# DRILLING COMPLETION REPORT

# WELL 6404/11-1 Havsule

Document No.:

COPY NO.:

THIS DOCUMENT MUST NOT BE PHOTOCOPIED.
ADDITIONAL NUMBERED COPIES MAY BE ISSUED
UPON APPLICATION TO BP.

| | |
|---|---|
| Prepared by: | Approved by: |
| ..... | ..... |
| Rolf Tapper | Richard W. Harland |
| Sr. Drilling Engineer | Deepwater Drilling Project Manager |
| Reviewed by: | Authorised for Issue by: |
| ..... | ..... |
| Tracy Mosness | Sam Johnson |
| Drilling Manager | Havsule Project Manager |

**Distribution List**

| Copy Holder | Copy No. | Comments |
|---|---|---|
| Norwegian Petroleum Directorate | NA | Drop Box to Logtek |
| Norske Conoco | 1 | 1 hard copy & 1 pdf.file |
| TotalFinaElf | NA | No hard copy & 1 pdf.file |
| Petoro AS | 2 | 1 hard copy & 1 pdf.file |
| Central Library | 3, 4 | 2 hard copies & 1 pdf.file |
| Well file | 5 | Original |

# TABLE OF CONTENTS

# 1 GENERAL DATA

## 1.1 Well Data

| | |
|---|---|
| Well No. | : 6404/11-1 |
| Prospect | : 6404/11-1- Havsule |
| Licence | : PL 254 |
| Well Classification | : Exploration |
| Rig | : Scarabeo 5 (Semi Submersible) |
| Seabed co-ordinates (spud – pilot hole) | : 64 deg, 10 min, 10.99 sec N |
| (ED50, Int. 1924 Intern. Spheroid) | : 04 deg, 21 min, 36.92 sec E |
| Seabed co-ordinates (re-spud) | : 64 deg, 10 min, 11.91 sec N |
| (ED50, Int. 1924 Intern. Spheroid) | : 04 deg, 21 min, 36.65 sec E |
| UTM Zone 31 | : 7 116 837.6 mN, 566 124.4 mE |

## 1.2 Target

| | |
|---|---|
| Primary Target Type | : Turbidite sandstone with 4-way dip closure.<br>Early Eocene T50 (Tare Fm?)<br>Turbidite sandstone with 4-way dip closure.<br>Maastrichtian K90 (Springar Fm) |
| Secondary Target Type | : Turbidite sandstone with 4-way dip closure.<br>Coniacian K72 (Lysing Fm) |
| Target Locations Co-ordinates | : Same as Surface Location |
| Seismic Lines | : RHD99 3D Survey. Inline 3063, Xline 4182. |
| TD | : 3650m MD (BRT)<br>: 3649.7m TVD (BRT)<br>: 3624.7m TVD (MSL) |
| RTE Elevation (Scarabeo 5) | : 25.0 m |
| Water Depth | : 1495.0m (MSL) |
| RTE to Sea Bed | : 1520 m (MSL) |

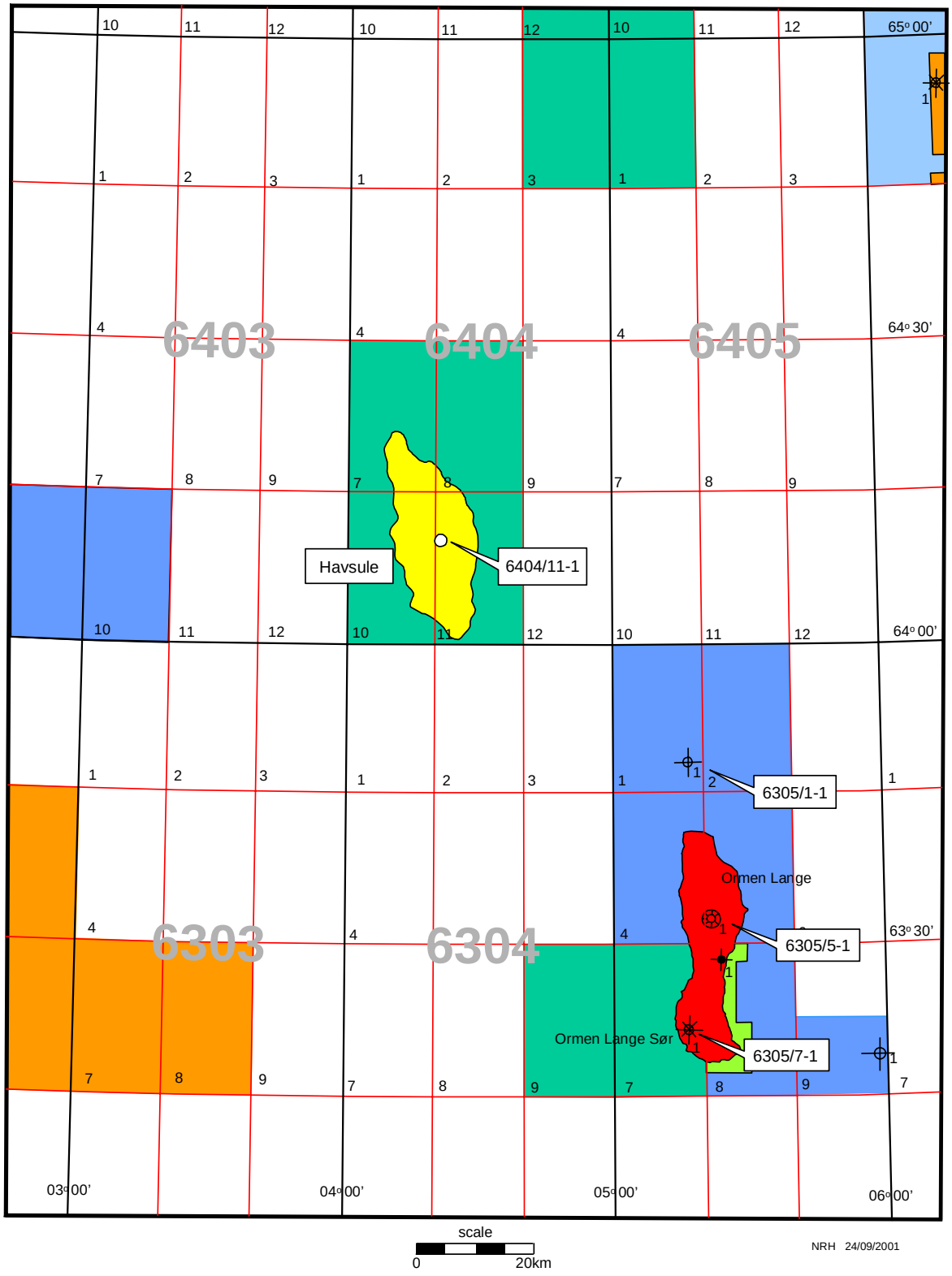
| Licence Interest: | |
|---|---|
| BP Amoco | 35% (Operator) |
| Petoro AS | 25% |
| Norske Conoco | 20% |
| TotalFinaElf | 20% |

## 1.3 Drilling Time

| | |
|---|---|
| Rig on Contract | : 19:00 hrs on 14.11.01 (Start transit from Snorre to Florø) |
| Rig in Florø | : 12:00 hrs on 16.11.01 (Start anchor handling) |
| Rig sail to location | : 13:00 hrs on 23.11.01 (Start transit to Florø pilot station) |
| Operations commenced | : 15:00 hrs on 24.11.01 (Rig on Havsule location) |
| Spud date (Pilot hole) | : 22:00 hrs on 01.12.01 |
| 2nd Spud | : 15:30 hrs on 06.12.01 |
| Drilling Ended (at TD 3897m) | : 02:45 hrs on 20.02.02 |
| End of TD logging | : 15:30 hrs on 22.02.02 |
| P&A and Rig Release | : 22:00 hrs on 10.03.02 |
| Total rig days | : 116,13 days (inclusive 2 days working for N.H.) |

| | |
|---|---|
| Estimated Final Well Cost | : 396 million NOK |
| Dry Hole AFE to 3500m | : 199.4 million NOK |
| Supplement AFE | : 197.0 million NOK |

## 1.4 Area Location Map



## 1.5 Casing and Well head Data

| Size (inch) | Weight (lbs/ft) | Grade | Connection | Casing shoe depth (m BRT) |
|---|---|---|---|---|
| 36" x 30" | 310 | X52 | SL 60 | 1622 |
| 20" | 133 | X56 | E60 MT | 2170 |
| 13 3/8" | 72 | L-80 | New Vam | 2443 |
| 9 5/8" | 53.5 | P110 | New Vam | 2728 |

The wellhead used was a Dril-Quip SS15 Universal well-head furnished with rigid lock down feature. The wellhead and BOP was fitted with a ABB Vetco H4 HD connector ("AX"-type).

The 36" well-head housing extension (approx. 18 m long) had a wall thickness of 1.5" (553 ppf) whereas all other conductor joints had a 1" wall thickness. A Titus cement grouting system was utilised for cement top up.

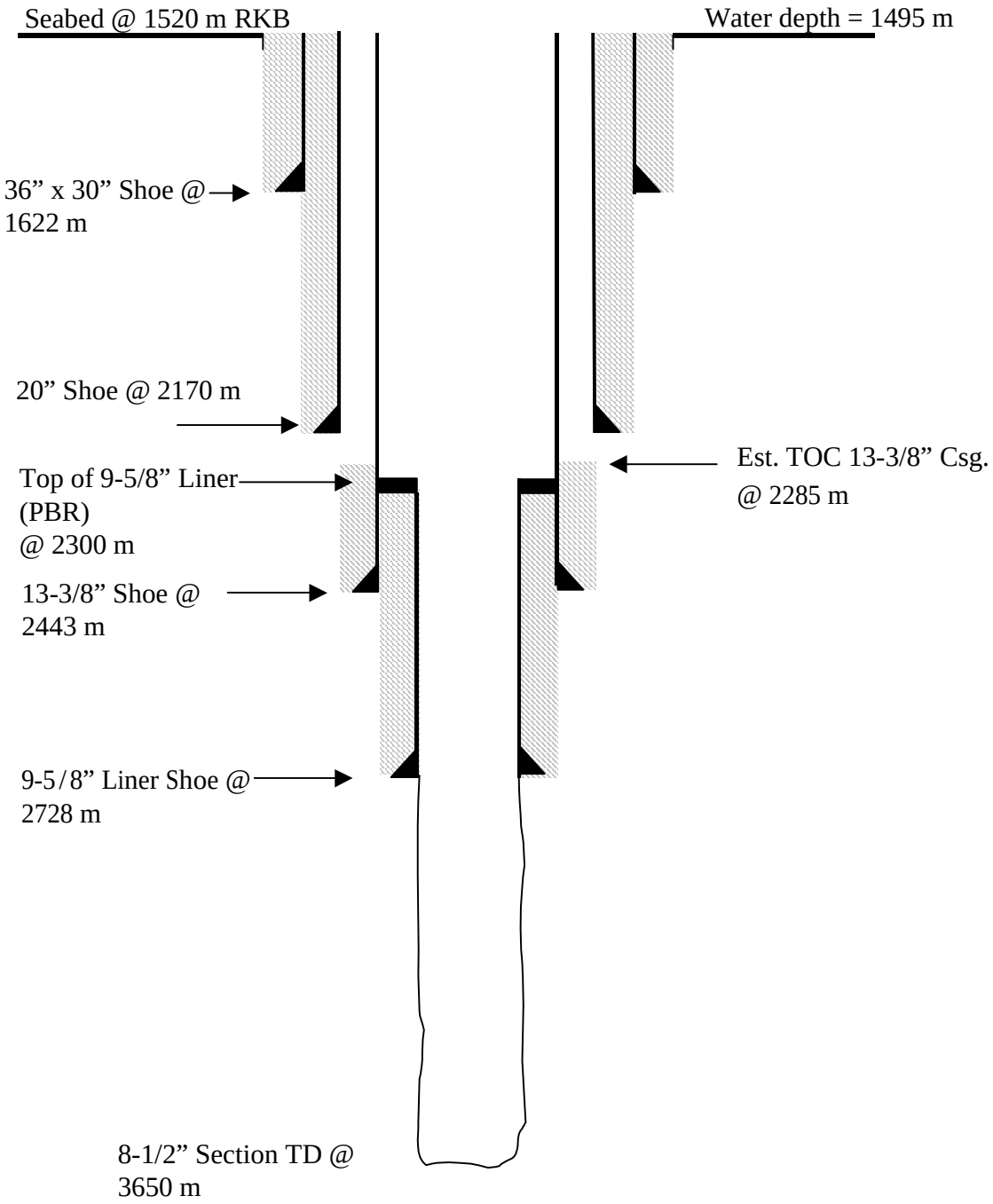
The 9 5/8" liner was set at 2728 m putting the top of the PBR at about 2300 m.

## 1.6 Well Data

| Hole Section | Depth (mBRT) | Fluid | Casing Size | Casing Depth (m BRT) |
|---|---|---|---|---|
| 36" x 42" | 1628 | SW/bentonite | 36" x 30" | 1622 |
| 26" | 2175 | SW/bentonite | 20" | 2170 |
| 17 | 2449 | KCL/ Polymer | 13 3/8" | 2443 |
| 12¼" | 2730 | Aquadrill Deepwater | 9 5/8" | 2728 |
| 8½" | 3650 | Aquadrill Deepwater | None | |

## 1.7 Well Bore Diagram

(All depth references are to Rotary Table elevation = 25 m above MSL)



## 1.8 Primary Cementation

### Casing and Liner Cementation

| | | |
|---|---|---|
| Casing size | : | 36x30" Conductor |
| Type and density | : | Class G, 1.92 SG |
| Top of cement | : | Sea Bed |
| Casing shoe | : | 1622 m BRT |
| Volume & Excess | : | 565 bbls ( 300%) |
| TITUS | : | 120 bbls |

| | | |
|---|---|---|
| Casing size | : | 20" Surface Casing |
| Type and density | : | DWFS-NC, 1.80 SG Surface / Foamed down to 1.38sg – Lead only pumped due to mechanical failure on cement unit. |
| Top of cement | : | Sea Bed |
| Casing shoe | : | 2170 m BRT |
| Lead Vol & Excess | : | 916 bbls (10 %) |
| Tail Vol & Excess | : | Not pumped |

| | | |
|---|---|---|
| Casing size | : | 13.3/8" Surface Casing |
| Type and density | : | Class G, 1.92 SG – Tail only |
| Top of cement | : | 2285 m |
| Casing shoe | : | 2443 m BRT |
| Lead Vol & Excess | : | Not pumped |
| Tail Vol & Excess | : | 70 bbls (50 % ) |

| | | |
|---|---|---|
| Casing size | : | 9 5/8" Liner |
| Type and density | : | Class G 1.44 SG Lead / 1.92 SG Tail |
| Top of cement | : | 2300 m |
| Casing shoe | : | 2728 m BRT |
| Lead Vol & Excess | : | 110 bbls (Caliper + 10 % ) |
| Tail Vol & Excess | : | 23 bbls (Caliper + 10%) |

### Cement Plugs used for Well Abandoment

| | | |
|---|---|---|
| Casing size | : | PTA 1 |
| Type and density | : | Class G, 1.98 SG Plug |
| Cement plug | : | 2679 m - 2479 m |
| Plug Vol & Excess | : | 50 bbls (0%) |

| | | |
|---|---|---|
| Casing size | : | PTA 2 |
| Type and density | : | Class G, 1.80 SG DWFS Plug |
| Cemnt plug | : | 1765 m – 1550 m |
| Plug Vol & Excess | : | 228 bbls (0%) |

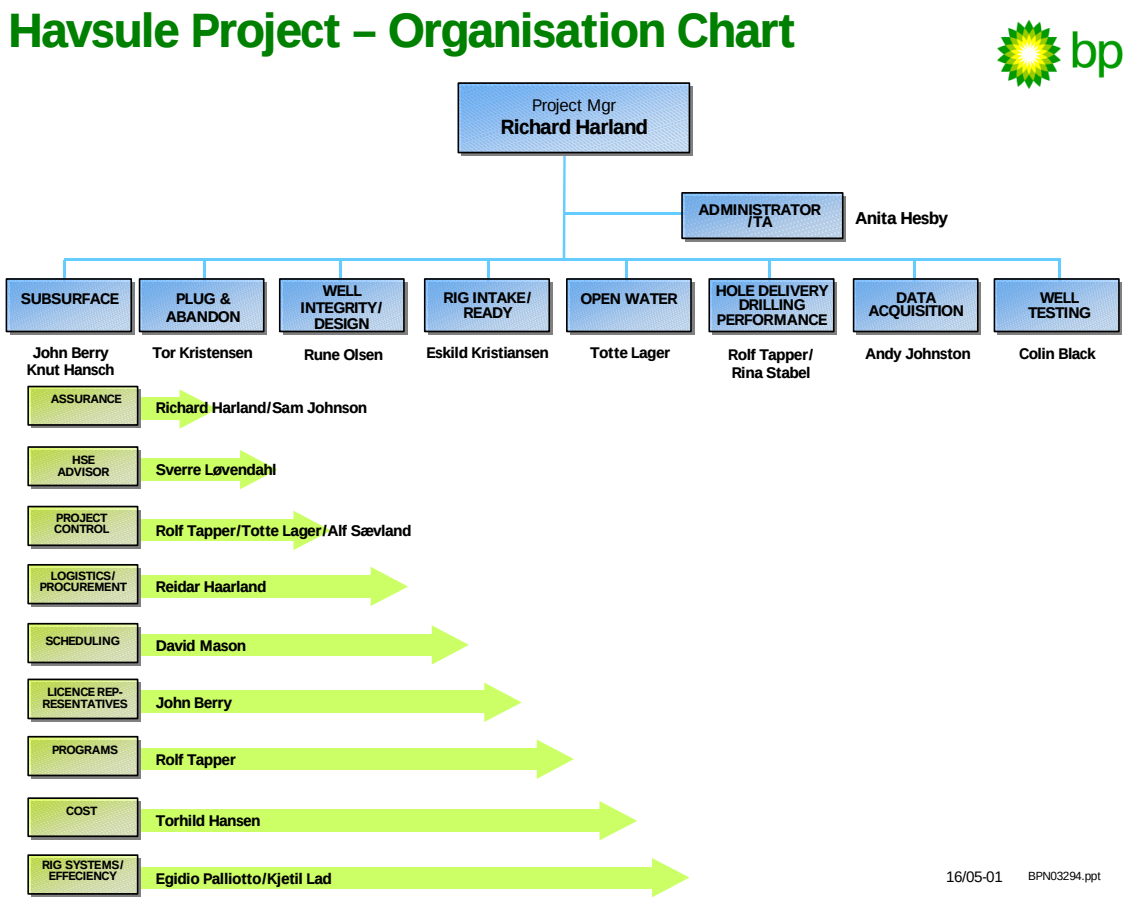
## 1.9 Mud Summary

| SECTION | 12 ¼" PILOT | 42"X36" | 26" | 17" | 12 ¼" | 8 ½" |
|---|---|---|---|---|---|---|
| **FLUID DATA** | | | | | | |
| Fluid system | SW / Hi-vis | SW / Hi-vis | SW / Hi-vis | KCl/Polymer | Aquadrill Deepwater | Aquadrill Deepwater |
| Mud weight (s.g.) | 1,05/ 1,20 displ. | 1,05/ 1,20 displ. | 1,05/ 1,20 displ. | 1,11 to 1,24 | 1,25 to 1,30 | 1,33 to 1,36 |
| Section Cost (NOK) | 325,587 | 109,568 | 370,875 | 1,470,462 | 2,437,833 | 667,399 |
| Engineering Cost (NOK) | | | | | | |
| Cost of Transport loss (NOK) | 15372,00 | -5124,00 | 7080,00 | 7785 | 0 | 0 |
| Spill to environment | 0 | 0 | 0 | 0 | 0 | 0 |
| Down time due to drilling fluid (hrs) | 0 | 0 | 0 | 0 | 0 | 0 |
| **SECTION DATA** | | | | | | |
| Section Start (m) | 1520 | 1520 | 1628 | 2175 | 2449 | 2730 |
| Section End (m) | 2195 | 1628 | 2175 | 2449 | 2730 | 3650 |
| Casing / liner (in) | | 36 / 30 | 20 | 13 3/8 | 9 5/8 | Not set |
| Casing / liner (m) | | 1622 | 2170 | 2443 | 2728 | " |
| Date completed | 3/12/01 | 9/12/01 | 16/12/01 | 28/01/02 | 9/02/02 | 05/03/02 |

- Cost of P & A programme: 40 320,16 NOK.

## 1.10 Project Organisation

A World Class Drilling Planning Process was used on this well, with the objective of delivering World Class Drilling Performance. The Team built an Organisational Structure that focused on the delivery of the well objectives with accountability assigned to the key process owners.



## 1.11 Contractor Data

| Service | Company |
|---|---|
| Mud logging | Geoservices |
| Directional Drilling | Drilling & Measurement Schlumberger |
| Coring | BHI |
| Directional tools (Motors, etc.) | Drilling & Measurement Schlumberger |
| Directional Surveying | Drilling & Measurement Schlumberger |
| LWD / MWD | Drilling & Measurement Schlumberger |
| Mud / Mud Engineering | BHI |
| Well-head / Conductors / 20" Casing | Dril-Quip |
| Well Positioning | Fugro Survey |
| Cementing | Halliburton |
| Casing running | ITM / Weatherford |
| Weather | Ocean Routes, Storm Weather |
| Sea Current Monitoring | Fugro GEOS |
| Liner Services | Weatherford/Nodeco |
| Bit Selection | BHI Oasis |
| Drill Rental Equipment | Weatherford Rental |
| Electric Wireline Logging | Schlumberger WL |
| Drilling / Rig Contractor | Saipem |
| Fishing, Milling, Hole opening | Weatherford |
| ROV | Oceaneering |
| Plug and Abandonment | Weatherford |
| Helicopters | CHC Helikopter Service A/S |
| Standby Vessel | K/S Rovde Shipping A/S |

# 2 HOLE SECTION SUMMARIES

## 2.1 Rig Mobilisation / Florø Stay

The semi-submersible rig "Scarabeo 5" went on contract to BP in the Snorre Field at 1900 hrs, November 14, 2001. The plan was to sail the rig to Florø to undergo some rig modification work, and change out the 5000 psi BOP with a 15000 psi BOP which is utilized for exploration drilling in deep waters.

During transit from Tampen a total of 16 hrs were lost due to the weather, and an additional 8 hrs were spent in sheltered waters waiting for daylight prior to proceeding into Florø harbour. Five anchors were run and rig heading was 300 degrees.

The main activities in Florø preparing the rig for the Havsule well operations consisted of the following;

- Backload Norsk Hydro equipment and load spud equipment, 30" conductor joints, 20" surface casing, and wellhead joints
- Finalize LWD / MWD as well as new pit sensor installations including cabling
- Install Oceaneering's back-up ROV system
- Repair cylinder for Crown Mounted Compensator system
- Install and test link tilt and rotating head on the Varco top drive
- Install new and longer MUX cables and prepare BOP.

"Scarabeo 5" left Florø at 1300 hrs, November 23, 2001. The total time spent in Florø and including rig transit was 8.8 days (210 hrs), compared to the initially planned 5 days (120 hrs). Out of this BP was responsible for 6.3 days (151.5 hrs). The extra time spent was caused by added work scope, general delays in work progress, and waiting on weather.

## 2.2 Rig Move / Prespud Operations

The Transit from Florø to Havsule location took 26 hours, and additional 5.5 hours were spent on positioning and ballasting of the rig at location. Then, the rig went through DP system failure mode tests (DP trials) and black out tests. Including deploying, testing and troubleshooting of the ROV and subsequently laying out transponders, this required 5 ½ days (134.25 hrs) prior to RIH with spudding assembly.

See below time break down.

| Description | Duration |
|---|---|
| Transit from Tampen towards Florø | 5 hrs |
| Waiting on weather 40 nm outside coast | 16 hrs |
| Continued towards Florø | 9 hrs |
| Stopped inshore Frøysjøen, waiting on daylight for harbour entrance | 8 hrs |
| Continued to location in Florø | 3 hrs |
| Ran anchors with Havila Crown and Far Senior | 7 hrs |
| Florø activity incl. Waiting on weather, see separate report. | 153.5 hrs |
| Pulled anchors with Far Senior and McNee Tide | 8.5 hrs |
| Transit from Florø to Havsule location | 26 hrs |
| Position and ballast rig | 5.5 hrs |
| Total | 241.5 hrs |
| DP system failure mode tests/black out tests/transponder pos. | 134.25 hrs |
| Total | 375.75 hrs |

Table 2.1 Description and duration of rig transit from Tampen to Havsule, incl. WOW.

### 2.2.1 Deployment of Transponders / LBL Array

The operation was planned carried out efficiently using a pre-manufactured transponder basket. However, the operation was delayed of following reasons:

- transponder floating elements were slightly bigger than the basket was designed for (transponder sizes varied also).
- the design of the basket did not account for the lifting bridle and the limited lifting height in the moonpool (including lifting the basket above the moonpool trolley) leading to difficulties launching the basket with all transponders loaded
- transponders, including anchors, were suspended on the outside of the basket further making the transfer into the sea difficult.

At seabed the operation was delayed due to difficulties to track the ROV at seabed, due to malfunctioning mini-HiPAP transponders, both on the ROV vehicle and cage. However, the mini ROV Nav on the ROV (used as transducer for the well positioning system) was used instead, and allowed the operation to proceed.

The ROV suffered several problems further delaying the operation:

- leaking valve package in the main ROV system (Magnum 37)
- wrong ballast on the ROV
- operator failures in preparing the back-up ROV system (Magnum 63) winch for operation
- operator failure in launching the transponder basket on pod-line reel to seabed – leading to the main ROV umbilical and podline reel entangling, causing a difficult recovery operation.
- problem in data link from vehicle to ROV control cabin.
- the back-up ROV was not equipped with the equipment required to position the well (mini ROV Nav) and hence was not considered a full fledged back-up solution for this part of the operation.

These problems combined with very rough weather, stopped the deployment and retrieval of the ROV's when the problems were encountered, and caused major delays in positioning of the tranpsonders.

The operation was carried out prior to and in preparation for the DP trials.

**Lessons learned:**

- The rig's ROV system should be fitted with a deployment system for winter conditions, i.e. that allows the ROV to be launched and retrieved at least with the same weather limitations as for drilling
- Transponder basket / new equipment must be tried out on the rig before use
- Work lines used to run equipment to seabed MUST be fitted with a deadweight approx. 20 m above the end of the line, such that the line is always in tension – even after the suspended weight is landed on the seabed and released from the work line.
- Back-up ROV system must be test dived / dry run to its' operational water depth before considered operational. This time both the winch and the ballast caused problems.
- Ensure that all equipment is rated for maximum water depth, i.e. buoys deflated and new ones were ordered.
- ROV not neutral at depth.

### 2.2.2 Well / Rig Positioning

Prior to the rig arriving the location, and whilst collecting drop cores from the area – in august 2001 – five LBL transponders were pre-installed at the location. These were used together with the DGPS system to place the rig as it arrived at the well location.

The rig and the well were positioned based on two different LBL systems, with separate transponders run concurrently, see 2.2.1 above. The rig used 7 transponders, and the LBL system for the well positioning used 5, where 3 of the pre-positioned transponders were reused, and another two were installed.

The rig was positioned and spudded within 1,5 meters of the target identified. It was further marked, using a SSBL transponder and three (only two marker sticks were planned) marker sticks, positioned around the well. Rig heading was 240 degrees.

Whilst running transponders, positioning of the rig and performing DP trials, the following SIMOPs were performed:

1. Laying down 3 ½" DP from the setback area and pick up 6 5/8"DP
2. Restring the block to 14 lines
3. Mix bentonite slurry for the tophole sections and mixed kill mud
4. Made up the 30" housing running tool to a stand of drillpipe.
5. Made up cement stand, pressure tested and racked back same in derrick
6. Inspected and prepared the 30" conductor for running.
7. A seabed survey was performed by the ROV.
8. The ADCP (sea current measurement system) were installed – both the seabed unit and the surface unit.

### 2.2.3 Mud, drillpipe and BHA

Ample time was available to make up not only the pilot hole and top hole assembly, but also the 26" hole assembly. Hence, mud, drillpipe and BHA's for the first hole sections was available at time of spud. There was still, however, some surplus 5" DP left in the derrick.

## 2.3 Surface Hole Section

### 2.3.1 Drill 12 ¼" Pilot Hole Section

The well was spudded on the 1st. December 21:30 hrs. following waiting on weather, final DP FMEA (failure mode effect analysis) trials and a pre-spud meeting, where the drilling plan, the DP emergency procedures, and shallow well control procedures were reviewed with the on-shift crew. A shallow gas drill was also carried out. The water depth confirmed @1495 m (1520mRKB).

The drilling parameters used for the entire section were:

| Drilling Parameter | Value |
|---|---|
| WOB (Tonnes) | 1 – 7.5 |
| RPM | 115 – 135 |
| Flow (lpm) | 2400 – 2720 |
| Average ROP (m/hr) | 16 (42 hrs, 675 m) |

Sea-water was the primary fluid used whilst drilling the section, and pumped two each 5 $m^3$ hi-vis sweeps on every stand to remove any cuttings build ups. A 30 $m^3$ hi-vis pill was circulated at section TD at 2195mRKB, before the hole was displaced to 1.2 s.g. mud. Max. recorded ECD at TD was 1.08 sg.

The pilot hole was drilled with drilling parameters as planned.

The data acquisition programme was fulfilled with good results.

No shallow gas was observed, and the hole was in good condition on the trip out.

Time spent on the section exceeded the plan by approx. 22 hrs, mainly relating the efforts to reduce building tendency of the hole – reaming every stand, and to include the pre-spud meeting and drills prior to spud that was not included in the execution plan. Also 3hrs NPT time waiting on ROV is included. The section was also drilled in heavy weather – in border line of advisory condition.

The strategy of using a "low flow" LWD tool was successful, as it gave good data, even with low flow, combining both the needs of drilling and data acquisition.

For future wells where a hole is left to be re-stabbed in open water it is a good idea to displace the last few meters of the hole below the seabed with seawater. This will give the ROV a better view of where the hole is when re-stabbing, as water will differ from the surrounding seabed characteristics, and show a dark spot.

### 2.3.2 Drill 36" Hole Section

The 36"x 42" hole opening assembly was lowered and stabbed into the pilot hole assisted by the ROV. The three spud markers were moved away from the hole as planned. The hole section was completed at 2628 m after severe drilling and reaming to keep hole angle down, and tight hole and possible boulder beds at 1555, 1560 and 1565m. Check surveys were taken very frequently – almost every single drilled. The operation was carried out in heavy weather with up to 7 m significant wave height, 3.5 m rig heave and the rig moving out of position.

The visibility 1-2 m around the hole was very poor after the hole section was finished. This was caused by the lower than anticipated seabed current.

The drilling parameters used were:

| Drilling Parameter | Value |
|---|---|
| WOB (Tonnes) | 4 – 5 |
| RPM | 71 |
| Flow (lpm) | 4100 |
| Average ROP (m/hr) | 7 (108 m in 15.5 hrs, excluding reaming) |

This section was drilled with seawater and 10m3 hi-vis bentonite sweeps pumped every single. A 30 $m^3$ hi-vis pill was circulated at section TD, and circulated out prior to displacing the well to 1.2 sg mud.

**Lessons learned:**
The hole section was drilled with a hole size of 42" at the top (to 20m below seabed) and a 36" x 17 ½" HO assembly to TD in one run.

The use of a pre-made BHA lead to less handling of BHA components on the drill floor.

The Mini ROV Nav and the well position LBL array were very useful in sorting out problems with drill string angle above seabed.

The Anderdrift tool worked very well, but has a limitation as it do not give azimuth data.

The rotary BHA worked well, and managed to take all the beating whilst the hole was reamed back to a vertical shape.

Inclination surveys were initially not possible to read, due to high deviation from start. This was either due to boulders, which deflected the BHA, or due to the drill string not being stationary above the hole whilst stabbing in, and a rig position which created an angle when the 17 ½" bit tried to follow the pilot hole.

A high precision Anderdrift tool, showing maximum 2.5° angle – in steps of 0.25 was used. This lead to the assumption that the Anderdrift tool after starting the hole section did not work. Time was spent sorting this out, when it later was found out that hole angle was +3 degrees, and which could not be seen with the tool that was used.

A lot of time was spent trying to reduce the angle in the bottom part of the hole section, which was not really necessary, as the critical part of this hole section was the first 20 meters. Any angle correction could have been handled more efficiently in the next hole section.

Due to the low visibility it was decided to move the spud markers closer to the well. One of the spud markers, equipped with a steel plate instead of a concrete dead weight, was then accidentally dropped into the well. It was the decided to re-spud the well as the steel plate could possible cause severe problems. On this occasion two errors were made; using a non-drillable weight, which was against the plan, and secondly deciding to move makers closer to the wellbore.

In order to reduce the building tendency, it is advisable to keep BHA assembly stable above seabed and take an inclination check survey before stabbing in. The BHA is very heavy and even in severe sea current it must be assumed that the BHA is vertical above seabed. Adjust rig position until BHA is vertical and stable above hole.

Consider using an Anderdrift tool with max angle of 5 degrees.

Deviations from plans, such as moving the marker buoys, must go thought a proper "management of change procedure" in order to understand the issues behind specific recommendations made.

### 2.3.3 Re-spud Drill 36" Hole Section

After it was decided to re-spud the well, the BHA was pulled to surface to inspect the two-stage 26" x 36" hole openers. It was decided to change out the hole opener assembly due to cone wear.

Simultaneously a new spud position had been picked approximately 27 m NNW of the original spud position (along the prognosed faults in the lower part of the 26" hole section), allowing some distance away should communication at top Brygge A be initiated between the new hole and the original well.

The seabed was also on this location very soft, and one seabed sandbag marker disappeared. Visibility above the mud cloud was very clear, and new seabed markers were positioned around new well location.

This time a check survey showing 0 degrees, was carried out with the Anderdrift tool, whilst the BHA was hanging steady in open water above the seabed. The hole was drilled to same depth with small angle at the top of 0.25 degrees, increasing to 1.5 degrees at 1566 m, assumed to be caused by boulders from 1544 to 1561 m. Tight spots (boulders?) necessitated controlled drilling and reaming to section TD at 1628 m (36" HO at 1621.5 m).

The same drilling parameters and drilling fluid was used for this section as for the first hole. Effective ROP (average, excluding reaming) was almost the same at 7.4 m/hr (108 m in 14.5 hrs).

Operation was halted once due to a DP alarm, which re-set itself after a short time. No loss of position or DP Integrity.

It was decided to wiper trip the hole primarily to ensure that the section that had been identified as tight was reamed open.
Survey at TD of hole showed 1.75 degrees. Pumped out of hole w/ 1900 lpm, simultaneously displacing the hole to 1.20 sg mud.

Prior to racking the BHA back in the derrick and preparing for running the conductor, the rig went into Yellow Alert status, after struck by heavy weather and rig heave from 4 - 7 m.

Hole section drilled without major problems, almost following the original timing of the execution plan.

No major low-lights on this section, except that some reaming and wiper trip was found necessary to keep hole vertical and open.

The well position LBL system again proved to be very useful in placing the new well and guiding the drill string/ rig positioning operations.

### 2.3.4 36” x 30” Conductor Running

The conductor operation was carried out according to plan, with 30” conductor run and installed on bottom. Conductor stick-up was estimated to 3 m, with the 30” conductor shoe at 1622 m. Conductor shoe was stabbed into hole w/o having to move the rig.

Handling of the Hydrate plate in the moonpool could be improved, with “overside” work and work under hanging load having to be performed.

The lower TITUS hose was too short which led to some strain on the system components.

### 2.3.5 36” x 30” Conductor Cementing

The cement job was also carried out almost to plan. However, due to logistical problems the class “DWFS” type cement that initially was planned for was replaced by normal “G” cement, and different chemicals to compensate for the low temperature. This special “low-temperature” cement blend is rarely available in Norway and could not be mobilised in time.

The operation went very well; 16 $m^3$ of dye marker was pumped first, followed by a 90 $m^3$ 1.92 sg. G-neat cement slurry, which again was displaced by sea water at 1400 lpm. Floats were holding and no leaks at the running tool (CART) was observed. The TITUS dart was dropped and the circulating valve was opened. Water was pumped through the system whilst the rig was re-positioned to attempt lowering the wellhead angle. The conductor was eventually cemented with a Top-up cement job through the TITUS system (19 $m^3$ of G-neat slurry). Whilst waiting for the cement to set up the upper TITUS hose was disconnected and the hydrate plate was cleaned by pumping seawater. A 1.25 $^0$ bull eyes reading on the Hydrate plate was eventually achieved – well inside the criteria that was established for the well.

## 2.4 26” Hole Section

### 2.4.1 Drill 26” Hole Section

In preparation for running the 20” casing the remote operated cement head was made up, pressure tested and racked back together with the 18 3/4” wellhead running tool.

The 26” BHA had been designed to utilise some of the same components as the 36” HO assembly in order to minimise BHA timing. A slight change in the plan was also suggested for the 26” hole section – including a mud motor in the BHA to be able to steer the new hole away from the first and ensure it remained within the small target box that have been identified for the section TD just above Brygge A. The hole section was also suggested to be shortened based on interpretation of the LWD data for the pilot hole that suggested that formation tops could come in 40 m higher than prognosed. Hence, to ensure that this hole was not drilled anywhere near the first hole the new hole section TD was decided to be 40 m shallow.

The BHA was run down and stabbed into the hole assisted by the ROV. Firm cement was tagged 6 m inside the 30” conductor shoe.

The hole section was drilled in rotary mode, and no correction using the mud motor was necessary. A slight hole angle build up in the opposite direction of the first hole was seen, but still well inside the top Brygge target box.

The drilling parameters used were:

| **Drilling Parameter** | **Value** |
|---|---|
| WOB (Tonnes) | 5 – 15 |
| RPM | 80 |
| Flow (lpm) | 4000 |
| Average ROP (m/hr), | 20.5 (26.75 hrs, 549 m) excluding reaming, wiper trips and flow checks |

Sea-water was the primary fluid used whilst drilling the section, with 15 - 20m$^3$ pre-hydrated bentonite pills (hi-vis sweeps) pumped every 15 m to remove any cuttings build ups. A check survey was taken every half stand. A 30 m$^3$ hi-vis pill was circulated at section TD, and the hole displaced to 1.20 s.g. mud. A wiper trip across what was thought to be a boulder bed between 1897m – 1925m was also carried out.

Before pulling out of hole a flow check using the ROV and Sonar was carried out. A possible water flow with associated gas was observed coming from the hole. Tripped to TD of the section and displaced the hole to 1.20 sg mud (two hole volumes) at 4000 lpm. Flow decreased, and time was taken to mix another 350 m$^3$ of 1.20 sg mud. Pumped OOH whilst circulating 1.20 sg mud at 3800 lpm, 2000 psi pump pressure and 3 min/ stand, and the well was confirmed stable. The flow was probably caused by performing a wiper trip without sufficient mud weight in the hole.

Formation sampling using the ROV was not successful at all. Almost nothing was collected in the cans and in the future a more reliable system must be built.

The flow check procedure in this hole section is not good enough – it masks the “gas”.

Whilst going into the hole on a wiper trip it must be weighted mud in the hole to ensure that ECD and hydrostatic overbalance is maintained.

### 2.4.2 Running 20" Casing.

The job was carried out much the same way it is normally executed, except for some major differences. The section was short, combined with a very deep water depth, meaning that the whole 20" string was run and on the landing string long before the shoe was stabbed into the conductor housing at the seabed.

Another difference from a "normal" 20" casing job, is the contingency 16" Liner hanger hang-off "No-go" shoulder that was run above the six lower most joints of the string. This resulted in that the next hole section could not be drilled with 17 ½" bit as usual, since the 16" supplemental adapter joint only has a drift diam. of 17.375".

The last major difference is that this casing wass run with a 18 ¾" wellhead which was pre-loaded into the 36" conductor housing, and a "heavy" housing extension (166.4 ppf) joint was used, whereas the rest of the string was a X-56 133 ppf string.

The casing was run with an average speed of 5.5 joints per hour, using the topdrive to fill every joint as it was run. The cement plug was installed as the rigid lock-down wellhead running tool was picked up to be installed on the wellhead. A 6 5/8" drill pipe was used as a landing string for the 20" casing..

The last two stands were washed down to prevent blocking the float in the event there was hole fill. The last stand took weight, up to 45 tonnes. The 20" casing was landed with the shoe at 2171 m.

The bulls eyes were inspected with the ROV, with no change in inclination being observed (1.25 degrees).

The running of the casing went very smooth, and more or less according to the execution plan, even though some precautions had to be taken not to provoke a flow from the well again. Hence, new displacement mud had been built, and circulated in whilst the 20" casing was run in hole and displacing out the 1.20 sg mud already in the hole.

Problems earlier that had been experienced by another operator with the Dril-Quip E-60/MT connections were absent.

### 2.4.3 20" Casing Cementing

The foam cement rig-up had been prepared and was ready by the time the cement job came up. Precautions and safety meetings with the crew were held to inform about the use of and risks associated with floating Nitrogen, which is used to create the foam.

The ROV was positioned next to the well head during the operation, observing the wellhead for any flow, and to give good indications of cement returns.

Water spacer, foamed spacer and main slurry were pumped according to plan. The foamed tail was cut short due to a problem with bulk supply. Pumped a total of 685 bbls of base slurry, estimated to 922bbls of 1.38sg foam slurry with 10% excess in open hole. It was decided to displace the cement before the bulk problem was resolved. Dropped dart and sheared plug with 3177 psi and with pumped volume spot on. Displaced the cement plug using rig pumps. Bumped plug with 500 psi, and pressure tested the 20" casing immediately to 1500 psi for 10 minutes. Observed wellhead with the ROV, but the well was static.

The running tool was released without difficulty and pulled to surface. The bullseyes were again checked and no change was noted (1.25 degrees).

The landing string was strapped on the way out and datum depth was confirmed to 1516 m.

Excellent preparations by and communication with Halliburton lead to a more or less spotless foam cement operation, where only a bulk supply problem at the end of the tail job created some concern. This included several Hazop meetings in the planning stage.

It was later found during the P&A that the foam cement had entered all small cavities in the wellhead system, indicating a very good cement job.

## 2.5 Run & Test the BOP and Riser

Whilst preparing for spud, drilling the top hole sections and installing the conductor and 20" casing, the BOP and riser systems were prepared to be ready in time for running. The main concern on the rig was to test the EQD sequence and required pressures, as well as the Re-coil system. Concern over the LMRP connector and pressures required to unlock it from the stack, required the LMRP to be lifted off the stack, and maintained such that release pressure was at an acceptable level. New BOP fluid was also circulated into the complete BOP control system.

Also the problem of getting all the 80 riser joints onboard safely and in time, had also been a major challenge for the rig team. However, one week of what can be regarded as an exceptionally calm weather for this operation, and preceding the BOP running operation had allowed all the risers to be onboard.

The running of the BOP stack started immediately following the 20" casing cementing job, cut and slip of the drill line, and L/D cement stand.
The riser was run with good progress until the BOP was at 482 m. Three slick joints were installed preparing for heavy weather, to allow for larger rig movements and clearance between the riser and the rotary. The WS Atkins Riser Analysis report did not account for a situation with hung-off BOP and riser and further analysis for such a situation was performed at such a shallow depth.

A period of four days (103 hrs) was spent waiting on weather to continue running the riser. A lot of maintenance work and preparations for upcoming operations were however carried out in this period. The riser joint that was hung-off in the spider had to be laid out afterwards, as it suffered damages during the WOW period, in particular to the conduit lines.

Operation continued with good progress down to 1230m, when problem to get the fill-up valve to work was experienced. Several attempts were made to sort the problem, but in the end the joint had to be laid down. Weather was again coming up, and preparations for another period of WOW started. This time, however, the riser was partly hung-off in the support ring and rucker lines, such that damages to riser joints through rotary could be limited, i.e. a soft hang-off. A total of 300 tonnes were hung off in the rucker lines and 170 tonnes in the block. WOW time was 82 hours.

When operation continued the riser handling gear was changed from 500 to 750 tonnes equipment. An attempt to make the Riser Fill-up Valve to work was made, but soon aborted. A change document was established that provided reasons why it could be accepted to run the riser without the riser fill-up valve.

Only 24 hrs more was required to run the BOP and install it on the wellhead.

BOP was landed, but problems were experienced trying to get a pressure test on kill line. Trouble shot same and got pressure test to 10,000psi. Whilst doing the connector test it leaked off at prior to reaching 2000psi and the BOP had to lifted off again. By checking with the ROV it was concluded that the reason for not achieving a pressure test was that a piece of the hydrate seal was found wedged between the ring gasket (sitting at an angle) and the wellhead. Further pieces of the hydrate seal were found in between locking segments of the BOP Connector. After several dives and adjusting tools the ROV managed to remove damaged seals and gaskets and installed new ring gasket on the wellhead. After another 10 hours waiting for the weather to come down, the BOP was reconnected, and a good pressure test was achieved.

Whilst preparing for the BOP test a BOP guidance bumper bar in the moonpool was accidentally extended and collided with the riser support ring. The bumper bar was bent upwards. However, even though the rig is moved away the bumper bar is still not clear of the support ring. A LMRP disconnect is consequently carried out, to minimise further damages on bumper bar and other critical equipment on the support ring.

The bumper bar was, however , repaired using the weight of the riser and LMRP to bend it back again. It could be retracted to its normal position and operation to test the BOP resumed.

The installation of the BOP and riser took a total of 15.6 days (375 hrs), which is approximately 11 days more than the execution plan. Waiting on weather was 7.7 days.

The riser/ BOP deployment study from WS Atkins was very useful when looking at conditions for running the riser. However, as it turned out some of the limitations in the report were not studied closely enough, and not really applicable as dimensioning for the deployment. WS Atkins, however, provided great support in adjusting and develop the deployment guidance when was required during the operation.

The riser was run without having to pull back and lay down any joints due to leaking main bore or service lines.

The start of the BOP running operation was very slow, and activities that could have been carried out in parallel turned out to be done on critical path/ rig time.

Too much time were spent to wait for stand-by boat assistance for "overside" work in preparations to recommence work after WOW time.

The hydrate seal on the wellhead connector either came loose or was not installed correctly, threatening the whole BOP running operation. It should be reconsidered whether the seal should be used in cases where a hydrate PGB shield is being run as well.Planning time must be assigned, for weather sensitive operations that will be carried out in winter time, to analyse work processes and identify limiting criteria, and what can be done to reduce the exposure of these operations/ work processes. This in order to change them or solve issues which makes them critical.

Tools must be available for safe hanging off the riser over periods with very heavy weather, and over an extended period of time. A special tool is available that allows the rig to pitch, roll and yaw, without exposing the riser for damages in the rotary area, such as a dedicated hang-off joint.

In cases where a hydrate shield is not being run (to prevent hydrates to enter the wellhead connector) the hydrate seal is crucial. It is important to inspect the position of the seal on a few occasions whilst running the BOP stack, especially if the operation drags on for an extended period of time. A theory is that heave and water movement in the connector have forced the seal out of its position.

The weight indicator showed extremely high weights in the hook just prior to landing the BOP, when the heave motions are accounted for (dynamic effects). This dynamic effect may have to be considered for future deepwater wells, and the capacity of the overhead drilling equipment may have to re-assessed

## 2.6 17” Hole Section

### 2.6.1 Drill 17” Hole Section

The predrill objectives for the hole section were:

- Drill section to ensure optimum setting depth of the 13 3/8” casing supported by formation strength – drilling to c. 2465mRKB to enable drilling next hole section to ca. 3500mRKB.
- 13 3/8” casing setting depth about 80m above top of T50 – Data acquisition requirement.
- Deliver a hole fit to run 13 3/8” casing in.
- Establish pore pressure trends.

Upper BHA components from above the MWD’s were designed identically with the 26” BHA in order to minimize the handling time.

A 17” Hughes Christensen GTX-C03 bit, which is an aggressive insert bit with sealed ball and roller bearings (IADC 415), was selected for this section. The bit was set up with 2x18, 1x20 and 1x14 vortex centre nozzles which gave a TFA of 0,9541 sq in.

At 1000 m a shallow hole test was performed in order to test the MWD/LWD tools.

Prior to drilling out the shoe the following well control drills were conducted:

- Kick whilst tripping drill – D1
- Diverter Drill – D3
- Stripping drill – D6
- Well kill drill – D5

During the stripping drill 2 stands of 6 5/8” drill pipe was stripped through the Upper Annular. For stripping 6 5/8” drill pipe 35 tons and 600 psi annular operating pressure were required. For the tool joints the requirement was 20 tons and 550 psi operating pressure.

The float collar was tagged at 2137 mBRT. Float and shoe track were drilled without any problems. After 6-7 m drilling the cement got firm. During the last 10m of the shoe track the well was displaced to 1,11 sg KCL/ polymer mud. Also the kill and choke lines were displaced to 1,11 sg KCL/ polymer mud. Continued to clean out rathole from 2174-2176 m, and drilled 3 m of new formation down to 2179 m.

Bottoms up was circulated once prior to conducting the LOT. The LOT was performed by pumping down both kill line and drill string using 1.11 sg mud. A leak off of 1.37 sg EMW was obtained.

Before drilling ahead the mud weight was increased to 1,13 sg. The kill and choke lines were displaced to 1,13sg glycol inhibited mud. Started drilling ahead from 2179m to 2281m using the following drilling parameters:

| Drilling Parameter | Value |
|---|---|
| WOB | 2-9 klbs |
| Rotation | 100-130 RPM Rotary and Bit |
| Pump Rate | 1000-1100 GPM |
| Avg. ROP | 10-40 m/hr |
| Pressure | 2520-2720 psi |
| Torque | 4-8 kft-lbs |

During drilling the heave was 3-6 m causing problems optimising drilling parameters. Continued drilling ahead to 2449 m and performed a dummy connection prior to circulating bottoms up. Had indications of gain in the active system during circulation. Closed in well and monitored well for pressure increase. Circulated well over kill line. Max gas seen was 1.4%, with a background gas of 0,5%. Opened the UA and performed a flowcheck on the trip tank – well static. Max gas recorded while circulating up riser was 3%. During circulation the mud weight was increased from 1.15 sg to 1.20 sg. Due to indications of increasing pore pressure the drilling was stopped and the section was TD-ed.

A wiper trip was made to the 20" casing shoe in preparation for severe weather and a potential disconnection. The well was displaced to 1,41 sg mud from TD to wellhead to obtain riser margin if the rig had to disconnect.

POOH with the BHA. Downloaded LWD tools and laid down same, the rest of the BHA was racked back in the derrick. Picked up a 17" wiper trip assembly and hang-off tool. Ran back in the hole with the new BHA and hung off same in the wellhead. Waited on weather for 69,5 hrs, including preparing and recovering from WOW.

When the weather conditions had improved the hang-off tool was recovered and a wipertrip was performed. At TD the well was displaced back to 1,20 sg mud. A flowcheck was preformed after the displacement was finished. The well was static. During tripping in to TD and lubricating while POOH the well was in good condition. The well was flowchecked at casing shoe and prior to pulling the BHA through the BOP, both checks were static.

Prior to testing the BOP to 5000 psi, a total of four runs with the Multipurpose tool (MPT) was required to retrieve the 18 ¾" nominal boreprotector. On the final run the MPT was redressed with a J-slot adapter and the wear bushing was recovered successfully. Significant wear on 25% of the boreprotector latch profile was observed after POOH.

### 2.6.2 13 3/8" Casing Running

The casing job commenced with making up the casing shoe at midnight January 13th. The rig supplied PS-30 slips was replaced with the FMS slips due to signal problems. The casing hanger was made up 26 hours later, at 02:00 in the morning. While running the casing the rig went into advisory mode due to significant wave height above 5 m. The casing string was run to above the BOP. During this period the rig went back to green status and the casing was run through the BOP. Due to make up problems of the New Vam threads, a total of 4 joints were rejected.

The casing running went fine down to 2407m where it stood up with 10 tons. Washed down the casing to 2441 m. At 2441 m several attempts where made to land the casing. Had no good indications of landing the casing. In order to check the landing depth the casing running tool was stripped through the annular

preventer. The measured distance was 7 m, calculated value should have been 7.1 m. Re-landed the 13 3/8" casing and the decision was made to cement.

The following casing was run:

| Description | Quantity | Length (m) | Cumulative length (top of jt) (m) |
|---|---|---|---|
| Csg Hanger above LOP | | 0.33 | 1517.4 |
| Csg Hanger below LOP | | 4.07 | 1517.7 |
| Csg, New Vam | 70 | 1129.2 | 1521.7 |
| Float Collar | 1 | 10.85 | 2409 |
| Intermed. jnt | 1 | 11.52 | 2419.9 |
| Shoe Joint | 1 | 12.22 | 2443.6 (TD) |

| Wt., Grade Conn. | Nom I.D. (in) | Drift I.D. (in) | Conn O.D. (in) | Minimum Tensile (x $10^6$ lbs) | Burst (psi) | Collapse (psi) |
|---|---|---|---|---|---|---|
| 72 ppf, L-80 | 12.347 | 12.25 | 14.375 | 1.662 | 5379 | 2668 |

Centralisers were run on the shoe joint, intermediate joint, float collar joint and the following 9 joints. All of the shoe track connections were Baker-locked prior to makeup.

### 2.6.3 13 3/8" Cementing

A pre-job meeting was held prior to starting the cement job. The surface lines where tested to 345bar prior to starting the cement job. Pumped 16 $m^3$ spacer (Tuned Spacer E+) at 1500 lpm using the cement pump. Dropped ball and mixed and pump 11 $m^3$ 1.92 sg G-neat cement. Released the dart and displaced the landing string volume using the cement pump at 1300 lpm. Did not see any signs of the top plug shearing out. Continued the displacement using the rig pumps. The displacement rate used was 1500-2000 lpm, reducing it down to 1000 lpm prior to reaching full displacement. Overdisplaced the shoe track with 70% and did not bump the plug. Lost about 2 $m^3$ during the total cement job. Bled back 1 bbl to the cement unit and verified that the float was holding.

Proceeded setting the Seal Assembly according to Dril-Quip procedures and instructions, and tested same to 3500 psi. Released casing hanger running tool with 30 tons overpull and started pulling out of the hole with the running tool. Experienced that the running tool was hanging up in the BOP's. Managed to pull and rotate the tool through the BOP with a max overpull of 25 tons. A sponge ball was pumped down the landing string to remove cement. A pressure spike of 2300 psi was seen as the ball went through the plug launching mandrel.

When the running assembly was pulled through the rotary the seal assembly was still attached to the running tool. The entire assembly was packed off with clay and cuttings, and the OD of the running tool was scored.

At this stage a decision was made to perform a cleanout run using a 5" bullnose and jetsub. The assembly tagged an obstruction at 1514 m (LPR cavity) with 10 MT. Continued to wash and reciprocate the pipe while pushing the obstruction down to 1516 m. Set down a max weight of 30 MT without any further progress. Decided to pull out of the hole on the assumption that this was the cement Top Plug in the BOP.

Made up a 12 ¼" junk bit, pony DC and 17" stabiliser above in an attempt to avoid bit contact with the BOP bore. At this point it was assumed that the obstruction was the top cement plug. RIH and washed down from 1497 m to 1516 m. Tagged the plug at 1516 m with 5 MT. Started rotating slowly and increased rotation and flow gradually, and was able to push the plug down to 1522m. Wiped through the BOP and wellhead area several times, but no resistance was observed. In order to check the depths, the piperam was closed round the pipe prior to POOH.

Based on the previous run it was concluded that the wellhead area was clear and a run with the Mill and Flush tool was performed. The seal assembly area was dressed off according to Dril-Quip procedures. Checked the nylon tell-tales which indicated correct working depth.

Ran in hole with a new seal assembly and set same according to procedures. Performed pressure test on the seal assembly to 5000 psi / 10 min. Relanded and pressure tested seal assembly again to 2500 psi/ 3 min - OK. Started POOH with the seal assembly running tool (SART).

When the SART was on the rigfloor an attempt was made to test the 13 3/8" casing. Managed to pressure the casing up to 4100 psi before the pressure bleed off to about 700 psi. Made a second attempt after having checked all surface lines. On the second attempt the max pressure obtained was 1000 psi, dropping to 850 psi.

The multi purpose tool (MPT), wearbushing and a cup tester (CT) were RIH to test the BOP. Pressured up to 5000 psi but the pressure bled back down to 150 psi. After a second attempt where it was not possible to reach 500 psi, the MPT and the CT was POOH.

Ran in hole with the SART in an attempt to test the BOP using this tool. After several more attempts to obtain pressure integrity it was suspected that the seal assembly was leaking. Based on impressions it seemed to be installed approx. 13 cm high. The MPT and BOP test tool was run in and the BOP test was performed to 5000 psi.

After pulling the seal assembly with the MPT tool, a major wash-out was found on the rubber seal and metal to metal seal.

Based on the findings in the previous run the mill and flush tool was made up and run in hole. The tool landed about 12cm too high based on middle pipe ram impression. When the tool was pulled the nylon tell-tales where missing and the mill worn indicating the correct working depth.

The seal assembly was then installed and tested to 3500 psi. After pulling out of the hole with the SART an attempt was made to test the 13 3/8" casing. Pressured up to 3045 psi, but had a sudden drop in the pressure to 780 psi. The pressure continued dropping and stabilized at 680 psi after 5 min.

Decided to install the wearbushing again in order to protect and support the seal assembly.

Made up and ran in hole with a cleanout assembly. Took a slight weight at 1528m and washed and reamed to 1734m Tagged minor obstructions a 2363m and washed and reamed down to the float collar at 2416m. Had only small amounts of rubber coming over the shaker.

Prepared and made up a casing scraper assembly and ran in hole to 2416m. Worked the scraper between 2404-2375m and 2330-2359m. Flowchecked the well and POOH.

Picked up and ran in hole with an RTTS packer assembly. After setting the packer at 2390 m it had to be released due to the deteriorating weather, and the rig entered Yellow Alert caused by station keeping power consumption being close to 100%. Stopped pulling when the RTTS packer was above the BOP's. After the weather had calmed down again the packer was set at 1570 m. The seal assembly and the casing below the packer were successfully tested to 4100 psi over 15 min. Released the packer and pulled out of hole.

Ran in hole to retrieve the wear bushing. Landed and latched to the wear bushings with 10 tons down weight and pulled wear bushing free with 35 tons overpull. Pulled out of hole and laid down the running tool and the wear bushing.

A special lead impression tool had been prepared and sent out to the rig. The intention with the run was to find out where exactly the casing was landed. After a successful surface test to 300 psi the tool was run in hole to the BOP. Tagged the lower shear ram prior to landing out. Landed the lead impression tool with 10 MT down weight. Pumped up to 2500 psi to activate the piston holding the lead impression block. Held pressure for two minutes, also closed middle shear ram to get an impression on the drill pipe for extra depth reference. At surface the led impression tool was inspected. Calculations showed that the hanger was set 0,158m high, indicating limited seal area on seal assembly.

Based on the results it was decided to install a piggyback 13 3/8" casing hanger. Prior to installing the hanger the seal assembly had to be retrieved. The SART was made up and the seal assembly was retrieved without any problems with 2-3 tons overpull. On the way out the wellhead area was flushed clean.

Continued to make up and run in hole with the piggyback hanger and cup tester. While running in hole the torque on every drill pipe joint was checked due to left turns when setting the hanger. Took free rotational torque readings above the BOP. Landed the piggy-back hanger and cup tester, and made up same according to Dril-Quip procedures. Pumped down DP to test against cup tester and running tool to confirm that hanger was fully engaged, but the pressure test failed. Re-torqued piggyback hanger and repeated the pressure test. Tested to 5000psi/ 15 min - OK. Retrieved running tool with 33 tons overpull and pulled out.

Picked up the seal assembly running tool. Ran in hole and installed same as per Dril-Quip procedures. Landed seal assembly at 1516,7m. Pressure tested the seal assembly to 5000psi/ 15min. Released the running tool from the seal assembly. Performed a repeat test of the seal assembly to 5000 psi / 15 min – OK.

The MPT was then made up to the modified wearbushing. The wearbushing was installed without any problems, and performed a test to 3200 psi / 5 min to ensure integrity and assist in proper seating – OK.

## 2.7 12¼" Hole Section

### 2.7.1 Drill 12 ¼" Hole Section

The pre-drill objectives for the hole section were:

- Deliver a hole that will deliver the data acquisition plan (coring, LWD and logs).
- Deliver a gauge hole fit to run the 9 5/8" liner to planned depth.
- Establish pore pressure trends.

The upper BHA weight components were identical for the pilot hole, 12 ¼" BHA, and 8 ½" BHA in order to minimize BHA handling time.

A 12 ¼" Hughes Christensen HC 604, which is a 4 bladed bit with 19mm cutters and large open junk slot area, was used in this hole section. The bit was dressed with 8x13 giving a TFA of 1.037sq in.

Made up the 12 ¼" BHA and RIH to 1020m and tested the MWD/LWD tools – ok.

Prior to drilling out the shoe the following well control drills were conducted:

- Kick whilst tripping drill – D1
- Well kill drill – D5

Took SCR's at 2402m with 1.25 sg mud up kill line and riser. RIH and tagged float collar at 2416m. Drilled out float collar, broke through and tagged cement at 2427m. The well was displaced to 1.25 sg Aquadrill Deepwater mud. At this stage the rig was back in green mode.

Continued drilling through shoe track and cleaned rat hole to 2449m. No firm cement encountered in the shoe track. Drilled 3m new formation to 2452m and circulated and conditioned mud. Performed leak-off test to 1.38sg EMW by pumping down drill string and kill line. Due to the low LOT obtained, a second LOT was performed with the same result.

Commenced drilling with the following parameters:

| Drilling Parameter | Value |
|---|---|
| WOB | 4-10 klbs |
| Rotation | 110-115 RPM Rotary and Bit |
| Pump Rate | 900 -925 GPM |
| Avg. ROP | 10-20 m/hr |
| Pressure | 2400 psi |

While drilling to 2728m the mud weight was increased to 1.27 sg, and new SCR's were taken at 2700 m. At 2730 m drilling stopped due to repair of two mud pumps.

While working on the mud pumps the increasing pore pressure development was discussed between onshore and rig.

Based on the revised pore pressure prediction the kick tolerance became too small; hence, the decision was made to commit the 9 5/8" liner, which was about 750m early compared to the base plan (9 5/8" liner planned depth at 3525m). By running the 9 5/8" liner and not 11 ¾", it was assumed at the time that the deeper targets most likely would not be drilled. The main reasons for running the 9 5/8" liner was connected to the poor operational performance experienced up to this point in the operation, and the additional cost (extra time) involved by running the 11 ¾" liner.

The mud weight was further raised to 1,30sg. Performed dummy connection at 2730m. Circulated bottoms up for connection gas – negative. Took SCR's and commence pumping out to 2419m.

Sat inside13 3/8" csg while waiting on wireline tool. An open hole LOT was performed to 1.38 sg, same as previously.

Performed wiper trip to section TD. Experienced a tight spot at 2710m. Circulated bottoms up at TD. Max gas recorded 1,33%. Continued to circulate whilst weighing up mud to 1.45 sg. Displaced open hole and casing to 1.45 sg mud in preparation for bad weather. POOH to 13 3/8" csg shoe and flow checked – negative. Took torque readings at 2443 m prior to POOH.

Rigged up wireline equipment and performed logging run no. 1A1: PEX-HRLA-EMS-DSP-SP. Rigged down Schlumberger.

Due to deteriorating weather the hang-off tool was RIH with bit at 2334 m, and the riser displaced to sea water. POOH with hang-off landing string. Activated EQD (emergency quick disconnect) and disconnected riser/LMRP when the rig heave came up to 9.5 m.

When the weather improved to 2 m heave the LMRP was re-connected. Set down 25 tons and locked LMRP connector with 1500 psi and performed overpull to 20 tons – OK. RIH and retrieved the hang-off tool. Pulled wet due to cuttings, rubber debris and small aluminium pieces plugging the bit. The debris entered the well from the BOP cavities when activating the shear rams.

Performed BOP test to 5000psi. Made up 12 ¼" wiper assembly. Swept BOP and wellhead area with 10m3 Hi-vis pill. RIH to 2120m, displaced 1.45 sg mud from well to 1.26 sg every 5th stand.

Took torque reading for liner in 13 3/8" csg shoe: 20RPM, 3000ft-lbs. Continued RIH. String took weight and torqued up several times. Tagged bottom at 2728m and displaced well to 1.30sg mud.

No drag seen while pulling out of the hole into the 13 3/8" csg. Circulated a 10m3 Hi-vis pill to clean-out BOP and wellhead area prior to POOH to surface.

### 2.7.2 9 5/8" Liner Running

The following casing was run:

| Wt., Grade, and Conn. | Wall (in) | Nominal ID (in) | Conn. ID (in) | Conn. OD (in) | Tensile x10$^6$lbs | Burst psi | Collapse psi |
|---|---|---|---|---|---|---|---|
| 53.5 ppf, P-110, New Vam | 0.545 | 8.535 | 8.535 | 10.650 | 1,710 | 10900 | 7950 |

Optimum / maximum torque settings were 14.3 / 15.6k ft-lbs respectively.

| Component | Wt ppf | Grade | Top Conn | Quantity | Length (m) | Cumulative length (m) |
|---|---|---|---|---|---|---|
| Liner hanger | 53.5 | P110 | New Vam | 1 | 9.91 | 9.91 |
| Liner | 53.5 | P110 | New Vam | 30 | 383.08 | 392.99 |
| Float Collar | 53.5 | P110 | New Vam | 1 | 9.84 | 402.83 |
| Intermediate joint | 53.5 | P110 | New Vam | 1 | 12.80 | 415.63 |
| Shoe joint | 53.5 | P110 | New Vam | 1 | 13.33 | 428.96 |

The original centraliser programme was changed to include centralisers on every second joint across the open hole interval and on every liner joint positioned in the liner lap. This was done to assist in achieving good cement placement and bonding over the liner interval. Good zonal isolation had become a priority due to the failed 13-3/8" cement job.

The entire shoetrack was Bakerlocked, and the remaining liner joints run as per programme. A Nodeco 9-5/8" PHR rotating liner hanger was installed, and the floating junk basket filled with a freeze resistant glycol / water mixture. Total weight of the 9 5/8" liner was 33 tons. Average running speed was 4.7 joints / hour including time for the shoetrack and equipment down time, which was only half the speed planned for.

Tight hole was encountered from 2678mand it took over 5 hours to work the liner to TD. Numerous tight spots with associated pack-off's were seen and a total of 10.2 m3 mud was lost.

The Remote Controlled Top Drive Head (RCTDH) was installed, and two times the annulus volume was circulated to clean the hole. The setting ball was dropped and pressured up to 2000 psi when setting liner hanger at 2306 m. Top of the PBR was at 2300 m.

After the liner hanger had been confirmed set and the ball seat sheared out (2600 psi), circulation was lost to the formation. Whilst attempting to regain circulation (varying flowrate and liner rotation) 2m$^3$ of LCM was pumped downhole. Circulation was regained the moment the LCM-pill exited the liner shoe. A total mud loss volume of 24.2m$^3$ was recorded at this stage. A thief-zone appeared to be present as further losses were seen when attempting to bring the circulation back up to the equivalent drilling ECD. Having confirmed that there was no pressure build-up associated with the increase seen in return flow as the ECD decreased, the hole cleaned up and full circulation / liner rotation established prior to the cement job. The upper annular was closed, the well was observed on the kill line while boosting the riser. Max gaas reading was 3%.

It was disappointing to experience that Weatherford (Nodeco) failed to deliver equipment according to the plans; the RCTDH was shipped to the rig with a 1.5m long handling pup as opposed to the agreed 4.5m. The short pup joint could not be used as the elevators and top drive bails would interfere with the cement head. Prior to the liner job the RCTDH had to be lifted to the floor, turned up side down and an extra pup joint screwed onto the top of the RCTDH. The operation was repeated in reverse order when the cement head was laid out after the job. Net result was lost time and unnecessary risk added to the operation.

### 2.7.3 9 5/8" Liner Cementing

Prior to the cement job a spacer train consisting of 20 bbls FW and 80 bbls tuned spacer E+ at 1.32 sg was pumped downhole. It was followed by 110 bbls lead slurry at 1.44 sg, 23 bbls tail slurry at 1.92 SG, and 10 bbls tuned spacer E+. The caliper showed a near-gauge hole apart from a section just below the 13-3/8" casing shoe. Still, an excessive amount of slurry was pumped downhole (caliper + 10% excess on OH volume, and 100m cement inside the 13-3/8" casing with no drill pipe in the hole). This was caused by the failed 13-3/8" cement job and thus a need to secure a very good zonal isolation for the 9-5/8" liner.

The cement slurries were displaced using the cement pumps and the liner wiper plug bumped 2 bbls early (wiper plug sheared 3 bbls early). The liner was rotated at 30 RPM throughout the job with no losses seen.

Norcem Class G-neat cement was used for both the tail - as well as the lead slurry.

## 2.8 8½" Hole Section

### 2.8.1 Drill 8½" Hole Section

Made up the 8 ½" BHA and started RIH on 48 stands of 5" drill pipe, and continued RIH with 6 5/8" drill pipe. The drill pipe was filled every 1000 m. Pressure tested 9 5/8" liner and liner lap to 4000 psi/ 15 min while RIH. Prior to drilling out the liner drills D2 (Well kick) and D5 (Well kill) were conducted with both day and night crews.

Continued RIH and tagged the landing collar at 2693 m with 10 tons while washing down the last stand. Had some difficulties drilling out the landing collar and varied drilling parameters to get the bit to drill. Spent a total of 7 hours drilling the shoe track. Drilled new formation down to 2732 and conditioned the mud to 1.33sg prior to performing the LOT to 1,47 sg EMW. Recorded SCRs prior to drilling ahead with new mud weight.

Drilled 8 ½" hole from 2732 – 2748 m when drilling was stopped due to high Gamma Ray readings from the MWD tool. A repeat log section was performed to check the readings on the gamma ray and proved equal. However, after the run was finished it was discovered that the high readings were due to an operator error when programming the tool.

Drilling continued with the following drilling parameters : 720 gpm, 3250 psi, 115 rpm, 3-6 k ft-lbs torque and 4.4 - 17klbs WOB. The rate of penetration was controlled to max 30 m/hr due to data acquisition requirements for log quality.

Drilling was stopped at 2782 m due to ECD increasing to 1.41 sg. Circulated bottoms up and increased pipe rotation to 130 rpm, and boosted the riser. Continued drilling ahead from 2782 m while pumping a 5 m3 hi-vis pill on every stand and ream the stand once prior to every connection. The ECD increased to 1.45 – 1.47 sg while drilling with controlled ROP of 17.5 m/hr down to 3351 m, and at this point it was decided to perform a wiper trip.

Circulated bottoms up twice and pumped out of the hole to the 9 5/8" casing shoe. The hole was in good condition but backreamed slowly from 3011 – 2985 m due to an increase in the pump pressure. Flow checked the well at the casing shoe prior to circulating bottoms up. Max gas observed on bottoms up was 3,2%. Continued to circulate and condition the mud prior to RIH. Ran in hole to 3351 m. The hole was in good condition with no fill on bottom.

Due to deteriorating weather the open hole and casing volume was displaced to 1,55 sg mud for riser margin purposes. The flow rate was adjusted to keep the ECD at 1,44 – 1,45 sg. Flow checked the well prior to pulling out and at the liner shoe. Observed about 1 m3/hr loss rate that slowly decreased to nil. Continued pulling out of hole. Entered Yellow DP Alert due to deteriorating weather and problems with the LBL array giving erroneous positioning data. Boosted the riser with two pumps while pulling out of the hole. Had a 9% gas peak on bottom up due to trapped gas in the riser from the previous trip. During tripping the rucker wire number 2B failed.

Installed a Kelly cock and Gray valve below the hang-off stand, and checked the Acme threads prior to running in hole with the hang-off tool. The shear rams were function tested while making up the hang-off assembly. The weather conditions at this stage were: wind 25 m/s, significant wave height 7,5 m and max wave height 11,8 m. Had another Yellow Alert warning at this stage due to high truster load. Started running in hole with the hang-off tool and landed same in the wellhead. Closed middle pipe ram and observed the well on the trip tank. Backed out the landing string and refilled the riser with booster pumps due to u-tubing up the landing string. Closed shear ram and pulled out of the hole.

Waited on weather while monitoring the well on the trip tank. During this period rucker wire number 1B failed in addition to 2B. Reduced the riser tension from 569 to 518 tons and displaced the riser to sea water

to allow further reduction in the riser tension. Monitored the well on the kill line and reduced riser tension further to 464 tons. The diverter running tool was also installed to allow a further reduction in the riser tension and enable repair on rucker wires. During the waiting period rucker wires 1B, 2A and 2B were slipped and cut.

As the weather improved the diverter running tool was laid down, and the hang-off tool retrieving stand made up and RIH. Opened upper shear ram and displaced the riser back to 1,33 sg mud. Started pulling slowly out of the hole with the hang-off tool. The tool hung up inside the upper annular preventer in the BOP due to the rubber elements were not properly retracted.. Managed to pass the annular by slow rotation and pulling up with 15 tons max overpull. Circulated out all the heavy 1,55 sg mud, and boosted the riser when the heavy mud came above the BOP. Slipped and cut rucker wire 8A during the circulation. POOH and racked back the hang-off tool and started running back in the hole with the 8 ½" BHA.

While tripping in the string was rotated at 90 rpm every 10 stands to break the mud gel strength, and the pipe filled every 1000m. Wiped through tight spots at 2970m and 2990 m without any problems, and continued to trip in hole. Washed down from 3324 m to 3335 m. Had 16 m fill on bottom. Washed and reamed light fill from 3335 m to 3351 m, and displaced well from 1,55 sg to 1,33 sg mud. Flowchecked the well, ok.

Continued drilling 8 ½" hole down to 3495 m where a slow gain of 2,4 m3 in the trip tank was observed. Suspected the increase was caused by rig heave (4 m) swabbing mud out of drill string with a float installed. The gained volume was equal to the volume used to fill pipe. Circulated bottoms up to 500 m below the BOP, and the remainder over the kill line at 30 spm. Max gas on bottoms up was 1,5%. Continued drilling ahead from 3495 m to 3582 m. Started adding 1,6% Penetrex (lubricity enhancer and bit balling preventer) into the active mud system. Drilled ahead to TD at 3650 m and took a survey.

Pumped a 5 m3 hi-vis pill at TD and started circulating bottoms up. Had a sudden 1700 psi pressure drop in the standpipe pressure. Investigated the pressure drop and found a washout on the standpipe valve to mud pump # 2, and a washout on piston for mud pump # 3. Continued to move the pipe and circulated using mud pump # 1. Circulated bottoms up twice while rotating slowly and reciprocating pipe without any losses, while increasing the mudweight from 1,35 sg to 1,36 sg. Meanwhile all the pumps were brought back on line.

Pumped out of the 8 ½" hole at 30 spm. The hole was in good condition. Flowchecked the well at the 9 5/8" liner shoe and prior to pulling the BHA through the BOP. Broke off and laid down bit, MWD and LWD, and racked back the rest of the BHA.

The drilling parameters used were:

| **Drilling Parameter** | **Value** |
|---|---|
| WOB | 15 klbs |
| RPM | 100-130 |
| GPM | 670-740 |
| AVG ROP (m/hr) | 23,2 |

Performed TD logging. See Chapter 7.4 Wireline logging for details.

## 2.9 Plug and Abandon

### 2.9.1 Cement and Bridge Plugs

The Plug & Abandonment Phase commenced at 1700 hrs, February 22, 2002. A 9 5/8" bridge plug was RIH on 3 ½" drill pipe and installed at 2684 m. The bridge plug was then weight tested with 10 MT and pressure tested to 100 bar/1450 psi.

The bottom cement plug was set on top of the bridge plug from 2679 – 2479 m. A total of 8 m3 seawater spacer was pumped, followed by 8 m3 of 1.98 SG "G" cement. The cement plug was displaced with 0.8 m3 seawater and 15.5 m3 1.36 SG mud. After pulling out to 2349 m while pumping 500 L/stand and circulating bottoms up while boosting the riser, no cement was observed at the shakers.

A total of 65 m3 of 1.7 SG mud was displaced in the well, and the 3 ½" drill pipe was POOH and laid down. Due to the weather increasingly getting worse, the rig entered Yellow Alert and the riser was displaced to seawater in preparation for a possible disconnect. At 1430 hrs, February 24, the drift off was 27 m and heave was up to 7.4 m. The LMRP was then disconnected on EQD due to station keeping problems with 27 m max drift off, and at this stage the rig was in Red Alert.

Two initial attempts were made to reconnect, and after the second attempt failed due to excessive movement on the LMRP and station keeping problems, the AX gasket had to be changed out. When the heave had dropped down to 1.5 m, the LMRP was successfully landed. With a down weight of 40 MT, the connector was locked with 1500 psi, and an over pull test to 20 MT was performed. During the pressure testing of the Kill & Choke lines a leak was observed on the kill line side. After pumping dye the leak was found to be at the mini connector on the LMRP. A later investigation on surface of the BOP confirmed a missing seal on the connector and a washout.

As the open hole now was isolated with a bridge plug and cement, it was decided not to pull the BOP for repairs and re-run it.

While running in hole with a casing brush and a 13 3/8" bridge plug the riser was displaced back to 1.25 SG mud. The 13 3/8" casing was scraped from 1765 – 1775 m, and the EZSV installed at 1770 m. After tagging the plug with 20 MT weight, the well was displaced to 1.25 SG mud. The LMRP connector was then pressure tested to 500/1450 psi, and the BOP function tested.

### 2.9.2 Casing Cutting Operations

In order to prove integrity and reduce any potential problems, the BOP was pressure tested to 500/3250 psi with a BOP cup tester run on the MPT. That enabled the wear bushing to be retrieved on the same run. Key seating was observed on one side of the wear bushing.

Due to only the choke line being available the plan to cut the 13 3/8" casing with a motor assembly had to be abandoned. This was due to the high back pressures created while cutting with a motor and circulating out through the choke line only.

As an extra precautionary measure the 13 3/8" casing was perforated at 1527 m with 7 shots on a wire line perforating gun run through a 5" drill pipe. The pressure dropped from 300 psi to zero, but no losses were observed. After circulating bottoms up through the choke line and flowchecking with an open annular, the wire line guns and 5" drill pipe were retrieved to the surface.

The 13 3/8" casing was cut at 1759 m with 100 RPM, 600 LPM (158 GPM), 1400 psi pumping pressure, and an rotational torque of 3000 – 6000 ft.lbs. After 8 min of cutting the torque dropped down to free

rotational torque. The well was flow checked for 20 min both with closed and open annular, and the cutting assembly pulled out of hole.

The 13 3/8" spear was RIH and landed with 4 – 5 MT down weight. With closed annular the 13 3/8" casing was pulled free with 28 MT over pull. After flow checking, the casing was pulled out and laid down. While laying down casing the riser was displaced to seawater, when entering Yellow Alert due to footprint exceeding 14 m.

After displacing the riser back to 1.25 SG mud a 5" cement stinger was RIH to 1765 m, 5 m above the EZSV packer depth. A total of 4.8 m3 seawater spacer and 36.25 m3 of 1.80 SG "DWFS" cement was pumped, followed by 0.25 m3 seawater and 13.2 m3 of 1.25 SG mud. While waiting on cement, the 13 3/8" cutting and retrieving assemblies were laid down.

The top cement plug was tagged at 1580 m with 10 MT down weight. After pulling the BHA above the BOP, the shear rams were closed and pressure tested the plug to 1400 psi down the choke line. In the meantime the riser was displaced to seawater, in preparation for the disconnect and retrieving of the riser and BOP.

### 2.9.3 Retrieving Riser and BOP

The 350 MT handling equipment was changed out with 500 MT equipment, and the diverter was laid down. The 750 MT handling equipment was then rigged up prior to disconnecting the BOP.

The BOP was disconnected at 1945 hrs, 4th of March, with approximately 100 MT over pull. While moving the rig 40 m away to the parking position, the wellhead was inspected with the ROV.

On two occasions the riser retrieving operation stopped due to lack of MOB assistance for personnel working in the moon pool area, as significant wave height went above 4 m. One dropped object incident occurred as one of the locking nuts for the riser flange bolts fell out of the riser on to the drill floor from a height of 8 – 9 m. The investigation showed that a safety pin in the nut had sheared when torque forces were transmitted to the pin itself. This again led to the retainer cap screws undoing themselves, causing the nut to fall out.

Another problem that manifested itself was that from approx 1050 m, the two MUX cables started twisting making it impossible to reel them directly onto the pod reels. Instead the cables had to be laid out in large loops on the deck and then transferred to the pod reels. The most likely cause for this is that several of the riser umbilical clamps were broken, and the cables started swinging with more slack.

The riser pulling speed slowed down considerable due to these problems, both handling the MUX cables and a more thorough inspection due to the risk of falling objects. The riser was pulled at an average speed of 1.3 joints/hr from 981 – 347 m. During the entire operation the 750 MT handling equipment was utilized as the change out time would not be made up by pulling faster. The BOP was pulled through the splash zone and secured on the BOP carrier at approximately 0200 hrs, 8th of March.

### 2.9.4 Cutting and Retrieving Wellheads

With the rig in parking position the MOST tool and 20"/36" cutting assembly were made up and run down. After moving in towards the wellhead, the ROV assisted in guiding the assembly into the well.

Meanwhile the ROV had collected all the seven transponders and the transponder basket was lowered down for retrieval. The retrieval process went very smoothly although the transponders with floating elements would not fit properly into each cage. With the clump weights hanging below and through the bottom hatch of each compartment there was never any danger of them dropping out.

The 20" & 36" casing strings were cut at 1525 m with 3200 LPM and 105 bar pumping pressure, and after cutting for 1:45 hrs a pressure spike with increasing flow around the wellhead were observed. The cutting operation continued for another 0:30 hrs to satisfy a proper cut through both strings.

After engaging the MOST tool to the 18 ¾" wellhead, the string released when attempting to lock the MOST tool, which was due to deteriorating weather. After re-engaging the MOST tool using the ROV to lock the locking segments, the wellheads and casing stumps were pulled free with 150 MT over pull. The wellhead then came free upon the first initial straight pull, and after visibility cleared it was observed sitting in the original hole.

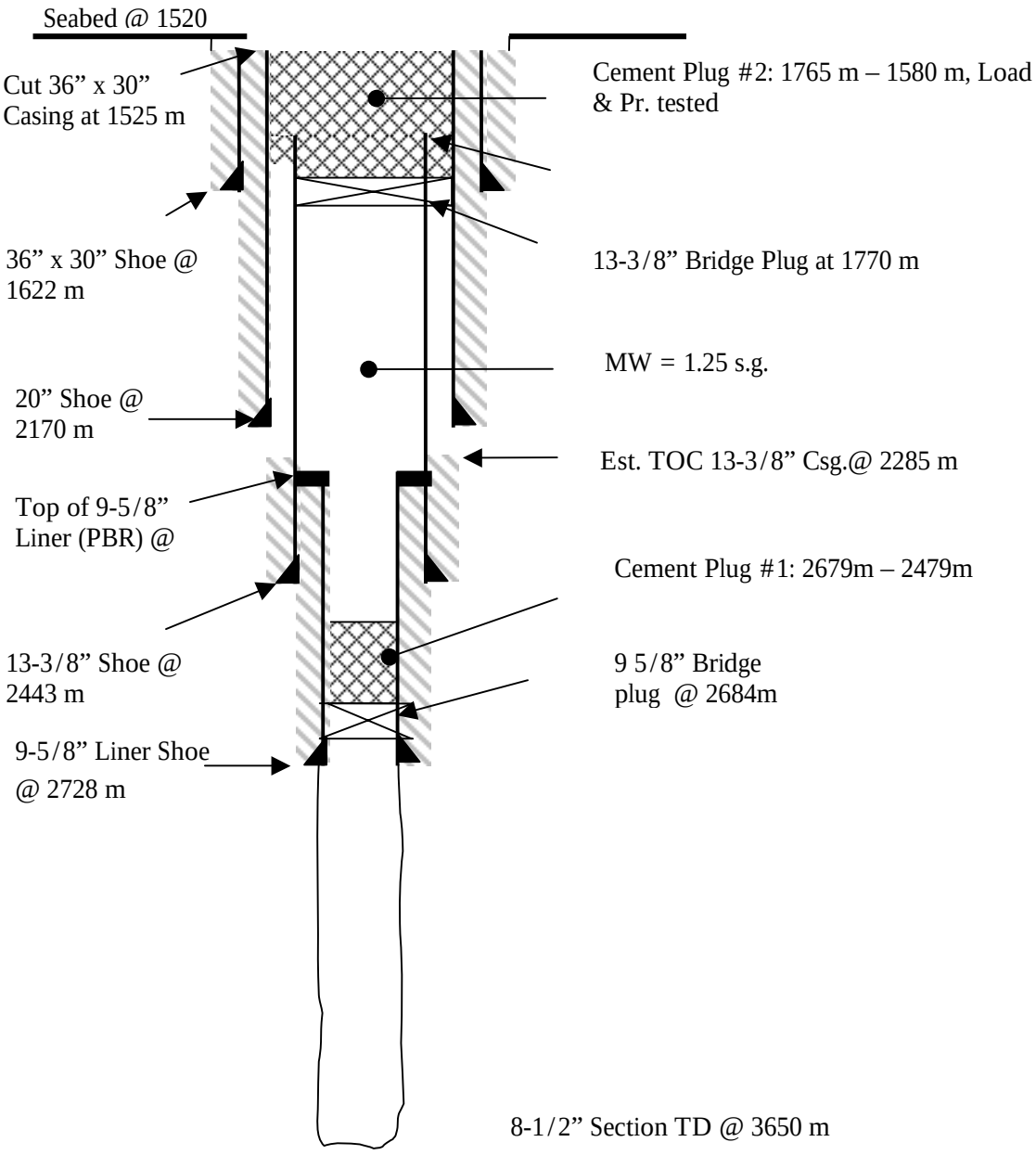
Due to heave now had increased to 4.2 m it was not possible to stab into the wellhead again. The excessive heave caused the mud motor to turn, and the cutting knives to extend and retract.

While waiting for the weather to come down, some excess pipe was laid down as well as performing rig repairs. After stabbing into the wellhead again the locking bolts for the MOST tool locking segments would not operate, and the assembly had to be pulled to surface. Upon inspection it was verified that the locking pins had been damaged due to the jarring effect caused by the big heave and overpull.

A wellhead spear was made up and successfully recovered the wellheads and hydrate plate (PGB) to surface. After securing the hydrate plate on the moon pool trolley and releasing the spear, it was not possible to release the hydrate plate from wellheads. This was caused by excessive cement and possibly a hydraulic locking effect. After several attempts to free the hydrate plate, the whole assembly was pulled out through the moon pool hatch and laid down directly onto the supply boat. The main block was utilized for this purpose as the total weight exceeded the whip line capacity of 15 MT.

"Scarabeo 5" was handed over to Norsk Hydro at 2200 hrs, March 10, 2002.

**P&A Well Schematic**



# 3 LOGISTICS & PROCUREMENT

## 3.1 Introduction

The over all Logistics and Procurement process was managed from the BP offices as part of the Havsule Project Team, where Logistics and Procurement was included as an element of the Lean Drilling Model.

Contract Strategy, Commitment Order, Equipment list / Group Loadings and Personnel Forecast was completed in good time in advance to the commencement of the well.

Key players, Asco Supply base, Vestbase, CHC Helicopter Services A/S where brought up to speed with respect to the planned logistics of the well.

By involving the key players, drilling contractor representative and representatives from the service companies on the Equipment list and personnel movement plans, a common understanding of the execution of the logistics for the well was reached to an acceptable level. There is, however, scope for improvement on this issue by avoiding new arrivals or late changes to the organization.

## 3.2 Contract Strategy

Contract Strategy document was issued and agreed at an early stage of the project. Most services, have been provided from existing contracts within BP.

The Contract Strategy has proven to be a worthwhile exercise for every drilling project to identify service lines required for the project. Drilling Engineers and leading project team members have however, addressed the need of:

a) updated / renewed contracts and

b) improvement on contracts content and contracts structure in general.

There is a common understanding that some contracts are too comprehensive, looks to be made on a `higher level` and not addressing the details for the project requirements properly. It has further been commented that some contracts documents are very little "user friendly" and that it has been difficult to find details that you are looking for.

A recommendation to SCM should be put forward to address the need of an updated contracts-portfolio for future exploration drilling activities.

## 3.3 Procurement

Services have been provided from existing contracts. For all commitments made under the Havsule Project, Orders have been issued.

For cost control purposes, separate orders were issued to cover for planning cost. Commitments orders were issued to all service companies (incl. rig contractor) for the execution of the well.

Logistics and Procurement Procedures and Well Specific Logistics and Procurement Guidelines have been issued and adhered to.

## 3.4 Supply Base(s)

The Havsule location is about 118 north-west of Kristiansund. Vestbase, Kristiansund was therefore used as forward supply base to ship materials and equipment to the offshore location.

The service and support executed by Vestbase personnel was delivered to `best in class` level. This understanding is well supported by BP logistics onshore and BP Drilling reps. offshore.

## 3.5 Helicopter

Personnel movements to Scarabeo 5 was done from Kristunsund heliport.

Four flights a week was scheduled. Recent exploration wells have had 3 fixed flights and 1 "floating" flight. The change to 4 fixed flights proved to be a correct move.

The flying operation from Kristiansund heliport was very much affected by the helicopter-pilot strike. In addition, on the average, winter 2001 / 2002 has proven to be the worse the last two decades.

It is also worthwhile to mention that the Havsule well was drilled in DP mode. Quite a few times, helicopter flights were cancelled due to too high "pitch and roll" values.

Due to the helicopter situation and the bad weather, logistics became a challenge during the Havsule operation. Despite these conditions, the Havsule project did not suffer any lost time or operational down time due to logistics.

During the last 12 – 16 months, the drilling activities out of Kristiansund have been higher than ever. This has affected the support and flexibility of helicopter services. Initially it was a challenge to get access to slots in the Kristiansund helicopter programme. Later we experienced, coming in as the last operator, with only one rig and with most of our scheduled flights late in the evening, that we suffered with the cancelled and/or delayed flights. Lesson learned is to ensure that minimum 50% of the scheduled flights are in the mornings, if possible.

## 3.6 Charter / Fixed wing

A scheduled fixed wing was not planned for this well. However, due to the winter season and quite a few unplanned events (with basis in weather and drilling operations), charter planes had to be mobilized on occasion.

Although not having a fixed wing, it was expected to make use of a charter to bring people from south to the north (Kristiansund) and return on an ad-hoc basis, but also to support the crew changes during Christmas time and New Year. It is proven that making use of a charter plane, fully booked and avoiding overnight stay, this is commercially beneficially.

## 3.7 Supply Vessel

Far Swan supported the Scarabeo 5 operation as supply vessel.

The supply vessel operation was fully dependent on the capability of Far Swan. A smaller supply vessel was involved for a shorter period, and it proved that only the best vessels on the market are sufficient for operations under extreme weather conditions, and there should not be any compromises when hiring supply vessels.

The Havsule location is far out on deep water with no infrastructure (read: other installations or drilling units). A dedicated vessel for this wildcat well during winter conditions was a must for this operation.

## 3.8 Stand-by Vessel

Sølvbas was selected to support the operation as stand-by vessel. This vessel was on assignment from Hydro and returned to Norsk Hydro at the same time the rig returned to Norsk Hydro.

## 3.9 Broker

Seabrokers were used as Broker in connection with providing supply vessels and stand-by vessel for the Havsule Project.

## 3.10 Group Loadings

Group Loadings were generated based on inputs from the Master Equipment List (MEL). Service companies were required to ensure that equipment, materials and bulk requirements were addressed on the MEL.

Worthwhile to mention is that the normal 7 days lead-time for drilling operations up north (from equipment / materials were delivered from the service companies warehouse until ready to run in the hole)

was reduced to 5 days. High value rental items were monitored very closely, with lead times of approximately 4 days.

The above principle has been working fine for previous exploration wells and also for this well when normal progress of the well.

However, too often on this project operational challenges and long delays occurred. A result of this, especially in the start up phase in the project, rental items were delivered from service companies too early. This problem should have high priority on future projects.

## 3.11 Scheduler

The scheduler has been a good support to the logistics operation, and "The Schedule" proved again to be a good tool for planning the logistics. However, see comments made in chapter "Group Loadings" above.

There is a consensus that daily reports must be simple and easy to understand. During the last drilling projects, the daily reporting has become too comprehensive. To be simplified and fine-tuned in future drilling projects.

# 4 SAFETY AND ENVIRONMENT

Application for Consent (AFC) preparation work and the rig intake process were carried out without any significant problems. The cooperation with Saipem HSE department went very well.

**Project HSE Targets**

1. No accidents/harm to people (DAFWC-RWI-MTI)
2. No environmental spills - (anything greater than zero)
3. No high potential events - (HIPO's or red events)
4. No dropped objects

In order to achieve the above targets, it was decided to:

- Conduct pre-job risk assessments
- Perform quality pre-job meetings
- Actively report misses and non-conformances (UER)
- Take time-out-for-safety (TOFS)
- Ensure all safety actions have priority and closed out
- Third party induction & safety participation
- Support and comply with Saipem 4-point plan
- Perform safety tours/ASA
- Ensure all changes address the impact of risk and time

Training for BP supervisors in the content of the bridging document and ASA training was carried out. A total of 144 risk assessments, 162 ASA`s and 353 UER`s were performed/reported during the operation.

The project HSE targets were not met completely. There were two DAFWC, two medical treatment cases, one restricted work injury, and eight dropped objects, but no spills or hipo`s.

The two DAFWC's were:

- During moving of Samson post, injured squeezed finger on right hand.
- During preparation to transfer pod wire from winch, injured person fell due to ice on deck and got snatch block over his leg, resulting in a broken leg.

**Learnings**

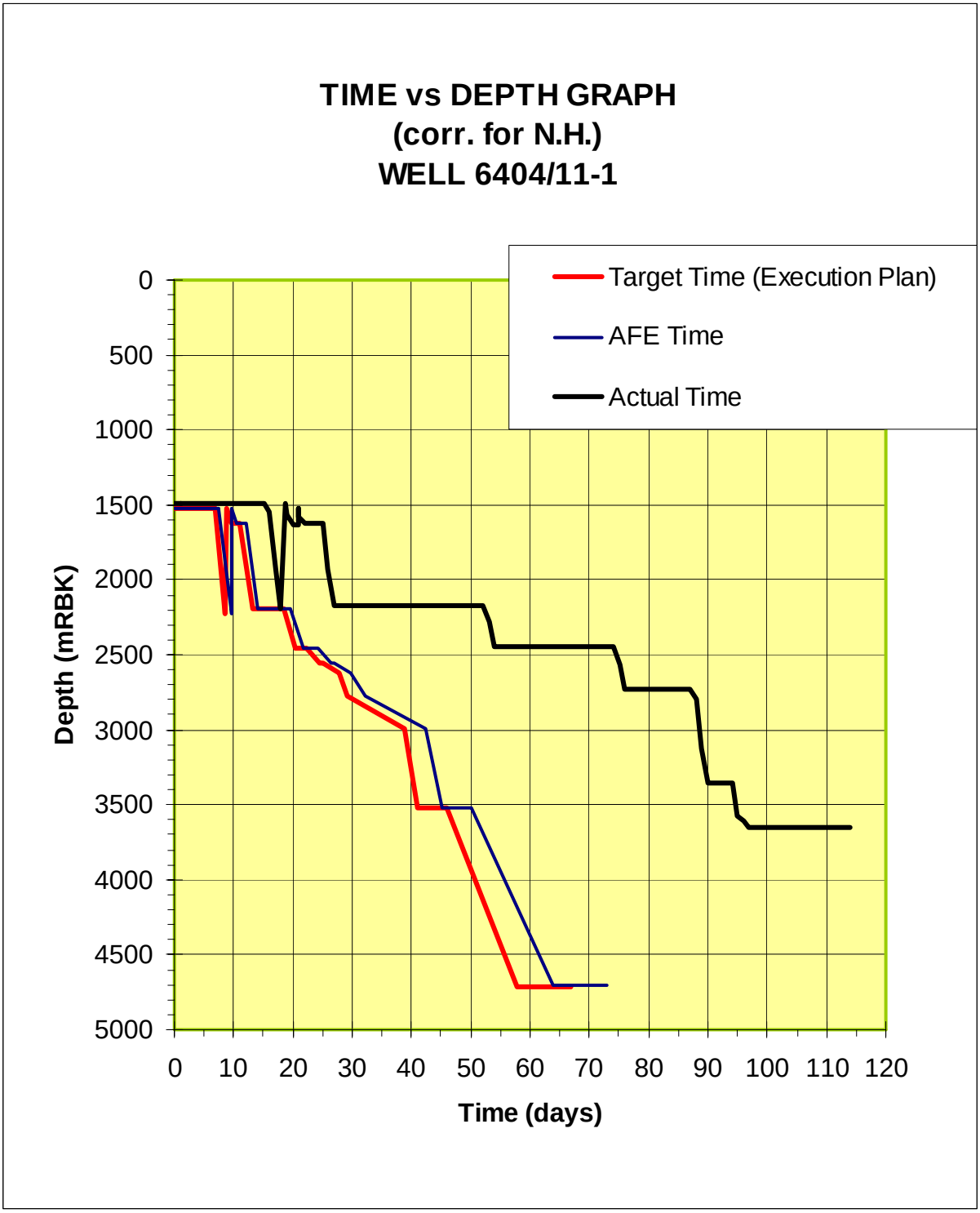
- Saipem`s Safety management systems as described onshore during audit, was not fully implemented on the rig. A more thorough inspection on the rig on how systems work in practice is needed.
- Need to run better training of all supervisory contractor personnel on the rig in BP incident reporting system, and BP`s HSE expectations.
- The crew was not too much trained in risk identification. Introduction of BP`s Risk Assessment Prompt Card was very well received and should be followed up.
- A thorough audit of contractors lifting procedures must be carried out and compliance with BP`s lifting directive must be verified.

**Environment**

The drilling operation was completed without any spills or other environmentally unacceptable events. The Environmental Emission Report came in from the rig on request and contained all data required.

# 5 PERFORMANCE REVIEW

## 5.1 Time-Depth Graph



## 5.2 Daily Drilling Summary

BP AMOCO

Page 1 of 4

**Final Well / Event Summary**

Legal Well Name: 6404/11-1
Common Well Name: Havsule
Event Name: ORIG DRILLING Start Date: 01/11/2001 End Date:

| DATE | TMD | 24 HOUR SUMMARY |
|---|---|---|
| 14/11/2001 | (m) | Took over rig at 19:00 hrs. Start transit towards Flore. |
| 15/11/2001 | (m) | Sailed from Snorre location to Flore. |
| 16/11/2001 | (m) | MOVE TO FINAL LOCATION IN FLORØ. ANCHORHANDLING. BACKLOAD HYDR |
| 17/11/2001 | (m) | CHANGE OUT BOPS. PERFORM BLACK OUT TEST. CONT BACKLOAD NH EQ |
| 18/11/2001 | (m) | CONT OFFLOAD/LOAD EQ. WORK ON CMC, TDS,CABLING, ROV |
| 19/11/2001 | (m) | CONT RIG MODIFICATIONS |
| 20/11/2001 | (m) | WORK ON TDS, CMC, PODS, STAB M. CABLING ETC. |
| 21/11/2001 | (m) | WOW SINCE 06:00 MEANWHILE COMPLETE WORK ON RIG. |
| 22/11/2001 | (m) | WOW while preparing rig move. |
| 23/11/2001 | (m) | Unmoored in Flore. Started transit to Havsule location. |
| 24/11/2001 | (m) | Completed rig move, position and ballast rig. Deploy ROV. |
| 25/11/2001 | (m) | Recovered ROV, commenced DP trials. |
| 26/11/2001 | (m) | DP system failure mode tests. |
| 27/11/2001 | (m) | Cont. DP trials, ROV mis-run, cont. MU BHA's. WOW. |
| 28/11/2001 | (m) | WOW. Jumped ROV, deployed 2 transponders. ROV leaking, pull to surface |
| 29/11/2001 | (m) | Repaired ROV. WOW to deploy same. |
| 30/11/2001 | (m) | Est. LBL-array. DP testing and deploy spud markers. |
| 01/12/2001 | 1,547.0 (m) | Completed DP-trials. Spudded well. |
| 02/12/2001 | 1,935.0 (m) | Drill 12-1/4" pilot hole f/1547 - 1935m |
| 03/12/2001 | 2,195.0 (m) | TD 12-1/4" pilot hole at 2195m. Swept hole, POH for BHA change. |
| 04/12/2001 | 2,195.0 (m) | MU 36" x 42" BHA, RIH and open hole to cond setting depth. |
| 05/12/2001 | 2,195.0 (m) | Opened pilot hole to 42" x 36". Spudmarker dropped into well. |
| 06/12/2001 | 1,580.0 (m) | RIH with new 42" x 36" BHA. Spud and open new hole. |
| 07/12/2001 | 1,628.0 (m) | Drilled and opened 36" x 42" hole to section TD, POOH with BHA, WOW. |
| 08/12/2001 | 1,628.0 (m) | POOH and racked back HO assy. Ran 30" x 36" conductor casing. |
| 09/12/2001 | 1,628.0 (m) | RIH with 30" x 36" conductor and cemented same. |
| 10/12/2001 | 1,628.0 (m) | Pulled 30" x 36" csg landing string. L/D previous BHA's, M/U 26" BHA. |
| 11/12/2001 | 1,931.0 (m) | RIH with 26" BHA. Drilled and surveyed 26" hole from 1622-1931 m. |
| 12/12/2001 | 2,175.0 (m) | Drilled 26" hole to 2175m. Wiped hole and displaced to 1.2 sg mud. |
| 13/12/2001 | 2,175.0 (m) | POOH w/ 26" BHA. R/U and start running 20" casing. |
| 14/12/2001 | 2,175.0 (m) | Ran and landed 20" casing. |
| 15/12/2001 | 2,175.0 (m) | Cemented and tested 20" casing. POOH w/ RT. Prepare for BOP. |
| 16/12/2001 | 2,175.0 (m) | R/U and prepared to run BOP. Function tested BOP, pressure tested acc. |
| 17/12/2001 | 2,175.0 (m) | Prepared and started to run riser. |
| 18/12/2001 | 2,175.0 (m) | Ran BOP/riser. WOW. |
| 19/12/2001 | 2,175.0 (m) | WOW |

BP AMOCO



## Final Well / Event Summary

Legal Well Name: 6404/11-1
Common Well Name: Havsule
Event Name: ORIG DRILLING Start Date: 01/11/2001 End Date:

| DATE | TMD | 24 HOUR SUMMARY |
|---|---|---|
| 20/12/2001 | 2,175.0 (m) | WOW |
| 21/12/2001 | 2,175.0 (m) | WOW |
| 22/12/2001 | 2,175.0 (m) | WOW. Ran riser/BOP. |
| 23/12/2001 | 2,175.0 (m) | Run riser/BOP |
| 24/12/2001 | 2,175.0 (m) | Ran riser/BOP |
| 25/12/2001 | 2,175.0 (m) | Prepare for WOW. WOW |
| 26/12/2001 | 2,175.0 (m) | WOW |
| 27/12/2001 | 2,175.0 (m) | WOW |
| 28/12/2001 | 2,175.0 (m) | WOW. Start running riser/BOP |
| 29/12/2001 | 2,175.0 (m) | Cont.'d to run BOP / riser. |
| 30/12/2001 | 2,175.0 (m) | Land BOP, troubleshoot kill line leak, test w/hd connector - OK. |
| 31/12/2001 | 2,175.0 (m) | Troubleshoot BOP connector leak. |
| 01/01/2002 | 2,175.0 (m) | Cont. troubleshooting connector leak. |
| 02/01/2002 | 2,175.0 (m) | Landed BOP, LP tested connector - OK. Repairs to slip jnt. |
| 03/01/2002 | 2,175.0 (m) | Disconnected from BOP, WOW. |
| 04/01/2002 | 2,175.0 (m) | Straightened BOP bumper bar, latched LMRP |
| 05/01/2002 | 2,175.0 (m) | Tested wellhead and LMRP connectors - OK |
| 06/01/2002 | 2,175.0 (m) | RIH 17" BHA. Troubleshoot st.pipe leaks. WC drills. |
| 07/01/2002 | 2,281.0 (m) | Drld shoetrack, LOT, displaced mud, drld ahead. |
| 08/01/2002 | 2,449.0 (m) | Drl to section TD, weigh up mud system. |
| 09/01/2002 | 2,449.0 (m) | Displaced well, POH. MU hang-off assy. |
| 10/01/2002 | 2,449.0 (m) | WOW. RIH hang-off tool on wiper trip assy. |
| 11/01/2002 | 2,449.0 (m) | WOW. Retrieved hang-off tool. RIH with 17" BHA. |
| 12/01/2002 | 2,449.0 (m) | Performed wiper trip, POOH w/BHA. Attempted to retr borepr. Neg. RIH. |
| 13/01/2002 | 2,449.0 (m) | Recovered bore protector. Prepared to run casing. |
| 14/01/2002 | 2,449.0 (m) | Ran 13 3/8" casing. |
| 15/01/2002 | 2,449.0 (m) | Landed and cemented casing. POOH with casing landing string. |
| 16/01/2002 | 2,449.0 (m) | Retrieved casing hanger R/T. Cleaned out BOP with jet sub. |
| 17/01/2002 | 2,449.0 (m) | Clean out wellhead. |
| 18/01/2002 | 2,449.0 (m) | Set and tested 13 3/8" seal assembly. |
| 19/01/2002 | 2,449.0 (m) | Attempting to test BOP, negative. |
| 20/01/2002 | 2,449.0 (m) | Attempt to pressure test BOP - negative |
| 21/01/2002 | 2,449.0 (m) | Pressure tested BOP. Pulled SA.Ran M&F tool |
| 22/01/2002 | 2,449.0 (m) | Ran seal assy. Installed WB and RIH with clean-out BHA. |
| 23/01/2002 | 2,449.0 (m) | C/O with 12 1/4" bit. POOH. RIH with csg scraper and bit |
| 24/01/2002 | 2,449.0 (m) | Performed casing scraper run. Ran RTTS. |

BP AMOCO

Page 3 of 4

## Final Well / Event Summary

Legal Well Name: 6404/11-1
Common Well Name: Havsule
Event Name: ORIG DRILLING Start Date: 01/11/2001 End Date:

| DATE | TMD | 24 HOUR SUMMARY |
|---|---|---|
| 25/01/2002 | 2,449.0 (m) | Ran RTTS, tested SA and CSG OK. POOH |
| 26/01/2002 | 2,449.0 (m) | Pulled WB and SA |
| 27/01/2002 | 2,449.0 (m) | Pulled SA, flushed WH. Ran new SA. Tested OK. |
| 28/01/2002 | 2,449.0 (m) | Ran WB. POOH. RIH with 12 1/4" assy. Drill FC/displace. |
| 29/01/2002 | 2,563.0 (m) | Drld shoetrack, performed LOT, drl ahead 12-1/4" OH. |
| 30/01/2002 | 2,563.0 (m) | Drl to 2730m, incr. MW to 1.3, pump OOH. |
| 31/01/2002 | 2,730.0 (m) | Wait on equipment. Meanwhile perform open hole LOT & wiper trip. |
| 01/02/2002 | 2,730.0 (m) | Completed w/line log. RIH hang-off tool. |
| 02/02/2002 | 2,730.0 (m) | Installed hang-off tool, POH. WOW, disconnect LMRP, cont. WOW. |
| 03/02/2002 | 2,730.0 (m) | WOW. |
| 04/02/2002 | 2,730.0 (m) | Cont. WOW. Latch LMRP, RU diverter. |
| 05/02/2002 | 2,730.0 (m) | Retrieved hang-off tool, RIH BOP test tool |
| 06/02/2002 | 2,730.0 (m) | Completed BOP test. POH, RIH with wiper trip assy. |
| 07/02/2002 | 2,730.0 (m) | Completed wiper trip to TD, POH, RU & run 9-5/8" liner. |
| 08/02/2002 | 2,730.0 (m) | Run liner, set hanger. |
| 09/02/2002 | 2,730.0 (m) | Cemented 9-5/8" liner. |
| 10/02/2002 | 2,730.0 (m) | MU 8-1/2" drlg assy, tested 9-5/8" liner - OK. |
| 11/02/2002 | 2,801.0 (m) | Drilled 9-5/8" shoetrack, LOT at shoe, cont. drlg ahead 8-1/2" OH. |
| 12/02/2002 | 3,127.0 (m) | Drilling 8 1/2" hole. |
| 13/02/2002 | 3,351.0 (m) | Drld 8-1/2" hole to 3351, wiper trip to shoe. |
| 14/02/2002 | 3,351.0 (m) | Hung off drill string, WOW. |
| 15/02/2002 | 3,351.0 (m) | WOW. |
| 16/02/2002 | 3,351.0 (m) | WOW. Slipped through rucker lines. |
| 17/02/2002 | 3,351.0 (m) | WOW. Restore rucker system and recovered HO tool. |
| 18/02/2002 | 3,380.0 (m) | Recovered HO stand. RIH w. 8 1/2" BHA and conditioned mud. |
| 19/02/2002 | 3,612.0 (m) | Drilled and surveyed 8 1/2" hole from 3380-3612 m. |
| 20/02/2002 | 3,650.0 (m) | Drilled to 3650 m, cleaned out hole, POOH and prepared for logging. |
| 21/02/2002 | 3,650.0 (m) | Perform WL logging operations, VSP and Super Combo runs. |
| 22/02/2002 | 3,650.0 (m) | Ran MSCT. POOH. RIH with 9 5/8" bridge plug |
| 23/02/2002 | 3,650.0 (m) | P&A:Ran 9 5/8" bridge plug/cemented. POOH |
| 24/02/2002 | 3,650.0 (m) | WOW |
| 25/02/2002 | 3,650.0 (m) | WOW. |
| 26/02/2002 | 3,650.0 (m) | Re-connected to BOP. WOW |
| 27/02/2002 | 3,650.0 (m) | Cont. WOW Set bridge plug at 1770. |
| 28/02/2002 | 3,650.0 (m) | Pressure test BOP/retrieve WB. |
| 01/03/2002 | 3,650.0 (m) | RIH with 5" DP, WL and gun. Perforated 13 3/8". Circ. |

BP AMOCO



## Final Well / Event Summary

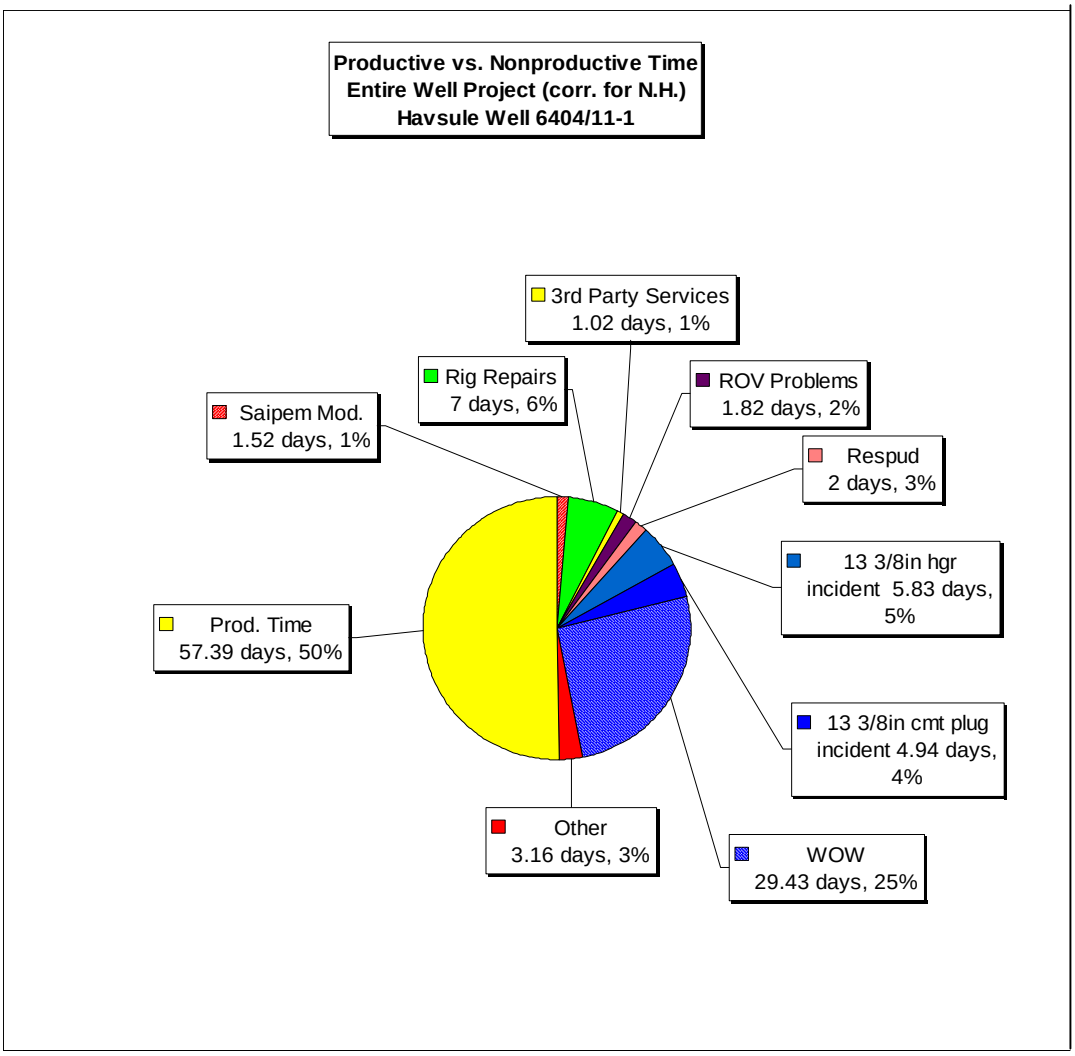
Legal Well Name: 6404/11-1
Common Well Name: Havsule
Event Name: ORIG DRILLING Start Date: 01/11/2001 End Date:

| DATE | TMD | 24 HOUR SUMMARY |
|---|---|---|
| 02/03/2002 | 3,650.0 (m) | Cut and pulled casing. |
| 03/03/2002 | 3,650.0 (m) | L/D 13 3/8" csg. Set top cmt plug |
| 04/03/2002 | 3,650.0 (m) | RU riser handling eq. and disconnected BOP, pulled riser/BOP. |
| 05/03/2002 | 3,650.0 (m) | Pull riser and BOP |
| 06/03/2002 | 3,650.0 (m) | Pulling riser and BOP |
| 07/03/2002 | 3,650.0 (m) | Completed pulling riser / BOP to surface. |
| 08/03/2002 | 3,650.0 (m) | MU & RIH MOST csg cutting assy. Cut cond and 20" casing. |
| 09/03/2002 | 3,650.0 (m) | Pulled WH free. MOST tool slipped. RIH w/ spear assy. |
| 10/03/2002 | 3,650.0 (m) | Recovered WH. Handed rig over to Hydro. |

## 5.3 Drilling Time Summary

| | Plan (days) | Actual (days) | Comments |
|---|---|---|---|
| | | | |
| Rig Mob – Transit Snorre – Florø, Florø loading, Transit Florø - Havsule | 7.5 | 16.8 | Ca.4 days weather related down time. 2 days directly charged to NH. Problems with ROV. |
| Drill 12 ¼" Pilot Hole | 2.1 | 4.6 | Re-spud due to marker buoy lost in hole. |
| Open up to 32"/40" | 0.9 | 2.4 | |
| Run & Cmt 30" x 36" Conductor | 1.6 | 2.8 | |
| Open up Pilot Hole to 26" | 2.0 | 2.4 | |
| Run & Cmt 20" Surface Csg | 1.6 | 2.1 | |
| Run Riser & BOP | 3.8 | 22.5 | WOW ca. 8 days, leaking H-4 connector, debris stuck inside connector, and bent BOP bumper bar. |
| Drill 17" Hole | 2.3 | 6.3 | WOW ca. 3 days |
| Run & Cmt 13 3/8" Csg | 2.4 | 15.7 | 13 3/8" incident ca. 11days |
| Drill 12 ¼" Hole to T50 | 2.1 | | The 12 ¼" hole was planned to be drilled to about 3525m. However, due to pore pressure ramping up the 9 5/8" liner had to be committed early – 2728m. The well was TD-ed at 3650m, approx. 1000m shallower than originally planned. WOW about 5days. |
| MDT Logging | 0.6 | | |
| Core 12 ¼" Hole | 2.9 | | |
| Cont. Drilling to Top K90 | 2.3 | 8.7 | |
| Core 12 ¼" Hole | 10.2 | | |
| Cont. Drilling to TD | 2.7 | | |
| Log 12 ¼" | 2.9 | 0.7 | Reduced logging program. |
| Run & Cmt 9 5/8" liner | 2.1 | 3.7 | Slow make up & running speed. |
| Drill 8 ½" Hole to Well TD | 13.8 | 9.5 | WOW ca. 5days. Drilled to 3650m, planned well TD was 4700m. |
| TD Logging | 2.3 | 1.7 | |
| P&A | 6.9 | 16.2 | WOW ca. 4days. |
| | | | |
| **Total** | **73** | **116.1** | |

## 5.4 Non Productive Time



## 5.5 Well AFE and Cost

### 5.5.1 Cost Estimation and Tracking

Bp has a process that is used for estimating and tracking costs of the Exploration World Class wells.

This includes that the Lead Drilling Engineer is preparing the AFE with input from vendors cost persons and engineers working on the well. The Crystal Ball analysis is used to ensure that the budget is within the correct range. The vendors themselves are responsible for mobilizing equipment and personnel and also to estimate their budget and follow up the cost of the well.

During the Execution of the well Weekly Cost reports is submitted by the vendors. This includes all the cost for one week; like personnel, equipment, onshore planning, mobilization cost, etc. It should also describe any discrepancies from the planned operation and extra cost in connection with that.

Within two weeks after the well is finished the Final Cost Reports needs to be done. Included in the reports is a summary of actual versus budgeted cost and a list of sent and outstanding invoices. These reports are reconciled in detail and this gives both BP and the Vendors a chance to reconcile their books and add/extract cost from the project.

The AFE cost vs. the actual cost can be seen on attached pie charts and cost table.

### 5.5.2 Drilling Operations Cost versus Plan

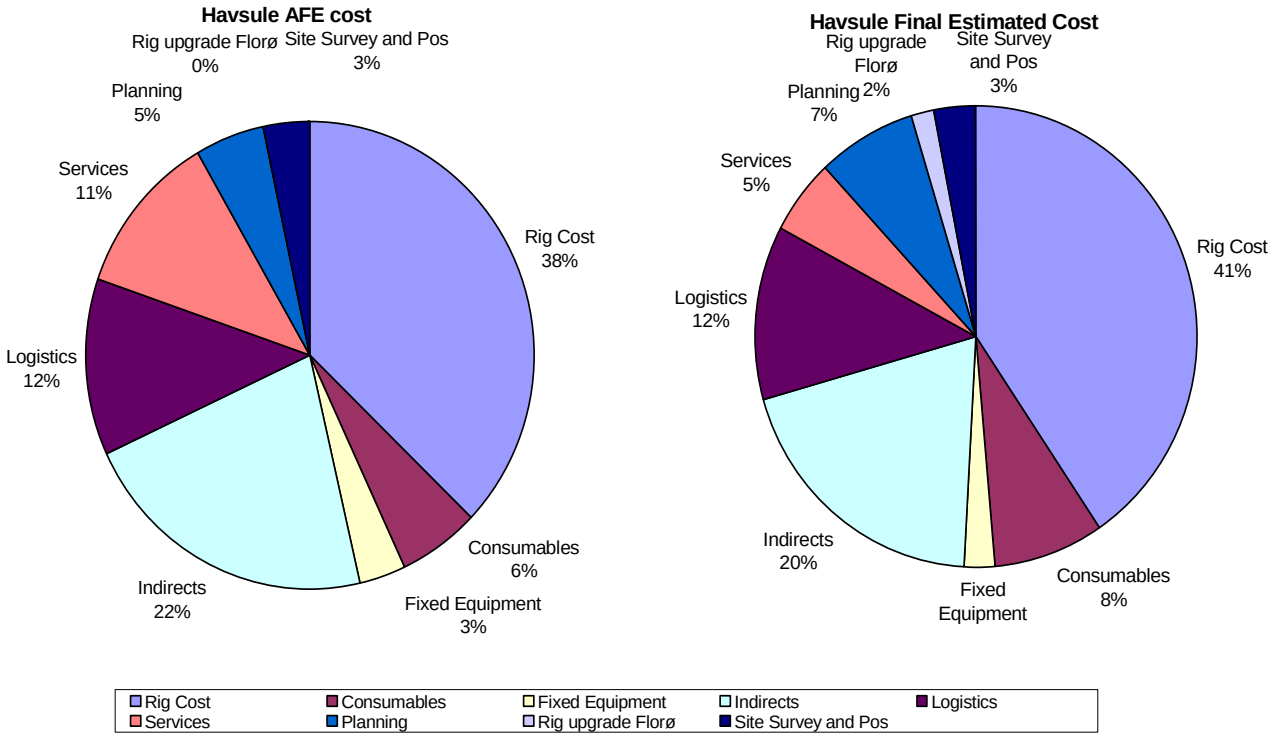
The well was initially budgeted for NOK 199,5 mill. A supplemental AFE was issued to cover for the overrun of the cost. The total AFE came up to NOK 396,5 mill, and the total estimated cost for the vertical well is NOK 392,0 mill.

The main reasons for the cost overruns are:

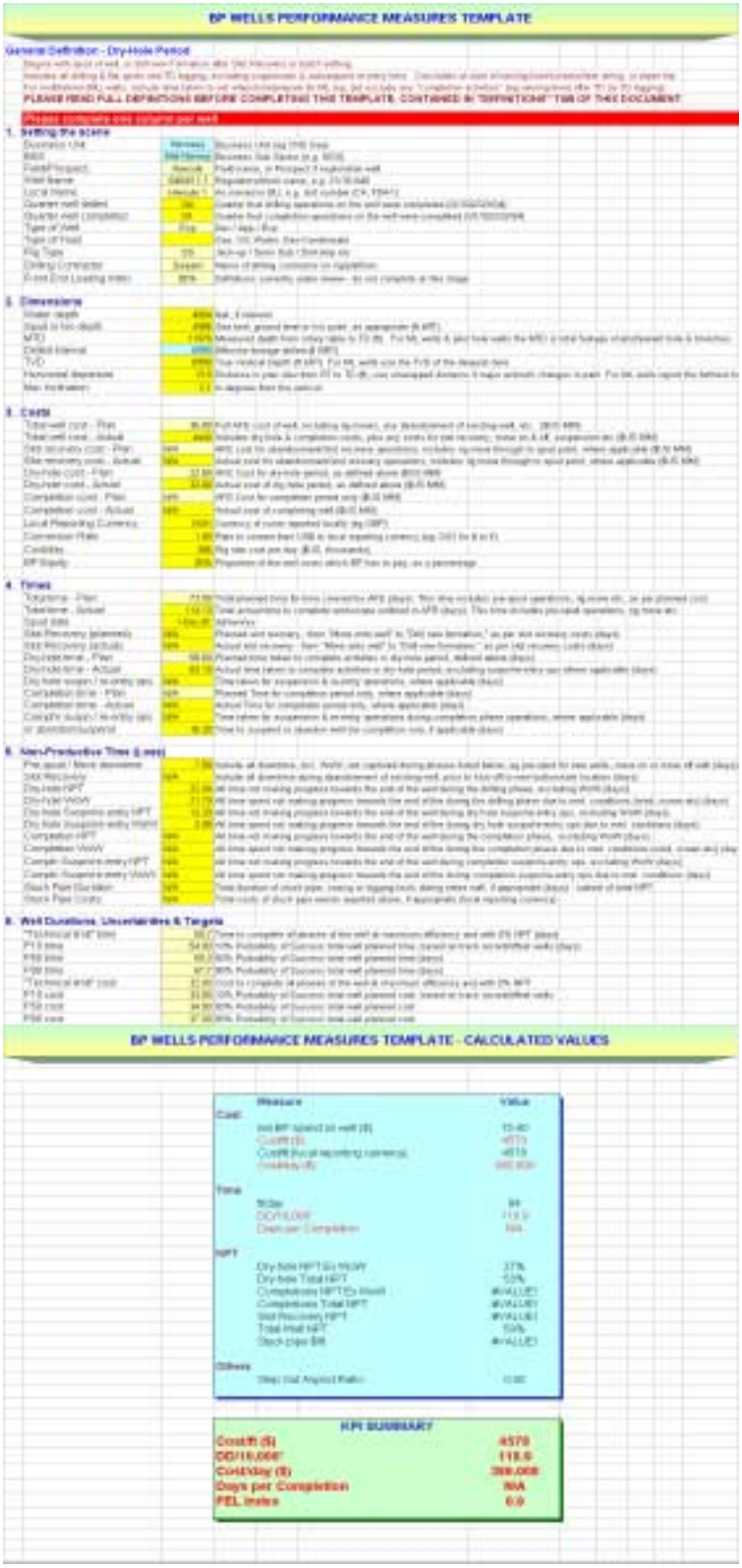
- The planning phase - delayed the start of the drilling last time from 25th of October to 14th of November.
- Rig upgrade in Florø not budgeted for, a total of NOK 3,7 mill.
- Down time related to weather – drilling in winter instead of summer. The original operation schedule plan(execution plan) was not adjusted for the winter time. About 30days were lost due to weather.
- Top hole had to be redrilled, due to a dropped marker buoy in the pilot hole.
- ROV technical problems and tether tangling.
- Rig failures – riser fill-up valve, leaking H-4 connector, BOP bumper bar , etc.
- 13 3/8" cementing incident and "piggy back" hanger requirement.

### 5.5.3 Well Cost Analysis

| Account | Description | AFE (NOK) | Tot. Actual (NOK) |
|---|---|---|---|
| 8105 | Freight charges | 1,441,546 | 1,350,131 |
| 8141 | Guidebase | 26,000 | 0 |
| 8142 | Wellhead,Equip. & X-mas trees (Tan) | 1,099,189 | 3,012,677 |
| 8144 | Conductors (Tan) | 954,980 | 581,518 |
| 8151 | 20" or 18 5/8" Casing (Tan) | 3,016,048 | 1,527,069 |
| 8152 | 13 3/8" Casing (Tan) | 4,814,852 | 5,048,284 |
| 8153 | 9 5/8" Casing (Tan) | 914,016 | 1,038,978 |
| 8154 | 7" Casing/liner (Tan) | 4,097 | 14,545 |
| 8156 | Casing accessories | 1,271,860 | 968,713 |
| 8157 | Liner hangers | - | 1,526,030 |
| 8358 | Rock bits | 817,236 | 1,172,989 |
| 8359 | Diamond bits / PDC bits | 577,800 | 1,248,485 |
| 8360 | Core heads | - | - |
| 8362 | Drilling Consumables | 400,000 | 379,208 |
| 8363 | Mud chemicals | 4,691,484 | 5,714,192 |
| 8364 | Cement & additives | 2,335,535 | 6,226,512 |
| 8365 | Drilling tools | - | 208,256 |
| 8400 | Base handling charges | 9,916,189 | 7,032,672 |
| 8466 | Wellhead, Completion Services | 1,468,728 | 743,715 |
| 8477 | Rig Fuel | 13,250,000 | 16,630,921 |
| 8515 | Engineering studies, UTG | 2,501,131 | 3,690,087 |
| 8661 | Drilling contract / rig site | 147,214,101 | 157,049,748 |
| 8662 | Site survey | 7,678,474 | 8,024,024 |
| 8664 | Towing / anchor handlers | 2,980,000 | 819,156 |
| 8666 | Site prep. And Rig positioning | 2,825,000 | 4,646,369 |
| 8669 | Rig Modification | - | 5,259,511 |
| 8691 | General transport, Truck | 470,000 | 0 |
| 8692 | Supply vessel | 35,629,500 | 31,690,990 |
| 8693 | Std.by vessel | 6,734,850 | 7,540,006 |
| 8694 | Helicopters | 5,928,892 | 6,243,303 |
| 8702 | Mud engineering | 871,800 | - |
| 8704 | Casing running | 2,774,921 | 3,038,351 |
| 8705 | Cement services | 5,183,223 | 2,588,759 |
| 8706 | Mud logging | 3,067,499 | 2,600,034 |
| 8707 | Measurement while drilling (MWD) | 13,523,817 | 12,162,187 |
| 8709 | Directional drilling/Surveying services | 2,772,700 | 701,915 |
| 8710 | Drilling Optimisation | 464,910 | 484,877 |
| 8711 | Fishing services | 524,342 | 2,550,440 |
| 8712 | ROV /Diving | 6,570,231 | 7,639,588 |
| 8715 | Coring | 2,327,668 | 1,821,561 |
| 8717 | Core analysis | - | 177,456 |
| 8718 | Sampling and Fluid analysis | 3,700,000 | 5,004,488 |
| 8721 | Rig and platform communication | 1,590,000 | 494,649 |
| 8723 | Wellsite Supervision | 16,114,534 | 1,215,762 |
| 8724 | Drill string tool rentals | 566,221 | - |
| 8725 | DST | - | 1,106,733 |
| 8730 | Containers/Tanks - waste disposal | 1,060,000 | 19,801 |
| 8732 | Aband./ susp./ site cleaning | 1,112,263 | |
| 8733 | Wireline logging | 18,713,250 | 8,394,901 |
| 8735 | Insp. Services | - | 111,767 |
| 8736 | Catering and acc. | - | 35,502 |
| 8738 | Weather forecast | - | 258,082 |
| 8739 | General drilling services rental | 240,000 | 618,709 |
| 8772 | Planning workshop costs | 382,384 | 369,902 |
| 8773 | Contractor/Consultant costs | 9,553,497 | 14,222,692 |
| 8790 | HSE, BPA manpower | 1,134,257 | 2,504,912 |
| 8791 | Operation dept., BPA manpower | 3,519,897 | - |
| 9727 | Exploration Mngt. BPA manpower | 9,206,009 | 6,605,695 |
| 8793 | Drilling, BPA manpower | 18,865,996 | 31,145,123 |
| 8700 | BPA Manpower, overhead | 10,295,192 | 6,738,024 |
| 8823 | Course, travel and Accommodation | 3,319,358 | - |
| **Total Drilling Cost** | | **385,518,000** | **392,000,000** |
| **Rig- up-grade in Florø** | | **6,482,000** | |
| **Total Well Cost** | | **392,000,000** | |


Havsule AFE cost
Rig upgrade Florø 0%
Site Survey and Pos 3%
Planning 5%
Services 11%
Rig Cost 38%
Logistics 12%
Consumables 6%
Indirects 22%
Fixed Equipment 3%
Havsule Final Estimated Cost
Rig upgrade Florø 2%
Site Survey and Pos 3%
Planning 7%
Services 5%
Rig Cost 41%
Logistics 12%
Indirects 20%
Fixed Equipment
Consumables 8%
Rig Cost
Consumables
Fixed Equipment
Indirects
Logistics
Services
Planning
Rig upgrade Florø
Site Survey and Pos

## 5.6 Global Drilling Performance Measurement Template



# 6 DRILLING DATA

## 6.1 DIMS Operation Summary

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 14/11/2001 | 0 | 19:00 | 00:00 | 5 | PRSPUD | MOB | RUNC | Rig on Contract 14/11/2001 at 19:00 Started transit from Snorre UPA to Florø. Rig handed over from Hydro to BP when 500m off location. Stopped approx 40 nm outside coast due to bad weather. Waiting on weather and daylight to proceed towards Florø. Geoservice: Have removed 17 old pit sensors. 10% complete. Anadrill / Sønnico: Installing cables. Install junction boxes and computer equipment in mud logging unit. 10% complete. CAN: Preparing for stab master support frame installation. Parts of existing support frame need to be removed. Oceaneering: Manned down to 3 for POB. 3 will enter rig in Florø. |
| 15/11/2001 | 0 | 00:00 | 16:00 | 16 | PRSPUD | MOB | WAIT | WOW and dayl light to proceed towards Florø. |
| 15/11/2001 | 0 | 16:00 | 00:00 | 8 | PRSPUD | MOB | RUNC | Continue transit to Florø.<br>Geoservice: Burnt hoses in cylinder lids. Attached 17 new probe pit sensors to cylinder lids with plastic nuts and place in position. Start to pull old cable back from local pit junction boces to main pit room junction box. Checked unit shut down systems: Loss of pressure OK Smoke x 2 OK Gas x 2 OK. 12% complete. Anadrill/ Sønnico: Pull cable from unit to shaker room. Install junction box in shaker. 12% complete. CAN: Coordinated job with rig crew. Wait on support bracket from boat. (Have been notified about BP logo on canvas to be installed in derrick. Canvas still on boat.) Oceaneering: Manned down to 3 for POB. 3 will enter rig in Florø. Saipem: prepare subs and X/O's for NDT inspection. Varco work with modification on TDS. Hold safety meeting and prepare rig up for work on CMS. Start rigging up for lowering CMC piston. Install new guide plate on iron roughneck. Work on trip tank outlet line. |
| 16/11/2001 | 0 | 00:00 | 01:00 | 1 | PRSPUD | MOB | RUNC | (1-BP) CONTINUE TRANSIT TOWARDS FLORØ. |
| 16/11/2001 | 0 | 01:00 | 09:00 | 8 | PRSPUD | MOB | WAIT | (1-BP) STOPPED INSHORE FRØYSJØEN. WAITING ON DAYLIGHT FOR HARBOUR ENTRANCE. |
| 16/11/2001 | 0 | 09:00 | 12:00 | 3 | PRSPUD | MOB | RUNC | (2-BP) MOVE FROM LOACTION IN FRØYSJØEN TO FINAL LOCATION OUTSIDE FLORØ. |
| 16/11/2001 | 0 | 12:00 | 19:00 | 7 | PRSPUD | MOB | RUNC | (3-BP) PREPARE FOR ANCHOR HANDLING. RUN ANCHORS WITH HAVILA CROWN AND FAR SENIOR. PRETENSION TESTS TO 70 MT. RIG HEADING 300 DEG TO OBTAIN GPS SIGNALS. |
| 16/11/2001 | 0 | 19:00 | 19:30 | 0.5 | PRSPUD | MOB | RUNC | (11-BP) P/U BP IT EQUIPMENT AND STABMASTER SUPPORT FRAME FROM SØLVBAS. |
| 16/11/2001 | 0 | 19:30 | 00:00 | 4.5 | PRSPUD | MOB | RUNC | (11-NH) BACKLOAD HYDRO SUBSEA EQUIPMENT WITH FAR SENIOR. HAVILA CROWN DELIVERED ANCHOR CHAIN AT BASE. OFF CONTRACT 00:00 17.11.01 GEOSERVICE: (16) PULLED BACK OLD CABLES FROM LOCAL PIT SENSOR JUNCTION BOXES TO MAIN PIT ROOM JUNCTION BOX. DRILLED AND BOLTED 17 NEW PIT SENSOR SUPPORTS WITH SENSORS TO TOP OF CYLINDERS. OPENED MUD ENGINEERS WORK STATION AND CHECKED PCBS AFTER COMPUTER SUFFERED FROM RIG MOVEMENTS DURING TRANSIT FROM SNORRE UPA. REASSEMBLED AND REPOSITIONED. WORKS OK. DISCONNECTED AND PULLED MW IN/TEMP IN/H2S CABLES FROM LOCAL JUNCTION BOXES TO MAIN PIT ROOM JUNCTION BOX. SKIPPED ALL OLD CABLES AND CLEARED PIT ROOM OF GEOSERVICES GEAR, MOVED CABLE DRUM FROM UNIT TO PIT ROOM. 20%COMPLETE. ANADRILL/SØNNICO (17) TIE UP CABLE, OPENING MCT FRAME, CONNECTING CABLES IN UNIT. MOUNTING JUNCTION BOXES ON DRILLFLOOR, OPENING MC FRAME, BUILD CABLE TRAY. 20% COMPLETE CAN (19) CONTINUE TO COORDINATE AND PLAN WORK FOR INSTALLATION OF SUPPORT BRACKET. CLEAN WORK AREA WITH HIGH PRESSURE GUN. STABMASTER SUPPORT BRACKET ONBOARD RIG AT 19:30. OCEANEERING (18) ASSIST IN HYDRO BACKLOAD. MAINTENANCE ON ROV EQUIPMENT. SAIPEM (14) CONTINUED TO PREPARE FOR LOWERING FORWARD CMC CYLINDER. HELD SAFETY MEETING, ANNOUNCE WORK IN DERRICK AND SEAL OFF RIG FLOOR PRIOR TO LOWERING CMC. LOWER AND PERFORM MAINTENANCE ON CMC CYLINDER. (12) WORK ON PIT SENSORS IN SHAKER ROOM AND PIT ROOM. PETAS CONTINUE TO INSPECT SUBS TO DS1 (6) PREPARE AND SKID 5K BOP TO LIFTING AREA. (15) VARCO WORK ON TDS. CHANGE TO 6 1/2" LINERS ON MP 3. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 17/11/2001 | 0 | 00:00 | 02:30 | 2.5 | PRSPUD | MOB | RUNC | (11-NH) BACKLOAD HYDRO EQUIPMENT ON FAR SENIOR. |
| 17/11/2001 | 0 | 02:30 | 06:00 | 3.5 | PRSPUD | MOB | RUNC | (11-NH) CONTINUE WORK ON TDS. PREPARE TO OVERHAUL CMC PISTON/CYLINDER WHILE FAR SENIOR GOES TO FLORØ BASE AND RETURN |
| 17/11/2001 | 0 | 06:00 | 08:30 | 2.5 | PRSPUD | MOB | RUNC | (11-NH) CONTINUE BACKLOAD HYDRO EQUIPMENT ON FAR SENIOR |
| 17/11/2001 | 0 | 08:30 | 10:30 | 2 | PRSPUD | MOB | RUNC | (5-BP) CRANE BARGE UGLEN READY AT STARBOARD SIDE. PREPARE LIFTING OPERATION. |
| 17/11/2001 | 0 | 10:30 | 13:00 | 2.5 | PRSPUD | MOB | RUNC | (11-NH) DEMOB HYDRO EQUIPMENT ON FAR SENIOR. |
| 17/11/2001 | 0 | 13:00 | 17:30 | 4.5 | PRSPUD | MOB | RUNC | (6,7,8,9-BP)CRANE BARGE UGLEN READY AT STARBOARD SIDE. LIFT OFF 5K BOP AND TRANSPORT TO FLORØ BASE. UGLEN P/U 15 KBOP AND TRANSPORT TO RIG. LAND SAME. RETURN TO BASE , P/U LMRP AND TRANSPORT TO RIG. LAND SAME. |
| 17/11/2001 | 0 | 17:30 | 18:00 | 0.5 | PRSPUD | MOB | RUNC | (4-BP) PREPARE FOR BLACK OUT TESTS. HELD PRE TEST MEETING. |
| 17/11/2001 | 0 | 18:00 | 19:30 | 1.5 | PRSPUD | MOB | RUNC | (4-BP) SAIPEM PERFORM BLACK OUT TESTS: TEST 2.8 - FULL BLACKOUT RECOVERY AND TEST 2.4A - 2+2 PARTIAL BLACKOUT. THE TESTS WERE SUCCESSFULY CARRIED OUT. ON FULL BLACK OUT, FIRST THRUSTER AVAILABLE IN 6 MINUTES. ALL THRUSTERS AVAILABLE IN 11,5 MINUTES. |
| 17/11/2001 | 0 | 19:30 | 22:30 | 3 | PRSPUD | MOB | RUNC | (11-NH) CONTINUE BACKLOAD HYDRO EQUIPMENT |
| 17/11/2001 | 0 | 22:30 | 00:00 | 1.5 | PRSPUD | MOB | RUNC | (11-BP) FAR SWAN ALONGSIDE. LOAD BP EQUIPMENT. GEOSERVICE: (16) REMOVE OLD CABLE FROM SKIP. MARK THE 17 NEW PIT SENSORS FOR IDENTIFICATION PURPOSES. RUN 11 CABLES FROM THE NEW PIT SENSORS TO MAIN PIT ROOM JUNCTION BOX. REMOVE 17 OLD JUNCTION BOXES FROM CYLINDERS. TIE WRAP CABLES BACK TO JUNCTION BOXES FROM CYLINDERS. TIE WRAP CABLES BACK TO JUNCTION POINTS. 35% COMPLETE. ANADRILL/SØNNICO (17) PULLING CABLE FROM UNIT TO JUNCTION BOX (MAINBOX). PULLING CABLE FROM MONKEYBOARD TO MAINBOX ON DRILLFLOOR. PULLING CABLES FROM UNIT TO PIPEDECK (TOOLDUMP AND LTB MODEM). MOUNTING CABLE TRAY, OPENING MCT FRAME PACKING MCT FRAME, TIE UP CABLES. 40% COMPLETE CAN RIGGING OF ROPE ACCESS EQUIPMENT. CLEAN STABBING BOARD WITH HIGH PRESSURE GUN. MEASURE AND TAKE PICTURES OF STABMASTER POSITION. INSTALL LEFT SUPPORT ARM. OCEANEERING MAGNUM #37 STANDBY ON DECK INSTALL SONAR ON CAGE, WEEKLY MAINTENANCE ON SYSTEM. DEMOB HYDRO SPECIFIC TOOLS. MAGNUM #63: LIFTING WINCH, A-FRAME, HPU AND ROV IN POSITION ON DECK. START INSTALLING DECK CABLE AND HYDRAULIC HOSES TO WINCH/HPU SEA OWL #516 - STANDBY ON DECK SAIPEM PREPARE TO SPOOL 1900 M MUX CABLE ON BLUE POD REEL. CONT WORK WITH CMC CYLINDER. CONT CHANGE LINERS ON MP 3. VARCO CONTINUE WORK ON TDS. |
| 18/11/2001 | 0 | 00:00 | 04:00 | 4 | PRSPUD | MOB | RUNC | (11,14,15-BP) CONTINUE OFFLOAD CARGO AND BULK FROM FAR SWAN. VARCO CONT WORK ON TDS. SAIPEM CONT WORK ON CMC. |
| 18/11/2001 | 0 | 04:00 | 06:00 | 2 | PRSPUD | MOB | RUNC | (14-SAIPEM)STOP WORK ON DRILLFLOOR WHILE WORK ON CMC. |
| 18/11/2001 | 0 | 06:00 | 13:30 | 7.5 | PRSPUD | MOB | RUNC | (14,15-NH/SAIPEM) CONT WORK WITH CMC CYLINDER. VARCO WORK ON TOP DRIVE. |
| 18/11/2001 | 0 | 13:30 | 14:00 | 0.5 | PRSPUD | MOB | RUNC | (19-BP) INSTALL STABMASTER SUPPORT BRACKET. HYDRO START RIGGING DOWN BURNERHEAD. |
| 18/11/2001 | 0 | 14:00 | 16:00 | 2 | PRSPUD | MOB | RUNC | (14-SAIPEM) CONT WORK WITH CMC CYLINDER. HYDRO RIGGING DOWN BURNER HEAD. |
| 18/11/2001 | 0 | 16:00 | 17:00 | 1 | PRSPUD | MOB | RUNC | (11-BP) BACKLOAD EMPTY CONTAINERS ON SØLVBAS TO MAKE DECK SPACE. CONT WORK WITH CMC CYLINDER. PRESSURE TEST CYLINDER OK. HYDRO RIGGING DOWN BURNER HEAD. READY FOR BACKLOAD. |
| 18/11/2001 | 0 | 17:00 | 22:30 | 5.5 | PRSPUD | MOB | RUNC | (11-BP) LOAD EQUIPMENT FROM SØLVBAS. HOLD SAFETY MEETING PRIOR TO P/U CMC. HOIST CMC CYLINDER IN DERRICK. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 18/11/2001 | 0 | 22:30 | 00:00 | 1.5 | PRSPUD | MOB | RUNC | (14-SAIPEM/NH) CONT WORK ON CMC IN DERRICK. GEOSERVICE (16) MARK SENSORS AND CABLES IN PIT ROOM. SØNNICO EL. TERMINATED 11 NEW PIT SENSORS CREATE NEW DATABASE FOR NEW WELL AND MAKE IT REAL TIME. REPAIR TRIP TANK SENSOR. CHECK DEPTH SYSTEM. INSPECT AND CLEAN SHAKER TANK SENSOR HEADS. SØNNICO EL. STARTED TO PRPARE PIT ROOM WIRING SCHEMATICS. 40% COMPLETE. ANADRILL/SØNNICO (17) INSTALL J.B. AND TOOLDUMP SOCKET ON DRILLFLOOR AND PIPEDECK. CONNECTING CABLES IN UNIT. INSTALL CABLE TRAY AND TIE UP CABLES. PACK MCT FRAME, TIE UP CABLES. 55% COMPLETE CAN (19) RIGGING FOR INSTALLATION OF STABMASTER SUPPORT FRAME. FRAME INSTALLED 4 CM OUT OFF POSITION DUE TO OBSTRUCTION BY STABBING BOARD. FRAME HELD IN POSITION WITH 4 CHAIN BLOCKS AND ONE BRACKET. PLANNING FOR INSTALLATION OF 2 BP SIGNS IN DERRICK. 40% COMPLETE OCEANEERING MAGNUM #37 STANDBY ON DECK MAGNUM #63: CONT INSTALLING DECK CABLE AND HYDRAULIC HOSES TO WINCH/HPU. INSTALLED HYDRAULIC CYLINDERS TO A-FRAME. INSTALLED UMBILICAL LIFTING CONE TO CAGE. CLAMPED A-FRAME TO DECK. START INSTALLING UMBILICAL CABLE TO CAGE J.B. 40% COMPLETE |
| 19/11/2001 | 0 | 00:00 | 04:00 | 4 | PRSPUD | MOB | RUNC | (14,15-SAIPEM/HYDRO)HELD PRE JOB MEETING. SECURE AREA IN DERRICK. ANNOUNCE ONGOING WORK ON P.A.INSTALL CLAMPS AND PIPES TO CMC CYLINDER. VARCO WORK ON TDS WHEN NOT IN CONFLICT WITH WORK IN DERRICK. |
| 19/11/2001 | 0 | 04:00 | 13:00 | 9 | PRSPUD | MOB | RUNC | (11-BP) CONT P/U CARGO FROM FAR SWAN. RE ARRANGE DECK AND DEMOB EMPTY CARGO ON FAR SWAN. TIDY RIG FLOOR AND CROWN AREA. SECURE EQUIPMENT. VARCO CONTINUE TO WORK ON TDS. CAN WORK ON STABMASTER SUPPORT FRAME. ANADRILL/SØNNICO INSTALL EL CABLE ON GOOSE NECK. PREPARE FOR AND WORK ON HYDRAULIC LOCKING SYSTEM IN CROWN. SKID 15 K PSI BOP TO PARKING AREA AND SECURE SAME. |
| 19/11/2001 | 0 | 13:00 | 13:30 | 0.5 | PRSPUD | MOB | RUNC | (14,15 - SAIPEM/HYDRO) CONT WORK WITH CMC AND TDS. |
| 19/11/2001 | 0 | 13:30 | 14:00 | 0.5 | PRSPUD | MOB | RUNC | (11,14,15 - BP) P/U CARGO FROM SØLVBAS. CONT WORK ON CMC AND TDS. |
| 19/11/2001 | 0 | 14:00 | 23:30 | 9.5 | PRSPUD | MOB | RUNC | (14,15 - SAIPEM,NH) CONTINUE WORK WITH TORQUE ASSEMBLY ON TDS. CONTINUE TO INSTALL HYDRAULIC LOCK VALVE ON CMC. OVERHAUL SAME. |
| 19/11/2001 | 0 | 23:30 | 00:00 | 0.5 | PRSPUD | MOB | RUNC | (11-BP) FAR SWAN ALONGSIDE FOR LOADING/BACKLOADING. START LOADING EQ TO RIG ON STARBOARD SIDE. GEOSERVICE (16) RECEIVED MORE CABLE VIA TAXI BOAT. RAN CABLES FROM MAIN PIT ROOM JUNCTION BOXES TO REMAINING PIT SENSORS. RAN CABLES FROM MW/H2S/TEMP LOCAL J.B. TO MAIN PIT ROOM J.B. SØNNICO TERMINATED CABLES INTO REMAINING PIT SENSORS. SØNNICO TERMINATING PIT SENSOR CABLES IN MAIN PIT ROOM JUNCTION BOXES. DISCONNECTED AND REMOVED OLD PIT SENSOR CONTROL PANELS IN UNIT. ALL CABLES RUN AND TIE WRAPPED IN PIT ROOM. 65% COMPLETE. ANADRILL/SØNNICO (17) INSTALL AND CONNECT J.B. INSTALL DEPTH AND CONNECTING IN J.B. INSTALL DISPLAY. INSTALL COMPUTERS IN UNIT. CONNECT CABLES ON MONKEYBOARD, CONNECT SENSOR CABLES. 70% COMPLETE. CAN SUPPORT FOR CABIN MOVED AND SECURED. BRACKET FOR GANG-WAY REMOVED. INSTALLED 2ND SUPPORT ARM FOR STABMASTER FRAME. TRIED TO POSITION STABMASTER FRAME - UNSUCCESSFUL DUE TO STABBING BOARD SUPPORT OBSTRUCTION. PLAN TO REMOVE STABBING BOARD. EQUIPMENT FOR INSTALLING BP SIGN MOVED TO MONKEY BOARD. 50% COMPLETE OCEANEERING (18) MAGNUM #37: STANDBY ON DECK. STARTING MODIFICATIONS ON TELEMETRY CAN. MAGNUM #63: CONTINUE INSTALLIATION OF UMBILICAL CABLE AND DECK CABLE. TROUBLE SHOOTING TELEMETRY LINK. PERFORM PULL TEST AND INSPECTION OF BACK-UP SYSTEM. CONTINUE TROUBLESHOOTING ON TELEMETRY LINK. LINK FIXED OK. PREPARE FOR DIVING TEST. SEA OWL #516: STANDBY ON DECK. 60% COMPLETE |
| 20/11/2001 | 0 | 00:00 | 06:00 | 6 | PRSPUD | MOB | RUNC | (11,12,14,15-HYDRO/SAIPEM) WORK WITH TORQUE ASSEMBLY AND INSTALL HYDRAULIC LINK TILT ON TDS. CONT WORK WITH HYDRAULIC LOCK VALVE ON CMC. PETAS NDT CHECK EQ. ON DRILL FLOOR AND DERRICK. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 20/11/2001 | 0 | 06:00 | 18:00 | 12 | PRSPUD | MOB | RUNC | (9,10,19-BP) SECURE BOP. WORK WITH GUIDING SYSTEM ON POD WINCHES AND START SPOOL/UNSPOOL MUX CABLES. REMOVE STAB MASTER SUPPORT FRAME PRIOR TO START REMOVING STABBING BOARD. LOAD EQUIPMENT FROM FAR SWAN. |
| 20/11/2001 | 0 | 18:00 | 00:00 | 6 | PRSPUD | MOB | RUNC | (14,15 HYDRO/SAIPEM) VARCO AND SAIPEM WORK WITH TDS. TUBOSCOPE NDT CHECK SUBS AND X/O'S. GEOSERVICES: (16) SØNNICO TERMINATED CABLES AT JUNCTION BOXES. MOUNTED MAIN JUNCTION BOX AND TERMINATE CABLES. TRACE CABLE FROM UNIT TO ACCOMODATION FOR WITS LINK TO PRESSURE ENGINEER. RAN WITS CABLE TO GEOLOGISTS OFFICE. 90% COMPLETE. ANADRILL/SØNICO: (17) CONNECTED UP REST OF SENSORS, TESTING CABLES, CONNECTING UP RIGFLOOR MONITOR. TESTING SENSORS. 85% COMPLETE. CAN: (19) REMOVE STABMASTER FRAME. R/U TO REMOVE STABBING BOARD. NO ACCESS TO RIG FLOOR BETWEEN 11:30 AND 13:15. FINISH RIGGING AT 16:00 HRS. STOPPED WORK BECAUSE TOP DRIVE AND SCAFFOLDING WAS IN WAY OF LIFT. REMOVED PLATFORM TO STABBING BOARD. REPAIRED HAND RAIL. PACKING OF EQUIPMENT. 85% COMPLETE. OCEANEERING (18) MAGNUM #37: CONTINUE MODIFICATION ON TELEMETRY CAN. FIXING TRANSDUCER BASKET AND GASLIGHT TO ROV. MAGNUM #63: TEST DIVE - OK. DISCONNECT MAGNUM #63 AND HOOK UP MAGNUM #37. STANDBY ON DECK SEA OWL #516. STANDBY ON DECK. 80% COMPLETE |
| 21/11/2001 | 0 | 00:00 | 06:00 | 6 | PRSPUD | MOB | RUNC | (14-SAIPEM) SUBSEA ENGINEER WORKING ON CMC. |
| 21/11/2001 | 0 | 06:00 | 11:00 | 5 | PRSPUD | MOB | RUNC | WORKING ON TORQUE ASSY. ON TDS |
| 21/11/2001 | 0 | 11:00 | 00:00 | 13 | PRSPUD | MOB | WAIT | WOW. CAN: CONTINUED WORKING ON OLD STABBING BOARD. INSTALLED STABMASTER - 100% COMPLETE. SAIPEM: CONTINUED TO SPOOL/ UNSPOOL POD CABLES. WEATHERFORD FUNCTIONTEST CASING ELEVATOR. NOGO. ANADRILL: TESTING REST OF SENSORS AND TOOLCOMS. MADE DRAWINGS AND MARKED ALL J.B. WITH TAG. DEMOB 1 SØNNICO. 95% COMPLETE. GEOSERVICES: PIT ROOM COMPLETED. UNIT JUNCION BOX AND CONNECTION TO SYSTEM COMPLETE. SØNNICO CHECK CONTINUITY OF CABLE RUNS. CHECK OPERATION OF PIT SENSORS. INSTALL AND CHECK LINK TO PRESSURE ENGINEER. 98% COMPLETE. OCEANEERING: WORKING ON MAIN DIVING SYSTEM. TROUBLESHOOTING SONAR. 90% COMPLETE. |
| 22/11/2001 | 0 | 00:00 | 08:00 | 8 | PRSPUD | MOB | WAIT | (15 - Hydro) Install protection frame on TDS. Electrician work with retract system. Perfom comissioning of TDS and torque assy - 100% complete. |
| 22/11/2001 | 0 | 08:00 | 16:00 | 8 | PRSPUD | MOB | WAIT | (14 - Saipem) Function test CMC |
| 22/11/2001 | 0 | 16:00 | 00:00 | 8 | PRSPUD | MOB | WAIT | (10, 12, 19 - BP) Work on BOP - connect clamps on kill/choke /conduit lines. Cont. prepare kelly hose from standpipe no. 2. Spool/ unspool POD cable. 100% complete Tidy derrick after stabmaster installation. 100% complete Change valves in pump room. (17) Anadrill: - Completed RU and inspection of cabling. - Tested WITS link to GeoService container. - Installed T-piece on kelly hose / standpipe RU-crew demobilised. 100% complete (18) Oceaneering (mob / prepare Mag 37): - Set-up sonar comm's lines sub / cage - Complete re-build of telemetry-can sub - Set-up new office computer - Test of new telemetry can set-up (ongoing). |
| 23/11/2001 | 0 | 00:00 | 04:30 | 4.5 | PRSPUD | MOB | WAIT | WOW. Prepare for anchor handling. Saipem:- Install kelly hose on mud standpipe and TDS. 02:00 - RU and test riser handling equipment. |
| 23/11/2001 | 0 | 04:30 | 13:00 | 8.5 | PRSPUD | RIGU | ANCH | (22, 23) Start anchor handling. 04:42 - P/L # 5 onboard Far Senior, start unmooring. 05:36 - P/L # 4 onboard McNee Tide, start unmooring 07:40 - Anchor chain # 4 sea fastened on bolster 07:55 - P/L # 3 onboard McNee Tide 08:15 - anchor chain # 5 released on Far Senior 08:45 - P/L # 2 onboard McNee Tide 09:20 - anchor chain # 2 sea fastened on bolster, P/L # 8 onboard Far Senior. 09:30 - anchor chain # 8 secured to the bolster 09:45 - P/L # 7 onboard Far Senior 09:54 - Far Swan released, ROB figures: Fuel oil, 1000 M3, Freshwater Nil, Lube Oil 17141 ltrs 10:00 - P/L # 1 onboard McNee Tide 11:24 - P/L # 6 onboard Far Senior 11:30 - P/L # 1 onboard SC5 11:55 - anchor chain # 8 secured on bolster 12:00 - McNee Tide released. ROB figures: Fuel Oil 503 M3, Freshwater 283 M3, Lube Oil 17112 ltrs. 12:30 - P/L # 6 onboard SC5. SAIPEM:- - Cont. preparing 750T riser handling equipment to perform "dummy" PU of riser - bails and elevator OK. - 08:30 - 09:30 Clear rig floor due to weld inspection using RA-tools. - 09:30 - 11:00 RD riser running eq. - 11:00 Install torque assy and 'BX'-elevator. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 23/11/2001 | 0 | 13:00 | 15:45 | 2.75 | PRSPUD | MOB | RUNC | (24) Start transit to Florø pilot station. SAIPEM: 13:00 - Cont. RD riser running eq. |
| 23/11/2001 | 0 | 15:45 | 00:00 | 8.25 | PRSPUD | MOB | RUNC | (30) Transit from Florø pilot station towards Havsule location. Distance sailed = 77 mls Average speed = 7 kts ETA Havsule location 23rd November at 13:30. SAIPEM:- 13:00 - 17:00 Modify kelly hose RU on TDS, tidy rig floor, check TDS & blocks for loose items, lift and store / secure spare kelly hose. 17:00 - 22:00 Held pre-job meeting. Re-arranged derrick to create space for 6-5/8" DP. 22:00 - 23:30 P/test outlet on standpipe and kelly hose to 35 Bar (500 PSI) / 5 mins, 345 Bar (5000 PSI) / 10 mins. 23:30 - 00:00 Cont. re-arrange derrick. OCEANEERING: - Changed / repaired transducer can - Oriented sonar on ROV / garage - Verified ROV set-up, inspection, maintenance - Modified transponder basket (interference problems between basket and transponder floatation elements). FUGRO GEOS: - Test upward looking ADCP and start data collection - OK. - Lift upward looking ADCP into seabed frame - Finish cable run to surface modem junction box and terminate cable. - Final preparations for downward looking ADCP deployment. - Install pilot house junction boxes and desktop PC. - Outstanding work - Install and test acoustic modems. |
| 24/11/2001 | 0 | 00:00 | 15:00 | 15 | PRSPUD | MOB | RUNC | (28) Rig in transit from Florø pilot station to Havsule location. Rig arrived on location at 15:00. Distance travelled = 165 mls. SAIPEM:- Cont. work on BOP Cont. preparations to re-spool drilling line. |
| 24/11/2001 | 0 | 15:00 | 16:00 | 1 | PRSPUD | MOB | RUNC | (30) Position rig. Attempted to launch ROV - nogo. SAIPEM:- Held pre-job safety meeting. Connected drill line to sandline and started to restring block to 14 lines at 15:30. Cont. work on BOP. |
| 24/11/2001 | 0 | 16:00 | 20:30 | 4.5 | PRSPUD | MOB | RUNC | (31) Ballast rig. Operations draft = 23.5 mts. SAIPEM:- Cont. to restring blocks to 14 lines. Cont. work on BOP. FUGRO GEOS:-: Installed/ finalised PC equipment in pilot house and labelled all cabling. Tested entire seabed ADCP system through acoustic modems to pilot house - OK. Bottom modem and cabling installed into seabed frame. 38kHz system tested and ready to deploy. Outstanding work - install top moden winch wire, remove transponder from modem deployment post and install block, and finalise seabed frame sling arrangement. |
| 24/11/2001 | 0 | 20:30 | 22:30 | 2 | PRSPUD | MOB | RIGU | (NPT) ROV deployed in the water. Launch transponder cage using pod wire winch. Re-arrange moonpool lifting arrangement (height limitations in moonpool and high basket lifting bridle). |
| 24/11/2001 | 0 | 22:30 | 00:00 | 1.5 | PRSPUD | MOB | RIGU | (32) Run ROV and transponder cage to seabed. Lost signal from ROV transponder (HiPaP) at +/- 700m. |
| 25/11/2001 | 0 | 00:00 | 00:30 | 0.5 | PRSPUD | MOB | RUNC | (34) ROV and transponder cage positioned just above seabed. |
| 25/11/2001 | 0 | 00:30 | 01:00 | 0.5 | PRSPUD | MOB | RUNC | (34) ROV perform mini-survey prior to landing cage. Commence seabed survey with ROV. ROV tether tangled up in the pod wire attached to the transponder cage. |
| 25/11/2001 | 0 | 01:00 | 01:30 | 0.5 | PRSPUD | MOB | RUNC | (NPT) Release pod wire and untangle tether. |
| 25/11/2001 | 0 | 01:30 | 03:00 | 1.5 | PRSPUD | MOB | RUNC | (NPT) ROV buoyancy deemed to be insufficent by ROV crew. ROV not able to deploy transponders. Decision made to pull ROV to surface and remove some weight. |
| 25/11/2001 | 0 | 03:00 | 03:30 | 0.5 | PRSPUD | MOB | RUNC | (NPT) ROV in splash zone - pod wire still tangled around ROV cable. Lost power to ROV - unable to communicate with ROV. |
| 25/11/2001 | 0 | 03:30 | 12:00 | 8.5 | PRSPUD | MOB | WAIT | (NPT) Deploy ROV below splash zone, initiate remedial work to recover ROV. Hold planning meeting with all involved personnel. |
| 25/11/2001 | 0 | 12:00 | 00:00 | 12 | PRSPUD | MOB | RUNC | (37) Start DP system failure mode tests. SAIPEM:- 00:00 - 04:30 (16) Cont. to restring blocks to 14 lines. 04:30 - 05:00 Change DP handling eq., prepare to LD Norsk Hydro cmt stand. 05:00 - 05:30 Check and adjust crown'o'matic 05:30 - 08:00 LD 5" HWDP and 2 std 5" DP.. 08:00 - 10:30 Rig repair - weld 2 broken safety wires. Meanwhile re-arrange hoses on TDU torque assy, repair TDU RPM sensor, and tie-up TDU service lines. 10:30 - 11:00 Cont. LD Norsk Hydro cmt stand. 11:00 - 12:00 (27) Change out DP handling eq. f/5" to 6-5/8". 12:00 - 00:00 (27) PU 6-5/8" DP f/deck and rack in derrick. 30 stands completed by report time. Cont. work on BOP. Start building kill mud. FUGRO GEOS:- Wind top modem wire onto winch, test and start S4 calibration current meter, wait to deploy ADCP's. OCEANEERING:- Recovered Magnum 37, commence fault-finding. Cut-off 150m of the umbilical, start re-termination work. Test Magnum 63, prepare for dive. Unable to launch due to heavy wind & seas. |
| 26/11/2001 | 0 | 00:00 | 03:00 | 3 | PRSPUD | MOB | RUNC | (37) Continue DP system failure mode tests. Saipem: (27) P/U 6 5/8" DP and rack back same. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 26/11/2001 | 0 | 03:00 | 09:00 | 6 | PRSPUD | MOB | RUNC | (27) Continue P/U 6 5/8" DP and rack in derrick. |
| 26/11/2001 | 0 | 09:00 | 17:30 | 8.5 | PRSPUD | MOB | RUNC | (37) Continue DP system failure mode tests. Outstanding work include:- 1) 4 UPS's (power distribution tests) 2) Thruster I/O signal failures. 3) Remaining engineering failure modes 4) LBL failure modes (seabed array required) 5) Emergency switchboard blackout test. Estimated time of completion is +/- 12 hours after transponder array deployment. |
| 26/11/2001 | 0 | 17:30 | 21:30 | 4 | PRSPUD | MOB | RUNC | (32) Deploy Magnum 37 primary ROV to 1481m. Observed leak from rate pack in cage - abort dive. ROV on deck at 20:30. |
| 26/11/2001 | 0 | 21:30 | 23:00 | 1.5 | PRSPUD | MOB | RUNC | (32) Rig up Magnum 63 , back-up ROV. Deploy same. |
| 26/11/2001 | 0 | 23:00 | 00:00 | 1 | PRSPUD | MOB | RUNC | (32) Run ROV to seabed. SAIPEM:- (27) 00:00 - 09:00 Continue P/U 6 5/8" DP and rack in derrick. 09:00 - 09:30 Change out TDU saver sub. 09:30 - 10:00 Change over to 5" handling equipment. 10:00 - 11:00 RIH 13 stnds ITAG HWDP. 11:00 - 15:00 LD ITAG pipe. 15:00 - 21:30 Pre-job meeting. MU 12-1/4" pilot hole assy. 21:30 - 22:00 Pre-spud meeting with both drill crews and service companies. 22:00 - 22:30 Handover with new drill crew. 22:30 - 00:00 PU 5" HWDP from deck. FUGRO GEOS:- Wait to deploy ADCP's. |
| 27/11/2001 | 0 | 00:00 | 00:30 | 0.5 | PRSPUD | MOB | RUNC | (34) Cont. running ROV to seabed. |
| 27/11/2001 | 0 | 00:30 | 02:45 | 2.25 | PRSPUD | MOB | RUNC | (34) ROV appear to be too buoyant in the water. Decide to pull ROV to surface. At 00:55 hrs stopped retrieval operation due to problems with ROV winch on deck (feeder mechanism mis-alignment). |
| 27/11/2001 | 0 | 02:45 | 03:15 | 0.5 | PRSPUD | MOB | RUNC | (34) Retrieve ROV to surface. |
| 27/11/2001 | 0 | 03:15 | 03:45 | 0.5 | PRSPUD | MOB | RUNC | (34) Load ROV with 42kg lead, remove support bracket from ROV winch. |
| 27/11/2001 | 0 | 03:45 | 04:30 | 0.75 | PRSPUD | MOB | RUNC | (34) Deploy ROV and run down to seabed level. ROV appear to be still to buoyant. Also sign of telemetry problems. |
| 27/11/2001 | 0 | 04:30 | 05:00 | 0.5 | PRSPUD | MOB | RUNC | (34) Troubleshoot ROV. |
| 27/11/2001 | 0 | 05:00 | 06:15 | 1.25 | PRSPUD | MOB | RUNC | (34) Abort dive. Retrieve ROV to 100m SS. Hydraulic oil on ROV winch overheating - stop and allow temperature to drop. Cont. retrieving ROV to surface. |
| 27/11/2001 | 0 | 06:15 | 12:00 | 5.75 | PRSPUD | MOB | RUNC | (NPT) Repair leaking ratepack on Magnum 37. Meanwhile cont. to investigate telemetry problems between ROV control unit and Magnum 63. |
| 27/11/2001 | 0 | 12:00 | 22:15 | 10.25 | PRSPUD | MOB | RUNC | (37) Cont. DP FMEA trials - power distribution tests. |
| 27/11/2001 | 0 | 22:15 | 00:00 | 1.75 | PRSPUD | MOB | WAIT | (NPT) WOW. SAIPEM:- 00:00 - 02:00 Cont. PU 5" HWDP (16 joints). 02:00 - 03:00 Re-arrange derrick, prepare to LD 3-1/2" DP due to space- and weight limits on set-back area. 03:00 - 06:00 Shift 24 stands in the derrick and LD 9 stands of 3-1/2" DP. 06:00 - 06:30 Change to 5" handling eq. Prepare to PU 8" DC's. 06:30 - 09:30 PU 9 x 8" DC's from deck. 09:30 - 10:00 Prepare to MU 42" HO assy. 10:00 - 11:30 Service 'BX'-elevator. 11:30 - 13:00 MU 42" HO assy and rack same. 13:00 - 19:30 Rig floor activity stopped due to DP blackout tests. 19:30 - 23:30 Cont. MU 36" assy incl. 9-1/2" DC's and rack in derrick. 23:30 - 00:00 Change handling eq. to 3-1/2". Cont. work on BOP, prepare for testing of the riser fill v/v. OCEANEERING:- Repair leaking ratepack on Magnum 37. Meanwhile cont. to investigate telemetry problems between ROV control unit and Magnum 63. |
| 28/11/2001 | 0 | 00:00 | 16:45 | 16.75 | PRSPUD | MOB | WAIT | Cont. WOW SAIPEM:- (44) 06:00 - 09:30 Cont. MU 26" BHA (less jar). (46) 09:30 - 12:00 MU cmt stand, install Titus dart. (63) 12:00 - 13:00 MU 36" housing running tool. |
| 28/11/2001 | 0 | 16:45 | 18:00 | 1.25 | PRSPUD | MOB | RUNC | (34) Deploy ROV and run down to 1480m. Locate transponder basket (30 mins). NOTE: Mini-beacon not responding. |
| 28/11/2001 | 0 | 18:00 | 19:00 | 1 | PRSPUD | MOB | RUNC | (35) Position Sonardyne transponder no. 504. Position Simrad transponder no. 7. |
| 28/11/2001 | 0 | 19:00 | 21:00 | 2 | PRSPUD | MOB | RUNC | (35) ROV report of leaking valve package. Retrieve ROV back to surface. |
| 28/11/2001 | 0 | 21:00 | 00:00 | 3 | PRSPUD | MOB | RUNC | (35) Check and test valve packs on cage, and Mag 37 ROV. |
| 29/11/2001 | 0 | 00:00 | 03:00 | 3 | PRSPUD | MOB | RUNC | (35) Repair Magnum 37 ROV. Starboard valve package leaking. Removed starboard valve package and re-configure functions through the other valve packages. Install additional hydraulic compensators on ROV. |
| 29/11/2001 | 0 | 03:00 | 00:00 | 21 | PRSPUD | MOB | WAIT | Cont. WOW to deploy ROV. |
| 30/11/2001 | 0 | 00:00 | 06:30 | 6.5 | PRSPUD | MOB | RUNC | (35) Jump ROV and lower to seabed. Deploy transponders for LBL-array. |
| 30/11/2001 | 0 | 06:30 | 11:00 | 4.5 | PRSPUD | MOB | RUNC | (36) Calibrate LBL-array. Meanwhile perform risk assessment for emergency switchboard blackout test. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 30/11/2001 | 0 | 11:00 | 14:00 | 3 | PRSPUD | MOB | RUNC | (37) Test of emergency switchboard blackout - test failed. Investigate corrective actions. At 11:30 Move rig 100m f/spud location to set ADCP. At 12:40 Deploy ADCP current meter. |
| 30/11/2001 | 0 | 14:00 | 15:30 | 1.5 | PRSPUD | MOB | RUNC | (37) Perform risk assessment of corrective actions. At 14:30 ADCP positioned on seabed. At 14:40 Move rig to 20m from spud location. |
| 30/11/2001 | 0 | 15:30 | 16:30 | 1 | PRSPUD | MOB | RUNC | (37) Prepare and implement corrective actions. At 16:30 Transport frame recovered and landed on deck. |
| 30/11/2001 | 0 | 16:30 | 17:00 | 0.5 | PRSPUD | MOB | RUNC | (37) Retest emergency switchboard blackout - passed test. Rig clear to restart final FMEA tests. |
| 30/11/2001 | 0 | 17:00 | 18:00 | 1 | PRSPUD | MOB | RUNC | (37) Prepare for final DP FMEA tests. (48)Meanwhile MU 12-1/4" pilot hole assy. |
| 30/11/2001 | 0 | 18:00 | 22:00 | 4 | PRSPUD | MOB | RUNC | (37) Commence final DP FMEA tests. Meanwhile prepare & deploy basket with spud markers, sand bags and spud location transponder. |
| 30/11/2001 | 0 | 22:00 | 00:00 | 2 | PRSPUD | MOB | RUNC | (39) ROV mark spud position with sandbags, deploy marker sticks and transponder. Meanwhile pull BHA out of splash zone and secure due to impeding, bad weather. |
| 01/12/2001 | 0 | 00:00 | 01:00 | 1 | PRSPUD | MOB | RUNC | (39) Cont. to mark spud position with marker sticks x 3, transponder, and sand bags. |
| 01/12/2001 | 0 | 01:00 | 07:30 | 6.5 | PRSPUD | MOB | WAIT | (37) WOW for final DP tests |
| 01/12/2001 | 0 | 07:30 | 13:45 | 6.25 | PRSPUD | MOB | RUNC | (37) Perform final DP FMEA tests - OK. Meanwhile RIH 12-1/4" pilot hole assy. |
| 01/12/2001 | 0 | 13:45 | 14:30 | 0.75 | PRSPUD | MOB | SKID | (49) Move rig to spud position. |
| 01/12/2001 | 0 | 14:30 | 15:00 | 0.5 | COND1 | DRILL | TRIP | (48) Cont. RIH to 1000m. Fill pipe & test MWD - OK. |
| 01/12/2001 | 0 | 15:00 | 15:45 | 0.75 | COND1 | DRILL | RIGR | (NPT) Repair TDS torque assy. |
| 01/12/2001 | 0 | 15:45 | 16:30 | 0.75 | COND1 | DRILL | SAFE | Conduct pre-spud meeting with on-shift crew and service personnel. Go through drilling plan, shallow well control procedures and DP emergency procedures. |
| 01/12/2001 | 0 | 16:30 | 17:15 | 0.75 | COND1 | DRILL | SAFE | (49) General rig alarm. Simulate shallow gas kick. Conduct shallow well control drill. |
| 01/12/2001 | 0 | 17:15 | 18:00 | 0.75 | COND1 | DRILL | TRIP | (48) Cont. RIH pilot hole assy to 1481m. |
| 01/12/2001 | 0 | 18:00 | 21:00 | 3 | COND1 | DRILL | MISC | (NPT) Retrieve ROV to surface to repair v/v on tether out function. |
| 01/12/2001 | 1,520.00 | 21:00 | 21:30 | 0.5 | COND1 | DRILL | TRIP | (49) TIH to just above seabed. Position rig, start pump and tag seabed at 1520m BRT. Wash down to 1525m w/30 SPM and 4 - 5 Ton WOB. Drill floor elevation 25m, water depth corrected to MSL = 1495m. Bit to LWD / MWD sensor distances:- RES: 8.62m Pres 9.15m Ga 11.97m Ga 17.28m D&I 17.89m |
| 01/12/2001 | 1,520.00 | 21:30 | 22:00 | 0.5 | COND1 | DRILL | SURD | (50) ROV grab drillstring and take well position survey. Spud location (preliminary):- 64 deg 10 min 10.98 sec, 04 deg 21 min 36.98 sec. |
| 01/12/2001 | 1,525.00 | 22:00 | 22:30 | 0.5 | COND1 | DRILL | DRL | (51) Drill down 1st stand to 1537m, 96 SPM, 500 PSI, 0 - 3T WOB. Repeated attempts to take check survey - dubious survey obtained (rig heave, D&I sensor still above seabed). Ream last single down x 3. |
| 01/12/2001 | 1,537.00 | 22:30 | 00:00 | 1.5 | COND1 | DRILL | DRL | (52) Cont. drilling ahead 12-1/4" pilot hole to 1547m. Pump 2 Hi-Vis pills on every stand, 98 - 126 RPM, 0 - 3Ton WOB, 800 PSI. Ream every stand to control inclination. |
| 02/12/2001 | 1,547.00 | 00:00 | 00:00 | 24 | COND1 | DRILL | DRL | (52) Cont. drilling ahead 12-1/4" pilot hole. MWD surveys taken every stand, pumping 5m3 Hi-Vis sweeps every 15m drilled. Flowrate 650 - 700 GPM/2400-2650lpm, Pressure 900 - 1050 PSI, WOB 2 - 7 T, RPM 130, Torque 3 - 10k ft-lbs. Weekly Area Inspection: Main Deck, Pipe Deck. Upper Moonpool Area. ASA: Current Meter Deployment ASA: Bundling / slinging pipe on deck. |
| 03/12/2001 | 1,935.00 | 00:00 | 15:30 | 15.5 | COND1 | DRILL | DRL | (53) Cont. drlg ahead 12-1/4" pilot hole f/1935 - 2195m. MWD surveys taken every stand, pumping 5m3 Hi-Vis sweeps every 15m drilled. Flowrate 2600 - 2720 lpm / 687 - 720 GPM, 1000 - 1230 psi, 115 - 135 RPM, 1500 - 3800 ft-lbs, WOB 1 - 7.5 T. |
| 03/12/2001 | 2,195.00 | 15:30 | 16:30 | 1 | COND1 | DRILL | CIRC | (54) Pump 30m3 Hi-Vis sweep. |
| 03/12/2001 | 2,195.00 | 16:30 | 17:00 | 0.5 | COND1 | DRILL | DSPL | (55, 56) Displace well to 1.20 SG mud (42m3). Flowcheck well - OK. |
| 03/12/2001 | 2,195.00 | 17:00 | 19:40 | 2.67 | COND1 | DRILL | TRIP | (57) Pump OOH (2.2m3 / stand). |
| 03/12/2001 | 2,195.00 | 19:40 | 20:00 | 0.33 | COND1 | DRILL | SURD | (58) Check marker buoys with ROV. |
| 03/12/2001 | 2,195.00 | 20:00 | 23:15 | 3.25 | COND1 | DRILL | TRIP | (59) Cont. POH. |
| 03/12/2001 | 2,195.00 | 23:15 | 23:40 | 0.42 | COND1 | EVAL | MISC | (60) Download MWD. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 03/12/2001 | 2,195.00 | 23:40 | 00:00 | 0.33 | COND1 | DRILL | BHA | (61) Break bit and rack back BHA in derrick. |
| 04/12/2001 | 2,195.00 | 00:00 | 00:30 | 0.5 | COND1 | DRILL | INSP | (62a) Inspect travelling assy for loose objects. Hold pre-job meeting. |
| 04/12/2001 | 2,195.00 | 00:30 | 01:00 | 0.5 | COND1 | DRILL | BHA | (64) MU 36" x 42" HO assembly. |
| 04/12/2001 | 2,195.00 | 01:00 | 01:30 | 0.5 | COND1 | DRILL | BHA | (66) MU x/o between TDS and BHA, surface test Anderdrift tool - OK. |
| 04/12/2001 | 2,195.00 | 01:30 | 04:15 | 2.75 | COND1 | DRILL | BHA | (64) Cont. MU BHA and 5" HWDP. |
| 04/12/2001 | 2,195.00 | 04:15 | 05:00 | 0.75 | COND1 | DRILL | BHA | (64) Change handling eq. f/5" to 6-5/8". |
| 04/12/2001 | 2,195.00 | 05:00 | 07:30 | 2.5 | COND1 | DRILL | TRIP | (67) TIH to 1000m. Fill string with seawater. |
| 04/12/2001 | 2,195.00 | 07:30 | 08:00 | 0.5 | COND1 | DRILL | SAFE | (62b) Pre-section / shallow well control meeting with crew. |
| 04/12/2001 | 2,195.00 | 08:00 | 09:00 | 1 | COND1 | DRILL | TRIP | (68) Position rig using ROV and stab into pilot hole. |
| 04/12/2001 | 2,195.00 | 09:00 | 09:30 | 0.5 | COND1 | DRILL | MISC | (69) ROV re-position spud markers and re-log on sonar. |
| 04/12/2001 | 2,195.00 | 09:30 | 12:30 | 3 | COND1 | DRILL | HLOP | (70) Drill and survey f/1520 - 1544m. WOB 1 - 2T, RPM 56, flowrate 1200 - 4000 lpm (320 - 1050 GPM), pressure 1000 - 2300 PSI. |
| 04/12/2001 | 2,195.00 | 12:30 | 14:30 | 2 | COND1 | DRILL | SURD | (71) Repeated attempts to take survey - no go. Suspect due to string movement. Surveys indicated 1.75deg to 2.0 deg, but unable to repeat. Drill 1544m to 1552m and attempt to survey. Unable to get survey from Anderdrift. Indicating 2.5deg+. |
| 04/12/2001 | 2,195.00 | 14:30 | 16:00 | 1.5 | COND1 | DRILL | MISC | (71) ROV used to measure string angle at seabed level. ROV confirmed hole angle. Re-position rig 12m SSE to reduce string angle straighten hole angle. |
| 04/12/2001 | 2,195.00 | 16:00 | 17:00 | 1 | COND1 | DRILL | REAM | (71) Ream last stand several times. |
| 04/12/2001 | 2,195.00 | 17:00 | 18:00 | 1 | COND1 | DRILL | SURD | (71) Take check survey with Anderdrift tool - 1.75 deg. |
| 04/12/2001 | 2,195.00 | 18:00 | 19:00 | 1 | COND1 | DRILL | REAM | (71) Cont. to ream hole section to reduce hole inclination. |
| 04/12/2001 | 2,195.00 | 19:00 | 20:00 | 1 | COND1 | DRILL | DRL | (72) Open hole f/1552 - 1563m. Sweep hole with 10m3 Hi-Vis pill. WOB 4 - 5T, RPM 71, flowrate 4000 lpm (1050 GPM), pressure 2100 - 2150 PSI. |
| 04/12/2001 | 2,195.00 | 20:00 | 20:30 | 0.5 | COND1 | DRILL | SURD | (72) Take check survey with Anderdrift tool - 2 deg. |
| 04/12/2001 | 2,195.00 | 20:30 | 22:00 | 1.5 | COND1 | DRILL | REAM | (72) Ream section f/1562 - 1542m. Repeat check surveys; 1st time - 1.75 deg, 2nd check survey 0.5 deg. Hole appeared tight (boulder bed?) around 1554m and 1557m. Torque signature disappeared after repeated reaming. Weather increasing (7m waves, max. 11m, wind gusting above 40 knots). Allow ROV to swim close to drill string on connection. Observed significant string movement due to rig excursion at surface. Rig heave 3.5m. |
| 04/12/2001 | 2,195.00 | 22:00 | 22:30 | 0.5 | COND1 | DRILL | DRL | (72) Open hole f/1563 - 1567m. Sweep hole with 10m3 Hi-Vis pill. WOB 2 - 5T, RPM 72, flowrate 4000 lpm (1050 GPM), pressure 2100 - 2200 PSI. |
| 04/12/2001 | 2,195.00 | 22:30 | 00:00 | 1.5 | COND1 | DRILL | REAM | (72) Ream interval between 1542 - 1567m, sweep hole with 10m3 Hi-Vis pills. Repeat check surveys; 1st time - 2.25 deg, 2nd check survey 2 deg. NOTE: All survey depths quoted are bit depth. Bit to survey point = 10.8m. |
| 05/12/2001 | 2,195.00 | 00:00 | 01:00 | 1 | COND1 | DRILL | REAM | (72) Cont. reaming interval between 1542 - 1567 m. Pump Hi-Vis pills as required. 3rd check survey 1.5 deg at 1565m. Hole appeared tight (boulder bed?) around 1560m and 1565m. Torque signature disappeared after repeated reaming. Rig heave 3,5m. |
| 05/12/2001 | 2,195.00 | 01:00 | 02:00 | 1 | COND1 | DRILL | HLOP | (72)Cont. hole opening to 1579m. Sweep hole with 10m3 Hi-Vis pill. Check survey 1 deg at 1576m. |
| 05/12/2001 | 2,195.00 | 02:00 | 02:50 | 0.83 | COND1 | DRILL | HLOP | (72) Cont. hole opening to 1589m. Sweep hole with 10m3 Hi-Vis pill. Check survey 0,75 deg at 1587m. |
| 05/12/2001 | 2,195.00 | 02:50 | 04:00 | 1.17 | COND1 | DRILL | HLOP | (72) Cont. hole opening to 1595m. Sweep hole with 10m3 Hi-Vis pill. Check survey 1,25 deg at 1593m. |
| 05/12/2001 | 2,195.00 | 04:00 | 05:00 | 1 | COND1 | DRILL | HLOP | (72) Cont. hole opening to 1608m. Sweep hole with 10m3 Hi-Vis pill. Inspect IBOP actuator. ROV observe 42" HO +/- 2,5m above seabed. Check survey 1,25 deg at 1606m. |
| 05/12/2001 | 2,195.00 | 05:00 | 06:00 | 1 | COND1 | DRILL | HLOP | (72) Cont. hole opening to 1617m. Sweep with 10m3 Hi-Vis pill. Check survey 1,5 deg at 1615m. |
| 05/12/2001 | 2,195.00 | 06:00 | 07:00 | 1 | COND1 | DRILL | REAM | (72) Ream interval from 1617m - 1599m. Sweep hole with 10m3 Hi-Vis pill. |
| 05/12/2001 | 2,195.00 | 07:00 | 09:00 | 2 | COND1 | DRILL | MISC | (72) ROV latch onto drillstring and take check survey at 1614m. Position 42" HO just above seabed and move rig. |
| 05/12/2001 | 2,195.00 | 09:00 | 10:00 | 1 | COND1 | DRILL | REAM | (72) Reamed top of well section with 42" HO. Check survey 1,25 deg at 1615m. |
| 05/12/2001 | 2,195.00 | 10:00 | 12:00 | 2 | COND1 | DRILL | HLOP | (72) Cont. hole opening to 1624m. Check survey 0,75 deg at 1623m. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 05/12/2001 | 2,195.00 | 12:00 | 14:00 | 2 | COND1 | DRILL | HLOP | (72) Cont. hole opening to section TD at 1629,5m. Check survey 0,75 deg at 1628m. |
| 05/12/2001 | 2,195.00 | 14:00 | 14:30 | 0.5 | COND1 | DRILL | CIRC | (73) Pump 30m3 Hi-Vis pill and displace with seawater. |
| 05/12/2001 | 2,195.00 | 14:30 | 15:00 | 0.5 | COND1 | DRILL | FCHK | (73) ROV flow check of well - OK. |
| 05/12/2001 | 2,195.00 | 15:00 | 15:30 | 0.5 | COND1 | DRILL | DSPL | (74) Displace well to 1,20 SG mud. Total volume 90m3. |
| 05/12/2001 | 2,195.00 | 15:30 | 16:00 | 0.5 | COND1 | DRILL | TRIP | (74) Pump out of hole from 1629m - 1541m. |
| 05/12/2001 | 2,195.00 | 16:00 | 17:00 | 1 | COND1 | DRILL | MISC | Deploy ROV to check position and replace marker buoy closer to hole. Buoy lost in spud crater. Attempted to improve visibility by pumping SW at high rate - no go. Pulled HO assy slowly out of hole - no sign of marker buoy. |
| 05/12/2001 | 2,195.00 | 17:00 | 20:00 | 3 | COND1 | DRILL | REST | (NPT) Allow mud cloud around spud location to subside - virtually no seabed current present. Meanwhile evaluate options and agree forward plan with town. |
| 05/12/2001 | 2,195.00 | 20:00 | 21:50 | 1.83 | COND1 | DRILL | TRIP | (NPT) Trip out from seabed to inspect BHA components. |
| 05/12/2001 | 2,195.00 | 21:50 | 22:20 | 0.5 | COND1 | DRILL | BHA | (NPT) Change to 5" handling equipment. |
| 05/12/2001 | 2,195.00 | 22:20 | 00:00 | 1.67 | COND1 | DRILL | TRIP | (NPT) Cont. trip out of hole with BHA. Meanwhile navigate ROV to well location and look for spud marker. Made several passes across the site - no sign of spud marker. Seabed around well covered by 1 - 2m thick mud cloud. |
| 06/12/2001 | 0 | 00:00 | 00:30 | 0.5 | COND1 | DRILL | TRIP | (75) Continued to POOH with BHA. |
| 06/12/2001 | 0 | 00:30 | 01:45 | 1.25 | COND1 | DRILL | TRIP | Changed out damaged 9 1/2" DC (galled threads). Changed pipe handling equipment. |
| 06/12/2001 | 0 | 01:45 | 03:45 | 2 | COND1 | DRILL | BHA | Laid down 9 1/2" DC. Inspected 26" x 36" HO assy; bearing failure on 3 out of 6 cones. Laid down 9 1/2" DC and changed to 5" DP handling eq. Laid down Anderdrift tool. |
| 06/12/2001 | 0 | 03:45 | 04:00 | 0.25 | COND1 | DRILL | RIGR | Replaced hydraulic hose on iron roughneck. |
| 06/12/2001 | 0 | 04:00 | 05:00 | 1 | COND1 | DRILL | BHA | Laid down remaining BHA. |
| 06/12/2001 | 0 | 05:00 | 08:30 | 3.5 | COND1 | DRILL | BHA | Inspected 17 1/2" bit - OK. Made up new 26" x 36" x 42" HO assy. P/U 2 x 9 1/2" DC from deck. Function tested Anderdrift tool on surface - OK. |
| 06/12/2001 | 0 | 08:30 | 12:00 | 3.5 | COND1 | DRILL | TRIP | RIH with BHA on 6 5/8" DP. Filled pipe @ 1000m. |
| 06/12/2001 | 0 | 12:00 | 13:30 | 1.5 | COND1 | DRILL | MISC | At 1484m, checked marker buoys with ROV and took open water check survey; 0 deg. |
| 06/12/2001 | 1,520.00 | 13:30 | 14:30 | 1 | COND1 | DRILL | TRIP | Positioned rig and tagged seabed @ 1520 m. Continued RIH, took 5 tons WOB @ 1525m. |
| 06/12/2001 | 1,525.00 | 14:30 | 15:30 | 1 | COND1 | DRILL | MISC | Verified spud position with ROV. |
| 06/12/2001 | 1,525.00 | 15:30 | 20:30 | 5 | COND1 | DRILL | DRL | Drilled and opened 36" hole from 1520-1568m. Took check survey @ 1529m (0,25 deg) and 1538m (0,25 deg). Pumped 10 m3 hi-vis sweeps every 10 m. Occasional tight spots (possible boulders) observed from 1544-1561 m during reaming. |
| 06/12/2001 | 1,568.00 | 20:30 | 22:00 | 1.5 | COND1 | DRILL | REAM | Took survey @ 1566m (1,5 deg). Reamed stand twice and took check survey at 1566m (1,5 deg). Swept hole with hi-vis pills as required for hole cleaning. Observed oil leak on DDM main shaft, troubleshot same. |
| 06/12/2001 | 1,568.00 | 22:00 | 23:30 | 1.5 | COND1 | DRILL | DRL | Drilled and opened 36" hole from 1568-1581m at controlled parameters (2-3 tons, 70 rpm, 4000 l/min, 2150 psi). Took check survey @ 1578m (1,75 deg). Pumped 10 m3 hi-vis sweeps every 10 m. |
| 06/12/2001 | 1,581.00 | 23:30 | 23:59 | 0.48 | COND1 | DRILL | REAM | Reamed stand twice and took check survey at 1566m (1,5 deg). Swept hole with hi-vis pills as required for hole cleaning. |
| 07/12/2001 | 1,581.00 | 00:00 | 00:30 | 0.5 | COND1 | DRILL | SURD | (75d) Checked BHA vertically from 1497m - 1467m with ROV heading west. Verified drillstring verticality. |
| 07/12/2001 | 1,581.00 | 00:30 | 01:00 | 0.5 | COND1 | DRILL | TRIP | Received yellow DP alarm (loss of sensor alarms on 2 out of 3 DP computers). No loss of DP capability or position. Immediately recovered ROV back into cage and POOH with BHA to 1530m. DP system recovered itself during incident - no problems with DP station keeping. Assured situation normalized and under control from bridge. |
| 07/12/2001 | 1,530.00 | 01:00 | 01:30 | 0.5 | COND1 | DRILL | TRIP | RIH from 1530-1581m. |
| 07/12/2001 | 1,581.00 | 01:30 | 02:30 | 1 | COND1 | DRILL | DRL | Drilled and opened 36" hole from 1581-1596m at controlled parameters (2-3 tons, 70 rpm, 4000 l/m, 2150 psi). Pumped 10 m3 hi-vis sweep. Check survey 2 deg @ 1595m. |
| 07/12/2001 | 1,596.00 | 02:30 | 05:15 | 2.75 | COND1 | DRILL | REAM | Reamed stand apart from lower 7m (17 1/2" hole). Check survey 1,25 deg @ 1588m. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 07/12/2001 | 1,596.00 | 05:15 | 08:00 | 2.75 | COND1 | DRILL | DRL | Drilled and opened 36" hole from 1596-1608m at controlled parameters (2-3 tons, 70 rpm, 4000 l/m, 2150 psi). Pumped 10 m3 hi-vis sweep. Check survey 1,75 deg @ 1607m. |
| 07/12/2001 | 1,608.00 | 08:00 | 12:15 | 4.25 | COND1 | DRILL | DRL | Drilled and opened 36" x 42" hole from 1608-1628m at controlled parameters (2-3 tons, 70 rpm, 4000 l/m, 2150 psi). Pumped 10 m3 hi-vis sweeps every 10 m. Check survey 2 deg @ 1628m. |
| 07/12/2001 | 1,628.00 | 12:15 | 13:00 | 0.75 | COND1 | DRILL | CIRC | Swept hole with 30m3 hi-vis pill. |
| 07/12/2001 | 1,628.00 | 13:00 | 13:30 | 0.5 | COND1 | DRILL | FCHK | Flow checked with ROV - negative. |
| 07/12/2001 | 1,628.00 | 13:30 | 14:00 | 0.5 | COND1 | DRILL | WIPE | Performed wiper-trip from 1628-1541m, pumping OOH with 380 l/min (20 spm). |
| 07/12/2001 | 1,628.00 | 14:00 | 14:45 | 0.75 | COND1 | DRILL | CIRC | Observed 4 m fill on bottom of hole. Washed down from 1624-1628m. Check survey 1,75 deg @ 1627m. |
| 07/12/2001 | 1,628.00 | 14:45 | 15:30 | 0.75 | COND1 | DRILL | CIRC | Swept hole with 30m3 hi-vis pill. |
| 07/12/2001 | 1,628.00 | 15:30 | 16:30 | 1 | COND1 | DRILL | DSPL | Displaced hole to 1,20 SG mud, pumping 90 m3. |
| 07/12/2001 | 1,628.00 | 16:30 | 17:30 | 1 | COND1 | DRILL | TRIP | Pumped out of hole with 1900 l/min (100 spm) from 1628-1520 m. |
| 07/12/2001 | 1,520.00 | 17:30 | 20:00 | 2.5 | COND1 | DRILL | TRIP | (75e) Dropped 4 1/4" drift inside 6 5/8" DP. POOH with BHA from 1520-175m. Removed drift from drill string (stopped against XO above dart sub). |
| 07/12/2001 | 175 | 20:00 | 00:00 | 4 | COND1 | DRILL | WAIT | WOW (unable to operate cranes due to exessive roll & pitch). Yellow DP alarm due to thruster output > 50%. Meanwhile held toolbox talks on rig floor prior to tripping operations, changed to 5" DP handling equipment and RIH with 8 stands of 5" DP. ROV umbilical got tangled around drill string, stopped tripping operations 22:30-23:00 to sort out same - OK |
| 08/12/2001 | 175 | 00:00 | 03:30 | 3.5 | COND1 | DRILL | WAIT | (75e) Continued WOW. Meanwhile RIH with 5" DP. Inspected DW brake and serviced DDM (changed gear box oil). |
| 08/12/2001 | 1,100.00 | 03:30 | 06:30 | 3 | COND1 | DRILL | RIGR | Troubleshot fault on Gantry crane. Meanwhile inspected derrick travelling assembly - OK. Performed SJA for manual pipe handling (use of slings). |
| 08/12/2001 | 1,100.00 | 06:30 | 10:30 | 4 | COND1 | DRILL | TBMV | L/D a total of 22 stands 5" DP on deck. |
| 08/12/2001 | 500 | 10:30 | 11:00 | 0.5 | COND1 | DRILL | TRIP | Racked back last 10 stands of 5" DP in derrick. |
| 08/12/2001 | 250 | 11:00 | 11:30 | 0.5 | COND1 | DRILL | BHA | (77) Racked back HO assy in derrick. |
| 08/12/2001 | 80 | 11:30 | 12:00 | 0.5 | COND1 | CASE | SAFE | (79) Held pre-job safety meeting prior to running 30" x 36" conductor. |
| 08/12/2001 | 80 | 12:00 | 13:30 | 1.5 | COND1 | DRILL | BHA | (77) Racked back remaining HO assy in derrick. |
| 08/12/2001 | 0 | 13:30 | 15:00 | 1.5 | COND1 | CASE | CSG | (80/81) Prepared 30" casing handling equipment. |
| 08/12/2001 | 0 | 15:00 | 15:30 | 0.5 | COND1 | CASE | CSG | (82) P/U 30" shoe joint, filled with seawater and verified flow through float equipment - OK. |
| 08/12/2001 | 12 | 15:30 | 17:00 | 1.5 | COND1 | CASE | CSG | (83) RIH with 6 intermediate 30" csg joints, filled same with seawater. Stabbed casing string through hydrate shield on cellar deck as RIH. |
| 08/12/2001 | 86 | 17:00 | 17:15 | 0.25 | COND1 | CASE | CSG | (85) Rigged down 30" csg handling equipment. |
| 08/12/2001 | 105 | 17:15 | 17:30 | 0.25 | COND1 | CASE | CSG | (86) P/U and installed 36" conductor housing. |
| 08/12/2001 | 105 | 17:30 | 18:00 | 0.5 | COND1 | CASE | CSG | (84) Made up flexible hose between TITUS ring and Hydrate shield (lower TITUS connections). |
| 08/12/2001 | 105 | 18:00 | 19:30 | 1.5 | COND1 | CASE | CSG | (88) Changed to BX elevator. Prepared to run casing inner string. |
| 08/12/2001 | 105 | 19:30 | 20:15 | 0.75 | COND1 | CASE | CSG | (89) Ran 5" DP inner string (spaced out 16,7m above casing shoe). |
| 08/12/2001 | 105 | 20:15 | 20:30 | 0.25 | COND1 | CASE | CSG | (90) Changed to 6 5/8" DP handling equipment. M/U CART to 5" inner string. |
| 08/12/2001 | 105 | 20:30 | 21:30 | 1 | COND1 | CASE | CSG | (91) M/U 36" CART. Removed 36" housing handling clamp, checked O-ring for hydrate shield - OK. |
| 08/12/2001 | 105 | 21:30 | 22:45 | 1.25 | COND1 | CASE | CSG | (92) Lowered 30" x 36" casing string through rotary. Installed hydrate shield, M/U upper TITUS hose, installed ball valve on CART and removed guide wires from hydrate shield plate. |
| 08/12/2001 | 110 | 22:45 | 00:00 | 1.25 | COND1 | CASE | CSG | (93) RIH and deployed 36" housing into the sea while pumping through same with seawater. Continued RIH with 30" x 36" conductor casing on 6 5/8" DP, verified pipe being filled with seawater every second stand. |
| 09/12/2001 | 457 | 00:00 | 03:30 | 3.5 | COND1 | CASE | CSG | (93) Continued to RIH with 30" x 36" conductor casing to 1502 m. |
| 09/12/2001 | 1,502.00 | 03:30 | 04:00 | 0.5 | COND1 | CASE | WAIT | Surveyed seabed on initial spud location with ROV. Unable to locate missing marker buoy. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 09/12/2001 | 1,502.00 | 04:00 | 04:15 | 0.25 | COND1 | CASE | CSG | Observed bulls eye on hydrate plate (1,0 deg W-NW). Closed ball valve on CART. |
| 09/12/2001 | 1,502.00 | 04:15 | 04:30 | 0.25 | COND1 | CASE | CSG | (97) Positioned ROV on re-spud location, lowered 30" casing string down to 5m above seabed. |
| 09/12/2001 | 1,515.00 | 04:30 | 05:30 | 1 | COND1 | CASE | CSG | (98) Stabbed conductor casing string into 42" open hole and continued RIH with same. Took 5 tons weight while entering into 36" hole @ 1541 m. |
| 09/12/2001 | 1,541.00 | 05:30 | 06:15 | 0.75 | COND1 | CASE | CSG | Made up cement stand. RIH and landed casing string on 1622 m. |
| 09/12/2001 | 1,622.00 | 06:15 | 07:30 | 1.25 | COND1 | CASE | CSG | (99) Poor visibility due to mud clouds on seabed. Picked up Hydrate Shield above cloud to check hole angle. Checked bullseye on hydrate plate with ROV (0,5 deg W). |
| 09/12/2001 | 1,622.00 | 07:30 | 08:00 | 0.5 | COND1 | CASE | RIGR | Repaired leak on 2" lo-torque valve on cement stand. Still unable to see bulls eye with ROV due to visibility. |
| 09/12/2001 | 1,622.00 | 08:00 | 08:30 | 0.5 | COND1 | CASE | PRST | (101) Held pre-job safety meeting prior to cement job. Pressure tested surface lines to 3500 psi - OK. |
| 09/12/2001 | 1,622.00 | 08:30 | 09:30 | 1 | COND1 | CEMT | CIRC | (100) Pumped 20m3 seawater spacer with rig pumps (1250 l/min, 400psi). Continued pumping seawater while adjusting casing stick-up to ~3m. Confirm bulls eyes 0,5 deg. |
| 09/12/2001 | 1,622.00 | 09:30 | 10:00 | 0.5 | COND1 | CEMT | CIRC | (100) Pumped 16 m3 dye marker with rig pumps (1000 l/min). |
| 09/12/2001 | 1,622.00 | 10:00 | 12:00 | 2 | COND1 | CEMT | CMTP | (103) Pumped 565 Bbls 1,92 SG cement slurry (G Neat cement w. CaCl2) at 1250 l/min. |
| 09/12/2001 | 1,622.00 | 12:00 | 12:30 | 0.5 | COND1 | CEMT | CMTP | (103, 104) Displaced cement in place with seawater at 1400 l/min. Bled off at surface and check for back flow - float OK. |
| 09/12/2001 | 1,622.00 | 12:30 | 14:00 | 1.5 | COND1 | CEMT | CMTR | (105) Dropped TITUS dart and allowed it to drop for 15 minutes. Meanwhile checked bulls eye on hydrate plate with ROV (1,50 deg S) and opened fill valve on CART. Carefully pumped seawater and seated dart inside TITUS diverter sub. |
| 09/12/2001 | 1,622.00 | 14:00 | 15:30 | 1.5 | COND1 | CEMT | CMTR | (106) Sheared TITUS diverter sleeve with 1450 psi and continued pumping seawater @ 750 l/min. Checked for leak in fill valve - negative. Re-positioned rig 40m N to reduce conductor inclination. Reduced from 1,50 deg to 1,0 - 1,25 deg. |
| 09/12/2001 | 1,622.00 | 15:30 | 16:30 | 1 | COND1 | CEMT | WOC | (107) Waiting for primary cement to set. |
| 09/12/2001 | 1,622.00 | 16:30 | 17:15 | 0.75 | COND1 | CEMT | CMTR | (108) Performed remedial top-up cementing through TITUS system. Pumped 120 bbls 1,92 SG cement slurry (G Neat cement w. CaCl2) at 1000 l/min. |
| 09/12/2001 | 1,622.00 | 17:15 | 17:45 | 0.5 | COND1 | CEMT | CMTR | (109) Displaced cement in place with 20 Bbls of seawater at 1400 l/min. |
| 09/12/2001 | 1,622.00 | 17:45 | 20:00 | 2.25 | COND1 | CEMT | CMTR | (110) Opened by-pass valve and disconnected TITUS connection at hydrate shield. Flushed and cleaned 6 5/8" DP with seawater at high rate. Simultaneously cleaned hydrate shield with the TITUS hose and ROV. |
| 09/12/2001 | 1,622.00 | 20:00 | 00:00 | 4 | COND1 | CEMT | WOC | (111, 112) Waited on top up cement to set. Meanwhile checked bulls eye on hydrate plate with ROV (1,25 deg S). |
| 10/12/2001 | 1,520.00 | 00:00 | 00:30 | 0.5 | COND1 | CASE | CSG | (113) Re-positioned rig to centre of well. |
| 10/12/2001 | 1,520.00 | 00:30 | 00:45 | 0.25 | COND1 | CASE | CSG | (113) Released running tool according to Dril-Quip procedure. |
| 10/12/2001 | 1,520.00 | 00:45 | 02:30 | 1.75 | COND1 | CASE | CSG | (113) Pulled out of water with landing string and cement stinger. |
| 10/12/2001 | 1,200.00 | 02:30 | 04:30 | 2 | COND1 | CASE | RIGR | (113a) Repaired Lower Racking Arm (broken chain on telescopic arm). |
| 10/12/2001 | 1,200.00 | 04:30 | 05:45 | 1.25 | COND1 | CASE | CSG | (113) Continued POOW with landing string. |
| 10/12/2001 | 50 | 05:45 | 06:45 | 1 | COND1 | CASE | CSG | (115) L/D 36" CART with TITUS assy. |
| 10/12/2001 | 50 | 06:45 | 08:00 | 1.25 | COND1 | CASE | TBMV | (115) L/D three stands of 5" stinger. |
| 10/12/2001 | 0 | 08:00 | 11:00 | 3 | COND1 | DRILL | BHA | (116) L/D 26"/36" and 42" hole opening assembly. L/D 9 1/2" DC's. |
| 10/12/2001 | 0 | 11:00 | 13:00 | 2 | COND1 | DRILL | BHA | (61a) L/D 12 1/4" Pilot Hole Assembly. |
| 10/12/2001 | 0 | 13:00 | 13:30 | 0.5 | COND1 | CASE | CSG | (115) L/D cement stand. |
| 10/12/2001 | 0 | 13:30 | 15:00 | 1.5 | COND1 | CASE | BHA | (152) Made up 18 3/4" well head running tool. |
| 10/12/2001 | 0 | 15:00 | 15:15 | 0.25 | COND1 | CASE | SAFE | (117) Held toolbox talks on rig floor prior to making up cement stand. |
| 10/12/2001 | 0 | 15:15 | 17:30 | 2.25 | COND1 | CASE | CSG | (118) Made up cement stand, laid down same on aft catwalk. |
| 10/12/2001 | 0 | 17:30 | 18:00 | 0.5 | COND1 | DRILL | BHA | (120) Changed to 5" handling equipment. |
| 10/12/2001 | 0 | 18:00 | 19:00 | 1 | COND1 | DRILL | BHA | (116) L/D 26" stabilizer and 9 1/2" pony collar from HO assy. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 10/12/2001 | 0 | 19:00 | 20:00 | 1 | COND1 | DRILL | BHA | (120) Picked up motor assy from deck. |
| 10/12/2001 | 0 | 20:00 | 20:15 | 0.25 | COND1 | DRILL | BHA | (119) Made up 26" bit and bit sub with solid float. |
| 10/12/2001 | 0 | 20:15 | 23:00 | 2.75 | COND1 | DRILL | BHA | (120) Aligned motor and MWD, continued M/U 26" BHA. |
| 10/12/2001 | 0 | 23:00 | 23:30 | 0.5 | COND1 | DRILL | SAFE | (120a) Took time-out for safety. Cranes down due to helicopter arrival, safety briefing of new personnel. |
| 10/12/2001 | 0 | 23:30 | 00:00 | 0.5 | COND1 | DRILL | BHA | (120) Continued M/U 26" BHA. |
| 11/12/2001 | 0 | 00:00 | 01:00 | 1 | COND1 | DRILL | BHA | (120) Continued to make up 26" BHA. |
| 11/12/2001 | 0 | 01:00 | 01:15 | 0.25 | COND1 | DRILL | TRIP | (120) Changed to 6 5/8" DP handling equipment. |
| 11/12/2001 | 230 | 01:15 | 03:30 | 2.25 | COND1 | DRILL | TRIP | (120) RIH with 26" BHA to 1510m. Filled pipe @ 1000 m. |
| 11/12/2001 | 1,510.00 | 03:30 | 04:00 | 0.5 | COND1 | DRILL | TRIP | (121/122) Positioned rig. Stabbed BHA into the 36" housing, assisted by ROV. |
| 11/12/2001 | 1,520.00 | 04:00 | 04:30 | 0.5 | COND1 | DRILL | TRIP | (123) Continued RIH with BHA to 1610 m. |
| 11/12/2001 | 1,610.00 | 04:30 | 05:00 | 0.5 | COND1 | DRILL | TRIP | (125) Filled pipe and tested MWD - OK. Washed down with seawater from 1610 m and tagged TOC at 1616 m. |
| 11/12/2001 | 1,616.00 | 05:00 | 09:15 | 4.25 | COND1 | DRILL | CMTD | (125) Drilled out cement and 30" shoe with seawater (3000 l/min, 40 rpm, 3.000-5.000 ft-lbs, 3 tons, 1600 psi). |
| 11/12/2001 | 1,622.00 | 09:15 | 10:15 | 1 | COND1 | DRILL | DRL | (126) Reamed rathole below 30" shoe and opened up 17 1/2" pilot hole down to 1626m. Swept hole with 15 m3 hi-vis pill. |
| 11/12/2001 | 1,626.00 | 10:15 | 00:00 | 13.75 | SURF | DRILL | DRLD | (127) Drilled and surveyed 26" hole from 1626-1931m (4000 l/min, 80 rpm, 12.000-15.000 ft-lbs, 5-15 tons, 2400-2600 psi). Boulders present from 1897-1925m. Swept hole with 15-20 m3 pre-hydrated bentonite pills every half stand, took check survey every stand. Collected formation samples with ROV at each connection (ea. 28,5m). |
| 12/12/2001 | 1,931.00 | 00:00 | 13:00 | 13 | SURF | DRILL | DRLD | (127) Continued to drill and survey 26" hole from 1931-2175m (4000 l/min, 80 rpm, 12.000-15.000 ft-lbs, 10-15 tons, 2600 psi). Swept hole with 15-20 m3 pre-hydrated bentonite pills every half stand, took check survey every stand. Problems obtaining in spec surveys on last two stands. Repeated surveys until good survey achieved. Collected formation samples with ROV at each connection (ea. 28,5m). |
| 12/12/2001 | 2,175.00 | 13:00 | 14:30 | 1.5 | SURF | DRILL | CIRC | (128) Swept hole with 30 m3 hi-vis pill. Continued to circulate well clean with seawater. |
| 12/12/2001 | 2,175.00 | 14:30 | 15:00 | 0.5 | SURF | DRILL | FCHK | (130) Flow checked well with ROV (sonar + visual) - negative. |
| 12/12/2001 | 2,175.00 | 15:00 | 16:30 | 1.5 | SURF | DRILL | TRIP | (132) Performed wiper trip above boulder bed. Pumped out of hole from 2175-1870 m with 100 spm (2 min/std). No overpull seen, hole in good condition. |
| 12/12/2001 | 1,870.00 | 16:30 | 16:45 | 0.25 | SURF | DRILL | FCHK | (132) Flow checked well with ROV - positive. Observed gas bubbles coming from well. |
| 12/12/2001 | 1,640.00 | 16:45 | 17:15 | 0.5 | SURF | DRILL | TRIP | (132) RIH from 1640-2170 m. Hole in good condition. |
| 12/12/2001 | 2,170.00 | 17:15 | 18:30 | 1.25 | SURF | DRILL | CIRC | (129) Displaced well to 1,2 sg mud (2 hole volumes) at 4000 l/min. Observed rate of gas bubbles deteriorating during circulation. |
| 12/12/2001 | 2,170.00 | 18:30 | 19:00 | 0.5 | SURF | DRILL | FCHK | (135) Flow checked well (visual observed with ROV) - negative, well static. |
| 12/12/2001 | 2,170.00 | 19:00 | 00:00 | 5 | SURF | DRILL | WAIT | (134) Started to mix 350 m3 of 1,2 sg mud. Meanwhile reciprocated pipe on full stand and observed well with ROV, no gas/hydrates seen. Jetted and cleaned bulls eyes on hydrate shield with ROV, inclination unchanged. |
| 13/12/2001 | 2,175.00 | 00:00 | 10:00 | 10 | SURF | DRILL | WAIT | (134) Mixed new 1,20 SG mud while observing well with ROV. Reciprocated the pipe on a full stand. |
| 13/12/2001 | 2,175.00 | 10:00 | 10:30 | 0.5 | SURF | DRILL | DSPL | (134) Mixing mud. 2 X hole displacement 1.20 sg. |
| 13/12/2001 | 2,175.00 | 10:30 | 13:30 | 3 | SURF | DRILL | TRIP | (136) Pumped out of hole (200 spm, 2000psi, 3 min/std) from 2175 - 1545m. |
| 13/12/2001 | 2,175.00 | 13:30 | 14:00 | 0.5 | SURF | DRILL | FCHK | (137) Flow checked well with ROV @ 1545 m. Well static. |
| 13/12/2001 | 2,175.00 | 14:00 | 17:00 | 3 | SURF | DRILL | TRIP | (138) Pumped out of hole (200 spm, 2000 psi, 3 min/std) from 1545 - 1520m. Continue POOH. |
| 13/12/2001 | 2,175.00 | 17:00 | 18:30 | 1.5 | SURF | DRILL | BHA | (138a) Changed handling equipment and continued to POOH with BHA. |
| 13/12/2001 | 2,175.00 | 18:30 | 20:30 | 2 | SURF | DRILL | BHA | (140) Racked back 26" BHA. L/D NM and stab's, MWD, motor and bit. |
| 13/12/2001 | 2,175.00 | 20:30 | 21:00 | 0.5 | SURF | DRILL | BHA | (141a) Tidy rigfloor for drilling equipment. Check block assy. |
| 13/12/2001 | 2,175.00 | 21:00 | 22:45 | 1.75 | SURF | CASE | CSG | (143) R/U for Weatherford casing. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 13/12/2001 | 2,175.00 | 22:45 | 23:00 | 0.25 | SURF | CASE | SAFE | (142) Perform prejob safety meeting. |
| 13/12/2001 | 2,175.00 | 23:00 | 23:30 | 0.5 | SURF | CASE | CSG | (144) P/U float shoe and land in rotary. |
| 13/12/2001 | 2,175.00 | 23:30 | 00:00 | 0.5 | SURF | CASE | CSG | (145) Install one intermediate/ lock joint. |
| 14/12/2001 | 2,175.00 | 00:00 | 00:30 | 0.5 | SURF | CASE | CSG | (145) Installed intermediate/ lock jnt. |
| 14/12/2001 | 2,175.00 | 00:30 | 08:00 | 7.5 | SURF | CASE | CSG | (148) Continued running 20" casing. Rejected jnt # 38. Filled every jnt w/ sea water. |
| 14/12/2001 | 2,175.00 | 08:00 | 08:30 | 0.5 | SURF | CASE | CSG | (150) Changed to BX elevator. |
| 14/12/2001 | 2,175.00 | 08:30 | 09:00 | 0.5 | SURF | CASE | CSG | (151) P/U WH assy and made up to casing. |
| 14/12/2001 | 2,175.00 | 09:00 | 09:30 | 0.5 | SURF | CASE | CSG | (150) Removed PS 30 slips and installed 6 5/8" gripping head on LRA. |
| 14/12/2001 | 2,175.00 | 09:30 | 11:30 | 2 | SURF | CASE | CSG | (155) Released handling tool and installed cement plug on hanger running tool. Filled void above cement plug w/ mix SW/glycol. Connected WH R/T to casing. |
| 14/12/2001 | 2,175.00 | 11:30 | 14:30 | 3 | SURF | CASE | CSG | (157) Continued RIH with 20" casing on 6 5/8" DP. Filled every 5 std with seawater. |
| 14/12/2001 | 2,175.00 | 14:30 | 15:00 | 0.5 | SURF | CASE | CSG | (159) Moved rig towards well. Continued RIH with casing to 1510m. |
| 14/12/2001 | 2,175.00 | 15:00 | 15:30 | 0.5 | SURF | CASE | CSG | (160) Stabbed casing into conductor housing. Observed with ROV. |
| 14/12/2001 | 2,175.00 | 15:30 | 16:00 | 0.5 | SURF | CASE | CSG | (161) Continue RIH with casing to 1556m. |
| 14/12/2001 | 2,175.00 | 16:00 | 17:30 | 1.5 | SURF | CASE | CIRC | (161a) Pumped 36m3 SW and displaced casing to 1,20sg mud w/ 1589 lpm. Total volume pumped 127m3. |
| 14/12/2001 | 2,175.00 | 17:30 | 20:30 | 3 | SURF | CASE | CSG | (161) Continued RIH w/ 20" casing on 6 5/8" DP. Filled pipe every 5 std with 1,20sg mud. Free up WT csg 210T, Washed down last 2 stds befor landing casing. Took weight last 30mtrs, max 45T. |
| 14/12/2001 | 2,175.00 | 20:30 | 21:30 | 1 | SURF | CASE | CMTR | (162) P/U cement stand + 1 sgl 6 5/8" DP. Connected hoses. |
| 14/12/2001 | 2,175.00 | 21:30 | 22:00 | 0.5 | SURF | CASE | CSG | (162) Landed 20" casing, shoe at 2171m. |
| 14/12/2001 | 2,175.00 | 22:00 | 22:30 | 0.5 | SURF | CASE | CSG | (163) Locked 18 3/4" wellhead in place, performed 20 tons over-pull test - OK. Performed wellhead overload test to 225T. Sheared pins and preload R/T according to Dril-Quip instructions. |
| 14/12/2001 | 2,175.00 | 22:30 | 23:00 | 0.5 | SURF | CEMT | SAFE | (166a) Held safety meeting and line walk prior to cement job. |
| 14/12/2001 | 2,175.00 | 23:00 | 00:00 | 1 | SURF | CEMT | CMTP | (166b) Flushed and pressure tested surface lines to 345 bar. Pumped 100bbls SW w/ Halliburton unit. Tested Nitrogen lines OK. |
| 15/12/2001 | 2,175.00 | 00:00 | 02:45 | 2.75 | SURF | CEMT | CMTP | (167) Pumped foamed spacer and cement slurry according to the program. Had to cut cement tail short due to problems with bulk supply. Total volume pumped 685bbls base slurry, estimated to 922bbls 1,38sg foam slurry. (10% excess in open hole) |
| 15/12/2001 | 2,175.00 | 02:45 | 03:00 | 0.25 | SURF | CEMT | CMTP | (167a) Troubleshoot cement supply problem. Decided to start displacing the cement. Lined up for same and dropped dart. |
| 15/12/2001 | 2,175.00 | 03:00 | 03:15 | 0.25 | SURF | CEMT | CMTP | (167) Displaced dart down landing string with the cement unit (293spm, 1412lpm, 620psi). Reduced pumprate after 24,3m3 to 180spm. Sheared plug with 3177psi and 25,76m3. (Theoretical 26m3) |
| 15/12/2001 | 2,175.00 | 03:15 | 04:00 | 0.75 | SURF | CEMT | CMTP | (167) Continued displacement with rig pumps. (158spm, 3020lpm, 150psi). Reduced rate at end of displacement to 1500lpm. Bumped plug with 500psi, 5837stks, 110,85m3. (Theoretical bump at 111,5m3, pump efficiency 97,6%) |
| 15/12/2001 | 2,175.00 | 04:00 | 04:15 | 0.25 | SURF | CASE | CSGT | (167b) Prepare for pressure test of casing. |
| 15/12/2001 | 2,175.00 | 04:15 | 05:00 | 0.75 | SURF | CASE | CSGT | (167c) Pressured up from 500 - 1500psi. Tested 20" casing string to 1500psi/ 10min - OK. Total volume pumped 3,9bbls. Bleed down from 1500 - 500psi, got 3,9bbls in return. Continued bleeding off pressure and got another 3bbls in return. Checked float - OK. |
| 15/12/2001 | 2,175.00 | 05:00 | 05:30 | 0.5 | SURF | WHEAD | TRIP | (168) Marked pipe and released WH RT according to Dril-Quip procedures. Pulled out of WH. Circulated one string volume. Observed WH with ROV, well static. |
| 15/12/2001 | 2,175.00 | 05:30 | 06:00 | 0.5 | SURF | CEMT | CMTP | (168a) L/D cement head. |
| 15/12/2001 | 2,175.00 | 06:00 | 09:30 | 3.5 | SURF | WHEAD | TRIP | (168) POOH w/ RT and landing string. Strapped string on the way out. Top of 18 3/4" Wellhead confirmed at 1516mBRT. |
| 15/12/2001 | 2,175.00 | 09:30 | 10:30 | 1 | SURF | WHEAD | TRIP | (169) L/D RT. |
| 15/12/2001 | 2,175.00 | 10:30 | 11:30 | 1 | SURF | WHEAD | BOPT | (212) Changed t/ 5" DP elevator and M/U BOP test tool. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 15/12/2001 | 2,175.00 | 11:30 | 13:45 | 2.25 | SURF | WHEAD | RIGS | (169a) Cut and slip drill line. |
| 15/12/2001 | 2,175.00 | 13:45 | 15:30 | 1.75 | SURF | CEMT | CMTP | (169b) L/D cement stand. Cleaned and inspected seal area with ROV. |
| 15/12/2001 | 2,175.00 | 15:30 | 18:00 | 2.5 | SURF | RIGD | CLNR | (171a) Cleaned rig floor. R/D BX elevator, changed bails. |
| 15/12/2001 | 2,175.00 | 18:00 | 22:00 | 4 | SURF | RIGU | RIGU | (171b) R/D torque assembly. R/U 500T BOP handling equipment. |
| 15/12/2001 | 2,175.00 | 22:00 | 00:00 | 2 | SURF | RIGU | RIGS | (172,177a) Inspected and adjusted drawworks while preparing BOP for skidding. |
| 16/12/2001 | 2,175.00 | 00:00 | 02:00 | 2 | SURF | WHEAD | RISR | (175) Continued to prepare for skidding BOP. Installed spider/ gimbal and R/U to run riser. |
| 16/12/2001 | 2,175.00 | 02:00 | 04:45 | 2.75 | SURF | WHEAD | RISR | (178) Inspected and P/U IRJ, installed same in spider. Skidded BOP on to BOP carrier. |
| 16/12/2001 | 2,175.00 | 04:45 | 05:30 | 0.75 | SURF | WHEAD | RISR | (178a) P/U and installed fins riser jnt. Prepared to skid BOP. |
| 16/12/2001 | 2,175.00 | 05:30 | 06:00 | 0.5 | SURF | WHEAD | BOPU | (177) Skidded BOP below RT. |
| 16/12/2001 | 2,175.00 | 06:00 | 12:00 | 6 | SURF | WHEAD | RISR | (178) Prepared to connect instrumented riser jnt and fins jnt to BOP. Connected supply t/ LMPR accumulators. Prepared test hose t/ conduit lines. Connected BOP. |
| 16/12/2001 | 2,175.00 | 12:00 | 14:00 | 2 | SURF | WHEAD | BOPT | (178) Connected POD cable t/ POD. Prepared t/ function test BOP. Clamp POD cable t/ BOP. |
| 16/12/2001 | 2,175.00 | 14:00 | 16:00 | 2 | SURF | WHEAD | BOPT | (178b) Troubleshot problems w/ pilot pressure on blue POD. Found valve on HP manifold not fully closed. |
| 16/12/2001 | 2,175.00 | 16:00 | 18:00 | 2 | SURF | WHEAD | BOPT | (180) Function tested BOP w/ yellow and blue POD. |
| 16/12/2001 | 2,175.00 | 18:00 | 19:00 | 1 | SURF | WHEAD | BOPU | (180) Installed safety clamps on pod cables. |
| 16/12/2001 | 2,175.00 | 19:00 | 20:00 | 1 | SURF | WHEAD | BOPU | (180) Arranged and strapped cables on LMRP. |
| 16/12/2001 | 2,175.00 | 20:00 | 00:00 | 4 | SURF | WHEAD | BOPT | (182) Opened WH connector on stump and prepared to pre charge accumulator bottles. |
| 17/12/2001 | 2,175.00 | 00:00 | 00:30 | 0.5 | SURF | WHEAD | BOPT | (182) Precharged accumulators on POD's. |
| 17/12/2001 | 2,175.00 | 00:30 | 01:00 | 0.5 | SURF | WHEAD | SAFE | (182a) Held prejob/ SJA meeting with crew. Prepare to lift BOP off stump. |
| 17/12/2001 | 2,175.00 | 01:00 | 02:30 | 1.5 | SURF | WHEAD | RISR | (183) Lifted BOP off stump and changed to VX stainless steel gasket. |
| 17/12/2001 | 2,175.00 | 02:30 | 03:30 | 1 | SURF | WHEAD | RISR | (184) Installed hydrate seal. Installed gate on guide funnel. Skidded BOP carrier back to parking area. |
| 17/12/2001 | 2,175.00 | 03:30 | 06:00 | 2.5 | SURF | WHEAD | RISR | (184a) Prepared to launch BOP in water. Connected el cables on IRJ and installed bulls eye, beacon and inclinometer. |
| 17/12/2001 | 2,175.00 | 06:00 | 10:30 | 4.5 | SURF | WHEAD | RISR | (184a) Continued to prepare to launch BOP in water. Installed compass on IRJ. |
| 17/12/2001 | 2,175.00 | 10:30 | 12:30 | 2 | SURF | WHEAD | RISR | (186) Launched BOP in water. Tested K/ C/ Conduit lines while holding prejob meeting with crew. |
| 17/12/2001 | 2,175.00 | 12:30 | 21:00 | 8.5 | SURF | WHEAD | RISR | (187) Ran riser and BOP to 193 m. Charged accumulators on yellow pod. Continued to run riser/BOP to 232 m meanwhile moving rig 100m south and 100m east. ROV surveyed old pilot hole. Found 3 marker buoys (2,3,4), marker buoy # 1 still missing. Unable to see the hole. No signs of gas on sonar or monitor. |
| 17/12/2001 | 2,175.00 | 21:00 | 22:30 | 1.5 | SURF | WHEAD | BOPT | (187) Prepared and performed pressure test to 10 000psi/10min on K/C line and 3000psi/10min on conduit lines after riser jnt # 12. All good tests. |
| 17/12/2001 | 2,175.00 | 22:30 | 00:00 | 1.5 | SURF | WHEAD | RISR | (187) Continued to run riser/BOP from 232 m to 250 m. |
| 18/12/2001 | 2,175.00 | 00:00 | 04:30 | 4.5 | SURF | WHEAD | RISR | (187) Run BOP according to running tally. Ran 22 riser jnts and installed 3 slick riser jnts for hang off. BOP at 482 m. Prepared to WOW. Adjust rig ballast to obtain 1.5 deg to port/aft to avoid collision between housing/support ring and riser. Filled K/C lines with water/glycol mix. Recharged accumulators to 3000 psi. Clean and tidy up rig floor and cellar deck. |
| 18/12/2001 | 2,175.00 | 04:30 | 05:00 | 0.5 | SURF | WHEAD | RIGR | Repair broken coupling on hydraulic hose on aft catwalk. |
| 18/12/2001 | 2,175.00 | 05:00 | 00:00 | 19 | SURF | WHEAD | WAIT | (187a) WOW prior to continue running BOP. Change rig heading from 120 deg to 105 deg at 14:00. Grease choke manifold. Clean and wash shaker room and mezzanine deck. Performed electrical maintenance on drawworks motors. Wash and clean pit room |
| 19/12/2001 | 2,175.00 | 00:00 | 18:00 | 18 | SURF | WHEAD | WAIT | (187b) Continued WOW. Repaired moi tank. Washed and cleaned cellar deck. Performed maintenance on equipment according to schedule. Tested choke manifold to 500/10000 psi, found leaking valve. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 19/12/2001 | 2,175.00 | 18:00 | 00:00 | 6 | SURF | WHEAD | WAIT | (187b) Continued WOW. Built scaffolding around leaking valve on choke manifold. Repaired same. Tested standpipe manifold to 500/5000 psi, found leaking valve. Mixed mud pre-mix. Rig heading: 120 deg. |
| 20/12/2001 | 2,175.00 | 00:00 | 06:00 | 6 | SURF | WHEAD | WAIT | (187a) WOW. Continued cleaning and house keeping work. Rig heading 110 deg. |
| 20/12/2001 | 2,175.00 | 06:00 | 18:00 | 12 | SURF | WHEAD | WAIT | (187a) Continued WOW. 08:40 - 09:30 P/U riser and BOP t/ install more clamps on POD cables in splash zone. Tidy and clean cellar deck and rig floor. Removed isolation in aft end dog house floor due to oil fumes. General rig maintenance. Attempted to test valve #25 on choke manifold, negative. Open same. |
| 20/12/2001 | 2,175.00 | 18:00 | 00:00 | 6 | SURF | WHEAD | WAIT | (187a) Continued WOW. Mixed mud to 1,07 sg. Built water/salt/glycol mix for K/C lines. Overhauled and retested valve no. 25 in choke manifold - nogo. |
| 21/12/2001 | 2,175.00 | 00:00 | 06:00 | 6 | SURF | WHEAD | WAIT | (187a) WOW. Continued cleaning and housekeeping. Prepared new hangoff tool for drillstring. Cleaned out mud sample trays in shaker room. Overhauled BX elevator. Performed maintenance according to program. |
| 21/12/2001 | 2,175.00 | 06:00 | 18:00 | 12 | SURF | WHEAD | WAIT | (187a) Continued WOW. Rigged up glycol pump on choke manifold. Pressure tested valve # 8 on drlg st. pipe t/ 500/ 5000psi - OK. Finished PM lists. Trained day crew in using PS-30 slips. R/D salablock/escape line from derrick. |
| 21/12/2001 | 2,175.00 | 18:00 | 00:00 | 6 | SURF | WHEAD | WAIT | (187a) Continued WOW. Trained night crew in using PS-30 slips. Went through functions, maintenance and operational limits. |
| 22/12/2001 | 2,175.00 | 00:00 | 06:00 | 6 | SURF | WHEAD | WAIT | (187b) WOW. Tidied sack store and equipment for elevators in corridor. Trimmed rig 1deg port-aft to avoid collision between riser and support ring. Built 35m3 water/salt/glycol mix to be used for K/C lines. |
| 22/12/2001 | 2,175.00 | 06:00 | 12:00 | 6 | SURF | WHEAD | WAIT | (187b) Continued WOW. R/D PS-30 slips, performed regular rig maintenance. |
| 22/12/2001 | 2,175.00 | 12:00 | 13:15 | 1.25 | SURF | WHEAD | RISR | (187c) Prepared to start pulling 3 slick riser jnt and disconnected safety clamps. |
| 22/12/2001 | 2,175.00 | 13:15 | 13:45 | 0.5 | SURF | WHEAD | SAFE | (187c) Held prejob safety meeting prior to start pulling riser jnt's. |
| 22/12/2001 | 2,175.00 | 13:45 | 15:45 | 2 | SURF | WHEAD | RISR | (187c) Pulled and L/D 3 slick riser jnt's. Marked the top riser jnt. |
| 22/12/2001 | 2,175.00 | 15:45 | 16:30 | 0.75 | SURF | WHEAD | BOPT | (187d) Pressure test K and C to 10 000psi and conduit lines to 3000 psi. |
| 22/12/2001 | 2,175.00 | 16:30 | 17:00 | 0.5 | SURF | WHEAD | RISR | (187d) P/U buoyancy riser joint, and prepared for running same. |
| 22/12/2001 | 2,175.00 | 17:00 | 17:30 | 0.5 | SURF | WHEAD | RISR | (187d) Held safety/coordination meeting with all crew members. |
| 22/12/2001 | 2,175.00 | 17:30 | 20:15 | 2.75 | SURF | WHEAD | RISR | (187d) Continued to run riser/BOP to 520 m. |
| 22/12/2001 | 2,175.00 | 20:15 | 20:45 | 0.5 | SURF | WHEAD | RISR | (187d) Deployed ROV. Waited on ROV prior to continue running. |
| 22/12/2001 | 2,175.00 | 20:45 | 00:00 | 3.25 | SURF | WHEAD | RISR | (187d) Continued to run riser/BOP from 520 m to 597 m. |
| 23/12/2001 | 2,175.00 | 00:00 | 00:30 | 0.5 | SURF | WHEAD | RISR | (187d)Continued to run riser and BOP from 597 m to 617 m. Trimmed rig to avoid collision between buoyant risers and support ring. |
| 23/12/2001 | 2,175.00 | 00:30 | 02:15 | 1.75 | SURF | WHEAD | BOPT | (187d) Started testing K/C lines and conduit lines. Repressured several times due to air and large volumes in lines. Tested K/C lines to 10 000 psi and yellow conduit line to 3000 psi - OK. |
| 23/12/2001 | 2,175.00 | 02:15 | 03:45 | 1.5 | SURF | WHEAD | RISR | (187d) Continued running riser and BOP from 617m to 654m. |
| 23/12/2001 | 2,175.00 | 03:45 | 04:30 | 0.75 | SURF | WHEAD | BOPT | (187d) Pressure tested blue conduit line to 3000psi - OK. |
| 23/12/2001 | 2,175.00 | 04:30 | 09:15 | 4.75 | SURF | WHEAD | RISR | (187d) Continued running riser and BOP from 654 - 808m. |
| 23/12/2001 | 2,175.00 | 09:15 | 11:30 | 2.25 | SURF | WHEAD | BOPT | (187d) Pressure tested K/C lines to 10 000psi and conduit lines to 3000psi - OK. |
| 23/12/2001 | 2,175.00 | 11:30 | 18:00 | 6.5 | SURF | WHEAD | RISR | (187d) Continued running riser and BOP from 808 - 1000m. |
| 23/12/2001 | 2,175.00 | 18:00 | 21:00 | 3 | SURF | WHEAD | BOPT | (187d) Pressure test K/C lines to 10 000 psi, test conduit lines to 3000psi while deploying ROV to check that acoustic antennas are out, only one out. Performed pre job meeting with crew prior to running riser. |
| 23/12/2001 | 2,175.00 | 21:00 | 21:45 | 0.75 | SURF | WHEAD | RISR | (187d) Continued to run riser from 1000m to 1020 m. |
| 23/12/2001 | 2,175.00 | 21:45 | 00:00 | 2.25 | SURF | WHEAD | RISR | (187d) Changed from 500 ton handling equipment to 750 ton equipment. |
| 24/12/2001 | 2,175.00 | 00:00 | 04:30 | 4.5 | SURF | WHEAD | RISR | (189) Ran riser and BOP from 1020 m to 1096 m. |
| 24/12/2001 | 2,175.00 | 04:30 | 05:00 | 0.5 | SURF | WHEAD | RISR | (189) Experienced problems with installing clamps on cellar deck. Observed increasing movement on control hoses due to increasing waves/ wind. |
| 24/12/2001 | 2,175.00 | 05:00 | 08:45 | 3.75 | SURF | WHEAD | RISR | (189) Continued running riser and BOP from 1096 m to 1196m. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 24/12/2001 | 2,175.00 | 08:45 | 11:15 | 2.5 | SURF | WHEAD | BOPT | (189) Pressure tested K and C lines to 10 000 psi and conduit lines to 3000 psi. |
| 24/12/2001 | 2,175.00 | 11:15 | 13:30 | 2.25 | SURF | WHEAD | RISR | (189) Continued running riser from 1196 m to 1230 m. |
| 24/12/2001 | 2,175.00 | 13:30 | 20:45 | 7.25 | SURF | WHEAD | RISR | (189) Attempted to install fill up valve jnt. Nogo. Re-arranged joints, ran 1 joint and P/U fill-up valve jnt. Attempted to M/U bottom flange on fill-up valve jnt to riser joint - nogo. Started to adjust adjustable spacer sleeve on blue conduit line on fill-up valve jnt. |
| 24/12/2001 | 2,175.00 | 20:45 | 22:15 | 1.5 | SURF | WHEAD | RISR | (189) Start preparation for hang-off due to weather.L/D buoyancy jnt and riser fill up valve jnt. |
| 24/12/2001 | 2,175.00 | 22:15 | 23:15 | 1 | SURF | WHEAD | RISR | (189) P/U and ran slick riser joint. |
| 24/12/2001 | 2,175.00 | 23:15 | 00:00 | 0.75 | SURF | WHEAD | BOPT | (189) Filled blue conduit line and test same to 3000 psi. |
| 25/12/2001 | 2,175.00 | 00:00 | 00:15 | 0.25 | SURF | WHEAD | WAIT | (189a) Filled and tested yellow conduit line to 3000psi. |
| 25/12/2001 | 2,175.00 | 00:15 | 01:45 | 1.5 | SURF | WHEAD | WAIT | (189a) P/U and ran slip jnt. |
| 25/12/2001 | 2,175.00 | 01:45 | 04:30 | 2.75 | SURF | WHEAD | WAIT | (189a) M/U and ran landing jnt. Clamped umbilical onto riser. Connected support ring, and hang off with approx. 300 tons on riser tensioners and 170 tons on block. |
| 25/12/2001 | 2,175.00 | 04:30 | 00:00 | 19.5 | SURF | WHEAD | WAIT | (189a) WOW. Performed maintenance on shale shakers. Performed service on yellow and blue conduit lines on riser fill up valve. 09:55 - 10:20 Deballasted rig up to 22,5m due to high waves. 19:20 - 19:35 Ballasted rig down to operational draft (23,5m |
| 26/12/2001 | 2,175.00 | 00:00 | 06:00 | 6 | SURF | WHEAD | WAIT | (187d) Continued WOW. Performed electrical maintenance on drawworks. Checked couplings on drawwork motors. |
| 26/12/2001 | 2,175.00 | 06:00 | 18:00 | 12 | SURF | WHEAD | WAIT | (187d) Continued WOW. Continued servicing shale shakers, installed new screens. Tidied sack store, arranged subs and x/o's. Drained water filled lines due to temp below 0. Rearranged valve handles on choke manifold. Overhauled lower racking arm. |
| 26/12/2001 | 2,175.00 | 18:00 | 00:00 | 6 | SURF | WHEAD | WAIT | (187d) Continued WOW. Conducted maintenance on Drlg equipment. Serviced lower racking arm. Started unspooling wire on blue pod winch |
| 27/12/2001 | 2,175.00 | 00:00 | 18:00 | 18 | SURF | WHEAD | WAIT | (189a) Continued WOW. Conducted maintenance on drilling equipment. Serviced lower racking arm. Unspooled wire on blue pod winch. |
| 27/12/2001 | 2,175.00 | 18:00 | 00:00 | 6 | SURF | WHEAD | WAIT | (189d) Continued WOW. TOFS - 2 hr stand down safety meeting with drillcrew. Spooled wire on blue pod winch. Slipped and cut rucker no. 4B. Tidied up cellar deck area. Sealed off rigfloor due to ice in derrick. Performed general maintenance on drilling equipment |
| 28/12/2001 | 2,175.00 | 00:00 | 06:00 | 6 | SURF | WHEAD | WAIT | (189a) Continued WOW. Spooled new pod wire on winch on cellardeck. Started up HPU on active heave compensator. |
| 28/12/2001 | 2,175.00 | 06:00 | 11:15 | 5.25 | SURF | WHEAD | WAIT | (189a) Continued WOW. Continued cut and slip rucker 4B. Performed prejob meeting with JSA prior to start running riser. Inspected derrick and removed ice. |
| 28/12/2001 | 2,175.00 | 11:15 | 14:45 | 3.5 | SURF | WHEAD | WAIT | (189b) Pulled riser and hung off support ring. Secured same. L/D landing jnt and slip joint. |
| 28/12/2001 | 2,175.00 | 14:45 | 16:30 | 1.75 | SURF | WHEAD | RISR | (189b) P/U and ran riser fill up valve jnt. Adjusted sleeve on choke line on RFV jnt to be able to M/U. |
| 28/12/2001 | 2,175.00 | 16:30 | 00:00 | 7.5 | SURF | WHEAD | RISR | (189b) Terminate control cable for riser fill up valve and test same. Nogo. Pull riser fill up valve jnt to rig floor and start troubleshoot |
| 29/12/2001 | 2,175.00 | 00:00 | 00:15 | 0.25 | SURF | WHEAD | RISR | (187) Continued to troubleshoot RFV jnt. Unable to work valve. |
| 29/12/2001 | 2,175.00 | 00:15 | 02:00 | 1.75 | SURF | WHEAD | RISR | (187) L/D buoyant riser jnt. no. 66 and RFV jnt. |
| 29/12/2001 | 2,175.00 | 02:00 | 02:45 | 0.75 | SURF | WHEAD | RISR | (189) P/U buoyant riser jnt. no. 66. |
| 29/12/2001 | 2,175.00 | 02:45 | 05:45 | 3 | SURF | WHEAD | PRST | (189) Pressure tested kill- and choke lines to 10000 psi, blue and yellow conduit lines to 3000 psi. |
| 29/12/2001 | 2,175.00 | 05:45 | 07:30 | 1.75 | SURF | WHEAD | RISR | (189) Continued to run riser from 1267 meters. |
| 29/12/2001 | 2,175.00 | 07:30 | 08:00 | 0.5 | SURF | WHEAD | RISR | (189) Changed broken strap on jnt. no. 68. |
| 29/12/2001 | 2,175.00 | 08:00 | 16:45 | 8.75 | SURF | WHEAD | RISR | (189) Continued to run riser to 1482 meters. |
| 29/12/2001 | 2,175.00 | 16:45 | 21:00 | 4.25 | SURF | WHEAD | PRST | (189) Fill bore & pressure test kill- and choke line to 10000 psi. Blue and yellow conduit lines tested to 3000 psi. |
| 29/12/2001 | 2,175.00 | 21:00 | 23:30 | 2.5 | SURF | WHEAD | RISR | (191) PU slip joint and MU same. Install pod line clamps. |
| 29/12/2001 | 2,175.00 | 23:30 | 00:00 | 0.5 | SURF | WHEAD | RISR | (192) PU and install landing joint. |
| 30/12/2001 | 2,175.00 | 00:00 | 00:30 | 0.5 | SURF | WHEAD | RISR | (192) Cont. MU landing joint. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 30/12/2001 | 2,175.00 | 00:30 | 01:30 | 1 | SURF | WHEAD | RISR | (193) Install support ring. |
| 30/12/2001 | 2,175.00 | 01:30 | 04:00 | 2.5 | SURF | WHEAD | RISR | (194, 196, 197) Open compensator, top-up the stack mounted accumulators, and set all ram preventers to the Open position. Move rig over wellhead, check stack mounted bullseye (0.5 - 0.75 deg), w/hd bullseye (+/-1 deg), and verify connector in Unlock position. Pre-landing hookload 550T incl. landing joint. |
| 30/12/2001 | 2,175.00 | 04:00 | 04:30 | 0.5 | SURF | WHEAD | RISR | (198) Land BOP, perform o/pull test to 40T - OK. |
| 30/12/2001 | 2,175.00 | 04:30 | 05:00 | 0.5 | SURF | WHEAD | RISR | Switch f/yellow to blue conduit on yellow pod, p/test conduit line to 3000 psi. |
| 30/12/2001 | 2,175.00 | 05:00 | 09:00 | 4 | SURF | WHEAD | RISR | (NPT) P/Test choke line to 300 / 10 000 psi - OK. Attempt to p/test kill line - no go. Troubleshoot leak on kill-line. P/Test against choke manifold - OK. |
| 30/12/2001 | 2,175.00 | 09:00 | 10:30 | 1.5 | SURF | WHEAD | RISR | (NPT) Flush kill-line & repeat attempt to p/test same - no go. Perform SJA for close inspection of slip ring kill line stab. |
| 30/12/2001 | 2,175.00 | 10:30 | 13:00 | 2.5 | SURF | WHEAD | RISR | Close kill-line isolation v/v & p/test kill-line to 5000 / 10 000 psi - OK. Flush through upper / lower failsafe v/v's, operate same. P/test kill line against inner upper/lower failsafe v/v's 300 / 10 000 psi for 5 / 10 mins - OK. |
| 30/12/2001 | 2,175.00 | 13:00 | 14:00 | 1 | SURF | WHEAD | PRST | (201) P/test WH connector and 20" casing against upper blind shear ram through upper kill line to 300 / 1500 psi - OK. |
| 30/12/2001 | 2,175.00 | 14:00 | 16:00 | 2 | SURF | WHEAD | RISR | (202, 203, 204) Open bolts and stroke out telescopic joint inner barrel. Connect hoses to telescopic joint, LD landing joint. |
| 30/12/2001 | 2,175.00 | 16:00 | 18:00 | 2 | SURF | WHEAD | RISR | Change out 750T elevator and bails to 500T equipment. |
| 30/12/2001 | 2,175.00 | 18:00 | 19:30 | 1.5 | SURF | WHEAD | BOPU | (205, 206) Install divertor, LD running tool. |
| 30/12/2001 | 2,175.00 | 19:30 | 21:30 | 2 | SURF | WHEAD | RISR | (208) Clear rig floor, RD riser handling equipment. |
| 30/12/2001 | 2,175.00 | 21:30 | 23:00 | 1.5 | SURF | DRILL | BHA | (209) Install torque wrench assy & link tilt. |
| 30/12/2001 | 2,175.00 | 23:00 | 00:00 | 1 | SURF | DRILL | BHA | (210) Install 'BX'-elevators. |
| 31/12/2001 | 2,175.00 | 00:00 | 01:00 | 1 | SURF | DRILL | BHA | (211) Cont. MU 'BX'-elevator. |
| 31/12/2001 | 2,175.00 | 01:00 | 02:00 | 1 | SURF | WHEAD | BOPT | (212, 213) PU BOP test tool and two stands of HWDP. MU stand of U-170 DP on top of test plug. |
| 31/12/2001 | 2,175.00 | 02:00 | 05:00 | 3 | SURF | WHEAD | BOPT | (214) RIH BOP test tool on 6-5/8" DP & land out in wellhead. |
| 31/12/2001 | 2,175.00 | 05:00 | 05:30 | 0.5 | SURF | WHEAD | BOPT | (215) Pressured up to 35 Bar (500 PSI) / 5 mins - OK. Attempt to pressure up to 690 Bar (10 000 PSI) - no go. |
| 31/12/2001 | 2,175.00 | 05:30 | 07:00 | 1.5 | SURF | WHEAD | BOPT | (215) Troubleshoot leak. Attempt to pressure test connector to 370 BAR (5400 PSI) - no go. |
| 31/12/2001 | 2,175.00 | 07:00 | 09:00 | 2 | SURF | WHEAD | BOPT | (215) Open MPR, flush through kill line. Close MPR and pressure test connector to 35 BAR (500 PSI) - OK. Attempted to pressure up to 138 BAR (2000 PSI) - no go. ROV observe leak from one of the seal ring retainer rod entry points on the BOP connector. Confirm that connector is locked onto wellhead. |
| 31/12/2001 | 2,175.00 | 09:00 | 13:00 | 4 | SURF | WHEAD | BOPT | (251a) POH BOP test tool assy. Check travelling assy for loose items. Release all four seal ring retainers. NOTE: Rig entered yellow alert condition at 09:30 (LBL-array not in communication with rig). System back up / normal operating condition re-established at 09:50. |
| 31/12/2001 | 2,175.00 | 13:00 | 14:30 | 1.5 | SURF | WHEAD | RISR | (215b) RD 'BX'-elevator and bails. Disconnect torque assembly, install 500T bails and elevator. |
| 31/12/2001 | 2,175.00 | 14:30 | 18:30 | 4 | SURF | WHEAD | RISR | (215 c,d,e) RU riser equipment, install gimble and spider. RU diverter handling tool and lay out diverter. NOTE: Rig entered yellow alert condition at 15:15 and again at 16:50 (LBL-array not in communication with rig). Held safety meeting with crew prior to RU riser handling equipment and later for continuing work under yellow alert condition. |
| 31/12/2001 | 2,175.00 | 18:30 | 20:00 | 1.5 | SURF | WHEAD | RISR | (215f) Change to 750T riser handling equipment. |
| 31/12/2001 | 2,175.00 | 20:00 | 21:30 | 1.5 | SURF | WHEAD | RISR | (215f,g) PU landing joint and MU same. Perform SJA. Connect lock bolts to inner barrel & unlatch BOP. |
| 31/12/2001 | 2,175.00 | 21:30 | 22:00 | 0.5 | SURF | WHEAD | MISC | Move rig 20m forward. |
| 31/12/2001 | 2,175.00 | 22:00 | 00:00 | 2 | SURF | WHEAD | RISR | (215h) ROV inspect wellhead. Found ring gasket sitting at an angle on top of wellhead. Rubber-like element wedged in between gasket and wellhead. Retrieve gasket to surface. |
| 01/01/2002 | 2,175.00 | 00:00 | 00:30 | 0.5 | SURF | WHEAD | MISC | (215 h) Prepare to launch ROV with replacement gasket. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 01/01/2002 | 2,175.00 | 00:30 | 02:00 | 1.5 | SURF | WHEAD | RISR | (215 h,i) RIH to seabed with ROV, inspect and flush wellhead. Install new ring gasket, inspect inside of BOP connector with ROV camera. |
| 01/01/2002 | 2,175.00 | 02:00 | 03:30 | 1.5 | SURF | WHEAD | RISR | (215 i) Retrieve ROV to surface. Flush bottom of BOP through lower choke line. |
| 01/01/2002 | 2,175.00 | 03:30 | 04:30 | 1 | SURF | WHEAD | MISC | (215 ia) Install new (colour rather than B&W) camera on ROV. |
| 01/01/2002 | 2,175.00 | 04:30 | 06:00 | 1.5 | SURF | WHEAD | RISR | (215 ia) RIH to seabed with ROV. Inspect inside of BOP connector with ROV camera. Rig heave makes it difficult to get a good survey done; ROV being hit by BOP frame, light knocked off the camera. |
| 01/01/2002 | 2,175.00 | 06:00 | 07:00 | 1 | SURF | WHEAD | RISR | (215 ia) Retrieve ROV to surface. |
| 01/01/2002 | 2,175.00 | 07:00 | 10:00 | 3 | SURF | WHEAD | MISC | (215 ia) Repair ROV camera, modify fixture. |
| 01/01/2002 | 2,175.00 | 10:00 | 13:00 | 3 | SURF | WHEAD | RISR | (215 ia) Dive ROV, inspect inside of BOP connector. Pieces of the connector hydrate seal appears to be wedged in between connector locking segments. Retrieve ROV to surface. |
| 01/01/2002 | 2,175.00 | 13:00 | 16:00 | 3 | SURF | WHEAD | MISC | (215 ia) Prepare ROV tooling. |
| 01/01/2002 | 2,175.00 | 16:00 | 18:00 | 2 | SURF | WHEAD | RISR | (215 ia) Dive ROV, attempt to clean connector, retrieve ROV to surface. |
| 01/01/2002 | 2,175.00 | 18:00 | 18:45 | 0.75 | SURF | WHEAD | MISC | (215 ia) Modify ROV tooling. |
| 01/01/2002 | 2,175.00 | 18:45 | 20:30 | 1.75 | SURF | WHEAD | RISR | (215 ia) Dive ROV, successfully dislodge remaining debris stuck in between connector locking segments. |
| 01/01/2002 | 2,175.00 | 20:30 | 00:00 | 3.5 | SURF | WHEAD | WAIT | (215 ib) WOW (heave to subside |
| 02/01/2002 | 2,175.00 | 00:00 | 04:30 | 4.5 | SURF | WHEAD | WAIT | (215IB) Cont. WOW. |
| 02/01/2002 | 2,175.00 | 04:30 | 06:40 | 2.17 | SURF | WHEAD | RISR | (215 J,K) Position rig / riser / BOP above wellhead. |
| 02/01/2002 | 2,175.00 | 06:40 | 07:30 | 0.83 | SURF | WHEAD | RISR | (215 L,M) Land BOP stack, close BOP connector and perform 40T O/pull test - OK. Lock connector with 2500 PSI. |
| 02/01/2002 | 2,175.00 | 07:30 | 08:30 | 1 | SURF | WHEAD | BOPT | (215 N,O) Line up and flush through kill line, p/test same against failsafe v/v's - OK. P/wellhead connector against 20" casing; 300 / 1600 PSI for 15 mins - OK. Inspect connector with ROV. |
| 02/01/2002 | 2,175.00 | 08:30 | 10:45 | 2.25 | SURF | WHEAD | RISR | (215 P) Adjust compensators and stroke out telescopic joint inner barrel. |
| 02/01/2002 | 2,175.00 | 10:45 | 19:00 | 8.25 | SURF | WHEAD | RIGR | (215 Q) Perform SJA and RA with rig crew prior to start repairing seal on telescopic joint upper housing double seal sub assy. Brake connection with rig tongs. Re-arrange and install slings on telescopic joint inner barrel. Unscrew upper housing sub assy, clean threads and install 2 new 'O'-rings. MU upper housing sub assy to telescopic joint inner barrel. RD slings on inner barrel. NOTE: Rig went into yellow alert at 10:50 - loss of LBL array. Representative from Simrad is onboard troubleshooting. |
| 02/01/2002 | 2,175.00 | 19:00 | 20:00 | 1 | SURF | WHEAD | RISR | (215 R,S) Connect telescopic joint inner barrel to diverter housing. LD riser R/T. |
| 02/01/2002 | 2,175.00 | 20:00 | 21:00 | 1 | SURF | WHEAD | BOPU | (215 T) Change bails and elevator in preparation for installing divertor. |
| 02/01/2002 | 2,175.00 | 21:00 | 22:15 | 1.25 | SURF | WHEAD | BOPU | (215 T,S) PU and install divertor. Overpull test to 15T. Divertor not aligned correctly in divertor housing. Re-align and repeat overpull test. Release and LD divertor RT. |
| 02/01/2002 | 2,175.00 | 22:15 | 23:15 | 1 | SURF | WHEAD | RIGR | (215 T) Change elevator, prepare service hose for air operated elevator. Meanwhile fill riser with trip tank pump. |
| 02/01/2002 | 2,175.00 | 23:15 | 23:45 | 0.5 | SURF | WHEAD | RIGR | (215 T) PU 1 stand of 5" HWDP, close divertor. |
| 02/01/2002 | 2,175.00 | 23:45 | 00:00 | 0.25 | SURF | WHEAD | RIGR | (215 T) Flush through lines, p/test choke line fail safe v/v's to 500 psi - OK. Note: Rig excursion recorded up to +20m during the night. |
| 03/01/2002 | 2,175.00 | 00:00 | 01:00 | 1 | SURF | WHEAD | RIGR | (215t) P/test 'O'-ring seals on telescopic joint upper housing double seal sub assy to 180 PSI - OK. |
| 03/01/2002 | 2,175.00 | 01:00 | 01:30 | 0.5 | SURF | WHEAD | RIGR | (215u) Open divertor, remove KC, and rack back stand of 5" HWDP. |
| 03/01/2002 | 2,175.00 | 01:30 | 02:30 | 1 | SURF | WHEAD | RISR | (215v) RD riser spider and gimble, clear rig floor. |
| 03/01/2002 | 2,175.00 | 02:30 | 04:30 | 2 | SURF | DRILL | BHA | (215w,x) Install TDS torque wrench assy, 350T bails and 'BX'-elevator. |
| 03/01/2002 | 2,175.00 | 04:30 | 05:00 | 0.5 | SURF | DRILL | RIGR | (215x) Hydraulic hose on TDS retract caught on RDS - change same. |
| 03/01/2002 | 2,175.00 | 05:00 | 05:30 | 0.5 | SURF | DRILL | BHA | (215y) PU 2 stand of 5" HWDP and BOP test tool. |
| 03/01/2002 | 2,175.00 | 05:30 | 06:00 | 0.5 | SURF | DRILL | BHA | (215y) Change f/5" to 6-5/8" handling equipment. RIH on 6-5/8" DP. |
| 03/01/2002 | 2,175.00 | 06:00 | 07:00 | 1 | SURF | DRILL | TRIP | (215y) Cont. RIH w/BOP test tool. |
| 03/01/2002 | 2,175.00 | 07:00 | 07:20 | 0.33 | SURF | DRILL | RIGS | (215y) Check travelling assy for loose items. Rig enters advisory alert condition at 07:05. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 03/01/2002 | 2,175.00 | 07:20 | 08:00 | 0.67 | SURF | DRILL | TRIP | (215y) Cont. TIH to 1450m. |
| 03/01/2002 | 2,175.00 | 08:00 | 09:00 | 1 | SURF | DRILL | SAFE | (215ya) Perform SJA and discussed disconnect procedure with U-170 DP in BOP cavity prior to entering BOP with test tool assy. |
| 03/01/2002 | 2,175.00 | 09:00 | 10:00 | 1 | SURF | DRILL | RIGR | (215) Fwd BOP bumper bar extended accidentally out into moonpool and hit riser support ring. Rig heave caused riser support ring to bend BOP bumper bar upwards, so unable to retract bumper. Risk of further damage. Move rig fwd, deballast 2m, and evaluate problem (3.6m heave). Perform EQD at 09:37 hrs - negative. Reset EQD sequence, increase operating pressure f/1700 - 3000 psi. Perform second EQD at 09:55 - OK. Deballast rig f/drilling to survival draft f/08:45 - 09:55. Draft = 21.5m. Rig enters yellow alert condition at 09:45, advisory alert at 09:55. Caused by surface / lower riser angle limits (max. 2.0 / 1.5 deg). |
| 03/01/2002 | 2,175.00 | 10:00 | 12:45 | 2.75 | SURF | DRILL | RIGR | (215ya) WOW. Meanwhile assess situation, move rig 45m off well centre. Rig enters green (normal) alert condition at 10:35. |
| 03/01/2002 | 2,175.00 | 12:45 | 16:00 | 3.25 | SURF | DRILL | RIGR | (215ya) WOW. Meanwhile POH BOP test tool, clear rig floor. |
| 03/01/2002 | 2,175.00 | 16:00 | 17:00 | 1 | SURF | DRILL | RIGR | (215ya) WOW. Check drawwork brake - OK. Ballast rig f/survival to drilling draft f/17:20 - 17:55. Draft = 23.5m. |
| 03/01/2002 | 2,175.00 | 17:00 | 18:00 | 1 | SURF | DRILL | TRIP | (215ya) WOW. Meanwhile prepare to MU 13-3/8" csg hanger and seal assy, and hang-off tool. |
| 03/01/2002 | 2,175.00 | 18:00 | 19:00 | 1 | SURF | DRILL | RIGR | (215ya) WOW. Meanwhile install new window in drillers cabin. |
| 03/01/2002 | 2,175.00 | 19:00 | 19:15 | 0.25 | SURF | DRILL | SAFE | (215ya) Arrange toolbox meeting prior to MU hang-off stand. |
| 03/01/2002 | 2,175.00 | 19:15 | 20:30 | 1.25 | SURF | DRILL | MISC | (215ya) MU hang-off stand and rack back. |
| 03/01/2002 | 2,175.00 | 20:30 | 21:30 | 1 | SURF | CASE | CSG | (215ya) MU 13-3/8" csg hanger, cmt plugs, seal assy and RT. |
| 03/01/2002 | 2,175.00 | 21:30 | 23:00 | 1.5 | SURF | DRILL | SAFE | (215ya) Assemble crews in the cinema for safety meeting. |
| 03/01/2002 | 2,175.00 | 23:00 | 00:00 | 1 | SURF | CASE | CSG | (215ya) Cont. to MU 13-3/8" csg hanger, cmt plugs, seal assy and RT. Note: Circulate and condition (polymer maintenance) mud across surface mud system. |
| 04/01/2002 | 2,175.00 | 00:00 | 02:00 | 2 | SURF | CASE | CSG | (218) Complete MU 13-3/8" csg hanger, cmt plugs, seal assy and RT. Rack same in derrick. |
| 04/01/2002 | 2,175.00 | 02:00 | 04:00 | 2 | SURF | CEMT | CMTP | (219) MU cmt stand incl. remote operated cement head. |
| 04/01/2002 | 2,175.00 | 04:00 | 06:30 | 2.5 | SURF | DRILL | BHA | (223) MU 17" BHA. |
| 04/01/2002 | 2,175.00 | 06:30 | 07:00 | 0.5 | SURF | DRILL | CLNR | (223) Tidy rig floor. |
| 04/01/2002 | 2,175.00 | 07:00 | 07:30 | 0.5 | SURF | DRILL | SAFE | (215ya) Pre-job meeting prior to RU riser handling equipment. |
| 04/01/2002 | 2,175.00 | 07:30 | 12:30 | 5 | SURF | WHEAD | BOPD | (215ya) Change bails and elevator f/350T to 500T equipment. Install riser spider / gimble. Install RT for diverter. Prepare RT and racking arm head. LD diverter. |
| 04/01/2002 | 2,175.00 | 12:30 | 13:30 | 1 | SURF | WHEAD | RISR | (215ya) PU riser landing joint. |
| 04/01/2002 | 2,175.00 | 13:30 | 16:30 | 3 | SURF | WHEAD | RISR | (215ya) Close telescopic joint inner barrel and MU same to outer barrel. Not initially making up fully, back off bolts and check alignment. Re-make connection - OK. |
| 04/01/2002 | 2,175.00 | 16:30 | 17:00 | 0.5 | SURF | WHEAD | SAFE | (215ya) Safety meeting with personnel involved in operation to straighten out bent BOP bumper bar. |
| 04/01/2002 | 2,175.00 | 17:00 | 19:30 | 2.5 | SURF | WHEAD | MISC | (215ya) RU sling arrangement at cellar deck. Attempt to straighten BOP bumper bar with 30T load - some improvement seen. |
| 04/01/2002 | 2,175.00 | 19:30 | 20:00 | 0.5 | SURF | WHEAD | SAFE | (215ya) Arrange SJA and evaluate options for increasing load to assist in straightening of bumper bar. |
| 04/01/2002 | 2,175.00 | 20:00 | 21:00 | 1 | SURF | WHEAD | MISC | (215ya) Modify sling arrangement. |
| 04/01/2002 | 2,175.00 | 21:00 | 22:30 | 1.5 | SURF | WHEAD | MISC | (215ya) Straighten out BOP bumper bar with 40T load. Retract same to parking position. RD sling arrangement. |
| 04/01/2002 | 2,175.00 | 22:30 | 23:30 | 1 | SURF | WHEAD | PRST | (215ya) RU and pressure test kill line to 500 / 10 000 psi over 5 / 10 mins against kill line isolation v/v - OK. Meanwhile move rig in over wellhead. |
| 04/01/2002 | 2,175.00 | 23:30 | 00:00 | 0.5 | SURF | WHEAD | BOPU | (215ya) Position rig / riser / LMRP over BOP, land same. |
| 05/01/2002 | 2,175.00 | 00:00 | 00:30 | 0.5 | SURF | WHEAD | BOPU | (215yb) Adjust LMRP position using CMC. Cock connector with 1500 psi, o/pull test to 30T - OK. |
| 05/01/2002 | 2,175.00 | 00:30 | 01:00 | 0.5 | SURF | WHEAD | BOPU | (215yb) Engage blue and yellow pods, configure BOP ram and v/v positions, arm EQD system. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 05/01/2002 | 2,175.00 | 01:00 | 02:00 | 1 | SURF | WHEAD | BOPU | (215ye) Flush lines, p/test K & C lines against Upper / Lower Inner failsafe v/v's to 500 / 10 000 psi for 5 / 10 mins - OK. |
| 05/01/2002 | 2,175.00 | 02:00 | 02:15 | 0.25 | SURF | WHEAD | SAFE | (215yc,yd) Prejob meeting with crew. |
| 05/01/2002 | 2,175.00 | 02:15 | 03:00 | 0.75 | SURF | WHEAD | RISR | (215yc,yd) Release telescopic joint lock bolts, stroke out inner barrel. |
| 05/01/2002 | 2,175.00 | 03:00 | 03:30 | 0.5 | SURF | WHEAD | RISR | (215yf) LD landing joint. |
| 05/01/2002 | 2,175.00 | 03:30 | 04:45 | 1.25 | SURF | WHEAD | BOPU | (215yg) PU divertor RT and divertor. Install same, o/pull test to 15T - OK. |
| 05/01/2002 | 2,175.00 | 04:45 | 06:00 | 1.25 | SURF | WHEAD | RISR | (215yh,yi) RD divertor RT, spider and gimble. Clear rig floor. |
| 05/01/2002 | 2,175.00 | 06:00 | 07:00 | 1 | SURF | DRILL | BHA | (215yj) Change bails f/500T to 350T, install'BX' elevator. |
| 05/01/2002 | 2,175.00 | 07:00 | 07:15 | 0.25 | SURF | DRILL | SAFE | (215yl) Prejob meeting prior to RIH with BOP test plug. |
| 05/01/2002 | 2,175.00 | 07:15 | 08:00 | 0.75 | SURF | DRILL | TRIP | (215yl) RIH 2 stds 5" HWDP, 1 std 5" DP, BOP test plug and 1 std 5" U-170 DP. |
| 05/01/2002 | 2,175.00 | 08:00 | 08:20 | 0.33 | SURF | DRILL | BHA | (215yl) Change slips and elevator inserts to 6-5/8". |
| 05/01/2002 | 2,175.00 | 08:20 | 10:30 | 2.17 | SURF | DRILL | TRIP | (215yl) RIH to 1500 m. Perform D1 - Kick while tripping - drill whilst RIH. |
| 05/01/2002 | 2,175.00 | 10:30 | 11:00 | 0.5 | SURF | DRILL | SAFE | (215yl) Perform pre-job meeting with crew prior to entering BOP with test plug assy. |
| 05/01/2002 | 2,175.00 | 11:00 | 11:30 | 0.5 | SURF | DRILL | TRIP | (215yl) Cont. RIH, land test plug in wellhead. |
| 05/01/2002 | 2,175.00 | 11:30 | 12:15 | 0.75 | SURF | DRILL | CIRC | (215z) Circ seawater to warm BOP elastomers prior to testing. Meanwhile retrieve ROV to surface for light bulb change out. |
| 05/01/2002 | 2,175.00 | 12:15 | 14:30 | 2.25 | SURF | WHEAD | BOPT | (215z) Function test BOP on yellow and blue pod from TP's panel - OK. |
| 05/01/2002 | 2,175.00 | 14:30 | 16:00 | 1.5 | SURF | WHEAD | BOPT | (217) Perform D4 - Accumulator drill from TP's panel - OK. |
| 05/01/2002 | 2,175.00 | 16:00 | 17:00 | 1 | SURF | WHEAD | BOPT | (215z) Test BOP wellhead connector against MPR for 5 / 15 mins to 500 / 8500 psi - OK. |
| 05/01/2002 | 2,175.00 | 17:00 | 18:00 | 1 | SURF | WHEAD | BOPT | (215za) Test LMRP connector against upper annular for 5 / 15 mins to 300 / 7000 psi - OK. Open annular, allow same to fully retract prior to start POH. |
| 05/01/2002 | 2,175.00 | 18:00 | 21:30 | 3.5 | SURF | WHEAD | TRIP | (216) POH and LD BOP test tool. |
| 05/01/2002 | 2,175.00 | 21:30 | 22:00 | 0.5 | SURF | WHEAD | SAFE | (222) Perform D3 - Divertor - drill. Abort drill - flowline valve not operating correctly, SS investigating. |
| 05/01/2002 | 2,175.00 | 22:00 | 22:30 | 0.5 | SURF | WHEAD | TRIP | (216) Cont POH BOP test tool assy. |
| 05/01/2002 | 2,175.00 | 22:30 | 00:00 | 1.5 | SURF | CASE | CSG | (222a) Configure casing landing string to include stand of 5" U-170 DP. NOTE: - Rig enters advisory alert status at 18:40 (due to testing of LBL, HPR system). Rig returns to green alert status at 01:00. Test choke manifold using SS test pump. |
| 06/01/2002 | 2,175.00 | 00:00 | 01:00 | 1 | SURF | CASE | CSG | (222a)Cont MU csg landing string |
| 06/01/2002 | 2,175.00 | 01:00 | 02:30 | 1.5 | SURF | WHEAD | BOPT | (222b) Test upper / lower IBOP to 500 / 5000 psi for 5 / 10 mins - OK. |
| 06/01/2002 | 2,175.00 | 02:30 | 03:00 | 0.5 | SURF | WHEAD | PRST | (222c) Attempt to p/test kelly hose and standpipe manifold - no go. |
| 06/01/2002 | 2,175.00 | 03:00 | 03:45 | 0.75 | SURF | WHEAD | PRST | (222d) Attempt to body shell test standpipe manifold - no go. |
| 06/01/2002 | 2,175.00 | 03:45 | 04:15 | 0.5 | SURF | DRILL | TBMV | (223) LD 2 single joints of 6-5/8" DP and 2 pup joints. |
| 06/01/2002 | 2,175.00 | 04:15 | 06:00 | 1.75 | SURF | DRILL | BHA | (223) MU 17" BHA. Check float valve - found to be ported. Change same, cont MU 17" bit and programme MWD / LWD tool. Bit to sensor offsets:- Bit - GR = 7.66m Bit - RES = 4.18m Bit - APRS= 4.89m Bit - D&I = 15.02m |
| 06/01/2002 | 2,175.00 | 06:00 | 08:00 | 2 | SURF | DRILL | BHA | (225) Cont. RIH w/17" BHA. |
| 06/01/2002 | 2,175.00 | 08:00 | 08:15 | 0.25 | SURF | DRILL | BHA | (224) Change to 6-5/8" DP handling equipment. |
| 06/01/2002 | 2,175.00 | 08:15 | 08:45 | 0.5 | SURF | DRILL | TRIP | (225) RIH to 400m |
| 06/01/2002 | 2,175.00 | 08:45 | 09:00 | 0.25 | SURF | DRILL | INSP | (225) Check travelling assy. |
| 06/01/2002 | 2,175.00 | 09:00 | 10:30 | 1.5 | SURF | DRILL | RIGR | (225) Change over kelly hose f/standpipe 2 to 1 due to leaking standpipe connection. |
| 06/01/2002 | 2,175.00 | 10:30 | 12:00 | 1.5 | SURF | DRILL | TRIP | (225) RIH 1000m. Clear off tooljoint marks and dope pipe over interval to be stripped during D6 drill. |
| 06/01/2002 | 2,175.00 | 12:00 | 12:45 | 0.75 | SURF | WHEAD | PRST | (225) Attempt to test kelly hose / standpipe manifold - no go. |
| 06/01/2002 | 2,175.00 | 12:45 | 13:15 | 0.5 | SURF | DRILL | BHA | (225) Fill pipe and test MWD / LWD tool - OK. 2500 lpm / 1100 PSI, 2700 lpm / 1200 PSI. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 06/01/2002 | 2,175.00 | 13:15 | 15:30 | 2.25 | SURF | WHEAD | PRST | (225) Attempt to pressure test kelly hose - no go. Leak traced to faulty instrument cable for pressure transmitter. |
| 06/01/2002 | 2,175.00 | 15:30 | 15:45 | 0.25 | SURF | DRILL | TRIP | (226) Cont. RIH to 1150m. |
| 06/01/2002 | 2,175.00 | 15:45 | 16:00 | 0.25 | SURF | WHEAD | PRST | (226) Pressure test kelly hose to 500 / 5000 psi for 5 / 10 mins - OK! |
| 06/01/2002 | 2,175.00 | 16:00 | 17:00 | 1 | SURF | DRILL | SAFE | (226) Conduct D3 - diverter drill. Checked all functions. Flushed through diverter lines. |
| 06/01/2002 | 2,175.00 | 17:00 | 19:15 | 2.25 | SURF | DRILL | TRIP | (226) Cont. RIH to 2160m. |
| 06/01/2002 | 2,175.00 | 19:15 | 20:45 | 1.5 | SURF | DRILL | CIRC | (226) Circ seawater to warm BOP elastomers. |
| 06/01/2002 | 2,175.00 | 20:45 | 21:15 | 0.5 | SURF | DRILL | CIRC | (230) Take SCR for MP3 at 30 SPM (in preparation for well kill drill). |
| 06/01/2002 | 2,175.00 | 21:15 | 22:00 | 0.75 | SURF | DRILL | SAFE | (226) Conduct D1 - kick whilst tripping drill. |
| 06/01/2002 | 2,175.00 | 22:00 | 22:45 | 0.75 | SURF | DRILL | SAFE | (228) Conduct D6 - stripping drill. Stripped 2 stands 6 5/8" DP through Upper Annular. Require 35 MT @ 600 psi annular operating pressure and 20 MT @ 550 psi operating pressure to strip tool joints. |
| 06/01/2002 | 2,175.00 | 22:45 | 23:30 | 0.75 | SURF | DRILL | SAFE | (227) Conduct D5 - well kill drill. |
| 06/01/2002 | 2,175.00 | 23:30 | 00:00 | 0.5 | SURF | DRILL | REAM | (226) Wash / rotate down to 2078m. NOTE: Rig enters advisory alert status at 12:25 due to testing of LBL-array. Rig returns to green alert status at 12:45.Rig enters advisory alert status at 13:15 due to testing of LBL-array. Rig returns to green alert status at 17:40. |
| 07/01/2002 | 2,175.00 | 00:00 | 00:45 | 0.75 | SURF | DRILL | REAM | (231) Cont. wash and rotate down to float collar at 2137m. |
| 07/01/2002 | 2,175.00 | 00:45 | 02:00 | 1.25 | SURF | DRILL | CMTD | (231) Drill cement in shoetrack to 2150m. Firm drilling after the initial 6 - 7m drilled. |
| 07/01/2002 | 2,175.00 | 02:00 | 02:30 | 0.5 | SURF | DRILL | DSPL | (231) Displace kill-, choke, and booster line to 1.11 SG mud. |
| 07/01/2002 | 2,175.00 | 02:30 | 04:45 | 2.25 | SURF | DRILL | CMTD | (231) Pump 25m3 weighted, Hi-Vis pill & displace well to 1.11 SG mud whilst drilling ahead to 2164m. |
| 07/01/2002 | 2,175.00 | 04:45 | 05:15 | 0.5 | SURF | DRILL | DSPL | (231) Complete displacement of 1.11SG mud on stand down. |
| 07/01/2002 | 2,175.00 | 05:15 | 07:45 | 2.5 | SURF | DRILL | CMTD | (231) Cont. drilling 20" shoetrack to 2174m. Clean out rathole to 2176m. |
| 07/01/2002 | 2,176.00 | 07:45 | 08:30 | 0.75 | SURF | DRILL | DRL | (231) Cont. drlg new fm. f/2176 - 2179m. Ream and work assy across shoe area. |
| 07/01/2002 | 2,179.00 | 08:30 | 10:00 | 1.5 | SURF | DRILL | CIRC | (231) Circ bottoms up with 1057 GPM, total strokes 19500. |
| 07/01/2002 | 2,179.00 | 10:00 | 10:15 | 0.25 | SURF | DRILL | CIRC | (231) Circ and condition kill line content. |
| 07/01/2002 | 2,179.00 | 10:15 | 11:00 | 0.75 | SURF | WHEAD | BOPT | (232) Close IBOP & kill line fail safe v/v's. Pressure test same to 1000 psi - OK. |
| 07/01/2002 | 2,179.00 | 11:00 | 12:30 | 1.5 | SURF | EVAL | LKOF | (232) Perform LOT by pumping down drillstring and kill line to 1.37 SG EMW. 812 psi surface pressure. |
| 07/01/2002 | 2,179.00 | 12:30 | 14:45 | 2.25 | INTER1 | DRILL | CIRC | (233) Circ and condition mud. Raise MW to 1.13 SG. Meanwhile xfer LWD memory data to surface. |
| 07/01/2002 | 2,179.00 | 14:45 | 15:00 | 0.25 | INTER1 | DRILL | CIRC | (232) Take SCR's at 2170m with MP 1, 2, and 3 at 20, 30, and 40 SPM. |
| 07/01/2002 | 2,179.00 | 15:00 | 15:15 | 0.25 | INTER1 | DRILL | CIRC | (233) Displace kill line to 1.13 SG mud & record kill line friction losses at SCR's. |
| 07/01/2002 | 2,179.00 | 15:15 | 16:00 | 0.75 | INTER1 | DRILL | DSPL | (233) Displace kill- and choke-line to 1.13 SG glycol inhibited mix. |
| 07/01/2002 | 2,179.00 | 16:00 | 00:00 | 8 | INTER1 | DRILL | DRL | (233) Cont. drlg ahead f/2179 - 2281m. 10 - 40 m/hr, 2 - 9klbs WOB, 96 - 132 RPM, 4 - 6kft lbs, 1000 - 1100 GPM, 2520 - 2720 psi. Rig heave 3-6 m causing problems optimizing drilling parameters. |
| 08/01/2002 | 2,281.00 | 00:00 | 08:00 | 8 | INTER1 | DRILL | DRL | (233) Cont. drlg ahead f/2281 - 2449m. 14 - 60 m/hr, 1 - 9klbs WOB, 111 - 132 RPM, 4 - 8 kft-lbs, 1043 - 1100 GPM, 2600 - 2700 psi. Rig heave 3 - 5m causing problems optimising drilling parameters. |
| 08/01/2002 | 2,449.00 | 08:00 | 08:15 | 0.25 | INTER1 | DRILL | FCHK | (235) Perform "dummy" connection, flowcheck well - OK. |
| 08/01/2002 | 2,449.00 | 08:15 | 08:45 | 0.5 | INTER1 | DRILL | CIRC | (235) Commence circulate bottoms up. Driller noticed apparent increase in active system. |
| 08/01/2002 | 2,449.00 | 08:45 | 09:00 | 0.25 | INTER1 | DRILL | FCHK | (235) Flowcheck well on trip tank - slow gain noticed. Did not stabilise. Precautionary shut well in on Upper Annular at 09:00 hours. Total gain in TT = 0.8m3 |
| 08/01/2002 | 2,449.00 | 09:00 | 09:45 | 0.75 | INTER1 | DRILL | WKIL | (235a) Arrange pre-job meeting. Line up surface equipment for circulation through kill line. Meanwhile monitor well for any pressure build-up. None present. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 08/01/2002 | 2,449.00 | 09:45 | 13:30 | 3.75 | INTER1 | DRILL | WKIL | (235a) Precautionary circulate bottoms up through kill line and across choke manifold whilst monitoring for excess gas and mud chloride levels. Initially unable to record gas levels due to poorboy flow bypassing header box. Geoservice rig up backup sensor in degasser pit. No connection gas noticed from dummy connection and flowcheck. 1,4% peak. Background 0,5%. Commenced circulation at 30 SPM, increasing to 40 SPM / 520 PSI pump pressure / 290 PSI choke pressure once ICP had stabilised. |
| 08/01/2002 | 2,449.00 | 13:30 | 14:00 | 0.5 | INTER1 | DRILL | WKIL | (235b) Flowcheck well up kill line - negative. |
| 08/01/2002 | 2,449.00 | 14:00 | 14:30 | 0.5 | INTER1 | DRILL | WKIL | (235b) Open BOP's, flowcheck well on trip tank - negative. Gas peak 3,0% (drilled gas). Meanwhile weigh up active system to 1.20 SG. |
| 08/01/2002 | 2,449.00 | 14:30 | 20:00 | 5.5 | INTER1 | DRILL | CIRC | (235c) Circ and condition well whilst increasing mud weight f/1.15 to 1.20 SG. |
| 08/01/2002 | 2,449.00 | 20:00 | 21:45 | 1.75 | INTER1 | DRILL | TRIP | (236) Pump OOH to 2160m. Boost riser continuously. Hole in good condition. Took 10T o/pull at 2233m. Worked tight spot once - OK. |
| 08/01/2002 | 2,449.00 | 21:45 | 22:15 | 0.5 | INTER1 | DRILL | FCHK | (237) Flowcheck well on trip tank - OK. |
| 08/01/2002 | 2,449.00 | 22:15 | 23:00 | 0.75 | INTER1 | DRILL | TRIP | (238) RIH to TD at 2449m. Wash down last stand - hole in good condition. |
| 08/01/2002 | 2,449.00 | 23:00 | 00:00 | 1 | INTER1 | DRILL | CIRC | (239) Circ and condition well whilst weighing up part of active system to 1.41 SG. Note:- Rig resumes normal alert status as of 05:00 (sign. wave height < 5m). |
| 09/01/2002 | 2,449.00 | 00:00 | 01:00 | 1 | INTER1 | DRILL | CIRC | (239) Cont. weighing up mud to 1.41 SG. |
| 09/01/2002 | 2,449.00 | 01:00 | 01:30 | 0.5 | INTER1 | DRILL | SAFE | (239a) Hold pre-job meeting. |
| 09/01/2002 | 2,449.00 | 01:30 | 03:30 | 2 | INTER1 | DRILL | CIRC | (239a) Displace hole f/TD - wellhead to 1.41 SG for riser margin. |
| 09/01/2002 | 2,449.00 | 03:30 | 04:15 | 0.75 | INTER1 | DRILL | TRIP | (239b) POH 3 stands, check correct hole fill - OK. Cont. POH to 20" casing shoe. |
| 09/01/2002 | 2,449.00 | 04:15 | 04:45 | 0.5 | INTER1 | DRILL | FCHK | (240) Flowcheck well - OK. |
| 09/01/2002 | 2,449.00 | 04:45 | 05:45 | 1 | INTER1 | DRILL | TRIP | (243) Cont. POH to 1849m |
| 09/01/2002 | 2,449.00 | 05:45 | 06:00 | 0.25 | INTER1 | DRILL | FCHK | (243) Flowcheck prior to pulling BHA through BOP's. |
| 09/01/2002 | 2,449.00 | 06:00 | 08:15 | 2.25 | INTER1 | DRILL | TRIP | (243) Cont. POH to 654m. |
| 09/01/2002 | 2,449.00 | 08:15 | 09:30 | 1.25 | INTER1 | DRILL | FCHK | (243) Flowcheck well. Meanwhile check and grease TDS, and racking equipment. |
| 09/01/2002 | 2,449.00 | 09:30 | 11:00 | 1.5 | INTER1 | DRILL | TRIP | (243) Cont. POH |
| 09/01/2002 | 2,449.00 | 11:00 | 12:00 | 1 | INTER1 | DRILL | BHA | (246) Rack back BHA. |
| 09/01/2002 | 2,449.00 | 12:00 | 14:00 | 2 | INTER1 | DRILL | BHA | (246a) Lay down Anadrill LWD/MWD tool. |
| 09/01/2002 | 2,449.00 | 14:00 | 16:30 | 2.5 | INTER1 | CASE | CSG | (246b) MU 13-3/8" csg hanger RT with 6-5/8" DP. |
| 09/01/2002 | 2,449.00 | 16:30 | 17:00 | 0.5 | INTER1 | DRILL | TBMV | (246c) LD 1 stand of U170 DP. |
| 09/01/2002 | 2,449.00 | 17:00 | 17:30 | 0.5 | INTER1 | DRILL | WAIT | (246d) WOW. Meanwhile clear rig floor and prepare to MU 17" BHA and hang-off tool. |
| 09/01/2002 | 2,449.00 | 17:30 | 22:15 | 4.75 | INTER1 | DRILL | WAIT | (246d) WOW. Meanwhile MU 17" wiper trip assembly. |
| 09/01/2002 | 2,449.00 | 22:15 | 22:30 | 0.25 | INTER1 | DRILL | WAIT | (246d) WOW. Meanwhile change handling equipment to 6-5/8". |
| 09/01/2002 | 2,449.00 | 22:30 | 23:30 | 1 | INTER1 | DRILL | WAIT | (246d) WOW. Meanwhile repair lower racking arm; el. circuit failure preventing correct function of jaw open / close sequence. |
| 09/01/2002 | 2,449.00 | 23:30 | 00:00 | 0.5 | INTER1 | DRILL | WAIT | (246d) WOW. Meanwhile RIH on 6-5/8" DP to 639m. NOTE:- Rig enters advisory alert status at 11:45 hrs (wave height > 5m). Rig returns to green alert status at 14:00 hrs. Rig enters advisory alert status at 20:00 hrs. (wave height >5m). Rig ballast up 1m to 22.5m at 05:55 (sign. wave height > 7.5m) |
| 10/01/2002 | 2,449.00 | 00:00 | 02:30 | 2.5 | INTER1 | DRILL | WAIT | (246d) WOW. Meanwhile MU new hang-off stand at 639m. Unblock slick DC joint, inspect and dope ACME-threads on hang-off tool. |
| 10/01/2002 | 2,449.00 | 02:30 | 04:00 | 1.5 | INTER1 | DRILL | WAIT | WOW. Meanwhile cont. RIH to 1449m. |
| 10/01/2002 | 2,449.00 | 04:00 | 04:30 | 0.5 | INTER1 | DRILL | WAIT | WOW. Meanwhile fill pipe, break circulation. |
| 10/01/2002 | 2,449.00 | 04:30 | 06:00 | 1.5 | INTER1 | DRILL | WAIT | WOW. Meanwhile run bit / BHA through BOP with CMC open. Cont. RIH to 2110m |
| 10/01/2002 | 2,449.00 | 06:00 | 06:15 | 0.25 | INTER1 | DRILL | WAIT | WOW. Meanwhile fill pipe. |
| 10/01/2002 | 2,449.00 | 06:15 | 07:00 | 0.75 | INTER1 | DRILL | WAIT | WOW. Meanwhile cont. RIH to 2153m |
| 10/01/2002 | 2,449.00 | 07:00 | 07:30 | 0.5 | INTER1 | DRILL | WAIT | WOW. Meanwhile open upper / lower choke line failsafe v/v's, close upper annular. Land hang-off tool on upper annular to confirm space-out. Observed depth discrepancy. Close lower annular and confirmed space-out OK. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 10/01/2002 | 2,449.00 | 07:30 | 08:00 | 0.5 | INTER1 | DRILL | WAIT | WOW. Meanwhile land hang-off tool on lower pipe ram w/20T downweight. Monitor well on trip tank. |
| 10/01/2002 | 2,449.00 | 08:00 | 00:00 | 16 | INTER1 | DRILL | WAIT | WOW. NOTE:- Rig ballast up 1m to 22.5m at 06:00 (sign wave height > 7.5m). Rig ballast up 1m to 21.5m at 12:20. |
| 11/01/2002 | 0 | 00:00 | 15:30 | 15.5 | INTER1 | DRILL | WAIT | (246d) Continued WOW. 06:15-06:40 Ballasted rig down to drilling draft 23.5m. @ 14:00 Deballasted rig to 22.5m. |
| 11/01/2002 | 0 | 15:30 | 16:00 | 0.5 | INTER1 | DRILL | FCHK | (246e) Opened LPR. Flow checked well - negative. |
| 11/01/2002 | 2,158.00 | 16:00 | 19:30 | 3.5 | INTER1 | DRILL | TRIP | (246e) POOH with hang-off tool. |
| 11/01/2002 | 638 | 19:30 | 20:15 | 0.75 | INTER1 | DRILL | BHA | (246e) Verified no pressure trapped below Gray valve. Racked hang-off stand back in derrick. |
| 11/01/2002 | 638 | 20:15 | 20:30 | 0.25 | INTER1 | DRILL | CIRC | (246f) Broke circulation (1170 lpm, 15 bar), verified returns over shakers. |
| 11/01/2002 | 638 | 20:30 | 21:45 | 1.25 | INTER1 | DRILL | TRIP | (246f) RIH with 17" wiper BHA from 638-1465 m. |
| 11/01/2002 | 1,465.00 | 21:45 | 23:30 | 1.75 | INTER1 | DRILL | RIGM | (246f) Cut and slipped drilling line. |
| 11/01/2002 | 1,465.00 | 23:30 | 00:00 | 0.5 | INTER1 | DRILL | TRIP | (246g) Filled pipe with 1,20 sg mud. |
| 12/01/2002 | 1,465.00 | 00:00 | 02:30 | 2.5 | INTER1 | DRILL | TRIP | (246f) Continued RIH from 1465-2415m. Took max 10 tons weight. |
| 12/01/2002 | 2,415.00 | 02:30 | 03:30 | 1 | INTER1 | DRILL | CIRC | (246f) Washed and reamed down from 2415-2449m (2000 lpm, 30 rpm). |
| 12/01/2002 | 2,449.00 | 03:30 | 07:00 | 3.5 | INTER1 | DRILL | CIRC | (246g) Displaced out 1.41SG with 1.20 SG mud as per program (2000-2700 lpm, 1040-1480 psi). Boosted riser when 1.41 SG mud above BOP. |
| 12/01/2002 | 2,449.00 | 07:00 | 07:15 | 0.25 | INTER1 | DRILL | FCHK | (246g) Flow checked well - negative. |
| 12/01/2002 | 2,449.00 | 07:15 | 09:00 | 1.75 | INTER1 | DRILL | TRIP | (246h) Lubricated out of 17" hole from 2449-2152m (800 lpm, 140 psi). Boosted riser with 2000 lpm while POOH. |
| 12/01/2002 | 2,152.00 | 09:00 | 09:15 | 0.25 | INTER1 | DRILL | FCHK | (246h) Flow checked well at casing shoe - negative. |
| 12/01/2002 | 2,152.00 | 09:15 | 10:00 | 0.75 | INTER1 | DRILL | TRIP | (246h) Droped dart and slugged pipe. Continued POOH from 2152-1722m. |
| 12/01/2002 | 1,722.00 | 10:00 | 10:15 | 0.25 | INTER1 | DRILL | FCHK | (246h) Flow checked well prior to pulling BHA through BOP - negative. |
| 12/01/2002 | 1,722.00 | 10:15 | 13:00 | 2.75 | INTER1 | DRILL | TRIP | (246h) Continued POOH with 17" BHA from 1722-257m. |
| 12/01/2002 | 257 | 13:00 | 14:30 | 1.5 | INTER1 | DRILL | BHA | (246h) Racked back 17" BHA in derrick. Broke bit. |
| 12/01/2002 | 0 | 14:30 | 15:00 | 0.5 | INTER1 | DRILL | BHA | (247a) M/U MPT (Multi Purpose Tool) with bore protector retrieval adapter to pull bore protector. |
| 12/01/2002 | 0 | 15:00 | 17:00 | 2 | INTER1 | DRILL | TRIP | (248) RIH with MPT. Boosted riser while RIH. |
| 12/01/2002 | 920 | 17:00 | 17:30 | 0.5 | INTER1 | DRILL | SAFE | (248) Performed emergency drill. |
| 12/01/2002 | 920 | 17:30 | 19:00 | 1.5 | INTER1 | DRILL | TRIP | (248) Continued RIH with MPT. |
| 12/01/2002 | 1,517.40 | 19:00 | 20:00 | 1 | INTER1 | WHEAD | TRIP | (249) Washed bore protector with 1800 lpm, sat down 5 tons and latched bore protector. Verified correct space-out using index line. Pulled up slowly while cleaning wellhead area with jet sub, 2-3 tons over-pull observed. |
| 12/01/2002 | 1,515.00 | 20:00 | 22:30 | 2.5 | INTER1 | WHEAD | TRIP | (250) Slugged pipe and POOH. Failed to recover bore protector. Checked MPT and prepared same for re-run (run #2). |
| 12/01/2002 | 0 | 22:30 | 00:00 | 1.5 | INTER1 | WHEAD | TRIP | (250a) RIH with MPT to 600 m. |
| 13/01/2002 | 627 | 00:00 | 01:30 | 1.5 | INTER1 | WHEAD | TRIP | (252b) Continued Re-run with MPT (Multi Purpose Tool). |
| 13/01/2002 | 1,517.00 | 01:30 | 02:30 | 1 | INTER1 | WHEAD | TRIP | (252c -e ) Washed bore protector with 2300 lpm, sat down 7 tons and latched same. Closed lower annular to centralize MPT inside bore protector. Repeated latching sequence several times, positive indications of latching - overpull, hanging up. Cleaned wellhead area. |
| 13/01/2002 | 1,510.00 | 02:30 | 05:30 | 3 | INTER1 | WHEAD | TRIP | (252f-g) Slugged pipe and POOH. Failed to recover bore protector. Checked MPT, latch ring in good condition. Prepared same for re-run (run #3). |
| 13/01/2002 | 0 | 05:30 | 08:30 | 3 | INTER1 | WHEAD | TRIP | (252h) RIH with MPT. Held pre-job planning meeting prior to latching bore protector. |
| 13/01/2002 | 1,398.00 | 08:30 | 10:00 | 1.5 | INTER1 | WHEAD | TRIP | (252j-k) Closed lower Shear Ram, tagged same with jet sub and confirmed correct depth. Washed bore protector with 3200 lpm, sat down 15 tons to latch with MPT. Closed lower annular to centralize MPT inside bore protector- opened. Picked up to neutral weight and rotated 6 turns with MPT inside bore protector, cycled annular to centralize will 15 tons down. Turned string 180 deg. and repeated MPT latching sequence. Cleaned wellhead area. Pumped 350 lpm down kill line while RIH and POOH past kill outlet in BOP, observed pressure spike on the way out suggesting recovery of bore protector. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 13/01/2002 | 1,517.00 | 10:00 | 13:00 | 3 | INTER1 | WHEAD | TRIP | (252l) Slugged pipe and POOH. Failed to recover bore protector. |
| 13/01/2002 | 0 | 13:00 | 14:30 | 1.5 | INTER1 | WHEAD | TRIP | (252m) Redressed MPT with J-slot adapter. |
| 13/01/2002 | 0 | 14:30 | 17:00 | 2.5 | INTER1 | WHEAD | TRIP | (252n-p) RIH with MPT (run #4), landed same in bore protector and sat down 5 tons. Latched J-profile (2 turns left, weight loss and torque increase to 5000 ft-lbs) and picked up weight. No over-pull seen. |
| 13/01/2002 | 1,517.00 | 17:00 | 19:00 | 2 | INTER1 | WHEAD | TRIP | (252r) Slugged pipe and POOH, bore protector successfully recovered. |
| 13/01/2002 | 0 | 19:00 | 20:00 | 1 | INTER1 | WHEAD | TRIP | (252s) Laid down bore protector and MPT. Observed significant internal wear on 25% of bore protector latch profile. |
| 13/01/2002 | 0 | 20:00 | 23:30 | 3.5 | INTER1 | CASE | CSG | (254) Cleaned and tidied up rig floor. Prepared casing handling equipment: Rigged up casing tong, changed to 500 tons bails, installed BX elevator, PS-30 spider and gripper head on LRA. Function tested casing handling equipment - OK. |
| 13/01/2002 | 0 | 23:30 | 00:00 | 0.5 | INTER1 | CASE | SAFE | (253) Performed pre-job safety meeting with involved personnel on rig floor. |
| 14/01/2002 | 0 | 00:00 | 02:30 | 2.5 | INTER1 | CASE | RIGR | (251a) Picked up 13 3/8" casing shoe joint, verified flow through float - OK. Unable to obtain closing signal on PS-30 control panel with casing in slips. Had to lay out shoe joint to replace PS-30 spider with FMS. Unable to operate pipe deck Gantry crane. Trouble shot and repaired magnets on Gantry crane during equipment handling operation. |
| 14/01/2002 | 0 | 02:30 | 03:00 | 0.5 | INTER1 | CASE | CSG | (251b) Unable to function Weatherford FMS. Trouble shot and repaired Weatherford FMS control panel. |
| 14/01/2002 | 0 | 03:00 | 05:00 | 2 | INTER1 | CASE | CSG | (252, 253, 254) Made up and RIH with 13 3/8" casing shoe, intermediate and float collar joints, checked float equipment - OK. Baker-locked each connection. @ 4:45 out of Advisory mode. Sign wave height below 5m. |
| 14/01/2002 | 35 | 05:00 | 07:00 | 2 | INTER1 | CASE | CSG | (255) RIH with 13 3/8" casing from 35-146 m. |
| 14/01/2002 | 146 | 07:00 | 07:15 | 0.25 | INTER1 | CASE | SAFE | (255a) Held pre-job meeting with new crew. |
| 14/01/2002 | 146 | 07:15 | 10:30 | 3.25 | INTER1 | CASE | CSG | (255) Continued running 13 3/8" casing from 146-350 m. Had to reject jnts no. 54, 53, 51, 50 due to inproper make-up torque characteristics. |
| 14/01/2002 | 350 | 10:30 | 14:00 | 3.5 | INTER1 | CASE | WAIT | (255b) Investigated casing make-up problems (conference call with town). Revised casing makeup procedures and adjust Weatherford JAM settings. |
| 14/01/2002 | 350 | 14:00 | 16:00 | 2 | INTER1 | CASE | CSG | (255) Continued running 13 3/8" casing from 350-490 m. Slow progress due to make up problems. |
| 14/01/2002 | 490 | 16:00 | 16:30 | 0.5 | INTER1 | CASE | CSG | (255c) Trouble shot and repaired Gantry crane. |
| 14/01/2002 | 490 | 16:30 | 22:15 | 5.75 | INTER1 | CASE | CSG | (255) Continued running 13 3/8" casing from 490-883 m. @ 22:00 in Advisory mode due to sign wave height above 5m. |
| 14/01/2002 | 883 | 22:15 | 22:45 | 0.5 | INTER1 | CASE | SAFE | (255d) Held pre-job meeting with new crew. |
| 14/01/2002 | 883 | 22:45 | 23:30 | 0.75 | INTER1 | CASE | CSG | (255) Continued running 13 3/8" casing from 883-922 m. |
| 14/01/2002 | 922 | 23:30 | 00:00 | 0.5 | INTER1 | CASE | CSG | (256) Rigged down BX elevator used for casing job. |
| 15/01/2002 | 922 | 00:00 | 02:00 | 2 | INTER1 | CASE | CSG | (256) Changed to drilling bails. Made up new BX elevator, dressed for 6 5/8" DP. |
| 15/01/2002 | 922 | 02:00 | 02:30 | 0.5 | INTER1 | CASE | CSG | (257) Made up casing hanger assy, weight of casing string 118 tons MD (block weight 37 tons included). |
| 15/01/2002 | 922 | 02:30 | 03:30 | 1 | INTER1 | CASE | CSG | (258) Laid out FMS. Changed LRA gripper head. |
| 15/01/2002 | 922 | 03:30 | 04:00 | 0.5 | INTER1 | CASE | CSG | (257) Removed protection and inspected casing hanger assy - OK. Ran hanger assy through rotary. |
| 15/01/2002 | 954 | 04:00 | 06:00 | 2 | INTER1 | CASE | CSG | (259) RIH with 13 3/8" casing string on 6 5/8" DP to top of BOP. Filled pipe every 5 stands. @ 05:20 out of Advisory mode. Sign wave height below 5m. |
| 15/01/2002 | 1,490.00 | 06:00 | 07:30 | 1.5 | INTER1 | CASE | CIRC | (259a) Circulated casing and landing string volume (82 m3) at 2000 l/min. Meanwhile held safety meeting with new crew prior to running casing through the BOP. Performed risk assessment of running non-shearable casing string through the BOP and discussed relevant DP emergency procedures. |
| 15/01/2002 | 1,490.00 | 07:30 | 10:30 | 3 | INTER1 | CASE | CSG | (259) Continued RIH with 13 3/8" casing from 1490-2377 m. Filled pipe every 5 stands. |
| 15/01/2002 | 2,377.00 | 10:30 | 12:00 | 1.5 | INTER1 | CASE | CSG | (259) Took weight at 2407 m. Washed down from 2407-2430 m (1000 l/min, 100 psi).Took 10 tons weight at 2407 m, increased flow to 1500 lpm, 200 psi. Washed down OK. |
| 15/01/2002 | 2,430.00 | 12:00 | 12:30 | 0.5 | INTER1 | CASE | CSG | (260) P/U cement stand. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 15/01/2002 | 2,430.00 | 12:30 | 13:00 | 0.5 | INTER1 | CASE | CSG | (261) Continued washing down casing from 2430-2441,5 m (1500-2000 lpm, 350-1000 psi). Attempted to land casing several times - appeared high. |
| 15/01/2002 | 2,441.50 | 13:00 | 18:30 | 5.5 | INTER1 | CASE | CSG | (261) Closed lower annular and stripped up to running tool to confirm landing depth. Tagged L. Ann 7,1m above R/tool (Calculated 7,0m). Re-land casing. Confirmed landing depth correlates with previous wearbushing retrieval depths taking account of landing string stretch and tides. |
| 15/01/2002 | 2,443.50 | 18:30 | 19:00 | 0.5 | INTER1 | CEMT | CIRC | (262) Circulated and conditioned mud with 2 times annulus volume (1000 lpm, 350 psi). Meanwhile held pre-job meeting with new crew prior to cement job. |
| 15/01/2002 | 2,443.50 | 19:00 | 19:15 | 0.25 | INTER1 | CEMT | CMTP | (262a) Leak test surface cement lines to 345 bar - OK. |
| 15/01/2002 | 2,443.50 | 19:15 | 19:30 | 0.25 | INTER1 | CEMT | CMTP | (263) Pumped 16 m3 spacer with cement pump at 1500 lpm. |
| 15/01/2002 | 2,443.50 | 19:30 | 20:15 | 0.75 | INTER1 | CEMT | CMTP | (264, 265) Dropped ball. Mixed and pumped 11 m3 1,92 sg G-neat cement slurry. |
| 15/01/2002 | 2,443.50 | 20:15 | 20:45 | 0.5 | INTER1 | CEMT | CMTP | (266) Released dart. Pumped and displaced landing string volume with cement pump at 1300 lpm. No indication seen on top plug being sheared. |
| 15/01/2002 | 2,443.50 | 20:45 | 21:45 | 1 | INTER1 | CEMT | CMTP | (266) Switched to rig pumps. Continued to displace cement in place at 1500-2000 lpm. Reduced pump rate to 1000 lpm prior full displacement volume. Over-displaced cement with 70% of shoe track volume, unable to bump plug. Observed pressure build-up as cement entering into annulus. Approx. 2 m3 losses observed during total circulation and cement displacement job. |
| 15/01/2002 | 2,443.50 | 21:45 | 22:00 | 0.25 | INTER1 | CASE | CSGT | (268) Bled back 1 bbl to cement unit and verified floats - OK. |
| 15/01/2002 | 2,443.50 | 22:00 | 23:00 | 1 | INTER1 | CASE | CSG | (269) Set seal assembly according to Dril-Quip procedures. |
| 15/01/2002 | 2,443.50 | 23:00 | 23:30 | 0.5 | INTER1 | CASE | CSG | (271) Released casing hanger R/T and pulled free with 30 tons over-pull. Racked back cement stand. Loaded sponge ball. |
| 15/01/2002 | 2,443.50 | 23:30 | 00:00 | 0.5 | INTER1 | CASE | CSG | (271) Took 40 tons over-pull when attempting to pull R/T through upper annular (8 m above casing hanger landing depth) and drag in BOP's. Picked up single 6 5/8" DP from deck. Pumped through pipe at low rate and confirmed returns. |
| 16/01/2002 | 2,441.00 | 00:00 | 00:45 | 0.75 | INTER1 | CEMT | CSG | (271) Casing hanger seal assy RT hanging up in BOP's. Pumped down pipe at 200 lpm, rotated pipe and pulled casing hanger R/T through upper BOP's with max 25 tons over-pull (15 rpm, 5000-15000 ft-lbs). Simultaneously circulated down kill line and verified full return. |
| 16/01/2002 | 2,441.00 | 00:45 | 05:15 | 4.5 | INTER1 | CEMT | TRIP | (271) Pumped slug and observed pressure spike of approx. 2300 psi when sponge ball was pumped out through the cement plug launching mandrel. Continued POOH with casing landing string, slight over-pull observed. Initially circulated riser down kill line at low rate to avoid swabbing of well. Recovered casing hanger R/T with seal assembly in place, entire assy packed with clay and cuttings. |
| 16/01/2002 | 0 | 05:15 | 06:00 | 0.75 | INTER1 | CASE | BHA | (272) Inspected and laid down casing hanger R/T assy. |
| 16/01/2002 | 0 | 06:00 | 07:00 | 1 | INTER1 | CASE | BHA | (273a) Prepared and made up Mill & Flush tool, racked same back in derrick. |
| 16/01/2002 | 0 | 07:00 | 09:00 | 2 | INTER1 | CASE | BHA | (274) Laid down cement head. |
| 16/01/2002 | 0 | 09:00 | 11:30 | 2.5 | INTER1 | DRILL | BHA | (280) Changed BX elevator inserts, Laid out 17" string stab from derrick and rebuilt 8" NM stand for 12 1/4" BHA. |
| 16/01/2002 | 0 | 11:30 | 14:30 | 3 | INTER1 | CASE | BHA | (274a) Made up clean-out assy (5" rubber bull nose and jet sub, 1std 5" DP, 17" string stab). Painted DP above jet sub, strapped pipe and changed to 6 5/8" DP handling equipment. |
| 16/01/2002 | 0 | 14:30 | 16:45 | 2.25 | INTER1 | CASE | TRIP | (274a) RIH with 5" jet sub assy. |
| 16/01/2002 | 1,446.00 | 16:45 | 21:00 | 4.25 | INTER1 | CASE | CIRC | (274a) Washed down from 1446-1510 m (4000 lpm, 3000 psi), took 10 tons weight. Continued to wash wellhead while reciprocating pipe and rotating 15 rpm, chased obstruction down to 1512 m. Sat down max 30 tons without any further progress. Pumped a viscous pill and circ riser content. Also circulated mud down lower choke outlet on BOP with cement pump (5-8 bpm, 350-700 psi) with full return to surface. With bull nose at top of obstruction, closed upper annular and rotated string carefully to make pipe impression for later verification of wellhead space-out. |
| 16/01/2002 | 1,512.00 | 21:00 | 21:30 | 0.5 | INTER1 | CASE | CIRC | (274a) Pumped slug and pulled BHA 2 stands above BOP. |
| 16/01/2002 | 1,455.00 | 21:30 | 22:15 | 0.75 | INTER1 | DRILL | RIGS | (274b) Inspected and greased TDS, function tested block saver system. |
| 16/01/2002 | 1,455.00 | 22:15 | 00:00 | 1.75 | INTER1 | CASE | TRIP | (274a) Continued POOH with jet sub assy from 1455-800 m. |
| 17/01/2002 | 800 | 00:00 | 01:30 | 1.5 | INTER1 | CASE | TRIP | (274c) Continued POOH with BHA. |
| 17/01/2002 | 0 | 01:30 | 03:00 | 1.5 | INTER1 | CASE | BHA | (274c) Changed inserts in BX elevator. Racked and L/D BHA. |
| 17/01/2002 | 0 | 03:00 | 03:30 | 0.5 | INTER1 | CASE | WAIT | (274d) Waited due to operational discussion with town. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 17/01/2002 | 0 | 03:30 | 07:45 | 4.25 | INTER1 | CASE | BHA | (274d) M/U 12 1/4" BHA for wellhead clean-out run. |
| 17/01/2002 | 0 | 07:45 | 11:15 | 3.5 | INTER1 | CASE | TRIP | (274d) Changed to 6 5/8" equipment and started RIH, strapped pipe to 1497m. |
| 17/01/2002 | 1,497.00 | 11:15 | 13:45 | 2.5 | INTER1 | CASE | TRIP | (274d) Broke circulation and washed down from 1497m. Tagged plug with 5T at 1516m. Sat down weight progressively 15-20T. Worked twice. Plug moved 0.3m. Started slow rotation 15rpm and rotated onto plug with 5T, 5 kftlbs. Increased progressively until max 10-15mT. Picked up several times. Rotated onto plug down to 1518m. Pick up. Pushed plug down to 1522m. Wiped through several times. No resistance. (Note: Bit to stab = 6m) |
| 17/01/2002 | 1,522.00 | 13:45 | 15:30 | 1.75 | INTER1 | CASE | CIRC | (247d) Pulled above BOP and circ B/U + 25% w/ 4200lpm at 1700psi. |
| 17/01/2002 | 1,522.00 | 15:30 | 16:30 | 1 | INTER1 | CASE | TRIP | (274d) Closed lower shear ram and confirmed depth - OK. |
| 17/01/2002 | 1,522.00 | 16:30 | 17:30 | 1 | INTER1 | CASE | CIRC | (274d) Pumped 15m3 hi-vis pill and displaced same above BOP. |
| 17/01/2002 | 1,522.00 | 17:30 | 18:00 | 0.5 | INTER1 | CASE | CIRC | (274d) Pulled bit above the BOP's, boosted riser with 2 mud pumps and displaced out pill while POOH. Pumped slug and prepared to POOH. |
| 17/01/2002 | 1,496.00 | 18:00 | 21:00 | 3 | INTER1 | CASE | TRIP | (274d) POOH with BHA, continued boosting riser 1,2 x bottoms up. |
| 17/01/2002 | 94 | 21:00 | 22:30 | 1.5 | INTER1 | CASE | BHA | (274d) Change inserts in BX elevator, broke bit and racked BHA in derrick. |
| 17/01/2002 | 0 | 22:30 | 00:00 | 1.5 | INTER1 | CASE | BHA | (274d) RIH with Mill & Flush tool. |
| 18/01/2002 | 0 | 00:00 | 00:30 | 0.5 | INTER1 | CASE | TRIP | (274e) Made up and RIH with Mill and Flush Tool. |
| 18/01/2002 | 0 | 00:30 | 00:45 | 0.25 | INTER1 | CASE | RIGS | Inspected and greased TDS block and Dolly. |
| 18/01/2002 | 0 | 00:45 | 03:00 | 2.25 | INTER1 | CASE | TRIP | (274e) Continued RIH to 1502m. |
| 18/01/2002 | 1,502.00 | 03:00 | 05:30 | 2.5 | INTER1 | CASE | MISC | (274e) Circulated with 2700 lpm and established free rotation torque (2000 ft-lbs). Continued RIH and took weight @ approx. 1517 m. Dressed off seal assy seal area with Mill & Flush tool according to DQ instructions (1000 lpm, 3000-7000 ft-lbs, 2-5 tons weight). Pulled off with Mill & Flush tool, run back in again, sat down weight (max 10-15 tons) and confirmed landing depth on casing hanger. Swept wellhead with 10 m3 hi-vis pill. Verified casing hanger depth 1517,4 m by tagging closed LSR @ 1512,1 m. |
| 18/01/2002 | 1,502.00 | 05:30 | 09:30 | 4 | INTER1 | CASE | TRIP | (274e) Pumped slug and POOH with Mill and flush tool. Boosted riser at 2100 lpm while POOH. |
| 18/01/2002 | 0 | 09:30 | 10:00 | 0.5 | INTER1 | CASE | BHA | (274e) Laid down and checked Mill & Flush tool. Nylon tell tales missing, indicating correct working depth. |
| 18/01/2002 | 0 | 10:00 | 12:00 | 2 | INTER1 | CASE | TRIP | (274f) Changed to 5" inserts on BX elevator. Picked up single 5" DP, painted same white. Made up SART (seal assembly running tool) with new seal assembly. Changed to 6 5/8" inserts on BX elevator. Continued RIH with SART assy to 723 m. |
| 18/01/2002 | 723 | 12:00 | 12:30 | 0.5 | INTER1 | CASE | TRIP | (274f) Repaired broken spinner motor on iron roughneck. |
| 18/01/2002 | 723 | 12:30 | 14:15 | 1.75 | INTER1 | CASE | TRIP | (274f) Continued RIH, tagged LSR gently @ 1512,1 m to confirm depth - OK. |
| 18/01/2002 | 1,512.20 | 14:15 | 15:15 | 1 | INTER1 | CASE | MISC | (274f) Continued RIH and landed seal assembly @ 1517,4 m with 15 tons. Closed MPR and sat seal assembly according to DQ procedure: Pressured up to 2500 psi down choke line with cement unit. Continued to pressure up to 3500 psi/5 min - OK. Pressure tested seal assy to 5000 psi/10 min - OK. Bled off pressure to cement unit and confirmed consistent volumes of 140 litres in/out. Opened MPR and released SART with 27 tons over-pull as per plan. Re-landed SART, closed MPR and re-tested seal assembly to 2500 psi/3 min with cement unit to confirm seal assy still in place - OK. |
| 18/01/2002 | 1,517.40 | 15:15 | 19:30 | 4.25 | INTER1 | CASE | TRIP | (274f) Pumped slug and POOH with SART, observed all shear screws sheared. |
| 18/01/2002 | 0 | 19:30 | 20:30 | 1 | INTER1 | CASE | BHA | (274f) Laid down SART and prepared WB assy. Meanwhile attempted to test 13 3/8" casing to 4100 psi, pressure leaked off @ 700-800 psi. Pumped 4,5 bbls, 1 bbl back. |
| 18/01/2002 | 0 | 20:30 | 00:00 | 3.5 | INTER1 | CASE | BHA | (280) L/D 8" jar, 17" and 16 3/4" stabs from derrick. |
| 19/01/2002 | 0 | 00:00 | 01:00 | 1 | INTER1 | CASE | BHA | (280) Continued L/D 17"stab, 16 3/4" stab and 8" jar. |
| 19/01/2002 | 0 | 01:00 | 01:45 | 0.75 | INTER1 | WHEAD | BOPT | (276) Continued M/U MPT with WB (Wear Bushing) and CT (Cup Tester). |
| 19/01/2002 | 0 | 01:45 | 05:45 | 4 | INTER1 | WHEAD | TRIP | (277) RIH w/ MPT/ WB/CT. |
| 19/01/2002 | 1,516.00 | 05:45 | 06:00 | 0.25 | INTER1 | WHEAD | TRIP | (277) Landed and sat WB according to Dril-Quip procedures. |
| 19/01/2002 | 1,516.00 | 06:00 | 06:45 | 0.75 | INTER1 | WHEAD | BOPT | (277) Attempted to test BOP. Low pressure test to 500 psi - OK. Cont. to pressure up to 5000 psi pump pressure - 600 l. Stopped pump. Pressure dropped to 150 spi. Attempted to re-pressure up to 500 psi. Nogo. |
| 19/01/2002 | 1,516.00 | 06:45 | 07:30 | 0.75 | INTER1 | WHEAD | TRIP | (278) POOH to change BOP test tool. Pumped 3,8m3 slug prior to POOH t/ 1327m. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 19/01/2002 | 1,327.00 | 07:30 | 07:45 | 0.25 | INTER1 | WHEAD | RIGS | Greased and checked TDS. |
| 19/01/2002 | 1,327.00 | 07:45 | 09:45 | 2 | INTER1 | WHEAD | TRIP | (278) Continued POOH f/ 1327m. |
| 19/01/2002 | 0 | 09:45 | 10:00 | 0.25 | INTER1 | CASE | BHA | (278) L/D Multi Purpose Tool. |
| 19/01/2002 | 0 | 10:00 | 10:45 | 0.75 | INTER1 | CASE | BHA | (278a) P/U BOP test tool and RIH w/ same to 615m. |
| 19/01/2002 | 615 | 10:45 | 11:00 | 0.25 | INTER1 | CASE | RIGS | (278a) Clean and tidy rig floor. |
| 19/01/2002 | 615 | 11:00 | 13:15 | 2.25 | INTER1 | CASE | TRIP | (278a) Continued RIH f/ 615m t/ 1516m. |
| 19/01/2002 | 1,516.00 | 13:15 | 14:00 | 0.75 | INTER1 | WHEAD | BOPT | (278a) Landed test plug in BOP w/ 10 mt. Closed MPR and attempted to pressure up - nogo. Observed flow out of DP. Opened MPR, sat down 20 mt, attempted to pressure up - nogo. Open MPR, P/U to neutral wt, set down 25 mt. Attempted to pressure test - no go. Pumped 400 l, no pressure. |
| 19/01/2002 | 1,516.00 | 14:00 | 14:45 | 0.75 | INTER1 | WHEAD | BOPT | (278a) Pulled to above BOP. Broke circ, RIH to wash w/2600 l/min through WH. Landed and sat down 25 mt. Attempted to pressure up - no go. 300 l/min - 300 psi. Observed flow out of DP. Pulled to above BOP. |
| 19/01/2002 | 1,516.00 | 14:45 | 15:15 | 0.5 | INTER1 | WHEAD | TRIP | (278a) Pumped slug. Closed LSR. Tagged LSR to confirm depth. |
| 19/01/2002 | 1,516.00 | 15:15 | 17:00 | 1.75 | INTER1 | WHEAD | TRIP | (278a) POOH to 100 m. |
| 19/01/2002 | 100 | 17:00 | 17:30 | 0.5 | INTER1 | WHEAD | TRIP | (278a) Performed kick drill. |
| 19/01/2002 | 100 | 17:30 | 18:00 | 0.5 | INTER1 | WHEAD | TRIP | (278a) Continued to POOH. |
| 19/01/2002 | 0 | 18:00 | 19:30 | 1.5 | INTER1 | CASE | BHA | (278a) Inspected BOP test tool. Found O-ring slipped out of groove. L/D tool. |
| 19/01/2002 | 0 | 19:30 | 20:30 | 1 | INTER1 | CASE | BHA | (278c) Re-dress BOP test tool. Installed new O-ring. |
| 19/01/2002 | 0 | 20:30 | 21:00 | 0.5 | INTER1 | WHEAD | RIGS | (278c) Checked and adjusted block saver system |
| 19/01/2002 | 0 | 21:00 | 00:00 | 3 | INTER1 | WHEAD | TRIP | (278c) RIH w/ BOP test tool. |
| 20/01/2002 | 1,516.00 | 00:00 | 00:30 | 0.5 | INTER1 | WHEAD | TRIP | (278b) Continued RIH with BOP test tool. |
| 20/01/2002 | 1,516.00 | 00:30 | 01:30 | 1 | INTER1 | WHEAD | BOPT | (278b) Landed BOP test tool in WB and sat down 10T. Closed MPR and attempted to pressure up with cement pump - nogo. Pumped 290 l, observed flow out of DP, no pressure. Open MPR, P/U to neutral string weight. RIH and set down 10 mt. P/U to neutral, RIH and set down 15 mt. Close MPR. Attempted to pressure up with cement pump - nogo. Pumped 150 l, observed flow out of DP, no pressure. Open MPR, P/U to neutral wt. RIH and set down 40 mt. P/U to 10 mt downweight. Close MPR. Attempted to pressure up with cement pump - nogo. Pumped 200 l - observed flow out of DP, no pressure. Open ram. |
| 20/01/2002 | 1,516.00 | 01:30 | 05:30 | 4 | INTER1 | WHEAD | TRIP | (278b) Pump slug and POOH. |
| 20/01/2002 | 0 | 05:30 | 05:45 | 0.25 | INTER1 | WHEAD | TRIP | (278b) L/D BOP test tool. Impression from LPR showed landing of BOP test tool 0.16 m high indicating no seal effect. |
| 20/01/2002 | 0 | 05:45 | 06:00 | 0.25 | INTER1 | WHEAD | TRIP | (278c) P/U Wear Bushing RT, M/U same and changed BX t/ 6 5/8" segments. |
| 20/01/2002 | 0 | 06:00 | 08:30 | 2.5 | INTER1 | WHEAD | TRIP | (278c) RIH w/ WB running tool. |
| 20/01/2002 | 1,517.00 | 08:30 | 09:30 | 1 | INTER1 | WHEAD | TRIP | (278c) Landed/ latched on wearbushing w/ 10T down wt. Performed 30T overpull and pulled above BOP. Pumped slug and prepared to POOH. |
| 20/01/2002 | 1,517.00 | 09:30 | 12:00 | 2.5 | INTER1 | WHEAD | TRIP | (278c) POOH, L/D wearbushing and RT. |
| 20/01/2002 | 0 | 12:00 | 14:30 | 2.5 | INTER1 | WHEAD | TRIP | (278d) P/U SART. M/U same and RIH. |
| 20/01/2002 | 1,517.00 | 14:30 | 14:45 | 0.25 | INTER1 | WHEAD | TRIP | (278d) Landed SART w/ 10T down. |
| 20/01/2002 | 1,517.00 | 14:45 | 15:15 | 0.5 | INTER1 | WHEAD | BOPT | (278d) Attempted to test BOP, no-go: Closed MPR and attempted to pressure up with cement unit, leaked off @ 200 psi (300 ltrs). Closed fail safe valves and pressured up to 345 bar to confirm intefrity of surface/BOP lines - OK. Opened MPR and closed upper annular. Attempted to pressure up, leaked off @ 200 psi (400 ltrs). No returns observed back to surface during testing, indicating possible leak through seal assembly. |
| 20/01/2002 | 1,517.00 | 15:15 | 17:00 | 1.75 | INTER1 | WHEAD | WAIT | (278d) Held conference call with BP office onshore. |
| 20/01/2002 | 1,517.00 | 17:00 | 17:15 | 0.25 | INTER1 | WHEAD | TRIP | (278d) Pulled SART free w/ 15T overpull. Pulled WB above BOP and pumped slug. |
| 20/01/2002 | 1,510.00 | 17:15 | 20:15 | 3 | INTER1 | WHEAD | TRIP | (278d) POOH w/ SART. |
| 20/01/2002 | 0 | 20:15 | 21:00 | 0.75 | INTER1 | WHEAD | TRIP | (278d) L/D SART tool. Impression from LPR showed landing of SART tool 0.13 m high. P/U and M/U BOP test tool. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 20/01/2002 | 0 | 21:00 | 22:00 | 1 | INTER1 | WHEAD | WAIT | (278d) Yellow alert due to rig movement 19 m off position. Prepared to displace riser to seawater. Standby. |
| 20/01/2002 | 0 | 22:00 | 00:00 | 2 | INTER1 | WHEAD | TRIP | (278d) Rig back in position - advisory mode. RIH with BOP test tool to 900 m at midnight. |
| 21/01/2002 | 0 | 00:00 | 01:00 | 1 | INTER1 | WHEAD | TRIP | (278f) Continued RIH with BOP test tool. |
| 21/01/2002 | 0 | 01:00 | 04:30 | 3.5 | INTER1 | WHEAD | BOPT | (278f) Landed test plug in BOP and sat down 10mt. P/U to neutral wt and sat down 10mt, increased to 15mt. Pumped through lines to verify valves open - OK. Closed MPR and pressure tested to 500psi/ 5min with cement pump - OK. Continued to pressure up to 2500psi/2min - OK. Continued to pressure up to 5000psi/10min - OK. Opened MPR and closed Upper Annular (UA). Pressure tested UA from below to 500psi/5min and 5000psi/ 10min - OK. Continued testing BOP to 500/5000 psi - OK. |
| 21/01/2002 | 0 | 04:30 | 07:30 | 3 | INTER1 | WHEAD | TRIP | (278f) Pulled test tool free and pumped slug. POOH w/ BOP test tool. |
| 21/01/2002 | 0 | 07:30 | 08:00 | 0.5 | INTER1 | WHEAD | TRIP | (278f) L/D BOP test tool. |
| 21/01/2002 | 0 | 08:00 | 09:00 | 1 | INTER1 | WHEAD | TRIP | (278g) P/U multi Purpose Tool, M/U same and RIH to recover seal assy. RIH to 670m. |
| 21/01/2002 | 0 | 09:00 | 11:00 | 2 | INTER1 | WHEAD | WAIT | (278g) Conference call with BP onshore to assess situation. |
| 21/01/2002 | 0 | 11:00 | 11:30 | 0.5 | INTER1 | WHEAD | TRIP | (278g) Continued RIH to 1374m. |
| 21/01/2002 | 0 | 11:30 | 12:00 | 0.5 | INTER1 | WHEAD | RIGR | (278g) Repaired Extension/ Retraction on topdrive. |
| 21/01/2002 | 0 | 12:00 | 12:30 | 0.5 | INTER1 | WHEAD | TRIP | (278g) Continued RIH from 1374m to top of BOP. |
| 21/01/2002 | 0 | 12:30 | 12:45 | 0.25 | INTER1 | WHEAD | TRIP | (278g) Washed down from top of BOP and down. Sat down 10mt and latched RT onto seal assy. |
| 21/01/2002 | 0 | 12:45 | 13:15 | 0.5 | INTER1 | WHEAD | WAIT | (278g) Conference call with BP onshore to assess situation. |
| 21/01/2002 | 0 | 13:15 | 14:00 | 0.75 | INTER1 | WHEAD | TRIP | (278g) Closed upper annular. Pulled up with 8mt overpull. Had 1000psi on upper annular. Monitored pressure over choke for 10min - OK. Opened bag and pulled above BOP. Pumped slug. |
| 21/01/2002 | 0 | 14:00 | 14:30 | 0.5 | INTER1 | WHEAD | TRIP | (278g) POOH to 1410m. |
| 21/01/2002 | 0 | 14:30 | 14:45 | 0.25 | INTER1 | WHEAD | RIGR | (278g) Experienced problems with the retraction on the topddrive. |
| 21/01/2002 | 0 | 14:45 | 17:45 | 3 | INTER1 | WHEAD | TRIP | (278g) Continued POOH from 1410m with block in extended position. |
| 21/01/2002 | 0 | 17:45 | 19:00 | 1.25 | INTER1 | WHEAD | TRIP | (278g) L/D seal assy and seal assy RT. Found major washout on rubber seal and metal to metal seal on the seal assembly. Prepare and dress tool for mill and flush run. |
| 21/01/2002 | 0 | 19:00 | 20:00 | 1 | INTER1 | WHEAD | RIGR | (278h) Replace broken el-cable on TDS re-track system. |
| 21/01/2002 | 0 | 20:00 | 21:30 | 1.5 | INTER1 | WHEAD | WAIT | (278h) Conference call with BP onshore to assess situation. |
| 21/01/2002 | 0 | 21:30 | 00:00 | 2.5 | INTER1 | WHEAD | TRIP | (278h) P/U and M/U mill and flush tool and RIH to 1350 m (midnight depth). |
| 22/01/2002 | 0 | 00:00 | 00:30 | 0.5 | INTER1 | WHEAD | TRIP | (278j) Continued RIH with Mill and Flush tool. Checked free rotating torque: 2000 ft/lbs at 10rpm. |
| 22/01/2002 | 0 | 00:30 | 01:30 | 1 | INTER1 | WHEAD | TRIP | (278j) Started pumping w/ 2500lpm and sat down 3mt at casing hanger. Dressed off seal area, rotated w/ 10rpm/3 kftlbs. Stopped circ and rotation. Closed LMR to mark pipe for depth correlation. Open MPR. Washed wellhead at 2500l/min. Pumped slug. |
| 22/01/2002 | 0 | 01:30 | 04:30 | 3 | INTER1 | WHEAD | TRIP | (278j) POOH while boosting riser to avoid debris in SA area. L/D mill and flush tool. Impression from MPR showed landing of mill and flush tool 0.12 m high compared to planned hanger depth. Nylon tell tale missing and mill worn, indicating correct working depth. |
| 22/01/2002 | 0 | 04:30 | 06:45 | 2.25 | INTER1 | WHEAD | RIGS | Held pre-job safety meeting. Slip and cut drill line. |
| 22/01/2002 | 0 | 06:45 | 07:15 | 0.5 | INTER1 | WHEAD | TRIP | (278l) M/U SART. |
| 22/01/2002 | 0 | 07:15 | 09:45 | 2.5 | INTER1 | WHEAD | TRIP | (278l) RIH w/ SART on 6 5/8" DP to set SA. |
| 22/01/2002 | 0 | 09:45 | 10:00 | 0.25 | INTER1 | WHEAD | TRIP | (278l) Landed and latched seal assy with 10mt downwt. |
| 22/01/2002 | 0 | 10:00 | 10:45 | 0.75 | INTER1 | WHEAD | TRIP | (278l) Closed MPR and sat SA according with 5000 psi according to Dril Quip procedures. Pressure tested SA to 3500 psi/10 min - OK. Pulled free from seal assy with 30mt over-pull. Re-landed SART and re-tested SA to 2500 psi/2 min to verify SA integrity - OK. |
| 22/01/2002 | 0 | 10:45 | 11:00 | 0.25 | INTER1 | WHEAD | TRIP | (278l) Pulled above BOP and pumped slug. |
| 22/01/2002 | 0 | 11:00 | 13:45 | 2.75 | INTER1 | WHEAD | TRIP | (278l) POOH and L/D SART. Mean while attempted to pressure test 13 3/8" casing with cement unit. Observed linear pressure profile up to 210 bar(3045psi), then pressure suddenly dropped to 54 bar and stabilized at 47,5 bar (650psi) after 5 min. Pumped/bled off 700/140 ltrs. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 22/01/2002 | 0 | 13:45 | 16:15 | 2.5 | INTER1 | WHEAD | TRIP | (278m) M/U wear bushing on MPT. Re-painted single DP above MPT white. RIH with WB on 6 5/8" DP. Rig in advisory mode from 12:50 to 14:10. |
| 22/01/2002 | 0 | 16:15 | 16:45 | 0.5 | INTER1 | WHEAD | TRIP | (278m) Landed WB with 10mt down weight. Closed MPR for depth correlation. Opened pipe ram and pulled free w/ 15T overpull. |
| 22/01/2002 | 0 | 16:45 | 17:00 | 0.25 | INTER1 | WHEAD | TRIP | (278m) Pulled above BOP. Greased and checked TDS while pumping slug. |
| 22/01/2002 | 0 | 17:00 | 19:45 | 2.75 | INTER1 | WHEAD | TRIP | (278m) POOH. Performed kick drill with crew during trip. Changed inserts in BX elevator and L/D MPT. Impression from MPR showed landing of WB 0.13 m high compared to planned hanger depth. |
| 22/01/2002 | 0 | 19:45 | 20:00 | 0.25 | INTER1 | WHEAD | TRIP | (278m) Cleared rigfloor. |
| 22/01/2002 | 0 | 20:00 | 21:30 | 1.5 | INTER1 | CASE | BHA | (278n) Prepared and M/U 12 1/4" clean-out assy. |
| 22/01/2002 | 0 | 21:30 | 22:00 | 0.5 | INTER1 | CASE | RIGS | (278n) Greased and checked travelling assembly. |
| 22/01/2002 | 0 | 22:00 | 22:30 | 0.5 | INTER1 | CASE | RIGR | (278n) Repaired BX-elevator |
| 22/01/2002 | 0 | 22:30 | 23:00 | 0.5 | INTER1 | CASE | BHA | (278n) Continued M/U BHA: 12 1/4" bit (B22JG850), bit sub w/solid float, 6X8" DC, X/O, 6X5" HWDP, jar, 9X5"HWDP, dart sub, X/O. |
| 22/01/2002 | 0 | 23:00 | 00:00 | 1 | INTER1 | CASE | TRIP | (278n) Changed to 6 5/8" equipment, RIH on 6 5/8" DP to 340 m (midnight depth) |
| 23/01/2002 | 0 | 00:00 | 01:15 | 1.25 | INTER1 | CASE | TRIP | (278n) Continued RIH with cleanout assy from 340m. Filled pipe at 940m. |
| 23/01/2002 | 0 | 01:15 | 01:30 | 0.25 | INTER1 | CASE | TRIP | (278n) Replaced damaged slips. |
| 23/01/2002 | 0 | 01:30 | 03:00 | 1.5 | INTER1 | CASE | TRIP | (278n) Continued RIH to top of BOP. |
| 23/01/2002 | 0 | 03:00 | 13:45 | 10.75 | INTER1 | CASE | REAM | (278n) Filled pipe at BOP and washed down. Took slight weight at 1528m (observed by pipe movement with open compensator). Started pumps and rotation when DC through BOP. Reamed down pumping at 3000lpm/ 50bar, 60 rpm/3-4 kft-lbs, down to 1734m while boosting riser with 880 lpm. In advisory mode from 09:50 to 10:45. |
| 23/01/2002 | 0 | 13:45 | 15:00 | 1.25 | INTER1 | CASE | REAM | (278n) Tagged minor obstruction at 2363m. Continued to wash and ream to float collar at 2416 m. |
| 23/01/2002 | 0 | 15:00 | 20:00 | 5 | INTER1 | CASE | CIRC | (278n) Pumped 15m3 hi-vis pill. Displaced with 1.24 sg mud. 2000lpm/600 psi. Circulated totally 1.8 x BU while reciprocating and rotating pipe down to float collar. Only minor amount of cement and rubber over shakers from pill and circulation overall. |
| 23/01/2002 | 0 | 20:00 | 21:00 | 1 | INTER1 | CASE | TRIP | (278n) Pumped slug and POOH to BOP. |
| 23/01/2002 | 0 | 21:00 | 00:00 | 3 | INTER1 | CASE | TRIP | (278n) Flowchecked for 15 min. with BHA below BOP. Negative - no flow. |
| 24/01/2002 | 0 | 00:00 | 01:30 | 1.5 | INTER1 | CASE | BHA | (278n) Changed inserts in BX elevator and continued to POOH. Racked back BHA. Checked bit and nozzles. Bit grading: 1-1-WT-G-3-I-NO-BHA. |
| 24/01/2002 | 0 | 01:30 | 02:30 | 1 | INTER1 | CASE | BHA | (278o) M/U and started RIH with casing scraper assy consisting of: 12 1/4" bit, bit sub w/ float, 1x8" DC, 13 3/8" Csg scraper, 5x8" DC, x/o, 6x5" HWDP, Jar, 9x5" HWDP, dart sub, XO, 6 5/8" DP to surface. |
| 24/01/2002 | 0 | 02:30 | 05:00 | 2.5 | INTER1 | CASE | TRIP | (278o) RIH w/ 6 5/8" DP to 1512m. |
| 24/01/2002 | 0 | 05:00 | 05:15 | 0.25 | INTER1 | CASE | TRIP | (278o) Took weight at 1512m. Turned pipe 1/2 turn and gently went through BOP/WH - OK. |
| 24/01/2002 | 0 | 05:15 | 09:45 | 4.5 | INTER1 | CASE | TRIP | (278o) Continued to RIH with the casing scraper. Tagged at 2416 m. Reciprocate string and work scrape between 2404 m and 2375 m. |
| 24/01/2002 | 0 | 09:45 | 10:15 | 0.5 | INTER1 | CASE | TRIP | (278o) Racked back 2 stands, scraped interval from 2330-2359 m. |
| 24/01/2002 | 0 | 10:15 | 11:00 | 0.75 | INTER1 | CASE | FCHK | (278o) Flow checked well prior to POOH. Well static. In advisory mode from 09:50 to 10:45 due to control system error message. |
| 24/01/2002 | 0 | 11:00 | 17:00 | 6 | INTER1 | CASE | TRIP | (278o) Pumped slug and POOH from 2372m. Flow checked hole prior to pulling BHA through the BOP - well static. Continued POOH. L/D BHA. Casing scraper in good condition Bit: 1-1-WT-G-3-I-NO-BHA. |
| 24/01/2002 | 0 | 17:00 | 19:00 | 2 | INTER1 | CASE | TRIP | (278p) P/U and M/U 13 3/8" RTTS packer assy. |
| 24/01/2002 | 0 | 19:00 | 21:15 | 2.25 | INTER1 | CASE | BHA | (278p) Rearranged 5" HWDP in derrick. Drifted 45 std 5" DP to 2,5". Prepared 5" pipe handling equipment. M/U dart sub. |
| 24/01/2002 | 0 | 21:15 | 00:00 | 2.75 | INTER1 | CASE | TRIP | (278p) RIH w/ RTTS packer on 5" DP to 890m. |
| 25/01/2002 | 0 | 00:00 | 04:30 | 4.5 | INTER1 | CASE | TRIP | (278p) Continued to RIH to 1290 m. Changed to 6 5/8" handling equipment and continued to RIH to 2395 m. In advisory mode from 04:10 to 05:00 due to wind above 40 knots. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 25/01/2002 | 0 | 04:30 | 05:00 | 0.5 | INTER1 | CASE | PRST | (278p) Recorded weights, 110 mt up wt and 119 mt down wt. Spaced out and closed upper annular preventer. Confirmed space out. Sat RTTS at 2390 m with 22 mt downweight and 1 turn. |
| 25/01/2002 | 0 | 05:00 | 07:15 | 2.25 | INTER1 | CASE | WAIT | (278q) Aborted pressure testing due to Yellow alert status caused by power consumption for station keeping above 65%. Released RTTS. Pumped slug and POOH to 1436 m. |
| 25/01/2002 | 0 | 07:15 | 09:30 | 2.25 | INTER1 | CASE | WAIT | (278q) Closed lower and upper shear ram and displaced riser to seawater rig columns at 4250 lpm. Prepared for disconnect. Deballasted rig to survival draught. Power consumption on thrusters up to 100% in short intervals. |
| 25/01/2002 | 0 | 09:30 | 15:00 | 5.5 | INTER1 | CASE | WAIT | (278r) WOW. Peaked up to hurricane, 32.7 m/s |
| 25/01/2002 | 0 | 15:00 | 17:30 | 2.5 | INTER1 | CASE | WAIT | (278s) Displaced riser back to 1.24 sg mud. Ballasted rig to operational draught. |
| 25/01/2002 | 0 | 17:30 | 18:00 | 0.5 | INTER1 | CASE | WAIT | (278t) Opened failsafe on kill line and check for pressure. Negative - no pressure. Opened both shear rams. Flow check for 30 min, well static. Yellow alert status changed to advisory status at 17:40. |
| 25/01/2002 | 0 | 18:00 | 18:15 | 0.25 | INTER1 | CASE | WAIT | (278t) Toolbox meeting between drill crew/BP/Halliburton. |
| 25/01/2002 | 0 | 18:15 | 19:00 | 0.75 | INTER1 | CASE | WAIT | (278u) RIH with RTTS from 1436 m to 1572 m. |
| 25/01/2002 | 0 | 19:00 | 19:30 | 0.5 | INTER1 | CASE | WAIT | (278u) Spaced out and close upper annular. Confirmed correct space out. Set RTTS at 1570 m |
| 25/01/2002 | 0 | 19:30 | 21:00 | 1.5 | INTER1 | CASE | PRST | (278u) Successfully pressured tested seal assembly to 4100 psi/10 min down kill line with cement pump. Confirmed consistent volume 180 litres in/out. Successfully pressure tested casing below RTTS to 4100 psi/15 min. Confirmed consistent volume of 9 bbls in/out. |
| 25/01/2002 | 0 | 21:00 | 21:45 | 0.75 | INTER1 | CASE | PRST | (278u) Closed upper annular, and pressured up to release RTTS. Pull string in neutral wt. Opened annular and pulled RTTS free with 15 mt . Verified released RTTS and pumped slug. |
| 25/01/2002 | 0 | 21:45 | 00:00 | 2.25 | INTER1 | CASE | TRIP | (278u) POOH with 6 5/8" DP. Changed to 5" handling eq. Continued to POOH to 1061 m midnight depth. |
| 26/01/2002 | 0 | 00:00 | 02:00 | 2 | INTER1 | CASE | TRIP | (278u) Continued to POOH with RTTS. |
| 26/01/2002 | 0 | 02:00 | 03:45 | 1.75 | INTER1 | CASE | BHA | (278u) L/D RTTS assembly. Started boosting riser |
| 26/01/2002 | 0 | 03:45 | 04:45 | 1 | INTER1 | CASE | BHA | (279a) P/U and prepared wear bushing R/T and changed to 6 5/8" DP handling equipment |
| 26/01/2002 | 0 | 04:45 | 05:15 | 0.5 | INTER1 | CASE | RIGR | (279a) Inspected block - changed out two safety wires on bolts that were broken. |
| 26/01/2002 | 0 | 05:15 | 08:15 | 3 | INTER1 | CASE | TRIP | (279a) RIH with wear bushing R/T on 6 5/8" DP. |
| 26/01/2002 | 0 | 08:15 | 08:30 | 0.25 | INTER1 | CASE | MISC | (279a) Washed wellhead area. |
| 26/01/2002 | 0 | 08:30 | 09:00 | 0.5 | INTER1 | CASE | CSG | (279a) Landed and latched on to wear bushing with 10 t downweight. Performed 10 t overpull, went back to neutral weight and closed middle piperam. Opened piperam and pulled wearbushing with 35 t overpull. Pulled up with wearbusing to above BOP and pumped slug. |
| 26/01/2002 | 0 | 09:00 | 11:15 | 2.25 | INTER1 | CASE | TRIP | (279a) POOH with wear bushing and multi purpose tool. L/D same. Wear bushing was polished on port-aft side. |
| 26/01/2002 | 0 | 11:15 | 14:00 | 2.75 | INTER1 | CASE | BHA | (279b) P/U and M/U lead impression tool. Tested tool at 300 psi on surface. Installed lead impression blocks and RIH to 1221 m. |
| 26/01/2002 | 0 | 14:00 | 14:15 | 0.25 | INTER1 | CASE | RIGR | (279b) Changed electronic card in block saver computer system. |
| 26/01/2002 | 0 | 14:15 | 15:00 | 0.75 | INTER1 | CASE | TRIP | (279b) Continued to RIH from 1221 m with lead impression block. |
| 26/01/2002 | 0 | 15:00 | 16:00 | 1 | INTER1 | CASE | MISC | (279b) Tagged on lower shear ram, opened same and landed lead impression tool on casing hanger with 10 t downweight. Pumped up pressure to 2500 psi to activate pistons holding the lead impression blocks. Held pressure for two minutes. Closed middle piperam to get impression on DP for extra depth reference. |
| 26/01/2002 | 0 | 16:00 | 18:30 | 2.5 | INTER1 | CASE | TRIP | (279b) Opened ram and pumped slug. Wait 5 min and POOH with Lead Impression Tool. Inspected same. |
| 26/01/2002 | 0 | 18:30 | 22:30 | 4 | INTER1 | CASE | WAIT | (279b) Inspected lead impressions on tool. Calculations showed hanger 0.158 m high, indicating limited seal area on seal assembly. Assessed situation with BP onshore. Removed coating in crown, tidied rig floor, inspected travelling block. Held kick drill with crew. |
| 26/01/2002 | 0 | 22:30 | 23:00 | 0.5 | INTER1 | CASE | TRIP | (279c) M/U and prepared SART for retrieving seal assy. |
| 26/01/2002 | 0 | 23:00 | 00:00 | 1 | INTER1 | CASE | TRIP | (279c) RIH with SART. At 650 m midnight depth. |
| 27/01/2002 | 0 | 00:00 | 01:00 | 1 | INTER1 | CASE | TRIP | (279c)Continued to RIH with SART from 650 m to 1492 m. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 27/01/2002 | 0 | 01:00 | 01:30 | 0.5 | INTER1 | CASE | TRIP | (279c) P/U one single DP and connected same to last stand. |
| 27/01/2002 | 0 | 01:30 | 02:15 | 0.75 | INTER1 | CASE | MISC | (279c) Closed upper annular and performed drag test. Opened upper annular, washed wellhead seal assembly area with 3500 lpm/300 psi. Sat down seal assembly RT with 2 t and closed lower annular with 1200 psi. Opened kill side against choke and pulled seal assembly free with 2-3 t o-pull. Flow checked over choke line to trip tank - no flow. |
| 27/01/2002 | 0 | 02:15 | 03:00 | 0.75 | INTER1 | CASE | FCHK | (279c) Opened annular and flow checked riser - well static. |
| 27/01/2002 | 0 | 03:00 | 03:30 | 0.5 | INTER1 | CASE | MISC | (279c) Washed wellhead with 3500 lpm/300 psi. Pumped slug. |
| 27/01/2002 | 0 | 03:30 | 06:00 | 2.5 | INTER1 | CASE | TRIP | (279c) POOH and boost riser with 1780 lpm. |
| 27/01/2002 | 0 | 06:00 | 06:15 | 0.25 | INTER1 | CASE | INSP | (279c) Washed and inspected seal assembly. L/D same. |
| 27/01/2002 | 0 | 06:15 | 06:30 | 0.25 | INTER1 | CASE | CLNR | (279c) Cleaned rig floor. |
| 27/01/2002 | 0 | 06:30 | 07:45 | 1.25 | INTER1 | CASE | BHA | (279d) Prepared and M/U piggy-back hanger with cup tester. |
| 27/01/2002 | 0 | 07:45 | 10:00 | 2.25 | INTER1 | CASE | TRIP | (279d) RIH with piggy-back hanger on 6 5/8" DP. Checked torque on every DP joint while RIH due to left turns when setting hanger. Observed slight loss in trip tank @ 1122 m. |
| 27/01/2002 | 0 | 10:00 | 10:45 | 0.75 | INTER1 | CASE | FCHK | (279d) Observed well static due to loss in trip tank - OK. Pumped and performed 15 minute flow check - OK. |
| 27/01/2002 | 0 | 10:45 | 11:45 | 1 | INTER1 | CASE | TRIP | (279d) Continued to RIH from 1122 m and down to above BOP. |
| 27/01/2002 | 0 | 11:45 | 12:45 | 1 | INTER1 | CASE | CSG | (279d) Monitored free rotating torque @ 3000 ft/lbs. Landed piggy-back hanger with cup tester according to Dril-Quip procedure. |
| 27/01/2002 | 0 | 12:45 | 14:00 | 1.25 | INTER1 | CASE | PRST | (279d) Pumped down DP for 5000 psi pressure test against cup tester and RT to verify that seal on piggy-back hanger are fully engaged - failed. Rotated the piggy-back hanger a few additional turns and made a new attempt to pressure up to 5000 psi - OK. Held pressure for 15 minutes. Pulled with 33 t o-pull to retrieve RT. |
| 27/01/2002 | 0 | 14:00 | 17:30 | 3.5 | INTER1 | CASE | TRIP | (279d) Pulled up to above BOP and pumped slug. POOH with RT and L/D same. Cleaned rig floor |
| 27/01/2002 | 0 | 17:30 | 18:30 | 1 | INTER1 | CASE | BHA | (279e) P/U and M/U SART and rack back in derrick. Installed seal assembly. |
| 27/01/2002 | 0 | 18:30 | 18:45 | 0.25 | INTER1 | CASE | RIGS | (279e) Greased and inspected block assembly. |
| 27/01/2002 | 0 | 18:45 | 22:15 | 3.5 | INTER1 | CASE | TRIP | (279e) RIH with seal assembly to setting depth. Performed kick drill with crew. |
| 27/01/2002 | 0 | 22:15 | 22:30 | 0.25 | INTER1 | CASE | TRIP | (279e) Landed seal assembly and sat down 12 t. Landed at 1516.7m. Lined up to pressure up with cement unit. |
| 27/01/2002 | 0 | 22:30 | 23:00 | 0.5 | INTER1 | CASE | PRST | (279e) Flushed kill line and closed MPR. Pressured up to 3000 psi/5 min - OK. Continued to pressure up to 5000 psi/15 min - OK. Pumped totally 98 litres, bled back 98 litres - OK. |
| 27/01/2002 | 0 | 23:00 | 23:15 | 0.25 | INTER1 | CASE | PRST | (279e) Opened MPR, released SART with 27 t o-pull as per plan. Re-land running tool with 12 t and closed MPR. |
| 27/01/2002 | 0 | 23:15 | 23:30 | 0.25 | INTER1 | CASE | PRST | (279e) Repeated pressure test to 5000 psi/15 min for confirmation - OK. Pumped 108 l, bled back 108 l - OK. |
| 27/01/2002 | 0 | 23:30 | 00:00 | 0.5 | INTER1 | CASE | TRIP | (279e) Opened MPR. POOH with SART. No o-pull. Pumped slug. |
| 28/01/2002 | 0 | 00:00 | 02:00 | 2 | INTER1 | CASE | TRIP | (279e) Continued to POOH with Seal Assembly Running Tool. |
| 28/01/2002 | 0 | 02:00 | 02:30 | 0.5 | INTER1 | CASE | BHA | (279e) L/D SART and changed to 5" DP equipment. Racked back HWDP. |
| 28/01/2002 | 0 | 02:30 | 03:00 | 0.5 | INTER1 | CASE | RIGS | (279f) Greased and inspected travelling assembly. Changed to 6 5/8" DP handling equipment. |
| 28/01/2002 | 0 | 03:00 | 03:30 | 0.5 | INTER1 | CASE | BHA | (279f) M/U MPT to modified wear bushing. |
| 28/01/2002 | 0 | 03:30 | 05:30 | 2 | INTER1 | CASE | CSG | (279f) RIH with modified wear bushing to set same. |
| 28/01/2002 | 0 | 05:30 | 06:00 | 0.5 | INTER1 | CASE | CSG | (279f) Landed wear bushing and sat same with 10 t downweight. Lined up cement unit. Closed MPR, applied 3200 psi/46 liters for 5 minutes against cup tester to confirm integrity and to assist proper seating - OK. |
| 28/01/2002 | 0 | 06:00 | 06:15 | 0.25 | INTER1 | CASE | CSG | (279f) Open MPR and pull free from wear bushing with 12 t overpull. |
| 28/01/2002 | 0 | 06:15 | 06:30 | 0.25 | INTER1 | CASE | CSG | (279f) Pulled out to above BOP and pumped slug. |
| 28/01/2002 | 0 | 06:30 | 08:45 | 2.25 | INTER1 | CASE | CSG | (279f) POOH with wear bushing running tool. |
| 28/01/2002 | 0 | 08:45 | 09:30 | 0.75 | INTER1 | CASE | BHA | (279f) Changed insert on BX elevator and L/D RT and 5" single. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 28/01/2002 | 0 | 09:30 | 11:30 | 2 | INTER1 | CASE | PRST | (279f) Pressure tested kelly hose and manual and remote operated IBOPs on TDS to 500 psi/ 5 min and 5000 psi / 10 min - OK. |
| 28/01/2002 | 0 | 11:30 | 14:30 | 3 | INTER1 | DRILL | BHA | (281) P/U and M/U 12 1/4" BHA assembly and RIH with same. |
| 28/01/2002 | 0 | 14:30 | 15:00 | 0.5 | INTER1 | DRILL | RIGR | (281) Repaired finger board - aft collar rack. |
| 28/01/2002 | 0 | 15:00 | 16:30 | 1.5 | INTER1 | DRILL | BHA | (281) Continued to MU 12 1/4" BHA and RIH to 250 meter with same. |
| 28/01/2002 | 0 | 16:30 | 17:30 | 1 | INTER1 | DRILL | TRIP | (284) Changed to 5" DP equipment on auto slips and RIH to 485 meters. |
| 28/01/2002 | 0 | 17:30 | 18:00 | 0.5 | INTER1 | DRILL | SAFE | (286) Held pre-job meeting with drill crew to go through the 12 1/4" hole drilling procedures, well control issues and DP emergency plans. |
| 28/01/2002 | 0 | 18:00 | 18:15 | 0.25 | INTER1 | DRILL | TRIP | (286) Continued to RIH to 536 m. |
| 28/01/2002 | 0 | 18:15 | 19:15 | 1 | INTER1 | DRILL | TRIP | (286) Changed to 6 5/8" DP equipment. Held pre job meeting with drill crew prior to displacing to Aqudrall Deepwater mud. |
| 28/01/2002 | 0 | 19:15 | 20:15 | 1 | INTER1 | DRILL | TRIP | (286) Continued to RIH to 1020 m. |
| 28/01/2002 | 0 | 20:15 | 20:45 | 0.5 | INTER1 | DRILL | CIRC | (286) Filled string and tested MWD. |
| 28/01/2002 | 0 | 20:45 | 23:30 | 2.75 | INTER1 | DRILL | TRIP | (286) Continued to RIH to 2401 m. Performed kick while trip drill - D1. |
| 28/01/2002 | 0 | 23:30 | 00:00 | 0.5 | INTER1 | DRILL | CIRC | (287) Performed well kill drill D5 with tool joint landed on MPR. |
| 29/01/2002 | 0 | 00:00 | 00:15 | 0.25 | INTER1 | DRILL | CIRC | (287) Complete well kick drill D5 with tool joint landed on MPR. |
| 29/01/2002 | 0 | 00:15 | 01:15 | 1 | INTER1 | DRILL | CIRC | (289) Perform SCR's @ 2402m / 1,25 SG mud up kill line and riser w/ pump 1&2. |
| 29/01/2002 | 0 | 01:15 | 01:45 | 0.5 | INTER1 | DRILL | TRIP | (290) RIH, tag float collar @ 2416 m. |
| 29/01/2002 | 0 | 01:45 | 03:45 | 2 | INTER1 | DRILL | CMTD | (290) Drill float collar; 80 RPM, 5 - 15k ft-lbs, 3000lpm / 2000 psi. Break through and tag cmt at 2427m w/13k-lbs WOB. **Rig in advisory status from 01:55** |
| 29/01/2002 | 0 | 03:45 | 05:15 | 1.5 | INTER1 | DRILL | CIRC | (294) Dump KCl mud and clean mud pits in preparation for the Aquadrill deep water mud. Transfer Aquadrill mud into active system. Displace kill-, choke-, and booster line to Aquadrill mud at 1.25SG. |
| 29/01/2002 | 0 | 05:15 | 05:30 | 0.25 | INTER1 | DRILL | CMTD | (290) Cont. to drill cement f/ 2427 - 2443m. Meanwhile displace well to Aquadrill mud. |
| 29/01/2002 | 0 | 05:30 | 07:15 | 1.75 | INTER1 | DRILL | DSPL | (294) Complete displacing well to 1.25 SG Aquadrill deep water mud. **Rig back into green status at 06:45** |
| 29/01/2002 | 0 | 07:15 | 08:15 | 1 | INTER1 | DRILL | DSPL | (294) Verify surface pit volumes, line up returns across shale shakers and fill shaker pits. |
| 29/01/2002 | 0 | 08:15 | 09:15 | 1 | INTER1 | DRILL | CMTD | (291) Ream out remaining part of the shoe track, drill through casing shoe and clean rat hole to 2449m. Shoe at 2443m, no firm cement encountered in the shoe track. |
| 29/01/2002 | 2,449.00 | 09:15 | 09:45 | 0.5 | INTER1 | DRILL | DRL | (291) Drill 3m of new formation to 2452m. |
| 29/01/2002 | 2,452.00 | 09:45 | 11:45 | 2 | INTER1 | DRILL | CIRC | (292) Circ and cond mud with 3520 l/min / 2300 psi / 40 rpm. |
| 29/01/2002 | 2,452.00 | 11:45 | 13:30 | 1.75 | INTER1 | EVAL | LKOF | (293) Pull back into casing shoe. Pressure test kill line against upper inner kill valve and iBOP to 3000 psi with cement unit - OK. Perform leak off test with 1.25 SG mud by pumping down drill string and kill line. Leak off calculated to 1.38 SG EMW w/33 Bar surface pressure. Repeat leak off test with the same result. |
| 29/01/2002 | 2,449.00 | 13:30 | 16:45 | 3.25 | INTER2 | DRILL | DRL | (296) Cont to drill and survey 12 1/4" hole f/2452 - 2496 m. 2 - 5T WOB, 113 RPM, 3500 lpm, 2400 PSI. Observe increase in torque / reduction of RPM @ 2489 m. |
| 29/01/2002 | 2,496.00 | 16:45 | 17:00 | 0.25 | INTER2 | DRILL | MISC | (296) Evaluated RAB resolution tools. |
| 29/01/2002 | 2,496.00 | 17:00 | 00:00 | 7 | INTER2 | DRILL | DRL | (296, 296a) Cont to drill and survey f/2496 - 2563m 2 - 5T WOB, 113 - 131 RPM, 3500 lpm, 2430 PSI. Bit to sensor offsets:- Bit - RBIT = 0.28m Bit - GR = 1.15m Bit - RES = 5.55m Bit - APRS= 6.08m Bit - Ga = 8.90m Bit - D&I = 16.21m |
| 30/01/2002 | 2,656.00 | 00:00 | 10:45 | 10.75 | INTER2 | DRILL | DRL | (345, 345a) Drill and survey 12 1/4" hole from 2563 - 2730 m. Displace kill / choke line with 7 m3 each at 06:30 hrs. Take SCR's at 08:30 hrs @ 2700 m with 1.27 SG mud up riser. |
| 30/01/2002 | 2,730.00 | 10:45 | 13:15 | 2.5 | INTER2 | DRILL | RIGR | (345b) Repair two mud pumps. Mud pump 2:- Change liner on cylinder no.1 Change piston on cylinder no. 1 & 3 Change discharge v/v's on cylinder 1, 2, and 3. Change discharge v/v seat on cylinder no. 2 Change discharge v/v control pin on cylinder no. 1 & 2. Mud pump no. 3:- Change piston on cylinder no. 2 Clean suction strainer. Meanwhile circulate well and increase MW to 1.30 SG. |
| 30/01/2002 | 2,730.00 | 13:15 | 16:15 | 3 | INTER2 | DRILL | CIRC | (345b) Increase MW to 1.30 SG. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 30/01/2002 | 2,730.00 | 16:15 | 19:00 | 2.75 | INTER2 | DRILL | CIRC | (345c) Perform dummy connection at 2730m. CBU & check for connection gas - negative. |
| 30/01/2002 | 2,730.00 | 19:00 | 19:15 | 0.25 | INTER2 | DRILL | CIRC | (345e) Take SCR's. |
| 30/01/2002 | 2,730.00 | 19:15 | 19:45 | 0.5 | INTER2 | DRILL | FCHK | (345d) Flow check well - negative. |
| 30/01/2002 | 2,730.00 | 19:45 | 20:00 | 0.25 | INTER2 | DRILL | TRIP | (345f) Commence pumping OOH. |
| 30/01/2002 | 2,730.00 | 20:00 | 20:30 | 0.5 | INTER2 | DRILL | INSP | (345f) Remove drill line coating from top of travelling assy. |
| 30/01/2002 | 2,730.00 | 20:30 | 22:30 | 2 | INTER2 | DRILL | TRIP | (345f) Cont. pumping OOH to 2419m. Hole in an excellent condition. |
| 30/01/2002 | 2,730.00 | 22:30 | 22:45 | 0.25 | INTER2 | DRILL | FCHK | (345f) Flow check well - negative. |
| 30/01/2002 | 2,730.00 | 22:45 | 23:00 | 0.25 | INTER2 | WHEAD | BOPT | (345f) Function test BOP from drillers' panel - OK. |
| 30/01/2002 | 2,730.00 | 23:00 | 00:00 | 1 | INTER2 | DRILL | WAIT | (345f) Wait on w/line tools. Meanwhile perform general maintenance on drilling equipment; -Block saver system -Change oil on TDS gearbox. |
| 31/01/2002 | 2,730.00 | 00:00 | 08:30 | 8.5 | INTER2 | DRILL | WAIT | (345f) Continue to wait on wireline tools. Meanwhile perform general maintenance on drilling equipment - Block saver system - Brake system on block |
| 31/01/2002 | 2,730.00 | 08:30 | 09:30 | 1 | INTER2 | DRILL | TRIP | (345f) Commence RIH for wiper trip to 2470m. Change of plans. Pull back inside 13-3/8" casing shoe. |
| 31/01/2002 | 2,730.00 | 09:30 | 12:00 | 2.5 | INTER2 | DRILL | WAIT | (345f) Wait for order from town. Meantime perform general maintenance. |
| 31/01/2002 | 2,730.00 | 12:00 | 13:00 | 1 | INTER2 | EVAL | LKOF | (345f) MU test stand and prepare for open hole LOT. Circulate and condition mud with 3000 lpm / 2000 psi. |
| 31/01/2002 | 2,730.00 | 13:00 | 13:30 | 0.5 | INTER2 | EVAL | PRST | (345f) Line up and pressure test suface lines with cement unit to 1500 psi - OK. Space out string and close upper annular preventer. |
| 31/01/2002 | 2,730.00 | 13:30 | 13:45 | 0.25 | INTER2 | EVAL | LKOF | (345f) Perform LOT with bit at 2440m to 1.38 SG EMW. |
| 31/01/2002 | 2,730.00 | 13:45 | 14:00 | 0.25 | INTER2 | EVAL | LKOF | (345f) Open annular, break circ and transmit memory APWD-data to surface. |
| 31/01/2002 | 2,730.00 | 14:00 | 14:45 | 0.75 | INTER2 | DRILL | WAIT | (345f) Wait for orders from town. |
| 31/01/2002 | 2,730.00 | 14:45 | 16:15 | 1.5 | INTER2 | DRILL | TRIP | (345g) RIH from 2440 - 2710m Tight spot / ledge @ 2710m; stood up with 22k-lbs. Connect TDS, fill pipe and wash through - OK. |
| 31/01/2002 | 2,730.00 | 16:15 | 16:30 | 0.25 | INTER2 | DRILL | TRIP | (345g) Cont. TIH, tag bottom @ 2730m. |
| 31/01/2002 | 2,730.00 | 16:30 | 18:00 | 1.5 | INTER2 | DRILL | CIRC | (345h) CBU. Max gas recorded = 1.33%. |
| 31/01/2002 | 2,730.00 | 18:00 | 19:45 | 1.75 | INTER2 | DRILL | CIRC | (345h) Cont. circ whilst weighing up mud to 1.45 SG. Take open hole torque readings. |
| 31/01/2002 | 2,730.00 | 19:45 | 20:45 | 1 | INTER2 | DRILL | DSPL | (345i) Displace open hole and casing volume to 1.45 SG mud. |
| 31/01/2002 | 2,730.00 | 20:45 | 21:00 | 0.25 | INTER2 | DRILL | FCHK | (345i) Flow check well - negative. |
| 31/01/2002 | 2,730.00 | 21:00 | 22:00 | 1 | INTER2 | DRILL | TRIP | (345i) POOH dry to 13-3/8" casing shoe. Hole in good condition. |
| 31/01/2002 | 2,730.00 | 22:00 | 22:15 | 0.25 | INTER2 | DRILL | FCHK | (345i) Flow check well - negative. |
| 31/01/2002 | 2,730.00 | 22:15 | 22:30 | 0.25 | INTER2 | CASE | MISC | (345i) Take torque readings at 2443m. |
| 31/01/2002 | 2,730.00 | 22:30 | 23:30 | 1 | INTER2 | DRILL | TRIP | (345i) Cont. POH to BOP. |
| 31/01/2002 | 2,730.00 | 23:30 | 23:45 | 0.25 | INTER2 | DRILL | FCHK | (345i) Flow check well prior to pulling BHA through BOP's - negative. |
| 31/01/2002 | 2,730.00 | 23:45 | 00:00 | 0.25 | INTER2 | DRILL | TRIP | (345i) Cont. POH to 1705m. |
| 01/02/2002 | 2,730.00 | 00:00 | 01:15 | 1.25 | INTER2 | DRILL | TRIP | (345i) Continue POH to 588m. |
| 01/02/2002 | 2,730.00 | 01:15 | 02:15 | 1 | INTER2 | DRILL | TRIP | (345i) Change to 5" DP handling equipment. |
| 01/02/2002 | 2,730.00 | 02:15 | 03:00 | 0.75 | INTER2 | DRILL | TRIP | (345i) Continue POH 5" DP |
| 01/02/2002 | 2,730.00 | 03:00 | 05:00 | 2 | INTER2 | DRILL | BHA | (345i) Pull out and rack back BHA. L/D jar. |
| 01/02/2002 | 2,730.00 | 05:00 | 05:45 | 0.75 | INTER2 | DRILL | BHA | (345i) Lay out LWD / MWD. |
| 01/02/2002 | 2,730.00 | 05:45 | 06:00 | 0.25 | INTER2 | DRILL | SAFE | (345j) Safety meeting prior to rigging up Schlumberger logging equipment. |
| 01/02/2002 | 2,730.00 | 06:00 | 11:45 | 5.75 | INTER2 | EVAL | LOG | (345j,k) R/U Schlumerger wireline eq. Test and calibrate same. |
| 01/02/2002 | 2,730.00 | 11:45 | 18:45 | 7 | INTER2 | EVAL | LOG | (345l) Perform logging run no. 1A1; PEX-HRLA-EMS-DSI-SP. Meanwhile p/test choke manifold to 5000 psi. |
| 01/02/2002 | 2,730.00 | 18:45 | 21:00 | 2.25 | INTER2 | EVAL | LOG | (345m) RD Schlumberger wireline equipment. |
| 01/02/2002 | 2,730.00 | 21:00 | 22:00 | 1 | INTER2 | DRILL | RIGM | (345n) Change saver sub on TDS. Rig enters advisory condition at 21:16; wind 40 knots, gusting 45 knots. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 01/02/2002 | 2,730.00 | 22:00 | 23:15 | 1.25 | INTER2 | DRILL | BHA | (345n) MU wiper trip BHA. |
| 01/02/2002 | 2,730.00 | 23:15 | 00:00 | 0.75 | INTER2 | DRILL | TRIP | (345o) RIH on 5" HWDP. PU jar. |
| 02/02/2002 | 2,730.00 | 00:00 | 00:45 | 0.75 | INTER2 | DRILL | TRIP | (245o) Cont. RIH 5" HWDP. |
| 02/02/2002 | 2,730.00 | 00:45 | 01:30 | 0.75 | INTER2 | DRILL | TRIP | (245o) RIH 20 stands of 5" DP. |
| 02/02/2002 | 2,730.00 | 01:30 | 02:15 | 0.75 | INTER2 | DRILL | TRIP | (245o) MU Dril-Quip hang-off tool. Service break same - OK. |
| 02/02/2002 | 2,730.00 | 02:15 | 04:45 | 2.5 | INTER2 | DRILL | TRIP | (245o) Cont. RIH to 2317 m. CMC open when going through BOP with bit. |
| 02/02/2002 | 2,730.00 | 04:45 | 05:30 | 0.75 | INTER2 | DRILL | TRIP | (245o) MU TDS, open CMC and land off hang-off string in wellhead. Bit depth = 2334 m. Pull back string to above BOP. |
| 02/02/2002 | 2,730.00 | 05:30 | 06:15 | 0.75 | INTER2 | DRILL | DSPL | (245p) Prepare to displace riser to seawater. Transfer mud to column tanks. |
| 02/02/2002 | 2,730.00 | 06:15 | 08:00 | 1.75 | INTER2 | DRILL | DSPL | (245p) Displace riser to seawater with 3600 lpm @ 1700 psi. Close lower- and upper shear rams, activate wedge locks. |
| 02/02/2002 | 2,730.00 | 08:00 | 10:45 | 2.75 | INTER2 | DRILL | TRIP | (245p) POOH with hang-off landing string. |
| 02/02/2002 | 2,730.00 | 10:45 | 00:00 | 13.25 | INTER2 | DRILL | WAIT | (245q-s) WOW. Meanwhile perform general rig maintenance and work on block saver system. De-ballast rig to 22.5 m at 10:30 hrs. De-ballast rig to survival draft (21.5 m) at 11:20 hrs. Move rig 20m off well center at 12:35hrs. Activate EQD and disconnect riser / LMRP from BOP @ 12:40 hrs. due to severe weather and associated rig-heave; wind SSE 18 m/s, SWH 10.1m, Tp 18 sec. Max WH 16.0m, Max Tp 21 sec, Max Heave 9.26m. Meanwhile continue calibration of block saver and overhaul iron roughneck |
| 03/02/2002 | 2,730.00 | 00:00 | 12:00 | 12 | INTER2 | DRILL | WAIT | (345s) WOW. Meanwhile perform general rig maintenance; El. work on SCR B&C for drawwork P/test v/v on cmt standpipe to 5000 PSI - OK. Change burst disc on rucker 8B. Cont. work on block saver. O/haul spinner on Iron roughneck |
| 03/02/2002 | 2,730.00 | 12:00 | 00:00 | 12 | INTER2 | DRILL | WAIT | (345s) WOW. Ballast rig to operations draft (23.5m) f/21:45 to 22:15. Cont. general rig maintenance; Slip and cut drill line Complete work on iron roughneck Inspect and grease TDS and CMC Inspect drill line spooler - OK. Test choke manifold v/v #26 to 500/5000 psi - OK. Check chains on drawwork. Additional maintenance done to mud pumps (cf. report no. 78):- All suction strainers have been cleaned. All dampeners (suction end) have been checked - MP1 dampener was repaired. Cleaned discharge filter on MP1 and 2. Waiting on spares (sealring) for MP3. |
| 04/02/2002 | 2,730.00 | 00:00 | 10:30 | 10.5 | INTER2 | DRILL | WAIT | (345s) Cont. WOW. Meanwhile rig up riser handling equipment. Cont. general rig maintenance; Modify and install new safety wire on retrack cylinder. Install new safety chains on riser spider bolts. |
| 04/02/2002 | 2,730.00 | 10:30 | 14:45 | 4.25 | INTER2 | DRILL | WAIT | (345s) WOW. Meanwhile L/D diverter. P/U riser landing joint and M/U same. |
| 04/02/2002 | 2,730.00 | 14:45 | 15:45 | 1 | INTER2 | DRILL | WAIT | (345s) WOW. Meanwhile MU landing joint to slip joint inner barrel. |
| 04/02/2002 | 2,730.00 | 15:45 | 17:30 | 1.75 | INTER2 | DRILL | WAIT | (345s) WOW. Meanwhile prepare for landing LMRP. Remove broken index lines from load ring. Check and tighten MUX-cable clamps. |
| 04/02/2002 | 2,730.00 | 17:30 | 18:00 | 0.5 | INTER2 | DRILL | WAIT | (345s) WOW. Transfer all riser / LMRP weight (400T) to main blocks. Adjust rucker tensioners to 40250 lbs |
| 04/02/2002 | 2,730.00 | 18:00 | 19:15 | 1.25 | INTER2 | WHEAD | BOPU | (345t) Move rig and position same above BOP, land LMRP. Rig heave recorded at rig floor at time of landing = 2m. |
| 04/02/2002 | 2,730.00 | 19:15 | 20:00 | 0.75 | INTER2 | WHEAD | BOPU | (345t) Set down 25T, lock LMRP connector w/1500 PSI & perform o/pull test to 20T - OK. Increase rucker tension to 77100 lbs. |
| 04/02/2002 | 2,730.00 | 20:00 | 20:45 | 0.75 | INTER2 | WHEAD | BOPU | (345t) Energise stack stingers, engage blue- and yellow pods, configure BOP ram and failsafe v/v positions. |
| 04/02/2002 | 2,730.00 | 20:45 | 21:30 | 0.75 | INTER2 | WHEAD | BOPT | (345t) Flush C&K-lines across BOP. P/test same against Inner Upper failsafe v/v's to 500 / 10 000 psi - OK. |
| 04/02/2002 | 2,730.00 | 21:30 | 22:00 | 0.5 | INTER2 | WHEAD | BOPU | (345u) Waiting on air compressors to charge APV's. |
| 04/02/2002 | 2,730.00 | 22:00 | 22:45 | 0.75 | INTER2 | WHEAD | RISR | (345u) Slack off block weight and stroke out slip joint. Arm EQD system. |
| 04/02/2002 | 2,730.00 | 22:45 | 23:00 | 0.25 | INTER2 | WHEAD | SAFE | (345u) Handover meeting with late incoming crew. |
| 04/02/2002 | 2,730.00 | 23:00 | 23:30 | 0.5 | INTER2 | WHEAD | SAFE | (345u) Conduct pre-job meeting with new crew. |
| 04/02/2002 | 2,730.00 | 23:30 | 00:00 | 0.5 | INTER2 | WHEAD | RISR | (345u) RD riser landing joint. |
| 05/02/2002 | 2,730.00 | 00:00 | 02:00 | 2 | INTER2 | WHEAD | BOPU | (345u) P/U divertor RT and & M/U same. Install same and perform overpull test to 20T - OK. Complete hooking up hydraulic- and electrical power, energise divertor seals. |
| 05/02/2002 | 2,730.00 | 02:00 | 04:00 | 2 | INTER2 | WHEAD | BOPD | (345u) Rig down divertor RT, spider and gimble. Change head on LRA and clear rig floor. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 05/02/2002 | 2,730.00 | 04:00 | 05:15 | 1.25 | INTER2 | DRILL | BHA | (345v) Change bails f/ 500 - 350 T, install 'BX'-elevator. |
| 05/02/2002 | 2,730.00 | 05:15 | 05:45 | 0.5 | INTER2 | DRILL | BHA | (345w) Break out ACME x/o from hang off tool retrieval stand. MU 6 m pup joint. |
| 05/02/2002 | 2,730.00 | 05:45 | 06:00 | 0.25 | INTER2 | DRILL | RIGR | (345w) Repair broken hydraulic hose on 'BX'-elevator. |
| 05/02/2002 | 2,730.00 | 06:00 | 06:45 | 0.75 | INTER2 | WHEAD | BOPT | (345w) Function test diverter system - OK. |
| 05/02/2002 | 2,730.00 | 06:45 | 09:30 | 2.75 | INTER2 | DRILL | TRIP | (345w) RIH with 5" DP to retrieve hang-off tool. |
| 05/02/2002 | 2,730.00 | 09:30 | 09:45 | 0.25 | INTER2 | DRILL | SAFE | (345w) Pre-job meeting prior to displacing riser to 1.26 SG mud. |
| 05/02/2002 | 2,730.00 | 09:45 | 11:30 | 1.75 | INTER2 | DRILL | DSPL | (345w) Displace riser and kill / choke lines to 1.26 SG mud - total 301M3. ROV inspect for leak in connection LMRP/BOP - OK. Increase rucker tension to 82000 lbs. |
| 05/02/2002 | 2,730.00 | 11:30 | 12:00 | 0.5 | INTER2 | DRILL | FCHK | (345w) Open rams and observe well for flow - negative. |
| 05/02/2002 | 2,730.00 | 12:00 | 13:15 | 1.25 | INTER2 | DRILL | TRIP | (345w) MU hang-off tool and POOH. Experience problems retrieving hang-off tool through upper annular. Rotate slowly through after several attempts. |
| 05/02/2002 | 2,730.00 | 13:15 | 13:30 | 0.25 | INTER2 | DRILL | TRIP | (345w) Start POOH. Pulling wet - string plugged. |
| 05/02/2002 | 2,730.00 | 13:30 | 13:45 | 0.25 | INTER2 | RIGD | RIGD | (345w) Remove casing modem and install mud bucket on aft catwalk. |
| 05/02/2002 | 2,730.00 | 13:45 | 17:30 | 3.75 | INTER2 | DRILL | TRIP | (345w) Cont. POH. Attempt to unplug string - no go. |
| 05/02/2002 | 2,730.00 | 17:30 | 18:00 | 0.5 | INTER2 | DRILL | BHA | (345w) Break and service hang-off tool. Found Gray v/v filled with large pieces of gravel / rubber pieces with diameter up to 4-5 cm. |
| 05/02/2002 | 2,730.00 | 18:00 | 19:00 | 1 | INTER2 | DRILL | TRIP | (345w) Cont. POH. wet. |
| 05/02/2002 | 2,730.00 | 19:00 | 19:15 | 0.25 | INTER2 | DRILL | SAFE | (345w) Pre-shift meeting. |
| 05/02/2002 | 2,730.00 | 19:15 | 22:00 | 2.75 | INTER2 | DRILL | TRIP | (345w) Cont. POH. Attempt to break circ every 5th stand - no go. |
| 05/02/2002 | 2,730.00 | 22:00 | 22:30 | 0.5 | INTER2 | DRILL | BHA | (345w) Break bit. Bit found full of cuttings, rubber debris and small Aluminium pieces. |
| 05/02/2002 | 2,730.00 | 22:30 | 23:30 | 1 | INTER2 | DRILL | TRIP | (345x) MU bullnose, jetsub & RIH 4 stands of HWDP and 2 stands 5" DP below BOP test plug. |
| 05/02/2002 | 2,730.00 | 23:30 | 00:00 | 0.5 | INTER2 | DRILL | TRIP | (345x) MU weight-set BOP test plug. |
| 06/02/2002 | 2,730.00 | 00:00 | 00:30 | 0.5 | INTER2 | WHEAD | BOPT | (345x) Continue MU BOP test plug. |
| 06/02/2002 | 2,730.00 | 00:30 | 02:45 | 2.25 | INTER2 | DRILL | TRIP | (345x) RIH with BOP test plug on 5" DP |
| 06/02/2002 | 2,730.00 | 02:45 | 03:00 | 0.25 | INTER2 | DRILL | CIRC | (345x) Wash BOP and wellhead with 160 SPM @ 1400 psi. |
| 06/02/2002 | 2,730.00 | 03:00 | 03:30 | 0.5 | INTER2 | DRILL | RIGR | (345x) Stroke out compensator and re-spool line on drawwork drum. |
| 06/02/2002 | 2,730.00 | 03:30 | 04:15 | 0.75 | INTER2 | DRILL | TRIP | (345x) Continue to RIH test tool, land in wellhead and set down 12T. |
| 06/02/2002 | 2,730.00 | 04:15 | 07:15 | 3 | INTER2 | WHEAD | BOPT | (345x) Test LMRP-connector. Initial problems getting test tool to seal. Evaluate options, PU to neutral weight & set down 18T. Attempt to pressure up to 7000 psi in steps of 1000 psi - No go. |
| 06/02/2002 | 2,730.00 | 07:15 | 08:00 | 0.75 | INTER2 | WHEAD | BOPT | (345x) Set down 30T and pressure up in steps of 1000 psi to 7000 psi / 10 min - OK. |
| 06/02/2002 | 2,730.00 | 08:00 | 08:45 | 0.75 | INTER2 | WHEAD | MISC | (345x) Troubleshoot cement unit. |
| 06/02/2002 | 2,730.00 | 08:45 | 10:00 | 1.25 | INTER2 | WHEAD | BOPT | (345x) Continue BOP test on blue pod, 500 psi/5 min and 5000 psi/10 min - OK. |
| 06/02/2002 | 2,730.00 | 10:00 | 10:30 | 0.5 | INTER2 | WHEAD | BOPT | (345x) Function test BOP on yellow pod - OK. |
| 06/02/2002 | 2,730.00 | 10:30 | 11:15 | 0.75 | INTER2 | WHEAD | BOPT | (345x) POH to BOP. |
| 06/02/2002 | 2,730.00 | 11:15 | 13:00 | 1.75 | INTER2 | DRILL | CIRC | (345x) Pump 10 m3 Hi-Vis pill and displace to surface. No debris seen on BU. |
| 06/02/2002 | 2,730.00 | 13:00 | 13:15 | 0.25 | INTER2 | DRILL | CIRC | (345x) Slug pipe. |
| 06/02/2002 | 2,730.00 | 13:15 | 14:30 | 1.25 | INTER2 | DRILL | TRIP | (345x) POOH with BOP test-plug assembly. |
| 06/02/2002 | 2,730.00 | 14:30 | 15:00 | 0.5 | INTER2 | DRILL | BHA | (345x) Lay down BOP test tool. Inspect same - OK. |
| 06/02/2002 | 2,730.00 | 15:00 | 15:15 | 0.25 | INTER2 | DRILL | TRIP | (345x) Rack DP and HWDP below BOP test-tool. |
| 06/02/2002 | 2,730.00 | 15:15 | 17:15 | 2 | INTER2 | DRILL | BHA | (345y) MU 12 1/4" wiper trip BHA. |
| 06/02/2002 | 2,730.00 | 17:15 | 18:00 | 0.75 | INTER2 | DRILL | TRIP | (345y) Cont. TIH to 1000m. |
| 06/02/2002 | 2,730.00 | 18:00 | 18:15 | 0.25 | INTER2 | DRILL | CIRC | (345y) Fill pipe, break circulation. |
| 06/02/2002 | 2,730.00 | 18:15 | 18:45 | 0.5 | INTER2 | DRILL | TRIP | (345y) Cont. TIH to 1400m. |
| 06/02/2002 | 2,730.00 | 18:45 | 19:15 | 0.5 | INTER2 | DRILL | SAFE | (345y) Conduct handover meeting with oncoming crew. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 06/02/2002 | 2,730.00 | 19:15 | 19:45 | 0.5 | INTER2 | DRILL | TRIP | (345y) TIH to 1571m |
| 06/02/2002 | 2,730.00 | 19:45 | 21:30 | 1.75 | INTER2 | DRILL | CIRC | (345y) Sweep wellhead and BOP area with 10M3 Hi-Vis pill and displace same to surface. No debris seen in return at the shale shakers. |
| 06/02/2002 | 2,730.00 | 21:30 | 00:00 | 2.5 | INTER2 | DRILL | TRIP | (345y) Cont. to stage drillstring in the hole. TIH to 2120m, displace 1.45 SG mud from wellbore with 320 BBL, 1.26 SG mud every 5th stand. Note: * ROV working on retrieving transponders to surface for battery change-out. Transponder no. 68, position 5 has been completed, 5 transponders left. * Port side crane out of operation. Unable to work Far Swan. Take priority cargo and release boat at 02:30. ETA Kristiansund 10:30. |
| 07/02/2002 | 2,730.00 | 00:00 | 02:45 | 2.75 | INTER2 | DRILL | TRIP | (345y) Continue to stage drillstring in the hole to 2441 m, displacing and mix 1,45 SG mud from the wellbore with 320 BBL, 1,26 SG mud every 5th stand (resultant weight 1,30 SG). Take torque reading for liner; 20 RPM, 3000 ft-lbs. |
| 07/02/2002 | 2,730.00 | 02:45 | 07:30 | 4.75 | INTER2 | DRILL | REAM | (345y) Attempt to continue RIH. String taking weight at 2499 m (20T), 2050 m (25T) and 2516 m (18T). Pull back, connect TDS and precautionary ream/wash in the hole to 2728m; 0 - 7T WOB, 160 SPM, 1800-1900 psi, 90-100 RPM and 2-3,5 k ft-lbs. String torqued up / took weight at 2622, 2643, 2657, 2670, 2710, and 2717m. Pull back string and ream passed - OK. Wipe each stand once with no rotation prior to each connection. Tag btm. at 2728m driller's depth. Up wt 130T, Down wt 135T, torque 3k ft-lbs. Boost riser w/MP1 once 1.30 SG mud return to surface. Stop MP1 at 06:15 due to liner wash-out on MP2. |
| 07/02/2002 | 2,730.00 | 07:30 | 09:45 | 2.25 | INTER2 | DRILL | CIRC | (345y) Circulate BU at 2237lpm, 164spm, 1850psi. Max gas recorded 0.45%. Resume boosting riser f/08:00 - 10:00 hrs. |
| 07/02/2002 | 2,730.00 | 09:45 | 10:00 | 0.25 | INTER2 | DRILL | FCHK | (345y) Flowcheck well - negative |
| 07/02/2002 | 2,730.00 | 10:00 | 10:30 | 0.5 | INTER2 | DRILL | TRIP | (345y) POOH 5 stands wet. Correct hole fill, no drag observed. |
| 07/02/2002 | 2,730.00 | 10:30 | 10:45 | 0.25 | INTER2 | DRILL | CIRC | (345y) Slug pipe. |
| 07/02/2002 | 2,730.00 | 10:45 | 12:45 | 2 | INTER2 | DRILL | TRIP | (345y) Cont. POH. No drag seen while POH to 13-3/8" casing shoe. Strap pipe while POOH. Flowcheck well at shoe and prior to pulling BHA through BOP - negative. |
| 07/02/2002 | 2,730.00 | 12:45 | 13:00 | 0.25 | INTER2 | DRILL | CIRC | (345y) Pump 10M3 Hi-Vis pill. |
| 07/02/2002 | 2,730.00 | 13:00 | 14:45 | 1.75 | INTER2 | DRILL | CIRC | (345y) Circulate pill out from BOP / wellhead area. No debris seen at shale shakers. |
| 07/02/2002 | 2,730.00 | 14:45 | 15:00 | 0.25 | INTER2 | DRILL | CIRC | (345y) Slug pipe. |
| 07/02/2002 | 2,730.00 | 15:00 | 17:30 | 2.5 | INTER2 | DRILL | TRIP | (345y) Continue POH. Strap pipe while POH. Meanwhile RU casing modem & check same. Flush through K&C-lines and poorboy degasser w/1.30 SG mud. |
| 07/02/2002 | 2,730.00 | 17:30 | 19:30 | 2 | INTER2 | DRILL | BHA | (345y) Rack back BHA, break bit. |
| 07/02/2002 | 2,730.00 | 19:30 | 20:00 | 0.5 | INTER2 | DRILL | INSP | (509) Lubricate travelling assy, check same for loose objects. |
| 07/02/2002 | 2,730.00 | 20:00 | 22:30 | 2.5 | INTER2 | CASE | CSG | (509-511) RU to run 9-5/8" liner. Change 'BX'-elevator and install 9-5/8" inserts. Remove master bushing and install adaptor ring and FMS-spider. Change gripper head on LRA. |
| 07/02/2002 | 2,730.00 | 22:30 | 23:00 | 0.5 | INTER2 | CASE | SAFE | (506) Prejob meeting with crews prior to start RIH 9-5/8" liner. |
| 07/02/2002 | 2,730.00 | 23:00 | 00:00 | 1 | INTER2 | CASE | CSG | (516) Run 9-5/8", 53.5 ppf, P-110, NV liner as per programme. Bakerlock shoe track. Verify floats working - OK. Torque setting opt./max = 14,3 / 15,66k ft-lbs. Note:- Landing string drifted to 2-5/8" Flush and clean transfer lines f/pit room to cmt unit. |
| 08/02/2002 | 2,730.00 | 00:00 | 01:30 | 1.5 | INTER2 | CASE | TRIP | (516) Continue to RIH w/ 9 5/8" liner as per programme to 125m. |
| 08/02/2002 | 2,730.00 | 01:30 | 02:00 | 0.5 | INTER2 | CASE | RIGR | Repair BX elevator. |
| 08/02/2002 | 2,730.00 | 02:00 | 02:30 | 0.5 | INTER2 | CASE | TRIP | (516) Continue to RIH w/ 9 5/8" liner to 138m. |
| 08/02/2002 | 2,730.00 | 02:30 | 02:45 | 0.25 | INTER2 | CASE | TRIP | (516) Back out jnt # 12 and re-make same. |
| 08/02/2002 | 2,730.00 | 02:45 | 06:00 | 3.25 | INTER2 | CASE | TRIP | (516) Continue to RIH w/ 9 5/8" liner to 419m. Count remaining joints on deck. 21 csg jnts and 4 pup jnts. |
| 08/02/2002 | 2,730.00 | 06:00 | 08:30 | 2.5 | INTER2 | CASE | TRIP | (517and 519) Prepare to P/U hanger. Changed out slips and elevators. Flush K- & C- lines at 07:30. |
| 08/02/2002 | 2,730.00 | 08:30 | 10:30 | 2 | INTER2 | CASE | TRIP | (518) Arrange pre-job safety meeting. P/U liner hanger assy, weight = 70T on Martin Decker, liner weight 33MT. Fill floating junk basket with glycol / water mixture. Circulate liner volume f/ 10:00 t/ 10:15 at 2000lpm and 130psi. |
| 08/02/2002 | 2,730.00 | 10:30 | 15:00 | 4.5 | INTER2 | CASE | TRIP | (520) RIH w/ 9 5/8" liner on 5" DP to 2413m. At 14:30 Rig in Advisory Mode, wind above 40 knots. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 08/02/2002 | 2,730.00 | 15:00 | 15:15 | 0.25 | INTER2 | CASE | TRIP | (520) Break circulation and circulate for 10 min. Record Up WT (128T) and Down WT (130T). |
| 08/02/2002 | 2,730.00 | 15:15 | 16:15 | 1 | INTER2 | CASE | TRIP | (521) Continued RIH at 2 min/ std to 2678m. |
| 08/02/2002 | 2,730.00 | 16:15 | 21:30 | 5.25 | INTER2 | CASE | TRIP | (521) Tight spot at 2678 - 2681m. Take 10T down weight. Break circulation and wash / work liner in the hole w/ 1100lpm, 450psi. Wash down to 2719m. Rotate down f/2715m w/2 - 4k ft-lbs. Packing off at 2719m, regain circulation to 1100lpm and work liner down to bottom. Volume lost = 10.2M3. Tag bottom at 2729m. |
| 08/02/2002 | 2,730.00 | 21:30 | 22:00 | 0.5 | INTER2 | CASE | MISC | (522) PU cmt head, secure same. |
| 08/02/2002 | 2,730.00 | 22:00 | 22:30 | 0.5 | INTER2 | CASE | CIRC | (524) Circ 2x annular volume; 1250 - 1300lpm at 700 - 750 PSI. |
| 08/02/2002 | 2,730.00 | 22:30 | 23:30 | 1 | INTER2 | CASE | CIRC | (525 - 526) Drop liner hanger setting ball, circ to ball seat. Pressure up to 2000 PSI and set liner hanger at 2306m. Release R/T and confirm RT free from liner hanger. Shear ball seat with 2600 PSI. Float Collar at 2697m. Landing Collar 2693m. Hanger at 2306m. Top PBR at 2300m. |
| 08/02/2002 | 2,730.00 | 23:30 | 00:00 | 0.5 | INTER2 | CASE | CIRC | (527a) Attempt to break circ., start losing circulation. Note: Three transponders have had batteries changed out. Three to go. |
| 09/02/2002 | 2,730.00 | 00:00 | 02:30 | 2.5 | INTER2 | CEMT | CIRC | (527a) Reduce flowrate in an attempt to regain circulation. Flow level in riser observed to be constant, monitor on trip tank. Vary parameters (flow and liner rotation) in an attempt to regain circulation. Meanwhile pump 2m3 LCM downhole. |
| 09/02/2002 | 2,730.00 | 02:30 | 04:00 | 1.5 | INTER2 | CEMT | CIRC | (527a) Regain circulation as LCM-pill exited 9 5/8" liner shoe. Circulate LCM-pill across loss zone at minimum rate. Total volume lost = 24.2m3. Stage up circulation rate to 600 lpm over 1 hour. Observe further losses. Reduce pumprate, notice increase in return flow, 8m3 returned. |
| 09/02/2002 | 2,730.00 | 04:00 | 04:45 | 0.75 | INTER2 | CEMT | FCHK | (527a) Flow check well, precautionary shut Upper Annular and check for any pressure build-up. Negative. |
| 09/02/2002 | 2,730.00 | 04:45 | 07:15 | 2.5 | INTER2 | CEMT | FCHK | (527a) Boost riser content whilst flow checking well over kill line and trip tank. Max gas recorded during circulation = 3%. |
| 09/02/2002 | 2,730.00 | 07:15 | 07:45 | 0.5 | INTER2 | CEMT | FCHK | (527a) Open upper annular. Flowcheck well on trip tank - negative. |
| 09/02/2002 | 2,730.00 | 07:45 | 09:15 | 1.5 | INTER2 | CEMT | CIRC | (527b) Break circulation and stage up flowrate to 750lpm. Hold pre-job meeting prior to liner cement job at 08:30. |
| 09/02/2002 | 2,730.00 | 09:15 | 09:45 | 0.5 | INTER2 | CEMT | CMTP | (528) Pump 20 bbls FW spacer followed by 80 bbls tuned spacer E+ at 1.32 SG. |
| 09/02/2002 | 2,730.00 | 09:45 | 10:30 | 0.75 | INTER2 | CEMT | CMTP | (529) Mix and pump 110 bbls lead cement at 1.44 SG and 23 bbls tail cement at 1.92 SG.<br>Lead Slurry: Seawater at 15.0 gps, NF-6 at 0.01 gps, Econolite at 0.5 gps, Yield: 2.54 cu.ft/sx, TT to 70 BC = 12:00 hours<br>Tail slurry: Seawater at 5.02 gps NF-6 at 0.01 gps, CFR-3L at 0.5 gps, Yield: 1.15 cu.ft/sx, TT to 70 BC = 4:46 hours |
| 09/02/2002 | 2,730.00 | 10:30 | 11:15 | 0.75 | INTER2 | CEMT | CMTP | (530) Drop DP wiper dart and displace lead- and tail slurries with the cement pump at 6 BPM. Sign of losses, reduce rate to 5 BPM. Observe liner wiper plug shear out w/1600 PSI (3 bbls early). Bump plug (2 bbls early on calculated value) to 1000 psi over final displacement pressure. Rotate liner at 30 RPM, 2 - 4k ft-lbs throughout cement job. |
| 09/02/2002 | 2,730.00 | 11:15 | 12:00 | 0.75 | INTER2 | CASE | CSGT | (531) Set down 30MT on liner running tool and attempt to pressure test 9 5/8" liner to 4000psi. Observe a slight drop in pressure. Suspect leak on surface. Bleed off pressure, floats holding - OK. No losses observed throughout job. |
| 09/02/2002 | 2,730.00 | 12:00 | 12:30 | 0.5 | INTER2 | CASE | CSGT | (533) Set liner top packer - no shear observed. Set down 35T, PU to top of liner. Close Upper Annular and confirm liner lap integrity with 1100 psi p/test. |
| 09/02/2002 | 2,730.00 | 12:30 | 13:30 | 1 | INTER2 | CEMT | CIRR | (534) Reverse circulate out excess cement from liner top. Initial pump rate kept at 870 lpm / 1100 psi to confirm liner lap integrity, increasing to final displacement rate of 1290 lpm / 2100psi. Dump returns from 12:45 to 13:10 hrs; observed 10m3 cement, and 20m3 spacer contaminated mud. Pumped a total of 2.5 x string volume. Rotate string to ensure free at regular intervals. |
| 09/02/2002 | 2,730.00 | 13:30 | 14:00 | 0.5 | INTER2 | CEMT | CIRC | (534) Open Upper Annular and circulate conventionally at 1540 lpm / 860 psi. |
| 09/02/2002 | 2,730.00 | 14:00 | 14:30 | 0.5 | INTER2 | CEMT | CMTP | (535) L/D cement head. |
| 09/02/2002 | 2,730.00 | 14:30 | 16:30 | 2 | INTER2 | CEMT | CIRC | (535a) Continue circulating 1.5 X B/U at 2235 - 3710 lpm / 1595 - 3280 psi. Max gas recorded = 3%. |
| 09/02/2002 | 2,730.00 | 16:30 | 16:45 | 0.25 | INTER2 | CEMT | FCHK | (535a) Flow check well - negative. |
| 09/02/2002 | 2,730.00 | 16:45 | 17:00 | 0.25 | INTER2 | CASE | CIRC | Slug pipe. |
| 09/02/2002 | 2,730.00 | 17:00 | 20:00 | 3 | INTER2 | CASE | TRIP | (536) POH with liner running tool. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 09/02/2002 | 2,730.00 | 20:00 | 20:15 | 0.25 | INTER2 | CASE | SAFE | (537) Pre-job meeting. |
| 09/02/2002 | 2,730.00 | 20:15 | 21:15 | 1 | INTER2 | CASE | MISC | (537) LD liner running tool and service break handling pup on Remote Controlled Top Drive Head (RCTDH). |
| 09/02/2002 | 2,730.00 | 21:15 | 21:30 | 0.25 | INTER2 | DRILL | SAFE | Pre-job meeting. |
| 09/02/2002 | 2,730.00 | 21:30 | 00:00 | 2.5 | INTER2 | DRILL | BHA | (546a) L/D 12-1/4" BHA. Note: Rig out of advisory mode at 14:00 hours. Await new batteries for DP transponders. Port crane not considered fit to work deck cargo to / from PSV's. |
| 10/02/2002 | 2,730.00 | 00:00 | 01:00 | 1 | INTER2 | DRILL | BHA | (546a) Continue L/D 12-1/4" BHA. Inspect TDS while clearing forward catwalk. |
| 10/02/2002 | 2,730.00 | 01:00 | 02:15 | 1.25 | INTER2 | DRILL | TBMV | (546a) L/D 3 jnts of DP with damaged tool joints. Clear rigfloor. |
| 10/02/2002 | 2,730.00 | 02:15 | 03:15 | 1 | INTER2 | CASE | PRST | (546a) Attempt to pressure test IBOP's - no go. Abort test and commence investigation to identify leak path. |
| 10/02/2002 | 2,730.00 | 03:15 | 07:00 | 3.75 | INTER2 | DRILL | BHA | (548) M/U 8-1/2" BHA. |
| 10/02/2002 | 2,730.00 | 07:00 | 08:00 | 1 | INTER2 | DRILL | RIGS | (548a) Change saversub to 6 5/8". |
| 10/02/2002 | 2,730.00 | 08:00 | 10:15 | 2.25 | INTER2 | CASE | PRST | (548a) Rig up and pressure test remote IBOP, manual IBOP, kelly hose t/ 500-5000psi. OK. R/D X/O's and test hose. |
| 10/02/2002 | 2,730.00 | 10:15 | 11:45 | 1.5 | INTER2 | DRILL | TBMV | (549a) Continue to P/U HWDP f/ deck and BHA from derrick. P/U Jar. |
| 10/02/2002 | 2,730.00 | 11:45 | 12:00 | 0.25 | INTER2 | DRILL | CIRC | (549) Install X/O and test MWD w/ 2180lpm - Good test. |
| 10/02/2002 | 2,730.00 | 12:00 | 13:45 | 1.75 | INTER2 | DRILL | TRIP | (550a) RIH w/ 48 stands of 5" DP. |
| 10/02/2002 | 2,730.00 | 13:45 | 14:15 | 0.5 | INTER2 | DRILL | TRIP | (551) Change to 6 5/8" pipe handling equipment. |
| 10/02/2002 | 2,730.00 | 14:15 | 15:00 | 0.75 | INTER2 | DRILL | TRIP | (552) Continue RIH w/ 6-5/8" DP. |
| 10/02/2002 | 2,730.00 | 15:00 | 15:30 | 0.5 | INTER2 | CASE | PRST | (553a) Perform body test on standpipe manifold to 5500psi. |
| 10/02/2002 | 2,730.00 | 15:30 | 16:30 | 1 | INTER2 | DRILL | TRIP | (554) Continue to RIH on 6 5/8" DP. Fill pipe every 1000m. Test MWD on one filling. |
| 10/02/2002 | 2,730.00 | 16:30 | 18:00 | 1.5 | INTER2 | DRILL | SAFE | (556) Conduct D2 and D5 drill (Well kick and well kill drill). |
| 10/02/2002 | 2,730.00 | 18:00 | 19:45 | 1.75 | INTER2 | CASE | PRST | (557a) Pressure test 9-5/8" liner and liner lap to 4000 psi / 15 mins - OK. |
| 10/02/2002 | 2,730.00 | 19:45 | 20:15 | 0.5 | INTER2 | DRILL | SAFE | (557b) Conduct pre-job / safety meeting prior to continue simultaneous operation; tripping and standpipe pressure testing. |
| 10/02/2002 | 2,730.00 | 20:15 | 21:00 | 0.75 | INTER2 | DRILL | TRIP | (557c) Cont. RIH f/2467 - 2670m |
| 10/02/2002 | 2,730.00 | 21:00 | 22:00 | 1 | INTER2 | EVAL | PRST | (557d) Complete test on standpipe manifold; 500 / 4500 psi for 5 / 10 mins. |
| 10/02/2002 | 2,730.00 | 22:00 | 23:00 | 1 | INTER2 | DRILL | REAM | (557e) Wash down f/2670 w/2175 lpm and 2200 PSI. Tag landing collar at 2693m w/10T. |
| 10/02/2002 | 2,730.00 | 23:00 | 00:00 | 1 | INTER2 | DRILL | SAFE | (557f) Rack back one stand. Conduct Well Kill Drill (D5) and Kick While Drilling Drill (D2). |
| 11/02/2002 | 2,730.00 | 00:00 | 01:00 | 1 | INTER2 | DRILL | SAFE | (557f) Cont. well kill drills. |
| 11/02/2002 | 2,730.00 | 01:00 | 01:30 | 0.5 | INTER2 | DRILL | RIGR | (557g) Troubleshoot annular opening volume (flow meter reading significantly less than expected) - OK. |
| 11/02/2002 | 2,730.00 | 01:30 | 04:45 | 3.25 | INTER2 | DRILL | CMTD | (558) Wash down to landing collar and commence drilling out same; 3 - 12T, 2.2 - 9k ft-lbs, 2400lpm at 2700 psi. Difficult to get bit to drill. Vary parameters to make progress. |
| 11/02/2002 | 2,730.00 | 04:45 | 05:15 | 0.5 | INTER2 | DRILL | CMTD | (558) Make connection at 2697m. Re-set Crown'O'Matic - accidentally activated during connection. |
| 11/02/2002 | 2,730.00 | 05:15 | 08:30 | 3.25 | INTER2 | DRILL | CMTD | (558) Cont. to drill cement in liner shoe track to 2629m. |
| 11/02/2002 | 2,730.00 | 08:30 | 08:45 | 0.25 | INTER2 | DRILL | DRL | (559) Drill through shoe at 2729m. Cont. drilling new formation to 2732m. |
| 11/02/2002 | 2,732.00 | 08:45 | 12:00 | 3.25 | INTER2 | DRILL | CIRC | (560) Pull back into liner shoe and circulate / condition mud to even 1.33 SG mud. 1.33 SG mud reported in returns at 10:00 hours. Displace K&C-lines to 1.33 SG mud. |
| 11/02/2002 | 2,732.00 | 12:00 | 12:15 | 0.25 | INTER2 | DRILL | FCHK | (560) Flow check well - negative. |
| 11/02/2002 | 2,732.00 | 12:15 | 12:45 | 0.5 | INTER2 | EVAL | LKOF | (561) Perform leak-off test to 1.47 SG EMW. Applied 540 psi surface pressure, pumped 3.5 bbls, lost 1 bbl to formation. |
| 11/02/2002 | 2,732.00 | 12:45 | 13:15 | 0.5 | PROD1 | DRILL | CIRC | (562) Take survey and SCR's. |
| 11/02/2002 | 2,732.00 | 13:15 | 14:45 | 1.5 | PROD1 | DRILL | DRL | (562) Drill, log and survey hole f/2732 - 2748m. 720 GPM, 3250 psi, 130 RPM, 4 - 7k ft-lbs, 4400 - 11000 lbs. |
| 11/02/2002 | 2,748.00 | 14:45 | 15:45 | 1 | PROD1 | EVAL | LOG | (562) Repeat log section f/2732 - 2748m. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 11/02/2002 | 2,748.00 | 15:45 | 16:30 | 0.75 | PROD1 | DRILL | WAIT | (562) Circ and work pipe while evaluating results from repeat log section. |
| 11/02/2002 | 2,748.00 | 16:30 | 16:45 | 0.25 | PROD1 | DRILL | FCHK | (562) Flow check well - negative. |
| 11/02/2002 | 2,748.00 | 16:45 | 19:15 | 2.5 | PROD1 | DRILL | DRL | (562) Drill, log, and survey f/2748 - 2770m. 720 GPM, 3200 psi, 115 RPM, 3 - 6k ft-lbs, 4400 - 17500 lbs. |
| 11/02/2002 | 2,770.00 | 19:15 | 19:45 | 0.5 | PROD1 | DRILL | FCHK | (562) Flow check well - negative. |
| 11/02/2002 | 2,770.00 | 19:45 | 20:45 | 1 | PROD1 | DRILL | DRL | (563) Drill, log, and survey f/2770 - 2782m. 720 GPM, 3250 psi, 115 RPM, 4 - 7k ft-lbs, 4000 - 12000 lbs. |
| 11/02/2002 | 2,782.00 | 20:45 | 22:30 | 1.75 | PROD1 | DRILL | CIRC | (563) Circ and condition well. |
| 11/02/2002 | 2,782.00 | 22:30 | 00:00 | 1.5 | PROD1 | DRILL | DRL | (563) Drill, log, and survey f/ 2782 - 2801m. 720 GPM, 3250 psi, 105 RPM, 4 - 6k ft-lbs, 0 - 18000 lbs. Note:- Bit to sensor offsets:- Bit - APRS= 8.47m Bit - RES = 9.08m Bit - GR = 9.16m Bit - D&I = 16.72m BU ROV (Magnum 63) non-operational (twisted bar from which the main sheave is suspended). |
| 12/02/2002 | 2,801.00 | 00:00 | 04:30 | 4.5 | PROD1 | DRILL | DRL | (563a) Continue to drill, log and survey 8 1/2" hole from 2801-2868m controlling ROP for data acquisition. 1.1 - 23k-lbs, 104 RPM, 2721 - 2746lpm, 3340 - 3489 psi, 2.2 - 4.2k ft-lbs. |
| 12/02/2002 | 2,868.00 | 04:30 | 05:15 | 0.75 | PROD1 | DRILL | CIRC | (563a) Circulate and condition well. |
| 12/02/2002 | 2,868.00 | 05:15 | 12:00 | 6.75 | PROD1 | DRILL | DRL | (563a) Continue to drill/ log/ survey 8 1/2" hole from 2868-2983m controlling ROP for data acquisition. 1.9 - 15.5k-lbs, 104 RPM, 2720 - 2755lpm, 3370 - 3500 psi, 2.5 - 5.5k ft-lbs. Flush kill and choke line w/6m3 mud. Rig out of advisory mode at 11:30 hours. |
| 12/02/2002 | 2,983.00 | 12:00 | 13:30 | 1.5 | PROD1 | DRILL | CIRC | (563a) Circulate BU due to increasing ECD, 1.39 - 1.41 SG EMW. Work string and increase RPM to 130. Change shaker screens. Start booster pump on riser. |
| 12/02/2002 | 2,983.00 | 13:30 | 15:15 | 1.75 | PROD1 | DRILL | DRL | (563a) Continue to drill/ log/ survey 8 1/2" hole from 2983-3011m controlling ROP for data acquisition. 1.2 - 1.35k-lbs, 124 - 130 RPM, 2700lpm, 3300 - 3400 psi, 2.8 - 6.3k ft-lbs. |
| 12/02/2002 | 3,011.00 | 15:15 | 16:30 | 1.25 | PROD1 | DRILL | CIRC | (628) Pump 10m3 hi-vis and chase same above BHA. |
| 12/02/2002 | 3,011.00 | 16:30 | 00:00 | 7.5 | PROD1 | DRILL | DRL | (628) Continue to drill / log / survey 8-1/2" hole from 3011-3127m. 0 - 20k-lbs, 130 RPM, 2700lpm, 3320 - 3520psi, 2.8 - 7.6k ft-lbs. Pump 5m3 hi-vis pill per stand. Ream stand once at full drilling rate prior to taking survey / make connection. Gradual increase of the ECD f/1.39 - 1.42 SG EMW. Some "spikes" seen as the Hi-Vis pills travel up to BOP level. |
| 13/02/2002 | 3,127.00 | 00:00 | 01:00 | 1 | PROD1 | DRILL | DRL | (628) Drill / log / survey 8-1/2" hole from 3127 - 3152m. Pump 5m3 Hi-Vis pill every stand. Ream every stand once. 6.5 - 13k-lbs, 130 RPM, 2700lpm, 3450 - 3500 psi, 3 - 6k ft-lbs. |
| 13/02/2002 | 3,152.00 | 01:00 | 01:30 | 0.5 | PROD1 | DRILL | CIRC | (628) Work pipe while circ and condition hole to reduce ECD prior to connection. |
| 13/02/2002 | 3,152.00 | 01:30 | 05:00 | 3.5 | PROD1 | DRILL | DRL | (628) Cont. to drill / log / survey 8-1/2" hole from 3152 - 3212m. 6 - 18k-lbs, 103 - 130 RPM, 2550 - 2700lpm, 3400 - 3600 psi, 3 - 6k ft-lbs. Pump 5m3 Hi-Vis pill every stand. Circ as required to control ECD, ream every stand, hole in good condition. |
| 13/02/2002 | 3,212.00 | 05:00 | 05:30 | 0.5 | PROD1 | DRILL | CIRC | (628) Work pipe while circ and condition hole to reduce ECD. |
| 13/02/2002 | 3,212.00 | 05:30 | 12:30 | 7 | PROD1 | DRILL | DRL | (628) Cont. to drill / log / survey 8-1/2" hole from 3112 - 3323m. 5 - 23k-lbs, 130 RPM, 2600lpm, 3250 - 3550 psi, 3 - 7k ft-lbs. |
| 13/02/2002 | 3,323.00 | 12:30 | 12:45 | 0.25 | PROD1 | DRILL | TRIP | (628) Pull back 5m without pumps to check hole condition / swabbing tendency. |
| 13/02/2002 | 3,323.00 | 12:45 | 14:00 | 1.25 | PROD1 | DRILL | DRL | (628) Cont. to drill / log / survey 8-1/2" hole from 3323 - 3351m. 8 - 20k-lbs, 130 RPM, 2600lpm, 3250 - 3500 psi, 3.5 - 6k ft-lbs. ECD increasing to 1.45 - 1.47SG EMW. Torque increasing 3 - 12k ft-lbs. |
| 13/02/2002 | 3,351.00 | 14:00 | 17:15 | 3.25 | PROD1 | DRILL | CIRC | (628a) CBU x 2 for wiper trip. Take survey. |
| 13/02/2002 | 3,351.00 | 17:15 | 21:30 | 4.25 | PROD1 | DRILL | TRIP | (628a) Pump out of hole to 9-5/8" casing shoe to prevent swabbing; 1m3 per stand, 30 SPM, 2 mins / stand. Hole in good condition. Precautionary backream slowly out of hole f/3011 - 2985m (increase seen in pump pressure). |
| 13/02/2002 | 3,351.00 | 21:30 | 21:45 | 0.25 | PROD1 | DRILL | FCHK | (628a) Flow check well - negative. |
| 13/02/2002 | 3,351.00 | 21:45 | 00:00 | 2.25 | PROD1 | DRILL | CIRC | (628a) Circulate BU at 9-5/8" liner shoe. Cont. circ 'till gas reading peak (3.2%) and reduce. Note: Rig in advisory mode as of 03:30; wind > 40 knots. Shaker no. 4 non-operational. |
| 14/02/2002 | 3,351.00 | 00:00 | 00:15 | 0.25 | PROD1 | DRILL | CIRC | (628b) Continue circulating and condition mud. |
| 14/02/2002 | 3,351.00 | 00:15 | 01:45 | 1.5 | PROD1 | DRILL | TRIP | (628b) RIH to 3154m. Hole in good condition. |
| 14/02/2002 | 3,351.00 | 01:45 | 02:00 | 0.25 | PROD1 | DRILL | CIRC | (628b) Fill pipe and break circulation. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 14/02/2002 | 3,351.00 | 02:00 | 02:30 | 0.5 | PROD1 | DRILL | TRIP | (628b) Continue RIH to 3325m. Hole condition good. |
| 14/02/2002 | 3,351.00 | 02:30 | 03:00 | 0.5 | PROD1 | DRILL | TRIP | (628b) Connect TDS and circulate slowly while RIH. Tag TD at 3351m - no fill. |
| 14/02/2002 | 3,351.00 | 03:00 | 03:45 | 0.75 | PROD1 | DRILL | WAIT | (628c) Displace OH and casing volume to 1,55 SG mud. Adjust flow rate to control ECD (1,44 sg EMW with spikes up to 1,45 sg EMW). |
| 14/02/2002 | 3,351.00 | 03:45 | 05:15 | 1.5 | PROD1 | DRILL | WAIT | (628c) Flow check well. POOH to 2725m (Above 9 5/8" liner shoe) Weather 04:00 Wind 20m/s, R/P/H 1,7/ 2,3/ 1,8 Sig Wave 3,8, Max Wave 6,8. |
| 14/02/2002 | 3,351.00 | 05:15 | 07:30 | 2.25 | PROD1 | DRILL | WAIT | (628c) Flow check well at liner shoe - observed 1,0m3/hr losses which reduced to nil. |
| 14/02/2002 | 3,351.00 | 07:30 | 09:00 | 1.5 | PROD1 | DRILL | WAIT | (628c) Continue POOH until BHA just below BOP. |
| 14/02/2002 | 3,351.00 | 09:00 | 09:45 | 0.75 | PROD1 | DRILL | WAIT | (628c) Function test rams on 5" DP. Meanwhile flow check well - 1,3m3/hr loss. |
| 14/02/2002 | 3,351.00 | 09:45 | 10:15 | 0.5 | PROD1 | DRILL | WAIT | (628c) Continue POOH. Yellow DP mode @ 10:10 hrs (weather deteriorating and spurious positioning data from LDL array, LDL array taken off line). Weather 10:00 Wind 24m/s, R/P/H 2,6/ 3,1/ 2,0, Wave sig 5,1, Wave max 8,2 |
| 14/02/2002 | 3,351.00 | 10:15 | 10:30 | 0.25 | PROD1 | DRILL | WAIT | (628c) Change to 5" running equipment. |
| 14/02/2002 | 3,351.00 | 10:30 | 10:45 | 0.25 | PROD1 | DRILL | WAIT | (628c) Continue POOH w/ 5" DP. |
| 14/02/2002 | 3,351.00 | 10:45 | 11:00 | 0.25 | PROD1 | DRILL | WAIT | (628c) Wash BOP and boost riser. |
| 14/02/2002 | 3,351.00 | 11:00 | 11:45 | 0.75 | PROD1 | DRILL | WAIT | (628c) Continue POOH w/ 5" DP. Boost riser with 2 rig pumps. 9% gas peak observed. Trap gas in riser from previous trip. |
| 14/02/2002 | 3,351.00 | 11:45 | 12:30 | 0.75 | PROD1 | DRILL | WAIT | (628c) Install Kelly cock and Gray valve below hang-off std, check Acme treads prior to RIH with HO std. Function test shear ram - OK. Weather 12:00 Wind 25m/s R/P/H 4,5/ 4,9/ 3,2, Wave sig 7,5 Wave Max 11,8 |
| 14/02/2002 | 3,351.00 | 12:30 | 13:00 | 0.5 | PROD1 | DRILL | WAIT | (628c) Change to 6 5/8" DP handling equipment. Yellow alert status - consequence analysis, thruster load. |
| 14/02/2002 | 3,351.00 | 13:00 | 15:30 | 2.5 | PROD1 | DRILL | WAIT | (628c) RIH w/ hang off stand on 6 5/8" DP, fill pipe at std # 35. Continue RIH w/ hang off stand and land same in WH. |
| 14/02/2002 | 3,351.00 | 15:30 | 16:30 | 1 | PROD1 | DRILL | WAIT | (628c) Close MPR and observe well on trip tank. |
| 14/02/2002 | 3,351.00 | 16:30 | 17:30 | 1 | PROD1 | DRILL | WAIT | (628c) Back out landing string and refill riser w/ booster pump due to U-tubing up landing string. Close blind shear ram. |
| 14/02/2002 | 3,351.00 | 17:30 | 20:00 | 2.5 | PROD1 | DRILL | WAIT | (628c) POOH w/ landing string. Meanwhile circulate surface line through rig choke and Poor boy degasser, open lower kill line. Check for gain/ loss in well. No losses. |
| 14/02/2002 | 3,351.00 | 20:00 | 00:00 | 4 | PROD1 | DRILL | WAIT | (628c) WOW. Meanwhile observe well on trip tank. |
| 15/02/2002 | 3,351.00 | 00:00 | 13:30 | 13.5 | PROD1 | DRILL | WAIT | (628c) WOW. Meanwhile observe well on trip tank |
| 15/02/2002 | 3,351.00 | 13:30 | 16:00 | 2.5 | PROD1 | DRILL | WAIT | Rucker wire # 1B failed. (# 2b already down 14.02.02) Reduce riser tension fro 569mT to 518mT. Displacing riser to SW via booster line to enable a reduction in riser tension. Monitor well via kill line. Reduce riser tension from 518mT to 464mT. |
| 15/02/2002 | 3,351.00 | 16:00 | 00:00 | 8 | PROD1 | DRILL | WAIT | (628c) WOW. Meanwhile observe well on trip tank – static. 15:40-16:30 De-ballasted rig to survival draught 21,5 m. (*) Max values. |
| 16/02/2002 | 3,351.00 | 00:00 | 21:00 | 21 | PROD1 | DRILL | WAIT | (628c) WOW. Meanwhile observe well on trip tank - static. Yellow Alert Status due to spurious positioning data from LDL array (HPR) until 09:00 hrs, thereafter failure on Gyro #1 (replaced - waiting on stabilization. 10:20-10:35 Ballasted rig down 1m to draught 22,5 m. (*) Max 10m values. |
| 16/02/2002 | 3,351.00 | 21:00 | 00:00 | 3 | PROD1 | DRILL | WAIT | (628c) Continue WOW. Meanwhile installed Diverter R/T and tensioned up riser inner barrel 60 mT. Simultaneously bled off rucker tensioners # 2A (36 mT), # 4A (9 mT) and # 8A (9 mT). Slipped through rucker wire # 1B. Observe well on trip tank - static. Yellow Alert Status due to WOW and Gyro No.1 failure. |
| 17/02/2002 | 3,351.00 | 00:00 | 10:30 | 10.5 | PROD1 | DRILL | WAIT | (628d) Slip new wires through Rucker 2b and 1b. Observe well on trip tank - static. Maintain 50mT tension on Diverter/Inner barrel whilst reducing tension on Rucker 8A, 2A. Yellow Alert Status due to WOW and Gyro No.1 failure. Advisory DP alert status from 07:15 hrs (Gyro No.1 operational, but significant waves still above 5m |
| 17/02/2002 | 3,351.00 | 10:30 | 12:30 | 2 | PROD1 | DRILL | WAIT | (628e) WOW for MOB assistance. Green DP alert status from 11:00 hrs. No mob boat assistance given until 12:30 hrs in order to work safely over open sea in the moon pool |
| 17/02/2002 | 3,351.00 | 12:30 | 18:00 | 5.5 | PROD1 | DRILL | WAIT | (628e) Slipped, cut and re-installed rucker lines 1B, 2A and 2B. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 17/02/2002 | 3,351.00 | 18:00 | 19:15 | 1.25 | PROD1 | DRILL | WAIT | (628f) Re-installed diverter and performed 10 mT over-pull test - OK. L/D Diverter R/T, function tested diverter - OK. |
| 17/02/2002 | 3,351.00 | 19:15 | 19:30 | 0.25 | PROD1 | DRILL | WAIT | (628f) Changed to 6 5/8" DP handling equipment. M/U hang-off stand retrieving tool. |
| 17/02/2002 | 3,351.00 | 19:30 | 22:00 | 2.5 | PROD1 | DRILL | WAIT | (628f) RIH with retrieving tool on 6 5/8" DP. Opened USR (Upper shear rams). 19:40-20:00 Ballasted rig down to drilling draught 23,5 m. |
| 17/02/2002 | 3,351.00 | 22:00 | 00:00 | 2 | PROD1 | DRILL | WAIT | (628f) Displaced riser to 1,33 sg mud at 2600 l/min. |
| 18/02/2002 | 3,351.00 | 00:00 | 01:00 | 1 | PROD1 | DRILL | WAIT | (628f) Continued to displace riser to 1,33 sg mud (2600 l/min). |
| 18/02/2002 | 3,351.00 | 01:00 | 01:30 | 0.5 | PROD1 | DRILL | WAIT | (628f) Broke circulation through kill & choke lines (15 spm), observed well on trip tank below MPR - static. Opened BOP fail safe valves on upper choke outlet and observed for flow below LSR - static. |
| 18/02/2002 | 3,351.00 | 01:30 | 02:00 | 0.5 | PROD1 | DRILL | WAIT | (628f) Opened LSR and carefully RIH with retrieving tool at slow pump rate. Tagged top of HO tool, shut down pump and carefully rotated into HO tool (5 1/4 turns, 25000 ft-lbs). Opened MPR and flow checked well - static. Pulled HO tool carefully out of BOP. Hung up inside upper annular (15 tons over-pull), came free with slow rotation. |
| 18/02/2002 | 3,351.00 | 02:00 | 05:45 | 3.75 | PROD1 | DRILL | WAIT | (628f) Circulated out 1,55 sg mud above 9 5/8" liner shoe at 1400 l/min, boosted riser when heavy mud above BOP (total rate 2800 l/min). Meanwhile slipped and cut rucker line 8A. After approx. 65 m3 mud being circulated, observed sudden pressure drop of 300 psi (unplugged bit nozzle). Max 1,4% gas and max 1,38 sg mud monitored in returns. |
| 18/02/2002 | 3,351.00 | 05:45 | 06:30 | 0.75 | PROD1 | DRILL | WAIT | (628f) Flow checked well - static. |
| 18/02/2002 | 3,351.00 | 06:30 | 08:15 | 1.75 | PROD1 | DRILL | WAIT | (628f) Slugged pipe and POOH with hang-off tool. |
| 18/02/2002 | 3,351.00 | 08:15 | 08:45 | 0.5 | PROD1 | DRILL | WAIT | (628f) Flow checked prior to pulling BHA through BOP - static. |
| 18/02/2002 | 3,351.00 | 08:45 | 10:00 | 1.25 | PROD1 | DRILL | WAIT | (628f) Continued POOH with HO tool. |
| 18/02/2002 | 3,351.00 | 10:00 | 11:00 | 1 | PROD1 | DRILL | WAIT | (628f) Changed to 5" DP handling equipment. Broke out retrieving tool centralize. |
| 18/02/2002 | 3,351.00 | 11:00 | 11:30 | 0.5 | PROD1 | DRILL | WAIT | (628f) Broke out saver sub from HO tool. |
| 18/02/2002 | 3,351.00 | 11:30 | 12:00 | 0.5 | PROD1 | DRILL | WAIT | (628f) Re-assembled HO stand and racked same back in derrick. Broke out Kelly valve and Gray valve. |
| 18/02/2002 | 3,351.00 | 12:00 | 13:00 | 1 | PROD1 | DRILL | WAIT | (628f) RIH with 8 1/2" BHA on 5" DP. |
| 18/02/2002 | 3,351.00 | 13:00 | 13:15 | 0.25 | PROD1 | DRILL | WAIT | (628f) Changed to 6 5/8" DP handling equipment. |
| 18/02/2002 | 3,351.00 | 13:15 | 18:00 | 4.75 | PROD1 | DRILL | WAIT | (628f) Continued RIH with 8 1/2" BHA on 6 5/8" to 3324m. Rotated pipe @ 90 rpm every 10 stands to break mud gel strength and filled pipe every 1000 m. Observed tight spots at 2970m and 2990m. 15T. Wipe through. |
| 18/02/2002 | 3,351.00 | 18:00 | 19:30 | 1.5 | PROD1 | DRILL | WAIT | (628f) Filled pipe and broke circulation. Washed down from 3324-3335 m and tagged fill 16m off bottom. Washed and reamed light fill from 3335-3351 m. Displaced 1,55 sg mud up below BOP. |
| 18/02/2002 | 3,351.00 | 19:30 | 20:00 | 0.5 | PROD1 | DRILL | WAIT | (628f) Flow checked well - static. |
| 18/02/2002 | 3,351.00 | 20:00 | 22:00 | 2 | PROD1 | DRILL | WAIT | (628f) Continued to displace well to 1,33 sg mud, boosted riser when heavy mud above BOP. Max 11,7% gas monitored on bottoms up. |
| 18/02/2002 | 3,351.00 | 22:00 | 22:15 | 0.25 | PROD1 | DRILL | WAIT | (628f) Flow checked well - static. |
| 18/02/2002 | 3,351.00 | 22:15 | 22:45 | 0.5 | PROD1 | DRILL | WAIT | (628f) Circulated and conditioned well while diluting heavy mud present in active system. Max mud weight in returns 1.43sg. |
| 18/02/2002 | 3,351.00 | 22:45 | 00:00 | 1.25 | PROD1 | DRILL | DRL | (628g) Drilled 8 1/2" hole from 3351-3580 m (35 m/hr, 2600 l/min, 3300 psi, 2-10 mT, 130 rpm, 4000-13000 ft-lbs, max 3,3% gas). |
| 19/02/2002 | 3,380.00 | 00:00 | 02:45 | 2.75 | PROD1 | DRILL | DRL | (628g) Drilled and surveyed 8 1/2" hole from 3380-3417m (27 m/hr, 2630 l/min, 3260 psi, 5-10 mT, 130 rpm, 5000-7000 ft-lbs). |
| 19/02/2002 | 3,417.00 | 02:45 | 03:15 | 0.5 | PROD1 | DRILL | RIGR | (628g) Troubleshot TDS gearbox oil pressure alarm. |
| 19/02/2002 | 3,417.00 | 03:15 | 06:45 | 3.5 | PROD1 | DRILL | DRL | (628g) Continued to drill and survey 8 1/2" hole from 3417-3467m (24 m/hr, 2600 l/min, 3240 psi, 5-10 mT, 131 rpm, 6000-7000 ft-lbs). |
| 19/02/2002 | 3,467.00 | 06:45 | 07:00 | 0.25 | PROD1 | DRILL | RIGR | (628g) Re-filled oil on TDS gear box. |
| 19/02/2002 | 3,467.00 | 07:00 | 09:30 | 2.5 | PROD1 | DRILL | DRL | (628g) Continued to drill and survey 8 1/2" hole from 3467-3495m (28 m/hr, 2780 l/min, 3670 psi, 5-10 mT, 131 rpm, 7000-8000 ft-lbs). Advisory DP alert status from 09:45 hrs (significant waves above 5m). |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 19/02/2002 | 3,495.00 | 09:30 | 10:30 | 1 | PROD1 | DRILL | FCHK | (628g) Flow checked well, observed 2,4 m3 slow increase on trip tank. Suspect increase caused by rig heave swabbing mud out of drillstring with float installed. 4m heave. (gained volume equal to volume used to fill pipe when resuming drilling operations). Active returned to previous level. |
| 19/02/2002 | 3,495.00 | 10:30 | 10:45 | 0.25 | PROD1 | DRILL | FCHK | (628g) Racked back 1 std. |
| 19/02/2002 | 3,495.00 | 10:45 | 11:30 | 0.75 | PROD1 | DRILL | CIRC | (628g) Circulated B/U to 500m below the BOP. |
| 19/02/2002 | 3,495.00 | 11:30 | 12:00 | 0.5 | PROD1 | DRILL | FCHK | (628g) Flow checked well and observed 2m3 slow increase on trip tank. |
| 19/02/2002 | 3,495.00 | 12:00 | 13:30 | 1.5 | PROD1 | DRILL | WKIL | (628g) Precautionary closed in well on upper annular. Circulated bottoms up kill line at 30 spm, 25psi. Increased to 40spm when b/u past BOP. Max gas on B/U was 1,5%. |
| 19/02/2002 | 3,495.00 | 13:30 | 13:45 | 0.25 | PROD1 | DRILL | FCHK | (628g) Flow checked well - static. |
| 19/02/2002 | 3,495.00 | 13:45 | 16:30 | 2.75 | PROD1 | DRILL | CIRC | (628g) Circulated, conditioned and increased MW to 1,35sg. |
| 19/02/2002 | 3,495.00 | 16:30 | 21:45 | 5.25 | PROD1 | DRILL | DRL | (628g) Continued to drill and survey 8 1/2" hole from 3495-3582 m (35 m/hr, 2750 l/min, 3790 psi, 5-10 mT, 131 rpm, 9000-10000 ft-lbs). Flushed kill and choke lines with 1,35 sg mud using cement unit. Started adding 1,6% Penetrex (lubricity enhancer & bit balling preventer) into the active mud system 21:00 hrs. Green DP alert status from 19:40 hrs. |
| 19/02/2002 | 3,582.00 | 21:45 | 22:00 | 0.25 | PROD1 | DRILL | WKIL | Took SCR's up riser with 1,35 sg mud. |
| 19/02/2002 | 3,582.00 | 22:00 | 00:00 | 2 | PROD1 | DRILL | DRL | (628g) Continued to drill and survey 8 1/2" hole from 3582-3612 m (30 m/hr, 2770 l/min, 3870 psi, 5-10 mT, 131 rpm, 8000-9000 ft-lbs). Monitored choke line friction, pumping down line with 1,35 sg mud. |
| 20/02/2002 | 3,417.00 | 00:00 | 02:45 | 2.75 | PROD1 | DRILL | DRL | (628g) Continued to drill and survey 8 1/2" hole from 3612-3650 m (34 m/hr, 2800 l/min, 3960 psi, 5-10 mT, 131 rpm, 9000-10000 ft-lbs). Took TD survey. |
| 20/02/2002 | 3,650.00 | 02:45 | 03:00 | 0.25 | PROD1 | DRILL | CIRC | (629) Pumped 5 m3 hi-vis sweep and started to circulate bottoms up. Observed 1700 psi pressure drop on standpipe. |
| 20/02/2002 | 3,650.00 | 03:00 | 04:00 | 1 | PROD1 | DRILL | RIGR | (629) Troubleshot loss of pump pressure, found wash-out on stand pipe valve MP #2 and piston on MP #3. Meanwhile moved pipe and circulated well on MP # 1. Isolated stand pipe valve MP #2. |
| 20/02/2002 | 3,650.00 | 04:00 | 07:30 | 3.5 | PROD1 | DRILL | CIRC | (629) Circulated 2 x bottoms up while rotating slowly and reciprocating pipe on full stand (2760 l/min, 3910 psi, 1600 ft-lbs, 11 rpm), no losses seen. Increased mud weight to 1,36 sg during circulation. Pumped 5 m3 hi-vis sweep when first sweep above BOP. Changed pump piston on MP #3 and started to boost riser at 05:00 hrs (pump repaired). |
| 20/02/2002 | 3,650.00 | 07:30 | 08:00 | 0.5 | PROD1 | DRILL | FCHK | (630) Flow checked well - negative. |
| 20/02/2002 | 3,650.00 | 08:00 | 13:15 | 5.25 | PROD1 | DRILL | TRIP | (630a) Pumped out of 8 1/2" hole at 30 spm (420 l/min, 3 min/std), hole in good condition. |
| 20/02/2002 | 3,650.00 | 13:15 | 13:30 | 0.25 | PROD1 | DRILL | FCHK | (631) Flow checked well with bit above 9 5/8" liner shoe - negative. |
| 20/02/2002 | 3,650.00 | 13:30 | 14:15 | 0.75 | PROD1 | WHEAD | BOPT | (631) Function tested BOP on blue and yellow pods from drillers panel. -OK. |
| 20/02/2002 | 3,650.00 | 14:15 | 14:30 | 0.25 | PROD1 | DRILL | CIRC | (631) Pumped heavy slug. |
| 20/02/2002 | 3,650.00 | 14:30 | 16:00 | 1.5 | PROD1 | DRILL | TRIP | (631) POOH with BHA from 2700-1800 m. |
| 20/02/2002 | 3,650.00 | 16:00 | 16:15 | 0.25 | PROD1 | DRILL | FCHK | (631) Flow checked well prior to pulling BHA through BOP - negative. |
| 20/02/2002 | 3,650.00 | 16:15 | 16:30 | 0.25 | PROD1 | DRILL | TRIP | (631) Continued POOH with BHA. |
| 20/02/2002 | 3,560.00 | 16:30 | 16:45 | 0.25 | PROD1 | DRILL | TRIP | (631) Changed to 5" DP handling equipment. |
| 20/02/2002 | 3,650.00 | 16:45 | 17:00 | 0.25 | PROD1 | DRILL | TRIP | (631) Continued POOH with BHA. |
| 20/02/2002 | 3,650.00 | 17:00 | 19:00 | 2 | PROD1 | DRILL | CIRC | (631) Washed inside BOP, pumped 10 m3 hi-vis sweep and circulated bottoms up from BOP while boosting riser (2800 l/min, 3500 psi). Observed clean returns over shakers. |
| 20/02/2002 | 3,650.00 | 19:00 | 19:15 | 0.25 | PROD1 | DRILL | CIRC | (631) Pumped heavy slug. |
| 20/02/2002 | 3,650.00 | 19:15 | 21:00 | 1.75 | PROD1 | DRILL | TRIP | (631) Continued POOH with BHA. Meanwhile function tested BOP shear rams on blue and yellow pods from remote panel (TP office) - OK. |
| 20/02/2002 | 3,650.00 | 21:00 | 22:00 | 1 | PROD1 | DRILL | BHA | (632) POOH and rack 8 1/2" BHA back in derrick. |
| 20/02/2002 | 3,650.00 | 22:00 | 23:30 | 1.5 | PROD1 | DRILL | BHA | (634) Broke bit, laid down MWD/LWD assy on deck. |
| 20/02/2002 | 3,650.00 | 23:30 | 00:00 | 0.5 | PROD1 | EVAL | LOG | (634) Prepared for logging operations. Cleaned and tidied up rig floor, rigged up compensator line. |
| 21/02/2002 | 3,650.00 | 00:00 | 01:00 | 1 | PROD1 | EVAL | LOG | (670) Held pre-job meeting on rig floor prior to logging operation. Rigged up compensator and sheaves. P/U logging tools (run 2A1), GR-VSP. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 21/02/2002 | 3,650.00 | 01:00 | 01:15 | 0.25 | PROD1 | EVAL | LOG | (671) Function tested logging tools. |
| 21/02/2002 | 3,650.00 | 01:15 | 01:30 | 0.25 | PROD1 | EVAL | LOG | (672) RIH with logging tools to 100 m. |
| 21/02/2002 | 3,650.00 | 01:30 | 02:00 | 0.5 | PROD1 | EVAL | LOG | (673) Moved air hose cable away from sheaves in derrick and activated compensator. |
| 21/02/2002 | 3,650.00 | 02:00 | 03:15 | 1.25 | PROD1 | EVAL | LOG | (674) RIH with logging tools to 9 5/8" liner shoe. Performed tool evaluation and VSP check shot while RIH. |
| 21/02/2002 | 3,650.00 | 03:15 | 04:15 | 1 | PROD1 | EVAL | LOG | (674) Continued RIH in 8 1/2" open hole to 3645m (loggers depth). Tool hung up at 2744m, 3320m, 3335m, 3343m, 3440 and 3600m. Tied in to the MWD log (drillers depth), tagged fill 9 m off TD. |
| 21/02/2002 | 3,650.00 | 04:15 | 11:00 | 6.75 | PROD1 | EVAL | LOG | (677) Performed open hole VSP logging at 20m intervals (2 x geophones with 10m spacing) from 3640-2720 m, minor telemetry problems experienced. |
| 21/02/2002 | 3,650.00 | 11:00 | 11:30 | 0.5 | PROD1 | EVAL | LOG | (677) Surface logging system locked up due to tool telemetry problems. Had to power down and reboot computer system. Advisory DP alert status from 11:30 hrs (wind speed above 40 knots). |
| 21/02/2002 | 3,650.00 | 11:30 | 14:00 | 2.5 | PROD1 | EVAL | LOG | (677) Performed cased hole VSP logging from 2720-2300m. |
| 21/02/2002 | 3,650.00 | 14:00 | 14:15 | 0.25 | PROD1 | EVAL | LOG | (677) Started POOH for VSP check shots. |
| 21/02/2002 | 3,650.00 | 14:15 | 14:45 | 0.5 | PROD1 | EVAL | LOG | (677) Broke shear pin on rig compensator line (rated to 8,4 mT), replaced shear pin. |
| 21/02/2002 | 3,650.00 | 14:45 | 15:30 | 0.75 | PROD1 | EVAL | LOG | (677) Performed VSP check shots from 2200-1700 m. |
| 21/02/2002 | 3,650.00 | 15:30 | 16:30 | 1 | PROD1 | EVAL | LOG | (678) Lost VSP signal due to free casing signals. POOH with logging tools. |
| 21/02/2002 | 3,650.00 | 16:30 | 17:45 | 1.25 | PROD1 | EVAL | LOG | (681) Rigged down VSP logging tools. Troubleshot telemetry problem and found poor electrical connection between TCC and ACTS. (.ie. ACTS and tool head OK for re-use). Note: Max downhole temperature recorded @ 80 degC. |
| 21/02/2002 | 3,650.00 | 17:45 | 19:15 | 1.5 | PROD1 | EVAL | LOG | (684) P/U Super Combo logging tools (run 2B1), NGS-PEX-HRLA-FMS-DSI-SP. Held safety meeting on rig floor prior to loading radio active sources. Rigged up compensator. |
| 21/02/2002 | 3,650.00 | 19:15 | 20:15 | 1 | PROD1 | EVAL | LOG | (688) RIH with logging tools to 9 5/8" liner shoe. |
| 21/02/2002 | 3,650.00 | 20:15 | 21:30 | 1.25 | PROD1 | EVAL | LOG | (688) Continued RIH in 8 1/2" open hole to 3645m (loggers depth). |
| 21/02/2002 | 3,650.00 | 21:30 | 23:45 | 2.25 | PROD1 | EVAL | LOG | (691) Performed open hole logging from 3645-2731m (loggers depth) at 2000 ft/hr. |
| 21/02/2002 | 3,650.00 | 23:45 | 00:00 | 0.25 | PROD1 | EVAL | LOG | (691) Continued logging inside 9 5/8" liner from 2731-2644m (loggers depth). Green DP alert status from 23:55 hrs. |
| 22/02/2002 | 3,650.00 | 00:00 | 01:00 | 1 | PROD1 | EVAL | LOG | (692) RIH to 3275 m, open calipers. Repeated logging section 3275 - 3145 m. Closed calipers. |
| 22/02/2002 | 3,650.00 | 01:00 | 03:45 | 2.75 | PROD1 | EVAL | LOG | (696-697) POOH with NGS-PEX-HRLA-FMS-DSI-SP. Removed sources and R/D tools. |
| 22/02/2002 | 3,650.00 | 03:45 | 05:30 | 1.75 | PROD1 | EVAL | CORE | (698 - 701) P/U MSCT tools (run 2C1). Changed logging head. Tested tools. Installed protector and activated compensator. |
| 22/02/2002 | 3,650.00 | 05:30 | 07:00 | 1.5 | PROD1 | EVAL | CORE | (702) RIH with MSCT to 1700 m. Tested telemetry - OK. Continued RIH to 2710 m, tested telemetry - OK. Continued RIH to 3620 m. |
| 22/02/2002 | 3,650.00 | 07:00 | 08:00 | 1 | PROD1 | EVAL | CORE | (703) Attempted to correlate log at 3620 m, poor log character. Correlated log at 3490 - 3424 m - OK. Relogged to verify correlation. |
| 22/02/2002 | 3,650.00 | 08:00 | 11:00 | 3 | PROD1 | EVAL | CORE | (704) Started core programme at 3593 m, moving up hole for priority 1 depths. Confirmed depth control at 3475 m with gamma log. Experienced problem with limit switch. Overrode limit switch and continued manually. Continued core programme with depth correlation at 3427 m and 3283 m, limit switch OK. Completed priority 1 points at 3208.7 m. |
| 22/02/2002 | 3,650.00 | 11:00 | 12:30 | 1.5 | PROD1 | EVAL | CORE | (704) RIH to deeper priority 2 points. Correlated with gamma over 3325 m area. Experienced limit switch problems at 3313.9 m. Overrode and continued coring using manual control. Continued core programme uphole, limit switch OK. Verified depth at 2826.7 m. Continued to cut last core at 2739.5 m. |
| 22/02/2002 | 3,650.00 | 12:30 | 14:15 | 1.75 | PROD1 | EVAL | CORE | (705 - 706) POOH, deactivated heave compensator. |
| 22/02/2002 | 3,650.00 | 14:15 | 15:30 | 1.25 | PROD1 | EVAL | CORE | (708-709) R/D MSCT equipment. Recovered 26 cores out of 27 cuts attempted. |
| 22/02/2002 | 3,650.00 | 15:30 | 17:00 | 1.5 | PROD1 | DRILL | RIGS | Cut and slip drill line. |
| 22/02/2002 | 3,650.00 | 17:00 | 17:30 | 0.5 | PXA | CEMT | TRIP | (711) Prepared to run 3 1/2" cement stinger. Changed to 3 1/2" DP equipment. |
| 22/02/2002 | 3,650.00 | 17:30 | 20:45 | 3.25 | PXA | CEMT | TRIP | (712) P/U 3 1/2" DP from deck and M/U 9 5/8" bridge plug. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 22/02/2002 | 3,650.00 | 20:45 | 22:45 | 2 | PXA | CEMT | TRIP | (712) Changed to 5" equipment, changed to 5" saver sub. |
| 22/02/2002 | 3,650.00 | 22:45 | 00:00 | 1.25 | PXA | CEMT | TRIP | (712) RIH with 9 5/8" bridge plug on 5" dp to 1000 m. Filled pipe. |
| 23/02/2002 | 3,650.00 | 00:00 | 04:00 | 4 | PXA | PXA | PLUG | (713) Continued to RIH with 9 5/8" bridge plug to 2684 m. Losses observed from 2660 m (total loss of 1 m3). |
| 23/02/2002 | 3,650.00 | 04:00 | 04:30 | 0.5 | PXA | PXA | PLUG | (713) Set bridge plug with 35 right turns and released from same by pulling up 22 mt in steps - OK. |
| 23/02/2002 | 3,650.00 | 04:30 | 04:45 | 0.25 | PXA | PXA | PLUG | (713) Set down 10 mt on plug - OK. Pulled up 5 m, closed MPR and pressure tested bridge plug to 100 bar/1450 psi/10 min - OK. Opened MPR. |
| 23/02/2002 | 3,650.00 | 04:45 | 05:15 | 0.5 | PXA | CEMT | SAFE | (729) Held pre-job meeting job with involved personnel prior to cement job. |
| 23/02/2002 | 3,650.00 | 05:15 | 05:30 | 0.25 | PXA | CEMT | TBMV | (729) P/U and M/U side entry sub. |
| 23/02/2002 | 3,650.00 | 05:30 | 05:45 | 0.25 | PXA | PXA | PRST | (730) Pressure tested cement lines to 3000 psi. Pumped 8 m3 / 50 bbls spacer. |
| 23/02/2002 | 3,650.00 | 05:45 | 06:45 | 1 | PXA | CEMT | CMTP | (732) Cemented over Bridge plug from 2679 m to 2479 m by pumping 7,95 m3 SW spacer and 8 m3 1.98 sg G Neat cement slurry with 0.10 gal/sack CFR-3L, 0.01 gal/sack NF-6 and 4.48 gal/sack SW. Displaced cement with 0,8 m3 SW spacer and 15,5 m3 1,36 SG mud. *Rig in advisory mode from 0635* |
| 23/02/2002 | 3,650.00 | 06:45 | 07:00 | 0.25 | PXA | CEMT | CMTP | (732) Broke off cement head and MU TDS. |
| 23/02/2002 | 3,650.00 | 07:00 | 08:15 | 1.25 | PXA | CEMT | CMTP | (736) Pumped OOH first seven stands with 500 ltr/std to place the balanced cement plug from 2679 - 2479 m. Pumped OOH to 2349 m. |
| 23/02/2002 | 3,650.00 | 08:15 | 10:30 | 2.25 | PXA | CEMT | CIRC | (736) Circulated bottoms up with 2500 lpm. Boosted riser when btms up above BOP. No cement observed over shakers. |
| 23/02/2002 | 3,650.00 | 10:30 | 11:00 | 0.5 | PXA | CEMT | DSPL | (736) Spotted 65 m3 1,7 SG mud in hole. |
| 23/02/2002 | 3,650.00 | 11:00 | 14:15 | 3.25 | PXA | CEMT | TRIP | (736) POOH with 5" DP and rack back. |
| 23/02/2002 | 3,650.00 | 14:15 | 14:45 | 0.5 | PXA | CEMT | TRIP | (736) Changed to 3 1/2" DP handling equipment. |
| 23/02/2002 | 3,650.00 | 14:45 | 15:30 | 0.75 | PXA | CEMT | TBMV | (736) POOH and L/D 3 1/2" DP on deck. |
| 23/02/2002 | 3,650.00 | 15:30 | 15:45 | 0.25 | PXA | CEMT | RIGR | (736) Troubleshot electrical problem on crane. |
| 23/02/2002 | 3,650.00 | 15:45 | 16:30 | 0.75 | PXA | CEMT | TRIP | (736) Continued to POOH 3 1/2" DP. Racked back last 7 stands. |
| 23/02/2002 | 3,650.00 | 16:30 | 00:00 | 7.5 | PXA | CEMT | WAIT | (736a) WOW. Rig in yellow alert status from 16:30. Deballasted rig to survival draft 17:00 - 18:00. Closed both shear rams and displaced riser to seawater. Circulated mud through centrifuges and cut back mud weight to 1,27 SG. |
| 24/02/2002 | 3,650.00 | 00:00 | 00:00 | 24 | PXA | PXA | WAIT | (736a) Continued WOW. Meanwhile: Bundled up hoses on TDS, electrical maintenance on TDS, Serviced brakes on drawwork. 14:30: Rig on Red status:Unable to maintain position of the rig - 27 m drift off (WindMax 28 m/s, SignWave 7,9m, Wave Max 12,8m, 7,4m heave, 5,9 deg roll, 8,8 deg pitch). Moved to a more favourable position and disconnected on EQD. Lifted off BOP nice and smoothly. Two ruckers observed slack after disconnect |
| 25/02/2002 | 3,650.00 | 00:00 | 00:00 | 24 | PXA | PXA | WAIT | (736a) WOW. Meanwhile: General maintenance. Closed flange on slip-joint @ 10:30. Finished loading/offloading to Far Swan. Boat left for KSU at 23:55 |
| 26/02/2002 | 3,650.00 | 00:00 | 04:30 | 4.5 | PXA | PXA | WAIT | (736a) Continued WOW. Meanwhile deployed ROV. |
| 26/02/2002 | 3,650.00 | 04:30 | 08:00 | 3.5 | PXA | WHEAD | BOPU | (736b) Moved rig and attempted to position same above BOP. Excessive movement of the LMRP due to problems with DP position keeping . Made two attempts to land LMRP - nogo. 1,8m heave recorded at rig floor when attempting to land LMRP. AX gasket on BOP damaged during 2nd attempt to land. |
| 26/02/2002 | 3,650.00 | 08:00 | 10:30 | 2.5 | PXA | WHEAD | BOPU | (736b) Changed gasket on BOP with ROV. |
| 26/02/2002 | 3,650.00 | 10:30 | 12:30 | 2 | PXA | WHEAD | BOPU | (736b) Changed to minimum gain on DP thruster respond to reduce rig movements. Positioned rig above BOP and landed LMRP. 1,5m heave on rig floor during landing. |
| 26/02/2002 | 3,650.00 | 12:30 | 13:00 | 0.5 | PXA | WHEAD | BOPU | (736c) Sat down 40 T, locked LMRP connector with 1500 psi and performed overpull test to 20mT - OK. Optimised rig position and checked bullseye with ROV - 1 deg on all eyes. Adjusted rucker tensioners. |
| 26/02/2002 | 3,650.00 | 13:00 | 15:00 | 2 | PXA | PXA | RIGR | (736c) Attempted to pressure test choke- and kill lines to 500 psi/5 min & 5000 psi/10 min. Observed leak on kill line - troubleshot same. |
| 26/02/2002 | 3,650.00 | 15:00 | 15:15 | 0.25 | PXA | PXA | RIGR | (736c) Flowchecked well for 15 min over choke line - negative. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 26/02/2002 | 3,650.00 | 15:15 | 16:00 | 0.75 | PXA | PXA | RIGR | (736c) Pumped white dye down kill line and observe for leak with ROV. Leak observed at LMRP mini connector on kill line. Closed kill line isolation valve and pressure tested kill line to 500 psi/5 min and 5000 psi/10 min - OK. *Rig in advisory mode @ 15:50 hrs* |
| 26/02/2002 | 3,650.00 | 16:00 | 00:00 | 8 | PXA | PXA | WAIT | (736d) WOW. Weather too rough to receive mob boat assistance for crew working over open sea in moonpool and release locking bolts on slip joint inner barrel. Rig in Yellow Alert Status from 17:10 (problems related to DP computer A |
| 27/02/2002 | 3,650.00 | 00:00 | 05:00 | 5 | PXA | PXA | WAIT | (736d) Continued WOW |
| 27/02/2002 | 3,650.00 | 05:00 | 07:00 | 2 | PXA | WHEAD | RISR | (736e) Held pre job meeting and commenced work on slip joint. Released same. L/D landing joint. |
| 27/02/2002 | 3,650.00 | 07:00 | 08:00 | 1 | PXA | WHEAD | BOPU | (736e) Held pre job meeting and P/U divertor. Installed same and performed 10T overpull test - OK. Completed hooking up hydraulic and electric power. Energised diverter seals. *Rig back to 'green mode' @ 07:30* |
| 27/02/2002 | 3,650.00 | 08:00 | 08:30 | 0.5 | PXA | WHEAD | RISR | (736e) Rigged down diverter running equipment and changed bails from 500 T to 350 T. Installed BX elevator. |
| 27/02/2002 | 3,650.00 | 08:30 | 08:45 | 0.25 | PXA | WHEAD | WAIT | (736e) Assess necessity to disconnect LMRP due to poor locking of mini connector. Based on images from ROV inspection decision was made to continue the operation. |
| 27/02/2002 | 3,650.00 | 08:45 | 10:00 | 1.25 | PXA | WHEAD | RISR | (736e) Continued to rig down divertor running equipment, changing bails and installing BX elevator. |
| 27/02/2002 | 3,650.00 | 10:00 | 11:45 | 1.75 | PXA | PXA | BHA | (736e) LD drill collars, monels, jar and HWDP. |
| 27/02/2002 | 3,650.00 | 11:45 | 15:15 | 3.5 | PXA | PXA | TRIP | (739,740) PU 13 3/8" casing brush and EZSV (bridge plug). MU same and RIH to 1412 m. Displaced riser from seawater to 1,25 SG mud while tripping in. |
| 27/02/2002 | 3,650.00 | 15:15 | 15:45 | 0.5 | PXA | PXA | SAFE | (740) Performed diverter drill (D3) - OK. Element closed in 45 sec. |
| 27/02/2002 | 3,650.00 | 15:45 | 16:30 | 0.75 | PXA | PXA | MISC | (740) Opened failsafe and flow checked well 15 min - negative (well static). Opened shear ram. |
| 27/02/2002 | 3,650.00 | 16:30 | 17:45 | 1.25 | PXA | PXA | TRIP | (740) Continued to trip in hole from 1412 m - 1775 m. Washed and reciprocated from 1765 m - 1775 m. |
| 27/02/2002 | 3,650.00 | 17:45 | 18:00 | 0.25 | PXA | PXA | PLUG | (741) Set EZSV @ 1770 m according to Halliburton procedures. Performed 25 T overpull and tagged plug with 20 T down weight. |
| 27/02/2002 | 3,650.00 | 18:00 | 20:15 | 2.25 | PXA | PXA | CIRC | (741) Pulled 5 m above bridge plug and displaced to 1.25 sg mud at 1500 l/min. Boosted riser with 2 pumps when 1,70 sg mud above BOP. |
| 27/02/2002 | 3,650.00 | 20:15 | 21:00 | 0.75 | PXA | PXA | CIRC | (741) Monitored SCR. |
| 27/02/2002 | 3,650.00 | 21:00 | 22:00 | 1 | PXA | WHEAD | BOPU | (741a) Tested LMRP connector to 500/1450 psi - OK. Function tested BOP. |
| 27/02/2002 | 3,650.00 | 22:00 | 22:30 | 0.5 | PXA | PXA | SAFE | (742) Performed kick drill (D1). 45 sec to stab and close kelly, 3 min to shut well in. Performed well kill drill (D5 and D2). |
| 27/02/2002 | 3,650.00 | 22:30 | 00:00 | 1.5 | PXA | PXA | CIRC | (742) Pumped slug and start POOH. |
| 28/02/2002 | 3,650.00 | 00:00 | 01:00 | 1 | PXA | PXA | TRIP | (742) Continued POOH while pumping slug. |
| 28/02/2002 | 3,650.00 | 01:00 | 01:30 | 0.5 | PXA | PXA | BHA | (742) LD EZSV running tool. |
| 28/02/2002 | 3,650.00 | 01:30 | 02:30 | 1 | PXA | PXA | BHA | (742a) PU MPT assembly and BOP cup tester. Redressed same. Travelling assembly greased and same inspected. |
| 28/02/2002 | 3,650.00 | 02:30 | 06:30 | 4 | PXA | PXA | TRIP | (742a) RIH with MPT and BOP cup tester. Washed wellhead with 1400 lpm / 55 bar. |
| 28/02/2002 | 3,650.00 | 06:30 | 08:30 | 2 | PXA | WHEAD | BOPT | (742a) Attempted to land BOP cup tester and MPT in wellhead. Took weight too early according to space out of string. Pulled out with 5 stands and closed shear ram. RIH and tagged same to confirm depth. Rig in advisory status due to footprint exceeding 8 m. |
| 28/02/2002 | 3,650.00 | 08:30 | 10:30 | 2 | PXA | WHEAD | BOPT | (742a) Ran back in wellhead with cup tester and MPT. Landed same in wellhead with 10 T. Performed a complete BOP test with cement unit to 500 psi/5 min and 3250 psi/10 min - OK. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 28/02/2002 | 3,650.00 | 10:30 | 10:45 | 0.25 | PXA | WHEAD | MISC | (742a) Pulled back, re-entered wear bushing with MPT and sat down 15 T. Retrieved wear bushing with 15 T overpull. Pumped 4 m3 slug. |
| 28/02/2002 | 3,650.00 | 10:45 | 13:30 | 2.75 | PXA | PXA | TRIP | (742a) POOH. Recovered WB - OK. Key seating observed on one side of wear bushing. |
| 28/02/2002 | 3,650.00 | 13:30 | 14:30 | 1 | PXA | PXA | BHA | (742a) LD wear bushing and MPT. Racked back 5" HWDP. |
| 28/02/2002 | 3,650.00 | 14:30 | 20:45 | 6.25 | PXA | PXA | BHA | (742b) Rebuilt from motor cutting to conventional 13 3/8" casing cutter assembly. |
| 28/02/2002 | 3,650.00 | 20:45 | 00:00 | 3.25 | PXA | PXA | RIGS | (742b) Performed maintenance on travelling equipment and drawworks. Rig in green status from 21:25. |
| 01/03/2002 | 3,650.00 | 00:00 | 01:00 | 1 | PXA | PXA | RIGS | (742b) Continued maintenance on travelling equipment and drawworks. |
| 01/03/2002 | 3,650.00 | 01:00 | 04:30 | 3.5 | PXA | PXA | TRIP | (742c) RIH with 5" open ended DP. Tagged lower shear ram and pulled out two stands. |
| 01/03/2002 | 3,650.00 | 04:30 | 05:00 | 0.5 | PXA | PXA | CLNR | (742c) Cleaned rig floor. |
| 01/03/2002 | 3,650.00 | 05:00 | 05:30 | 0.5 | PXA | CEMT | TBMV | (742b) LD cement stand. |
| 01/03/2002 | 3,650.00 | 05:30 | 08:30 | 3 | PXA | PXA | CUT | (742d) RU Schlumberger wireline running equipment including extended bails, sheaves, kelly cock, T-sub, 5" pup and x-over. |
| 01/03/2002 | 3,650.00 | 08:30 | 12:30 | 4 | PXA | PXA | CUT | (742d) Schlumberger prepared tools for perforation of 13 3/8" casing. |
| 01/03/2002 | 3,650.00 | 12:30 | 13:00 | 0.5 | PXA | PXA | SAFE | (742d) Pre-job meeting prior to rigging up wireline and guns. |
| 01/03/2002 | 3,650.00 | 13:00 | 15:15 | 2.25 | PXA | PXA | CUT | (742d) Positioned string. Closed upper annular and stripped tool joint up to same. MU toolstring. |
| 01/03/2002 | 3,650.00 | 15:15 | 16:45 | 1.5 | PXA | PXA | CUT | (742e) RIH with 8 shots/2 ft perforating gun on WL. Opened failsafe and monitored for pressure below shear ram. Pressured up well to 300 psi with cement unit and recorded pressure against closed choke. Perforated casing @ 1527 m and recorded a drop in pressure to 0. No losses observed. |
| 01/03/2002 | 3,650.00 | 16:45 | 17:15 | 0.5 | PXA | PXA | CIRC | (742e) Circulated 7 m3 up choke line (bottoms up +). No hydrocarbons detected. |
| 01/03/2002 | 3,650.00 | 17:15 | 17:30 | 0.25 | PXA | PXA | WKIL | (742f) Opened annular and performed flow checked for 15 min - negative (well static). |
| 01/03/2002 | 3,650.00 | 17:30 | 18:00 | 0.5 | PXA | PXA | CUT | 742g) POOH with wireline and guns. |
| 01/03/2002 | 3,650.00 | 18:00 | 18:30 | 0.5 | PXA | PXA | CUT | (742g) Held pre job meeting prior to L/D guns. L/D guns, found all shots fired. |
| 01/03/2002 | 3,650.00 | 18:30 | 21:00 | 2.5 | PXA | PXA | CUT | (742g) R/D wireline equipment. |
| 01/03/2002 | 3,650.00 | 21:00 | 00:00 | 3 | PXA | PXA | TRIP | 742h) Pumped slug and POOH with 5" DP to 100 m at report time. |
| 02/03/2002 | 3,650.00 | 00:00 | 01:00 | 1 | PXA | PXA | TRIP | (742h) Continued to POOH with 5" DP and pumped slug. |
| 02/03/2002 | 3,650.00 | 01:00 | 06:00 | 5 | PXA | PXA | TRIP | (743) PU casing cutter assembly and RIH with same. Landed marine swivel in wellhead with 7 T downweight. |
| 02/03/2002 | 3,650.00 | 06:00 | 06:15 | 0.25 | PXA | PXA | SAFE | (745) Pre-job meeting prior to cutting 13 3/8" casing. |
| 02/03/2002 | 3,650.00 | 06:15 | 07:30 | 1.25 | PXA | PXA | CUT | (745) Cut casing with 100 rpm, 600 lpm, 1400 psi and 3000-6000 ft-lbs torque (free rotational torque recorded to 2000 - 4000 ft-lbs). Observed a drop in torque and pressure after 8 min of cutting. Closed upper annular and observed for pressure build up on choke - negative. Flow checked with annular closed for 20 min - negative (well static). Opened annular and flow checked for 20 min - negative (well static). |
| 02/03/2002 | 3,650.00 | 07:30 | 08:30 | 1 | PXA | PXA | TRIP | (746a) Pumped slug and POOH to 1504 m with casing cutter assembly. |
| 02/03/2002 | 3,650.00 | 08:30 | 09:30 | 1 | PXA | PXA | RIGR | Broken clavis on lower racking arm cylinder. Repaired same. |
| 02/03/2002 | 3,650.00 | 09:30 | 12:30 | 3 | PXA | PXA | TRIP | (746a) Continued to POOH from 1504 m. *Rig into advisory mode @ 12:20 due to sign. Wave height of 5,4 m* |
| 02/03/2002 | 3,650.00 | 12:30 | 14:00 | 1.5 | PXA | PXA | BHA | (746b) MU casing spear for retrieving 13 3/8" casing and hanger. |
| 02/03/2002 | 3,650.00 | 14:00 | 16:30 | 2.5 | PXA | PXA | TRIP | (746b) RIH with spear on 5" DP to above BOP. |
| 02/03/2002 | 3,650.00 | 16:30 | 16:45 | 0.25 | PXA | PXA | SAFE | (746b) Held pre-job meeting prior to latching on to casing. *Rig in green mode @ 16:30* |
| 02/03/2002 | 3,650.00 | 16:45 | 17:45 | 1 | PXA | CASE | CSG | (746b) Landed and latched on spear in wellhead with 4-5 T downweight. Performed 15 T overpull. Closed upper annular. Pulled casing free with 28 T overpull. Flowchecked well up choke line for 20 min - negative (well static). Opened annular and performed flow check for 20 min - negative (well static). |
| 02/03/2002 | 3,650.00 | 17:45 | 21:00 | 3.25 | PXA | CASE | CSG | (747) Pumped slug and POOH with 13 3/8" casing. |

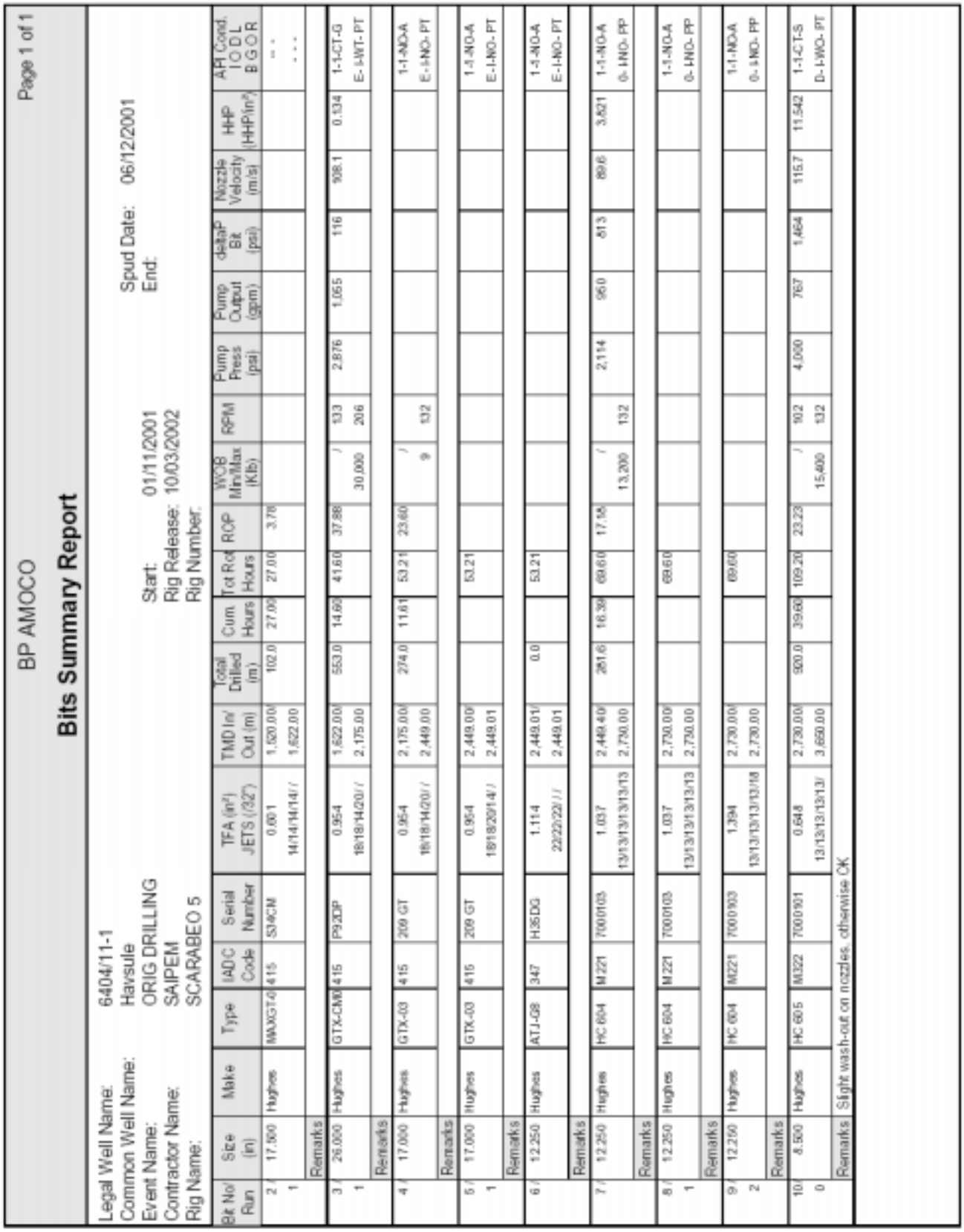
| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 02/03/2002 | 3,650.00 | 21:00 | 22:00 | 1 | PXA | CASE | CSG | (748) Released spear and racked back spear assembly in derrick. |
| 02/03/2002 | 3,650.00 | 22:00 | 22:30 | 0.5 | PXA | CASE | CSG | (748) Cleaned up rig floor. |
| 02/03/2002 | 3,650.00 | 22:30 | 00:00 | 1.5 | PXA | CASE | CSG | (749) Prepared for handling casing: Changed bails and elevator. |
| 03/03/2002 | 3,650.00 | 00:00 | 01:45 | 1.75 | PXA | CASE | CSG | (749) Continued changing bails and elevator for handling casing. Installed 13 3/8" spider. Closed lower shear ram prior to displacing riser to seawater due to yellow alert (footprint more than 14 m.) *Rig into yellow alert @ 00:45* |
| 03/03/2002 | 3,650.00 | 01:45 | 02:00 | 0.25 | PXA | CASE | SAFE | (749) Held pre-job meeting prior to LD casing. |
| 03/03/2002 | 3,650.00 | 02:00 | 06:30 | 4.5 | PXA | CASE | CSG | (749) LD 13 3/8" casing - total 18 joints + cut joint (7,6 m). Confirmed cut at 1759 m. Meanwhile displaced riser to seawater. *Rig in advisory mode @ 05:45* |
| 03/03/2002 | 3,650.00 | 06:30 | 07:00 | 0.5 | PXA | PXA | CLNR | (749) Cleaned rigfloor. *Rig from advisory to green mode @ 06:30* |
| 03/03/2002 | 3,650.00 | 07:00 | 09:45 | 2.75 | PXA | PXA | BHA | (749a) Changed to 5" DP running equipment. Meanwhile held pre-job meeting and displaced riser to 1,25 SG mud. |
| 03/03/2002 | 3,650.00 | 09:45 | 10:15 | 0.5 | PXA | PXA | RIGR | Repaired broken hose on lower racking arm - OK. |
| 03/03/2002 | 3,650.00 | 10:15 | 13:30 | 3.25 | PXA | PXA | TRIP | (750) RIH with diverting tool on 5" DP. Tagged cut @ 1759 m. Experienced problems to enter 13 3/8" casing. Managed to get in after several attempts. RIH to 1764 m. |
| 03/03/2002 | 3,650.00 | 13:30 | 13:45 | 0.25 | PXA | CEMT | CMTP | (750) PU and MU top drive, pump in sub and cement hose. |
| 03/03/2002 | 3,650.00 | 13:45 | 16:00 | 2.25 | PXA | CEMT | CIRC | (751) Circulated bottoms up with two pumps on booster line and one on standpipe manifold. Pressure tested surface line to 3000 psi/10 min and held cementing pre-job meeting while circulating. |
| 03/03/2002 | 3,650.00 | 16:00 | 17:30 | 1.5 | PXA | CEMT | CMTP | (753,754) With OEDP 5 m above the 13 3/8" bridge plug, pumped 30 bbls seawater spacer at 6 BPM and 228 bbls of 1,80 SG DWFS cement at 6 BPM. Displaced cement with 1.6 bbls seawater tail spacer and 83 bbls 1,25 SG mud (3 bbls under displacement) with cement unit at 6 BPM. Slowed down displacement to 3 BPM after pumping 75 bbls mud. |
| 03/03/2002 | 3,650.00 | 17:30 | 18:00 | 0.5 | PXA | CEMT | TRIP | (755) POOH slowly from with 3 min/stand 1765 m to 1550 m. |
| 03/03/2002 | 3,650.00 | 18:00 | 20:30 | 2.5 | PXA | CEMT | CIRC | (756) Circ bottoms up with 2890 lpm. Rucker wire 8b broke off. It had run 11,5 mill ton-milages. |
| 03/03/2002 | 3,650.00 | 20:30 | 21:00 | 0.5 | PXA | CEMT | CIRC | (757) Racked back 1 stand and wash BOP and wellhead. |
| 03/03/2002 | 3,650.00 | 21:00 | 23:00 | 2 | PXA | CEMT | TRIP | (757) Pumped slug and POOH. |
| 03/03/2002 | 3,650.00 | 23:00 | 00:00 | 1 | PXA | PXA | TRIP | (757) L/D cutting and retrieving assemblies while WOC. |
| 04/03/2002 | 3,650.00 | 00:00 | 02:45 | 2.75 | PXA | PXA | BHA | (757) Continued to LD cutting and retrieving assemblies while WOC. |
| 04/03/2002 | 3,650.00 | 02:45 | 05:30 | 2.75 | PXA | PXA | TRIP | (758) MU flat bottom mill to tag cement and RIH to 1473 m. WOC. *Rig in advisory @ 05:30* |
| 04/03/2002 | 3,650.00 | 05:30 | 06:15 | 0.75 | PXA | PXA | RIGS | (758) Normal rig service on travelling equipment. WOC. |
| 04/03/2002 | 3,650.00 | 06:15 | 07:45 | 1.5 | PXA | PXA | TRIP | (758) Continued to RIH to tag cement. Tagged cement with 8 T @ 1570 m. Washed down to 1580 m and sat down 10 T. |
| 04/03/2002 | 3,650.00 | 07:45 | 10:00 | 2.25 | PXA | PXA | PRST | (758,759,760) Pumped slug and POOH. Meanwhile closed both shear rams when above BOP and pressure tested cement plug to 1400 psi down choke line - OK. Displaced riser to seawater while POOH. |
| 04/03/2002 | 3,650.00 | 10:00 | 10:30 | 0.5 | PXA | PXA | CLNR | (762) Cleaned rig floor. |
| 04/03/2002 | 3,650.00 | 10:30 | 13:00 | 2.5 | PXA | WHEAD | RISR | (763) Held pre-job meeting, RD BX-elevator and changed bails from 350T to 500T. RU riser equipment. Installed gimble and spider. |
| 04/03/2002 | 3,650.00 | 13:00 | 14:30 | 1.5 | PXA | WHEAD | BOPD | (764) RU divertor handling tool and LD divertor. |
| 04/03/2002 | 3,650.00 | 14:30 | 16:30 | 2 | PXA | WHEAD | RISR | (764) Changed to 750 T handling equipment. |
| 04/03/2002 | 3,650.00 | 16:30 | 18:00 | 1.5 | PXA | WHEAD | RISR | (765) PU landing joint and MU same. Connected lock bolts to inner barrel. |
| 04/03/2002 | 3,650.00 | 18:00 | 18:30 | 0.5 | PXA | PXA | WAIT | Waiting due to hydraulic leak on ROV. Leak repaired. |
| 04/03/2002 | 3,650.00 | 18:30 | 20:00 | 1.5 | PXA | WHEAD | RISR | (765) Positioned rig and disconnected BOP @ 19:45. Observed 100 mt O-pull on WH connector. Oberved WH with ROV - OK. |
| 04/03/2002 | 3,650.00 | 20:00 | 20:15 | 0.25 | PXA | WHEAD | RISR | (765) Moved rig to parking position 40 m from WH. |
| 04/03/2002 | 3,650.00 | 20:15 | 20:45 | 0.5 | PXA | WHEAD | RISR | (766) Removed clamps for pod wires. |
| 04/03/2002 | 3,650.00 | 20:45 | 21:45 | 1 | PXA | WHEAD | RISR | (766) Hung off support ring |
| 04/03/2002 | 3,650.00 | 21:45 | 22:00 | 0.25 | PXA | WHEAD | RISR | (767) L/D landing joint. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 04/03/2002 | 3,650.00 | 22:00 | 22:15 | 0.25 | PXA | WHEAD | RISR | (767) Held pre job safety meeting with new crew. |
| 04/03/2002 | 3,650.00 | 22:15 | 23:30 | 1.25 | PXA | WHEAD | RISR | (767) Pulled and L/D slip joint |
| 04/03/2002 | 3,650.00 | 23:30 | 00:00 | 0.5 | PXA | WHEAD | RISR | (767) Pulled and L/D riser joints (tot 4 at midnight). |
| 05/03/2002 | 3,650.00 | 00:00 | 04:00 | 4 | PXA | WHEAD | RISR | (767)Continued to pull and LD riser joints. |
| 05/03/2002 | 3,650.00 | 04:00 | 05:45 | 1.75 | PXA | WHEAD | WAIT | WOW due to no MOB boat assistance (wind too strong |
| 05/03/2002 | 3,650.00 | 05:45 | 12:30 | 6.75 | PXA | WHEAD | RISR | (767) Continued to pull and LD riser (from 1384 m - 1115 m). |
| 05/03/2002 | 3,650.00 | 12:30 | 15:00 | 2.5 | PXA | WHEAD | WAIT | WOW. Standby vessel not able to give MOB assistance due to rough weather |
| 05/03/2002 | 3,650.00 | 15:00 | 15:30 | 0.5 | PXA | WHEAD | SAFE | (767) Safety meeting on rigfloor prior to cont. pulling riser and BOP due to falling object. |
| 05/03/2002 | 3,650.00 | 15:30 | 16:30 | 1 | PXA | WHEAD | RISR | (767) Continued to pull and LD riser (from 1077 m to 1057 m). |
| 05/03/2002 | 3,650.00 | 16:30 | 17:45 | 1.25 | PXA | WHEAD | BOPD | Two pod cables were twisted due to slack in the cable. L/O the cables in large loops on deck to be able to spool them back onto the drums. |
| 05/03/2002 | 3,650.00 | 17:45 | 18:30 | 0.75 | PXA | WHEAD | RISR | (767) Continued to pull and LD riser from 1057 to 1038 m. |
| 05/03/2002 | 3,650.00 | 18:30 | 19:15 | 0.75 | PXA | WHEAD | RISR | (767) Investigation meeting on drillfloor due to falling object incident. |
| 05/03/2002 | 3,650.00 | 19:15 | 21:30 | 2.25 | PXA | WHEAD | RISR | (767) Continued to pull riser/BOP from 1038 m to 981 m. |
| 05/03/2002 | 3,650.00 | 21:30 | 00:00 | 2.5 | PXA | WHEAD | RISR | (767) Unable to release 2 riser bolts with riser torque tools. Rigged up tugger and tools to attempt to release the bolts, nogo. Cut the bolts with cutting torch - OK. |
| 06/03/2002 | 3,650.00 | 00:00 | 00:00 | 24 | PXA | WHEAD | RISR | (767) Continued to pull and LD riser (from 981 m - 347 m). Pulling approx.1,3 joints pr. hour. Checked every riser flange for loose nut sleeves, missing retaining cap screws and missing dowel pins. Experienced problems with releasing 2 bolts on a riser joints. Rigged up tugger and tools to attempt to release the bolts, nogo. Cut the bolts with cutting torch - OK. Found slipped buoyancy elements on 2 joints. Used spanner and sledge hammer to undo bolts instead of riser torque tools. Totally 3 retainer cap screws found missing on the bolt subs. Blue and spare pod cable are laid out in loops on the cellar deck due to twisting and kinks before they are spooled onto the drum. Some kinks were difficult to straighten, which caused occasional delays in the operation. |
| 07/03/2002 | 0 | 00:00 | 13:00 | 13 | PXA | WHEAD | RISR | (767) Continue to pull and LD riser (from 347 m - 117 m). Check every riser flange for loose nut sleeves, missing retaining cap screws and missing Dowell pins - OK. |
| 07/03/2002 | 0 | 13:00 | 14:00 | 1 | PXA | WHEAD | RISR | Spider and gimble dislodged from their locking position when a slick riser joint got caught when pulling through. Re-align same. |
| 07/03/2002 | 0 | 14:00 | 15:00 | 1 | PXA | WHEAD | RISR | (767) Continue to pull and LD riser (from 117 m - 60 m). |
| 07/03/2002 | 0 | 15:00 | 15:15 | 0.25 | PXA | WHEAD | CLNR | (767) Clean rig floor and catwalk due to slippery conditions. |
| 07/03/2002 | 0 | 15:15 | 17:45 | 2.5 | PXA | WHEAD | RISR | (767) Continue to pull and LD riser (from 60 m - 40 m). |
| 07/03/2002 | 0 | 17:45 | 18:30 | 0.75 | PXA | WHEAD | RISR | (767) Prepare to pull BOP out of the water. |
| 07/03/2002 | 0 | 18:30 | 21:30 | 3 | PXA | WHEAD | RISR | (768) Pull BOP through splash zone. Extend bumper bars, position BOP carrier underneath the BOP and land same. |
| 07/03/2002 | 0 | 21:30 | 00:00 | 2.5 | PXA | WHEAD | RISR | (768) Secure BOP to BOP carrier, prepare to disconnect IRJ from flex joint flange. |
| 08/03/2002 | 0 | 00:00 | 02:00 | 2 | PXA | WHEAD | RISR | (768) Cont. preparing BOP for transfer to storage position. Disconnect MUX cables and IRJ from flex joint flange. |
| 08/03/2002 | 0 | 02:00 | 08:30 | 6.5 | PXA | WHEAD | RISR | (768) Commence skidding BOP towards starboard and prepare to raise BOP. One arm for the BOP acoustic control system not fully retracted - unable to raise BOP (the second arm damaged and hanging down beside the BOP connector). Skid BOP back towards moonpool centre allowing man riding ops. to secure arms for BOP acoustic control system. Meanwhile lay down IRJ and last riser joint. RD torque tools, riser gimble and spider. RD 750T riser handling equipment. Meanwhile skid BOP to storage position, prepare sea fastening. Meanwhile deploy pod wire for ADCP retrieval. |
| 08/03/2002 | 0 | 08:30 | 10:30 | 2 | PXA | RIGD | MISC | (769) RU TDU torque wrench assy, 350T bails, 'BX' elevator and slips. Meanwhile retrieve seabed ADCP. |
| 08/03/2002 | 0 | 10:30 | 11:45 | 1.25 | PXA | PXA | RIGS | (770) Change saver sub to 6-5/8" FH. |
| 08/03/2002 | 0 | 11:45 | 13:45 | 2 | PXA | PXA | CUT | (770) PU MOST tool and function test same. Mark scribe line on MOST tool and motor. |
| 08/03/2002 | 0 | 13:45 | 15:00 | 1.25 | PXA | PXA | CUT | (770) Cont. MU cutting assembly. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 08/03/2002 | 0 | 15:00 | 16:15 | 1.25 | PXA | PXA | MISC | Run in water with transponder basket on pod wire to collect seabed transponders. |
| 08/03/2002 | 0 | 16:15 | 16:45 | 0.5 | PXA | PXA | MISC | (770) Change DP handling equipment from 5" to 6 5/8". |
| 08/03/2002 | 0 | 16:45 | 20:00 | 3.25 | PXA | PXA | TRIP | (771) RIH with cutting assy to 1400m. Note: no need to fill pipe whilst tripping in. Meanwhile retrieve transponder basket w/7 transponders to surface - OK. |
| 08/03/2002 | 0 | 20:00 | 20:15 | 0.25 | PXA | PXA | MISC | (771) Wait for ROV to locate cutting assy. |
| 08/03/2002 | 0 | 20:15 | 20:45 | 0.5 | PXA | PXA | TRIP | (772) Cont. TIH to 1511m. Take up / down weights; 100T / 105T. Move rig towards well centre, ROV assist in stabbing assy into wellhead. Set down 5 - 6T, verify correct lad-out with ROV. |
| 08/03/2002 | 0 | 20:45 | 23:00 | 2.25 | PXA | PXA | CUT | (773) Commence cutting 20" & 36" casing strings w/3200lpm, 105 Bar pump pressure. At 22:30 notice pressure spike and increasing amount of flow from outer annuli. Meanwhile ROV conduct seabed survey. |
| 08/03/2002 | 0 | 23:00 | 00:00 | 1 | PXA | PXA | CUT | (774) Attempt to engage MOST tool to 18-3/4" wellhead - OK. NOTE: weather conditions deteriorating rapidly. NOTE: MOST tool inspected by ROV and found to be in good working order. |
| 09/03/2002 | 0 | 00:00 | 01:00 | 1 | PXA | WHEAD | TRIP | Pulled WH and casing stump free with 150T overpull. Observed Most tool come free from WH. |
| 09/03/2002 | 0 | 01:00 | 02:00 | 1 | PXA | WHEAD | TRIP | Activate AHC and attempted to stab tool string in to WH - Nogo due to excessive rig heave of 4,2m. |
| 09/03/2002 | 0 | 02:00 | 04:00 | 2 | PXA | WHEAD | WAIT | WOW. Meanwhile POOH w/ 6 5/8" DP. |
| 09/03/2002 | 0 | 04:00 | 05:30 | 1.5 | PXA | WHEAD | RIGR | Drive chain on DW motor C broke. Remove broken chain prior to continuing operation. |
| 09/03/2002 | 0 | 05:30 | 06:00 | 0.5 | PXA | WHEAD | TRIP | Cont POOH w/ 6 5/8" DP to enable L/D 5" DP. |
| 09/03/2002 | 0 | 06:00 | 06:30 | 0.5 | PXA | WHEAD | TRIP | Change handling equipment f. 6 5/8" t. 5". |
| 09/03/2002 | 0 | 06:30 | 10:30 | 4 | PXA | WHEAD | TRIP | Held pre-job meeting and L/D 30jnts 5" DP. ROV inspected MOST tool, changed back to 6 5/8" handling equipment. |
| 09/03/2002 | 0 | 10:30 | 11:00 | 0.5 | PXA | WHEAD | TRIP | RIH w/ 6 5/8" DP f. 1227-1451m |
| 09/03/2002 | 0 | 11:00 | 12:00 | 1 | PXA | WHEAD | SUBS | ROV locate POD wire w/ wire sling for hydrate plate. Attempt to release MOST tool locking segments, nogo. |
| 09/03/2002 | 0 | 12:00 | 13:00 | 1 | PXA | WHEAD | TRIP | Stabbed toolstring in WH. Attempted to release segments. Nogo due to jammed bolts. |
| 09/03/2002 | 0 | 13:00 | 14:00 | 1 | PXA | WHEAD | SUBS | Pulled tool string out of WH and set down same on sea-bed. Attempted to release lock segment w/ ROV. Nogo. |
| 09/03/2002 | 0 | 14:00 | 16:00 | 2 | PXA | WHEAD | TRIP | POOH f/ 1516 -609m. |
| 09/03/2002 | 0 | 16:00 | 16:30 | 0.5 | PXA | WHEAD | TRIP | Rebuild stop sub for spear assy. |
| 09/03/2002 | 0 | 16:30 | 17:30 | 1 | PXA | WHEAD | TRIP | Continued POOH f. 609m. |
| 09/03/2002 | 0 | 17:30 | 18:00 | 0.5 | PXA | WHEAD | TRIP | L/D sgl 8" DC. |
| 09/03/2002 | 0 | 18:00 | 19:30 | 1.5 | PXA | WHEAD | RIGR | Due to excessive rig movement 6 std 3 1/2" DP and hangoff std fell out of fingerboard. Collected and secured same. |
| 09/03/2002 | 0 | 19:30 | 21:00 | 1.5 | PXA | WHEAD | TRIP | Cont POOH w/ MOST tool. |
| 09/03/2002 | 0 | 21:00 | 00:00 | 3 | PXA | CASE | BHA | M/U spear assy. |
| 10/03/2002 | 0 | 00:00 | 02:00 | 2 | PXA | PXA | TRIP | Change to 6 5/8" handling equipment and RIH to 1300m. Used ROV to install 2X6,5T emergency slings on hydrate plate. |
| 10/03/2002 | 0 | 02:00 | 02:30 | 0.5 | PXA | PXA | TRIP | ROV continued to install slings, meanwhile grease and inspect travelling assy. |
| 10/03/2002 | 0 | 02:30 | 03:30 | 1 | PXA | PXA | TRIP | Cont. RIH to 1502m. Adjust rig position and stab in WH. Engage grapple and pull WH free. No OP observed. |
| 10/03/2002 | 0 | 03:30 | 04:00 | 0.5 | PXA | PXA | TRIP | POOH w/ fish to 1182m. |
| 10/03/2002 | 0 | 04:00 | 05:00 | 1 | PXA | PXA | RIGR | Repair hydraulic coupling on Iron Roughneck and LRA. |
| 10/03/2002 | 0 | 05:00 | 07:00 | 2 | PXA | PXA | TRIP | Cont POOH w/ fish. |
| 10/03/2002 | 0 | 07:00 | 08:00 | 1 | PXA | PXA | TRIP | Land hydrate plate on trolley and release spear. |
| 10/03/2002 | 0 | 08:00 | 09:30 | 1.5 | PXA | PXA | BHA | Rack back 8" DC and L/D spear assy. |
| 10/03/2002 | 0 | 09:30 | 10:00 | 0.5 | PXA | PXA | BHA | P/U WH RT and make up to sgl DP. |

| Date | Depth (m) | Start | Finish | Dur (Hrs) | Phase | Task | Activity | Operation |
|---|---|---|---|---|---|---|---|---|
| 10/03/2002 | 0 | 10:00 | 15:00 | 5 | PXA | PXA | WRKP | Engage RT in WH and work to release hydrate plate from wellhead - nogo. |
| 10/03/2002 | 0 | 15:00 | 21:30 | 6.5 | PXA | PXA | BHA | Held safety meeting and transported hydrate plate, 20" and 36" csg from base trolley via deck onto the supply boat. |
| 10/03/2002 | 0 | 21:30 | 22:00 | 0.5 | PXA | PXA | MISC | Handed rig over to Hydro. BP contract ended at 22:00. |

## 6.2 Bit Record



BP AMOCO — Page 1 of 1

**Bits Summary Report**

Legal Well Name: 6404/11-1
Common Well Name: Havsule
Event Name: ORIG DRILLING
Contractor Name: SAIPEM
Rig Name: SCARABEO 5

Start: 01/11/2001
Rig Release: 10/03/2002
Rig Number:

Spud Date: 06/12/2001
End:

| Bit No/ Run | Size (in) | Make | Type | IADC Code | Serial Number | TFA (in²) JETS (/32") | TMD In/ Out (m) | Total Drilled (m) | Cum. Hours | Tot Rot Hours | ROP | WOB Min/Max (Klb) | RPM | Pump Press (psi) | Pump Output (gpm) | deltaP Bit (psi) | Nozzle Velocity (m/s) | HHP (HHP/in²) | AFI Cond. I O D L B G O R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 / 1 | 17.500 | Hughes | MAXGT-C | 415 | S34CM | 0.601<br>14/14/14/14/ / | 1,520.00<br>1,622.00 | 102.0 | 27.00 | 27.00 | 3.78 | | | | | | | | - -<br>- - - |
| | Remarks | | | | | | | | | | | | | | | | | | |
| 3 / 1 | 26.000 | Hughes | GTX-CM6 | 415 | P93DP | 0.954<br>18/18/14/20/ / | 1,622.00<br>2,175.00 | 553.0 | 14.60 | 41.60 | 37.88 | /<br>30,000 | 133<br>206 | 2,876 | 1,055 | 116 | 108.1 | 0.134 | 1-1-CT-G<br>E- I-WT- PT |
| | Remarks | | | | | | | | | | | | | | | | | | |
| 4 / | 17.000 | Hughes | GTX-03 | 415 | 209 GT | 0.954<br>18/18/14/20/ / | 2,175.00<br>2,449.00 | 274.0 | 11.61 | 53.21 | 23.60 | /<br>9 | 132 | | | | | | 1-1-NO-A<br>E- I-NO- PT |
| | Remarks | | | | | | | | | | | | | | | | | | |
| 5 / 1 | 17.000 | Hughes | GTX-03 | 415 | 209 GT | 0.954<br>18/18/20/14/ / | 2,449.00<br>2,449.01 | | | 53.21 | | | | | | | | | 1-1-NO-A<br>E- I-NO- PT |
| | Remarks | | | | | | | | | | | | | | | | | | |
| 6 / | 12.250 | Hughes | ATJ-08 | 347 | H35DG | 1.114<br>22/22/22/ / / | 2,449.01<br>2,449.01 | 0.0 | | 53.21 | | | | | | | | | 1-1-NO-A<br>E- I-NO- PT |
| | Remarks | | | | | | | | | | | | | | | | | | |
| 7 / | 12.250 | Hughes | HC 604 | M 221 | 7000103 | 1.037<br>13/13/13/13/13/13 | 2,449.40<br>2,730.00 | 281.6 | 16.39 | 69.60 | 17.18 | /<br>13,200 | 132 | 2,114 | 950 | 613 | 89.6 | 3.621 | 1-1-NO-A<br>0- I-NO- PP |
| | Remarks | | | | | | | | | | | | | | | | | | |
| 8 / 1 | 12.250 | Hughes | HC 604 | M 221 | 7000103 | 1.037<br>13/13/13/13/13/13 | 2,730.00<br>2,730.00 | | | 69.60 | | | | | | | | | 1-1-NO-A<br>0- I-NO- PP |
| | Remarks | | | | | | | | | | | | | | | | | | |
| 9 / 2 | 12.250 | Hughes | HC 604 | M221 | 7000103 | 1.394<br>13/13/13/13/13/M | 2,730.00<br>2,730.00 | | | 69.60 | | | | | | | | | 1-1-NO-A<br>0- I-NO- PP |
| | Remarks | | | | | | | | | | | | | | | | | | |
| 10 / 0 | 8.500 | Hughes | HC 605 | M322 | 7000101 | 0.648<br>13/13/13/13/13/ | 2,730.00<br>3,650.00 | 920.0 | 39.60 | 109.20 | 23.23 | /<br>15,400 | 102<br>132 | 4,030 | 767 | 1,464 | 115.7 | 11.542 | 1-1-CT-S<br>D- I-WO- PT |
| | Remarks | Slight wash-out on nozzles, otherwise OK | | | | | | | | | | | | | | | | | |

## 6.3 BHA Record

BP AMOCO

Page 1 of 9

### BHA Summary Report

Legal Well Name: 6404/11-1
Common Well Name: Havsule
Event Name: ORIG DRILLING
Contractor Name: SAIPEM
Rig Name: SCARABEO 5

Start: 01/11/2001
Rig Release: 10/03/2002
Rig Number:

Spud Date: 06/12/2001
End:

#### BHA #1

| BHA Name | Bit# | Purpose | Bit to Survey (m) | Min Id (in) | Motor | Pred. Perf. / Act. Perf. | Pred. Build/Walk / Act. Build/Walk | I O D L B G O R |
|---|---|---|---|---|---|---|---|---|
| BHA 12 1/4" pilot ho | 1 | DRILLING | 17.89 | 2.750 | N | | | |

Date In: 30/11/2001 Time In: 22:00 TMD In: 1,520.00 (m) Date Out: 03/12/2001 Time Out: 23:40 TMD Out: 2,195.00 (m)

| BHA Detail Item Description | # Jts | Length (m) | OD (in) | ID (in) | Connection Size (in) | Connection Type | Pin Box | Gauge (in) In | Gauge (in) Out | Serial # | Spiral | Fishing Neck (in) | Blade Width (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BIT | 1 | 0.32 | 12.250 | | | | | | | | | | |
| NB STAB | 1 | 2.20 | 8.000 | 2.750 | | | | | | | | 27.95 | |
| Pony Collar | 1 | 2.72 | 8.000 | 2.750 | | | | | | | | | |
| NON-MAG BLADE STABILIZ | 1 | 1.71 | 8.000 | 2.750 | | | | | | | | 30.71 | |
| CDR w APWD sub | 1 | 6.76 | 8.250 | 2.750 | | | | | | | | 83.10 | |
| Saver sub | 1 | 0.46 | 8.250 | 2.750 | | | | | | | | | |
| MWD | 1 | 7.03 | 8.250 | 2.750 | | | | | | | | | |
| Saver sub | 1 | 0.47 | 8.250 | 2.750 | | | | | | | | | |
| NON-MAG BLADE STABILIZ | 1 | 2.27 | 8.000 | 2.750 | | | | | | | | 30.71 | |
| NON MAGNET. DRILL COLL | 2 | 18.12 | 8.000 | 2.750 | | | | | | | | | |
| XO | 1 | 0.46 | 8.000 | 3.000 | | | | | | | | | |
| HWDP | 6 | 55.59 | 5.000 | 3.000 | | | | | | | | | |
| JAR | 1 | 9.36 | 6.500 | 2.750 | | | | | | | | 24.02 | |
| HWDP | 10 | 91.44 | 5.000 | 3.000 | | | | | | | | | |
| XO | 1 | 0.52 | 8.000 | 3.000 | | | | | | | | | |
| **Total Length:** | | **199.43** | | | | | | | | | | | |

| BHA Chk | Check TMD (m) | Check Date | Check Time | Hook Load (psi) Allow | Hook Load (psi) Actual | String Weight (lbs) Up | String Weight (lbs) Down | String Weight (lbs) Rot | Drag (lbs) | BHA Wt Jar (lbs) | Torque (ft-lbf) On | Torque (ft-lbf) Off |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1,542.00 | 01/12/2001 | 23:45 | 800 | 800 | 236,000 | 236,000 | 231,000 | 5,000 | | 3,000 | 3,000 |
| 1 | 1,935.00 | 02/12/2001 | 23:59 | 1,066 | 1,066 | 268,964 | 268,964 | 264,555 | 4,409 | | 2,400 | 2,400 |

#### BHA #2

| BHA Name | Bit# | Purpose | Bit to Survey (m) | Min Id (in) | Motor | Pred. Perf. / Act. Perf. | Pred. Build/Walk / Act. Build/Walk | I O D L B G O R |
|---|---|---|---|---|---|---|---|---|
| Hole Opening (cond) | 2 | HOLE OPENING | | | N | | | |

Date In: 04/12/2001 Time In: 01:00 TMD In: 1,520.00 (m) Date Out: 06/12/2001 Time Out: 01:00 TMD Out: 1,520.00 (m)

| BHA Detail Item Description | # Jts | Length (m) | OD (in) | ID (in) | Connection Size (in) | Connection Type | Pin Box | Gauge (in) In | Gauge (in) Out | Serial # | Spiral | Fishing Neck (in) | Blade Width (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17 1/2" Bit | 1 | 0.40 | 17.500 | | | | | | | | | | |
| FLOAT SUB | 1 | 0.91 | 9.500 | 2.750 | | | | | | | | | |
| Pony Collar | 1 | 2.97 | 11.250 | 2.750 | | | | | | | | | |
| 26" Hole Opener | 1 | 1.96 | 26.000 | | | | | | | | | | |
| 36" Hole Opener | 1 | 1.96 | 36.000 | 2.750 | | | | | | | | 1.32 | |
| Bit-sub x/o w/solid fl. | 1 | 0.92 | 9.500 | 2.750 | | | | | | | | | |

BP AMOCO

Page 2 of 9

## BHA Summary Report

Legal Well Name: 6404/11-1
Common Well Name: Havsule
Event Name: ORIG DRILLING
Contractor Name: SAIPEM
Rig Name: SCARABEO 5
Start: 01/11/2001
Rig Release: 10/03/2002
Rig Number:
Spud Date: 06/12/2001
End:

| BHA Detail Item Description | # Jts | Length (m) | OD (in) | ID (in) | Connection Size (in) | Connection Type | Pin Box | Gauge (in) In | Gauge (in) Out | Serial # | Spiral | Fishing Neck (in) | Blade Width (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Anderd. w/Totco Ring | 1 | 3.35 | 9.500 | 2.750 | | | | | | | | | |
| DRILL COLLAR | 4 | 36.35 | 9.500 | 2.750 | | | | | | | | | |
| Stabiliser | 1 | 2.00 | 26.000 | 2.750 | | | | | | | | 0.83 | |
| DRILL COLLAR | 4 | 36.51 | 9.500 | 2.750 | | | | | | | | | |
| Pin/pin X/O | 1 | 0.29 | 9.500 | 2.750 | | | | | | | | | |
| 42" Hole Opener | 1 | 1.83 | 42.000 | 2.750 | | | | | | | | 0.30 | |
| Box/Box XO | 1 | 1.03 | 8.000 | 3.000 | | | | | | | | 0.47 | |
| DRILL COLLAR | 9 | 82.53 | 8.000 | 3.000 | | | | | | | | | |
| XO | 1 | 1.10 | 8.000 | 3.000 | | | | | | | | 0.61 | |
| HWDP | 9 | 83.46 | 6.500 | 3.000 | | | | | | | | | |
| Dart sub | 1 | 0.80 | 6.500 | 2.500 | | | | | | | | | |
| XO | 1 | 0.52 | 8.000 | 3.000 | | | | | | | | | |
| **Total Length:** | | **258.89** | | | | | | | | | | | |

| BHA Chk | Check TMD (m) | Check Date | Check Time | Hook Load (psi) Allow | Hook Load (psi) Actual | String Weight (lbs) Up | String Weight (lbs) Down | String Weight (lbs) Rot | Drag (lbs) | BHA Wt Jar (lbs) | Torque (ft-lbf) On | Torque (ft-lbf) Off |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1,567.00 | 04/12/2001 | 23:59 | 2,200 | 2,200 | 236,000 | 236,000 | 236,000 | | | 4,800 | 4,800 |

### BHA #3

| BHA Name | Bit# | Purpose | Bit to Survey (m) | Min Id (in) | Motor | Pred. Perf. Act. Perf. | Pred. Build/Walk Act. Build/Walk / | I O D L B G O R |
|---|---|---|---|---|---|---|---|---|
| Hole Opening (cond) | 2 | HOLE OPENING | 10.25 | | N | | | |

Date In: 06/12/2001 Time In: 14:30 TMD In: 1,520.00 (m) Date Out: 07/12/2001 Time Out: 17:30 TMD Out: 1,622.00 (m)

| BHA Detail Item Description | # Jts | Length (m) | OD (in) | ID (in) | Connection Size (in) | Connection Type | Pin Box | Gauge (in) In | Gauge (in) Out | Serial # | Spiral | Fishing Neck (in) | Blade Width (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17 1/2" Bit | 1 | 0.40 | 17.000 | | | | | | | | | | |
| FLOAT SUB | 1 | 0.91 | 9.500 | 2.750 | | | | | | | | | |
| Pony Collar | 1 | 2.97 | 11.250 | 2.750 | | | | | | | | | |
| 26" Hole Opener | 1 | 1.69 | 26.000 | | | | | | | | | | |
| 36" Hole Opener | 1 | 1.69 | 36.000 | 2.750 | | | | | | | | 1.32 | |
| Bit-sub x/o w/solid fl. | 1 | 0.92 | 9.500 | 2.750 | | | | | | | | | |
| Anderd. w/Totco Ring | 1 | 3.35 | 9.500 | 2.750 | | | | | | | | | |
| DRILL COLLAR | 4 | 36.35 | 9.500 | 2.750 | | | | | | | | | |
| Stabiliser | 1 | 2.00 | 26.000 | 2.750 | | | | | | | | 0.83 | |
| DRILL COLLAR | 4 | 37.04 | 9.500 | 2.750 | | | | | | | | | |
| Pin/pin X/O | 1 | 0.29 | 9.500 | 2.750 | | | | | | | | | |
| 42" Hole Opener | 1 | 1.83 | 42.000 | 2.750 | | | | | | | | 0.30 | |
| Box/Box XO | 1 | 1.03 | 8.000 | 3.000 | | | | | | | | 0.47 | |
| DRILL COLLAR | 9 | 82.53 | 8.000 | 3.000 | | | | | | | | | |
| XO | 1 | 1.10 | 8.000 | 3.000 | | | | | | | | 0.61 | |
| HWDP | 9 | 83.46 | 6.500 | 3.000 | | | | | | | | | |
| Dart sub | 1 | 0.80 | 6.500 | 2.500 | | | | | | | | | |
| XO | 1 | 0.52 | 8.000 | 3.000 | | | | | | | | | |

BP AMOCO

Page 3 of 9

## BHA Summary Report

Legal Well Name: 6404/11-1
Common Well Name: Havsule
Event Name: ORIG DRILLING
Contractor Name: SAIPEM
Rig Name: SCARABEO 5
Start: 01/11/2001
Rig Release: 10/03/2002
Rig Number:
Spud Date: 06/12/2001
End:

| BHA Detail Item Description | # Jts | Length (m) | OD (in) | ID (in) | Connection Size (in) | Connection Type | Pin Box | Gauge (in) In | Gauge (in) Out | Serial # | Spiral | Fishing Neck (in) | Blade Width (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Total Length:** | | 258.88 | | | | | | | | | | | |

| BHA Chk | Check TMD (m) | Check Date | Check Time | Hook Load (psi) Allow | Hook Load (psi) Actual | String Weight (lbs) Up | String Weight (lbs) Down | String Weight (lbs) Rot | Drag (lbs) | BHA Wt Jar (lbs) | Torque (ft-lbf) On | Torque (ft-lbf) Off |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1,520.00 | 06/12/2001 | 14:30 | | | | | | | | | |
| 1 | 1,622.00 | 07/12/2001 | 17:30 | | | | | | | | | |

### BHA #4

| BHA Name | Bit# | Purpose | Bit to Survey (m) | Min Id (in) | Motor | Pred. Perf. Act. Perf. | Pred. Build/Walk Act. Build/Walk / | I O D L B G O R |
|---|---|---|---|---|---|---|---|---|
| 26" Hole | 3 | DRILLING | | | N | | | 1/1/CT/G E/ I/WT/ PT |

Date In: 11/12/2001 Time In: 19:00 TMD In: 1,622.00 (m) Date Out: 13/12/2001 Time Out: 20:30 TMD Out: 2,175.00 (m)

| BHA Detail Item Description | # Jts | Length (m) | OD (in) | ID (in) | Connection Size (in) | Connection Type | Pin Box | Gauge (in) In | Gauge (in) Out | Serial # | Spiral | Fishing Neck (in) | Blade Width (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BIT | 1 | 0.56 | 26.000 | | | | | | | | | | |
| Motor ass. w/seal float | 1 | 11.27 | 9.500 | 7.850 | | | | | | | | | |
| NON-MAG BLADE STABILIZ | 1 | 2.10 | 26.000 | 3.250 | | | | | | | | 0.66 | |
| Power Puls HF w/MVC | 1 | 8.94 | 9.250 | 5.900 | | | | | | | | | |
| NON-MAG BLADE STABILIZ | 1 | 2.25 | 26.000 | 3.250 | | | | | | | | 0.72 | |
| XO | 1 | 0.41 | 8.000 | 3.250 | | | | | | | | | |
| NON MAGNET. DRILL COLL | 2 | 17.78 | 8.000 | 2.750 | | | | | | | | | |
| DRILL COLLAR | 4 | 36.70 | 8.000 | 2.750 | | | | | | | | | |
| JAR | 1 | 9.73 | 8.000 | 2.750 | | | | | | | | 0.53 | |
| DRILL COLLAR | 4 | 37.03 | 8.000 | 2.750 | | | | | | | | | |
| ACCELERATOR | 1 | 10.16 | 8.000 | 3.000 | | | | | | | | 0.58 | |
| DRILL COLLAR | 1 | 8.80 | 8.000 | 3.000 | | | | | | | | | |
| XO | 1 | 0.46 | 8.000 | 3.000 | | | | | | | | 0.33 | |
| HWDP | 9 | 83.46 | 5.000 | 3.000 | | | | | | | | | |
| Dart sub | 1 | 0.80 | 6.500 | 2.500 | | | | | | | | | |
| XO | 1 | 0.47 | 6.500 | 3.500 | | | | | | | | | |
| **Total Length:** | | 230.92 | | | | | | | | | | | |

| BHA Chk | Check TMD (m) | Check Date | Check Time | Hook Load (psi) Allow | Hook Load (psi) Actual | String Weight (lbs) Up | String Weight (lbs) Down | String Weight (lbs) Rot | Drag (lbs) | BHA Wt Jar (lbs) | Torque (ft-lbf) On | Torque (ft-lbf) Off |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1,622.00 | 11/12/2001 | 00:00 | 2,600 | 2,670 | 302,000 | 286,000 | 298,000 | 4,000 | | 8,000 | 4,000 |
| 1 | 2,175.00 | 12/12/2001 | 13:00 | 2,800 | 2,876 | 320,000 | 300,000 | 315,000 | 5,000 | | 11,000 | 3,300 |
| 1 | 2,175.00 | 13/12/2001 | 20:30 | | | | | | | | | |

BP AMOCO



## BHA Summary Report

Legal Well Name: 6404/11-1
Common Well Name: Havsule
Event Name: ORIG DRILLING
Contractor Name: SAIPEM
Rig Name: SCARABEO 5
Start: 01/11/2001
Rig Release: 10/03/2002
Rig Number:
Spud Date: 06/12/2001
End:

### BHA #5

| BHA Name | Bit# | Purpose | Bit to Survey (m) | Min Id (in) | Motor | Pred. Perf. / Act. Perf. | Pred. Build/Walk / Act. Build/Walk | I O D L B G O R |
|---|---|---|---|---|---|---|---|---|
| 17" rotary assy | 4 | DRILLING | 15.02 | 2.500 | N | | / | 1/1/NO/A E/ I/NO/ PT |

Date In: 06/01/2002 Time In: 04:15 TMD In: 2,175.00 (m) Date Out: 09/01/2002 Time Out: 14:00 TMD Out: 2,449.00 (m)

| BHA Detail Item Description | # Jts | Length (m) | OD (in) | ID (in) | Connection Size (in) | Connection Type | Pin Box | Gauge (in) In | Gauge (in) Out | Serial # | Spiral | Fishing Neck (in) | Blade Width (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BIT | 1 | 0.42 | 17.000 | | | | | | | | | | |
| NB STAB | 1 | 1.79 | 16.750 | 4.857 | | | | | | | | 0.70 | |
| LWD | 1 | 7.15 | 9.750 | 3.000 | | | | | | | | | |
| In Line Stab | 1 | 1.51 | 17.000 | 3.000 | | | | | | | | 0.52 | |
| Saver Sub | 1 | 0.46 | 9.125 | 3.000 | | | | | | | | | |
| MWD | 1 | 7.52 | 9.125 | 3.000 | | | | | | | | | |
| Saver Sub | 1 | 0.46 | 9.125 | 3.000 | | | | | | | | | |
| NON-MAG BLADE STABILIZ | 1 | 2.04 | 17.000 | 3.000 | | | | | | | | | |
| XO | 1 | 0.45 | 9.500 | 3.000 | | | | | | | | | |
| NON MAGNET. DRILL COLL | 2 | 18.05 | 8.000 | 3.000 | | | | | | | | | |
| DRILL COLLAR | 4 | 36.70 | 8.000 | 2.750 | | | | | | | | | |
| JAR | 1 | 9.73 | 8.000 | 2.750 | | | | | | | | 0.53 | |
| DRILL COLLAR | 4 | 37.04 | 8.000 | 2.750 | | | | | | | | | |
| ACCELERATOR | 1 | 10.16 | 8.000 | 3.000 | | | | | | | | 0.58 | |
| DRILL COLLAR | 1 | 8.80 | 8.000 | 2.750 | | | | | | | | | |
| XO | 1 | 0.46 | 8.000 | 3.000 | | | | | | | | | |
| HWDP | 9 | 83.46 | 5.000 | 3.000 | | | | | | | | | |
| Dart Sub | 1 | 0.80 | 6.500 | 2.500 | | | | | | | | | |
| XO | 1 | 0.47 | 6.500 | 3.500 | | | | | | | | 0.33 | |
| **Total Length:** | | **227.47** | | | | | | | | | | | |

| BHA Chk | Check TMD (m) | Check Date | Check Time | Hook Load (psi) Allow | Hook Load (psi) Actual | String Weight (lbs) Up | String Weight (lbs) Down | String Weight (lbs) Rot | Drag (lbs) | BHA Wt Jar (lbs) | Torque (ft-lbf) On | Torque (ft-lbf) Off |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2,279.00 | 07/01/2002 | 23:34 | 2,650 | 2,600 | 308,647 | 330,693 | 308,647 | | 24,251 | 3,481 | 1,962 |
| 1 | 2,448.00 | 08/01/2002 | 07:25 | 2,600 | 2,641 | 315,261 | 337,307 | 315,261 | | 24,251 | 5,000 | 4,200 |
| 1 | 2,449.00 | 09/01/2002 | 14:00 | | | | | | | | | |

### BHA #6

| BHA Name | Bit# | Purpose | Bit to Survey (m) | Min Id (in) | Motor | Pred. Perf. / Act. Perf. | Pred. Build/Walk / Act. Build/Walk | I O D L B G O R |
|---|---|---|---|---|---|---|---|---|
| 17" hang-off string | 5 | WIPER/CHECK | | 2.500 | N | | / | 1/1/NO/A E/ I/NO/ PT |

Date In: 09/01/2002 Time In: 23:15 TMD In: 2,449.00 (m) Date Out: 12/01/2002 Time Out: 14:30 TMD Out: 2,449.01 (m)

| BHA Detail Item Description | # Jts | Length (m) | OD (in) | ID (in) | Connection Size (in) | Connection Type | Pin Box | Gauge (in) In | Gauge (in) Out | Serial # | Spiral | Fishing Neck (in) | Blade Width (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BIT | 1 | 0.42 | 17.000 | | | | | | | | | | |

BP AMOCO

Page 5 of 9

## BHA Summary Report

Legal Well Name: 6404/11-1
Common Well Name: Havsule
Event Name: ORIG DRILLING
Contractor Name: SAIPEM
Rig Name: SCARABEO 5
Start: 01/11/2001
Rig Release: 10/03/2002
Rig Number:
Spud Date: 06/12/2001
End:

| BHA Detail Item Description | # Jts | Length (m) | OD (in) | ID (in) | Connection Size (in) | Connection Type | Pin Box | Gauge (in) In | Gauge (in) Out | Serial # | Spiral | Fishing Neck (in) | Blade Width (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NB STAB | 1 | 1.79 | 16.750 | 4.857 | | | | | | | | 0.70 | |
| XO | 1 | 1.14 | 8.000 | 3.000 | | | | | | | | 0.60 | |
| DRILL COLLAR | 1 | 8.72 | 8.000 | 3.000 | | | | | | | | | |
| XO | 1 | 0.86 | 9.500 | 3.000 | | | | | | | | 0.34 | |
| NB STAB | 1 | 2.37 | 17.000 | 3.000 | | | | | | | | 0.90 | |
| XO | 1 | 0.90 | 8.000 | 3.000 | | | | | | | | 0.55 | |
| NON MAGNET. DRILL COLL | 1 | 8.94 | 8.000 | 3.000 | | | | | | | | 8.00 | |
| DRILL COLLAR | 4 | 36.70 | 8.000 | 2.750 | | | | | | | | | |
| JAR | 1 | 9.73 | 8.000 | 2.750 | | | | | | | | 0.53 | |
| DRILL COLLAR | 3 | 27.28 | 8.000 | 2.750 | | | | | | | | | |
| XO | 1 | 0.46 | 8.000 | 3.000 | | | | | | | | | |
| HWDP | 9 | 83.46 | 5.000 | 3.000 | | | | | | | | | |
| Dart Sub | 1 | 0.80 | 6.500 | 2.500 | | | | | | | | | |
| XO | 1 | 0.47 | 6.500 | 3.500 | | | | | | | | 0.33 | |
| **Total Length:** | | **184.04** | | | | | | | | | | | |

| BHA Chk | Check TMD (m) | Check Date | Check Time | Hook Load (psi) Allow | Hook Load (psi) Actual | String Weight (lbs) Up | String Weight (lbs) Down | String Weight (lbs) Rot | Drag (lbs) | BHA Wt Jar (lbs) | Torque (ft-lbf) On | Torque (ft-lbf) Off |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2,449.00 | 09/01/2002 | 03:14 | | | | | | | 19.842 | | |
| 1 | 2,449.00 | 10/01/2002 | 02:46 | | | | | | | 19.842 | | |

### BHA #7

| BHA Name | Bit# | Purpose | Bit to Survey (m) | Min Id (in) | Motor | Pred. Perf. Act. Perf. | Pred. Build/Walk Act. Build/Walk / | I O D L B G O R |
|---|---|---|---|---|---|---|---|---|
| Cleanout BHA | 6 | CLEAN OUT | | | N | | | 1/1/NO/A E/ I/NO/ PT |

Date In: 17/01/2002 Time In: 03:30 TMD In: 2,449.01 (m) Date Out: 17/01/2002 Time Out: 22:30 TMD Out: 2,449.01 (m)

| BHA Detail Item Description | # Jts | Length (m) | OD (in) | ID (in) | Connection Size (in) | Connection Type | Pin Box | Gauge (in) In | Gauge (in) Out | Serial # | Spiral | Fishing Neck (in) | Blade Width (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BIT | 1 | 0.29 | 12.250 | | | | | | | | | | |
| XO | | 0.96 | 8.000 | 3.000 | | | | | | | | 0.48 | |
| Pony Collar | | 3.82 | 9.500 | 3.000 | | | | | | | | | |
| Stabiliser | | 2.20 | 16.750 | 3.000 | | | | | | | | 0.51 | |
| XO | | 0.98 | 8.000 | 3.000 | | | | | | | | 0.54 | |
| DRILL COLLAR | | 8.72 | 8.000 | 3.000 | | | | | | | | 0.43 | |
| XO | | 0.86 | | | | | | | | | | 0.50 | |
| Stabiliser | | 2.37 | 17.000 | | | | | | | | | 0.90 | |
| XO | | 0.91 | 8.000 | 3.000 | | | | | | | | 0.30 | |
| DRILL COLLAR | 6 | 54.34 | 8.000 | 3.000 | | | | | | | | | |
| JAR | | 9.73 | | | | | | | | | | 0.53 | |
| DRILL COLLAR | | 9.34 | 8.000 | | | | | | | | | | |
| XO | | 0.34 | | | | | | | | | | | |
| **Total Length:** | | **94.86** | | | | | | | | | | | |

BP AMOCO



## BHA Summary Report

Legal Well Name: 6404/11-1
Common Well Name: Havsule
Event Name: ORIG DRILLING
Contractor Name: SAIPEM
Rig Name: SCARABEO 5
Start: 01/11/2001
Rig Release: 10/03/2002
Rig Number:
Spud Date: 06/12/2001
End:

| BHA Chk | Check TMD (m) | Check Date | Check Time | Hook Load (psi) Allow | Hook Load (psi) Actual | String Weight (lbs) Up | String Weight (lbs) Down | String Weight (lbs) Rot | Drag (lbs) | BHA Wt Jar (lbs) | Torque (ft-lbf) On | Torque (ft-lbf) Off |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2,449.01 | 17/01/2002 | 13:45 | 1,700 | | | | | | 7 | | |

### BHA #8

| BHA Name | Bit# | Purpose | Bit to Survey (m) | Min Id (in) | Motor | Pred. Perf. / Act. Perf. | Pred. Build/Walk / Act. Build/Walk / | I O D L B G O R |
|---|---|---|---|---|---|---|---|---|
| Lead Impression Tool | | OTHER | | | N | | | |

Date In: 26/01/2002 Time In: 12:00 TMD In: (m) Date Out: 26/01/2002 Time Out: 18:00 TMD Out: (m)

| BHA Detail Item Description | # Jts | Length (m) | OD (in) | ID (in) | Connection Size (in) | Connection Type | Pin Box | Gauge (in) In | Gauge (in) Out | Serial # | Spiral | Fishing Neck (in) | Blade Width (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lead Impression Tool | 1 | 1.10 | | | | | | | | | | | |
| DRILL PIPE | 1 | 9.68 | 5.000 | | | | | | | | | | |
| XO | 1 | 0.46 | | 3.500 | | | | | | | | 0.31 | |
| **Total Length:** | | **11.24** | | | | | | | | | | | |

| BHA Chk | Check TMD (m) | Check Date | Check Time | Hook Load (psi) Allow | Hook Load (psi) Actual | String Weight (lbs) Up | String Weight (lbs) Down | String Weight (lbs) Rot | Drag (lbs) | BHA Wt Jar (lbs) | Torque (ft-lbf) On | Torque (ft-lbf) Off |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | 26/01/2002 | 12:00 | | | | | | | | | |
| 2 | | 26/01/2002 | 18:00 | | | | | | | | | |

### BHA #9

| BHA Name | Bit# | Purpose | Bit to Survey (m) | Min Id (in) | Motor | Pred. Perf. / Act. Perf. | Pred. Build/Walk / Act. Build/Walk / | I O D L B G O R |
|---|---|---|---|---|---|---|---|---|
| 12 1/4" BHA | 7 | DRILLING | 16.21 | 2.125 | N | | | 1/1/NO/A 0/ I/NO/ PP |

Date In: 28/01/2002 Time In: 12:00 TMD In: 2,449.40 (m) Date Out: 01/02/2002 Time Out: 05:00 TMD Out: 2,730.00 (m)

| BHA Detail Item Description | # Jts | Length (m) | OD (in) | ID (in) | Connection Size (in) | Connection Type | Pin Box | Gauge (in) In | Gauge (in) Out | Serial # | Spiral | Fishing Neck (in) | Blade Width (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bit | 1 | 0.36 | 12.250 | | | | | | | | | | |
| GVR8-12 1/4" Stab+Float | 1 | 3.86 | | | | | | | | | | | |
| CDR with APRS | 1 | 6.36 | | | | | | | | | | | |
| 12 1/4" inline stab | 1 | 1.47 | | | | | | | | | | | |
| Power Pulse HF | 1 | 8.42 | | | | | | | | | | | |
| NM Stab. | 1 | 2.35 | 12.250 | 2.800 | | | | | | | | 0.92 | |
| NON MAGNET. DRILL COLL | 2 | 17.51 | 8.000 | 3.250 | | | | | | | | | |
| DRILL COLLAR | 7 | 63.82 | 8.000 | | | | | | | | | | |
| XO | 1 | 0.47 | 8.000 | 3.000 | | | | | | | | | |
| HWDP | 6 | 55.59 | 5.000 | | | | | | | | | | |
| JAR | 1 | 9.43 | 7.875 | 2.750 | | | | | | | | 0.58 | |
| HWDP | 9 | 82.09 | 5.000 | | | | | | | | | | |
| Dart sub | 1 | 0.50 | 6.250 | 2.125 | | | | | | | | | |
| DRILL PIPE | 10 | 284.30 | 5.000 | | | | | | | | | | |
| XO | 1 | 0.46 | 7.875 | 3.500 | | | | | | | | 0.31 | |

BP AMOCO

Page 7 of 9

## BHA Summary Report

Legal Well Name: 6404/11-1
Common Well Name: Havsule
Event Name: ORIG DRILLING
Contractor Name: SAIPEM
Rig Name: SCARABEO 5
Start: 01/11/2001
Rig Release: 10/03/2002
Rig Number:
Spud Date: 06/12/2001
End:

| BHA Detail Item Description | # Jts | Length (m) | OD (in) | ID (in) | Connection Size (in) | Connection Type | Pin Box | Gauge (in) In | Gauge (in) Out | Serial # | Spiral | Fishing Neck (in) | Blade Width (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Total Length:** | | **536.99** | | | | | | | | | | | |

| BHA Chk | Check TMD (m) | Check Date | Check Time | Hook Load (psi) Allow | Hook Load (psi) Actual | String Weight (lbs) Up | String Weight (lbs) Down | String Weight (lbs) Rot | Drag (lbs) | BHA Wt Jar (lbs) | Torque (ft-lbf) On | Torque (ft-lbf) Off |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2,563.00 | 29/01/2002 | 00:00 | 2,400 | 2,450 | 309,000 | 330,700 | 330,700 | -21,700 | 11,000 | 3,500 | 3,000 |
| 1 | 2,729.00 | 30/01/2002 | 10:30 | 2,114 | 2,050 | 321,875 | 341,717 | 341,717 | -19,842 | 11,023 | 3,850 | 1,000 |
| 1 | 2,730.00 | 01/02/2002 | 05:00 | | | | | | | | | |

### BHA #10

| BHA Name | Bit# | Purpose | Bit to Survey (m) | Min Id (in) | Motor | Pred. Perf. Act. Perf. | Pred. Build/Walk Act. Build/Walk / | I O D L B G O R |
|---|---|---|---|---|---|---|---|---|
| 12 1/4" wiper trip | 8 | WIPER/CHECK | | 2.125 | N | | | 1/1/NO/A 0/ I/NO/ PP |

Date In: 01/02/2002 Time In: 22:00 TMD In: 2,730.00 (m) Date Out: 05/02/2002 Time Out: 22:00 TMD Out: 2,730.00 (m)

| BHA Detail Item Description | # Jts | Length (m) | OD (in) | ID (in) | Connection Size (in) | Connection Type | Pin Box | Gauge (in) In | Gauge (in) Out | Serial # | Spiral | Fishing Neck (in) | Blade Width (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bit | 1 | 0.36 | 12.250 | | | | | | | | | | |
| NB STAB | 1 | 1.76 | 12.125 | 3.000 | | | | | | | | 0.48 | |
| Pony Collar | 1 | 3.06 | 8.250 | 2.875 | | | | | | | | | |
| IB STAB | 1 | 2.20 | 12.250 | 2.750 | | | | | | | | 0.88 | |
| DRILL COLLAR | 1 | 8.73 | 8.000 | 3.000 | | | | | | | | 0.44 | |
| NM Stab. | 1 | 2.35 | 12.250 | 2.800 | | | | | | | | 0.92 | |
| NON MAGNET. DRILL COLL | 2 | 17.51 | 8.000 | 3.250 | | | | | | | | | |
| DRILL COLLAR | 7 | 63.82 | 8.000 | | | | | | | | | | |
| XO | 1 | 0.47 | 8.000 | 3.000 | | | | | | | | | |
| HWDP | 6 | 55.59 | 5.000 | | | | | | | | | | |
| JAR | 1 | 9.43 | 7.875 | 2.750 | | | | | | | | 0.58 | |
| HWDP | 9 | 82.09 | 5.000 | | | | | | | | | | |
| Dart sub | 1 | 0.50 | 6.250 | 2.125 | | | | | | | | | |
| **Total Length:** | | **247.87** | | | | | | | | | | | |

| BHA Chk | Check TMD (m) | Check Date | Check Time | Hook Load (psi) Allow | Hook Load (psi) Actual | String Weight (lbs) Up | String Weight (lbs) Down | String Weight (lbs) Rot | Drag (lbs) | BHA Wt Jar (lbs) | Torque (ft-lbf) On | Torque (ft-lbf) Off |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2,730.00 | 01/02/2002 | 22:00 | | | | | | | | | |
| 1 | 2,730.00 | 05/02/2002 | 22:00 | | | | | | | | | |

### BHA #11

| BHA Name | Bit# | Purpose | Bit to Survey (m) | Min Id (in) | Motor | Pred. Perf. Act. Perf. | Pred. Build/Walk Act. Build/Walk / | I O D L B G O R |
|---|---|---|---|---|---|---|---|---|
| Weight Set BOP test | | OTHER | | | N | | | |

Date In: 05/02/2002 Time In: 23:59 TMD In: 2,730.00 (m) Date Out: 06/02/2002 Time Out: 15:15 TMD Out: 2,730.00 (m)

BP AMOCO



## BHA Summary Report

Legal Well Name: 6404/11-1
Common Well Name: Havsule
Event Name: ORIG DRILLING
Contractor Name: SAIPEM
Rig Name: SCARABEO 5
Start: 01/11/2001
Rig Release: 10/03/2002
Rig Number:
Spud Date: 06/12/2001
End:

| BHA Detail Item Description | # Jts | Length (m) | OD (in) | ID (in) | Connection Size (in) | Connection Type | Pin Box | Gauge (in) In | Gauge (in) Out | Serial # | Spiral | Fishing Neck (in) | Blade Width (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bullnose | 1 | 0.97 | 6.500 | | | | | | | | | | |
| Jetsub | 1 | 0.56 | 6.500 | | | | | | | | | | |
| HWDP | 12 | 110.60 | 5.000 | | | | | | | | | | |
| DRILL PIPE | 6 | 56.95 | 5.000 | 4.275 | | | | | | | | | |
| Wt. set BOP tool | 1 | 1.44 | 18.600 | | | | | | | | | 0.29 | |
| **Total Length:** | | **170.52** | | | | | | | | | | | |

| BHA Chk | Check TMD (m) | Check Date | Check Time | Hook Load (psi) Allow | Hook Load (psi) Actual | String Weight (lbs) Up | String Weight (lbs) Down | String Weight (lbs) Rot | Drag (lbs) | BHA Wt Jar (lbs) | Torque (ft-lbf) On | Torque (ft-lbf) Off |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2,730.00 | 05/02/2002 | 23:59 | | | | | | | | | |
| 1 | 2,730.00 | 06/02/2002 | 15:15 | | | | | | | | | |

### BHA #12

| BHA Name | Bit# | Purpose | Bit to Survey (m) | Min Id (in) | Motor | Pred. Perf. Act. Perf. | Pred. Build/Walk Act. Build/Walk / | I O D L B G O R |
|---|---|---|---|---|---|---|---|---|
| 12 1/4" wiper trip | 9 | WIPER/CHECK | | 2.125 | N | | | 1/1/NO/A 0/ I/NO/ PP |

Date In: 06/02/2002 Time In: 15:15 TMD In: 2,730.00 (m) Date Out: 07/02/2002 Time Out: 19:30 TMD Out: 2,730.00 (m)

| BHA Detail Item Description | # Jts | Length (m) | OD (in) | ID (in) | Connection Size (in) | Connection Type | Pin Box | Gauge (in) In | Gauge (in) Out | Serial # | Spiral | Fishing Neck (in) | Blade Width (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bit | 1 | 0.36 | 12.250 | 3.000 | | | | | | | | | |
| NB STAB | 1 | 1.76 | 12.125 | 3.000 | | | | | | | | 0.48 | |
| Pony Collar | 1 | 3.06 | 8.250 | 2.875 | | | | | | | | 3.06 | |
| IB STAB | 1 | 2.20 | 12.250 | 2.750 | | | | | | | | 0.88 | |
| DRILL COLLAR | 1 | 8.73 | 8.000 | 3.000 | | | | | | | | 0.44 | |
| NM Stab. | 1 | 2.35 | 12.250 | 2.800 | | | | | | | | 0.92 | |
| NON MAGNET. DRILL COLL | 2 | 17.51 | 8.000 | 3.250 | | | | | | | | | |
| DRILL COLLAR | 7 | 63.82 | 8.000 | | | | | | | | | | |
| XO | 1 | 0.47 | 8.000 | 3.000 | | | | | | | | | |
| HWDP | 6 | 55.59 | 5.000 | | | | | | | | | | |
| JAR | 1 | 9.43 | 7.875 | 2.750 | | | | | | | | 0.58 | |
| HWDP | 9 | 82.09 | 5.000 | | | | | | | | | | |
| Dart sub | 1 | 0.50 | 6.250 | 2.125 | | | | | | | | | |
| **Total Length:** | | **247.87** | | | | | | | | | | | |

| BHA Chk | Check TMD (m) | Check Date | Check Time | Hook Load (psi) Allow | Hook Load (psi) Actual | String Weight (lbs) Up | String Weight (lbs) Down | String Weight (lbs) Rot | Drag (lbs) | BHA Wt Jar (lbs) | Torque (ft-lbf) On | Torque (ft-lbf) Off |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2,730.00 | 06/02/2002 | 15:15 | | | | | | | | | |
| 1 | 2,730.00 | 07/02/2002 | 19:30 | | | | | | | | | |

BP AMOCO

Page 9 of 9

## BHA Summary Report

Legal Well Name: 6404/11-1
Common Well Name: Havsule
Event Name: ORIG DRILLING
Contractor Name: SAIPEM
Rig Name: SCARABEO 5
Start: 01/11/2001
Rig Release: 10/03/2002
Rig Number:
Spud Date: 06/12/2001
End:

### BHA #13

| BHA Name | Bit# | Purpose | Bit to Survey (m) | Min Id (in) | Motor | Pred. Perf. / Act. Perf. | Pred. Build/Walk / Act. Build/Walk / | I O D L B G O R |
|---|---|---|---|---|---|---|---|---|
| 8 1/2" Drilling Assy | 10 | DRILLING | 16.72 | | N | | | 1/1/CT/S D/ I/WO/ PT |

Date In: 10/02/2002 Time In: 03:30 TMD In: 2,730.00 (m) Date Out: 20/02/2002 Time Out: 22:30 TMD Out: 3,650.00 (m)

| BHA Detail Item Description | # Jts | Length (m) | OD (in) | ID (in) | Connection Size (in) | Connection Type | Pin Box | Gauge (in) In | Gauge (in) Out | Serial # | Spiral | Fishing Neck (in) | Blade Width (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BIT | 1 | 0.30 | 8.500 | | | | | | | | | | |
| NB STAB | 1 | 1.73 | 8.250 | 2.800 | | | | | | | | 0.70 | |
| Pony Collar | 1 | 3.05 | 6.750 | 3.250 | | | | | | | | | |
| IB STAB | 1 | 1.58 | 8.500 | 3.250 | | | | | | | | 0.70 | |
| MWD | 1 | 5.88 | 6.750 | 4.875 | | | | | | | | | |
| MWD | 1 | 8.40 | 6.750 | 5.111 | | | | | | | | | |
| NB STAB | 1 | 1.37 | 8.500 | 3.250 | | | | | | | | 0.72 | |
| NON MAGNET. DRILL COLL | 3 | 26.09 | 6.500 | 3.000 | | | | | | | | | |
| Pony Collar | 3 | 11.02 | 6.500 | 2.750 | | | | | | | | | |
| HWDP | 11 | 100.99 | 5.000 | 2.750 | | | | | | | | | |
| JAR | 1 | 9.71 | 6.500 | 2.750 | | | | | | | | 0.71 | |
| HWDP | 9 | 82.09 | 5.000 | | | | | | | | | | |
| DART SUB | 1 | 0.50 | 6.250 | 2.125 | | | | | | | | | |
| **Total Length:** | | **252.71** | | | | | | | | | | | |

| BHA Chk | Check TMD (m) | Check Date | Check Time | Hook Load (psi) Allow | Hook Load (psi) Actual | String Weight (lbs) Up | String Weight (lbs) Down | String Weight (lbs) Rot | Drag (lbs) | BHA Wt Jar (lbs) | Torque (ft-lbf) On | Torque (ft-lbf) Off |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2,800.00 | 11/02/2002 | 23:55 | 3,250 | 3,560 | 308,650 | 282,200 | 304,250 | 4,400 | 6,614 | 3,000 | 2,200 |
| 1 | 3,126.00 | 12/02/2002 | 23:55 | 3,200 | 3,450 | 326,285 | 306,440 | 326,285 | | 6,614 | 4,400 | 7,600 |
| 1 | 3,351.00 | 13/02/2002 | 13:50 | 3,200 | 3,520 | 330,700 | 315,200 | 315,200 | 15,500 | 6,614 | 4,000 | 6,000 |
| 1 | 3,380.00 | 18/02/2002 | 00:00 | 3,220 | 3,240 | 150,000 | 130,000 | 140,000 | 10,000 | 46,000 | 4,440 | 2,812 |
| 1 | 3,612.00 | 19/02/2002 | 00:00 | 3,950 | 4,000 | 160,000 | 148,000 | 155,000 | 5,000 | 46,000 | 8,100 | 5,000 |
| 1 | 3,612.00 | 20/02/2002 | 00:00 | 3,920 | 3,960 | 160,000 | 148,000 | 155,000 | 5,000 | 46,000 | 8,100 | 3,800 |

## 6.4 Drilling Fluids Report

The table below specify programmed drilling fluid properties and actual values experienced while drilling this well.

| Section | Values | Mud weight (s.g.) | 10 Min Gel (lbs/100 ft²) | 3 RPM (lbs /100ft²) | KCl/ NaCl (g/l) | API (ml) | YP (lb/100²ft) | pH | Glycol (%) |
|---|---|---|---|---|---|---|---|---|---|
| | Program | 1.04 /1.20[1] | | | | | | | |
| 12 ¼" Pilot hole | Max | 1.06 | | | | | | | |
| | Min | 1.06 | | | | | | | |
| | Average | 1.06 | | | | | | | |
| | Program | 1.04 /1.20[1] | | | | | | | |
| 42"/36" | Max | | | | | | | | |
| | Min | | | | | | | | |
| | Average | | | | | | | | |
| | Program | 1.04 /1.20[1] | | | | | | | |
| 26" | Max | | | | | | | | |
| | Min | | | | | | | | |
| | Average | | | | | | | | |
| | Program | 1,11 | < 30 | 4 | 100 g/l No NaCl | <4 | > 10 | 8 – 9,5 | 0 |
| 17" | Max | 1,24 | 6 | 4 | 126 | 5,8 | 19 | 9,8 | 0 |
| | Min | 1,11 | 4,5 | 4 | 108 | 3,4 | 11 | 9,2 | 0 |
| | Average | 1,15 | 5 | 4 | 113 | 3,8 | 15 | 9,5 | 0 |
| | Program | 1,25 to 1,30 | < 30 | 4 + | 60/210 | < 3 | > 10 | 7,5 – 8,5 | 13,0 + |
| 12 ¼" | Max | 1,30 | 7 | 5 | 65/208 | 2,3 | 18 | 10,8 | 14,91 |
| | Min | 1,25 | 5 | 4 | 57/196 | 2,2 | 11 | 7,7 | 13,69 |
| | Average | 1,30 | 5,5 | 4,5 | 60/206 | 2,2 | 16 | 8,3 | 14,50 |
| | Program | 1,33 | < 30 | 4 + | 60/210 | <4 | >10 | 7,5 – 8,5 | 13,0 + |
| 8 ½" | Max | 1,36 | 8 | 6 | 60/214 | 1,9 | 26 | 9,5 | 14,09 |
| | Min | 1,33 | 6 | 4 | 53/192 | 1,6 | 18 | 8,3 | 13,25 |
| | Average | 1,34 | 7 | 5 | 57/205 | 1,8 | 23 | 8,56 | 13,86 |

**Comments:**

- Displacement mud. The displacement mud was a straightforward bentonite/PAC regular premix weighted to 1,20 s.g. Fluid loss below 10cc and 3 rpm >10. Simple and effective.
- No problems maintaining mud parameters within programmed guidelines were experienced.

## 6.5 Directional Surveys

| | | | | | | | | | Grid Coordinates | | Geographic Coordinates | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Station ID | MD (m) | Incl (°) | Azim (°) | TVD (m) | VSec (m) | N-S (m) | E-W (m) | DLS (°/30m) | Northing (m) | Easting (m) | Latitude | Longitude |
| Tie in Point | 1520.00 | 0.00 | 0.0 | 1520.00 | 0.00 | 0.01 | -0.00 | | 7116837.10 | 566124.30 | N64 10 11.890 | E4 21 36.637 |
| | 1661.64 | 2.08 | 337.6 | 1661.61 | -2.19 | 2.39 | -0.98 | 0.44 | 7116839.48 | 566123.32 | N64 10 11.968 | E4 21 36.569 |
| | 1690.54 | 1.95 | 341.7 | 1690.49 | -3.07 | 3.34 | -1.33 | 0.20 | 7116840.43 | 566122.97 | N64 10 11.999 | E4 21 36.544 |
| | 1719.06 | 1.88 | 339.8 | 1719.00 | -3.91 | 4.24 | -1.65 | 0.10 | 7116841.33 | 566122.65 | N64 10 12.028 | E4 21 36.522 |
| | 1764.95 | 1.92 | 342.6 | 1764.86 | -5.25 | 5.68 | -2.14 | 0.07 | 7116842.77 | 566122.17 | N64 10 12.075 | E4 21 36.488 |
| | 1804.07 | 1.92 | 342.6 | 1803.96 | -6.43 | 6.93 | -2.53 | 0.00 | 7116844.02 | 566121.77 | N64 10 12.115 | E4 21 36.461 |
| | 1832.71 | 1.50 | 342.4 | 1832.59 | -7.19 | 7.74 | -2.79 | 0.44 | 7116844.83 | 566121.52 | N64 10 12.142 | E4 21 36.444 |
| | 1861.10 | 1.43 | 332.3 | 1860.97 | -7.80 | 8.41 | -3.06 | 0.28 | 7116845.50 | 566121.24 | N64 10 12.164 | E4 21 36.424 |
| | 1889.49 | 1.72 | 321.6 | 1889.35 | -8.38 | 9.06 | -3.49 | 0.44 | 7116846.15 | 566120.81 | N64 10 12.185 | E4 21 36.393 |
| | 1918.38 | 1.78 | 324.7 | 1918.22 | -8.99 | 9.77 | -4.02 | 0.12 | 7116846.85 | 566120.28 | N64 10 12.208 | E4 21 36.355 |
| | 1946.06 | 1.70 | 318.7 | 1945.89 | -9.56 | 10.42 | -4.54 | 0.22 | 7116847.51 | 566119.76 | N64 10 12.230 | E4 21 36.318 |
| | 2004.73 | 1.56 | 313.0 | 2004.54 | -10.55 | 11.62 | -5.70 | 0.11 | 7116848.71 | 566118.60 | N64 10 12.269 | E4 21 36.234 |
| | 2061.25 | 1.29 | 313.4 | 2061.04 | -11.34 | 12.58 | -6.73 | 0.14 | 7116849.67 | 566117.58 | N64 10 12.301 | E4 21 36.160 |
| | 2091.01 | 1.20 | 309.0 | 2090.79 | -11.68 | 13.01 | -7.21 | 0.13 | 7116850.10 | 566117.09 | N64 10 12.315 | E4 21 36.124 |
| | 2150.05 | 0.88 | 294.3 | 2149.82 | -12.11 | 13.59 | -8.10 | 0.21 | 7116850.67 | 566116.20 | N64 10 12.334 | E4 21 36.059 |
| | 2232.75 | 0.91 | 295.7 | 2232.51 | -12.40 | 14.08 | -9.31 | 0.10 | 7116851.16 | 566114.99 | N64 10 12.351 | E4 21 35.971 |
| | 2264.00 | 0.71 | 288.4 | 2263.76 | -12.50 | 14.25 | -9.72 | 0.22 | 7116851.33 | 566114.58 | N64 10 12.357 | E4 21 35.941 |
| | 2291.29 | 0.72 | 287.5 | 2291.05 | -12.55 | 14.35 | -10.05 | 0.02 | 7116851.44 | 566114.26 | N64 10 12.360 | E4 21 35.917 |
| | 2319.98 | 0.64 | 278.6 | 2319.73 | -12.58 | 14.43 | -10.38 | 0.14 | 7116851.52 | 566113.93 | N64 10 12.363 | E4 21 35.893 |
| | 2347.42 | 0.57 | 275.9 | 2347.17 | -12.57 | 14.47 | -10.66 | 0.08 | 7116851.55 | 566113.64 | N64 10 12.364 | E4 21 35.871 |
| | 2375.53 | 0.51 | 281.9 | 2375.28 | -12.56 | 14.51 | -10.92 | 0.09 | 7116851.59 | 566113.38 | N64 10 12.366 | E4 21 35.852 |
| | 2403.54 | 0.41 | 260.5 | 2403.29 | -12.54 | 14.52 | -11.15 | 0.21 | 7116851.60 | 566113.16 | N64 10 12.366 | E4 21 35.836 |
| | 2432.94 | 0.60 | 270.3 | 2432.69 | -12.48 | 14.50 | -11.40 | 0.21 | 7116851.59 | 566112.90 | N64 10 12.366 | E4 21 35.817 |
| | 2454.47 | 0.69 | 256.1 | 2454.22 | -12.41 | 14.47 | -11.64 | 0.25 | 7116851.55 | 566112.66 | N64 10 12.365 | E4 21 35.799 |
| | 2511.45 | 0.57 | 260.3 | 2511.19 | -12.19 | 14.34 | -12.25 | 0.07 | 7116851.42 | 566112.05 | N64 10 12.361 | E4 21 35.753 |
| | 2540.51 | 0.52 | 259.7 | 2540.25 | -12.10 | 14.29 | -12.53 | 0.05 | 7116851.38 | 566111.78 | N64 10 12.360 | E4 21 35.733 |
| | 2571.46 | 0.35 | 242.3 | 2571.20 | -11.99 | 14.22 | -12.75 | 0.21 | 7116851.31 | 566111.56 | N64 10 12.358 | E4 21 35.717 |
| | 2600.60 | 0.46 | 222.8 | 2600.34 | -11.84 | 14.09 | -12.91 | 0.18 | 7116851.18 | 566111.40 | N64 10 12.354 | E4 21 35.705 |
| | 2629.87 | 0.35 | 218.7 | 2629.61 | -11.67 | 13.94 | -13.04 | 0.12 | 7116851.02 | 566111.26 | N64 10 12.349 | E4 21 35.694 |
| | 2656.57 | 0.31 | 245.6 | 2656.31 | -11.55 | 13.85 | -13.16 | 0.18 | 7116850.93 | 566111.15 | N64 10 12.346 | E4 21 35.686 |
| | 2686.14 | 0.31 | 233.5 | 2685.88 | -11.45 | 13.77 | -13.30 | 0.07 | 7116850.85 | 566111.01 | N64 10 12.343 | E4 21 35.675 |
| | 2714.10 | 0.40 | 234.6 | 2713.84 | -11.33 | 13.66 | -13.44 | 0.10 | 7116850.75 | 566110.87 | N64 10 12.340 | E4 21 35.665 |
| | 2762.55 | 0.45 | 211.4 | 2762.29 | -11.04 | 13.40 | -13.67 | 0.11 | 7116850.49 | 566110.63 | N64 10 12.332 | E4 21 35.647 |
| | 2791.53 | 0.40 | 224.5 | 2791.27 | -10.85 | 13.23 | -13.80 | 0.11 | 7116850.32 | 566110.50 | N64 10 12.327 | E4 21 35.637 |
| | 2819.19 | 0.33 | 235.2 | 2818.93 | -10.71 | 13.12 | -13.94 | 0.11 | 7116850.21 | 566110.37 | N64 10 12.323 | E4 21 35.627 |
| | 2847.86 | 0.15 | 206.6 | 2847.60 | -10.62 | 13.04 | -14.02 | 0.22 | 7116850.13 | 566110.29 | N64 10 12.321 | E4 21 35.621 |
| | 2875.33 | 0.17 | 173.3 | 2875.07 | -10.55 | 12.97 | -14.03 | 0.10 | 7116850.05 | 566110.27 | N64 10 12.318 | E4 21 35.620 |
| | 2904.11 | 0.06 | 257.4 | 2903.85 | -10.50 | 12.92 | -14.04 | 0.18 | 7116850.01 | 566110.26 | N64 10 12.317 | E4 21 35.619 |
| | 2932.31 | 0.13 | 15.5 | 2932.05 | -10.53 | 12.95 | -14.05 | 0.18 | 7116850.03 | 566110.26 | N64 10 12.318 | E4 21 35.618 |
| | 2961.45 | 0.14 | 15.1 | 2961.19 | -10.59 | 13.01 | -14.03 | 0.01 | 7116850.10 | 566110.28 | N64 10 12.320 | E4 21 35.620 |
| | 2988.45 | 0.28 | 319.8 | 2988.19 | -10.67 | 13.10 | -14.06 | 0.26 | 7116850.18 | 566110.24 | N64 10 12.322 | E4 21 35.617 |
| | 3018.63 | 0.43 | 330.1 | 3018.36 | -10.81 | 13.25 | -14.17 | 0.16 | 7116850.34 | 566110.14 | N64 10 12.328 | E4 21 35.610 |
| | 3048.10 | 0.41 | 332.0 | 3047.83 | -10.98 | 13.44 | -14.27 | 0.03 | 7116850.53 | 566110.03 | N64 10 12.334 | E4 21 35.603 |
| | 3076.20 | 0.45 | 319.6 | 3075.93 | -11.13 | 13.61 | -14.39 | 0.11 | 7116850.70 | 566109.92 | N64 10 12.339 | E4 21 35.594 |
| | 3103.72 | 0.52 | 335.7 | 3103.45 | -11.30 | 13.81 | -14.51 | 0.17 | 7116850.89 | 566109.79 | N64 10 12.346 | E4 21 35.585 |
| | 3132.71 | 0.51 | 338.0 | 3132.44 | -11.52 | 14.05 | -14.62 | 0.02 | 7116851.13 | 566109.69 | N64 10 12.354 | E4 21 35.578 |
| | 3161.67 | 0.61 | 334.4 | 3161.40 | -11.76 | 14.31 | -14.73 | 0.11 | 7116851.39 | 566109.58 | N64 10 12.362 | E4 21 35.570 |
| | 3190.74 | 0.73 | 335.6 | 3190.47 | -12.04 | 14.62 | -14.87 | 0.12 | 7116851.70 | 566109.43 | N64 10 12.372 | E4 21 35.560 |
| | 3219.16 | 0.67 | 324.8 | 3218.89 | -12.31 | 14.92 | -15.04 | 0.15 | 7116852.00 | 566109.26 | N64 10 12.382 | E4 21 35.548 |
| | 3245.75 | 0.75 | 318.2 | 3245.47 | -12.53 | 15.17 | -15.25 | 0.13 | 7116852.26 | 566109.06 | N64 10 12.390 | E4 21 35.533 |
| | 3274.39 | 0.73 | 313.5 | 3274.11 | -12.75 | 15.44 | -15.51 | 0.07 | 7116852.52 | 566108.80 | N64 10 12.399 | E4 21 35.514 |
| | 3301.31 | 0.61 | 320.6 | 3301.03 | -12.94 | 15.67 | -15.72 | 0.16 | 7116852.75 | 566108.58 | N64 10 12.407 | E4 21 35.499 |
| | 3332.43 | 0.62 | 327.8 | 3332.15 | -13.18 | 15.94 | -15.92 | 0.07 | 7116853.02 | 566108.39 | N64 10 12.415 | E4 21 35.485 |
| | 3360.55 | 0.49 | 324.0 | 3360.27 | -13.38 | 16.16 | -16.07 | 0.14 | 7116853.25 | 566108.24 | N64 10 12.423 | E4 21 35.474 |
| | 3389.36 | 0.14 | 318.8 | 3389.08 | -13.49 | 16.29 | -16.16 | 0.37 | 7116853.37 | 566108.14 | N64 10 12.427 | E4 21 35.467 |
| | 3418.24 | 0.09 | 337.2 | 3417.96 | -13.53 | 16.34 | -16.20 | 0.06 | 7116853.42 | 566108.11 | N64 10 12.429 | E4 21 35.465 |
| | 3448.28 | 0.10 | 256.3 | 3448.00 | -13.54 | 16.35 | -16.23 | 0.12 | 7116853.44 | 566108.08 | N64 10 12.429 | E4 21 35.462 |
| | 3476.08 | 0.13 | 128.2 | 3475.75 | -13.51 | 16.33 | -16.23 | 0.22 | 7116853.41 | 566108.08 | N64 10 12.428 | E4 21 35.462 |
| | 3504.71 | 0.17 | 95.7 | 3504.43 | -13.50 | 16.30 | -16.16 | 0.10 | 7116853.39 | 566108.15 | N64 10 12.427 | E4 21 35.467 |
| | 3534.14 | 0.14 | 130.7 | 3533.86 | -13.48 | 16.28 | -16.09 | 0.10 | 7116853.36 | 566108.22 | N64 10 12.426 | E4 21 35.472 |
| | 3563.23 | 0.35 | 189.7 | 3562.95 | -13.38 | 16.16 | -16.08 | 0.31 | 7116853.25 | 566108.23 | N64 10 12.423 | E4 21 35.473 |
| | 3592.32 | 0.39 | 185.4 | 3592.03 | -13.19 | 15.98 | -16.10 | 0.05 | 7116853.06 | 566108.20 | N64 10 12.417 | E4 21 35.471 |
| | 3620.96 | 0.58 | 200.8 | 3620.67 | -12.95 | 15.75 | -16.16 | 0.24 | 7116852.83 | 566108.14 | N64 10 12.409 | E4 21 35.466 |
| | 3632.49 | 0.59 | 211.6 | 3632.20 | -12.84 | 15.64 | -16.22 | 0.29 | 7116852.73 | 566108.09 | N64 10 12.406 | E4 21 35.462 |

## 6.6 LOT Summary

BP AMOCO

Page 1 of 1

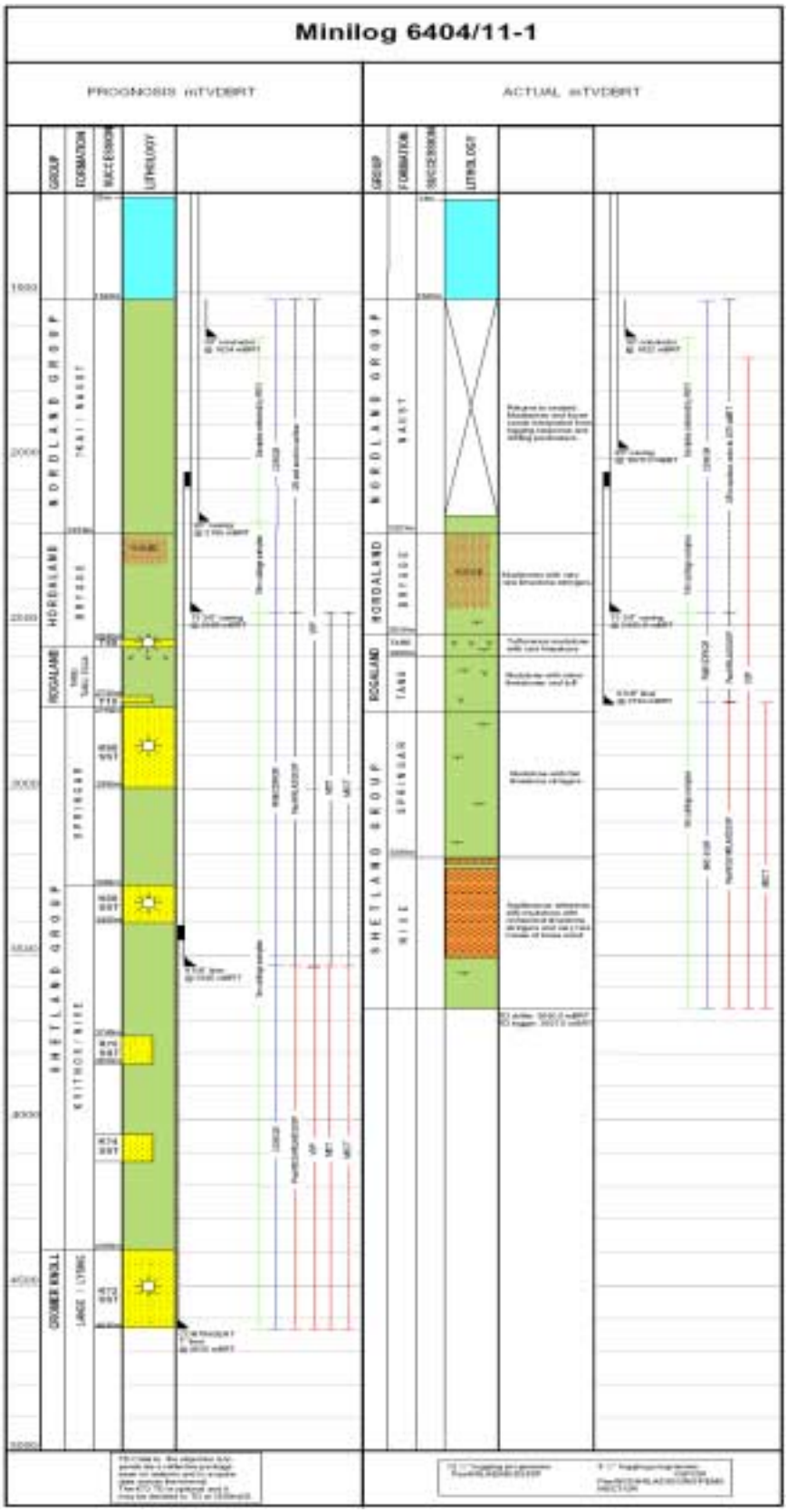
**Leak-Off Test Summary**

Legal Name: 6404/11-1
Common Name: Havsule

| Test Date | Test Type | Test Depth (TMD) | Test Depth (TVD) | AMW | Surface Pressure | Leak Off Pressure (BHP) | EMW |
|---|---|---|---|---|---|---|---|
| 30/11/2001 | LOT | (ft) | (ft) | (SG) | (psi) | (psi) | (SG) |
| 07/01/2002 | LOT | 2,179.80 (ft) | 2,179.00 (ft) | 1.11 (SG) | 612 (psi) | 4,252 (psi) | 1.37 (SG) |
| 29/01/2002 | LOT | 2,443.80 (ft) | 2,443.00 (ft) | 1.25 (SG) | 479 (psi) | 4,822 (psi) | 1.39 (SG) |
| 31/01/2002 | LOT | 2,730.80 (ft) | 2,730.00 (ft) | 1.30 (SG) | 295 (psi) | 5,343 (psi) | 1.38 (SG) |
| 11/02/2002 | LOT | 2,730.80 (ft) | 2,730.00 (ft) | 1.33 (SG) | 540 (psi) | 5,704 (psi) | 1.47 (SG) |

# 7 GEOLOGICAL EVALUATION

## 7.1 Geological mini-log



## 7.2 Strategraphy

The following table lists formation tops corrected to wireline depths.

Table 5.2.1 Formation Tops

| **Chrono / Lithostratigraphy** | | **Tops** | | | |
|---|---|---|---|---|---|
| | | **Depths (mBRT)** | **Depths (mTVDBRT)** | **Depths (mTVDSS)** | **TVT (m)** |
| | | | | | |
| | **Seabed** | 1520.0 | 1520.0 | 1495.0 | |
| **Recent** | Storegga 2 and 1 | 1520.0 | 1520.0 | 1495.0 | 54.0 |
| | | | | | |
| **Early Miocene - Recent** | **Nordland Group** | | | | |
| | Naust “R” P. Slide 2 | 1574.0 | 1574.0 | 1549.0 | 83.0 |
| | Naust “R” upper flow | 1657.0 | 1657.0 | 1632.0 | 25.0 |
| | Naust “R” lower flow | 1682.0 | 1682.0 | 1657.0 | 52.0 |
| | Naust “S” | 1734.0 | 1734.0 | 1709.0 | 107.0 |
| | Naust “U” | 1841.0 | 1841.0 | 1816.0 | 90.5 |
| | Naust “W” | 1931.5 | 1931.5 | 1906.5 | 291.1 |
| | | | | | |
| **Eocene – Early Miocene** | **Hordaland Group** | | | | |
| | Brygge “A” | 2222.9 | 2222.9 | 2197.6 | 86.0 |
| | Brygge “C” | 2308.8 | 2308.8 | 2283.6 | 217.5 |
| | | | | | |
| **Danian – Late Palaeocene** | **Rogaland Group** | | | | |
| | Tare Fm | 2525.9 | 2526.1 | 2501.1 | 73.6 |
| | Tang Fm | 2600.0 | 2599.7 | 2574.7 | 148.0 |
| | | | | | |
| **Turonian - Maastrichtian** | **Shetland Group** | | | | |
| | Springar Fm | 2748.0 | 2747.7 | 2722.7 | 458.0 |
| | Nise Fm | 3206.0 | 3205.7 | 3180.7 | >444.0 |
| | | | | | |

**Note:** Nordland Group picks were made in the pilot hole that was drilled 28.6m from the main wellbore and have not been depth shifted to wireline that was acquired in the respudded hole.

The following table lists forecasted vs. actual depths. Overall, all depths were within, or close to, the predicted error bars as shown below.

Table 5.2.2 Forecasted vs. Actual Depths

| **Marker Horizon** | **Pre-Drill Forecast** | | | **Actual** | | |
|---|---|---|---|---|---|---|
| | **Depths (mTVDSS)** | **Seismic TWT (msec)** | **Error Bar** | **Depths (mTVDSS)** | **VSP TWT (msec)** | **Error (m)** |
| | | | | | | |
| **Seabed** | **1495** | **2028** | **+/- 7.5** | **1495.0** | | **0** |
| Storegga 2 and 1 | 1495 | 2028 | | 1495.0 | | |
| | | | | | | |
| **Nordland Group** | **1558** | **2091** | | **1549.0** | | **-9** |
| Naust "R" P. Slide 2 | 1558 | 2091 | | 1549.0 | | -9 |
| Naust "R" upper flow | 1659 | 2192 | | 1632.0 | | -27 |
| Naust "R" lower flow | 1686 | 2219 | | 1657 | | -29 |
| Naust "S" | 1747 | 2281 | | 1709 | | -38 |
| Naust "U" | 1867 | 2401 | | 1816 | | -51 |
| Naust /Kai | | | | | | |
| Base Pliocene | 1931 | 2484 | +/-30 | 1907.0 | | -24 |
| | | | | | | |
| **Hordaland Group** | **2210** | **2748** | **+/-40** | **2197.6** | **2717.6** | **-12.4** |
| Brygge Fm | 2210 | 2748 | +/-40 | | | |
| Top T50 (Tare?) | 2520 | 3096 | +/-50 | 2501.1 | | -18.9 |
| Base T50 | 2545 | 3120 | +/-50 | | | |
| | | | | | | |
| **Rogaland Group** | **2605** | **3184** | **+/-60** | **2501.1** | **3065.8** | **-103.9** |
| Top T40b | 2605 | 3184 | +/-60 | | | |
| Top T10 | 2710 | - | +/-70 | | | |
| | | | | | | |
| **Shetland Group** | **2731** | **3316** | **+/-70** | **2722.7** | **3272.8** | **-8.3** |
| Top K90 (Springar Fm) | 2731 | 3316 | +/-70 | 2722.7 | | -8.3 |
| Intra K90 Temp 3 | 2835 | 3420 | +/-80 | | | |
| Intra K90 | 2970 | 3544 | +/-100 | | | |
| Top K80 (Nise Fm) | 3260 | 3772 | +/-120 | 3180.7 | | -79.3 |
| Base K80? | 3380 | 3912 | +/-150 | | | |
| Top K76 | 3720 | 4072 | +/-200 | NP | | |
| Base K76? | 3805 | 4180 | +/-200 | NP | | |
| Top K74 | N/A | | | | | |
| | | | | | | |
| **Cromer Knoll Group** | **4360** | **4440** | **+/-250** | **NP** | | |
| Top 72 | 4360 | 4440 | +/-250 | NP | | |
| Base K72 | 4610 | 4740 | +/-250 | NP | | |

## 7.3 Pore and Fracture Pressure Summary

Pore pressure evaluation was performed at the wellsite by Knowledge Systems Inc. For a detailed review see report 'Final Report – Realtime Geopressure Monitoring While Drilling – from Drillworks /Services', E. Doyle, 2002.

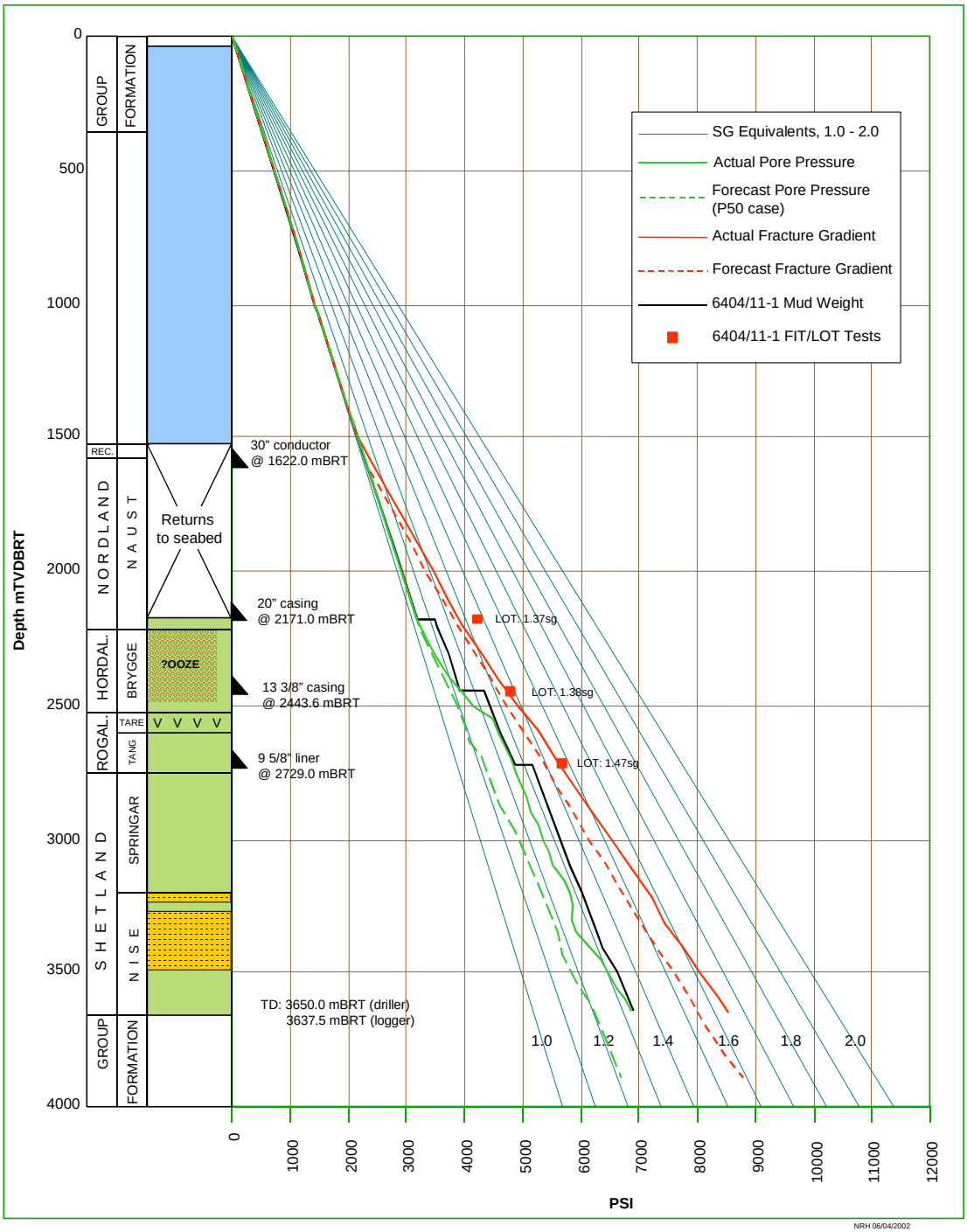


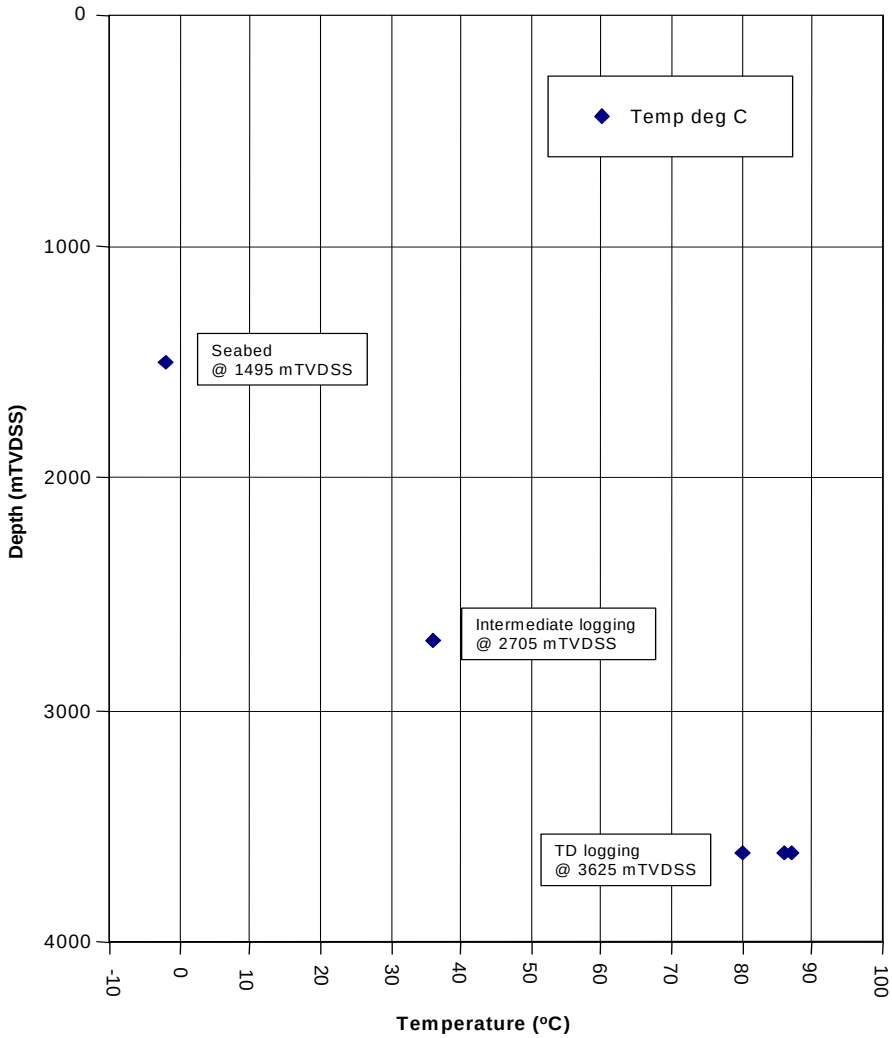

Figure 5.3.1 Pressure Profile

## 7.4 Wireline Logging

Table 5.4.

| Run No. | Date | Tool String | Hole Size | Logged Interval (mBRT) | | Opr. Time (hrs:min) | Lost Time (hrs:min) |
|---|---|---|---|---|---|---|---|
| 1A1 | 01/02/02 | Pex/HRLA/EMS/DSI/ | 12 ¼" | 2718.5 | 2440.0 | 14:30 | 0:00 |
| | | | | | | | |
| 2A1 | 21/02/02 | VSP/GR | 8 ½" | 3645.0 | 1700.0 | 17:40 | 0:00 |
| 2B1 | 21/02/02 | Pex/NGS/HRLA/DSI/SP/EMS | 8 ½" | 3640.5 | 2649.8 | 10:00 | 0:00 |
| 2C1 | 22/02/02 | MSCT/GR | 8 ½" | 3593.0 | 2739.5 | 11:25 | 0:00 |
| | | | | | | | |

## 7.5 Temperature Data



# 8 LESSONS LEARNT SUMMARY

Please refer to section 2 for more details regarding each of the lessons learned summarised below.

| **PROJECT** | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| | | | |
| 1.1 | Offset data gathering | Commenced too late, although limited offset wells were available. Started in ca. March should have been done pre. Christmas early in Appraise phase | Include in correct place in project plans for future wells - early appraise |
| 1.2 | Lessons Learned | As above. | Format and process to be developed at outset of project in conjunction with licence. |
| 1.3 | Project Mgr Change | Continuity and process gap. In position for 4 months then changed, also distracted by other project work. | Endeavour to keep continuity if not have a comprehensive handover |
| 1.4 | Appraisal & loss of key members. Team competency balance. Team re-sourcing /support | Team selection criteria critical from both a technical and behavioural characteristic required. Inherited team had a degree of wrong skills set & competency with too many in first time roles or lacking BP company knowledge. A major project such as this was not afforded the luxury of the ability of acquiring a few of the best people available worldwide. | Ensure appropriate selection is made. Interview in advance if possible. Obtain professional selection assistance (externally sourced if necessary) to ensure both competency and behavioural suitability. Deployment of resources and numbers will always be an issue, (internal or partners), and needs to be worked accordingly with compromises made and where deficient plan to fix at the earliest opportunity whatever the outcome. |
| 1.5 | Management of conflict | Be aware of possible conflict with high performers and strong personalities | Be aware of the potential |
| 1.6 | Mentoring | Insufficient mentoring of new hires, people etc. | Ensure numbers balance in team is predominantly experienced and or familiar with their expected duties |
| 1.7 | Project ramp up | Not carried out due to availability/late arrival of core team, a pre-set schedule and planned initiation meeting | Core team session pre-initiation meeting is essential to establish the ground rules and base plan |
| 1.8 | Communication of skills/experience | Key players of the team have experience but possibly not known to all members as is the limitations | A specific facility/session for the core team to inform each other would be beneficial |
| 1.9 | Managing the timeline | Setting of deadlines was dictated by an ever changing rig availability date. Initially this required regular changes to plans, however, after a couple of iterations the deadlines were fixed. It was recognised however, that fixing boundaries not only forces delivery, but can result in perceived team | Fixing boundaries |

| PROJECT | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| | | pressure | |
| 1.10 | Planning time | If project was to spud on the 15th. June as initially intended with a core team not fully in place by mid Feb/early March then the plans would have been sub optimal | Ensure a clean 6 months is allowed for deep water, unknown territory exploration drilling |
| 1.11 | Appraise/Select Gate | Combined as one and no real formal gate deliveries early on in the project to drive activity closure | Do not combine the phases |
| 1.12 | BtB Integration | Excellent effort may by all members of the team | Others to utilise processes Havsule have established |
| 1.13 | Part time working | Avoid team members working for other asset as focus is lost. Core team not established early enough | Strive for agreed and committed placement of resources |
| 1.14 | Budget estimating | 16th. Round a long way removed from a realistic estimate for the Havsule well. Budget must cater for relevant offsets and local performance and represent a realistic design for the well | Do not plan a budget for a target performance. Peer review of budgets should be carried out. |
| 1.15 | Budget methodology | Inconsistent not only in a business unit but across business units | Common process missing to be incorporated in BtB, however, will rely on commitment from licence dept's re. Conformance/agreement of process. Consistent approach required |
| 1.16 | Partner impact | Issues/topics do take longer to resolve | Be aware and plan for potential delays, alternatively get them involved in peer reviews etc. to facilitate things |
| 1.17 | Project Schedule content | Perception does not reflect all activities taking place | Ensure priorities are always highlighted and undertake interim reviews away with the team |
| 1.18 | Project control focus | Dedicated resource required early who has company experience to avoid unnecessary investigation of processes etc. Integration of BtB required more effort than expected | Enforce as early as possible and dedicate a resource until completed. Initiate at core team ramp up if possible, i.e. The bones of it. |
| 1.19 | Documents | Format and requirements found to vary | Early clarification is beneficial |
| 1.20 | File structure | Late and new and took more time to develop along with BtB than expected. Decision to apply rather than change mid way was made at the outset. Comments include too many folders/topics repeated in different top level folders resulting in lost, repetitive, conflicting documents ie. Lessons Learnt. Many folders not obvious to find.. | Established structure in line with BtB now established and should be used, however this structure must be reviewed, and ambiguous or wrongly position files corrected for future BtB projects. If folders are required in different phases of the project/ different projects, they should be "shortcut" folders or linked folders in preference to separate ambiguous folders. |
| 1.21 | Retention of core team | Excessive rig slippage will place pressure on the team to share resources, however, where re- | Be flexible, however, try to preserve the core team |

| PROJECT | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| | | assigned ensure work is shared with the remainder and possible look at alternatives | |
| 1.23 | Excess e-mail usage | Sometimes used instead of talking - a cover! | Discipline use check sheet to be applied. If urgent/critical/important use personal communication where possible |
| 1.24 | Working environment | Adequate space not available to work effectively and productively due to noise, space & compaction | Allow for extended team at the outset |
| 1.25 | Cost | Shared service/resource used whereas the perception is that for a high profile/cost project a dedicated resource should be utilised | |
| 1.26 | Resource sharing | Planner, risk database mgr & TA all part time and sometimes result in poor project support and hence inefficiencies | Avoid an excess of part timers |
| 1.27 | Reporting of equipment failures | Rig reporting focus and tracking systems are more suited to safety & incidents and equipment related failures were lost or omitted in this system. Ie UER reporting. | UERs, Synergy etc not the best for tracking purely mechanical/ operational deficiencies and failures. A technical focussed system to report and track equipment failures should be in place. |
| 1.28 | Programme amendments | Reason why sometimes questioned | Include the reason for the change. Achieved after comments raised. |
| 1.29 | Control of service co. Docs | Sometimes poor | Degree of control imposed is required |
| 1.30 | Ops/Drl Supv support onshore | Strain on the DS/Project mgr excessive due to poor operational support especially in times of simultaneous operational and safety problems | Onshore team requires DS/Drl Supv/SDE as min. |
| 1.31 | BP alignment | Insufficient knowledge of BP's working principles were somewhat destructive in progressing issues. | Team alignment to BP's policy, practices and workings are fundamental to avoid excessive waste discussions around principles of operations |
| 1.32 | Subsurface alignment | Very good | Co-location is the key |
| 1.33 | Deepwater policy | Gaps within current policy are missing re. Deepwater rigs and engineering requirements, eg. Riser margin, BOP configs, etc… | Action: End of project review of policy and guidelines for deepwater applications |
| 1.34 | Deepwater well control training | Key players were trained before the well which prepared them and impacted the well control procedures. Three courses (3 day) were held in Aberdeen with Drilling supervisors, Senior engineers, project manager, Saipem Rig Super, toolpushers, Drillers and ADs, Rig Manager. Studied and reviewed | Strong recommendation to repeat for the future. Note. Third course was poorly received due to change of instructors and no BP project leaders on the course, must avoid this pitfall. |

| PROJECT | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| | | deepwater WC but also developed Havsule specific guidelines. Had very significant positive impact on DW WC understanding during the well. | |
| 1.35 | Deepwater experience | Team had limited deepwater experience in 80% of it's members. There was also an assumption that as SC5 was a Deepwater DP Rig, it had a higher level of DP deepwater experience onboard. This was found not to be necessarily the case. Rig had drilled only a small number of significantly DW wells, and virtually no DP. Significant turnover of personnel also limited DW experience levels. There was a continuos learning game ongoing. | Project member selection criteria should have an increased focus. |
| 1.36 | Project management skills and understanding | Team had limited understanding of discipline and rigour required for successful project management of a well. Limited Project management training of project leaders. | Key project managers require project management training. Identify at project ramp up. Do not forget newcomers or personnel changing roles during project. |
| 1.37 | Roles and responsibilities | Roles and responsibilities of delivery structured organisation not fully understood by some members of the team | Message of what roles people have and how the team should work needs to be clear at beginning of planning phase |

| SUBSURFACE | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| 2.1 | Plan a well in a week. Scoping of the well. | Core team not in place when done, hence, objectives not fully challenged and bought in on early enough. Final team were not involved. I.e. Project Manager not involved. | Choose the right time, and get the right people in place to do it, otherwise end result will be flawed. |
| 2.2 | Subsurface delivery v's spud date | Deliverables held versus a slipping spud date caused concern by subsurface regarding external influencing the completing of work etc., however, control of overspend also required and in conflict with same. | Ensure early plans reflect complexity of well and amount of work likely. |
| 2.3 | Well location | Late assignment of well location somewhat governed the following work scope, however, needs to be consciously planned for if early or late as in our case | |
| 2.4 | Pore pressure estimate | Pore pressure exceeded the P50 /P90 window and resulted in | = |

| SUBSURFACE | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| | | remedial action been required - 9.5/8" liner set early. | |
| 2.5 | HIVE sessions | For both engineering and rig teams they have been extremely useful in communicating the well issues, expectations etc. | Continue to do in the future. Ensure offshore team and newcomers also included. Note: Skarv did it at prespud meeting. |
| 2.6 | Shallow Hazard Assessment - Remote support | Done remotely, SHA took time due to resourcing and non-Norway office based. | Ensure this receives the focus it needs and schedule sessions in the receiving office |
| 2.7 | Late PP estimating | Change to PP prognosis occurred months after final design was completed | Manage change more rigorous, eg. Project change requests - time, money & risk. If PP estimate changes a "Management of Change" is required. |
| 2.8 | TD decision | Attempts to align partnership to agree TD depth caused uncertainty in both onshore and offshore team | Attempt to align partnership to commit to TD in a timely fashion |

| RIG READY | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| 3.1 | BPN Rig Intake process | Does not conform to BP Europe practices, do these exist? | Intake process requires detailed review. Require a Global Rig Intake Process, with Local and then Rig Specific Elements. Oliver Tomlins is working on rig intake process. Action on RWH to address with OT. |
| 3.2 | Calibration of Rig Gauges | Poor calibration of all rig gauges/ instrumentation. | Commission a full recalibration (check) of all rig instrumentation. Rig maintenance issue that needs to be captured in rig auditing process. |

| PLAN AND DESIGN | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| 4.1 | Drilling Ops Procedures | Integration of DOP and HSI, (Hole section instructions) is planned. Expected to avoid duplication and will be more robust. Content was good but needs to be more concise. A lot of repetition and differing formats due to "silo" planning. Early preparation of section guidelines makes them less focussed and not up to date. | Will advise if successful/preferred. BP Norway undergoing a general review of all DOPs to get consistency. RWH inputting Havsule comments. |
| 4.2 | Design Freeze | Too many options kept open too long - partner impact, overburden uncertainty, late assessment of location and site | Slam the door and freeze the concept. Later requests etc. manage through change process |
| 4.3 | External design | The remoteness needs to be | Be aware more effort will be required to |

| PLAN AND DESIGN | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| | inputs | addressed re. delivery of key information and more effort is required to both extract information and co-ordinate reviews, e.g. Riser analysis, pore pressure, site assessment | ensure delivery of products |
| 4.4 | Magnitude of planning effort | Underestimated for the well and it's complexity which slowly surfaced | 6 months needed for a Havsule type well. Requires early involvement up front |
| 4.5 | Wellsite and Site specific risk assessment | Effort needed to integrate with the risk register developed by the team for future projects | Successfully achieved. |
| 4.6 | Riser & conductor analysis | Slow input and delivery of data and results | Kick off meeting with all relevant parties, i.e. soils, weather, designers & material suppliers would have been extremely beneficial |
| 4.7 | 13.3/8" design - borderline | No allowance for any surprises or ability to set packers in joints under hanger to test BOP's etc or to resolve wellhead/ seal assy problems. | Casing design needs to be more robust to cater for unknowns in the future. Recommend running a heavy/ high strength joint under wellhead for setting packers etc under wellhead. |
| 4.8 | Design engineer continuity | Loss of design skill through a shift to an offshore position left the team exposed | Ensure the placement/conversion of the team for execute is addressed correctly such that skills are retained both onshore & offshore |
| 4.9 | Conductor & riser final design review | Late changes required due to poor communication and understanding of conductor and riser analysis by drilling contractor | Advantageous to hold a rig, project and design house meeting to review final designs/program for riser and conductor analysis to ensure all are on the same page re. results, interpretation and requirements |
| 4.10 | Project initiation meeting | Meeting held too early | Reduce amount of planning time by streamlining process thus reducing risk of keeping extended team in place too long prior to spud |
| 4.11 | Peer Reviews | Value and cost of formal peer reviews was questioned. For planning, peer assist (ie. Paul Bezant visit) to work planning issues was considered very high value. Formal peer review is considered a necessary and important part of the assurance process rather than assistance in the planning process. Attention has to be paid to ensure that the time and effort required to present to the peer review team is not at the expense of planning time and resources. | Make greater use of Peer Assist. Plan and Control the time and resource input required for peer reviews to that necessary for effective assurance. |
| 4.12 | Waiting on weather | Significantly more WOW incurred than was forecast prior to taking rig on contract | Ensure Weather impact is properly assessed in AFE contingency calculation |

| LOGISTICS | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| 5.1 | Contract understanding | Contracts content not fully understood as established contracts are been utilised | Key components to be made available to the team or team briefed accordingly. Action on AIJ to input end of project "contract review". |
| 5.2 | Boat for riser | AHV was procured to aid mobilisation of riser after failure of Florø plan to load at Florø. This boat was limited for northern Norway offshore work, and very restrictive handling the risers. Boat was selected because it was also an anchor handler, therefore could be used for both tasks. | Get the best boat for winter weather, even if this is designated as the backup boat. In such weather/ rig cost constrained situations, do not compromise Supply vessel requirements by using an anchor handler. |
| 5.3 | Equipment delivery | Too much too quick & too early - Group loading system did not work correctly – look ahead process was inflexible to changes | Better system with rigour required |
| 5.4 | Deepsea cargo stowage | Inadequately done on both primary & support vessel resulting in risers becoming loose in heavy weather. Chocks requested but not provided!! | Establish standards/address the issue in future winter ops. As well as improving securing and chocking, We modified load out to procedures to prohibit stacking of risers joints on the deck, and attempted to load boats with a row of risers that filled the full boat width. I.e. no free space to allow movement. |
| 5.5 | Air freight procedure | Vital airfreight went amiss. Company guideline to not fly freight resulted in no adequate procedure being adopted to cover this requirement when things went amiss. The rig was not kept informed on urgent helifreight arrangements making verification of it's dispatch and tracking of lost cargo impossible. | Have a rigid procedure that everyone knows no matter what the policy as it will be required at some point'. Ensure the rig is kept fully informed as to the planned routing/timing of urgent freight requirements. |
| 5.6 | Helicopter scheduling & contract | Using existing operator contracts in Kristiansund proved difficult as our operation was always low priority | Have a more user friendly contract alternatively source separately |
| 5.7 | Materials controllers | Excessive effort by supervisors on logistics, helicopters etc. as opposed to allow them and the engineers to do their job. Wrong scheduling of equipment has cost a lot of money on standby etc. | Materials controller required offshore in future deepwater wells to co-ordinate logistics effort, helicopters, personnel & deck loading |
| 5.8 | Supply boat - Far Swan | Ideal vessel for winter deepwater operations | This type and size of vessel is key in contributing to a successful campaign |
| 5.10 | Load out on rig | Lesson - Load was not controlled by deck space in early stages but by the variable deck load available. Logistics planning severely | VDL assessment should be part of logistics process. Planning process must include the drilling contractor, BP offshore and onshore well planning team. |

| LOGISTICS | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| | | underestimated these constraints. | |
| 5.11 | Supply boat availability | Back up for primary boat during repairs not the ideal boat | |
| 5.14 | Waiting on weather | significantly more WOW incurred than was forecast prior to taking rig on contract | Ensure Weather impact is properly assessed in AFE contingency calculation |
| 5.15 | Helicopter Personnel and freight movements | Helicopter strike created significant problems getting the right people to and from the rig. Helicopter arrangements gave extremely poor alternatives in the event of weather problems, industrial problems and operational problems requiring heli logistic support. | Availability of alternative helicopter cover should be assessed to mitigate the threat from striking pilots, mechanical problems, Helicompanies inability to provide etc when critical operations taking place. |
| 5.16 | Drilling supervisors | Drilling supervisors need induction to BP Norway logistics process and the commitment to follow it. DSV response was that deviation became necessary because the process and procedures in place were not adequate or followed. I.e. Florø load-out, helibooking process, heli freight arrangements, scheduling. | Review of logistics process for remote operations and forward base operations required. |

| MOBILISATION | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| 6.1 | Weather forecasting | Inaccuracy leading to poor decisions | Have 2 forecast; from Ocean Routes and Storm. |
| 6.2 | Florø workscope planning | Poor planning & follow up and monitoring | DO NOT leave for contractor to co-ordinate/play lead role - keep control in house with contractor involvement. |
| 6.3 | Logistics controller | Logistics co-ordination poor/non-existing at Florø. | Assign a BP logistics person at any forward or temporary base in the future |
| 6.4 | Well test equipment demob | Well test equipment left onboard. Missed as a key item in planning as testing was retained as an option | Priority should have been deck loading & space as opposed what can we live with onboard |
| 6.5 | Deck loading | Spud and initial phases then riser took priority and carry over pipe etc. remained as did stocking up for spud mud etc. A major change in plan was the fact the very little riser joints were loaded onto the rig in Florø. This caused problems in mobilising large quantities of heavy riser joints to the rig in rough weather. Actually both supply vessels experienced problems and some damages were experienced during these operations<br>Approx. 247 tons more than | Have a specific deck load plan from the start. Deck-load plan must prioritise weather sensitive operations. All non-critical equipment onboard should be back-loaded, 3 1/2" pipe and 5" pipe left in the derrick should have been laid down, to allow the rig to get as much riser joint onboard as possible. At least 230tonnes of SC5 excess tubulars. (DP and DCs) were backloaded from rig whilst infield. These should have been removed from the rig before the rig left Florø to aid VDL. |

| MOBILISATION | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| | | anticipated were on the rig at time for rig-move from Florø. VDL was not clearly specified. | |
| 6.6 | ROV operating limits | 6m was the final figure after which indemnity was required | Highlight up front operating limits etc. |
| 6.7 | ROV hydraulic spooler cooler | Not present on back-up which then overheated | All units to have one |
| 6.8 | Original Manifest from ASCO | Several items that were put on Far Swan at Tananger were not included on the manifest. Several cont/baskets were not identified with actual weights. Also items not belonging in GL 1 from WF were included on Far Swan, resulting in a juggling of equipment to/from boat. There was a discrepancy of 247 MT between manifested equipment and actual, both from BP and Saipem | Include all weights and descriptions of equipment on the manifest. Equipment should be sent acc. To GL lists. Consider sending such equipment to Kr.sund with truck |
| 6.9 | Logistical problems | All through the mob. Phase in Florø a lot of time was spent trying to get boats handled at Fjordbase in a timely manner, as well as trying to connect with the right people. K.Jansen A/S was only handling the taxi boat, while Saipem had their own coordinator at base. A lot of the manifests were poorly filled out, and several times equipment was late arriving on the rig. The whole operation was very messy. | A key element to the success of the project in the early stage is managing the logistics chain. All it would have taken is getting a person representing BP at Fjordbase, either from Vestbase or from Fjordbase itself |
| 6.10 | Varco TD Rotating Head | Scope of work largely under estimated. In addition the work had to be fitted amongst other derrick and drillfloor related work which caused a lengthy duration of task. | Attempt to reduce the scope of work of such a short yard stay, when several tasks are being undertaken at the same time. Assess what jobs really are necessary. |
| 6.11 | Taxi boat | The taxi boat between rig - Florø (Solbris) is not suitable for winter operations. There will be problems anytime the wind approaches 30 knots. At the end people were delayed and helicopter from Kr.sund was set on standby. Solbris has on a previous job been identified as unsuitable. Use of a pontoon in Floro has previously been beneficial, was overlooked by Saipem. | Part of the yard stay should include getting a sturdier boat and a pontoon for personnel traffic |
| 6.12 | DP Verification/ Trials #1 | Excessive time spent carrying out full failure mode DP trials but proved worthwhile in that major single point failure defect was found - black-out associated with shutting | Comprehensive failure mode DP trials to be carried out for all DP deepwater & winter campaigns as part of the Rig Ready process prior to spud. |

| MOBILISATION | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| | | down the emergency switchboard resulted in loss of position due to drop out of one of the dif. links for the DGPS systems was not operational. | |
| 6.13 | DP Verification/ Trials #2 | Efficiency in performing the DP tests was slow (estimated almost twice as slow) due to rig personnel having to learn the process during the job, despite detailed procedure being used. Note: Lack of critical path focus associated with problems with the ROV also did not help. | Drilling contractor should designate or contract a DP specialist familiar with failure mode analysis to co-ordinate DP trial execution to improve efficiency and cost effectiveness of the trials. Control room operators and marine staff should be more trained in performing the trials. |

| PRESPUD OPERATIONS | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| 7.1 | Oceaneering Transponder Basket, developed and provided to the project, to save time in running the rig and navigation LBL array transponders. | The aluminium basket was divided into eight compartments for the Simrad (rig) transponders and Fugro Sonardyne transponders. The size of the compartments had small tolerances versus the floating elements of some of the transponders that were used, such that modifications had to be made. It was not sufficient lifting height in the moon pool to lift the basket above the moonpool trolley. The lifting bridle was also too high such that it was difficult and time consuming moving the basket with the overhead crane and launch it into the moonpool. | The basket should be dimensioned for worst case floating element. It may be difficult to use in future with other transponders. The basket should have been dry-run out of critical path/ rig time to confirm it worked as intended. |
| 7.2 | Deep water ROV operations | To operate the ROV concurrently with a Pod-line to seabed, deploying transponders or other equipment to seabed must never be done such that ROV umbilical and Podline can get entangled. High risk in deep waters due to sea current. | Pod line should always be run in tension. even when load has been released, the line must be run with a deadweight to keep pod line in tension. Maintain a proper distance between launching point between ROV and pod line on surface to reduce the risk of entanglement. |
| 7.3 | Deep water ROV operations in wintertime | Continuous ROV support is decisive in ensuring progress for drilling operations in deep waters. Since operations are conducted on a year around basis ROV operability must also be ensured in wintertime. | All weather sensitive operations must be analysed and corrective measures implemented such that e.g. the ROV can be used with at least the same weather limitations as drilling operations. I.e. proper systems for launching and retrieval of the ROV through the splashzone must be in place. Cursor system and compensated winch recommended. |

| PRESPUD OPERATIONS | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| 7.4 | Spud Markers | Oceaneering/ ROV contractor provided spud markers and anchors that are "drillable". These anchors were "lost" and someone installed steel plates instead. Steel plates are NOT drillable, and when one of the spud markers by accident was dropped in the hole, the well had to be re-spudded. | All spud markers should be of the "drillable" type, including anchors. A concrete clump weight can be moulded in a plastic bucket if no other means are available. Sand bags were not used as they were not compatible with the transponder basket that was used. Also spud markers shall be kept in safe distance from the spud position, especially during drilling of large surface holes (as was described in the DOP). |
| 7.5 | Wave radar | Excellent tool in advising start time for the resumption of operations post hang-off or EQD | Consider for all deepwater wells where inclement weather is likely. Should not be limited to DW operations, suitable for all floating operations. |
| 7.6 | Well Positioning | Lesson - Using a navigation LBL array combined with a mini ROVNav (Transducer on the ROV) is an excellent tool in placing the well, as well as a good backup for positioning of the ROV/ equipment on the seabed. | Should be considered used for all deepwater wells.<br>Was also used to find out that the spud assembly was RIH with an angle more than 2,5 degrees, i.e. helping finding out in what direction the rig should be moved to correct drillstring angle. |
| 7.7 | DP Positioning Arrays | Excessive time and weather dependence | Should have laid arrays with a supply vessel/ROV before rig was mobilised. Note: transponders were rig owned and they did not have sufficient backups to prelay the array. May need to rent in future. |
| 7.8 | ADCP | Current Measurement. Problems laying ADCP due to weather and ROV problems. By the time this had been installed and had obtained data, it would have been too late to act upon Riser Analysis issues, had the sea currents been greater than anticipated. Recommend this is laid and interrogated before the rig comes on location. | Should lay ADCP with a supply vessel/ROV before rig was mobilised in conjunction with array. |

| PILOT HOLE | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| 8.1 | LWD | Lo flow tool performed well in 12 1/4" pilot hole | Loflow tools to be used in pilot hole |
| 8.2 | TD Criteria | 20m from TD - good formation to set 20" casing - in the event of LWD tool failure the section could be TD-ed with no loss to the well plan | Capture and document in predrill decision process |
| 8.3 | Location marker buoys | Not rated for 1500m water depth - discovery at the 11th. Hour - tested | Deepwater ops checklist point |

| PILOT HOLE | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| | | out and imploded. | |
| 8.4 | ROV buoyancy | Repeated dives to get the correct ROV ballast was required on both units. Deepwater issue due to compressibility of buoyancy modules. | Factor into programme. If possible do a DW trial of ROV. ROV contractor should investigate bladder system to actively compensate vehicle. |
| 8.5 | ROV leaks | Leak on valve packages & cages occurred on both units resulting in shutdown | Investigation under way |
| 8.6 | ROV telemetry problems | Loss of telemetry at depth resulted in aborted dives - 2 | Investigation under way |
| 8.7 | Pumping Hi-Vis pills with bit on bottom | Torque increases noticed while pumping Hi-Vis pills with bit on bottom were eliminated by pumping off-bottom instead. Torque increases were due to pumping at reduced pressure and flow. | Pump Hi-Vis pills off-bottom. |
| 8.8 | Pilot Hole | Programmed method of opening up pilot hole did not guarantee that the new hole would follow the pilot hole. After cementing the 20" casing this could have left a conduit for well fluids to get to surface. Risk was considered negligible in planning stage, but was still a major point of debate at the execution phase even though the well was respudded 30m away from the pilot hole. This suggests original assessment is debateable. | Pilot hole/ hole opening procedure must account for chimney effect. |
| 8.9 | Re Spud Contingency | Was never covered. Deepwater well experience in Norway has shown this to be a likely contingency. | Ensure this is one of the contingency risks. |

| SURFACE AND CONDUCTOR SECTION | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| 9.1 | Hydrates & funnels | Funnel up & hydrate seal caused a problem re. Entry, damage to the wellhead and getting the BOPs on | Vema learning was to have the funnel down on the BOP |
| 9.2 | Hole location & loss | Low currents meant mud cloud around the hole in excess of 10m - difficult to see hole to stab in. Resultant action by rig was to move markers nearer the hole nominally 5-6m away, but in the event 2-3m away resulting in one falling downhole with a steel anchor attached, resulting in the well being respudded. | Stick to the plan - min distance from wellbore to be ca. 6m. Must use drillable anchors on all marker buoys. I.e. Sandbag or cement. |
| 9.3 | Visibility deep | Poor visibility and very low current | Nothing previous was known so useful |

| SURFACE AND CONDUCTOR SECTION | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| | | at this location and depth proved difficult for operations and monitoring | for this area in the future. Procedures for spudding/ stabbing BHAs/ conductor etc must take account of likelihood of no visibility. |
| 9.4 | WSOG update | Update of the planned WSOG once some site experience was in place resulted in better understanding of limitations and optimisation of the set points | Plan - learn & update worked well here - not to be forgotten |
| 9.5 | Hole angle on first spud | Building hole angle above limit for inclination tool - Anderdrift (2,5 degrees) and thought the tool did not work. Even on repudded hole with a survey taken before spudding, and low WOBs the assy was still continuously trying to build. Rig considers this to be a BHA related problem- inherent building assy due to Pony DC length below the "stabiliser" (36" hole opener). | The spud assembly, designed to be very heavy, should not be stabbed into the pilot hole crater until found stable above this position. Take an Anderdrift survey before spudding in to verify that the BHA is vertical, with the rig in a stable position above the well prior to drilling ahead. Evaluate using a 5 degree Anderdrift tool. |
| 9.6 | Overside Work | Unrealistic environmental limits. Equipment and Moonpool area not designed adequately to remove overside risk. BP v Saipem procedures not in alignment. | Future rig contracts and selection must include or address safe working environment for overside work, and comprehensive procedures to safely control such work. Moonpool design should remove requirement for majority of overside/ man riding work. Future rig programme must include working arrangements that can guarantee safe overside work in marginal conditions. |
| 9.7 | Standby Boat Cover | Standby boat provided excellent cover for MOB requirements within it's vessel specification in up to 5m seas. Vessel management had a very proactive and sensible approach to safe launching weather limitations. It was well equipped with compensated MOB launch system, however the operation still suffered very considerable downtime due to the inability to provide cover in excess of 4-5m. BP Norway HSE procedures are written from the perspective of a routine platform work scope and environment and need to be realistic for floating drilling operations. | A step change in providing safe overside working environment in weather where MOB launch is not possible must be implemented on future wells. Review MOB limits, MOB launch systems, Dacon Scoop, PLBs, Survival suits, Agreed procedures BP/Saipem. BP Norway overside procedure needs review to cater for floating drilling operations. |
| 9.8 | ROV Surveying | Fugro Mini ROV Nav Array (transducers) were very accurate and good for ROV and drillstring, marker beacon, transponder | Recommended. Use again |

| SURFACE AND CONDUCTOR SECTION | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| | | positioning. Essential for finding the hole. It was accurate enough to survey the BHA inclination when Anderdrift surveys were in doubt. | |
| 9.9 | BHA | Hole opening assy was a traditional "building" assy by using a pony on the bottom of the assy with no stabilisation above the hole opener. Difficult to control inclination with subject BHA when 17" pilot bit 6m below 36" HO even with very controlled drilling parameters and reaming hole. | BHA must not be build assy. Use short assy below HO. ie.bit and X/O only. |
| 9.10 | Running conductor casing/ Hydrate Base | Experienced rapid and uncontrollable lateral movements of hydrate shield/plate during installation of same to conductor housing, rigging of TITUS system, etc. As plate has to be landed on cellar deck trolley during subject work, the movements are a potential risk towards personal injuries (easy to get a foot squeezed between plate and trolley). | Have a robust skirt fitted underneath the hydrate shield/plate in order to stop lateral movements of plate during installation on conductor housing and rigging of TITUS equipment. Must be tailored to fit into trolley opening. |
| 9.11 | TITUS system | Needs to be designed so that no person is required to go overside or below the suspended plate when installing the hose arrangement. | DrilQuip should redesign to remove HSE hazards. |
| 9.12 | Installation of TITUS equipment. | The TITUS hose between ROV quick disconnect and swivel jnt was made a bit too short and hence difficult to install. While WOC after the top-up cement job, the ROV connection was disconnected and hose used to clean the hydrate shield. An extended hose would have made the cleaning job more efficient. | Subject TITUS hose to be extended approx. 2m. |
| 9.13 | Availability of spare cross-overs | A spare cross-over was not provided for the backup MWD tool. This prevented it's use as a replacement for the Ander-drift inclination tool for the re-spud. Could also have been a problem if original BHA was lost in hole/in sea. | Provide all back-up tools in 'ready-to-run' status. |

| 26" HOLE SECTION | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| 10 | | No lessons learned taken down for this hole section. | |

| BOP, RISER AND RIG EQUIPMENT | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| 11.1 | Riser recoil | Rig had never function tested it's riser recoil system since first installation. With up to 180mT overpull across the LMRP high risk of major damage if Recoil system failure during EQD. Challenge to confirm EQD and recoil system. Phase 1 & 2 tests carried out , i.e. Valve timings Logic function testing was carried out followed by surface disconnect using EQD system and the performance of the recoil system measured. This was very successful. However in the planning stage, Recoil test was intended to be as close to an actual recoil as practical. By using Subsea precharged accumulator pressures for the recoil test the same conditions as seen subsea were not present. This may not give the same connector unlatch times. 33secs v.29secs.. | Verification of recoil system is critical. Assess the relevant degree for each specific well - our conclusion was that simulations and surfaces testing was acceptable. This was verified by 2 real EQD events. Ensure surface testing procedures are as close to subsea conditions as possible. Process on Havsule to be cascaded to others in a similar position |
| 11.2 | Riser Protectors. Mobilisation of riser joint to the rig #1 | Riser mobilised offshore without end protectors. Observation - Saipem do not normally send large quantities of riser joints back and forth to the rig. The fact that the riser joints are not equipped with solid protection caps, however, affects operations where this have to be carried out. Especially if this is to be carried out in wintertime with a lot of rig motions, and the risk of damaging riser joints/ pin ends is large wood etc. was required to afford some protection. Contractor not too concerned!! | There should be enough solid end protectors available for at least as many riser joints that at any point in time is expected to be "on the move". Action: Ensure inclusion in future contracts. |
| 11.3 | Riser Lifting Padeyes - Mobilisation of riser joint to the rig #2 | Observation - Similar to the observation above, and based on the same reasoning, the riser joints was not prepared for handling; 1) lifting lugs were not certified for lifting, 2) slings were not available, pre-made up to each joint. The idea to re-sling riser joints offshore because the riser joints on the boat do not all have slings | All riser joints shipped out to the rig, whilst off-shore, should have slings made up in advance. Ensure inclusion in future contracts. |

| BOP, RISER AND RIG EQUIPMENT | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| | | installed from shore, is an unsafe practice, and should not be planned for. | |
| 11.4 | LMRP Connector unlatch failure | Surface test of LMRP disconnect failed. Connected with 1500 psi - would not release with up to 1950 psi. Connector cleaned & checked - lacked grease/lubrication. Problem believed to be associated with lack of lubrication after considerable (30+) functions of the LMRP connector whilst BOP function testing, troubleshooting and preparing for recoil testing trials. However there may be some connection with the failure to disconnect during the first EQD attempt during the well. | Connector condition & use to be tracked post inspection/overall |
| 11.5 | Riser padeyes | Inspection of lifting points not carried out since new - some - 10 yrs despite Riser joints being "maintained and inspected". SEE ALSO IN THIS SECTION various other QA/QC inspection and audit issues on riser and BOP system. | Contractor maintenance and inspection standards are seriously lacking. Also BP independent auditing of rig maintenance and inspection procedures have failed. - Future rig audits and QA/QC process must include review of actual inspection and maintenance records and physical confirmation to confirm contractors written procedures are being complied with. |
| 11.6 | Riser handling & mgt | Inadequacies in knowing a full detailed list of equipment & condition was lacking. Tracking of Riser joints etc was poor. | Independent audit required to focus on this aspect |
| 11.7 | Instrumented Riser Joint | Never really worked & contractor reluctant to fund to correct. Due to unreliability differential inclinometers used | Have contingency for IRJ failure as opposed to bullseyes |
| 11.8 | Park position of rig | Questioned by some due to shift changes. | Ensure charts and maps with park and escape are highly visible on the bridge. |
| 11.9 | Riser space out | Wire tag marker to assist in riser space out was useful. Used as confirmation that riser calculations were correct prior to picking up slip joint. | To help for BOP space out (Riser space-out) hang off the bottom of the BOP - rope and a sand bag. Ensure it is non damaging (not metallic). |
| 11.10 | Weather forecasting | 3 day forecast was inadequate for deepwater BOP running | 5 day forecast plus 2 is required to best assess weather windows |
| 11.11 | Riser and Hang off Stress Analysis running | Running Stress Analysis check was made by design house to verify as run figures and interpolate criteria for exact weather experienced to verify limitations etc. Questions on angles/axial loads & weak points were questioned. Hang-off stresses were not checked in the Riser analysis and | Design house WS Atkins were used as a check for design figures when actually running the riser, in particular axial loading due to heaves that were excessive. Beneficial to provide allowance available & options to take re. Hang-off procedure and what equipment was required. |

| BOP, RISER AND RIG EQUIPMENT | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| | | a stress check had to be done at short notice during the hang-off situation. | |
| 11.12 | Dedicated hang-off joint | In heavy weather and running has to be suspended, the joint in the rotary will be subject to high side loads and damages in the rotary. | Dedicated or special build joint required to allow rig roll and pitch without getting damaged in the rotary and through the diverter and support ring. Hang-off Stress joint is required on future DW operation. |
| 11.13 | LBL & BOP transponders | Interference between them both intermittently to ca. 1200m resulted in repeated yellow alerts. Worked ok with greater depth | |
| 11.14 | Buoyancy modules | 2 became detached upon lifting | Checks required before shipping and prior to running. Again Quality of inspection, and maintenance procedures needs to be addressed in future audits. |
| 11.15 | Riser Fillup Valve misalignment | Would not make up to a specific riser joint. Prior to Gjaller all Riser joints had been reassembled without being aligned. Following Gjaller well, and problems experienced riser joints had been realigned, however the RFV was not realigned. | |
| 11.16 | Riser Fillup Valve functionality | Once made up RFV would not function. Assurance from contractor was that this item was checked before use. Fact revealed minimal maintenance work was done. Lack of ownership of equipment and maintenance responsibilities. | Needs auditing along with the riser and other key riser components. |
| 11.17 | Filling/ Testing of K&C lines | Hoses for testing K&C lines were small bore. Excessive time to test K&C lines using Subsea test pump. Risk of pressure trapped in lines if small bore valves. Also Safety incident; Residual air in the system after pressure tests resulted in jump of equipment - potentially dangerous. | Should use large bore, 1"min, hoses and valves. Consider to use cement unit to pressurise. |
| 11.18 | LBL & BOP transponders loss | Loss of both due to rig heading due to thruster wash - repeated issue in calmer weather | |
| 11.19 | Riser weight - Dynamic loading of Riser v's Depth | Project underestimated the dynamic effects of running riser in heavy seas. At 1300m hanging weight was ca. 540 mt with 11 jts to go. Seas at 1.5m heave gave +/- 50mt and 2m gave +/- 125 mt, therefore rig equipment rating of 650mt was becoming the limitation. A decision to proceed meant we had to land the BOP! At planning stage we had been debated on whether 750T rated equipment | Deeper water or worse weather means 750mt running equipment. (we already had restrung to 14 lines!!)Riser analysis must include dynamic loading of BOP and riser in anticipated and maximum weather conditions. |

| BOP, RISER AND RIG EQUIPMENT | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| | | was necessary, and whether restringing the block was necessary. Decisions were confirmed as correct after experiencing dynamic loading. | |
| 11.20 | C & K line connections | Unable to get test on K&C lines after landing stack. Extensive leak testing of the system was carried out, with difficultly getting a test without pumping up several barrels. Suspect poor testing was due to fluid level in K&C lines dropping away due to hydrostatic differences in 1500m K&C lines. Resolved testing by flushing K&C and closing fail safes immediately after. Then investigated leak in Kill line. Was believed to be attributed to hydraulic K&C line connectors on the riser support ring not seating correctly. Leak not detected until after landing BOP which if it had not been rectified, would have meant unlatching BOP/LMRP to replace seals. | Air needed flushing out, also hydraulic connectors needed a pressure bump to seat correctly - local unit aspect! Ensure maintenance on these are up to date. Must ensure K&C lines are tested against failsafe valves before landing BOPs as good practice. Rig procedures do not include this, and should be modified accordingly. |
| 11.21 | Hydrate seal on wellhead connector dislodgement | Hydrate seal installed in BOP connector came free and landed across VX profile resulting in no wellhead test. Delays, disconnected BOP, removed with ROV, checked, and re-landed BOP. Very real risk of having to pull BOPs. May have been due to BOP movement whilst WOW (heave and surge). Although there is no evidence of this, it may also be attributed to improper installation due to person having to work below BOP immediately prior to running. W | ROV to check before BOP land out in future if run. Saipem must urgently implement design change to allow safe working below BOP for VX and hydrate seal change, and routine inspection and maintenance of connector.<br><br>Should also be on check list prior to launching BOP in water. |
| 11.22 | Wellhead Connector test | Several tests to 5000psi+ for a long time were carried out during investigation of 11.21 above. This increased risk of washout on wellhead or BOP connector seal faces. Note: After recovery of the wellhead, there was evidence of washing on the wellhead seal surface. | Greater focus required on investigating leaks to prevent critical washout occurring. Use of ROV to do visual inspection. Immediate bleed off of pressure. Use of dye etc. |
| 11.23 | Slip joint leak | Inner barrel threaded connection to Diverter leaked under no pressure. Had to be stripped down and repacked. Seal areas in very poor condition, threads showed old corrosion, o-ring seals were not making contact with worn and | Rig contractor maintenance and inspection issue and an audit point for rigs in the future. See action 11.5 |

| BOP, RISER AND RIG EQUIPMENT | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| | | corroded seal area. Supposedly checked before installation - had been "cleaned up" but should have been reworked and threads recut. Very poor maintenance carried out. No test of seal done after stripping and "cleaning". Again a management & maintenance issue | |
| 11.24 | RFV (Riser Fill Valve) needs | After being unable to install RFV a review as to whether it was required or not was done, determined as not required. | Should have been done up front as part of riser analysis study. |
| 11.25 | HD connector lock pressures | LMRP connector failed to unlock on EQD with 1700psi applied. Was partially attributed to higher "lock" pressures being applied to LMRP connector when 3000psi was applied to lock wellhead connector as they are on same circuit. Limits were not instantly known by contractor neither was the revised deepwater recommendations from the connector manufacturer. See SC5 incident report. | Ensure procedures are available at outset. Connector locks should be on separate circuits. Solution during programme was to leave connectors in "vent" position therefore any increase in operating pressure required (ie. On rams or ramlocks or other connector) would not be inadvertently applied to other connector. Disconnect procedures and Connector latch procedures were revised on the rig to ensure inadvertent trapping of 3000psi in connector lock chambers was avoided. |
| 11.26 | Shearability of U170 pipe | Recommended U170 pipe was discovered not to be shearable very late. This pipe was planned to be used to run 13-3/8" to allow BOP test to be done immediately after casing and cement job. 6-5/8" S135 was subsequently used and the BOP test rescheduled to be done on the wear bushing installation run. 5" S135 could have been used but this would have significantly reduced the tensile capability in a stuck casing situation. | Clarity required early to avoid confusion. Selection process must specify shearable landing string with collapse rating for max BOP test, and sufficient tensile for running casing. Saipems 5" ITAG would have met this criteria, but may have conflicted with position of rams. U170, 5"S135 and 6-5/8" S135 did not meet requirements. |
| 11.27 | 9.5/8" shearability | 9.5/8" 47lb/ft casing was identified as shearable, however 53.5lb/ft was planned to be run. Interim testing proved the 53.5lb/ft was determined to be non shearable.(Actual shear occurred slightly over 3000psi operating pressure). This trial resulted in procedural changes. Note: there was offshore discussion on the action to be taken if an Emergency disconnect occurred whilst running 9-5/8". There was support for making several attempts to shear pipe. This "probably" would have achieved a shear, but if it would not, it could | Get firm test data re. Shearablility of all pipe to be used in the future. Include repeated shear attempt testing if this is considered an option. ie. Must have a guaranteed shear as failure to shear could preclude dropping the string. Future work needs a full risk assessment on acceptability of running non shearable strings, v. cost and practicality of modifying or install SuperSeal or casing rated shear rams. |

| BOP, RISER AND RIG EQUIPMENT | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| | | most likely prevent the casing from falling when finally dropping the casing string, making the situation worse. | |
| 11.28 | Connector test | Reduced to 8,500 psi as opposed to 10,000 psi to reduce effective stress on the system when not needed | Test to max anticipated wellhead pressures. Requirements only as opposed to equipment ratings |
| 11.29 | Leak on manifolds | Post pre-test leaks or known leaks were identified late | Full test on ALL valves prior to rig handover |
| 11.30 | Gas sensor | No mud gas sensor on the choke line or poorboy degasser outlet make it very difficult to determine exact readings of bottoms up etc. when circulating through choke manifold. Returns from the manifold and poorboy bypass the header box mud gas sensor.The Geoservices backup mud gas sensor trap was routinely rigged up into the degasser pit to allow monitoring of the returns during bypass to the Chokemanifold. This was a compromise solution. | Rig audit item (Mudlogging Service)- mud gas sensor on choke & degasser returns line required. Future operations should consider a recirculating or dual system whereby continuous monitoring of mud gas levels is possible. |
| 11.31 | BOP configuration | 2 shear rams as recommended by NPD for deepwater, results in compromises with a 4 stack BOP, leaving only 2 pipe rams. Lower rams for last resort only, so only one working ram. Only option is to install Variable rams with related integrity issue. Outlets were wrongly positioned and too short lead time available to change to acceptable position. In future therefore need reviewing into where rams and outlets are placed for contingency operations. See also Havsule\05 Engineering Workspace\26 Rig Operations\Well Control\Evaluation of Havsule BOP config Ver 1.doc | Used Kill line as primary well control "choke line", which resolved issue in short term, but resulted in compromised contingencies. Deepwater 4 ram BOP's need specifically reviewing as to operational line up and acceptability - BP rig audit. |
| 11.32 | Wave periods | Worst for the SC5 is 17 - 20 secs | Fact only - a future consideration |
| 11.33 | Riser Tension Analysis operating Limits | After failure of two MRTs the rig was not able to quickly reassess and change the riser tensioners to compensate. Whilst there was reasonable understanding of the optimum and programmed riser tension to be applied throughout the operations, there was very limited offshore guidance and knowledge of the minimum and maximum riser tension limits and resulting operating | 569 MT reduced to 518mt after riser displaced to seawater then to 460mt to give only 100 mt at connector - ok. Rig must know upper and lower limits up front - in particular the lower should failure of lines occur. Riser Analysis Operating Guidelines should be more user friendly. |

| BOP, RISER AND RIG EQUIPMENT | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| | | limitations. | |
| 11.34 | Rucker slip & cutting | Problems adhering to Slip and Cut interval due to consistently bad weather restricting MOB cover. Also hazardous and difficult to carry out job with in seas consistently giving 3 - 4m heave, even when MOB was available. | Must be another way - hydraulic!! Future rig selection should investigate this, and if necessary invest in upgrade. |
| 11.35 | Landing LMRP after disconnect | Problems experienced relanding LMRP. Resulted in aborted attempt and damaged AX ring. Rig DP system was in Medium not fine gain. LMRP had been previously relanded in c. 1.5 -1.8m max heave. There was rig opinion that the DP system has a mathematical modelling problem, resulting in late correction and over correction of rigs positioning especially when weather is from ahead. | DP system should be operating to it's maximum potential when landing BOPs/LMRP. I.e. Fine Gain. Rig Audit to confirm DP performance based on data recording and DP operator feedback.<br><br>Should consider changing AX ring with ROV each disconnect as a routine. |
| 11.36 | Riser Condition - Rig In Take | Riser lifting equipment (Rotating pad eyes) were not included in the rigs maintenance program resulting in the pad eyes never having been inspected since new supply. | All pad eyes inspected, seized ones freed off & damaged ones replaced (5off replaced). General issue regarding thoroughness of BP auditing process (through Nexus). Necessary for audit and QA inspections to verify that contractor maintenance and inspection has actually been performed as per contractors procedures and claims. |
| 11.37 | Riser Condition - Rig In Take | Riser sections handled on rig & shipped to shore with 21 1/4" seal subs fitted. These seal subs are not retained & can fall out | All seal subs removed prior to further movement |
| 11.38 | Riser Condition - Rig In Take | General riser condition poor with makeshift end protectors & hard caked mud in bores. | Riser sections cleaned, inspected & bores re protected |
| 11.39 | Riser Tension Ring - Rig In Take | Riser Tension ring last inspection report (NDT) did not contain a reference traceable back to the tension ring | All inspection reports must be positively identified to the pertaining equipment. Inspection company amended report. |
| 11.40 | Instrumented Riser Joint - Rig In Take | Instrumented riser joint instruments not fit for the intended purpose. (temperature & Pressure transducers Beyond economical repair) | Saipem should have the IRJ fully serviceable for future use as part of the Riser Management system |
| 11.41 | Flex Joint Rating - Rig InTake | Capabilities of lower flex joint not known (i.e. max mud weight) by Saipem prior to Intervention | Original Manufacturer of element provided data in tabulated form |
| 11.42 | BOP Condition - Rig In Take | BOP in very poor condition when received in Floro with all bonnets leaking despite recent overhaul | Saipem should consider a more robust maintenance regime |
| 11.43 | BOP | Float type accumulators floats | Testing procedure amended, however |

| BOP, RISER AND RIG EQUIPMENT | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| | Accumulator folats - Rig In Take | susceptible to sinking rendering the accumulation unusable. | Cameron Engineering now not recommending this type of accumulator for this application. |
| 11.44 | BOP test plug | Drilquip unable to satisfactorily assess effect of U-tube pressure exerted on weight set BOP test plug during BOP test if seawater is used as test medium. Ie. 1.33sg mud in test string, 1.03sg seawater in K&C lines exerts 180klbs upward force to unseat WSTT. BOP tests were therefore all carried out with mud in circulation. if SW had been used, as BP guidelines there is increased well control risk. | BP well control guidelines recommend seawater as test medium. Is this applicable to DW operations, and does it increase the potential for well control incidents due to loss of hydrostatic? What are BP DW practices world wide? |

| 17" HOLE SECTION | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| 12.1 | ROP restricted | Restriction to 30m/hr due to heave - could have drilled 50 - 60 m/hr | Info only |
| 12.2 | Gas influx avoidance | Must pump out on all sections in deepwater | Common approach to be adopted in deepwater of known or unknown gas presence to avoid hydrates. Must have a common understanding of how much to pump, i.e. closed end displacement, or steel displacement |
| 12.3 | Weather integration | Must integrate and manage weather against the plan in winter & deepwater wells | Info only |
| 12.4 | Bore Protector | Difficult to recover due to wear with minor use - impact of RMS was suspected as the cause as the rig was predominantly in SE quadrant, 20m off for optimum position with consequential adverse affect of wear bushing resulting in 3 runs to recover. Note: Actual wear on bore protector was only approx 10-15% of inner circumference but still enough to cause major loss. Eventually recovered using J Slot adapter on MPT. Successful but not a reliable contingency plan. | Awareness of RMS and bore protectors such that use brand new every time and do not be surprised if pulling is a problem, alternatively always run a tool than will recover a worn protector. DrilQuip should investigate a "Vetco" fishing spear type of pulling tool as backup.<br><br>Note: No wear on lower flex joint was observed after retrieval to surface. |
| 12.5 | 13.3/8" joint make up, weight, grade and thread type. | Bad batch with black steel and ovality created problems. Many bad make-ups due to thread torque exceeding max shoulder torque before reaching shoulder. Re-assessed and set Max makeup torque to 105% of recommended figures. Increased Optimum, Minimum, Max Shoulder | Max figures used for make up - mill problem initial acceptance problem. Should also check mill makeup torque charts for couplings to see if similar problems were observed in mill. I.e. original cut problem or re-cut or storage problem. Action Weatherford to produce "Contingency Procedures for |

| 17" HOLE SECTION | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| | | torques by 10%. Max Shoulder torque set at 70% of Optimum. Reference torque /turns set at 10% of optimum and 1.35 turns. Some joints still required backing out and remaking. Removed elevators during final turns. | makeup of badly threaded tubulars" based on historical experience of last few BP Norway casing jobs. This should be available to operations when a similar problems occur rather than relying on supervisors "guessing" the best way forward. |
| 12.6 | 13.3/8" cementing | NO top plug bump, consequently confirmed top plug had not released. Wiper dart had released but not landed in top plug. When pulling landing string and running tool, cleaning sponge ball exiting pipe showed a 2300 psi spike - top plug had sheared off leaving plug in BOPs. Temperature issues. Drill out procedure to get rid of plug lodged in BOP without causing BOP damage was very successful. Used a 17" stabilised assy with Pony DC and 12-1/4" bit below, BHA was calculated/designed to be impossible to contact BOP faces. | Under investigation also focus on the details- see Halliburton report. |
| 12.7 | RMS and bullseye angle conflict | RMS angle indicated spot on zero for running casing whilst bull eye showed 1.75 degrees - conflict - which do you believe | Ensure calibration and settings are correct to the outset and track compatibility intermittently to track divergence |
| 12.8 | Tally error | Computerised systems for tallies are not to be trusted blindly. Essential to maintain good quality control and good practices. | Old drilling practices of BHA's, pick-up book etc. to be adopted as check |
| 12.9 | 13.3/8" centralisers | Non-welded were used inadvertently. Greater risk of failure of centralisers due to more heave than on conventional wells. | USE welded only on deepwater wells |
| 12.10 | Hole/Riser/ well clean up | Poor cleaning of riser, WH & BOP due to WBM & low gel strength. Very dirty hole experienced with knock on effect to hanger landing, circ. Scoring in wellhead etc. | Circ. With BHA under the BOP and pump back whilst also boosting riser. WBM with low gel strength has been a real issue - focal point of the future |
| 12.11 | Cementing 13-3/8" | Halliburton Cement Head racked in derrick. This is a precarious operation. Dropped object risk. Left up for "three days" but actually "two weeks" . If big storm had come it would be a big risk. Cement head caught up on Kelly hoses when making up. Would have caught on upper racking assy if tight hole situation. Required 3 trips in riding belt to get it rigged up. 45mins to rig up. Similar problems | Always lay out cementing assy based on safety, time economics and guarantee of cmt head properly configured to pump through. Don't believe assurances that it will be OK racked back. There are too many instances of this not happening. Have proved an identical head assy was OK when laid out (on 20" casing job, with single also in mousehole) |

| 17" HOLE SECTION | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| | | with 30" cement head. Also "Baku Incident" risk. | |
| 12.12 | Running 13-3/8" Casing | Need a casing cutter assy to be on the rig if non shearable casing strings to be run, in case casing gets stuck across BOP. | Include in future MELs and as a contingency plan in the DOP. |
| 12.13 | Casing Running/ Wear Bushing Running/ BOP test tools / hangoff assys etc. | Confusion and poorly planned tool strings racked back leading to inefficiency. Could be avoided by preplanning these assemblies. | Get full stickup drawings showing tool strings, landoff points and BOP ram positions for all these assemblies to ensure. Include in programme. |
| 12.14 | Running 13-3/8" Casing | Only one Baker locked joint was sent out. | Problems backing off and bakerlocking another joint when threads get damaged. |
| 12.15 | 17" Hangoff stand | DrilQuip EDPHOT requires landing off on a Wear Bushing. Bore protector doesn't have the required rating. Not sufficient room to hang-off on Rams. Also require to clarify requirements for use of Gray valves, kellycocks etc.in hang-off string. | Need properly configured DrilQuip hang-off stand or Saipem hang-off tool (Cameron) on VBRs.<br>Note: Common problem that not possible to hang-off on a nominal bore protector, and will have to land off on rams in this section. |
| 12.16 | Mud Storage | Mud logistics relied on access to the boat during critical rig operational periods. If this period coincided with bad weather rig would have been shut down. | Ensure Mud logistics allow sufficient mud to be taken onboard before operationally required and remove dependence on good weather. Should have cleaned out last two column mud tanks prior to rig take over. |
| 12.17 | Mud Hydrate Inhibition | Original programme had provision to change out mud to Glycol/ KCL Hydrate inhibited mud if leak off test allowed. When high leak off was obtained, this plan was abandoned, exposing rig to risk of hydrate problems. | |
| 12.18 | Running Casing | U170 determined as non shear able. | Use ITAG pipe. Shear able and has required tensile rating. |
| 12.19 | Well Control | Hydrate risks due to rapid cooling of Choke lines in cold seawater environment. BOP cool down to Hydrate critical temperatures takes many hours (see Mud Programme),however choke lines cool down within a much shorter period requiring expensive hydrate inhibited muds to be used. | Insulating K&C lines may be more cost effective v. Hydrate inhibited mud as detailed in industry Deepwater Hydrate studies. Should be evaluated if lead time permits in future deepwater work.. |
| 12.20 | Drilling optimzation and loss prevention | Downhole torque and stick-slip measurements showed high torque at start of drilling the section. Possible twist-off avoided by lowering surface | Use downhole drilling mechanical measurements in future well, especially if expecting rough weather. |

| 17" HOLE SECTION | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| | | weight. Stick-slip with RC bit due to excessive rig heave. | |
| 12.21 | Hole caliper | CDR computed caliper (phase caliper) used to determine hole size and profile | Use again in top hole sections where wireline calipers will not be run. |
| 12.22 | Riser Margin | Unable to maintain Riser Margin during all drilling phases. i.e. 1.41sg required v. 1.37sg Leak-off test. This resulted well being displaced to Riser Margin Mud up to BOPs prior to each weather disconnect. This was very time consuming and increased risk of losses. After each occasion, problems were experienced getting casing to bottom, possibly caused by hole instability following subsequent reduction in the mud weight after reconnection. | Future work should include a risk analysis of benefit v. Cost of this strategy. Evaluate whether the risk of loss of BOP integrity whilst disconnected is sufficiently real to justify disadvantages of displacement to heavy mud. |
| 12.23 | Running 13-3/8" Casing | Uncertainty of casing land off caused casing to be pulled back and relanded on wrong land off shoulder. Hanger design issue and deepwater issue. Problem initiated by casing land-off being uncertain. Casing was washed down last 30m. There was c. 1.5m stretch in the landing string due to the casing weight and deepwater. Both of these masked a "solid" land off. The stretch also wrongly suggested the casing had landed off high. The casing was picked up to repeat the land-off to get confirmation, during which the landing mechanism malfunctioned allowing casing to be landed off 16cm high on the lockring. A riser reference line had been rigged up but had parted due to excessive weather. Also contributory was poor tally management of landing strings. | See separate report from Dril-Quip.<br><br>Drilquip had supplied old design hanger, the SS-15 Subsea Wellhead System. Do not use this design (even on conventional well designs). Avoid picking up casing when landed. Future programmes must highlight soft landing issue and depth discrepancy/ calculation due to stretch. Must use riser reference line or preferably laser reference system. Absolutely must have an accurate tally of landing strings especially if landing string has been inherited racked back from previous well/operator. |
| 12.24 | Well Control on connections | Connections were flow checked by switching returns to trip tank. Geoservices were able to record a "signature" for flow to stop. | Lesson learnt. Good practice. |
| 12.25 | Well control - Pumping out of hole | When pumping out of hole one pump was continuously left circulating on the riser boost line in order to aid monitoring of pit volumes when making the connection. 6-8m3 flow back volumes between pumps on and off were therefore eliminated allowing accurate monitoring of well for well | Lesson learnt. Good practice. |

| 17" HOLE SECTION | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| | | control purposes should the well kick when ECD was removed. | |
| 12.26 | Contingency for critical equipment failure | All problems with 13 3/8" casing did not have a contingency plan in place. Ie Hanger and seal assy failure. Casing landed high, with no backup contingency plans. | Investigate whether the failures on 13 3/8" could have been identified pre-drill and the remedial actions identified prior to start of operations |
| 12.27 | Flowmeter | Both rigs and Geoservices flowmeters worked well throughout the well and were critical during some operations, ie regaining circulation whilst running 9-5/8" casing.. This should be noted for future as many (most) floating drilling units make very poor use of the flowmeter due to rig heave/roll. | Do not accept claims of flowmeter not being useful/ feasible on floating operations. Ensure flowmeters are in full working condition prior to contract, i.e. should be calibrated as all other gauges as part of rig acceptance program. |
| 12.28 | 13 3/8" piggy - back hanger | A 13 3/8" piggy back hanger was installed to provide sufficient sealing area for seal assy. A modified WB was also installed. | Info only. |

| 12 ¼" HOLE SECTION | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| 13.1 | Kick tolerance tracking | Guide and limits required to be set by town - poor tracking at the wellsite due to unclear guidance from onshore of safety factors and pore pressure kick intensities. Toolkit was wrong. | Clearer understanding between onshore and offshore required. Include calculation, monitoring and recording in roles and responsibilities of offshore staff. This require training in use of BP toolkit. |
| 13.2 | Riser mud & displacment plan | Delay to operations when PP & FG required change to mud weights etc. Mud logistics plan still resulted in a dependence of loading /backloading mud during critical stage of operation mainly because all available mud storage tanks had not been cleaned. If weather had been bad it would have resulted in NPT. | Strategy required up front in future re. Range of weights & tanks etc. Must remove boat/ weather dependency from critical path. |
| 13.3 | ROV excursion test | Tether only allowed 100m radial run - tether increased to 200m allowing all transponders in LBL array to be accessed & batteries replaced without the need for an additional vessel or a rig move. ROV flew 290m! | 200M tether do work in 1500 m water depth - check versus LBL array and apply if required |
| 13.4 | Kill mud | Keep a much higher weight for the section and cut back as opposed to weigh up | Worked well to cater for hole variations |
| 13.5 | 9.5/8" floats | No single back-up items available on the rig - late discovery | Greater focus & details on group loadings & materials co-ordinators offshore as opposed to hiring at a remote base would be beneficial |

| 12 ¼" HOLE SECTION | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| 13.6 | Weather variance | Weather forecasting varied within the same station due to people | Be-aware and have a second station for weather forecasting and challenge if perceived difference or inconsistencies |
| 13.7 | 9.5/8" centralisers | Spirogliders were used - ok - good cement placement | Do not use non-solid equipment in deepwater |
| 13.8 | Batteries on transponders - life | Life on subsea transponders is limited and a plan to change out is required up front rather than an afterthought | Have plans in place up front, and make sure all involved are aware of battery life limits prior to spud. |
| 13.9 | Cleaning of hole & whd | Again like the previous section poor cleaning was observed and required a plan to be implemented | Procedure required in future to be same for all suspect sections once identified |
| 13.10 | Excess cement for short liner | No agreed excess on short liners | 100m was used on top of liner - tbc - worked very well but probably more than needed as 100% of excess was reversed out. In hindsight 50m is recommended for future for liners set in 13-3/8" Casing. |
| 13.11 | Preparation for disconnect | Important to plan and execute all actions necessary to be able to disconnect riser in a controlled manner. Attempt to decide in due time whether to hang-off or stay out of the hole | Make proper displacement plan and hold SJA with all involved. Consider the installation of a mud saver ram on the bottom of the riser (effectively an upside down shear ram)especially if OBM is used. If OBM is required consider using SOBM for minimising environmental impact in the event of unplanned disconnect. |
| 13.12 | 5 1/2" Mud pump liners | Had to change out pistons, liners and valves on MP 2 and MP 3 due to washouts. While repairing pumps was not able to circulate at full rate with only two pumps. DOP states 5.5" liners to be used in this section instead of 6". Max expected P in 12 1/4" hole was 3810 psi | With 6" liners (max P 4665 psi/16.67 l/str) would have been able to circ/drill ahead at 3500 LPM with only two pumps on line.<br><br>Drilling ahead with only two mud pumps, needs to be agreed up front. |
| 13.13 | Pressure testing LMRP conn. | Was not able to get good seal while attempting to pressure test LMRP connector to 7000 psi. Leaked off at 4000 psi. Increased down weight on BOP test tool to 30 MT from neutral point. DQ recommendation in manual is 15,000 lbs; however, this was done in agreement with DQ. | Ran only 6 stds of 5" DP below BOP test tool. Should run more weight and consider using DC joints |
| 13.14 | Plugged drillstring | Found large cuttings and some rubber and metal pieces inside Gray valve and bit. Was not able to circulate through string and had to POOH. Potentially dangerous if unable to circulate in a well control situation. Not known where the cuttings came from, but possibly after disconnecting from EDPHOT and the dislodged | Implement proper washing procedures of wellhead and BOP on every opportunity. The same area will be washed three times prior to run liner. A disconnect procedure was implemented following this event. Shear rams were closed immediately after backing out hang-off tool. When recovering string washed down onto shear rams then |

| 12 ¼" HOLE SECTION | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| | | from BSR cavities when closing same | opened and immediately screwed into string. Successfully avoided future problems. |
| 13.15 | Running 9-5/8" Casing | Need a casing cutter assy to be on the rig if non shearable casing strings to be run, in case casing gets stuck across BOP. | Include in MELs and as a contingency plan in DOP. |
| 13.16 | 9 5/8"Liner | Liner System loadout : Intervention found that the Liner Hgr Systems where old units with the primary Hgr having been stored in the horizontal for 2 years & not tested prior to load out. BSP elastomers over 3 years old, quality checks did not identify this pre load out. (max shelf life 3 years) | Primary & Back up units Re pinned, tested redressed & prepared for shipping. BSP changed out for one with new elastomers & pressure tested to prove internal seals Caught by external audit - Nexus - great advantage to have a QA person ready to go for such key items/events |
| 13.17 | Pore pressure evaluation | Offshore pore pressure evaluation showed kick tolerance limits being exceeded | Mudloggers to have continuous kick tolerance output on rig VDU |
| 13.18 | Contingent 11 3/4" casing | Due to accrued costs of well so far the option to run a contingent 11 3/4" casing was dropped. Need to be recognised that ability to implement planned (and paid for) contingencies may be affected by other factors ie. Overrun costs. | Realistic cost evaluation of maintaining contingencies for deepening the well to 4700m should be explored in planning phase |
| 13.19 | Intermediate logging | Rapid mobilisation of intermediate logging string (supercombo) | Time /cost evaluation for unexpected event i.e. Early TD needs carried out in planning phase to evaluate requirement to carry logging tools from start of section |
| 13.20 | Logging in top T50 | Logging crew mobilised by rig team too early | Liaison with accountable delivery team leader would have avoided this. |
| 13.21 | Logging | Senior logging engineer kept on board rig to the limit of his allowable days | See above - it is noted that helicopter pilot strike had a significant impact on personnel movements. |
| 13.22 | Coring | One coring engineer required to check equipment and dress core barrel | Avoid sending second coring engineer until core point is identified |
| 13.23 | Tritium tracing of mud system | Dedicated technician required for doping the mud system with tritium - this takes up bed space and leaves an individual on board the rig with little to do | Investigate the possibility of finding alternative individual to trace mud i.e. Cross trained Mud engineer or mud logger |
| 13.24 | Coring | Rental costs of coring equipment could have been reduced. Deck space and people saving. | Sufficient coring equipment onboard rig for the time it takes to mobilise extra equipment i.e. Just in time delivery should be explored on future wells. Smarter planning. If possibly, check equipment at forward base. |
| 13.25 | Pore pressure evaluation | KSI only have one suitably qualified specialist to perform well site pore | Identify suitably qualified individuals to offer a continuous service - either in |

| 12 ¼" HOLE SECTION | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| | | pressure evaluation in Norway | KSI or alternative contractors |
| 13.26 | Lithology prediction | Predrill prediction of lithologies was incorrect, the planning did not take this possibility fully into account | Well options should have a zero engineering option |

| 8 ½" HOLE SECTION | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| 14.1 | 6.1/2" DC's not on the rig | When starting to make up 8 1/2" BHA it was revealed that there were no 6 ½" DC onboard the rig. | Ensure OWE & Night rep are aware of their responsibilities. Improved use of MEL by rig and contractors is required. |
| 14.2 | Hook load sensor | Anadrill sensor fitted 3m at easy access point up line- forgotten about and subsequently got damage with adjustment bolt falling out post Slip & Cut operation | Third party equipment checks & rig contractor checks of 3rd. Party equipment required. See SC5 incident report. |
| 14.3 | Gas peaks | When running close to kick tolerance, PP & FG be aware of effect of having multiple connection gas peaks in annulus. Dummy connections were very useful in connection gas monitoring. | Procedure of 1 peak in annulus at any one time adopted. |
| 14.4 | Coring balls & dart subs | Coring circ sub ball was found not to go through 5" dp dart sub | An upper dart sub in 6.5/8" was adopted |
| 14.5 | Hole cleaning | Rig experience lacking re. Good practices so required Drilling supv. to ensure practices were applied | Pre- contract review contractors past workscope and identify & train early |
| 14.6 | Shaker spares | Severely lacking | Sparing philosophy of contractor to be addressed at audit |
| 14.7 | Back up ROV operability | With the back-up continuously on standby when test dived or potentially needed problems were seen. Luckily these were off the critical path. Despite continuous instructions by BP to dive the unit regularly it was not. | Ensure all units are dived frequently to maintain operability. At least once per week. |
| 14.8 | Hang-off Procedure | Used saver sub on bottom of drill pipe to re-enter hang-off tool to prevent damage to pin connection. This was too short to get tong onto to back out. | Use single or pup joint on bottom of stand |
| 14.9 | BOP/ Riser Tensioners | 2 Rucker tensioners parted after 15Million tonne-cycles. Slip and cut frequency is too long for deepwater environment. After revision to 12 million tonne-cycles, a further line failed after 11,5 million tonne-cycles. | Changed S&C frequency to 12MMtonne.cycles then to 10MMTCs. Is conventional tonne cycle calculation valid for high tensions? Is life of wire directionally proportional to tension? Investigate Slip and cut policy with other DW operations. Samples of broken wires have been sent in to wire supplier Scan-Rope for investigation. the possibilities are a) poor quality of |

| 8 ½" HOLE SECTION | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| | | | wire, b) Too much stress on the wire during deepwater operations and reduced life. |
| 14.10 | Pore Pressure Prediction | Felt need for Norway expertise | Training of local staff member to basic/int level on pressure prediction tools |
| 14.11 | LWD tool availability | CDR tools unavailable for this hole section - ARC tools supplied as a replacement | ARC tools are a suitable alternative for CDR |
| 14.12 | TD selection | No predefined TD criteria in place (due to partner issues) caused major planning and logistic issues. | Attempt to ensure TD decision is pre-agreed |
| 14.13 | Tritium tracing of mud system | Following displacement to heavy kill mud in readiness for riser disconnect a complicated displacement procedure created a situation where an inexperienced technician failed to correctly trace the mud system | Ensure the tritium is added by a suitably experienced individual |

| LOGGING | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| 15.1 | Logging tool availability | A surprise halt to ops resulted in waiting on tools due to the remote forward base | |
| 15.2 | Compensator wire | Shear link failed during logging job due to heave. Compensator was operating better (relative to beginning of well) but still gave +/-2T variation in tension. Shear pin rated to 8T = 16T tension on block. Required minimum 9T to be maintained to cover maximum logging overpulls. 10T +/-2T heave was maintained on block. 10T Tension is "measured" on a 750T Martin Decker. | Investigate tension measurement of compensator line. I.e. Install a tong line sensor or similar, in line to allow real time monitoring of compensator line tension. Ensure regular replacement of the shear link to avoid weakening of pin over time. |
| 15.3 | TD logging | Changed order of logging runs to make best use of weather window for crane operations .e. Ran VSP before super combo | Good practice retain learning for future operations |
| 15.4 | TD logging | Use of MSCT - excellent performance - contrary to the pre-drill concerns about loose and unconsolidated formations | MSCT can be used in shallow sediments in deepwater wells |
| 15.5 | TD logging | Good competency of logging engineer | Experienced and competent logging engineer is critical to the success of any logging job in a harsh environment |
| 15.6 | TD logging | Good competency of specialists for MSCT and VSP | Experienced and competent specialist technicians are critical to the success of the logging job. |
| 15.7 | TD logging | Engineers should be dual skilled to | This removes the requirement to have |

| LOGGING | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| | | take over from specialist if their hours run out | two VSP, MDT and MSCT technicians on board the rig |

| P & A | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| 16.1 | Cut and Pull tool configuration | Equipment proposed for cut & pull was "discovered" at a late stage to be the first time run in deepwater. Duty person from Service provider was also not happy with the configuration. The cut and pull job was therefore changed at the last minute. | Lack of operational attention due to being one of the last jobs. Known practices reverted to. Must ensure the original designers of programmes are consulted in the management of change. Sensible to avoid trials of new techniques on such cost sensitive operation. |
| 16.2 | Complex & small tools in deepwater | Risk of failure with 3.1/2" pipe would have significant impact | Avoid being in a trial mode - use tried & tested methods |
| 16.3 | Policy Dispensation, external opinion impact | Impact of a kill line leak resulted in a major deviation to the plan at the request of the drilling function to further mitigate 13.3/8" recovery risk. Lesson learnt is that dispensation requests must be supported by sufficiently thorough and detailed risk assessment and mitigation plan. | Drilling policy for deepwater requires establishing as does ops. Note that are regarded as policy. |
| 16.4 | Casing cutting assy | Mud motor selected for the cutting operations required 2800-3000 lpm pump rate to operate. Even if return is taken up kill & choke simultaneously, a much too high back-pressure is generated on the well. | Use a low-rate mud motor to minimize choke line friction or carry out cutting job with conventional rotating assy, using marine swivel and annular swivel sub. Recommend to go conventional with annular swivel sub as per original plan |
| 16.5 | Casing cutting assy | Recovery of wear bushing was planned prior to cut & recovery of 13 3/8" casing string (D-Q SS-15 WH system). However the wear bushing could have been recovered on the cutting run saving time as a mud motor was used. The reason it was originally planned to pull the WB first was because there was planned WOC time. When the entire abandonment programme changed, and the WOC time was no longer required, the wear bushing pulling run was overlooked. | Replace stop sub with MPT (dressed to recover WB), pull free with WB and carry out csg cutting afterwards in same run. Management of change. When last minute changes are made to programme must ensure impact of changes are taken into account. Again, try to involve original programmers in change process where possible |
| 16.6 | Perforating 13 3/8" casing | Preparing perforating gun and rigging wireline sheaves and stuffing box took longer than planned. The main reasons for this were that only one crew was sent out, and that the job was not planned long in advance | Attempt to send out two crews if possible, also if only one perforating run is planned. The job execution would also benefit from a thorough job planning execution on land prior to doing it offshore |

| P & A | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| 16.7 | 13 3/8" Casing hanger and 13 3/8" wear-bushing | After retrieving the 13 3/8" wear bushing key seating up to 1" was observed. It was not possible to determine for certain in what direction/heading. The 13 3/8" wear-bushing load ring was upon retrieval observed to be cocked. Scratch marks and some pitting was also observed on one side (outside of the hanger). When running the 13 3/8" hanger it was not landed correctly. The casing was pulled upwards and down again to land it. It was later confirmed to be landed out approx 0.16 m high and a piggy back hanger had to be installed. | The 13 3/8" WB and hanger should be inspected on the base by DQ, followed up by a report to BP. Photos from rig have been sent in. During installation the casing should not be pulled on, especially with the hanger in the BOP area. Excessive wear has also previously been observed on the nominal bore protector, while the drilling and running of tubulars has not been extensive on this well. This could lead to the conclusion that the rig has not been in the optimum position related to the wellhead. However, the riser management system (RMS) instrumentation placed on the lower flex joint has indicated that the rig has operated in the most favourable position, except in severe weather situations. |
| 16.8 | MOST Tool | After cutting 20" and 36" casing strings with wellhead, and pulled up approx 1.5 m with MOST tool engaged by utilizing the ROV to lock the bolts on top of the housing, the csg stumps/wellheads came free after pulling up approx 1.5 m. Due to heave of 3.5 - 4 m was not able to stab workstring back into the wellhead. The heave caused the PDM to turn and extend the knives unabling stabbing in, in addition to the general rig motion. The combined forces from the heave and approx 150 MT overpull when pulling free caused a jarring effect knocking the wellhead free from the MOST tool. After WOW and established that the locking bolts were knocked flat, the MOST tool was pulled and a spear was utilized to retrieve the wellheads. | The weather should be assessed prior to engaging the MOST tool after the cut was made. In this case time would also be saved if the tool had been pulled and inspected after the initial failed attempt. The pad eyes on the hydrate shield were too small to actually fit an ROV with safety sling through them. It is recommended that prior to running the hydrate shield, shackles with a safety wire sling should be pre-installed. This would simplify a retrieval operation if the wellheads and hydrate shield would accidentally fall off the MOST tool during retrieval. |
| 16.9 | Hydrate shield | When retrieving the hydrate shield and wellhead stumps, it was not possible to release the same on the moonpool trolley. The shield was strapped down with x-tra wire slings and consideration was made to welding it secure on the trolley (not a good idea). The hydrate shield and wellhead stump was finally lifted up on deck through the cellar deck hatch | The time spent was due to the hydrate shield was going to be utilized with the next operator, and not planned to be sent onshore. It is recommended to simplify the release mechanism (D-Q), to avoid heavy and dangerous lifts. The other recommendation would be to build more hydrate shields, to avoid the quick transfer between operators. |

| P & A | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| | | and down on a boat. Total weight was 15 MT incl. excess cement. | |

| HSE | | | |
|---|---|---|---|
| **No** | **Phase/Topic** | **Lesson/Observation/Description** | **Recommendation/Action** |
| 17.1 | Incident reporting | Tolerance of reporting 30 mins after an event was uncovered. Conflict between Saipem (ie. Saga, Norsk Hydro) and BP expectations which persisted through the contract. Saipem required only serious incidents to be reported within 30mins. BP expects all incidents immediately. | Letter sent from BP Rep (KMW) to PLMR copied to Croatta; Harland detailing BP expectation. Check for future contracts not normally associated with working for BP and establish clarity with contractor at beginning of operations. |
| 17.2 | Rig SMS failure | System breakdown required an intervention to address RA, TOFS, planning, PTW, work processes & responsibilities | Operability audit of live systems as opposed to a paper exercise is required as part of the rig audit |
| 17.3 | Incident Reporting | Initial Poor quality incident investigation and reporting when following Saipem SMS. Inadequate cause analysis. Inadequate/impractical actions identified. Required large amount of intervention from BP supervisors to adequately investigate incidents to BP acceptable standard. Objectiveness and honest assessment of root causes was hampered by SMS procedures requirement to have involved persons on investigation Team. Although it is recognised that there was consequently openness in the initial fact finding phase of incidents. | BP to set basic criteria for investigations to it's new contractors and to make clear it's expectations in investigation process. I.e TORs, who, format, and required minimum information. Training issue. |
| 17.4 | Bridging of Policy and Procedures | Compliance with Policy and Procedures should include sufficient quality assessment of policy and procedures. Ie. They should not only focus on whether they are in conflict with BP P&P's but also do they work, are they sufficiently detailed and up to sufficient standard for BP. Ie. over side work. | |