From: Leary, Michael J
Sent: Fri Apr 30 04:44:18 2010
To: O'Brien, Patrick L
Subject: FW: BP Macondo Well Control Modeling 043010.ppt
Importance: Normal
Attachments: BP Macondo Well Control Modeling 043010.ppt
Attachment: BP Macondo Well Control Modeling 043010.ppt

Pat:

I would like to visit with you about this in the morning. The MMS is asking the question on worst case (Napolitano apparently has asked the question). The POE has 162,000 BOPD.

Suttles wanted me to visit with you to get your view on potential.

Call me on my mobile.

Mick

From: Mic, Kurt
Sent: Thursday, April 29, 2010 2:59 PM
To: Leary, Michael J
Subject: BP Macondo Well Control Modeling 043010.ppt
Case 6 - Sandhills Cut
3" 6-1/2" Casing Flowpath 3-1/2" Casing

Assumptions:
Oil production: Initial casing was drilled out during the well operating process.
Production increased through casing 6-1/2" Screen

Oil Rate:
1,000 bbl/day
Case 4 - Splitter Exit
2-1/2" 2-3/8" Casing: Fracture Drilling/Drilled out 7" Casing

Assumptions:
- Collapse was not during the fracturing process but happens after the fracture
- 1-7/8" drill pipe and 9" liner in 7" Casing acts as a whole in the flow
- 1-7/8" 9-5/8" and pipe sliding test

Oil Rate
77,000 bpd
## Well Control Simulation Results
### Surface Exit Up The Riser

<table>
<thead>
<tr>
<th>Case</th>
<th>CH Rate</th>
<th>Gas Flow</th>
<th>SOE</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>185,300</td>
<td>191</td>
<td>172,910</td>
<td>No Oilpipe</td>
</tr>
<tr>
<td>2</td>
<td>110,000</td>
<td>110</td>
<td>107,693</td>
<td>Oil @ Surface</td>
</tr>
<tr>
<td>3</td>
<td>50,000</td>
<td>111</td>
<td>114,230</td>
<td>Oil @ Dropped</td>
</tr>
</tbody>
</table>

**Flow Inhibited 7" x 9.75" casing joint**

| 4    | 54,000  | 91       | 8221/4" | 21" Exposed |

---

HIGHLY CONFIDENTIAL

BP-HZN-2179MDL05688710

TREX-160004.012
<table>
<thead>
<tr>
<th>Well Control Simulation Results</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Seafloor Exit @ 4,992 ft Water Depth</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Oil Rate</td>
<td>Gas Rate</td>
<td>DOI</td>
<td>Comments</td>
<td></td>
</tr>
<tr>
<td>Flow up the 7&quot; x 3/8&quot; casing string</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>145,000</td>
<td>147</td>
<td>172,160</td>
<td>No Deluge</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>71,200</td>
<td>33</td>
<td>90,491</td>
<td>Off @ Dropped</td>
<td></td>
</tr>
<tr>
<td>Flow behind 7&quot; x 5/8&quot; casing string</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>140,300</td>
<td>72</td>
<td>188,587</td>
<td>22&quot; Exposed</td>
<td></td>
</tr>
<tr>
<td>Date</td>
<td>Oil Rate</td>
<td>Gas Rate</td>
<td>SOE</td>
<td>Comments</td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>----------</td>
<td>----------</td>
<td>-----</td>
<td>----------</td>
<td></td>
</tr>
<tr>
<td>6-1/2&quot; Open Hole @ 9,800' BHS</td>
<td>257,000</td>
<td>661</td>
<td>100,000</td>
<td>Nr Dr/Bipac</td>
<td></td>
</tr>
<tr>
<td>RHZ</td>
<td>112,000</td>
<td>180</td>
<td>90,000</td>
<td>Dr @ Surface</td>
<td></td>
</tr>
</tbody>
</table>
### Dynamic Kill Simulation Results

Seafloor Exit @ 1,002 ft Water Depth

<table>
<thead>
<tr>
<th>Standpipe</th>
<th>Flow Rate (bbl/min)</th>
<th>Mud Weight (lb/gal)</th>
<th>Kill Rate (bpm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow-up the 7&quot; x 5-7/8&quot; Casing String N.O.</td>
<td>140,000 bbl</td>
<td>14 gal</td>
<td>25 bpm</td>
</tr>
<tr>
<td></td>
<td>147 no-slip</td>
<td>18 gal</td>
<td>25 bpm</td>
</tr>
<tr>
<td></td>
<td>15 gal</td>
<td>20 bpm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>20 gal</td>
<td>18 bpm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>20 gal</td>
<td>12 bpm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>20 gal</td>
<td>18 bpm</td>
<td></td>
</tr>
<tr>
<td>Flow-back the 7&quot; x 5-7/8&quot; Casing String N.O.</td>
<td>77,000 bbl</td>
<td>70 no-slip</td>
<td>15 2/3 bpm</td>
</tr>
<tr>
<td></td>
<td>70 no-slip</td>
<td>15 2/3 bpm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>70 no-slip</td>
<td>15 2/3 bpm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>70 no-slip</td>
<td>15 2/3 bpm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>70 no-slip</td>
<td>15 2/3 bpm</td>
<td></td>
</tr>
</tbody>
</table>
Document 2
From: Leary, Michael J
Sent: Fri Apr 30 15:48:21 2010
To: O'Bryan, Patrick L; Sutlies, Doug J; Price, Bruce
Subject: URGENT REVIEW REQUESTED BY 1200 Hours - BP Macondo Well Control Modeling 043010.ppt
Importance: Normal
Attachments: BP Macondo Well Control Modeling 043010.ZIP
Attachments: BP Macondo Well Control Modeling 043010.ZIP

Draft of worst case flow model slide for review and comment prior to sending to the MMS
Suttles, Doug J

From: Leary, Michael J
Sent: Friday, April 30, 2010 11:24 PM
To: Blankenship, Cynthia L
Cc: Suttles, Doug J; O'Bryan, Patrick L; Price, Bruce
Subject: Possible Discharge Rates
Attachments: BP Macondo Modeling 043010Rev2.ppt (Compressed)

As per your request, attached is a slide that was put together today to answer a question that the Secretary of the Interior asked. I discussed this with Lars Herbst today.

This was networked with Pat O'Bryan and others in Houston.

I understand that the President wants to be briefed on this. I would suggest that whomever does this briefing needs to be knowledgeable about the issues around these estimates.

I would suggest that Doug Suttles also needs to endorse this prior to sending it up. Doug and I visited about an earlier version of this last night.

Mick

BP Macondo Modeling 043010Rev2.
Worst case theoretical flow assumes:
- Split 5-1/2" drill pipe at subsea BOP and flow out 6-5/8" drill pipe
- Maximum theoretical flow rate is 60,000 BOPD

Items that reduce worst case theoretical flow:
- Crushed and bent riser and drill pipe
- Cement sheath in open hole by casing annulus
- Casing hanger and pack-off restriction
- Sand production (unconsolidated formation)
- Shale collapse
- Water production
- BOP functions activated
- Expected range of possible flow rates is 5,000 to 40,000 BOPD

NOTE: Removal of all restrictions (riser, BOP, and drill pipe) adds ~10,000 BOPD to rates above
From: Leary, Michael J
Sent: Wed May 05 19:28:37 2010
To: Rainey, David I
Subject: Information You Requested
Importance: Normal
Attachments: BP Macondo Modelling 043010Rev2.ZIP

<<...>>

Michael J. "Mick" Leary  
Functional Performance Manager  
BP America Production Inc.  
CDO/Drilling and Completions  
Office - 281-366-2371  
e-mail - michael.leary@bp.com
Seafloor Exit
7" x 9-7/8" Casing Annulus Flow Path

Worst case theoretical flow assumes:
- Split 5-1/2" drill pipe at subsea BOP and flow out 6-5/8" drill pipe
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- Shale collapse
- Water production
- BOP functions activated
- Expected range of possible flow rates is 5,000 to 40,000 BOPD

NOTE: Removal of all restrictions (riser, BOP, and drill pipe) adds ~10,000 BOPD to rates above
Other Assumptions

- 18360 Sand
- Black Oil
- Linear PI
- 13066 – 13090
- 10255 psi
- 260 deg F
- PI – 50 bopd / psi
- GOR – 3000 scf/stb
- 10% water cut
- 35 API gravity crude
Document 5
From: Leary, Michael J <Michael.Leary@bp.com>
Sent: Friday, June 11, 2010 2:07 PM (GMT)
To: Rainey, David I <david.rainey@bp.com>
Subject: FW: David: question re summary of video requests and deliveries
Attach: RE_New Plume Video.msg; RE_New Plume Video - Clarification.msg; FW_New Plume Video.msg; FW_Video for NOOA.msg

Shouldn't the FRTG be able to answer this question and ask us to see if we agree with it. Unless you have a good e-mail trail, this may be difficult to do. Derek Anthony probably has the actual submission e-mails, although I don't think he is here on site.

I have attached the key e-mails I have in my records. All of my e-mail trails are from Monday 24 May. I don't know when the earlier request came. Obviously it was earlier than this due to the time required to get the ROV folks to put the data on DVD or hard drive. Once we received the data off the vessels, we got them the key information they needed on the same day on this request list.

Mick

From: Mark K Sogge [mailto:mark_sogge@usgs.gov]
Sent: Friday, June 11, 2010 8:42 AM
To: Rainey, David I
Cc: Leary, Michael I; Martha N Garcia
Subject: David: question re summary of video requests and deliveries
Importance: High

Hi David,

We are getting requests from the Coast Guard and the Department of Interior to develop a timetable of when the Flow Rate Technical Group requested plume video data and when we received the various videos. Most of this occurred before I began my assignment, so I only have this information for the most recent video from after the riser was cut and before the Top Hat was applied.

Martha Garcia (the USGS liaison to the NIC) and I are working to gather information for the period before the June 3 videos. Do you have any log of when the data requests came to you, or emails from which we could compile the information? If this query is best directed to someone else, could you point us in the right direction?

Any help or insights you have are much appreciated.

Mark

Mark Sogge
Chief of Staff, USGS Western Region
2265 Camina Drive, Flagstaff, AZ 86001
Cell: 928-566-1260, FAX: 928-566-7266
mark_sogge@usgs.gov

WHBP00011177
From: Openshaw, Graham (TecPM) <graham.openshaw@tecpm.com>
Sent: Monday, May 24, 2010 3:53 PM (GMT)
To: Leary, Michael J <Michael.Leary@bp.com>
Cc: Sullivan, Paul <paul.sullivan@uk.bp.com>
Subject: RE: New Plume Video

Thanks Mick,
There has been a lot of confusing noise on this one.

Note: There were two drives, one addressed to me directly. This is a much larger drive that should not be uploaded. The one addressed to the USCG should correspond to the video log and is the one to upload.

New videos will arrive from the Skandi, Ot# and Enterprise around lunch time. These need to be uploaded to a separate folder labeled as today's data.

Please call me if there are any problems.

Graham

T: (603) 373-8228
M: (832) 244 2163

From: Leary, Michael J [mailto:Michael.Leary@bp.com]
Sent: Monday, May 24, 2010 10:28 AM
To: Openshaw, Graham (TecPM)
Subject: RE: New Plume Video

Graham:

Will get it uploaded as soon as we get the ftp site address.

Mick

Michael J. "Mick" Leary
Deepwater Horizon Response
Unified Area Command - Technical Specialist
Cell - 281-782-8994
e-mail - michael.leary@bp.com

From: Graham Openshaw [mailto:graham.openshaw@tecpm.com]
Sent: Monday, May 24, 2010 10:25 AM
To: Sullivan, Paul; Leary, Michael J
Cc: Murdoch, Alastair; Bronnan, William H(HOU)
Subject: RE: New Plume Video

Attached is the video log with upload priority if the log references separate files.

WHBP00011178
From: Sullivan, Paul [mailto:paul.sullivan@uk.bp.com]
Sent: Monday, May 24, 2010 8:50 AM
To: Easley, Max
Cc: Openshaw, Graham ( TecPM); Murdoch, Alistair; Broman, William H (HOU)
Subject: FW: New Plume Video

Mick,

Steve Haden asked me to follow up on a package of video that is coming in from the Skandi this morning. I believe the chopper is in the air at the moment. Once the package gets to Houma I have asked logistics to get it sent over to Roberts.

If you have IT support in Roberts this data needs to get uploaded to a government site -- The contact person for details of the upload is Lance Devey 1-2052761761

Please can you help direct once the package gets to Roberts and advise when the upload has been completed.

Thanks.

Paul

From: Haden, Steven K
Sent: Monday, May 24, 2010 8:34 AM
To: Easley, Max
Cc: Openshaw, Graham ( TecPM); Sullivan, Paul
Subject: FW: New Plume Video

Max,

I may push these guys your way if there starts to be lots of requests. Just trying to help with the immediate one for now. Sounds like they are upping their team - Dr. McNutt is head of the USGS I believe and is now leading this group - so may be more questions. In the mean time, Graham, Paul and I are trying to get the material to their satisfaction.

Steve

From: Moore, David M. [mailto:David.Moore@mms.gov]
Sent: 24 May 2010 08:32
To: McNutt, Marcia
Cc: Bill.Lehr@mms.gov; White, Michael CAPT; Grave, William; Scott.B.Beeson@uscg.mil; Moore, David M.; Haden, Steven K
Subject: New Plume Video

Dr. McNutt,

I was just contacted by BP regarding additional video footage that was requested. BP staff will bring it to the UC, upload it, and then notify you that it is available for viewing.

The primary contact for offshore video is Mr. Steve Haden 011-44-7917-554495.

Thank You.
From: Openshaw, Graham (TecPM) <graham.openshaw@tecpm.com>
Sent: Monday, May 24, 2010 3:43 PM (GMT)
To: Openshaw, Graham (TecPM) <graham.openshaw@tecpm.com>; Sullivan, Paul <paul.sullivan@uk.bp.com>; Leary, Michael J <Michael.Leary@bp.com>
Cc: Murdoch, Alistair <Alistair.Murdoch@bp.com>; Broman, William H(HOU) <william.broman@bp.com>; Anthony, Derek (SULLEXIS LLC) <Derek.Anthony@bp.com>
Subject: RE: New Plume Video - Clarification

The excel spreadsheet sent recently is associated with the video file(s) sent to Roberts early this morning from the Skandi Neptune and, hopefully, now with Derek Anthony.

There is now another set of videos of recent activity from the Skandi, the OIS and the Enterprise that has an approx ETA of 13:00hrs. We will ship these to Derek Anthony at Roberts.

Please let me know if you need additional information.

Graham

T: (603) 373-8228
M: (832) 244-2153

From: Graham Openshaw [mailto:graham.openshaw@tecpm.com]
Sent: Monday, May 24, 2010 10:25 AM
To: Sullivan, Paul; Leary, Michael J
Cc: Murdoch, Alistair; Broman, William H(HOU)
Subject: RE: New Plume Video

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From: Sullivan, Paul [mailto:paul.sullivan@uk.bp.com]
Sent: Monday, May 24, 2010 8:50 AM
To: Leary, Michael J
Cc: Openshaw, Graham (TecPM); Murdoch, Alistair; Broman, William H(HOU)
Subject: FW: New Plume Video

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If you have IT support in Roberts this data needs to get uploaded to a government site – The contact person for details of the upload is Lance Davey 1-2022761761

Please can you help direct once the package gets to Roberts and advise when the upload has been completed.

WHBP00011179
Thanks,

Paul

From: Haden, Steven K
Sent: Monday, May 24, 2010 8:48 AM
To: Easley, Max
Cc: Openshaw, Graham [To:PM]; Sullivan, Paul
Subject: FW: New Plume Video

Max,

I may push these guys your way if there starts to be lots of requests. Just trying to help with the immediate one for now. Sounds like they are upping their team - Dr. McNutt is head of the USGS I believe and is now leading this group - so may be more questions. In the mean time, Graham, Paul and I are trying to get the material to their satisfaction.

Steve

From: Moore, David M. [mailto:David.Moore@mms.gov]
Sent: 24 May 2010 08:32
To: McNutt, Marcia
Cc: Bill.Lehr@noaa.gov; White, Michael CAPT; Grawe, William; Scott.L.Blueson@uscg.mil; Moore, David M.; Haden, Steven K
Subject: New Plume Video

Dr. McNutt,

I was just contacted by BP regarding additional video footage that was requested. BP staff will bring it to the UC, upload it, and then notify you that it is available for viewing.

The primary contact for offshore video is Mr. Steve Haden 011-44-7917-554696.

Thank You,

David M. Moore
Information on the video coming off of the Skandi: Looks to be the video we talked about this morning in the telecon.

Let me know what I can do to assist.

From: Sullivan, Paul
Sent: Monday, May 24, 2010 8:50 AM
To: Leary, Michael J
Cc: Openshaw, Graham (TecPM); Murdoch, Alistair; Broman, William H(HOU)
Subject: FW: New Plume Video

Mick,

Steve Haden asked me to follow up on a package of video that is coming in from the Skandi this morning. I believe the chopper is in the air at the moment. Once the package gets to Honolulu I have asked logistics to get it sent over to Roberts.

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Cc: Openshaw, Graham (TecPM); Sullivan, Paul
Subject: FW: New Plume Video

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The primary contact for offshore video is Mr. Steve Haden 011-44-7917-554495.

Thank You,

David M. Moore
FYI. Sounds like they have information they need to at least get started on.

Mick

From: Anthony, Derek (SULLEXIS LLC)
Sent: Monday, May 24, 2010 5:31 PM
To: Leary, Michael J
Subject: FW: Video for NOOA
Importance: High

FYI

Derek Anthony
Mobile: +1 225 623 7213 (provisional)
Office: +1 281 366 7046
DC: 148*39672*166
E-mail disclaimer: The information in this e-mail is confidential and may be legally privileged. It is intended solely for the addressee(s) only. Access to this e-mail by anyone else is unauthorized. If you are not the intended recipient, any disclosure, copying, distribution or action taken or omitted to be taken in reliance on it, is prohibited and may be unlawful. Within the Bounds of law, electronic transmission through internal and external networks may be monitored to ensure compliance with internal policies and legitimate business purposes.

From: Graham Openshaw [mailto:graham.openshaw@beach.com]
Sent: Monday, May 24, 2010 4:53 PM
To: Peirs, Jasper
Cc: Anthony, Derek (SULLEXIS LLC); Baker, Kate H (UNKNOWN BUSINESS PARTNER); Dupree, James H; Hyde-Barber Catherine
Subject: Video for NOOA
Importance: High

Jasper,

Derek and I have had a very good online editing session that has resulted in a succinct set of files of good quality as described below. I recommend that we speed things up by allowing Jasper to make two copies of the files, sending one to your contact and one to you or Cathie Hyde-Barber who is replacing me. This should be done this evening. Text to on pass as follows:

We have provided two sets of video files. The first are 30min segments from the 36hr window that occurred between trenching out the riser end and the insertion of the RIIT. This was also without dispersant. These files are as follows:

May 12 2010 1004 H14 Riser End Plume 157deg.mpg
May 14 2010 2024 H14 Riser End Plume 91deg.mpg
May 15 2010 1950 H14 Riser End Plume 322deg.mpg

More recent, and better quality, video was obtained last night that includes both the RIIT production and dispersant.

Filenames for this are:

WHBP00011181
May 24 2010 0247 H6 Riser End Plume 87deg.mgp
May 24 2010 0254 H14 Riser End Plume 1deg.mgp (this video has a bad first 4mins)
May 24 2010 0825 Riser Kink Plume 89deg.mgp (this may arrive as a separate DVD if a converter is not located)

These are also 30min segments.

Regards

Graham Openshaw

Tel: 1 (603) 373 8228
Mob: 1 (832) 244 2163

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