$N_2$ CMT Summary

# $N_2$ Job Summaries

| General Info: | Units | Macondo | Isabella | King South | Nakika H2 |
|---|---|---|---|---|---|
| date | | 4/29/2010 | 4/13/2007 | 4/19/2009 | 7/4/2009 |
| slurry density | ppg | 16.74 | 16.94 | 16.74 | 16.74 |
| slurry yield | gal / sx | 1.37 | 1.32 | 1.04 | 1.04 |
| foam density | ppg | 14.5 | 13.9 | 14 | 14.5 |
| foam yield | gal / sx | 1.69 | 1.73 | | |
| N2 | scf / bbl | 584 | 719 | ? | 411 |
| Final ESD | ppg | 14.17 | 12.9 | | 12.3 |
| TVD | ft | 18304 | 19187 | | 16600 |
| Annular Hydrostatic Estimate | psi | 13487 | 12871 | | 10617 |
| Calculated Foam Quality (bbl N2 / bbl cement at downhole) | | 18.9% | 23.7% | | |
| **Recipe:** | | | | | |
| EZ Flo (bulk flow enhancer) | | 0.07% | 0.07% | 0.07% | 0.07% |
| SSA-1 (silica flour) | | 20% | 20% | | |
| SSA-2 (silica flour) | | 15% | 15% | | |
| Zonesealant 2000 (Foamer) | gal / sx | 0.11 | 0.14 | 0.11 | 0.11 |
| HR-6L (retarder) | gal / sx | | 0.07 | | |
| SCR-100L (Retarder) | gal / sx | 0.09 | | 0.03 | 0.07 |
| Fresh Water (Mixing Fluid) | gal / sx | 5.13 | 7.74 | | 3.921 |
| KCL (Clay Control) | lb / sx | 1.88 | | 1.88 | 1.8 |
| WellLife 734 (LCM) | lb / sx | 1 | | 1 | 0.2 |
| Premium Cement (Cement) | lb / sx | | | 94 | 94 |
| Premium Cement (Cement) - Class H | lb / sx | | | | |
| D-air 3000 | | 0.25% | | | |
| SA-541 (high temp suspension / viscofier) | | 0.20% | | | |

# $N_2$ OPERATION SUMMARIES

date of job: 19-Apr-2008 MC 129 #3 (King South) 9-7/8"

| Sequence | Operation | Vol | Density | Foam Den | Yield | scf / bbl | rate bpm | Comments |
|---|---|---|---|---|---|---|---|---|
| 1 | spacer | 5 | 11 | | | | | |
| 2 | spacer | 100 | 11 | | | | | |
| 3 | lead | 2 | 16.74 | | 1.04 | | | |
| 4 | drop btm dart | | | | | | | |
| 5 | lead | 8 | 16.74 | | 1.04 | | | |
| 6 | foam tail | 76 | 16.74 | 14 | 1.04 | | | |
| 7 | shoe cmt | 13.8 | 16.74 | | 1.04 | | | |
| 8 | drop top dart | | | | | | | |
| 9 | spacer | 15 | 11 | | | | | |
| 10 | CaCl2 | 462 | | | | | 10 | |
| 11 | mud | 87 | 10.5 | | | | | |
| 12 | bump bleed 1900 psi and 2-1/2 bbls back | | | | | | | |

date of job: 4-Jul-2009 MC 520 H2 (Nakika) 9-7/8"

| Sequence | Operation | Vol | Density | Foam Den | Yield | scf / bbl | rate bpm | Comments |
|---|---|---|---|---|---|---|---|---|
| 1 | base oil | 100 | 6.5 | | | | 5 | complete lost returns at 2.5 bpm |
| 2 | spacer | 67 | | 11.7 | | 945 | 4 | |
| 3 | drop btm dart | | | | | | | |
| 4 | lead | 14.3 | 16.74 | | 1.04 | | | |
| 5 | foamed tail | 99.7 | | 14.5 | 1.26 | 411 | | |
| 6 | shoe cmt | 21.3 | 16.74 | | 1.04 | | | |
| 7 | drop top dart | | | | | | | |
| 8 | cement | 8 | | | | | | |
| 9 | spacer | | | | 16 | | | |
| 10 | CaCl | 12 | | | | | 5 | |
| 11 | CaCl | 129 | 10.2 | | | | | |
| 12 | CaCl | 549 | 10.2 | | | | | |
| 13 | spacer | 22 | 11 | | | | | |
| 14 | | 182 | | | | | | lost 2291 bbls during cement job |
| 15 | did not bump plug. Displaced 7 bbls over. Bled back 1.5 bbls. Floats holding. | | | | | | | cement contamination obs with bond log |

date of job: 13-Apr-2007 Isabela 10-3/4" x 9-7/8"

| Sequence | Operation | Vol | Density | Foam Den | Yield | scf / bbl | rate bpm | Comments |
|---|---|---|---|---|---|---|---|---|
| 1 | Spacer | 100 | 13.3 | | | | | |
| 2 | lead | 10 | 16.9 | | | | | |
| 3 | drop btm dart | | | | | | | |
| 4 | lead | 208.1 | | 13.9 | 1.73 | 719 | | |
| 5 | tail | 26 | 16.9 | | 1.32 | | | |
| 6 | drop top dart | | | | | | | |
| 7 | mud | 10 | 12.9 | | | | | |
| 8 | mud | 180 | 12.9 | | | | 6 | |
| 9 | mud | 982 | 12.9 | | | | | 958 bls (HES post report) vs 982 bbls DIMS |
| 10 | bumped plug 1590 psi. Press increased to 1950psi. Bled to zero with 7 bbls back. Floats holding. | | | | | | | |

date of job: 19-Apr-2010 Macondo 9-7/8" x 7"

| Sequence | Operation | Vol | Density | Foam Den | Yield | scf / bbl | rate bpm | |
|---|---|---|---|---|---|---|---|---|
| 1 | base oil | 7 | 6.7 | | | | | |
| 2 | spacer | 10 | 14.3 | | | | | tested lines to 5k. was this included in the following 62 bbl vol???? |
| 3 | spacer | 62 | 14.3 | | | | 4 | |
| 4 | Class H cmt | 4 | 16.7 | | 1.37 | | 2 | |
| 5 | drop dart #1 | | | | | | | |
| 6 | Class H cmt | 4 | 16.7 | | 1.37 | | 2 | |
| 7 | N2 Foam cmt | 48 | 16.7 | 14.5 | 1.69 | 584 | | 39 bbl cmt & 48 bbls once foamed |
| 8 | Class H cmt | 4 | 16.7 | | 1.37 | | | |
| 9 | spacer | 0 | 14.3 | | | | | 3 bbls displace surface lines from cmt unit to wellhead |
| 10 | drop dart #2 | | | | | | | |
| 11 | spacer | 20 | 14.3 | | | | | (3 bbls to clear lines + drop dart + 17 bbls per DIMS) |
| 12 | mud | 133 | 14.0 | | | | | with cement unit |
| 13 | bottom dart to diverter | | | | | | | 43 bbls to diverter, 3500 psi sheared |
| 14 | bottom dart to DTD | | | | | | | 150 bbls to DTD, 3250 psi sheared |
| 15 | no indication of bottom plug shear | | | | | | | |
| 16 | top dart to diverter | | | | | | | 100 bbls to diverter, 3200 psi sheared |
| 17 | top dart to DTD | | | | | | | 109 bbls pumped, 3400 psi sheared |
| 18 | top dart to plug | | | | | | | 119 bbls, 3300 psi sheared |
| 19 | switch to rig pumps | | | | | | | |
| 20 | mud | 727 | 14 | | | | 4 | 530 psi circ rate. |
| 21 | bottom plug to XO | | | | | | | 469 bbls at 830 psi |
| 22 | top plug to XO | | | | | | | 523 bbls at 590 psi |
| 23 | bottom plug landed FC | | | | | | | 673 bbls at 2932 psi |
| 24 | top plug to land FC | | | | | | | 727 bbls at 740 psi over circ press |
| 25 | bled press to 0 psi with 5 bbls back | | | | | | | |