**From**: Hine, Andy J
**Sent**: Thu May 06 16:36:29 2010
**To**: G D&C Operations Network; Abusaid, David F; Silva, Elvis I
**Subject**: D&C Ops Network Telecom Notes/Actions - 20th April 2010
**Importance**: Normal
**Attachments**: Savonette 02 Stuck Pipe-Investigation 1-Pager v1.0.pdf; One Pager Stuck Pipe DELE B 1Z.ZIP; Norway NPT - Valhall IP G-8 Parted 7 5_8 liner.ppt; DEX_Stuck_Pipe_Reduction_Initiative_Network Presentation V2.ppt; 2010 Critical wells List - Key Drilling and Completion Risks - April 2010.xls; Cementing Zonal Isolation .zip; SDA06 BHI CoPilot Success.ZIP

Notes and actions from the D&C Ops Network telecon held on Tuesday 20th April are attached for your information and to cascade within your SPU. Thanks to everyone who gave their time and participated in the call.

## D&C Operations Network Notes/Actions, 20th April 2010

### On the Call:

Alaska - Mike Schultz
Andean - Claudia Ruiz
Andean - Carlos Vargas
Andean - David Abusaid `
Andean - Elvis Silva
Angola - Charlie Gilbertson
Angola - Sarah Gay
Asia-Pacific - David MacDonald
AzSPU - Jon Perry
AzSPU - Sahib Hasanov
AzSPU - Tommy Sigmundstad
AzSPU - Cecil Cheshire
AzSPU - Dom Cumberlege
AsSPU - Sam Massey
Egypt - Kevin Walter
EPT - Hugh Williamson
EPT - Brian Hay
EPT - Tom Christopher
EPT - Andy Hine
EPT - Allen Pere
EPT - Phil Pattillo
GoM - Keith Daigle
North Africa - Hendrik De Jong
North Sea - Jim Cowie
Norway - Marton Haga
Trinidad - Carlyle Kalloo

### Apologies:

Douglas Frisby
Harry Thierens
Robin Barr
Richard Smith
Al Nord
David Sims

**Notes and Actions**. These follow the agenda.

**1) Major NPT Operational Incidents:**

**Trinidad - Savonette 2 well. Carlyle Kalloo** described the Savonette 2 stuck pipe event and the recommendations following the incident investigation. Attached is the NPT one pager which was not available to all at the time of the

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Worldwide Court Reporters, Inc.

telecon. Main cause of the stuck pipe incident was inadequate hole cleaning. The investigation gives recommendations to prevent re-occurrence.

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**Colombia - Dele B-1 well**. David Abusaid took the team through the recent stuck pipe incident and the attached one pager. The key message is the non-rotating sleeve with the big OD (7 7/8") HES RSS Geopilot tool and impact if get into a stuck pipe situation. If running this system in an interbedded lithology then teams need to understand potential risk. Incident cost $5m and 30 days lost time.

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See Stuck Pipe Analysis below which shows that of the three main RSS providers the HES Geopilot system had the highest number of stuck pipe incidents, occurring nearly twice as often as competitors.

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**Norway - Valhall G-8 Well. Parted 7 5/8" liner. Marton Haga.** A very detailed one page NPT incident report attached.

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**3)Stuck Pipe. Allen Pere** talked through the analysis and findings of the stuck pipe review, see below. The analysis looks at stuck pipe incidents by operation, by likely cause, by mechanism and by RSS provider. It also provides some comment for each of the key problem areas. The review team proposes a forward plan to get into action and reduce the number of stuck pipe incidents. This still needs DCL agreement however at least with this information pack you maybe able to prevent a further stuck pipe incident occurring in your SPU. One additional action will be to a refresh of the stuck pipe training courses and examine applicability to your SPU needs.

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**4) Wellsite Leaders Handbook**. Richard Smith has issued the North Sea version of the WSLs Handbook to the North Sea SPU, the DCL and D&C Ops Managers/Network members. An excellent document and again many thanks to Ian Tinegate, Alan Barron and Richard Smith for making this happen.

The next stage is that Ian and Richard will edit the North Sea edition to produce the World Wide version over the next three months. The intention is to place the World Wide version of the Handbook on the Global D&C Library, formatted as a 'Guidance Document' once completed.

**5) 2010 Critical Well List.** The key drilling and completion risks to the 2010 critical wells activity has been pulled together following feedback from the network members. In addition to presenting the key D&C risks for each of the critical wells it also groups the risks by SPU and by risk type in a summary table. The good news is that the highest and most frequently occurring risks were identified at the beginning of the year and have been incorporated into one of the network performance contracts and in action.

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6) **Cementing - Zonal Isolation**. The Baku drilling team talked through the process ACG have in place for Zonal Isolation Verification and Decision tree. With the imminent issue of the Zonal Cementing SRP it was suggested SPUs review what verification process, decision tree and criteria for evaluation of cement bonds they have in place. Zonal isolation remains an area of focus.

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7) **Message from Barbara Yilmaz**.

You may already have seen this message from Barbara Yilmaz following last week's Well Managers telecon regarding the Horizon GoM incident but it does no harm to reiterate and if not seen then to start taking the appropriate steps in your SPU.

'Steps you should take now:

· Test that your emergency evacuation at the rig site is well understood and practiced.

· Confirm that your well control contingency plans are current and well understood including relief well drilling plans.

· Confirm that you have a working BOP

· Confirm that if you need to intervene on your BOPs, you have access to the right resources and equipment to do so

· Remain focused on our key safety agenda - Control of Work, Lifting, and Dropped Objects; it is still relevant.

As you follow through with these steps, please ensure that the folks involved understand the importance of staying focused on their existing operation and avoid speculation on the event'.

8) **Success Stories**. Please forward your SPU success stories to me. All the success stories can be found on the D&C global website under 'What's New' - link attached.

https://epti.bpglobal.com/C9/C3/What's%20New/default.aspx Also increase the awareness in your SPU of this data base particularly where someone else's success would help improve your operations.

Success story of drilling performance in 16.5" x 22" hole section on SDA06 in Shah Deniz Alpha.

In the past on Shah Deniz Alpha, this section was drilled in 2 passes due to unavailability of underreamers of 16.5" x 22" capability and it has been a difficult section with numerous tool failures and twist offs mainly as a result of off-bottom reaming. With XR Reamers there is now the capability to do a tandem underreaming to drill 16.5" x 22" section. The SD team also used the BHI CoPilot tool to get real time drilling dynamics and vibration information to optimize the drilling parameters. Another significant design change was including 19.5" XR Reamers above 22" XR Reamers for additional stabilization and matching the cutting structures to ensure that bit would take up the majority WOB.

**Result** - Drilled 933m of 16.5" x 22" hole section in one run without any tool failures and minimal vibrations and increased RoP from 12.6 to 21.2m/hr.

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9) **Next Network Telecon.** This will be on **Tuesday 18th May 13.30-15.00 UK time**. One item on the agenda will be a technology update on the ERA Flagship (Efficient Reservoir Access) following its progress into DEFINE. The session will bring you up to speed on the direction ERA is heading and make one or two requests for help to engage the broader community and to build the content for the ERA Advisor Consoles (this request will be much clearer once covered in the update).

Finally the link to the D&C Operations Network SharePoint where you can find the monthly telecon agendas, material including NPT Investigation reports, notes and actions, network documents and material from annual ftf meetings

https://epti.bpglobal.com/sites/DC-OperationsNetwork/default.aspx

Andy

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# Critical Activity (2010) plus Other SPU High Profile Wells

## Key Drilling Risks to Delivery

| | Well Type | Date on Line - Plan | SPA | Drilling Start Date | No. of Casing Strings | Rig Type | Rig New Startup | Key Drilling Risk(s) to Delivery |
|---|---|---|---|---|---|---|---|---|
| **Alaska** | | | | | | | | |
| Liberty Project | Producer | - - | Robinson | Nov-10 | 4 | Land | Yes | New rig start up.Crew competency and equipment reliability. High angle, ultra ERD well. Hole cleaning, wellbore stability and extended length mud-air casing installations on two casing strings. Downhole tool reliability with tool failures resulting in extra trips placing additional stability risk on wellbore from swab, surge and ECD cycles. |
| **Angola** | | | | | | | | |
| CrIA | Injector | 02/10 | Foreman | | | Semi | No | Losses during hole cleanout, tight hole and oil seeps with 20" casing, WBS in 12 1/4" @ 80 deg inclination., lost returns run/cmt 10 3/4" csg. |
| PuPH | Producer | 04/10 | Foreman | | | Semi | No | WBS in 17 1/2" and 12 1/4"x13 1/2" hole sections, hole cleaning in 12 1/4"x13 1/2" section, lost returns in M50 and M40 sands. |
| PdIF | Injector | 05/10 | Foreman | | | Semi | No | Long step out in 12 1/4" section compromising hole cleaning, well losses. Getting 10 3/4" casing to TD. Losses on 10 3/4" cmt job. |
| PuIJ | Producer | 06/10 | Foreman | | | Semi | No | Time constraint - Sedco Express contract expires 16th to 20th June. NPT delays on previous 3 wells preventing well being spudded. Greater depletion of sands than predicted, depth uncertainty, if NOT top setting in reservoir long section of reactive shale open. |
| PSVM PA-WD | Injector | 09/10 | Foreman | | | Drill Ship | Yes | New rig start-up. Late rig arrival. Contractor performanance, Critical equipment failures: BOP, top drive,cement unit etc, Cameron equipment delivery. Low 13 3/8" csg shoe LOT. Getting adequate zonal isolation when cmt 13 3/8" and 9 5/8"csg. |
| PSVM PA -GA | Injector | 11/10 | Foreman | | | Drill Ship | Yes | New rig start-up. Late rig arrival compromising 2010 schedule. Contractor performanance, Critical equipment failures: BOP, top drive, cement unit etc, Cameron equipment delivery. Low 13 3/8" csg shoe LOT. Adequate zonal isolation when cmt 13 3/8" and 9 5/8"csg |
| PSVM PA - PC | Producer | 2011 | Foreman | | | Drill Ship | No | Long high angle well. Narrow PPFG. Hole cleaning in high angle. WBS in 12 1/4" section. low 20" csg LOT. Adequate zonal isolation when cmt 20" and 9 5/8" csg. Directional control in 17 1/2" and 12 1/4" missing target. Ledging and key seating in 12 1/4" leading to stuck pipe.Entering reservoir in gas cap. TLC failure/stuck pipe. |
| **Azerbaijan** | | | | | | | | |
| SDA06 | Producer | 11/10 | Christman | Feb-10 | 7 | Platform | No | New Well System;_ New rig equipment (low pressure riser & diverter), interface between Rig, AGR and ROV & operational issues.<br>New Cameron Wellhead System (replace Plexus): First time in Shah Deniz & operational issues<br>Well Cement Integrity; Cement job is critical for well life integrity (top to bottom) - New BOD<br>Stuck Pipe or Wireline; High overbalance, tectonics, radioactive sources run across reservoir section.<br>Narrow PPFG window in 22" casing section; ECD's constrains (large hole size, diverter restriction), losses and/or gains<br>Potential Rig Contract Change during SDA-06 well execution; Distraction and disruption of rig crews |
| E13 / E13Z | Producer | 02/10 | Christman | Jan-10 | 5 | Platform | No | Differential sticking while drilling 6-1/2" hole in reservoir.<br>Generic ACG OHGP Risks with downsized 4" OHGP completion - screen running and plugging. |
| E14 | Producer | 05/10 | Christman | Apr-10 | 4 | Platform | No | Geological mis-interpretation can have major impact on reservoir access.<br>Delivering quality cemented Production Casing String in high angle well to target @ top of P-Reservoir<br>Generic ACG OHGP Risks - screen running and plugging. |
| E15 | Producer | 09/10 | Christman | Oct-10 | 5 | Platform | No | Geological mis-interpretation can have major impact on reservoir access<br>Delivering quality cemented Production Casing String in high angle ERD well to target @ top of P-Reservoir<br>Generic ACG OHGP Risks - screen running and plugging. |
| A09Y | Producer | 03/10 | Christman | N/A | | Platform | No | ERD Sidetrack. Getting long 7 5/8" Liner (+/-2100m) to bottom. |
| A16WI | Injector | 05/10 | Christman | N/A | | Platform | No | N/A |
| PDA22 | Producer | 10/10 | Christman | Mar-10 | | Platform | No | First new well drilled in Chirag since 2007 (lessons learnt from top hole drilling from other platforms, esp. around zonal isolation of 16" liner) .<br>Generic ACG OHGP Risks - screen running and plugging. |
| D18 | Producer | 06/10 | Christman | Jun-10 | 6 | Platform | No | Stuck Pipe in 12-1/4" Hole section due to wellbore stability issues. Generic ACG OHGP Risks - screen running and plugging. |
| D16 | Producer | 09/10 | Christman | Nov-10 | 6 | Platform | No | Stuck Pipe in 12-1/4" Hole section due to wellbore stability issues. Generic ACG OHGP Risks - screen running and plugging. |
| C19 | Producer | 01/10 | Christman | Jul-10 | 6 | Platform | No | |
| C24 | Producer | 06/10 | Christman | Mar-10 | 5 | Platform | No | Loss Circulation in 16" and 12-1/4" hole section. Stuck Pipe & Casing in 12-1/4" Hole section. Zonal Isolation |
| **Egypt** | | | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Hodoa | Exploration | -- | Cocking | | | Semi | Yes | New rig start up after major upgrade in shipyard. HPHT well. 1st well drilled by BP using MPD from a floater. Narrow PPFG. Losses. Tool and w/l failures. Formation top uncertainty. Multiple strings with significant amount of under-reamin. Tight tolerances. |
| West Ahken 7 | Pulldown (NSC) | -- | Cocking | | | JU | No | High angle well and longest step out well with ENDbig bore casing design. Hole cleaning. Depleted reservoir drilling. Unknown reservoir pressure (range 5500-10500psi) with multi zones with potential high differewntial pressures - stuck pipe. Zonal isolation. |
| **GoM** | | | | | | | | |
| Thunderhorse MC 778#22 | Producer | 05/10 | O'Bryan | In Progress | 3 (w/o prod) | Drill Ship | No | Depleted sands (differential sticking, zonal isolation to prevent early water break-through) |
| Thunderhorse MC775#1 | Producer | 01/10 | O'Bryan | | Completed in 2009 | | | |
| Thunderhorse MC775#2 | Producer | 10/10 | O'Bryan | May-10 | 5 (w/o prod) | Drill Ship | No | Extremely narrow PPFG window at salt exit, depleted sands (differential sticking and zonal isolation to prevent early water break-through) |
| Thunderhorse MC 778 #2 | Producer | 07/10 | O'Bryan | | Completed in 2009 | | | |
| Thunderhorse MC822 #10 | Producer | 07/10 | O'Bryan | Jan-10 | NA | PDQ | | 4-1/2" liner, Completion risks |
| Thunderhorse MC 822#4 | Replace Tree | 08/10 | O'Bryan | Mar-10 | NA | PDQ | | Intervention risks |
| Thunderhorse MC 822#5 | Producer | 2011 | O'Bryan | Aug-10 | NA | PDQ | | 7" liner hanger repair risk, Completion risks |
| Nakika K-4 | Producer | 08/10 | O'Bryan | Dec-10 | 5 (w/o prod) | Drill Ship | No | Depleted sands |
| Atlantis DC 102 "F" | Producer | 02/10 | O'Bryan | Drilled in 2009 | 7 | Semi | No | Conventional core, depletion |
| Atlantis DC 131 "V" | Producer | 03/10 | O'Bryan | Drilled in 2009 | 7 | Semi | No | Longest step-out to date at Atlantis, zonal isolation in production intervals |
| Atlantis DC 133 "C" | Producer | 2011 | O'Bryan | In Progress | 7 | Semi | No | Highly depleted zones in reservoir section, zonal isolation in production intervals |
| Atlantis DC 132 "E" | Producer | 11/10 | O'Bryan | Mar-10 | 7 | Semi | No | Highly depleted zones in reservoir section, zonal isolation in production intervals |
| Atlantis DC 314 | Producer | 07/10 | O'Bryan | In Progress | 6 | Semi | Yes | Geologic uncertainty, new rig, subsalt |
| Atlantis DC 311 | Producer | 08/10 | O'Bryan | Jul-10 | 6 or 7 | Semi | Yes | Geologic uncertainty, new rig, subsalt |
| Atlantis DC 312 | Producer | 2011 | O'Bryan | Mar-10 | 6 or 7 | Semi | Yes | Geologic uncertainty, new rig, subsalt |
| Kodiak Appraisal | Appraisal | 02/10 | O'Bryan | Finished | NA | Semi | No | Finished Feb. 2010 |
| Kashida IFT | Well Test Only | 09/10 | O'Bryan | May-10 | 7 (incl prod) | Semi | No | Narrow PPFG window, salt uncertainties, production tieback, HP equipment delivery (serial #1) |
| Macondo | Exploration | | O'Bryan | In Progress | 7 | Semi | No | PPFG, Lost circulation, Pressured and Depleted sands in shallow interval |
| Tiber 2 | Appraisal | | O'Bryan | Nov-10 | 6 (w/o prod) | Semi* | No* | *Aug 2010 start date if use new drill ship* - PPFG, shallow hazards, salt uncertainty, high BHP, deep directional, formation evaluation |
| Gila | Exploration | | O'Bryan | Aug-10 | 7 (w/o prod) | Drill Ship | Yes | Shallow hazards, complex salt, salt exit, narrow PPFG window, poor image, high BHP, deep directional, formation evaluation |
| **MEP Oman** | | | | | | | | |
| KZN-9 | Appraisal | | O'Neill | May-10 | 3 | Land | No | WBS in tectonic stressed formations. Inability to achieve build angle and maintain horizontal trajectory. Low RoP in horizontal section. |
| **North Africa** | | | | | | | | |
| Sfen C | Exploration | | Little | Jun-10 | | Semi | Yes | 1st well by BP offshore Libya. 1st deepwater in this area of Sirt Basin. New rig start up with upgraded 3rd gen. semi-sub moored in 5700ft WD. Logistics with small rig and limited VDL. Formation top depth uncertainty. V.little offset data. Drill +/- 1000ft of anhydrite with losses and slow RoP. Lost circ/severe losses in vuggy/fractured/karstified carbonate reservoir. H2S risk. TD uncertainty. |
| 2nd Offshore Sirt Basin Well | Exploration | | Little | Nov-10 | | Semi | Yes | 2nd deepwater well testing different play.WD 6250ft and rig at operating envelope limit. Other drilling risks as above. |
| Caracal | Exploration | | Little | Aug-10 | | Land | Yes | New rig start up for both water well rig and exploration rig. HSSE standards and engagement. Land transportation.Relations with Noc particularly with well TD. Procurement process. Totalheavy losses in fractured/karstified carbonates - drill blind top hole section. Zonal isolation/cementing upper sections - National aquifer. Shallow target well test. |
| **North America Gas (NAG)** | | | | | | | | |
| Onshore Unconventional Gas | Producer | | Patteson | | | | | |
| **North Sea** | | | | | | | | |
| Cyrus | Producer | -- | Denholm | | | Semi | Yes | New rig start up (Byford Dolphin) |
| Harding PNE4 | Producer | | Denholm | | | Platform | No | ERD well. WBS, hole cleaning, directional control. |
| Harding IC6 | Producer | | Denholm | | | Platform | No | First use of MPD by BP in North Sea. New technology. HSE issues with new equipment, performance |
| Magnus PMEP3 | Producer | | Denholm | | | Platform | No | Compressed planning time |
| Corona Ridge ( North Uist) | Exploration | | Denholm | | | Semi | Yes | New rig start up (West Phoenix). Schedule slippage moving operation into winter months - WoS. |
| Devenick S2 | Producer | | Denholm | | | Semi | No | HPHT well, first in North Sea for 4 years and first for PBLJ in 9yrs - lack of crew and bp experience. High angle well - 800m horizontal. Losses. Narrow PPFG window. Slow RoP. |
| **Trinidad** | | | | | | | | |
| Savonette A-02B02 | Producer | 02/10 | Bartholomew | Mar-10 | 4/5 | JU | | Equipment availability, wellbore stability, hole cleaning, zonal isolation. Stuck pipe |
| Savonette A-04B01 | Producer | 02/10 | Bartholomew | May-10 | 5 | JU | | Subsurface uncertainty (seismic quality), wellbore stability, hole cleaning. Stuck pipe. |
| Savonette A04 (TQ40 CR) | Producer | -- | Bartholomew | | | | | |
| Serette TQ52 | Producer | 12/10 | Bartholomew | Nov-10 | 4 | JU | Yes | New rig start-up, wellbore stability, zonal isolation, hole cleaning. Possible stuck pipe. |
| Serette TQ55 | Producer | 02/11 | Bartholomew | Oct-10 | 3 | JU | Yes | New rig start-up, wellbore stability, zonal isolation |

BOLD - Original Critical Activity (2010) Well Set

# Key Risks To Delivery Across SPU's

| SPU | Key Drilling Risks To Delivery | | | | | | | | | Total Key Drilling Risks by SPU | Number of Wells Drilled | Key Drilling rRsks per Well |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Zonal Isolation/Cementing | Wellbore Stability/Narrow PPFG | Lost Circulation | Stuck Pipe | New Rig Start Ups | Reservoir/Geological Uncertainty | Depleted Sands | Hole Cleaning | ERD/High Angle Wells | | | |
| Alaska | | 1 | | | 1 | | | 1 | 1 | 4 | 1 | 4.0 |
| Angola | 6 | 3 | 7 | 4 | 2 | 1 | 1 | 5 | 2 | 31 | 7 | 4.4 |
| Azerbaijan | 5 | 3 | 2 | 5 | | 2 | 1 | | 3 | 21 | 9 | 2.3 |
| Egypt | 1 | | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | 2 | 4.5 |
| GoM | 5 | 5 | 1 | 2 | 4 | 5 | 8 | | 1 | 31 | 14 | 2.2 |
| MEP Oman | | 1 | | | | | | | 1 | 2 | 1 | 2.0 |
| North Africa | 3 | | 3 | | 3 | 2 | | | | 11 | 3 | 3.7 |
| NAG | | | | | | | | | | 0 | 0 | 0.0 |
| NoS | 1 | 2 | 2 | | 2 | | | 1 | 2 | 10 | 6 | 1.7 |
| Trinidad | 4 | 4 | | 4 | 2 | 1 | | 3 | | 18 | 4 | 4.5 |
| | | | | | | | | | | | | |
| | 45% | 35% | 31% | 29% | 27% | 22% | 20% | 20% | 20% | | | |

1) "Key Drilling Risks to Delivery" that have been identified and are common to SPU's
2) Are there leveraging opportunities for capital or manpower efficiency gains?
3) How is the best way to capture the efficiency gains?
4) Zonal isolation/cementing is identified as most common key risk across the critical well activity. Being addressed by 5 Cementing SRPs plus other Network activities
5) Experience has shown Wellbore Issues often preceed Cementing issues
6) Project already in place to address New Rig Start Ups.
7) Drilling Engineering and D&C Ops Networks in action on stuck pipe, lost circulation, depleted sands (currently GoM dominated problem)
8) What's currently being done in your SPU to address these identified themes?

# Critical Activity (2010) plus Other SPU High Profile Wells

## Key Completion Risks to Delivery

| | Well Type | Original Plan Prod. FY | Original Plan Date on Line | SPA | Completion Start Date | Tree | Completion Type Lower | Completion Type Upper | Key Completion Risk(s) to Delivery |
|---|---|---|---|---|---|---|---|---|---|
| Alaska | | | | | | | | | |
| Liberty Project | Producer | | - - | Robinson | 11/10 | Dry | C&P | 7" Gas Lift | Perf-pill damage, Integrity management, complex ERD installation |
| Angola | | 9 | | | | | | | |
| CrIA | Producer | 1 | 02/10 | Foreman | Feb-10 | SS | SAS | DHFC | AFIV Failure |
| PuPH | Producer | 1 | 04/10 | Foreman | Apr-10 | SS | OHGP | - - | NPT on Cr-IA well delaying start of this well |
| PuIF | Producer | 4 | 05/10 | Foreman | May-10 | SS | SAS | - - | NPT on Cr-IA and knock on effect |
| PuLJ | Producer | 2 | 08/10 | Foreman | Jun-10 | SS | SAS | - - | Sedco Express contract expiry 16th to 20th June (hard date) |
| PSVM PA-WD | Producer | - | 09/10 | Foreman | Aug-10 | SS | SAS | - - | FLCV (FS-2) Performance in Mud and rig delivery in July |
| PSVM PA -GA | Producer | - | 11/10 | Foreman | Oct-10 | SS | CHFP | - - | Frac Boat - Availability & Performance and rig delivery in July |
| PSVM PA - PC | Producer | - | 2011 | Foreman | Dec-10 | SS | OHGP | - - | Open hole condition for Screen deployment and OHGP and rig delivery in July |
| Azerbaijan | | 10 | | | | | | | |
| SDA06 | Producer | 1 | 11/10 | Christman | 10/10 | Dry | C&P | - - | Cement Integrity (Annulus Pressure Build-Up)<br>Underbalance Perforating (successfully trialed in 2009)<br>New Cameron wellhead / TH system (replace Plexus system) |
| E13 / E13Z | Producer | 2 | 02/10 | Christman | 02/10 | Dry | OHGP | DTS / Gas Lift | Cement Integrity (Zonal Isolation)<br>Sidetrack - 7-5/8" set across reservoir, downsized completion - Tortuosity<br>Generic ACG OHGP Risks - screen running and plugging. |
| E14 | Producer | 1 | 05/10 | Christman | 06/10 | Dry | OHGP | DTS / Gas Lift | Geological mis-interpretation can have major impact on reservoir access.<br>Generic ACG OHGP Risks - screen running and plugging. |
| E15 | Producer | 1 | 09/10 | Christman | 10/10 | Dry | OHGP | Gas Lift | Getting casing to bottom<br>Geological mis-interpretation can have major impact on reservoir access<br>ERD well - slim hole contingency not defined |
| A09Y | Producer | 1 | 03/10 | Christman | 09/10 | Dry | N/A | Jet Pump | |
| A16WI | Producer | 1 | 05/10 | Christman | 10/10 | Dry | N/A | 7" Tbg. | |
| PDA22 | Producer | 0 | 10/10 | Christman | 06/10 | Dry | OHGP | 7" Tbg. | First New Well drilled in Chirag since 2007 (incorporate learnings for top hole drilling from other platforms, specially around zonal isolation of 16" liner).<br>Generic ACG OHGP Risks - screen running and plugging. |
| D18 | Producer | 1 | 06/10 | Christman | 07/10 | Dry | OHGP | Gas Lift | Stuck Pipe in 12-1/4" Hole section.<br>Generic ACG OHGP Risks - screen running and plugging. |
| D16 | Producer | 0 | 09/10 | Christman | 11/10 | Dry | OHGP | Gas Lift | Stuck Pipe in 12-1/4" Hole section<br>Generic ACG OHGP Risks - screen running and plugging. |
| C19 | Producer | 2 | 01/10 | Christman | Finished | Dry | OHGP | DTS / Gas Lift | Lost DTS due to stinger not fully engaging. |
| C24 | Producer | 1 | 06/10 | Christman | 06/10 | Dry | OHGP | Gas Lift | Loss Circulation in 16" and 12-1/4" hole section, Stuck Pipe.<br>Generic ACG OHGP Risks - screen running and plugging. |
| Egypt | | | | | | | | | |
| Hodoa | Exploration | | - - | Cocking | N/A | N/A | N/A | N/A | |
| West Ahkon 7 | Exploration Well | - | - - | Cocking | 08/10 | Dry, NUI | OHGP | 5 1/2" | Depleted Reservoir drilling, longest step-out well with END big bore casing design, Zonal Isolation, unknown reservoir pressure (range 5500 - 10500psi), multi-zone with potential high differential pressures |
| GoM | | 50 | | | | | | | |
| Thunderhorse MC 778#22 | Producer | 5 | 05/10 | O'Bryan | Mar-10 | SS-V | HRWP or FP | 5-1/2" tbg | 9-7/8" casing to bottom (7-5/8" contingency) |
| Thunderhorse MC775#1 | Producer | 11 | 01/10 | O'Bryan | Finished (12/09) | SS-V | FP | DHFC | |
| Thunderhorse MC775#2 | Producer | 3 | 10/10 | O'Bryan | Sep-10 | SS-V | FP | 5-1/2" w/ DHFC | zonal isolation, DHFC issues, Subsurface uncertainty (need to carry 2 completion options) |
| Thunderhorse MC 778 #2 | Producer | 10 | 07/10 | O'Bryan | Finished (9/09) | SS-V | C&P | none | |
| Thunderhorse MC822 #10 | Producer | 7 | 07/10 | O'Bryan | Apr-10 | SS-V | C&P | 5-1/2" tbg | 4.5" liner. 1st Peach comp. Perforating (UB wireline perf with flowback, perf thru 2 strings, 9perf runs). Currently experiencing issues testing upper tubing. |
| Thunderhorse MC 822#4 | Replace Tree | 1 | 08/10 | O'Bryan | Apr-10 | SS-V | FP | none | |
| Thunderhorse MC 822#5 | Producer | - | 2011 | O'Bryan | Sep-10 | SS-V | C&P | 5-1/2" tbg | HWO start-up. (First use of HWO?) |
| Atlantis DC 102 "F" | Injector | 1 | 02/10 | O'Bryan | Finished (12/09) | SS-H | FP | none | |
| Atlantis DC 131 "V" | Producer | 5 | 03/10 | O'Bryan | Finished (1/1/10) | SS-H | FP | 5-1/2" w/ DHFC | |
| Atlantis DC 133 "C" | Producer | - | 2011 | O'Bryan | Jul-10 | SS-H | FP | 5-1/2" w/ DHFC | reservoir uncertainty, Up to 3500 psi depletion. 1st BJ radial flow valve? |
| Atlantis DC 132 "E" | Producer | - | 11/10 | O'Bryan | Sep-10 | SS-H | FP | 5-1/2" w/ DHFC | reservoir uncertainty, Up to 3500 psi depletion. Up to 40 degree completion. Equipment delivery. |
| Atlantis DC 314 | Producer | 4 | 07/10 | O'Bryan | Jun-10 | SS-H | FP | 5-1/2" w/ DHFC | 1st DD3 (new rig) completion. complexity, depleted sand issues |
| Atlantis DC 311 | Producer | 3 | 08/10 | O'Bryan | Jan-11 | SS-H | FP | 5-1/2" w/ DHFC | DD3, reservoir and completion complexity, depleted sand issues |
| Atlantis DC 312 | Producer | - | 2011 | O'Bryan | Aug-10 | SS-H | FP | 5-1/2" w/ DHFC | DD3, reservoir and completion complexity, depleted sand issues |
| Kodiak Appraisal | Appraisal | - | 02/10 | O'Bryan | No Completion | SS-Test | N/A | N/A | No completion; so no completion risks. |
| Kaskida IFT | Well Test Only | --- | 09/10 | O'Bryan | Feb-11 | Dry | FP | none | Serial #1 Equipment Qualification, Zonal Isolation |
| North Africa | | | | | | | | | |
| Onshore and Exploration Offshore | | | | Little | | | | | |
| North America Gas (NAG) | | | | | | | | | |
| Onshore Unconventional Gas | Producer | | | Patteson | | | Frac | | New operations in So. Texas - new Halliburton crews / water shortage for frac fluids<br>Supply chain management - BP is not a big player<br>Moving from vertical to horizontal wells, more frac's per well<br>Increased visibility to US Regulatory arena |
| North Sea | | | | | | | | | |
| Cyrus | Producer | - | - - | Denholm | 05/10 | SS | Predrilled Liner | - - | Reservoir uncertainty / isolation of water, 2 zones / 1st completion with new rig |
| Harding IS5 | Producer | - | - - | Denholm | 02/10 | Dry | SAS | - - | More shale than expected in reservoir. RDIF and Completion Fluids are critical. |
| Trinidad | | 49 | | | | | | | |
| Savonette A-02B02 | Producer | 28 | 02/10 | Bartholomew | Feb-10 | Dry | SZ OHGP | 7" w/PQG | Reservoir Uncertainty, Short Reservoir Section, Small GP Tools & Screens |
| Savonette A-05B01 | Producer | 20 | 02/10 | Bartholomew | Apr-10 | Dry | SZ OHGP | 7" w/PQG | Seismic Uncertainty, WBS may force liner and small GP Tools & Screens |
| Savonette A04 (TQ40 CR) | Producer | - | - - | Bartholomew | Aug-10 | Dry | SZ OHGP | 7" w/PQG | Seismic and Reservoir Uncertainty, WBS, 5 string program, small GP Tools & Screens |
| Serette TQ52 | Producer | - | 12/10 | Bartholomew | Nov-10 | Dry | SZ OHGP | 7" w/PQG | New Rig Intake, Sand Prodution due to shallow reservoirs |
| Serette TQ55 | Producer | - | 02/11 | Bartholomew | Jan-11 | Dry | SZ OHGP | 7" w/PQG | New Rig Intake, Sand Prodution due to shallow reservoirs |

BOLD - Original Critical Activity (2010) Well Set

# Key Risks To Delivery Across SPU's

| SPU | Key Completion Risks To Delivery | | | | | | | | | | | | Total by SPU | Number of Completions | Key Risks per Completion |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Reservoir Uncertainty | New Rig, Ist Time Activity, Lapse in Activity | Screen Deployment & Completion Fluids | Wellbore Issues: Casing to Bottom, Stuck Pipe, Lost Circulation and Wellbore Stability | Euipment Integrity, FLCV, DTS | Small Wellbore Completion | Zonal Isolation / Cement Integrity | Depleted Zones / High Delta P's | Timing - Schedule & Contracts | ERD / High Angle | Completion Complexity | Perforating | | | |
| Alaska | | | | | 1 | | | | | 1 | | 1 | 3 | | |
| Angola | | 3 | 1 | | 2 | | | | 4 | | | | 10 | 7 | 1.4 |
| Azerbaijan | 2 | 1 | 6 | 5 | 2 | 2 | 3 | | | 1 | | 1 | 23 | 9 | 2.6 |
| Egypt | 1 | | 1 | | | | 1 | 1 | | 1 | | | 5 | 1 | 5.0 |
| GoM | 5 | 5 | | 1 | 4 | 2 | 2 | 5 | 1 | 1 | 3 | 1 | 30 | 10 | 3.0 |
| NoS | 2 | 1 | 1 | | | | 1 | | | | | | 5 | 2 | 2.5 |
| Trinidad | 3 | 2 | | 3 | | 3 | | | | | | | 11 | 5 | 2.2 |
| | **13** | **12** | **9** | **9** | **9** | **7** | **7** | **6** | **5** | **4** | **3** | **3** | 87 | | |
| | **15%** | **14%** | **10%** | **10%** | **10%** | **8%** | **8%** | **7%** | **6%** | **5%** | **3%** | **3%** | | | |

1) What are the "Key Completion Risks to Delivery" that are common to SPU's
2) Are there leveraging opportunities for capital or manpower efficiency gains?
3) How is the best way to capture the efficiency gains?
4) Previous work has shown Wellbore Issues preceed Cementing issues in a number of cases, an area of concern?
5) How do these "Key Risks" square with "Rate and/or Reserve Impairment" theme from 2009 Reliability Study?
    a) Wellsite Execution
    b) Equipment Integrity
    c) Cementing
    d) Well Handover & Operations
    e) Reservoir Surprises

- What's currently being done to address these identified themes?