HW DRILL PIPE	6,6250		27,78	57,14
JAR	6,75		9,45	66,59
H W DRILL PIPE	5		44,37	110,96

BHA NO: 11
BHA KIND:
DESCRIPTION: Coring
BHA NAME: 11

String component	OD in	ID in	Length m	Acc length m
CORE BIT NAME,	8,50	4	0,42	0,42
X-OVER	6,75		0,31	0,73

String component	OD in	ID in	Length m	Acc length m
CORE BARREL			57,29	58,02
TOP SUB	6,75		0,44	58,46
FLOAT SUB,	6,5630		1,21	59,67
NM HW DRILL PIPE	6,6250	2,8130	27,78	87,45
JAR	6,75		9,45	96,90
H W DRILL PIPE	5		44,37	141,27
PUP JOINT	5		1,75	143,02

BHA NO: 12
BHA KIND: Drilling
DESCRIPTION: RSS (Xceed9) Assembly
BHA NAME: 12

String component	OD in	ID in	Length m	Acc length m
BIT, PDC	8,50		0,26	0,26
POWERDRIVE, XCEED	6,8130		7,66	7,92
VISION675	6,8750		5,68	13,60
POWER PULSE MWD	6,75		8,44	22,04
ADN-6 W/8 1/4" STABILIZER	6,8750		6,11	28,15
FLOAT SUB	6,75		1,21	29,36
NM HW DRILL PIPE	6,6250		27,78	57,14
JAR	6,75		9,45	66,59
H W DRILL PIPE	5		44,37	110,96
DRILL PIPE	5		4436,90	4547,86
XO SUB	6,6250		0,60	4548,46

BHA NO: 13
BHA KIND: Drilling
DESCRIPTION: RSS (Xceed9) Assembly
BHA NAME: 13

String component	OD in	ID in	Length m	Acc length m
BIT, PDC	8,50		0,26	0,26
POWERDRIVE, XCEED	6,8130		7,65	7,91
VISION675	6,8750		5,68	13,59
POWER PULSE MWD	6,75		8,81	22,40
ADN-6 W/8 1/4" STABILIZER	6,8750		6,54	28,94
FLOAT SUB	6,75		1,21	30,15
NM HW DRILL PIPE	6,6250	2,8130	27,78	57,93
JAR	6,75	2,50	9,66	67,59
H W DRILL PIPE	5	3	44,37	111,96
DRIFT SUB	6,6250	2,25	1	112,96
DRILL PIPE	5	4,2760	4797,48	4910,44
XO SUB	6,6250		0,60	4911,04
DRILL PIPE	6,6250	5,9650		4911,04

BHA NO: 14
BHA KIND:
DESCRIPTION:
BHA NAME:

String component	OD in	ID in	Length m	Acc length m
OTHER			55,34	55,34
XO SUB			0,92	56,26
DP 5"			4883,33	4939,59
SIDE ENTRY SUB			1,67	4941,26
DP 5"				4941,26
FLOAT SUB			1,21	4942,47
DP 5"				4942,47
XO SUB			0,86	4943,33
DP 6 5/8"				4943,33

BHA NO: 15
BHA KIND:

DESCRIPTION:
BHA NAME:

String component	OD in	ID in	Length m	Acc length m
OTHER	6,60		39,11	39,11
XO SUB			0,92	40,03
DP 5"			4883,33	4923,36
SIDE ENTRY SUB	6		1,67	4925,03
DP 5"				4925,03
FLOAT SUB	6,56		1,21	4926,24
DP 5"				4926,24

BHA NO: 16
BHA KIND:
DESCRIPTION:
BHA NAME:

String component	OD in	ID in	Length m	Acc length m
CEMENT STINGER			1,93	1,93
DP 3 1/2"			437,33	439,26
XO SUB			1,10	440,36
DP 5"				440,36

BHA NO: 17
BHA KIND: Drilling
DESCRIPTION: RSS (Xceed9) Assembly
BHA NAME: 17

String component	OD in	ID in	Length m	Acc length m
BIT, PDC	8,50		0,26	0,26
POWERDRIVE, XCEED	6,8130		7,66	7,92

String component	OD in	ID in	Length m	Acc length m
VISION675	6,8750		5,70	13,62
POWER PULSE MWD	6,75		8,36	21,98
FPWD	6,75		10,20	32,18
ADN-6 W/8 1/4" STABILIZER	6,8750		6,48	38,66
FLOAT SUB	6,5630	2,8130	1,21	39,87
NM HW DRILL PIPE	5	2,8130	27,78	67,65
JAR	6,50	2,50	9,52	77,17
5" HW DRILL PIPE	5	3	44,28	121,45
DRIFT SUB	6,6250	2,25	1	122,45
DP 5"	5	4,2760	4475,10	4597,55
XO SUB	8	3	0,83	4598,38
DP 6 5/8"	6,6250	5,9650		4598,38

8.6 Drilling fluids

End of well report for Drilling Fluids — **Well: 34/10 - 48 S**

Drilling Fluid Properties (design/actual)

Section: 48 S — **Mud Type: 24" Spud mud**

Programmed Properties

Depth m MD	MW sg	YP Pa	PV cP	Gels Pa	3 rpm lbs/100ft2	MBT kg/m3	pH	API Sand %	LGS kg/m3	Ca++ mg/l			
443	1.03-						7.5-						
1355	1,20	n/a	alap	>4/<20	>4	<60	9	<1	<180	<1000			

Actual Properties

Depth m MD	MW sg	YP Pa	PV cP	Gels Pa	3 rpm lbs/100ft2	MBT kg/m3	pH	API Sand %	LGS kg/m3	Ca++ mg/l			
443	1,03-	8-	14-	2/4			8.2						
1287	1,20	19	27	2/12.5	2.5-8	2-30	10.1	0-3.5	28-159	800-1400			

Comments:
The section was drilled without any mudrelated problems.
Drilling through Utsira sand formation generated sand in the mud. The pump rate of 5000 liter per minute dictated a coarse screen set up on the shakers. The shakers were ran in a combination of 52, 84 and 105 mesh bottom screens. No problems experien to handle the high flow rate in flowlines , or sand plugging the shakers screen. The generated sand content (3,5%) in the mud after U indicated for further operations that a screen set up of 120mesh screen through Utsira sand formation would have been a more suitable choise. The sand content in the mud was circulated down after Utsira by usage of 140mesh bottom screen for one circulation and with a pump rate of 3000 l/min. This reduced sand content from 3.5% to 1.5%. Another circulation was done with 175 mesh on all shakers and this took down sand content further to 1%It is important when drilling this section to have a good stock with coarse shaker screens from star The dilution factor for the 24" section ended at 8,2 m3/ m3 somewhat higher than the dilution factor (5,9 m3/ m3) programmed in the mud programme. Higher losses at shaker than anticipated explain why the dilution factor ended higher than expected. For further operations a better selection of coarse screen inventory could help to optimize losses and decrease final dilution factor.
-Shear the CMC mud system well before displacement to avoid losses at shakers from start.
. The pump rate of 5000 litres per min while drilling requires all three mud pumps and no shearing can take take place after the mud is displaced.

Section Data

	Planned	Actual
Meter drilled	912	844
Maximum angle	63,0	63
Casing size	20"	20"
Depth Casing set	1355	1282,5
Drilling Days	12,1	2,8
Days on interval	21,5	
Dilution factor: m3/m3	5,8	2,85
Mud Cost/mtr	249,41	539,75
Mud Usage: m3/mtr		1,72

Drlg Fluid Composition

Additives	Programmed kg/m3	Actual kg/m3
Barite		104.36
CMC EHV	12,0	13.91
Glute 10	0,5	0
Soda Ash	1,0	1.61
Sod. Bicarb	0,4	0
Citric Acid	0,3	0
Safe Cide		0.58

Comments
Barite was neeede to increase the MW up to 1.20 sg. This because the screen inventory did not allow to put coarses screens on the shakers

Section: 48 S — **Mud Type: 17 1/2" Glydril**

Programmed Properties

Depth m MD	MW sg	YP Pa	PV cP	Gels Pa	3 rpm lbs/100ft2	Ca++ mg/l	pH	API FL ml	Sand %	KCl kg/m3	Glycol %	MBT kg/m3	LGS kg/m3
1355	1,20				7		7,5	2		140	4		
2610	1,50	n/a	alap	>4/<20	10	<1000	8,5	4	<1	160		<60	<180

Actual Properties

Depth m MD	MW sg	YP Pa	PV cP	Gels Pa	3 rpm lbs/100ft2	Ca++ mg/l	pH	API FL ml	Sand %	KCl kg/m3	Glycol %	MBT kg/m3	LGS kg/m3
1287	1,28	11	14	3.5/4	6	1600	7.6	2.8	0.1	131	2.5	13	99
2667	1,55	27	42	11/23	15	2000	8.3	3.8	0.6	158	4.5	70	168

Comments:

-The mud from shore must have a lowest possible weight (<1,25sg) if the mudweight from start should be 1,20 sg. Weight reduction with 1,14 sg KCl brine requires large volumes to have effect.
-The mud from shore should have a highest possible KCl concentration (>140 kg/m3)
- The KCl concentration should be initially 160 kg/m3 when displacing to Glydril.
- Glycol concentration should be rapidly increased to 4 % and kept at this level throughout the section.
-Some additions of Polypac ELV and Hibtrol may be necessary both to inhibit cuttings (Polypac ELV) and lowering the API fluid loss.
-The 3 rpm readings were increased from 7-10 to 14-15 after sand free Hordaland performing good hole cleaning.
- The cutting quality/inhibition was overall very good. No tendency was ever seen that cuttings tended to stick to the shaker screens.
All the cuttings from start to TD showed to be firm and dry inside.
-Sticky cuttings or cuttings that lumped together was never seen at the shakers, this indicating an excellent cutting inhibition with the chosen mud parameters.

Section Data

	Planned	Actual
Meter drilled	1255	1380
Maximum angle		69
Casing size	13 3/8	13 3/8
Depth Casing set		2662
Drilling Days		
Days on interval		
Dilution factor m3/m3:	6,00	
Mud Cost/mtr		
Mud usage: m3/mtr		

Drlg Fluid Composition

Additives	Programmed kg/m3	Actual kg/m3
Barite	688	435
KCl-brine	0,545	0,687
Soda Ash	1,25	3,18
Duotech NS	4	3,23
Polypac ELV	12	19,2
Hibtrol	3	2,1
Glydril MC	40	16,6
Sod. Bicarb		
Citric Acid		
Defoam NS		
Am. Bisulph.		
KD-40		

Comments:

Reusage of Glydril mud: 243 m3
(Reusage =m3 from shore / m3 build mud)

Section **Mud Type**

Drilling Fluid Properties (design/actual)

C48S
12 1/4" **Versavert**

Programmed Properties

Depth m MD	MW sg	YP Pa	PV cP	10 s Gel Pa	10 m Gel Pa	100 rpm lb/100ft2	3 rpm lb/100ft2	HTHP ml	Stability Volts	Ex Lime kg/m3	WPS kg/m3	OWR	LGS kg/m3
2610							10	<3		8	105	75/25	
5100	1,65		alap	>5.5	<20	<35	13	<2 at TD	>600	10	125	80/20	<200

Actual Properties

2667	1,65	10	49	8	14	33	11	2.5	578	5.55	104.8	75/25	148
5105	1,65	17	58	10	16	36	15	1.4	910	6.29	125	78/22	172

Comments:
Total 506 m3 1.62 sg Versavert mud received from shore. 250 m3 of the mud was treated with new mixed premix and emulsifiers and lime to increas ES stability. Barite added to increase MW to 1.65. Prior displacment from WBO to OBM a 10 m3 fresh water pill and 10 m3 of high-vis / high weight pill were pumped ahead of the OBM.
The temperature at TVD was maximum 100 deg. C in this section. While drilling through the 12,25" the MWD measured 123 deg. C, this indicated that drilling generated +- 20 deg. C (due to inclination, well path and lithology). Temperature out in active mud system was +- 70 deg. C. Due to this we had to compensate for the expansion factor. The mud weight was adjusted according to chart that showed temperature as a function of mud weight. Mud weight in/out at 70 degrees C was 1,63 sg according to this chart.
Drilled this well with a 3 rpm at 11, increased 3 rpm to 12 at the end of the section to improve the hole cleaning.
Prior to pull out of the hole at TD the 3 rpm readings was increased to 15 by addition of 2 kg/m3 VG Supreme. Versavert F and Versatrol were added to decrease HTHP fluid loss from 2,5 mls to 1,4 mls prior logging.
Experienced after 3 days logging and 2 days liner running only a slight variation in the mud weight coming out of the hole from 1.62 sg to 1.70 sg when started to circulate. The highest readings is most possibly from the slug.
The 9 5/8" liner was ran in hole quite easy, and everything indicated a clean hole.
When circulated out excess cement, treated mud to remain in hole with VG-Supreme to achieve 3 rpm = 17 and excess Lime = 14 kg/m3. Sat RTTS packer at appr. 500 m. Displaced well above packer to treated seawater before leaving well 48 S for some length of time.

Section Data

	Planned	Actual
Meter drilled	2490	2443
Maximum angle	73,0	70
Casing size	9 5/8	9 5/8
Depth Casing set	5100	5104,5
Drilling Days		8
Days on interval		
Dilution factor m3/m3	3	3,9
Mud usage/mtr		
Mud Cost/mtr		

Drlg Fluid Composition

Additives	Programmed kg/m3 & l/m3	Actual kg/m3
Fine barite	1100,0	880
EDC 95/11	570,00	570
VersaVert PE	25	20.5
VersaVert SE	10	17.1
VersaVert F	5	5.5
Lime	19	27.3
VG supreme	**12**	8.9
Versatrol	12	13.1
CaCl2 brine		
Bentone 128	3	2,2
CaCl2	37	170

Comments:

C48S
8 1/2" **Versavert**

Programmed Properties

Depth m MD	MW sg	YP Pa	PV cP	10 s Gel Pa	10 mGel Pa	100 rpm lb/100ft2	3 rpm lb/100ft2	HTHP ml	Stability Volts	Ex Lime kg/m3	WPS kg/m3	OWR	LGS kg/m3
5100							10			8	105	75/25	
6840			asap	>5.5	<20	<35	13	<2	>600	10	125	80/20	<200

Actual Properties

5100	1,58 -	17 -	33 -	6 - 13	8,5 -	27 -	9 - 13	1 - 2,6	522 -	5,2 -	97,6 -	74/26 -	100 -
7393	1,60	33	60		12,5	43			1236	11,1	125	79/21	190

Comments:
Received and conditioned 194 m3 Versavert from town to optimize properties. An RTTS plug at 598m with water above and Versavert underneath was pulled.Drilled to 5174m and found dry gas. RIH with core and cored to 5208m. Continued drilling to 6057m, but lost signals from MWD and pulled out.RIH with new BHA and had seepage losses at 3505m. Reduced weight to 1,58sg. Drilled 8 1/2" hole from 6057 to 6715m and observed seepage losses. Losses stopped by reducing pumprate from 2100 to 2000 lpm. Drilled ahead to TD at 7393m.
RIH with TLC log on 5" DP and logged from 5109 m to 6412 m (took pressure points, CMR and ECD), got failure on MDT tool. Third attemt of logging was successful and pressure points and fluids and gas samples were taken.

Decided to set kick of plug and drill new side track to optimize oil production. Sat cement plug from 5400 m to 5060 m. Worked several days on DDM.
Ran in hole and drilled cement plug. Displaced to new modified Versavert mud with low concentration of VG-Supreme and Versavert F. Started to kick off into 48A well path.

Section Data

	Planned	Actual
Meter drilled		2293
Maximum angle	105	92,5
Casing size	7"	
Depth Casing set		
Drilling Days	8,1	9,6
Days on interval		50
Dilution factor m3/m3		4,2

Drlg Fluid Composition

Additives	Programmed kg/m3	Actual kg/m3
Barite	1,100	604,000
EDC 95/11	0,57	
VersaVert PE	25	24,8
VersaVert SE	10	11.9
VersaVert F	5	7.2
Lime	19	30,3
VG Supreme	12	10,0
Versatrol	12	12.1
CaCl2	37	
Bentone 128	3	2,0

Comments:
194 m3 at sg of 1,28 was received. Treated with emulsifiers/lime to increase emulsion, base oil to increase O/W ratio and barite to increase weight to 1,60sg. Active was treated with different premixes to maintain properties. Mud gelled up under static conditions/low temp. Need to shear/circulate surface active regulary HTHP was reduced below 1,5 mls in reservoir with Versavert F. Increased low end reading to 13 before logging.

Drilling Fluid Properties (design/actual)

C48A 8 1/2" — **Versavert**

Programmed Properties

Depth m MD	MW sg	YP Pa	PV cP	10 s Gel Pa	10 mGel Pa	100 rpm lb/100ft2	3 rpm lb/100ft2	HTHP ml	Stability Volts	Ex Lime kg/m3	WPS kg/m3	OWR	LGS kg/m3
5100							10			8	105	75/25	
6840			asap	>5.5	<20	<35	13	<2	>600	10	125	80/20	<200

Actual Properties

5120	1,57	18-	32-	6.5-9	9.5-	27 -	10-13	1.1-	1082-	6.3-	93-	74/26 -	105-
6221	1,61	26	44		13.5	36		1.8	1243	10.4	115	80/20	155

Comments:

Displaced well to new modified Versavert mud with low concentration of VG-Supreme and Versavert F.
The mud was mixed up of a mixture of 40 % Versavert from shore (13 kg/m3 Bentone 128) and 40% new mud mixed offshore (9 kg/m3 Bentone 128) and 20 % active mud from 48 S (2.5 kg/m3 Bentone + 8.5 kg/m3 Vg-Supr + 6 kg/m3 Versavert F).

Drilled and steered 8 1/2" hole from 5120 m to 5845 m where rotation stopped. Pull out to shoe to change AC motor on DDM.
Washed down from shoe to 5845 m. No response on MWD tool. Pumped 5 m3 premix and increased MW to 1.59 sg.
Increased rheology prior POOH to change MWD tool.
Ran in hole to TD with new assembly. Drilled to 6221 m, but lost communication with exceed tool, circulated hole clean and POOH.
Ran in hole with new assembly to 5970 m but got stuck. Reamed down to 6217 m. Attempted to increase pump rate, but packed off. Tried to ream down to TD but packed off several times. Lubricated out of hole and slip and cut drill line while circulating.

Decided to perform open hole side track from 5558 m. Increased MW to 1,61 sg.

Section Data

	Planned	Actual
Meter drilled:		1101
Maximum angle		
Casing size	7"	
Depth Casing set		
Days on interval		20
Dilution factor m3/m3		4,3

Drlg Fluid Composition

Additives	Programmed kg/m3	Actual kg/m3
Barite	1,100	774
EDC 95/11	0,57	
VersaVert PE	25	21.5
VersaVert SE	10	9.3
VersaVert F		1.65
Lime	19	25.8
VG Supreme		1.8
Versatrol	12	11.8
CaCl2	37	
Bentone 128	10-15	9.3

Comments:

The mud was mixed up of a mixture of 40 % Versavert from shore (13 kg/m3 Bentone 128) and 40% new mud mixed offshore (9 kg/m3 Bentone 128) and 20 % active mud from 48 S (2.5 kg/m3 Bentone + 8.5 kg/m3 Vg-Supr + 6 kg/m3 Versavert F).

C48AT2 8 1/2" — **VersaVert**

Programmed Properties

Depth m MD	MW sg	YP Pa	PV cP	10 s Gel Pa	10 m Gel Pa	100 rpm lb/100ft2	3 rpm lb/100ft2	HTHP ml	Stability Volts	Ex Lime kg/m3	WPS kg/m3	OWR	LGS kg/m3
5100							10			8	105	75/25	
6840			asap	>5.5	<20	<35	13	<2	>600	10	125	80/20	<200

Actual Properties

5608	1,61	15-	35-	6.5-8	8.5-	28-	9.5-	1.2-	964-	8.1-	109-	78/22 -	129-
5879		23	42		11	33	11	1.3	1201	9.3	122	79/21	137

Comments:
Attempted to kick of with new well path and succeeded after to days with time drilling. Kick off point was 5608 m.

Drilled and oriented 8 ½" hole from 5608 m to 5878 m. Problems with very hard limestone/ sandstone stringers which resulted in reduced ROP. Decided to set TD at 5878 m due to low progress in drilling speed.
Circulated hole clean and increased rheology before POOH.

Ran in hole with 7" liner. Circulated BU after 7" liner was set at 5877 m to thin mud in annulus. Continued to circulate out gas (Max gas:29 %). Cemented liner by pumping 15 m3 spacer and 16 m3 1.80 sg cement slurry. Displaced slurry with 79.3 m3 1.61 sg Versavert mud. Circulated out excess cement, got 52 m3 interface and spacer contaminated mud in return that had to be routed to slop pit. Flow checked well, slugged pipe and pull out of hole.
Made up wash assembly and ran in hole to 5072 m. Unable to get past 5072 m. POOH. Changed to a new drift sub.
Ran in hole with wash string. Displaced well to sea water by first pumping 10 m3 base oil and 10 m3 HEC pill as spacer followed by sea water. When first indication of baseoil was observed in mud return, the return from hole was routed to slop pit.
Pumped 320 m3 1.61 sg Versavert mud down to Nordmann Skarven and started to clean surface equipment.

Section Data

	Planned	Actual
Meter drilled:		271
Maximum angle		90
Casing size	7"	7"
Depth Casing set		4372
Drilling Days		4,00
Days on interval		10
Dilution factor m3/m3		3,50

Drlg Fluid Composition

Additives	Programmed kg/m3	Actual kg/m3
Barite	1,100	725,00
EDC 95/11	0,57	
VersaVert PE	25	21,4
VersaVert SE	10	9,3
VersaVert F		1,4
Lime	19	26,8
VG Supreme		1,6
Versatrol	12	12,3
CaCl2	37	
Bentone 128	10-15	9,5

Comments:

Received mud from previous 8 1/2" section with low concentration of Versavert F and VG-Supreme. No problems with viscous mud during tripping at low temperatures.

8.7 Cementing program

Well: **34/10-48-S / AT2**
Field: **Gullfaks**
Rig: **Gullfaks C**

CEMENT REPORT

HOLE		CASING SHOE		TOC	EXCESS	CEMENT SLURRY DESIGN										SPACER	DISPLACEMENT	COMMENTS
SIZE	TVD MD	SIZE	TVD MD	TVD MD		Components	Lead [ltr/100kg]	Tail [ltr/100kg]	Density [SG]	Yield [ltr/100kg]	Stat. / Circ. Temp [°C]	Thickening time [hrs to 30 Bc]	API Free Water [%]	API Fluid loss [cc/30min]	24 hrs C. S. [psi]		Fluids and Rates	
24"	1166	20" FR	1165	SB		Gascon 469	10,00	--	1,50 - L	141,63 - L	40/30	08:39 - L	0 - L	34 cc - L	500 - L			
section	1287	20" Casing	1282			HR-4L	2,50	0,80	1,90 - T	76,76 - T		04:15 - T	1,0 - T		2500 - T	30 m^3 of sea water	Sea Water 3000 lpm	
						Halad-344L	21,00	--										
L - GTGLF						NF-6	0,10	0,10										
T - MPT14					30% on L	Fresh Water	76,97	44,80										
17 ½"	1722	13 3/8" FR	1720	1281		Gascon 469		3,50	1,90	77,81	62/47	07:37	0	38 cc	2000			
section	2667	13 3/8" csg	2661	1650		CFR-3L		1,50								20 m^3 Tuned Spacer E+	WBM	
						Halad 600LE		1,50										
Slurry type		Gastight			25 %	HR-4L		1,10									3000 lpm	
GTT90						Halad-613LE		4,00										
Slurry 16 A						NF-6		0,10										
						Fresh Water		35,05										
12 1/4"	2871	9 5/8" FLR	2871	2050		SSA -1 (BWOC)		35%	1,90	102,27	123/96	07:30	0	42 cc	1800			
section	5105	9 5/8" liner	5105	3277		Gascon 469		5,00								20 m3 Tuned Spacer E+	OBM	
					Caliper	SCR-100L		3,60									2500 lpm	
Slurry type		Gastight			10 %	Halad-600LE+		6,50										
GTTTZ						NF-6		0,10										
						Fresh Water		42,70										
KOP	2871	KOP		2850		SSA -1 (BWOC)		35%	2,00	97,67	127/115	08:15	0	NA	3700			
	5400		NA	5060		Microsilica L		16,00								8 m3 Tuned Spacer E+	OBM	
Slurry type					30 %	SCR-500L		4,90									1100 lpm	
PO slurry						CFR-3L		0,50										
						Halad-600LE+		2,50										
						NF-6		0,10										
						Fresh Water		29,31										
8 1/2"	2870	7" FLR	2845	TOL		SSA -1 (BWOC)		35%	1,80	125,49	125/115	07:57	0	40 cc	2000			
section	6221	7" liner	5877			Microsilica L		22,00								15 m3 Tuned Spacer E+	OBM	
					60 %	SCR-500L		5,30									1000 lpm	
Slurry type		Gastight				Halad-413L		10,00										
HTG80						NF-6		0,10										
						Fresh Water		43,72										

8.8 Completion schematic

8.9 Wellhead / TSR / X-tree schematic

9 Appendix 4: Contractors list (optional)

Service	Contract no	Contractor
Cementing	SAP4600002160	Halliburton
Drilling Fluids	SAP4600002159	M-I Drilling Fluids
Compl/sand contr. equip.	SAP4600003724	Roxar
Measurement While Drilling	SAP4600002711	Schlumberger
Directional Drilling	SAP4600002064	Schlumberger
Compl/sand contr. equip.	SAP4600002220	Camco - Schlumberger
Electric Wireline Logging	SAP4600002337	Schlumberger
Compl. fluid/Pumping	SAP4600002161	BJ Services
TCP Equipment	SAP4600004034	Schlumberger
Rig Operations	DTJ007304	Prosafe Drilling Services
Wireline	SAP4600004872	Aker Kværner Well Services
Directional survey	SAP4600005276	Gyrodata
Liner Hanger Equipment	SAP4600002689	Weatherford Norge AS
Mud Logging	SAP460002064	Schlumberger
Casing Crew Service	SAP4600003586	Prosafe Drilling Services
Plug	PI Intervention Dummy	PI Intervention
Rig Operations	SAP4600006200	Smedvig

Contact person	Company	Service	Telephone
Svein Grimen	Prosafe Drilling Services	Drilling Contractor	
Ketil Hartveit	Smedvig	Drilling Contractor	
John Peter Robertson	Schlumberger	Directional Drilling, MWD/LWD Mudlogging	
Tore Bjerga Håland	MI	Drilling Fluids	
Stig Ole Koppen	Halliburton	Cement	
Karl Gerhard Longvastøl	Weatherford	Liner hanger systems	
Erland Sæverhagen	BHI	Dirctional Drilling	
Arne Kvamsdal	SDBS	Bit	
Vegard Dale	Huhges Chistensen	Bit	
Lars Haugom	Smith Bits	Bit	
Tor Jørgensen	Schlumberger WL	Logging	
Jan Ove Steinsland	Gyro Data	Directional survey	

10 Appendix 5: Distribution list (optional)

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