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**From:** David Barnett  
**Sent:** Thursday, April 29, 2010 3:29 PM  
**To:** 'Jace.Larrison@bp.com'  
**Subject:** FW: 042910 - Dept. of Interior Well Control Modeling Presentation  
**Attachments:** BP Macondo Well Control Modeling 042910.ppt

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**From:** William Burch  
**Sent:** Wednesday, April 28, 2010 8:49 PM  
**To:** Mix, Kurt  
**Cc:** David Barnett; David W Moody; Kerry L. Girlinghouse; Mike Cargol; Christopher J. Murphy; Dicky J. Robichaux; Shawn Mossman  
**Subject:** 042910 - Dept. of Interior Well Control Modeling Presentation

Kurt,

See attached.

Bill

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**MC 252 #1 – Macondo Prospect  
OCS-G-32306**

**Well Control Simulation Results**

April 29, 2010

# Case 1 – Surface Exit Up The Riser 7" x 9-7/8" Casing Flowpath; No Drillstring

## Assumptions:

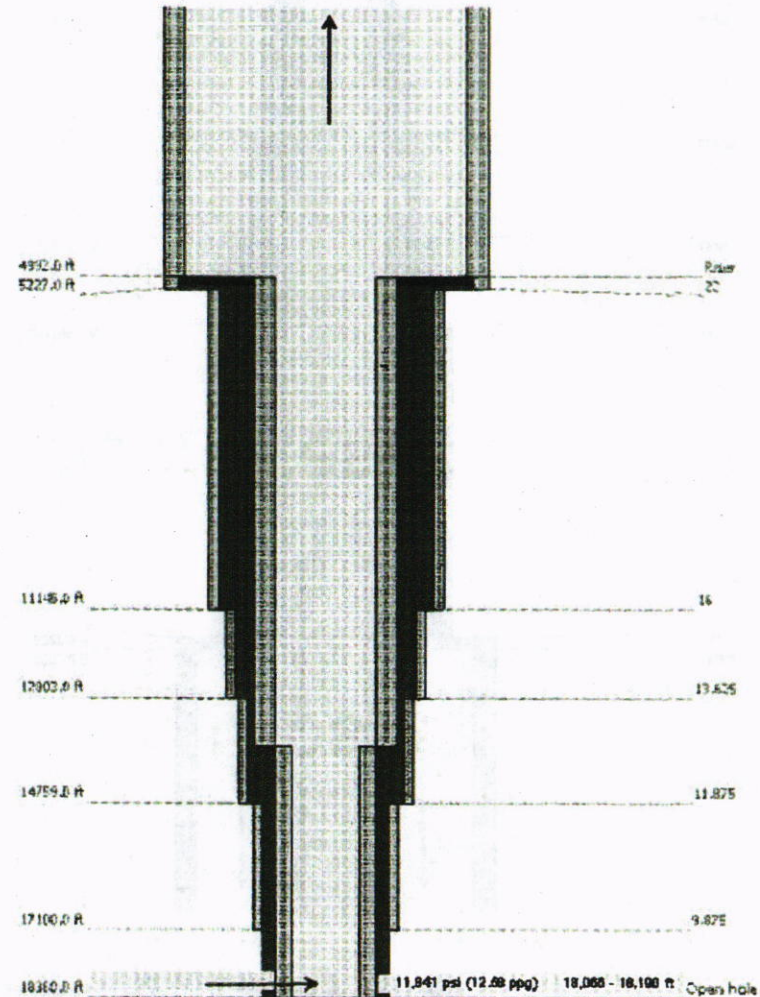
- Drillpipe was ejected out during the unloading process.
- Worst-Case Surface Scenario

Oil Rate

138,300 bpd

Gas Rate

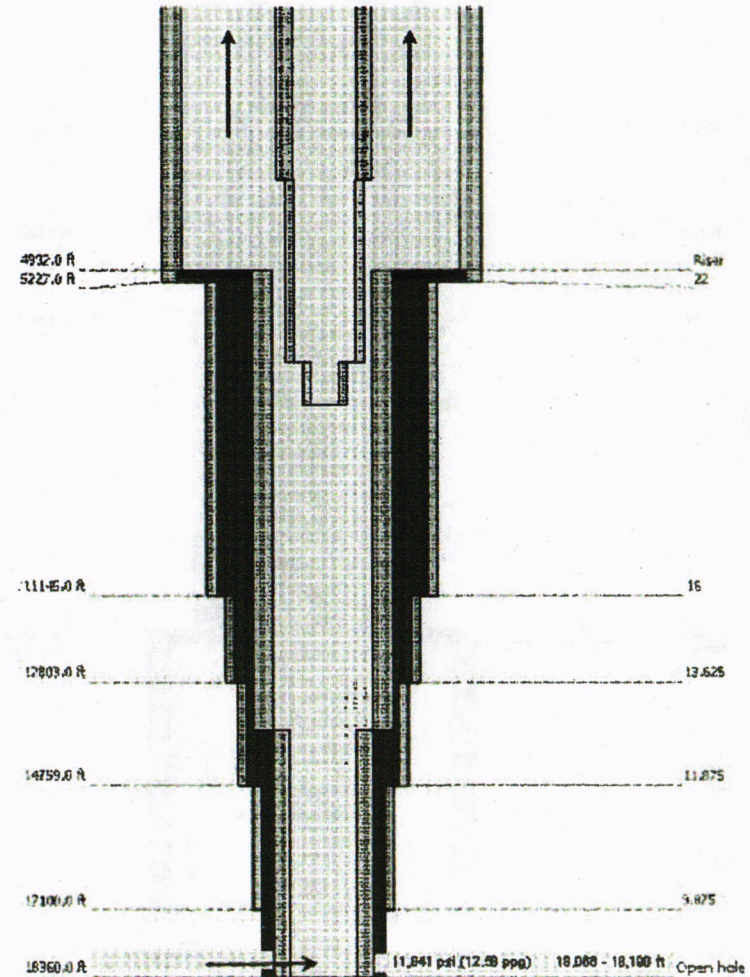
194 mmscf



## Case 2 – Surface Exit Up The Riser 7" x 9-7/8" Casing Flowpath; Drillstring in Rotary Table

### Assumptions:

- Drillpipe remains in tact and provides choke at the subsea BOP.



Oil Rate

110,000 bpd

Gas Rate

155 mmscf



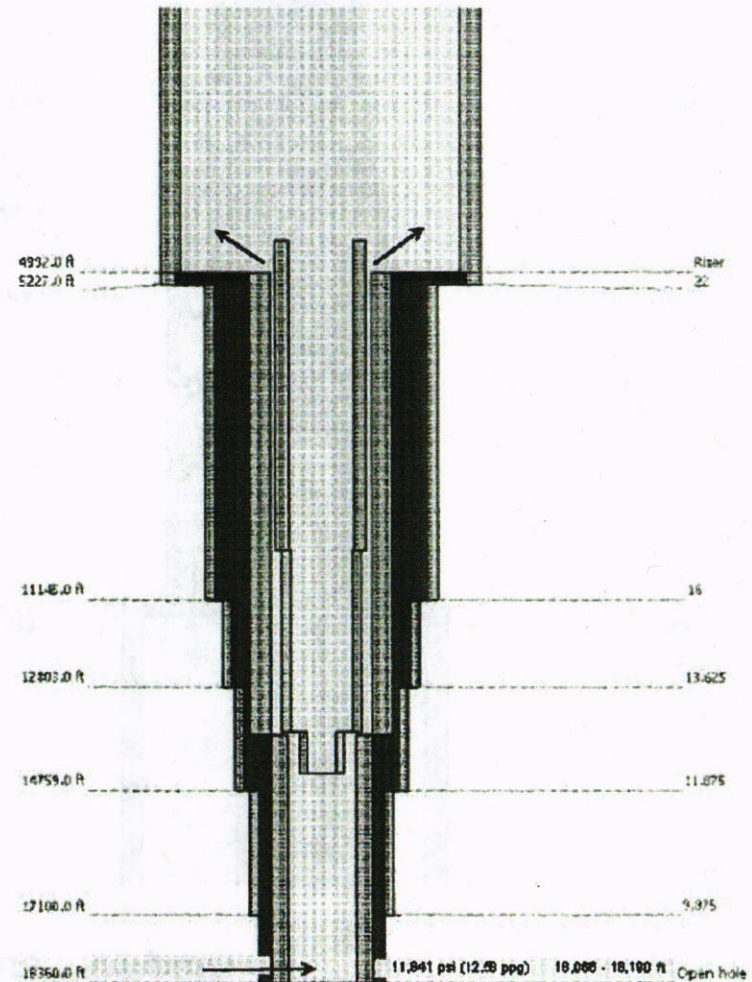
# Case 3 – Surface Exit Up The Riser 7" x 9-7/8" Casing Flowpath; Drillstring Dropped into 7" Casing

## Assumptions:

- Drillpipe was cut out during the unloading process and hangs up in the top of the 7" casing due to the 5-1/2" drill pipe tool joints being 7" OD.
- ~147 ft 6-5/8" drill pipe sticking out

Oil Rate  
93,000 bpd

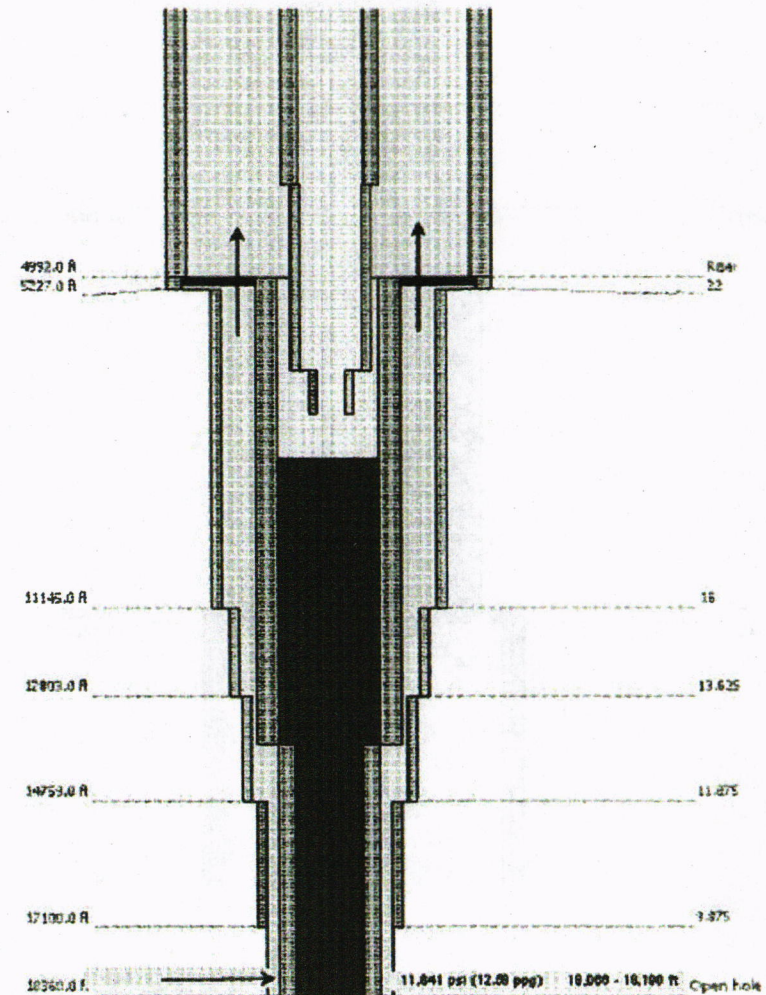
Gas Rate  
131 mmscf



## Case 4 – Surface Exit Up The Riser 7" x 9-7/8" Casing Annulus Flowpath

### Assumptions:

- Wellhead packer does not provide isolation.



Oil Rate

64,000 bpd

Gas Rate

91 mmscf

## Case 5 – Seafloor Exit 7" x 9-7/8" Casing Flowpath; No Drillstring

### Assumptions:

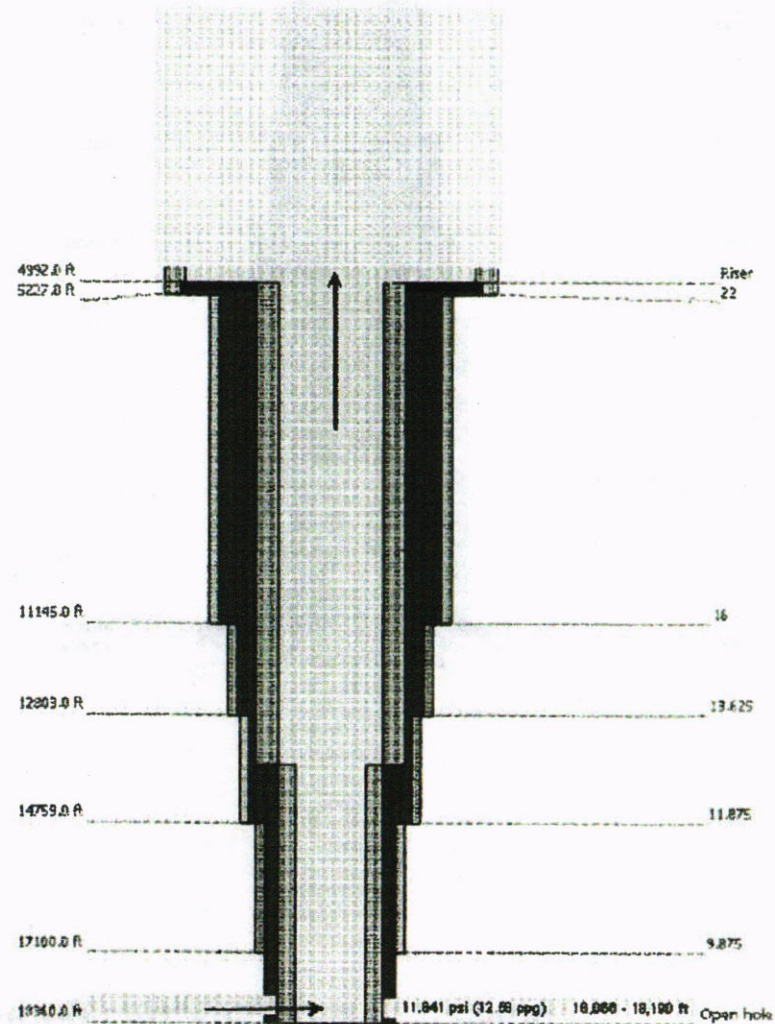
- Drillpipe was ejected out during the unloading process.
- Worst-Case Unrestricted Through Casing Subsea Scenario

**Oil Rate**

**146,000 bpd**

**Gas Rate**

**147 mmscf**





## Case 6 – Seafloor Exit

### 7" x 9-7/8" Casing Flowpath; Drillstring Dropped into 7" Casing

#### Assumptions:

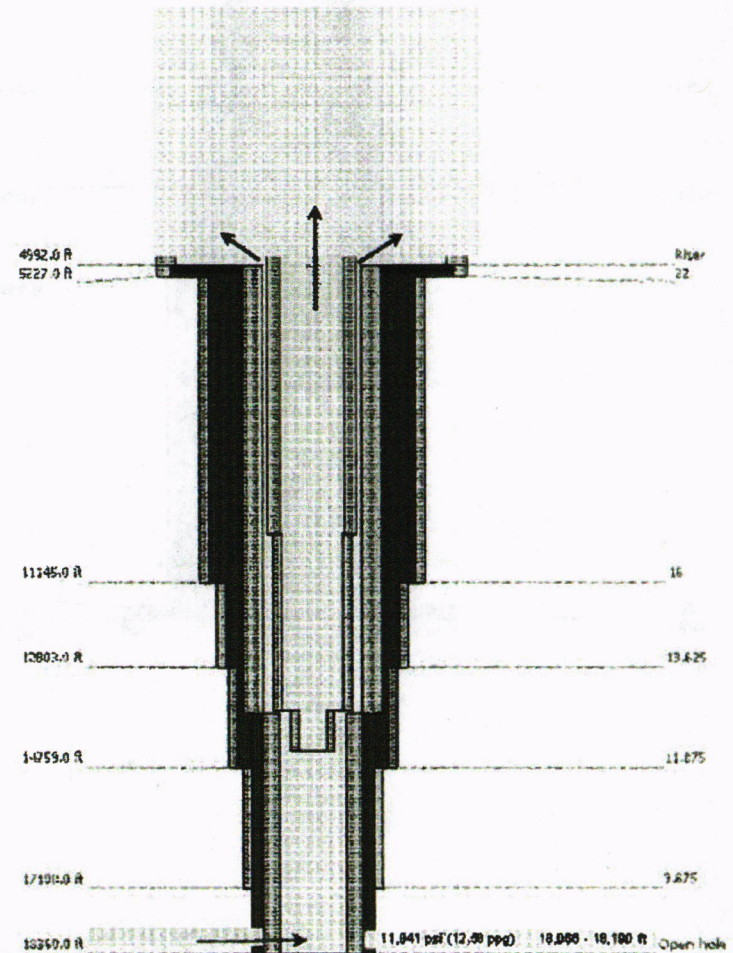
- Drillpipe was cut out during the unloading process and hangs up in the top of the 7" casing due to the 5-1/2" drill pipe tool joints being 7" OD; acts as a choke on the flow.
- ~147 ft 6-5/8" drill pipe sticking out

Oil Rate

77,000 bpd

Gas Rate

78 mmscf





## Case 7 – Seafloor Exit 7" x 9-7/8" Casing Annulus Flowpath

### Assumptions:

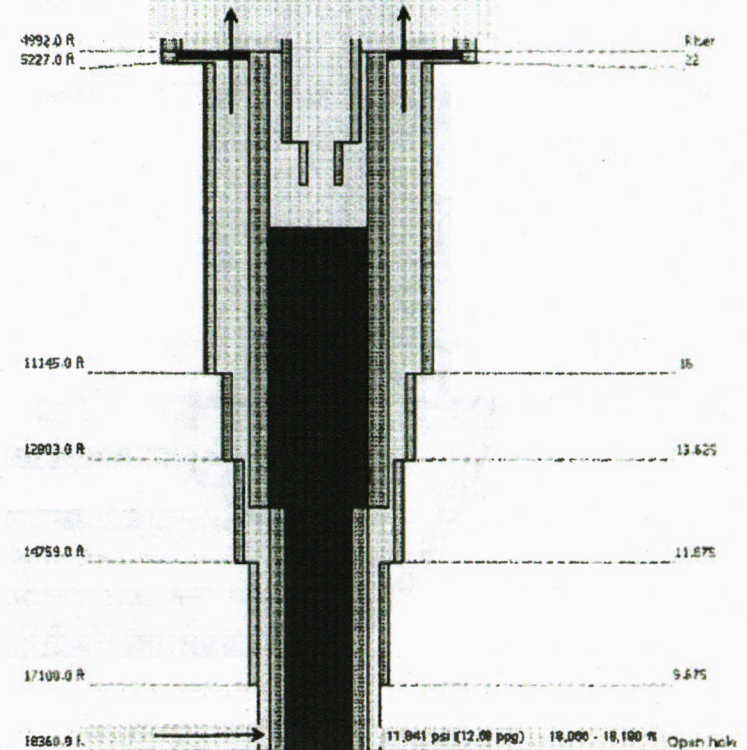
- Drillpipe inside Riser with LMRP disconnected at subsea BOP
- Worst-Case Restricted Seafloor Annulus Flow

**Oil Rate**

**69,500 bpd**

**Gas Rate**

**70 mmcsf**

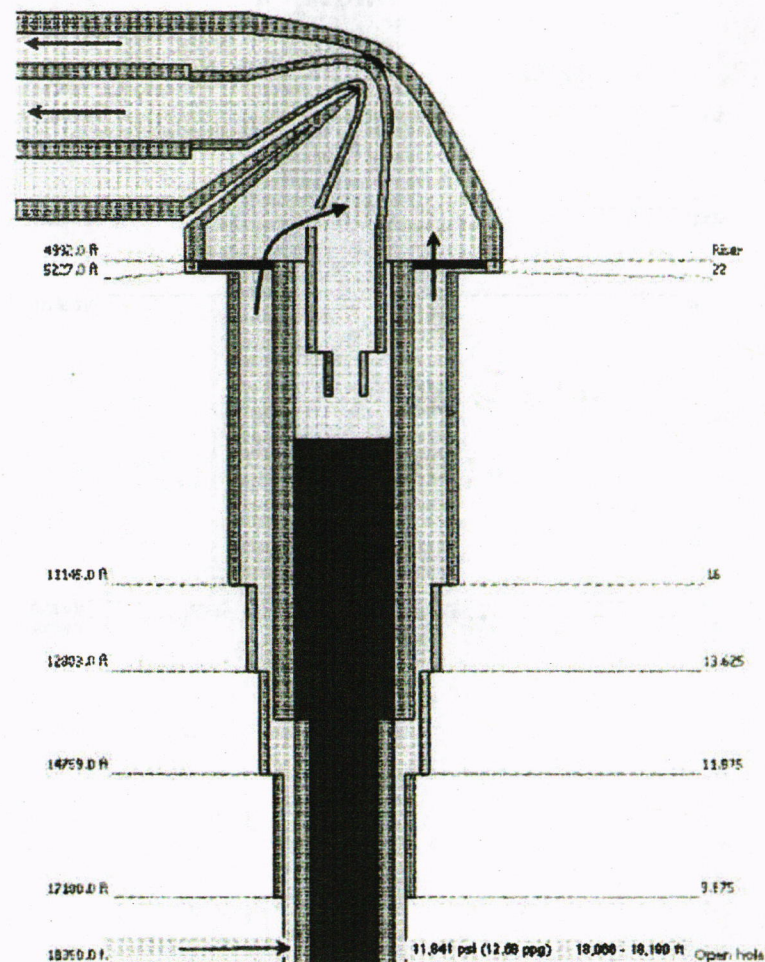


## Case 8 – Seafloor Exit 7" x 9-7/8" Casing Annulus Flowpath

### Assumptions:

- Crushed Riser splits 5-1/2" drill pipe at subsea BOP and allows flow out 6-5/8" drill pipe.

ID	Oil Rate	Gas Rate
5.625"	51,800	54
4.000"	42,100	45
3.000"	23,600	26
2.000"	8,600	10
0.730"	1,000	2



## Well Control Simulation Results

### Surface Exit Up The Riser

Case	Oil Rate	Gas Rate	BOE	Comments
Flow up the 7" x 9-7/8" Casing String				
1	138,300	194	172,550	No Drillpipe
2	110,000	155	137,605	DP @ Surface
3	93,000	131	116,330	DP @ Dropped
Flow behind the 7" x 9-7/8" Casing Annulus				
4	64,000	91	80,207	22" Exposed



# Well Control Simulation Results

## Seafloor Exit @ 4,992 ft Water Depth

Case	Oil Rate	Gas Rate	BOE	Comments
Flow up the 7" x 9-7/8" Casing String				
5	146,000	147	172,180	No Drillpipe
6	77,000	78	90,891	DP @ Dropped
Flow behind the 7" x 9-7/8" Casing Annulus				
7	69,500	70	81,967	22" Exposed
8				

## Well Control Simulation Results

### Relief Well - Surface Exit Up Riser

Case	Oil Rate	Gas Rate	BOE	Comments
8-1/2" Open Hole @ M56 Sand Package				
RW1	257,000	601	356,500	No Drillpipe
RW2	110,000	162	136,800	DP @ Surface

## Dynamic Kill Simulation Results

### Seafloor Exit @ 4,992 ft Water Depth

Oil Rates	Gas Rates	Mud Weight	Kill Rate
Flow up the 7" x 9-7/8" Casing String			No Drillstring
146,000 bpd	147 mmscf	15 ppg	28 bpm
		16 ppg	26 bpm
		20 ppg	18 bpm
77,000 bpd	78 mmscf		DP @ Dropped
		16 ppg	15 bpm
Flow behind the 7" x 9-7/8" Casing Annulus			
69,500 bpd	70 mmscf	15 ppg	18 bpm
		16 ppg	16 bpm
		20 ppg	10 bpm



**OLGA ABC**

**OLGA Advanced blowout control**

**Version 1.0.1.27879**

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**Demo version.**

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**OLGA ABC is built with OLGA and Driftcheck  
technology**



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