EXHIBIT # 545

WIT:

From: Morel, Brian P
Sent: Fri Apr 16 04:38:03 2010
To: Sepulvado, Ronald W; Vidrine, Don J; Kaluza, Robert; Lambert, Lee; Guide, John; Hafle, Mark E; Cocales, Brett W; Walz, Gregory S
Cc: Lindner, Leo T (MI DRILLING FLUIDS, INC)
Subject: Updated Procedure
Importance: Normal
Attachments: Macondo_Drilling_Production_Interval BP01_rev2.ZIP

Attached is the updated procedure based on our current plan forward. If anything changes I will update and send the next revision out. We are still waiting for approval of the departure to set our surface plug 3000' BML. If we do not get this approved, the displacement/plug will be completed shallower after running the LDS (basic details of this change are included in this procedure). Please let me know if you have any questions or suggestions.

A detailed cement procedure should be available from Jesse sometime tomorrow.

Thank You,
Brian Morel

Table of Contents

Interval Notes

Item	Comment
Bits	14-3/4" QD507Z (primary)
Underreamers	N/A
BHA	PWD, GR, RES, DDS
Special Equipment	Dril-Quip 1st (dummy) / 2nd position hangers (connected), Wear sleeve retrieval tool, mud surge tool, Weatherford dual plug system, Allamon Diverter and DTD, BlackHawk Automated cement head, 7" H513 x 9-7/8" H523 x-over, 4 pip tags, lockdown lead impression tool, lockdown sleeve running tool, LDS measurement tool, riser wiper brushes , foam cementing equipment, Welllife 734 LCM material, IBC-CBL log equipment, Versaflex 9-7/8" x 11-7/8" hanger (cont)
Drillstring	5-1/2" 21.9 ppf S-135 x 6-5/8" 32 ppf S-135
Mud system	14.0 ppg SOBM
Casing	7" 32 ppf HCQ-125, 0.5" wall, Hydril 513 x 9-7/8" 62.8 ppf Q-125, 0.625" wall, Hydril 523
Landing string	6-5/8" 40 ppf S-135 FH x 6-5/8" 40 ppf V-150 FH
Cementing	14.5 ppg Halliburton Class H nitrogen foam cement (see detailed cement program)

9 Production Casing Operations

9.1 Operations Procedure

1. Ensure BOP has been tested (per compliance with approved APD).
2. Ensure 16" liner and blind shear rams have been tested (per APD requirements). Record pressure with volume pumped.
3. Pick-up and run-in-hole with **8-1/2" clean-out** drilling assembly (same as drilling assembly)
   - Dril-Quip Wear Sleeve Running/Retrieval Tool should be run in the 6-5/8" DP
4. RIH to bottom and wipe/work any tight spots (document)
5. At TD circulate per WSL recommendation / hole conditions
   - If a short trip is not required, circulate per step 7.
6. If tight spots were seen, make a short trip to the casing shoe to ensure any tight areas have been properly cleaned up and mud weight is correct.
7. Once at TD again, pump a 100 bbl weighted / viscous sweep and circulate hole clean with a minimum of 1-1/2 capacity.
   - Plan to set the 7" x 9-7/8" long string 50-60' off bottom
   - Circulate and condition, as required, to clean hole and lower yield point for running liner (lower YP to ~15 or as hole conditions dictate and keep gels flat).
   - Do not need to set 16.5 ppg mud in rat hole as volume is only ~4 bbls and a large volume may cause issues with the cement job or breaking down the formation.
8. POOH and retrieve the wear sleeve.
   - Do not rotate once the wear bushing has been pulled

9.2 7" x 9-7/8" Casing and Cementing Operations

9.2.1 Casing and Cementing Preparation

- Dril-Quip will ship the primary running tool made up to the hanger (1st dummy and 2nd position hangers included). Weatherford dual plugs will also be stabbed up to this assembly.
- Landing string will be **6-5/8" 40 ppf FH**, all surge reduction tools should be setup for use with **6-5/8" FH** connections.
- Prior to shipping, primary float equipment will be bucked up and thread-locked onto a joint of pipe. Inspect shoe and float collar joints for debris prior to PU. 6 jts have centralizers which all should be run.
- Ensure cement, additives, fresh water, and seawater samples are sent to cement company lab for final lab testing.
- Boost riser while rigging up casing equipment (not while running 7" x 9-7/8" as mud can flow up through liner).
- Prepare 7" x 9-7/8" casing tally. Inspect box threads and clean as required.
- Prior to shipment, verify casing has been drifted. Visually inspect to ensure there is no debris in pipe.
- Back-up Dril-Quip running tool and hangers are supplied loose.
- Ensure all critical load-bearing equipment has been inspected.
- Calculate swab/surge pressures for various running speeds. Select an acceptable running speed to ensure formation breakdown pressure is not exceeded.
- Prior to running casing, rabbit landing string to a min of 2-3/8 in.
- Final ID for displacement calculations equals 6.143" (7" casing) and 8.598" (9-7/8").
- Ensure all crossovers in landing string have been inspected and that material certifications are provided to verify proper load capabilities.
- WSL should ensure proper Weatherford darts have been loaded in the Blackhawk cement head.
- WSL should confirm proper 1-5/8" Allamon conversion ball is loaded in the Blackhawk head prior to picking up.
- Ensure all crossovers do NOT have square shoulders (may hang up drill pipe darts).
- Ensure (4) pip tags are on location with Pro-Technics hand. (Placement will be per the Completions Engineer)
- Rig up the Blackhawk Top Drive Cement Head and stand back (if desired).
- Confirm Blackhawk equipment has the updated panel so darts can not be prematurely release.
- Ensure Versaflex Hanger (contingency) is shipped.
- Ensure IBC/CBL logs are shipped and proper wireline is in place prior to Schlumberger OH logging crews leave.

9.2.2 Casing Procedure

1. Rig-up and run 7" x 9-7/8" casing:

Item	Ftg	Size	Wall	ppf	Grade	Connection
Shoe Jt with reamer shoe (centralized)	~48'	7"	0.500	32	HCQ-125	H513
Centralized Shoe Track Jts (centralized)	~134'	7"	0.500	32	HCQ-125	H513
Float Collar Jt with M45AP float collar (centralized)	~48'	7"	0.500	32	HCQ-125	H513
Intermediate jt (centralized)	~45	7"	0.500	32	HCQ-125	H513
Intermediate jts	~x,xxx'	7"	0.500	32	HCQ-125	H513
X-over	~4	9-7/8"	N/A	N/A	P110	7" H513 x 9-7/8" H523
Intermediate jts (9-7/8")	~x,xxx'	9-7/8"	0.625	88.2	Q-125	H523
Dril-Quip 1st (dummy) and 2nd Position Hanger	~27'	18.615"	N/A	N/A	P110	H523
Weatherford Dual Plug	----	7" x 9-7/8"	N/A	N/A	NA	N/A
Dril-Quip Running Tool	~5'	N/A	N/A	N/A	N/A	6-5/8" FH (top)
Landing String (=>4 stands)	~240'	6-5/8"	0.500"	32	S-135	FH
ATC DTD sub	~6'	9"	N/A	N/A	Q-125	FH
Landing String (=>4 stands)	~240'	6-5/8"	0.500"	32	S-135	FH
ATC Diverter Sub	~6'	9-1/4"	N/A	N/A	Q-125	FH
Landing String	~x,xxx	6-5/8"	0.625"	40	S-135	FH

Centralizer details: Weatherford Bow Spring subs (6) / Weatherford Slip-on (15)

Casing ID: 6 in x 8.625 in – - > Caliper Avg 6.143" x 8.598"

Casing collar OD: 7 in x 10.087 in.

Note: Run all of the 7" followed by 9-7/8" casing to the wellhead.

Connection Size	Minimum Torque Required	Optimum Torque	Maximum Torque
7 in.	10,700 ft-lb	12,900 ft-lb	68,000 ft-lb
9-7/8 in.	25,000 ft-lb	30,000 ft-lb	187,000 ft-lb

- Have Tenaris Hydril thread representative on location to inspect casing threads and connection make-up.
- Thread lock first **5 joints** up.
- Monitor well via choke and kill lines on trip tank.

- 7" and 9-7/8" pin threads will be delivered pre-doped with Jet Lube Seal Guard. Only pin should have a thin coating of Jet Lube.
- As required, clean box threads prior to make-up.
- 4 Pip tags should be placed in the string at: *18210.34 / 18114.82./ 12488.57 / 5084.74*
- *Attach slip on centralizers every joint from 7-21* (use all that are available)

2. Limit running speed to avoid surging formation. (Actual running speed to be based on hole conditions.) Start and stop casing slowly.
   - Recommended running speed **30-40 ft/min** (~3-4 min/stand)
   - Attempt to manage surge below 14.5 ppg if possible (based on models)
3. 2" ball is caged inside float equipment, do not drop a ball.
4. MU Dril-quip hanger / running tool per Dril-Quip procedure/hand:
   - 1st position dummy hanger pre-installed
   - 2nd position hanger
   - Running tool with Weatherford dual tapered plugs previously stabbed.
   - Record liner weight
   - Run casing on 6-5/8" 40 ppf FH landing string.
   - Make up Allamon DTD and Diverter to the 6-5/8" 40 ppf FH landing string. (Ensure both tools have FH connections once on location).
   - Check to ensure pipe is filling (Fill every 10 stands).
   - Do not circulate liner greater than 5 bpm, unless required, as it will convert autofil equipment.
   - Slow running speed and proceed with caution when running shoe and hanger through the wellhead.

Notes:	**Recommended Well Control consideration while running this equipment and subsea casing:** **If fillups are marginal, there are two options:** • **Convert auto-fill float equipment to a positive float shoe and run subsea casing conventionally.** • **Run a 1-5/8" drop ball in place in ATC Diverter Sub to minimize time required to close tool. With the 1-5/8" drop ball on seat, if you observe any type of increased returns while running drillpipe, stop running drillpipe and screw top drive into drillstring. Commence pumping. It should take 20 to 30 strokes to pressure-up on ball to close diverter sub and then blow ball.** **WSL should check balls for correct size and witness Weatherford drop each ball as prescribed in the procedure.**

5. Just prior to the liner reaching open hole, record pickup, slack-off, and slow pump rates (15 – 25 – 35 spm).
6. Free drop 1-5/8" wash down ball when the liner enters open hole (brass).
7. Continue RIH with casing until 1 stand off bottom. MU top drive.
8. While slacking off on the last stand prior to picking up the cement head, pressure up to 1000 psi slowly and hold for 2 minutes. Then increase to 2500 psi to yield the ball seat.
9. Let ball free fall to DTD sub, repeat step 9 (test diverter is close).
10. Give ball time to free fall through the liner hanger and plugs
11. Continue to circulate and slowly increase pump rates greater than 8 bpm to convert the float equipment (~ 500 - 700 psi) per Weatherford recommendation.
12. Make up Blackhawk cement head and land out casing in the wellhead
    a. Monitor running speeds to minimize surge and reduce losses as much as possible.

9.2.3 Cementing Production Casing

Test Pressures and Volumes are only as a reference, review APD for final values.

1. Circulate at least one (1) casing and drill pipe capacity, if hole conditions allow. Recommend circulating at reduced rates ***(3 bpm)*** based on MI models to keep ECD below 14.5 ppg.
2. Pump **7 bbls** of **base oil**
   - Base oil volume is important to maintain 14.17 ppg on backside at all times which is equal to current hydrostatic and slightly above sand at 17,700')
3. Mix & displace the 14.3 ppg spacer ***(4 bpm)*** and launch the **bottom DP dart** (1.91" No Go).
   - When the dart leaves the cement head, the Blackhawk cement head indicator should confirm the dart has left the head.
4. Mix & pump the 14.5 ppg cement job per HES procedure (***2 bpm***).
   - Slow pump rates to 2 bpm while mixing foam cement (reduces surge on formation from nitrogen spike)
   - After pumping the cement job, **launch the top DP dart** (2.126" No Go) with 5-10 bbl of cement behind dart. Indicators should be seen from the Blackhawk cement head confirming the top dart left the head.
   - Line up rig pumps to take over cement displacement after cement unit pushes out top DP dart.

5. After pumping cement job, launch Weatherford top dart (yellow) and displace with rig pumps ***(4 bpm).*** Maximize pump rates until displacing fluid has caught up with the cement slurry.

Note:	**Minimum pump rate on darts in the landing string is 3 bpm.**

6. Continue with displacement (make sure to account for compressibility).
   - Approximately 5 bbls before the **bottom DP Dart** reaches the diverter sub, ensure the pump rate is 3-4 bpm. The pressure required to yield the seat in the diverter and DTD with the bottom DP dart should be 2500-3000 psi above the circulating rate.
   - After yielding the seat, continue to pump the **bottom DP Dart** down to the **bottom plug** at 3-4 bpm. The bottom plug with launch with 800-1200 psi. After the plug is released, continue with the displacement of the cement at the maximum rate.
   - Approximately 5 bbls before the **top DP Dart** reaches the diverter sub, ensure the pump rate is 3-4 bpm. The pressure required to yield the seat in the Diverter and DTD with the top DP dart should be 2500-3000 psi above the circulating rate.
   - After yielding the seat, continue to pump the **top DP Dart** down to the **top plug** at 3-4 bpm. The top plug should release with 2000-2500 psi. After the plug is released, continue with the displacement of the cement at the maximum rate.
   - Just prior to the bottom plug reaching the float collar, ensure the pump rate is 3-4 bpm to witness the landing of the plug. The bottom plug burst tube should rupture with 900-1100 psi.
   - After bottom plug has landed, re-zero the stroke counter and pump calculated cement volume to see the top plug land.
   - If bottom plug does not bump or top plug is late, do not exceed 1/2 shoe track volume + compressibility. Bump top plug with 500-1000 psi over circulating pressure (land).
   - Bleed off pressure and check floats are holding. Measure flow back.
7. Once confirmed floats are holding prepare to release the running tool per DQ procedure/hand.
8. Pick up drill string leaving 20k down on the running tool (mark drill pipe for: rotation / vertical movement)
9. Rotate 5-6 turns to the right until drill string drops 10 inches.
10. Set entire drill string weight down.
11. Close rams and test to 3000 psi, then 10,000 psi for 10 seconds (locks down assembly and provides metal to metal seal). Release pressure
12. Pickup to retrieve the running tool (60-90k overpull to shear 12 pins).

13. POOH and lay down running equipment
14. Test casing and blind shear rams (**per APD requirements**) while out of the hole preparing lockdown sleeve equipment. (2500 psi w/ 14 ppg mud)
15. Negative test with base oil to the wellhead (monitor for 30 min no flow)

9.2.4 Surface Cement Plug

1. If cement job **is not** successful: (no returns or lift pressure seen).
   - Set wear bushing
   - Run IBC-CBL log
   - Wait on decision to do remedial work (MMS and BP)
2. If cement job **is** successful (partial returns or lift pressure seen) **or** IBC/CBL log and required remedial work is completed.
3. RIH to 8367' and displace to seawater:
   - Run 3-1/2" (1000'+) stinger x 5-1/2" DP to above the wellhead (no mule shoe / open ended pipe)
   - Ensure MMS Departure to set deeper plug is approved (*if depature does not get approved, displacement & 300' cement plug will be completed after LDS is set at 5800')*
   - Monitor well for 30 minutes to ensure no flow
   - *Pull wear bushing if it was set*
4. Set a 300' cement plug from 8367' – 8067' (*if approved*)
5. Wait on cement to set and tag top of cement with 15k down
   - Pump a nerf ball behind cement job
6. POOH retrieve wear bushing
7. Prepare to run lead impression tool and lockdown sleeve

Note: Drilling program will be updated with actual plug depths if MMS departure is not approved.

Notes:

- **Do NOT slow displacement rate other than directed.**
- **To have a greater chance to bump plug on float collar:**
  1. **Caliper ~20% of casing with Tri-Mic's to determine a more accurate ID. (Do NOT use mill or book specs.)**
  2. **Calculate mud compressibility based on actual conditions.**
  3. **Factor in rig pump efficiency.**
- **Whenever you attempt to wash-down, you have a greater chance of sticking subsea casing with additional ECD or creating a packing off problem due to cuttings bed you are pushing.**

	• When closing diverter sub, pipe should be moving at all times. • After closing diverter tool, go back to circulating slowly (no more than 15 SPM) and start washing to bottom immediately. • If you plan on using boost line prior to landing hanger, do NOT drop ball early. Circulate through diverter prior to dropping ball. (This prevents debris from plugging diverter sub and causing high shear out pressures.) • All pup joints and cross-overs must be free of "bore-backs" or square shoulders (less than 1/8" transition) and must have high angle tapers to the ID from the root thread in the box. Tapers should be at least 30 degrees. *Special attention should be given to the TIW valve below the Cement head. This is to prevent hanging-up the DP dart during displacement. A Teflon bushing on top of the valve assembly will help transition the dart cleanly.
Note:	It is responsibility of Driller, Mud Engineer, and Mud Logger to closely monitor and agree on amount of mud lost during liner job. Separate and report mud losses during different phases of job as follows: • Bbls lost while PU and running casing. • Bbls lost while TIH with casing on landing string. • Bbls lost while washing casing to bottom, if required. • Bbls lost while circulating, after casing is landed. • Bbls lost while pumping and displacing cement. • Bbls left behind pipe.

9.1 Lead Impression / Lockdown Sleeve Ops

9.1.1 LIT / LDS Operations

1. Prepare to run the lead impression tool / assembly per Dril-Quip and BP subsea procedures *(steps below are just for quick reference).*
   - A minimum of 40k buoyed is required to properly set LIT (~52k air)
   - Running tool has 4-1/2" IF x 6-5/8" xover on top / 4-1/2" x HT-55 on bottom
   - Run 6-1/2" collars XH x 5-1/2" HWDP HT-55 x 5-1/2" 21.9 ppf HT-55 (confirm HT-55 (box) x XH pin X-over is available)
2. RIH to the wellhead
3. Set down to neutral weight and slack off 40k (don't exceed 60k)
4. Line up to pressure down the kill/choke lines
5. Pressure up to 2500 psi and hold for 2 minutes
6. Allow pressure to bleed off and hold 0 psi for 5 minutes
7. PU to neutral weight
8. Pressure up down drill pipe until gate shears (3450-3850 psi / max of 7500 psi)
9. Pressure will bleed off quickly, maintain 0 psi for 3 minutes
10. Retrieve the LIT and ensure impressions were properly made
11. Prepare the Lockdown sleeve and RIH
    - 100k air weight tail pipe
    - Running tool has 4-1/2" IF x 6-5/8" X-over on top / 4-1/2" x HT-55 on bottom
    - Run 6-1/2" collars XH (6) x 5-1/2" HWDP HT-55 (28) x 5-1/2" 21.9 ppf HT-55 (~36) (confirm HT-55 (box) x XH pin X-over is available)
12. Record PU/Slack off weights
13. Slowly slack off and land the LDS
14. Set down 72k (do not exceed 78k / will put the string into compression)
15. Close pipe rams and line up to pressure down the kill/choke lines
16. Pressure up to 6400 psi assuming 14.0 ppg mud and hold for 10 minutes (no more than 100 psi loss)
17. Bleed off pressure and open rams, prepare to pump down the drill pipe
18. Pressure up to 1000 psi, followed by 100 psi increments to 2500 psi (do not exceed 300 psi) hold for 5 minutes
19. Bleed pressure to 0 psi
20. Repeat pressure build sequence again to ensure properly stroked

21. Pull 30k over string weight (do no exceed 60k)
22. Release from LDS by picking up past 60k
23. POOH
24. Prepare to clean the riser for Nile PA

9.2 Riser Cleaning

9.2.1 Rig Cleaning Prior for Nile PA

1. Clean the shaker area thoroughly, especially the ditch lines from the sand traps to the pit room. Large amounts of water should be pumped through all centrifugal pumps at the shaker area including the desanders, desilters, centrifuge and degasser.
2. After the initial clean up has been completed 250 bbls of water treated with 138 gallons Safe Surf O (0.55 gpb) should be pumped through all of the surface equipment. This includes the pumps and pump manifolds, chemical hopper, barite hopper and any other seldom used lines that may affect the completion fluid. Capture the 250 bbl Safe Surf O flush for proper disposal.
3. Clean and dry all pits, then bring the completion fluid onboard. The take on hose must be dry and not contaminated with mud or seawater.
4. After displacing the hole, clean the shaker area again. At this point, cleaning the flow line from the slip joint to shakers should be cleaned as well. Do not allow any cleaning water to get down the ditch to the pit room.

9.2.2 Riser Cleaning

1. Build a pumpable volume of spacers as follows in Table 1 and
2. Table :

Table 1: Spacer I - 200-bbls High Viscosity Spacer

Formulation for 1 barrel of Hi-Vis spacer:	Formulation for 200 barrels of transition spacer:
1-barrel of seawater	200-barrels of seawater
0.75 gpb of Flo-Vis L	150-gallons Flo-Vis L

Table 2: Spacer II - 350-bbls Solvent/Surfactant Spacer

Formulation for 1-barrel of solvent spacer:	Formulation for 350-barrels of solvent spacer:
0.800-barrels of drill water	280-barrels of drill water
0.200-barrels of ECF-1840	2940 gallons of ECF-1840

Note:	• **Spacer II cannot be dumped overboard. Spacer II should be segregated**

	in a separate pit or container for disposal. • **Do not Run BHA below Wellhead**

3. Install ditch magnets and eventually load shaker screens with 175 mesh to remove solids from the fluids.
4. Trip in Hole (TIH) with Riser Clean-Out Assembly to base of BOP (Caution: Do not enter wellhead with Clean-out Assembly as it may damage the lockdown sleeve).

Riser Cleanout BHA
Bottom
Mule Shoe NC50 Box
16" SABS Jetting tool NC50 Box X Pin
Crossover 6 5/8" FH Box X NC50 Pin
Pup Joint 6 5/8" FH Box X Pin
1 Stand of 6 5/8" FH workstring
Pup Joint 6 5/8" FH Box X Pin
Crossover NC50 Box X 6 5/8" FH Pin
PUP Riser Brush NC50 Box X Pin
Crossover 6 5/8" FH Box X NC50 Pin
Pup Joint 6 5/8" FH Box X Pin
6 5/8 FH workstring to surface
Top

Note:	• **For mud pump efficiency it is important to have accurate strokes and volumes to minimize interface.** • **Assign specific pumps to specific lines and do not switch during the procedure.**

5. Ensure that all valves are closed prior to beginning this operation. Open the boost valve and pump 20-bbls Spacer II followed by approximately 51-bbls of seawater down the boost line at 8 BPM and then close the boost line.
6. Open the lower choke valve and pump 20-bbls Spacer II followed by 78-bbls of seawater to the end of the lower choke line at 8 BPM. Isolate the lower choke. Momentarily open the upper choke line to flush. Ensure that all valves are closed
7. Open the lower kill valve and pump 20 bbls Spacer II followed by 78-bbls of seawater to the end of the lower kill line at 8 BPM. Isolate the lower kill line. Momentarily open the upped kill line to flush. Momentarily open the IGV to flush. Ensure that all valves are closed.

8. Pump the following spacers at approximately 16-BPM (do not stop pumping once spacers are begun:

- 100-bbl Spacer I
- 250-bbl Spacer II
- 100-bbl Spacer I

9. When the cleaning spacer has entered the riser, slow the rig pump rate to 2 BPM. Open the boost, choke and kill lines and pump 20 bbls of seawater down the choke line, 20 bbls of seawater down the kill line and 20 bbls of seawater down the boost. This pushes the cleaning spacer from the lines into the cleaning spacer entering the riser. Close the boost, choke and kill lines. Increase pump rate down the workstring to 16 BPM. Once the final 100-bbl Spacer I is 50' above the choke and kill lines, open the boost line, upper choke and upper kill lines and pump seawater at 8 BPM through each while continuing to pump down the drill pipe. (Do not exceed a combined pumping speed higher than 40 BPM as this will affect the contact time of the chemicals
10. Displace the spacers to surface at the maximum rate (approximately 40-BPM); Reduce the pump rates as the spacers near the surface and divert spacer returns for proper disposal. Do not stop pumping until all spacers are recovered and seawater returns are visually clean.
11. Drop the 2 3/8-in ball to open the SABS jetting tool. Pump pressure can be applied to save time, no more than 3 bbl/min.
12. Apply approximately 900psi to shear open the SABS jetting tool
13. Once open, begin jetting the BOP stack at 10 bpm with 15 – 20 rpm. Make 3 passes through the BOP stack.
14. Pick up above BOP and function rams.
15. Make one more pass with SABS jetting tool.
16. Drop the 2 1/5-in ball to close the SABS jetting tool. Pump pressure can be applied to save time, no more than 3 bbl/min.
17. Apply approximately 2,800 psi to close the SABS jetting tool.
18. Pump down the workstring and boost riser for at least one bottoms up or until seawater returns are visually clean.
19. POOH and lay down Riser Cleanout BHA.

Attachments

No.	Title
1	Clean-out run - MOP
2	Clean-out BHA
3	7" x 9-7/8" Casing Diagram
4	7" x 9-7/8" Casing Landing String – MOP
5	Rig Clean up Check List
6	Derrickman's Checklist
7	Riser Brush Assembly

Attachment 1: Clean-out Run - MOP

Yellow cells = input data, Green cells = calculated results

Drill String Design - Margin of Overpull

This worksheet calculates *Margin of Overpull (MOP)* for pipe configurations with up to 5 different sizes of drill pipe and 3 different sizes of drill collars plus hevi-wate dp. It can also incorporate a safety factor.

Well: Macondo **Description:** 8-1/2" x 9-7/8" OH SECTION

Drill Pipe Data

Bottommost Section → Uppermost Section	Pipe #1		Pipe #2		Pipe #3		Pipe #4		Pipe #5
	5.5	OD	6.625	OD		OD		OD	
	4.778	ID	5.625	ID		ID		ID	
	21.9	Nominal Wt	32.67	Nominal Wt		Nominal Wt		Nominal Wt	
	25.42	Adjusted Wt	37.71	Adjusted Wt		Adjusted Wt		Adjusted Wt	
	135,000		135,000						
	80	% rem wall	80	% rem wall		% rem wall		% rem wall	

Tensile strengths from the pipe drill pipe data entered above

1,205,617 Tensile Strength 1,022,117 Tensile Strength Tensile Strength Tensile Strength

BHA Data

6.500	⇐ DC #1 OD		⇐ DC #2 OD		⇐ DC #3 OD	5.5	⇐ HWDP OD	Tensile Str.	
2.8	⇐ DC #1 ID		⇐ DC #2 ID		⇐ DC #3 ID	3.375	⇐ HWDP ID	918,400	
260	⇐ DC #1 Length		⇐ DC #2 Length		⇐ DC #3 Length	1000	⇐ HWDP Length	HWDP Air Wt.	
☑ Spiraled	⇐ Spiraled (Y)	☑ Spiraled	⇐ Spiraled (Y)	☐ Spiraled	⇐ Spiraled (Y)	☑ Spiraled	⇐ Spiraled (Y)	51,101	
88	Wt/ft DC #1		Wt/ft DC #2		Wt/ft DC #3	Buoyancy Factor		0.7861	
22,989	Wt DC #1		Wt DC #2		Wt DC #3	Air weight of BHA		74,090	
			Wt/Wt equip			Buoyed weight of BHA		58,244	
Depth of Interest → → → →			18,360		80 %	Total length of BHA		1,260'	
Anticipated mud weight			14.00	Black Wt	180,000	Total depth		14,000	

		Buoyed Wt	Section MOP		
Enter Length DP #1 →	5,400	107,910	798,339 #	Pipe recession last sec.	0"
Enter Length DP #2 →	11,700	346,846	304,694 #	Weak point in string	304,694
Enter Length DP #3 →	0			Total weight of string	513,000
Enter Length DP #4 →	0			Tot's weight BHA + string	693,000
Enter Length DP #5 →	0			Total weight indicator Reading with overpull	997,694

NOTE: The air weight of spiraled hevi-wate drill pipe is calculated as 96% of non-spiraled HWDP.
Assumes lowest planned mud weight of 14.3 ppg for section

Attachment 2: BHA Schematic

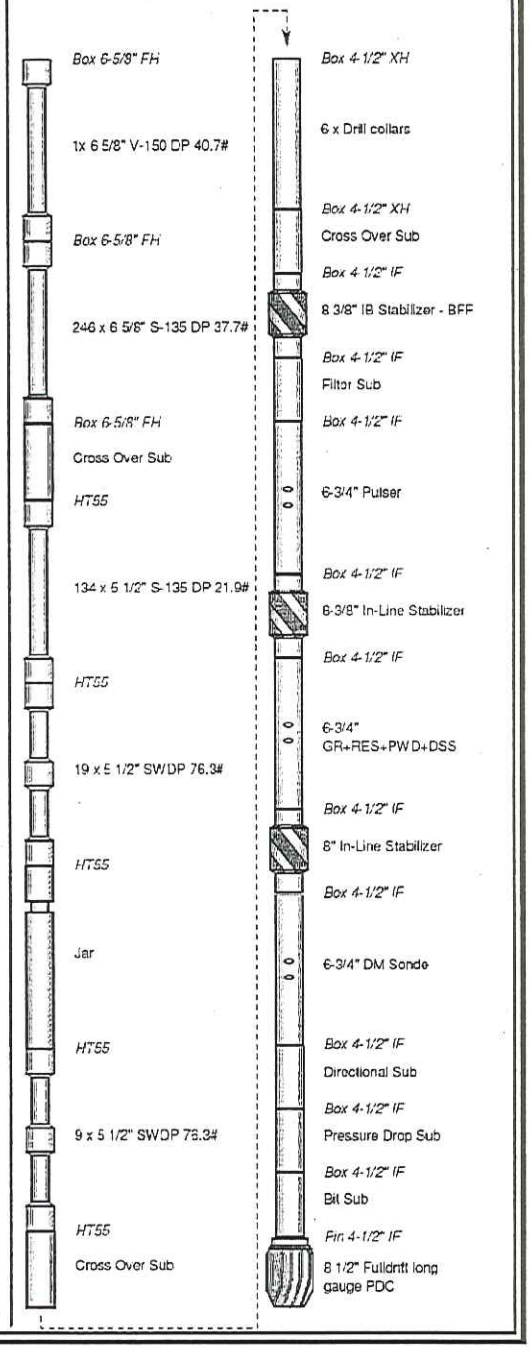
sperry-sun
DRILLING SERVICES

BHA Schematic

Bp America Production
Macondo Prospect
BHA ID #: 13
8 1/2" Rotary

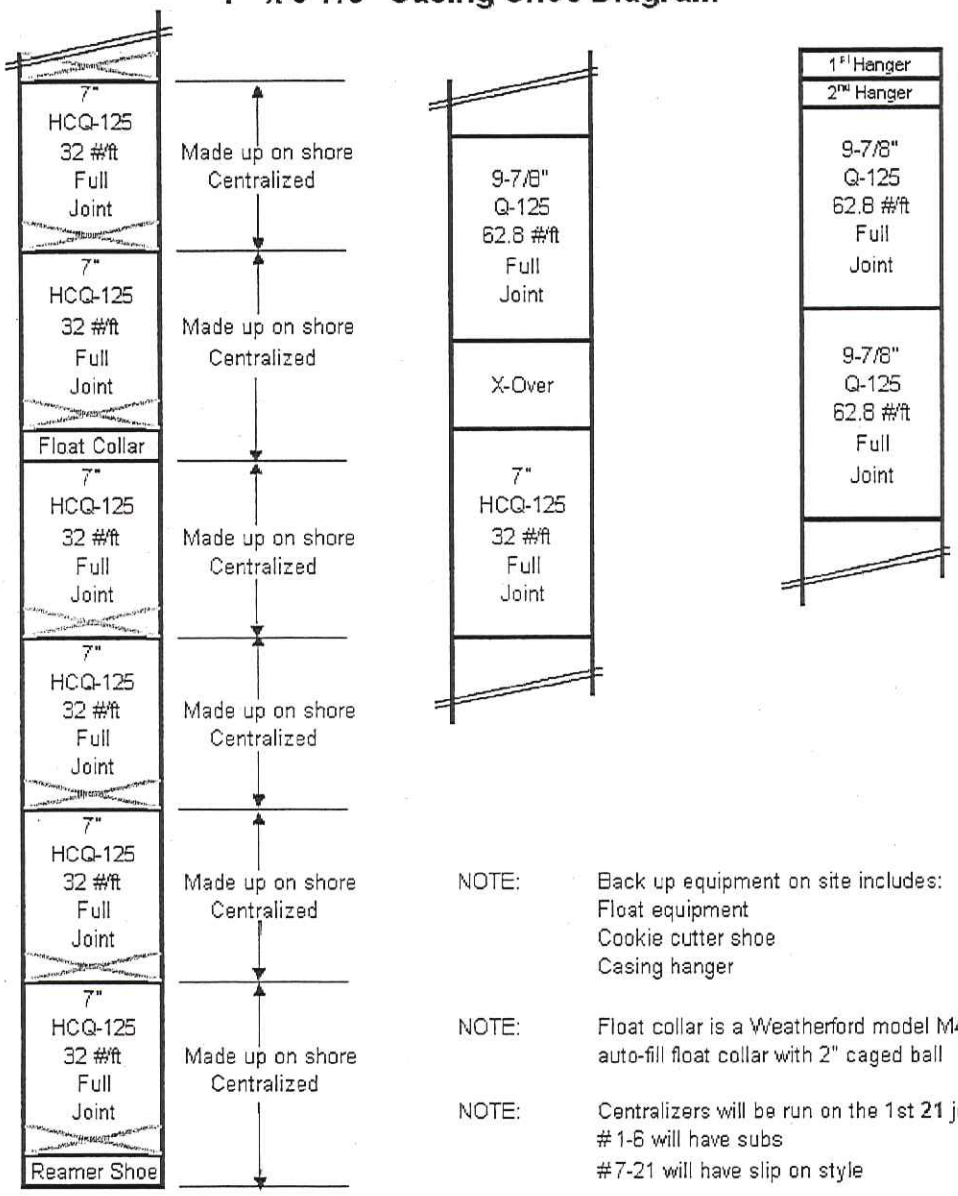
BHA Configuration

O.D.	Length	Description
8.5"	1.53'	8 1/2" Fulldrift long gauge PDC
6.821"	5.21'	Bit Sub
6.75"	3.71'	Pressure Drop Sub
6.75"	2.56'	Directional Sub
6.75"	8.51'	6-3/4" DM Sonde
6.75"	2.2'	8" In-Line Stabilizer
6.75"	23.5'	6-3/4" GR+RES+PWD+DSS
6.75"	2.1'	8-3/8" In-Line Stabilizer
6.75"	11.23'	6-3/4" Pulsar
6.75"	7.98'	Filter Sub
6.75"	4.13'	8 3/8" IB Stabilizer - BFF
6.75"	4.89'	Cross Over Sub
6.5"	186.2'	6 x 6x Drill collars
6.75"	4.65'	Cross Over Sub
5.5"	277.05'	9 x 9x 5 1/2" SWDP 76.3#
5"	31.87'	Jar
5"	584.83'	19 x 5 1/2" SWDP 76.3#
5.5"	4028'	134 x 5 1/2" S-135 DP 21.9#
6"	4'	Cross Over Sub
6.625"	7390'	246 x 6 5/8" S-135 DP 37.7#
6.825"	43'	1x 6 5/8" V-150 DP 40.7#



Attachment 3: 7" x 9-7/8" Casing Diagram

7" x 9-7/8" Casing Shoe Diagram



NOTE: Back up equipment on site includes:
Float equipment
Cookie cutter shoe
Casing hanger

NOTE: Float collar is a Weatherford model M45AP auto-fill float collar with 2" caged ball

NOTE: Centralizers will be run on the 1st 21 joints
#1-6 will have subs
#7-21 will have slip on style

Attachment 4: Production Casing Landing String – MOP

Yellow cells = input data, Green cells = calculated results

Landing String Design - Margin of Overpull

This worksheet calculates *Margin of Overpull (MOP)* for pipe configurations with up to 5 different sizes of drill pipe and 3 different sizes of drill collars plus heavyweight. It can also incorporate a safety factor.

Well: Macondo **Description:** 7" x 9-7/8" CASING LANDING STRING

Drill Pipe Data

Bottommost Section Casing		Casing	Pipe #1		Pipe #3	Uppermost Section Pipe #4
7	OD	9.875	OD	6.625	OD	
6	ID	8.625	ID	5.375	ID	
32	Nominal Wt	62.8	Nominal Wt	40.01	Nominal Wt	
32	Adjusted Wt	62.8	Adjusted Wt	46.46	Adjusted Wt	
125,000		125,000		135,000		
100	% rem wall	100	% rem wall	80	% rem wall	

Tensile strengths from the pipe drill pipe data entered above

1,276,272 | 2,270,292 | 1,245,838

BHA Data

	DC #1	DC #2	DC #3		HWDP
	DC #1 OD	DC #2 OD	DC #3 OD	6.625	HWDP OD
	DC #1 ID	DC #2 ID	DC #3 ID		HWDP ID
	DC #1 Length	DC #2 Length	DC #3 Length		HWDP Length
	☐ Spiraled	☐ Spiraled	☐ Spiraled	☐ Spiraled	
	Wt/ft DC #1	Wt/ft DC #2	Wt/ft DC #3		
	Wt. DC #1	Wt. DC #2	Wt. DC #3		
		WH / RT	200		
Depth of Interest → → →		18,300	80 %		
Anticipated Mud weight		14.00	Block Wt.	180,000	

		Buoyed Wt	Section MOP	
Enter Casing Length →	6,000	150,937		
Enter Casing Length →	7,233	357,085		
Enter Length DP #2 →	5,067	185,065	303,426 #	
Enter Length DP #3 →	0			
Enter Length DP #4 →	0			

Buoyancy Factor	0.7861
Air weight of BHA	200
Buoyed weight of BHA	157
Total length of BHA	0'
Total depth	18,300

Pipe needed on last sec.	0'
Weak point in string	303,426
Total weight of string	693,244
Total weight BHA & string	873,244
Total weight indicator Reading	
With over pull	1,176,670

Assumes lowest planned mud weight of 14.0 ppg for section
WH / RT includes running tool, hanger, and seal assembly

Attachment 5: Rig Clean-up

A. *AREAS TO CLEAN*

1. *Strongly suggest removing all of the drilling mud from the rig.*
2. *Clean the suction, return, settling, and reserve pits.*
3. *Clean the sand traps.*
4. *Clean the ditches and troughs.*
5. *Clean the trip tank.*
6. *Clean the shaker area including all solids equipment and lines.*
7. *Clean the mixing hoppers.*
8. *Clean the cement unit.*
9. *Clean mud bucket and its related lines.*
10. *Any other pits or equipment that may come into contact with the completion fluid.*

B. ITEMS TO FLUSH OUT

1. *All mud pumps and suction lines.*
2. *All centrifugal pumps and lines.*
3. *Chemical and weight mixing lines.*
4. *Lines form the pit room to the trip tank.*
5. *Lines from the rig floor to the trip tank.*
6. *Choke, choke manifold and kill lines.*
7. *Standpipes.*
8. *Degassing and solids control equipment.*
9. *Lines to the cement unit and/or other pumping equipment.*
10. *Casing fill up line.*
11. *Lines to and from the filtration line.*
12. *Take on and return lines to and from the boat.*
13. *Any other lines that the completion fluid may contact.*

NOTE: A VALVE ON THE END OF THE TAKE ON HOSE, THE END THAT IS ON THE BOAT, IS STRONGLY RECOMMENDED. THE VALVE SHOULD BE ABLE TO BE CLOSED TO PREVENT FLUIDS FROM SPILLING INTO ANY ADJACENT WATERS OR ENVIRONMENTALLY SENSITIVE AREAS.

Attachment 6: Derrickman's Cleanup Checklist

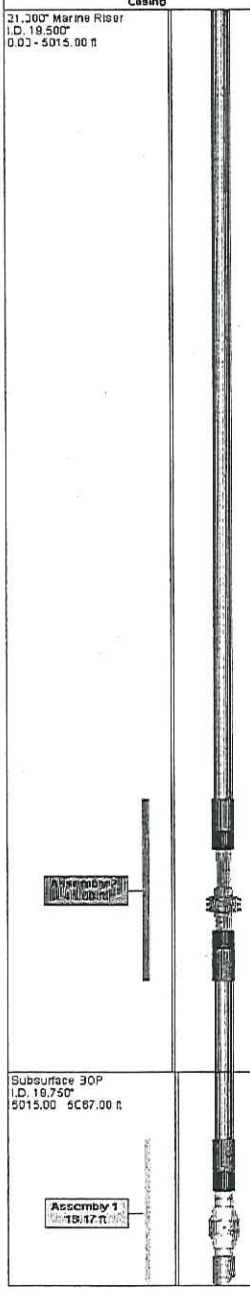
EQUIPMENT	*CHECK (?)*	*EQUIPMENT*	*CHECK (?)*
Pits - (All where Drilling		*Rig Pumps*	
Fluid will be stored)		*Choke Lines*	
Sand Traps		*Upper Kill Line*	
Degasser		*Lower Kill Line*	
Mud Cleaner		*Reverse Circulating Line*	
Mud Ditches		*Overboard Lines*	
Pumps		*Pit Gun Lines (All)*	
Header Box		*Transfer Lines: -*	
Shakers		*To & From All Pits*	
Gumbo		*To & From Filter Unit*	
Poor Boy		*Diverter*	
Trip Tank		*Equalizing Lines*	
Trip Tank Fill Line		*Lines to Drill Floor*	
Trip Tank Overflow Line		*Hole Fill Pump*	
Standpipe Manifold		*Pop Off Lines*	
Top Drive		*Bleed Off Lines*	
Chiksans		*Kill Pump*	
Choke Manifold		*Solids Handling Equip*	
Buffer Tank		*Hose to Boat*	
Choke & Kill Manifold		*Relief Overboard (Cmt.)*	
Mud Pump Charging Pumps		*Mud Cleaner Pump*	
General Service Pump			
H.P. Suction Manifold			

Attachment 7: Riser Brush Assembly

M-I SWACO

24 Hour Contact
Broussard 337 837 8655

BHA 1 (Page 1):
Displace & clean riser; jet BOP
M-I SWACO JOB NUMBER:
Quote #
SCHEMATIC BY:
Courtney Hughes
OPERATOR:
BP
AREA/REGION:
GOM Deepwater
WELL, FIELD & NUMBER:
VK 914 #1 ST3
PROJECT NAME:
Nile
REVISION:
1
DATE:
9 Feb 2010
APPROX. SHIP DATE:
15 Mar 2010
WORKSTRING PROVIDER:
OCS-G:
8705
SALES CONTACT:
Neal Brackeen
ENGINEER:
MAXIMUM ANGLE:
RIG:
Deepwater Horizon
RIG PHONE:
DISPLACEMENT TYPE:
INITIAL FLUID:
COMPLETION FLUID:
SPECIAL BILLING / COMMENTS
Water Depth: 4,992'
Reviewed By: Courtney Hughes



Casing	Description	OD (in)	ID (in)	Tool Length (ft)	Depth from Top of Tool (ft)	Depth from Bottom of Tool (ft)
	6.625", 27.70# Workstring w/ 6 5/8" FH (Box up)	8.500	4.500	4917.23	0.00	4917.23
	Pup Joint w/ 6 5/8" FH (Box) X 6 5/8" FH (Pin)	8.500	4.500	15.00	4917.23	4932.23
	Crossover w/ 6 5/8" FH (Box) X NC-50 (Pin)	8.500	2.625	3.00	4932.23	4935.23
	21.000" PUP Riser Tool, Brush Type for 2C" w/NC 50 Boxx Pin (PRB 108) NC-50 (Box) X NC-50 (Pin)	17.000	2.750	10.60	4935.23	4945.83
	Crossover w/ NC-50 (Box) X 6 5/8" FH (Pin)	8.500	2.625	3.00	4945.83	4948.83
	Pup Joint w/ 6 5/8" FH (Box) X 6 5/8" FH (Pin)	8.500	4.500	10.00	4948.83	4958.83
	6.625", 27.70# Workstring w/ 6 5/8" FH (Box up)	8.500	4.500	90.00	4958.83	5048.83
	Pup Joint w/ 6 5/8" FH (Box) X 6 5/8" FH (Pin)	8.500	4.500	10.00	5048.83	5058.83
	Crossover w/ 6 5/8" FH (Box) X NC-50 (Pin)	8.500	2.625	3.00	5058.83	5061.83
	18.000" Single Action By-Pass Sub, Jetting Type (SABS 105) NC-50 (Box) X NC-50 (Pin) [Ball 1 Size OD: 2.375in] [Ball 2 Size OD: 2.500in]	18.000	2.312	4.17	5061.83	5066.00
	Mule Shoe w/ NC-50 (Box)	8.625	2.625	1.00	5066.00	5067.00