From: Baker, Kate H
Sent: Mon May 17 00:09:37 2010
To: Mason, Mike C; Cecil, Chris
Subject: FW: Quetsions for National Labs
Importance: Normal
Attachments: Questions for National Labs.doc

Here's what went to the labs, with (eventually, when I was able to electronically capture a virtual copy) the referenced compsite log. FYI, John Turnbull has put that log on the sharepoint.

From: Tooms, Paul J
Sent: Sunday, May 16, 2010 7:26 AM
To: tohunte@sandia.gov; Tatro, Marjorie (Sandia National Laboratories)
Cc: 'Marcia K McNutt'; Dupree, James H; Brookes, David; Looney, Bernard; Baker, Kate H
Subject: Quetsions for National Labs

Tom, Marjorie

Please find attached the written questions that we are requesting the labs assist us with.
Please call me or Kate Baker if you have any questions or require clarification on the above.

With regards

Paul

Paul Tooms
VP Engineering
Mobile phone number: [redacted]

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Questions for which National Labs' Assistance Would be Beneficial

1. Question: **What is the maximum predicted shut-in pressure at the mudline?** Requested by Mike Mason at noon meeting 14 May.

This question is already under consideration by several groups, and discussions have been most helpful. Separate calculations from 3 other groups in the National Labs are expected Sunday. This is the number one priority.

2. Question: i) **Calculate the mass flow rate through the system for the 4 geometries** based on the pressures (in the pressure folder) and the reservoir properties and other information provided through Chris Cecil, in the file named Subsurface_situation_Macondo(3).ppt in the Wellbore folder. We believe the first two are the flow geometries to focus on. ii) Given a constant flow rate of 5000 stock tank barrels (STB) of oil per day, an initial reservoir pressure of 11,850 psi (see below) and the reservoir properties provided, for the "hanger failure annular flow drill-pipe only" case, how does the pressure vary along the flow profile (up the outer annulus, down the inner annulus and out the drill pipe?
This question or set of questions was originally conceived by those participating in the 1800 meeting 12 May.

Additional information you may need: The reservoir pressure of 11,850 psi is the original static reservoir pressure at 17, 991 feet true vertical depth subsea (TVDSS), or 12,999 feet below mudline, given a water depth on location of 4992 feet. Owing to well inclination, the measured depth of the well at 17,991 feet TVDSS is 13,047 feet measured depth below the seabed. Ambient pressure at the mudline is 2270 psi.

This work is already in progress but the questions are restated here to ensure clarity of purpose.

3. Question: **What is the likely pressure external to the 16" casing under static conditions?**
This is a new request made by Paul Tooms and Kate Baker on 15 May

Additional information you may need: Annotated 1":100' MD combo log.

4. **We would value an independent review of the dynamic kill pumping schedule**. Top kill of the well, if successful, would shut off the well flow more quickly than other options available, but we should only undertake such an operation if we are confident that there exists a window of achievable pump rates and pressures high enough to kill the well but low enough to avoid further damage to the well construction. We envision such a review might include 5 or 6 scientists/engineers from the National Labs holding a range of relevant domain expertise. To allow time to use the outcomes of such a review to inform the forward plan and yet move forward expeditiously to halt the flow of hydrocarbons, we hope such a review might take place on Monday, 17 May. We believe

BP staff and contractors can be ready to present by then if you can assemble the right expert team on such notice.

We will endeavour to provide you with the details of the well kill schedule today so that review team members have a chance to understand the problem before they arrive.

Please call me or Kate Baker if you have any questions or require clarification on the above.

With regards

Paul