

HALLIBURTON

BP America
PO Box 22024
Tulsa, Oklahoma 74121-2024

OCS-G-32306 , Macondo #1
Mississippi Canyon Block 252
Offshore Gulf of Mexico
United States of America

Rig Name: Transocean Horizon

9.875" x 7" Foamed Production Casing Post Job Report

Prepared for: Jesse Gagliano

April 20, 2010

Submitted by:
Nathaniel Chaisson
Technical Professional
100 Capital Dr Ste 200
Lafayette, LA 70508

| | | | | | |
|---|-----------------------------|----------------------------------|------------------------|---------------------------------|----------------------------|
| String: | 9.875" x 7" | Type: | Production Casing | Weight (ppf): | 62.80 #/ft x 32.00 #/ft |
| Callipered ID: | N/A | Casing MD: | 12488 ft x 18304 ft | Casing TVD: | 12488 ft x 18304 ft |
| Landing String OD/ID (in): | 6.625 / 5.426 32.67 #/ft | Landing String Length: | 5060 ft | Water Depth/Air Gap: | 4992' / 75' |
| Inner String OD/ID (in): | N/A | Innerstring Length: | N/A | BHST/BHCT: | 210 / 135 degrees |
| Hole Size: | 10.50" x 8.88" | Rat Hole: | 55 ft | Open Hole Actual Excess: | 0 % |
| Shoe Track Length: | 189 ft | Circulation Rate: | 4 bpm | Circulation Volume: | 150 bbls |
| Returns While Circulating? | Yes | Pipe Movement? | No | Displacement Rate: | 4 bpm |
| Returns While Cementing? | Yes | Mud Lost While Cementing: | No | Mud Weight /Type: | 14.0 ppg SBM Pad Mud |
| Annular Flow Before/After Cementing? | No | Dart Shear? | Yes | Estimated TOC: | 17,300 ft. |
| Casing Test: | 1000 psi | Cement Tagged At: | N/A | Hard Cement in Shoe? | N/A |
| MMS Req. met | Yes | Actual Shoe Test: | N/A | Squeeze Performed? | N/A |

Fluids Pumped

1. **Spacer:** 72 bbls of Tuned Spacer III mixed at 14.3 ppg with 0.6 gal/bbl Surfactant A + 0.6 gal/bbl Surfactant B + 0.6 gal/bbl SEM-8 + 1 lb/bbl WellLife 734 + Fresh Water
2. **Lead:** 5.26 bbls / 22 sks Premium H + .07% EZ-Flo + .25% D-Air 3000 + 1.88 lb/sk KCL + 20% SSA-1 + 15% SSA-2 + .2 % SA-541 + .11 gps Zoneseal 2000 + .09 gps SCR-100L + 1 lb/bbl WellLife 734 mixed with fresh water at 16.74 lb/gal .
3. **Foamed Tail:** 38.90 bbls / 159 sks (47.75 bbls foamed) Premium H + .07% EZ-Flo + .25% D-Air 3000 + 1.88 lb/sk KCL + 20% SSA-1 + 15% SSA-2 + .2 % SA-541 + .11 gps Zoneseal 2000 + .09 gps SCR-100L + 1 lb/bbl WellLife 734 mixed with fresh water at 16.74 lb/gal and foamed to 14.5 lb/gal with a 1.69 cuft/sk foamed yield (N2 conc. of 584 scf/bbl).
4. **Shoe Track:** 6.93 bbls / 28 sks Premium H + .07% EZ-Flo + .25% D-Air 3000 + 1.88 lb/sk KCL + 20% SSA-1 + 15% SSA-2 + .2 % SA-541 + .11 gps Zoneseal 2000 + .09 gps SCR-100L + 1 lb/bbl WellLife 734 mixed with fresh water at 16.74 lb/gal
5. **Spacer** 20 bbls of Tuned Spacer III mixed at 14.3 ppg with 0.6 gal/bbl Surfactant A + 0.6 gal/bbl Surfactant B + 0.6 gal/bbl SEM-8 + 1 lb/bbl WellLife 734 + Fresh Water
6. **Displacement:** 133 bbls 14.0 ppg SBM w/ Halliburton pumps.
7. **Displacement:** 728.5 bbls 14.0 ppg SBM w/ Rig pumps, leaving 189 ft of cement in shoe.

Job Log

| <u>Time</u> | <u>Event</u> |
|----------------|--|
| <u>4-19-10</u> | |
| 13:40 | Casing landed out at 18,310', which was 5 ft. deeper than planned. Rig did not have to wash casing down, and only saw one tight zone at 18,218 (took 10k). |
| 14:00 | Rigging up nitrogen manifold on rig floor. |
| 14:16 | Using rig pump #4, pressure up on ball to close Allamond diverter. Pumping at 1 bpm, diverter shifted with 2442 psi. |
| 14:20 | Ball on DTD, sheared at 2765 psi. Diverter is closed. Pressure broke back, continue pumping at 1 bpm. |
| 14:25 | Pressure climbed to 1800 psi while attempting to circulate at 1 bpm. Situation discussed on the rig floor leads to the conclusion that the floats have not converted. |
| 14:29 | Bleed pressure off. |
| 14:30 | Pressure up to 1900 psi at 1 bpm while attempting to convert floats. Unsuccessful. A small stream of returns were observed during this process...thought to be expansion of casing. |
| 14:38 | Bleed pressure off. |
| 14:53 | Pressure up to 2000 psi at 1 bpm while attempting to convert floats. Observed a .70 bbl gain in the trip tanks, so returns due to expansion of casing while pressuring up. Unsuccessful at converting floats. Bleed off. |
| 15:00 | Pressure up to 2000 psi at 1 bpm while attempting to convert floats. Unsuccessful..Bleed off pressure. (32 strokes / 4.0 bbls / 1000psi , 53 strokes / 6.6 bbls / 2000 psi) |
| 15:13 | Pressure up to 2000 psi at 1 bpm while attempting to convert floats. Unsuccessful..Bleed off pressure. (31 strokes / 3.91 bbls / 1000psi , 52 strokes / 6.6 bbls / 2000 psi) |
| 15:30 | Pressure up to 2000 psi at 2 bpm while attempting to convert floats. (52 strokes / 6.6 bbls / 2000 psi). Held pressure. Pressure dropped to 1950 psi and held. |
| 15:33 | Mud engineer ran a compressibility model that showed 5.9 bbls to the floats. Company man got permission to increase pressure to 2500 psi. |
| 15:37 | Pressure still holding at 1950 psi. Bleed off. |
| 15:41 | Pressure up to 2250 psi at 1 bpm while attempting to convert floats. (31 strokes / 3.91 bbls / 1000psi, 52 strokes / 6.6 bbls / 2000 psi, 58 strokes / 7.3 bbls / 2250 psi). |
| 15:42 | Pressure held at 2200 psi. Continue to hold pressure. |
| 15:52 | Bleed off pressure. |

- 15:54 Pressure up to 2500 psi at 1 bpm while attempting to convert floats. (62 strokes / 7.8 bbls / 2500 psi).
- 16:03 Unsuccessful...bleed pressure off.
- 16:16 Pressure up to 2750 psi at 1 bpm while attempting to convert floats. (67 strokes / 8.44 bbls / 2750 psi). Pressure held at 2700 psi.
- 16:18 Increased pressure to 3000 psi, which required an additional 5 strokes for a total of 72 (9.07 bbls).
- 16:19 Pressure held at 2950 psi for 2 minutes.
- 16:21 While attempting to increase to 3500 psi, pressure broke back with a max of 3142 psi (76 strokes / 9.6 bbls). Floats converted.
- 16:24 Circulating at 1 bpm with 137 psi. Company man feels uncomfortable with the circulating pressure being this low. Spoke with Jesse Gagliano about the situation.
- 16:30 Circulating at 1.5 bpm with 137 psi.
- 16:40 Circulating at 2.0 bpm with 190 psi.
- 16:44 Circulating at 2.5 bpm with 215 psi.
- 16:47 Circulating at 2.7 bpm with 233 psi.
- 16:49 Circulating at 3.0 bpm with 255 psi.
- 16:51 Circulating at 3.25 bpm with 274 psi.
- 16:53 Circulating at 3.5 bpm with 295 psi.
- 17:00 Circulating at 4.0 bpm with 340 psi. MI Swaco model estimates circulating pressure should be about 570 psi @ 4.0 bpm. Opticem estimated 370 psi at 1.0 bpm.
- 17:20 Rig decided to circulate with a different rig pump. Had been utilizing rig pump #4, will circulate utilizing rig pump # 3 to see the difference. Break circulation at 1 bpm with 245 psi. Pressure decreased to 205 psi.
- 17:22 Circulating at 1.5 bpm with 224 psi.
- 17:23 Circulating at 2.0 bpm with 260 psi.
- 17:24 Circulating at 2.5 bpm with 290 psi.
- 17:25 Circulating at 3.0 bpm with 320 psi.
- 17:26 Circulating at 3.5 bpm with 345 psi.
- 17:27 Circulating at 4.0 bpm with 396 psi. Note: Over time of circulating, driller noticed hookload had gradually decreased by 63k (from 450k to 387k). Did not drop off instantaneously, but gradually. Driller pulled up to initial hookload of 450k.

- 18:00 Closed annular BOPs, circulated down the drill pipe and took returns up the choke line. Determined that the Allamond diverter was closed.
- 18:20 Shut down while BP decides what will happen next.
- 18:51 Decision made to circulate 110 bbls at 4 bpm, and prepare for cement job.
- 19:00 Pre job safety meeting job meeting with rig crew reviewing detailed pumping procedure.
- 19:29 Blow nitrogen through choke to assure line is clear. Nitrogen line plugged.
- 19:38 Nitrogen line cleared.
- 19:39 Test nitrogen lines to 5000 psi. Leak found. Leak repaired.
- 19:45 Test N2 Lines to 51000 psi – bleed off no leaks noticed
- 19:47 Pump 7 bbls of 6.7 ppg base oil. Had 5 bbls of mud ahead of base oil.
- 19:53 Pump 10 bbls of 14.3 ppg Tuned Spacer III to break circulation.
- 19:54 Returns seen at wellhead
- 19:57 Test Cement Lines to 5000psi – bleed off no leaks noticed
- 19:59 Pump 62 bbls of Tuned Spacer III at 14.3 ppg – Sem-8 online.
- 20:17 Finished pumping spacer. Wash out measuring tanks.
- 20:28 Start weighing up cement.
- 20:37 Started pumping 16.74 ppg Unfoamed Lead Cement – ZoneSeal 2000 online.
Pumped 4 bbls of Unfoamed Lead Cement (1 Downhole / 3 In Lines)
- 20:39 Drop dart to release bottom plug.
- 20:41 Completed Unfoamed Lead Cement. Total of 5 bbls.
- 20:42 Started pumping Tail Cement foamed to 14.5 ppg – Nitrogen online.
- 21:00 Completed Foamed Tail Cement. Total of 39 surface bbls – Nitrogen offline.
- 21:01 Started pumping 16.74 ppg Un-foamed Shoe Cement.
- 21:03 Completed Un-foamed Shoe Cement. Total of 7 bbls.
- 21:04 Pump 3 bbls of 14.3 ppg Tuned Spacer to clear lines of cement.
- 21:05 Drop dart to release top plug.
- 21:06 Pump 17 bbls of 14.3 ppg Tuned Spacer – Sem-8 online.
- 21:11 All spacer pumped.
- 21:12 Start displacing cement with 14.0 ppg SBM using HES pumps.

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21:21 Dart #1 through diverter at 3500 psi with 43 bbls of SBM pumped using HES pumps.
21:23 Dart #1 through DTD at 3200 psi with 50 bbls of SBM pumped using HES pumps.
21:35 Dart #2 through diverter at 3150 psi with 101 bbls of SBM pumped using HES pumps.
21:37 Dart #2 through DTD at 3350 psi with 109 bbls of SBM pumped using HES pumps.
21:39 Dart #2 launched top plug at 3300 psi with 117 bbls of SBM pumped using HES pumps.
21:43 Finished pumping 133 bbls of SBM & turn over to the rig to complete displacement.
23:39 Bottom plug through X-over at 830 psi with 469.5 bbls of SBM pumped with the rig pumps.
23:53 Top plug through X-over at 500 psi with 525 bbls of SBM pumped with the rig pumps.

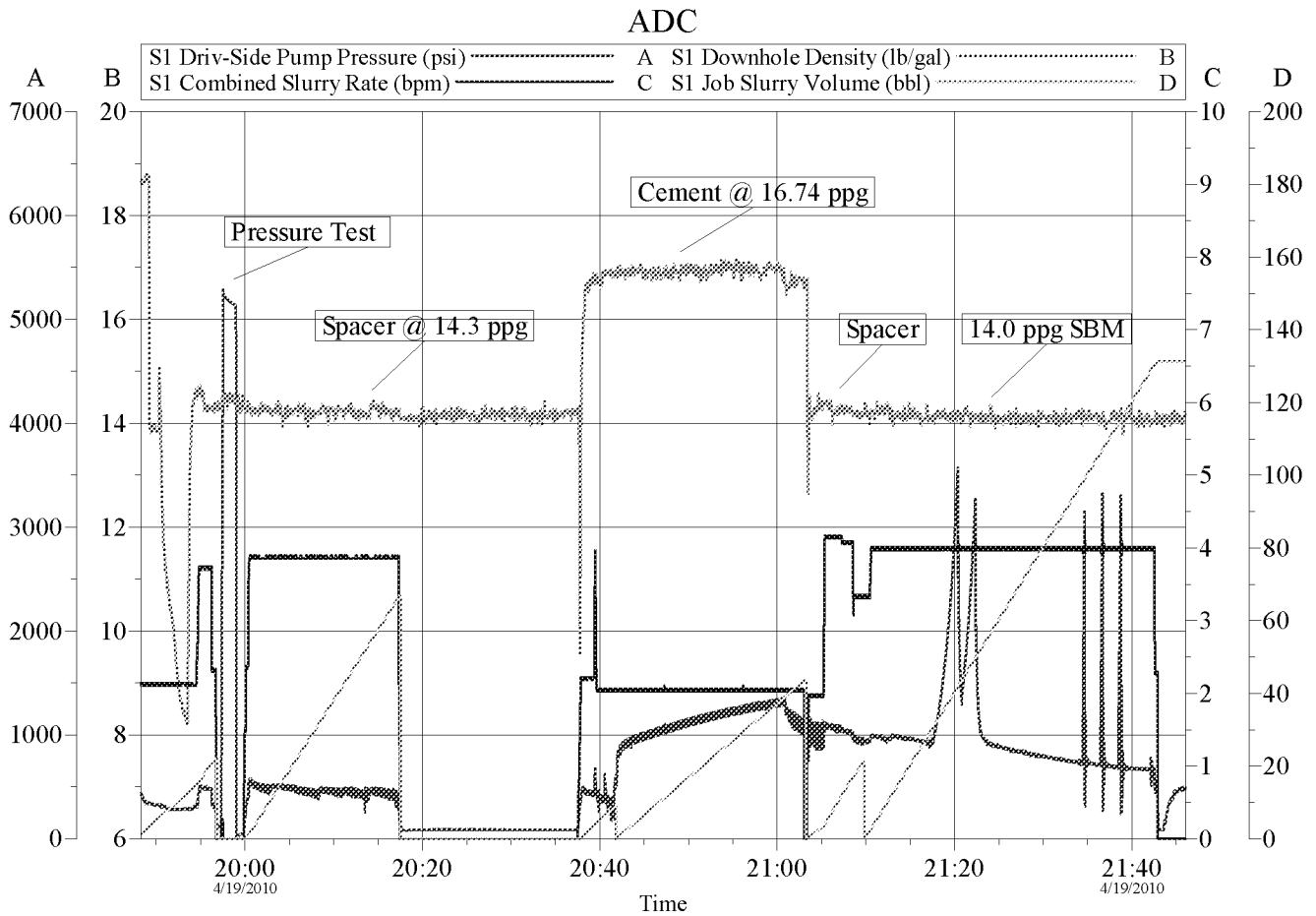
4-20-10

00:29 Bottom plug bumped at 2900 psi with 673 bbls of SBM pumped with the rig pumps.
00:40 Top plug bumped at 1150 psi (1000 psi over circulating) with 728.5 bbls of SBM with the rig pumps.
00:43 Check floats...bled back 5 bbls. Floats held.

Significant Points

- Cement job pumped as planned.
- Chemical straps determined that additives were pumped at planned volumes
- Rig completed displacement and both plugs were bumped.
- Full returns seen throughout entire job.
- Estimated 100 psi of lift pressure (350 psi circulating to 450 psi circulating), before bumping top plug.
- Floats held after job.

Recorded at cementing unit (Down Hole Density, Pressure, Rate, Stage Slurry Volume):

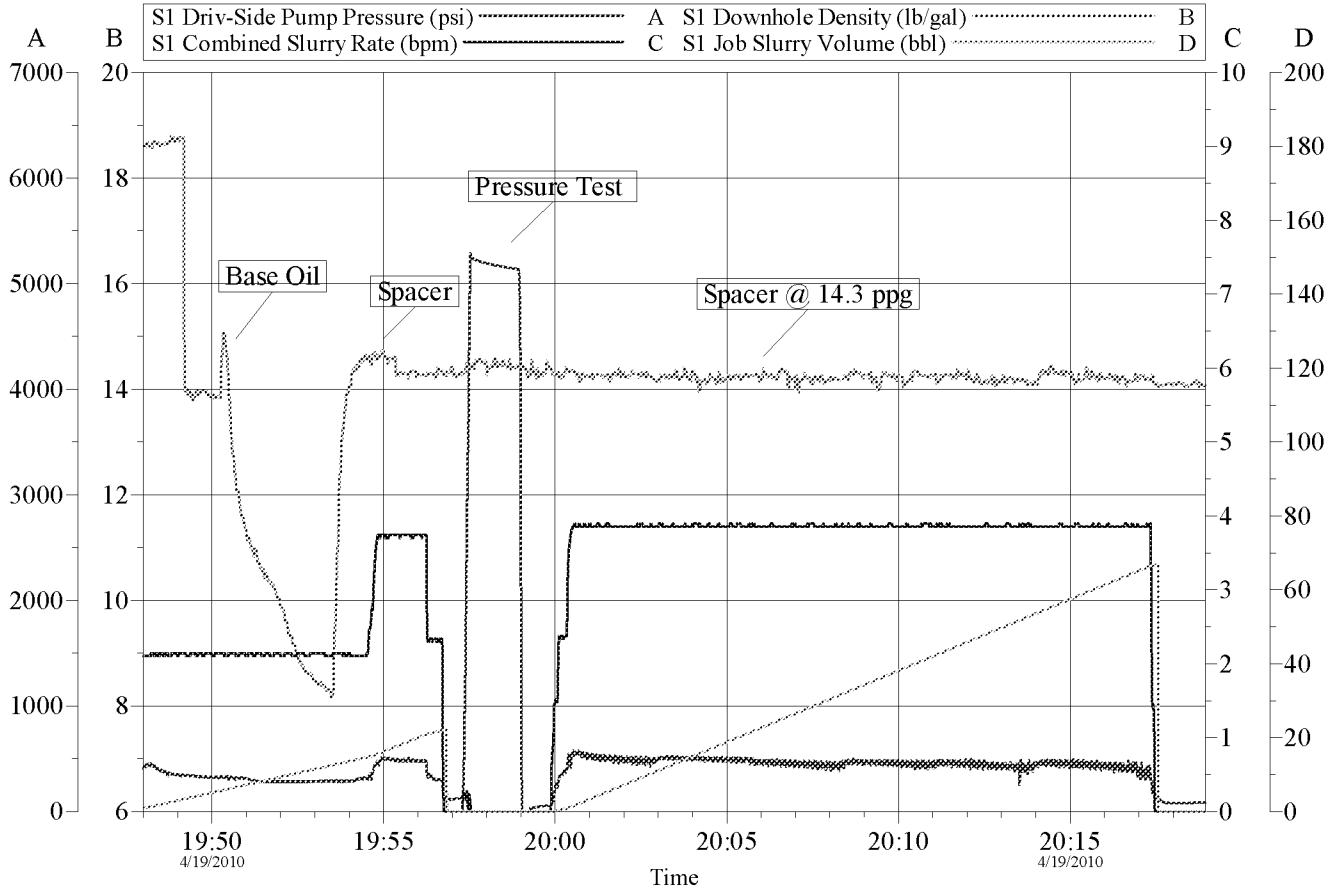


| | | |
|---|-----------------------|----------------|
| Customer: BP AMERICA PRODUCTION COMPANY | Job Date: 19-Apr-2010 | Sales Order #: |
| Well Description: Macondo #1 | UWI: | |

OptiCem v6.4.7
20-Apr-10 02:50

Recorded at cementing unit (Down Hole Density, Pressure, Rate, Stage Slurry Volume):

ADC - Spacer

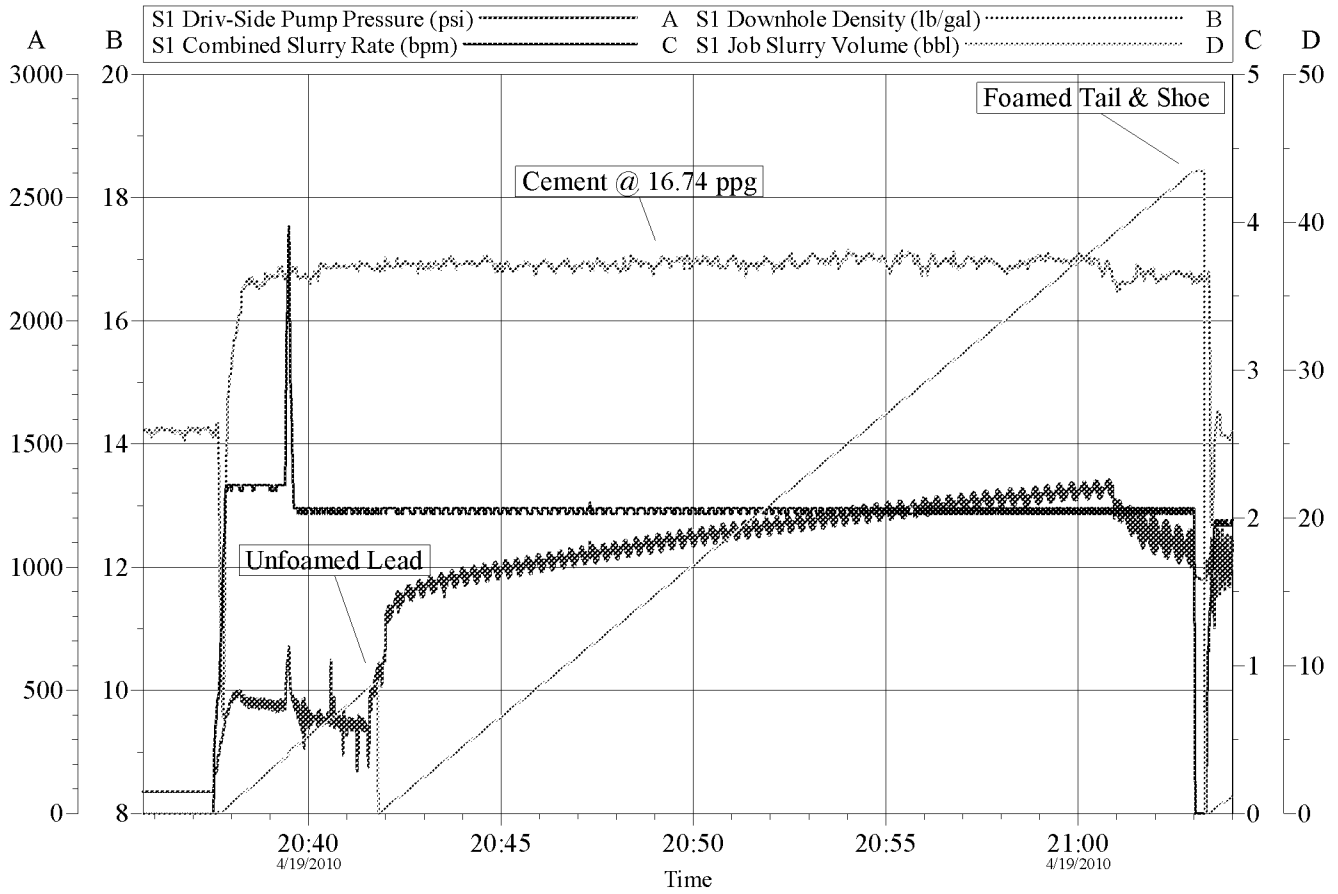


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|---|-----------------------|----------------|
| Customer: BP AMERICA PRODUCTION COMPANY | Job Date: 19-Apr-2010 | Sales Order #: |
| Well Description: Macondo #1 | UWI: | |

OptiCem v6.4.7
20-Apr-10 02:54

Recorded at cementing unit (Down Hole Density, Pressure, Rate, Stage Slurry Volume):

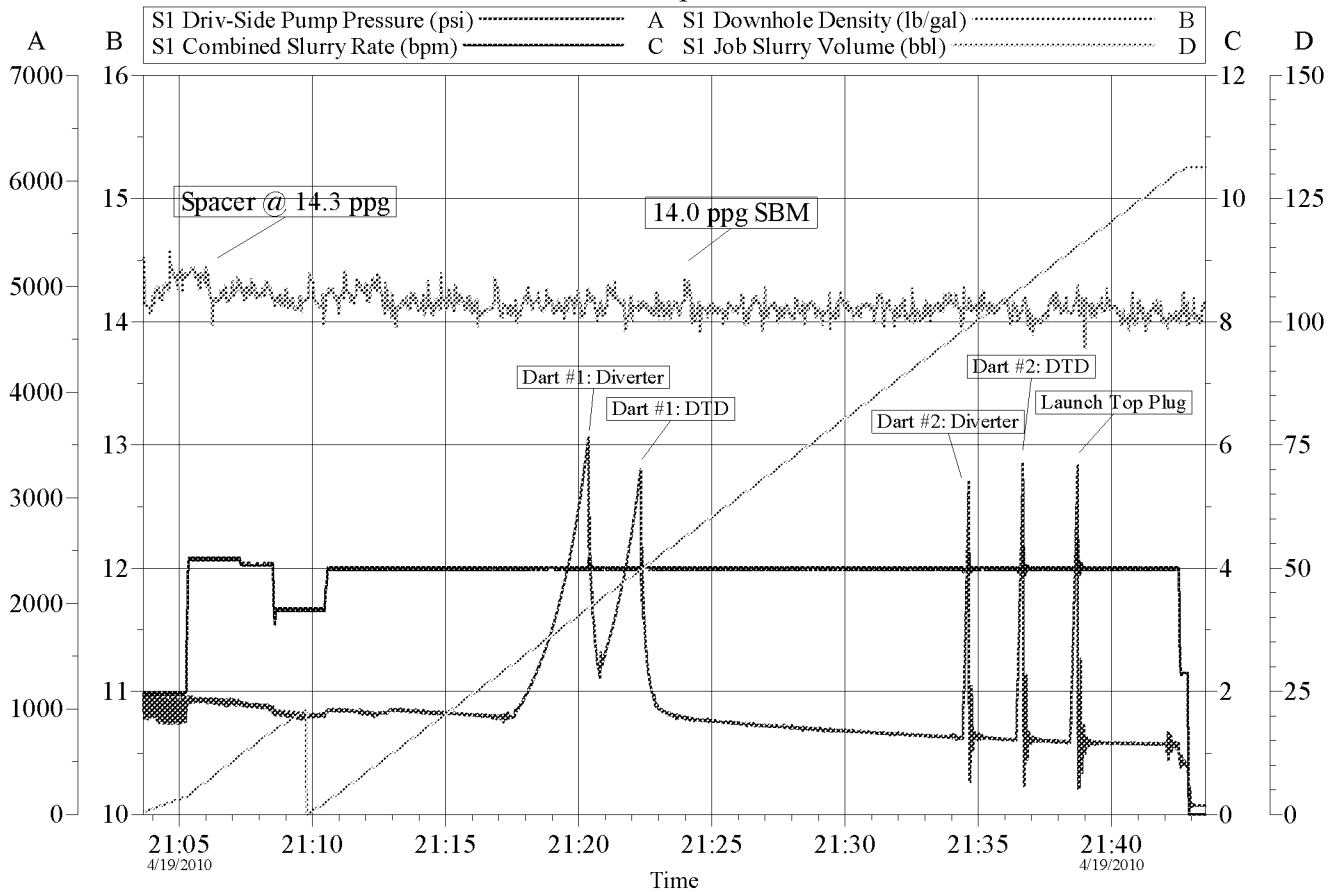
ADC - Cement



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|---|-----------------------|----------------|-----------------------------------|
| Customer: BP AMERICA PRODUCTION COMPANY | Job Date: 19-Apr-2010 | Sales Order #: | OptiCem v6.4.7 20-Apr-10 03:02 |
| Well Description: Macondo #1 | UWI: | | |

Recorded at cementing unit (Down Hole Density, Pressure, Rate, Stage Slurry Volume):

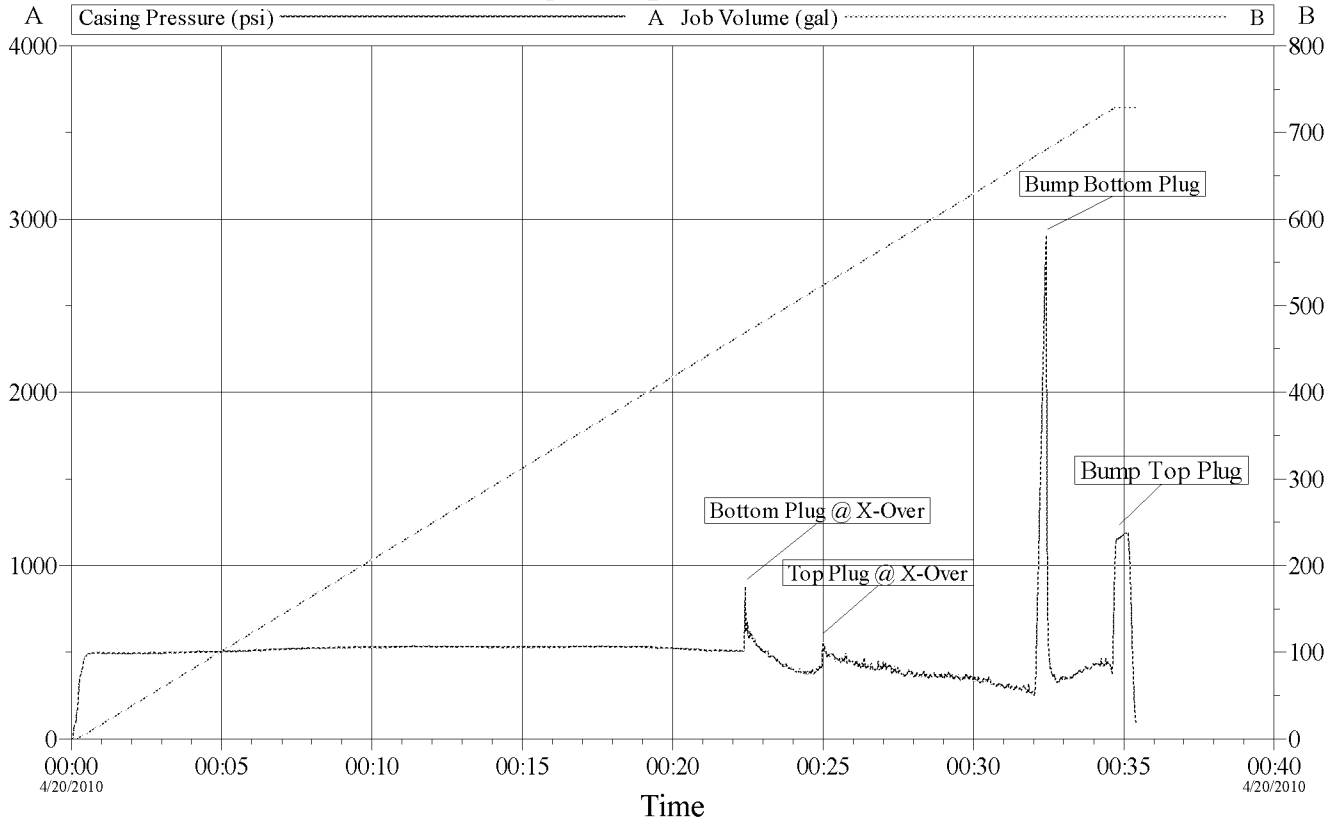
ADC - Displacement



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|---|-----------------------|----------------|-----------------------------------|
| Customer: BP AMERICA PRODUCTION COMPANY | Job Date: 19-Apr-2010 | Sales Order #: | OptiCem v6.4.7 20-Apr-10 03:21 |
| Well Description: Macondo #1 | UWI: | | |

Recorded at Sperry's unit (Pressure, Stage Slurry Volume):

Rig Displacement

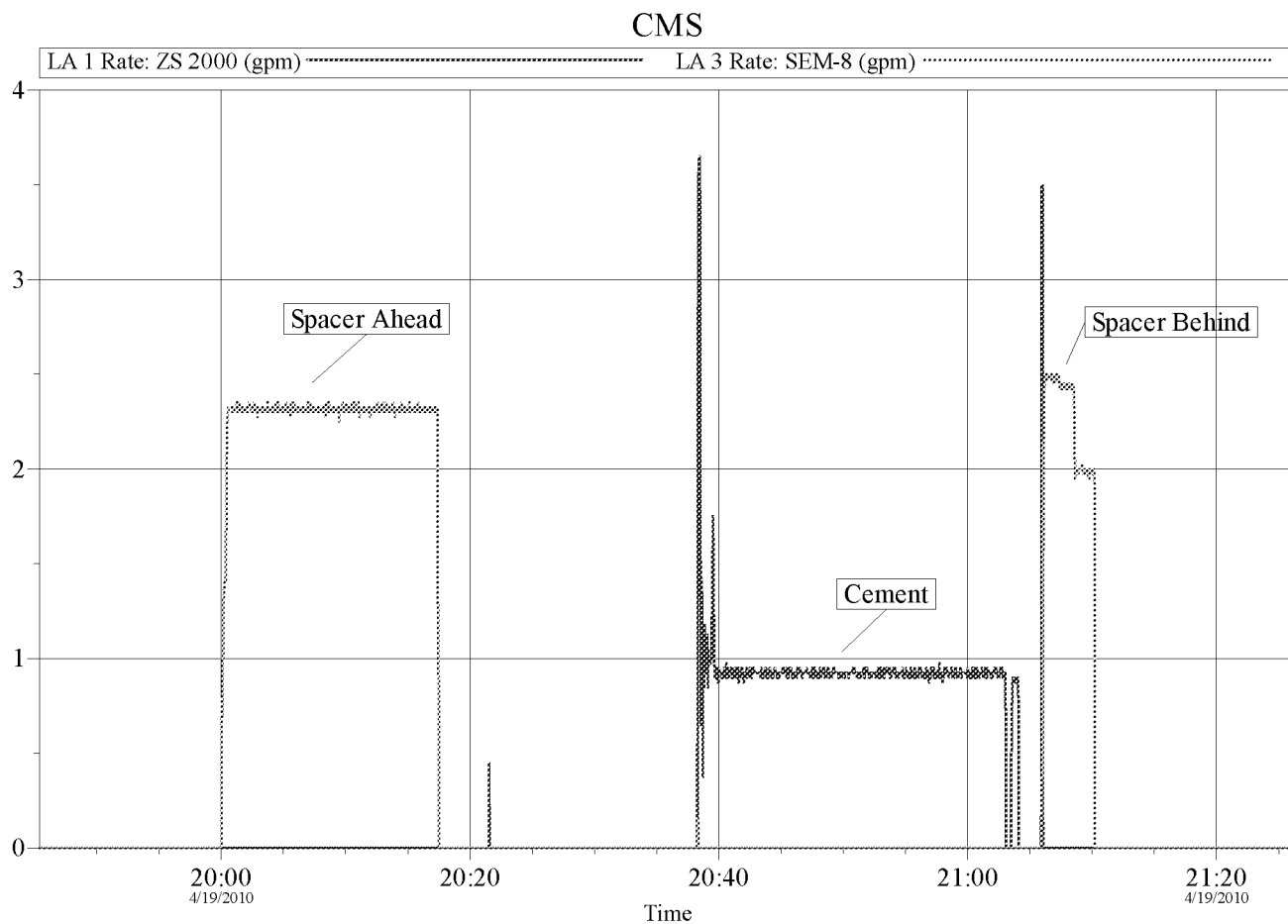


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|------------|-----------|-----------|
| Customer: | Job Date: | Ticket #: |
| Well Desc: | UWI: | |

CemWin v1.7.2
20-Apr-10 04:52

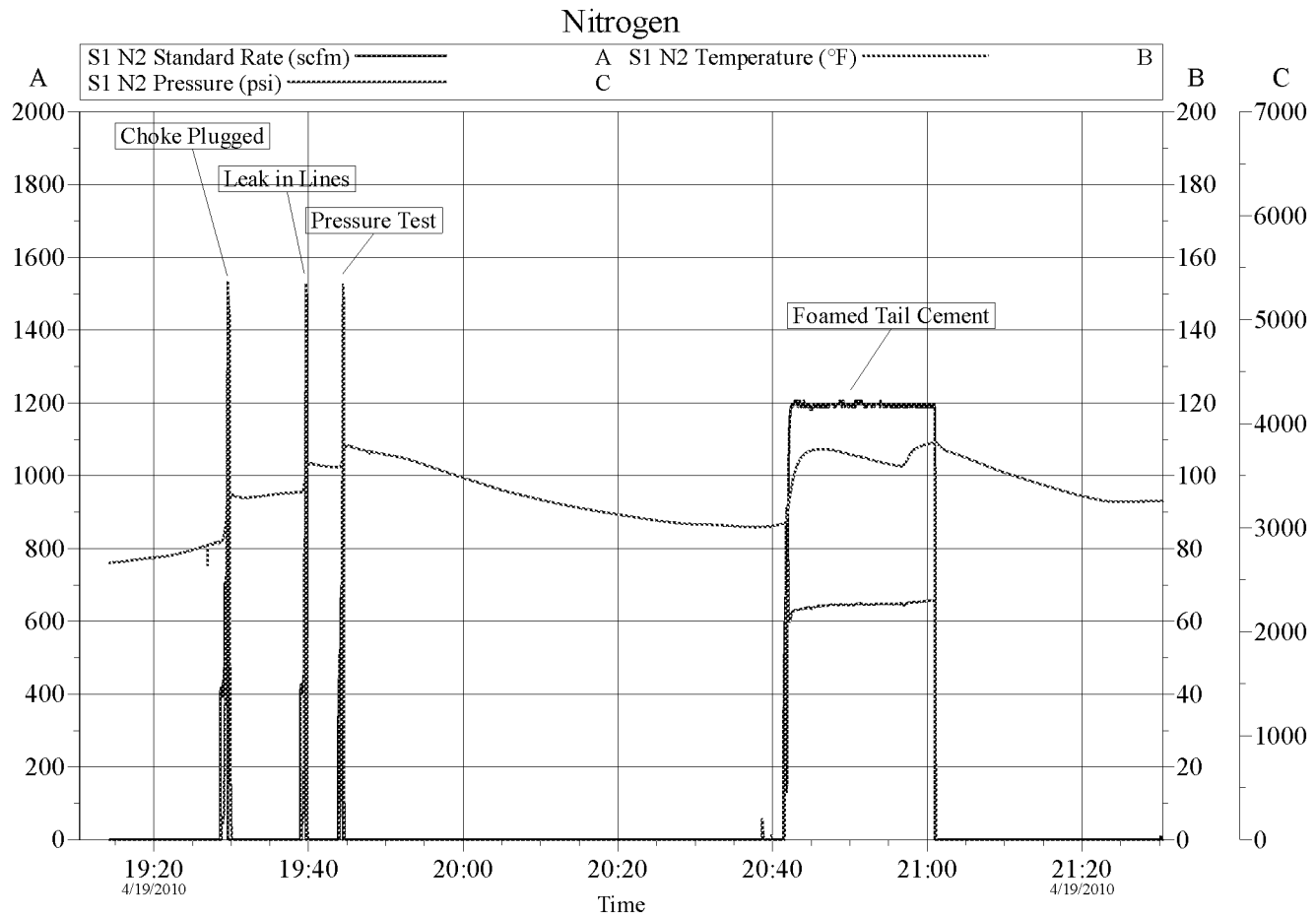
Note: Graph created from Sperry's data, time of events are not correct.

Recorded at cementing unit (CMS Rate - ZoneSeal 2000 automates from Combined Pump Rate):



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|---|-----------------------|----------------|-----------------------------------|
| Customer: BP AMERICA PRODUCTION COMPANY | Job Date: 19-Apr-2010 | Sales Order #: | OptiCem v6.4.7 20-Apr-10 03:44 |
| Well Description: Macondo #1 | UWI: | | |

Recorded at N2 unit (N2 rate automates from Combined Pump Rate read by Nitrogen Unit):



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|---|-----------------------|----------------|
| Customer: BP AMERICA PRODUCTION COMPANY | Job Date: 19-Apr-2010 | Sales Order #: |
| Well Description: Macondo #1 | UWI: | |

OptiCem v6.4.7
20-Apr-10 05:17