

**From:** Hand, Steve  
**Sent:** Friday, July 25, 2008 9:41 PM  
**To:** Pathak, Mandar; Braniff, Barry (Houston); McMahan, Larry  
**Subject:** FW: Marianas, Kodiak sidetrack

Oops - who told Steven that!!

*Steve Hand* ✉  
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**From:** Newman, Steven (Houston)  
**Sent:** 25 July 2008 15:30  
**To:** Hand, Steve  
**Subject:** RE: Marianas, Kodiak sidetrack

"...we would need to word our comments carefully..." - that's why we have really really bright people like you and Mandar to help us.

SN

**Steven L. Newman**  
President and Chief Operating Officer  
Transocean  
Note my new e-mail address: [steven.newman@deepwater.com](mailto:steven.newman@deepwater.com)

*"Operations conducted in an incident-free environment - all the time, everywhere."*

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**From:** Hand, Steve [<mailto:SHand@mail.deepwater.com>]  
**Sent:** Friday, July 25, 2008 3:26 PM  
**To:** Newman, Steven (Houston)  
**Subject:** RE: Marianas, Kodiak sidetrack

Steven,

Yes, we will see more of this as we drill deeper and more challenging wells, however this is not a new approach and I suspect we have drilled many wells where the "maximum anticipated surface pressure" has been calculated using similar formula to the calculation by BP. One thing we need to do before we try to control this, by including something in the manual, is to understand what controls/conditions our clients use to calculate this value. Mandar has done a lot of research on this (there are a few SPE papers around the subject) and there is no industry standard we can apply. To refuse to drill a well by not accepting the assumptions for the well design calculations will have serious consequences - not only could the BOP become under-rated, but also the casing design (in some cases the casing grade required for full evacuation does not exist). We would need to word our comments carefully, to avoid creating a serious conflict, while maintaining an acceptable standard.

Regards

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**From:** Newman, Steven (Houston)  
**Sent:** 25 July 2008 13:15  
**To:** Hand, Steve  
**Subject:** RE: Marianas, Kodiak sidetrack

Thanks for this.

I suspect we will see more of this going forward. I assume that your update to the W/C manual will give clear guidance on how to calculate MASP as well as operating procedures for drilling such a well.

Thanks.

SN

**Steven L. Newman**  
President and Chief Operating Officer  
Transocean  
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**From:** Hand, Steve [<mailto:SHand@mail.deepwater.com>]  
**Sent:** Friday, July 25, 2008 7:13 AM  
**To:** Newman, Steven (Houston)  
**Subject:** FW: Marianas, Kodiak sidetrack

Steven,

Copy of e-mail as discussed this morning

(MAR is 15k)

Regards

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**From:** Wascom, Steve  
**Sent:** 24 July 2008 11:38  
**To:** Hand, Steve  
**Subject:** RE: Marianas, Kodiak sidetrack

Hi Steve,

It looks like the Kodiak well for the Marianas is back on. We are currently working on a farm out to ENI but should be going back to BP around the middle of August.

I have been addressing the points that you brought up below and have put some more information below in bold.

Also, attached is the revised drill pipe plan. BP is looking at using a tapered string of 6 5/8" and 5 1/2". I've cut and pasted the correspondence from BP below.

"Same 5 1/2" on bottom, but above that, instead of 5 7/8" will be 9500' of 6 5/8" 34 ppf and the remainder 6

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5/8" 40 ppt. Spec sheets are attached, along with preliminary hydraulics modeling from MI & Sperry. We still have at least 200K overpull on all components of the string."

I believe that we will be all right with this well but just wanted to double check with you once again, just in case we are missing something. BP is trying to rush putting this well together so it is also possible that they are missing something. I do not have a final set program yet but we are getting closer.

Thanks

Steve

**Steve Wascom Jr.** ●●  
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**From:** Hand, Steve  
**Sent:** Wednesday, June 25, 2008 1:53 PM  
**To:** Wascom, Steve  
**Cc:** Pathak, Mandar; Cameron, Dave  
**Subject:** RE: Marianas, Kodiak sidetrack

Steve,

Based on a quick look at the documents you sent, we have listed our comments below. We could comment further when you get a copy of the drilling program if required.

The rig has drilled to 29,000 ft in past. This subject well is planned to be drilled to similar depth (29740 ft MD). Use of 5 1/2" drill pipes will provide better hydraulics.

The expected drilling parameters, GPM, SPP, Torque, hookload, based on the offset well appear to be within the operating envelope of the Marinas (SPP exception - require clarification on the swivel packing rating as commented in the equipment list) The hydraulic calculation indicates the SPP could be around +/- 5300psi. For now we have presumed the pressure drop in Geo pilot equipment in drill string @ 600 psi. This needs to be confirmed from Directional contractor. Hydraulics calculation is attached for reference. **Swivel packing rating has been confirmed at 5,500 psi. We are still waiting on information concerning the pressure drop in the Geo pilot equipment.**

Mud management could pose a challenge. This could be better understood once the drilling program is reviewed.

H2S suppression / treatment through mud system needs to be understood. Will you need a cascade system to cover the potential risk of H2S? **Total Safety has visited the rig and is working up the plan for the H2S risk.**

Based on the information provided the Presmod and Osprey simulations did not highlight any significant issues.

The bottom hole pressure based on the mud weight =  $28388 \times 14.8 \times 0.052 = 21847$  psi. The maximum anticipated surface pressure(MASP) at Mudline based on the worst case scenario works out to =  $21847 - 0.1 \times (28388 - 5106) = 19519$  psi. This exceeds the BOP pressure rating. It will be helpful to find out clients MASP calculation assumptions.

**Client MASP Assumptions:**

**On the MASP:** for purposes of BOP test pressures, we'll only be testing rams to 9500 psi max (might even reduce it to 9300 psi). Even when we calculate a MASP that's higher, we have been running with

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the philosophy that (a) something else will break down before we ever reach that pressure, and (b) we don't want to put unnecessary wear and tear on the stack components.

The main difference in our MASP calculations is the gas gradient assumption & the mix of gas/mud.

$MASP_{MMS} = \text{lesser of } MASP_{pore} \text{ or } MASP_{frac}$   
 $MASP_{pore} = PP(OH) - (Equiv. Fluid Density)(TVD OH)$   
 $MASP_{pore} = (14.8)(.052)(28300) - (.5)(28300)(14.8)(.052) - (.5)(.15)(28300)$   
 $MASP_{pore} = 8767 \text{ psi}$   
 $MASP_{frac} = FP(11-7/8") - (gas gradient)(TVD 11-7/8")$   
 $MASP_{frac} = (15.7)(.052)(24500) - (.15)(24500)$   
 $MASP_{frac} = 16327 \text{ psi}$   
 $MASP_{min} = \text{Minimum of } (MASP_{pore}) \text{ or of } (MASP_{frac}) = 8767 \text{ psi}$

We also had a quick look in GRS at the well as drilled by the DWH, there are a couple of issues to note, these may require some discussion with the DWH, to understand fully.

a) 2-3 days were spent trying to get the BOP off the wellhead, it looks from the reports in GRS that this may have been a hydrate issue? The DWH confirms that this was a hydrate issue

b) Wireline MDT was run at 28178ft and got stuck, resulting in having to strip over the wireline to fish. Subsequent runs at TD were run on drillpipe. I am checking with BP on this.

Hope this helps, please let us know if you need anything else. As stated previously we would be happy to review the drilling program when you have a copy.

Regards

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**From:** Wascom, Steve  
**Sent:** 24 June 2008 15:12  
**To:** Hand, Steve  
**Subject:** Marianas, Kodiak sidetrack

Steve,

The Marianas is looking at re-entering the Kodiak well that was drilled by the Horizon and doing a sidetrack and core for our next well. Our concern is that we will be close to our maximum drill depth of 30,000 ft. The side track will use a tapered string of 5 1/2" DP and 5 7/8" DP with a 10 5/8" open hole section to roughly 29,900 ft. The basic plan is as follows:

- Re-enter well - drill plugs, displace mud
- Open hole sidetrack at 25,000'+
  - Planned with GeoPilot at 1 degree DLS (if possible)
  - 10 5/8" hole
  - Limiting drop & going for more of a turn to minimize logging difficulties (directional plan attached)
  - Drillstring design (attached) - preferred option if do-able. Estimated block weight (145K) for now.
  - Parameters from original well at ~30,000': 600 to 650 gpm, 5150 SPP, 110 RPM, 36 - 42K ft-lbs torque, hookload up/down rotating: 1,005,000/830,000/895,000 lbs

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- Three core intervals - all extended coring (making connections on bottom)
- TD close to 30,000' (28,300' TVD, 29,740' MD)
- Mud weight - max expected: +/-14.7 ppg
- H2S risk - saw up to 14 ppm in samples from original well (in situ concentration may be higher because mud contamination may have scrubbed some H2S out)
- Extensive logging, including two planned TLC runs for MDT fluids
- Temporarily abandon well

I have attached the well diagram, string design and sidetrack plot. I believe that we should be able to do this work but wanted to double check in case there is an issue. The rig has drilled to 29,000 ft before but the tapered string was using 4 1/2" DP and the open hole was not as large as this one will be.

Thanks for your help Steve.

Regards,

Steve

**Steve Wascom Jr. ●●**

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