



From: Hill, Trevor  
Sent: Wed May 12 16:58:12 2010  
To: Lockett, Tim  
Subject: RE: Status of flow modelling  
Importance: Normal

Tim  
Thanks... Let's talk tomorrow. Pressure upstream of kink is 2700psia...

Sent from my HTC

-----Original Message-----

From: Lockett, Tim <Tim.Lockett@uk.bp.com>  
Sent: 12 May 2010 11:41 AM  
To: Hill, Trevor <trevor.hill@uk.bp.com>  
Cc: Stilwell, Ian <Ian.Stilwell@uk.bp.com>  
Subject: Status of flow modelling

Hi Trevor

When we spoke yesterday we kicked off the following 3 pieces of work:

1) Ian to run cases to define how much the flowrate changes by if the kink is currently restricting the flow and this is removed.

Cases were run for well PI values of 1 - 10 bbl/d/psi and for each case the kink was adjusted such that the pressure at the BOP (upstream of the kink) was close to 4000 psia. Then a large diameter leak (19.5 inch) was opened up to see how much extra flow you get.

Results are in the attached and summarised as follows:

WELL PI STB/psi/d	1	2	5	10
INITIAL FLOWRATE STB/d	4844.15	9469.96	18829.30	27018.00
FINAL FLOWRATE STB/d	7126.77	13151.30	25323.80	29173.10
DIFFERENCE STB/d	2282.62	3681.34	6494.50	2155.10
INCREASE IN FLOWRATE %	47.12%	38.87%	34.49%	7.98%

The results can be interpreted by considering that there are 3 restrictions in the system and we are removing one of them. The three are the well PI, the casing/tubing which largely restricts around the length of 3 inch drill string we have, and then the kink which is the restriction we will remove.

At low well PI we see a big relative increase (47%) but in a number which is fairly small to start with. At high well PI we are restricted on the 3 inch tubing so taking away the kink has only a small relative increase in flow (8%) but on a large number to start with. Worst in terms of absolute increase in flow lies in the middle ground where we can get a 35% increase in flow and this is an extra 6500 bbl/d.

I note that some results which appear to be for the same situation are contained in the file on the EPTi site:

[https://epti.bpglobal.com/sites/GoM\\_Response\\_Eng/default.aspx](https://epti.bpglobal.com/sites/GoM_Response_Eng/default.aspx)  
Then "data collection" arca and file "Holistic System Modelling Rcv9 9 May10.doc"  
Table 1 (page 3). This shows a flowrate increase in the range +16% to +30% for a "measured pressure at location" of 4000 psi.

To the extent that we may not be answering the same problem and are using different tools, I agree with this ball-park range.

2) CFD of the plume thermal aspects. This is with Samir.

3) Model to be set up which can examine the hot-tap options and assess any impact from leaving the old riser as a dead-leg.

I have just about got a model together which does this but I have had some teething problems so it may not yet be fully ready to be passed on. Attached is a model description...

<<Operating with the hot tap.doc>>

and the raw OLGA model as it currently stands in case others need to work on it.

<<Horizon-2phase-2May10.tab>> <<Hot-Tap-complete-system-with2holes-startcollection.rsw>>

<<Hot-Tap-complete-system-with2holes-startcollection2.opi>>

Best regards

Tim

Tim Lockett

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