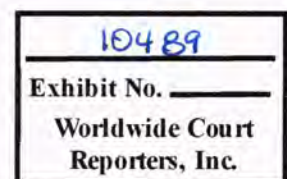

From: William Burch
Sent: Thursday, April 29, 2010 11:03 AM
To: 'Mix, Kurt'
Subject: Revised Numbers for Choked Cases
Attachments: BP Macondo Well Control Modeling 042910.ppt

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"Experience Makes The Difference"

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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:

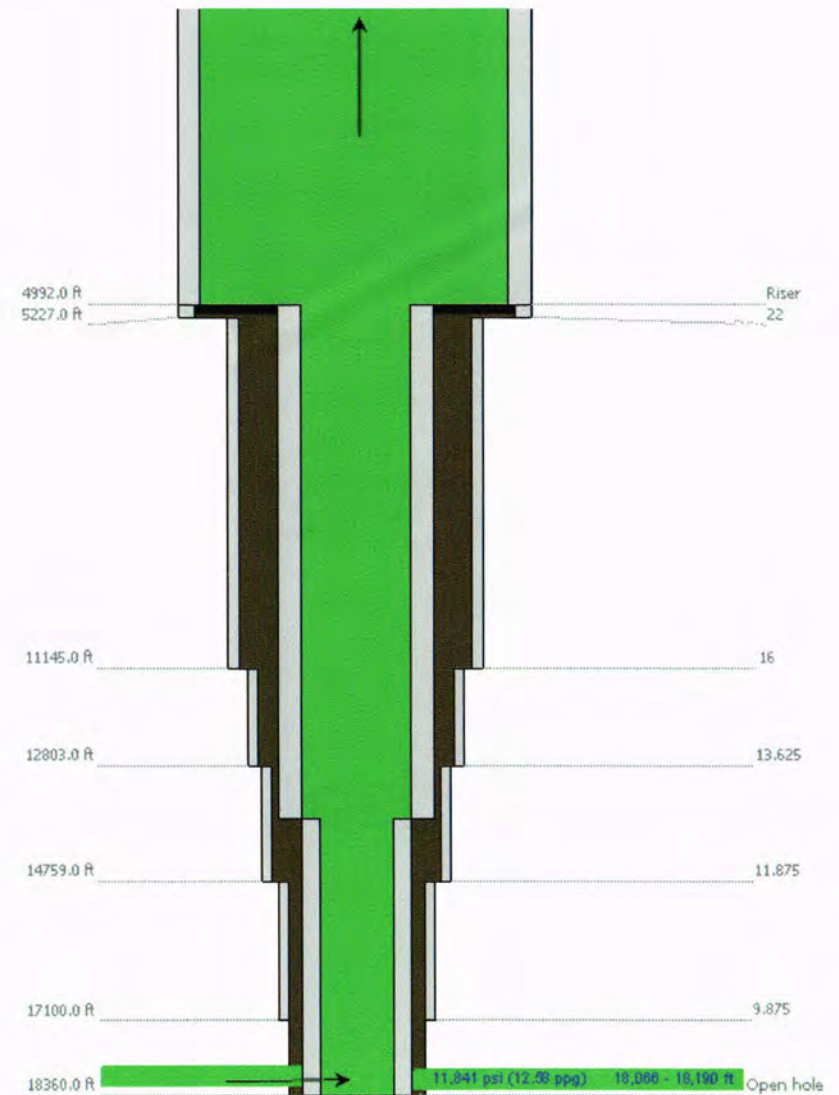
- Drillpipe was ejected out during the unloading process.
- Worst-Case Surface Scenario

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:

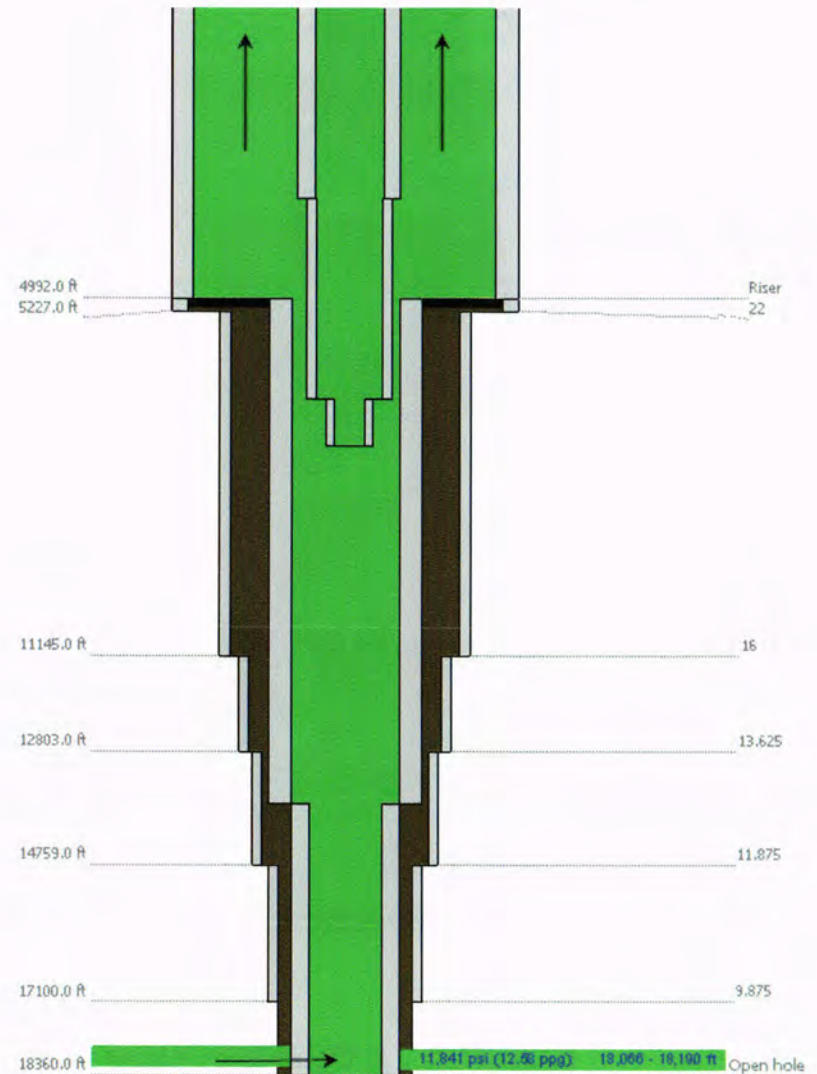
- Drillpipe remains in tact and provides choke at the subsea BOP.

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:

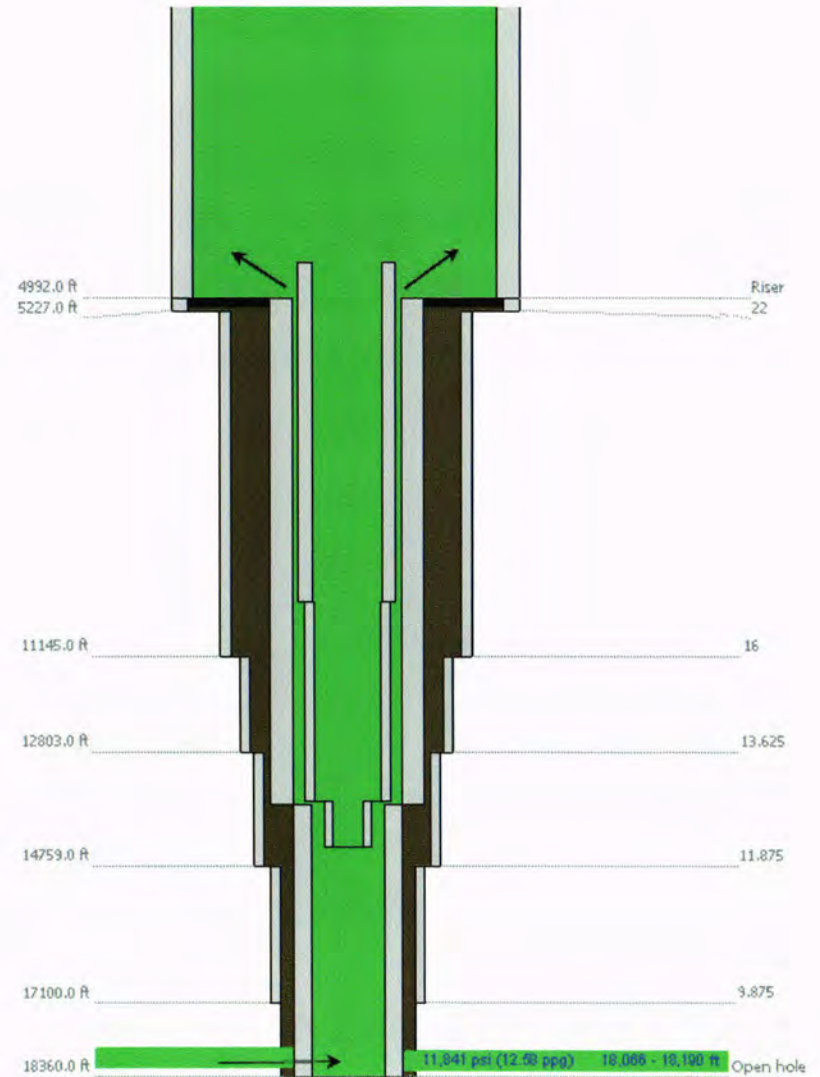
- Drillpipe was cut out during the unloading process and hangs up in the top of the 7" casing due to the 5-1/2" drill pipe tool joints being 7" OD.
- ~147 ft 6-5/8" drill pipe sticking out

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:

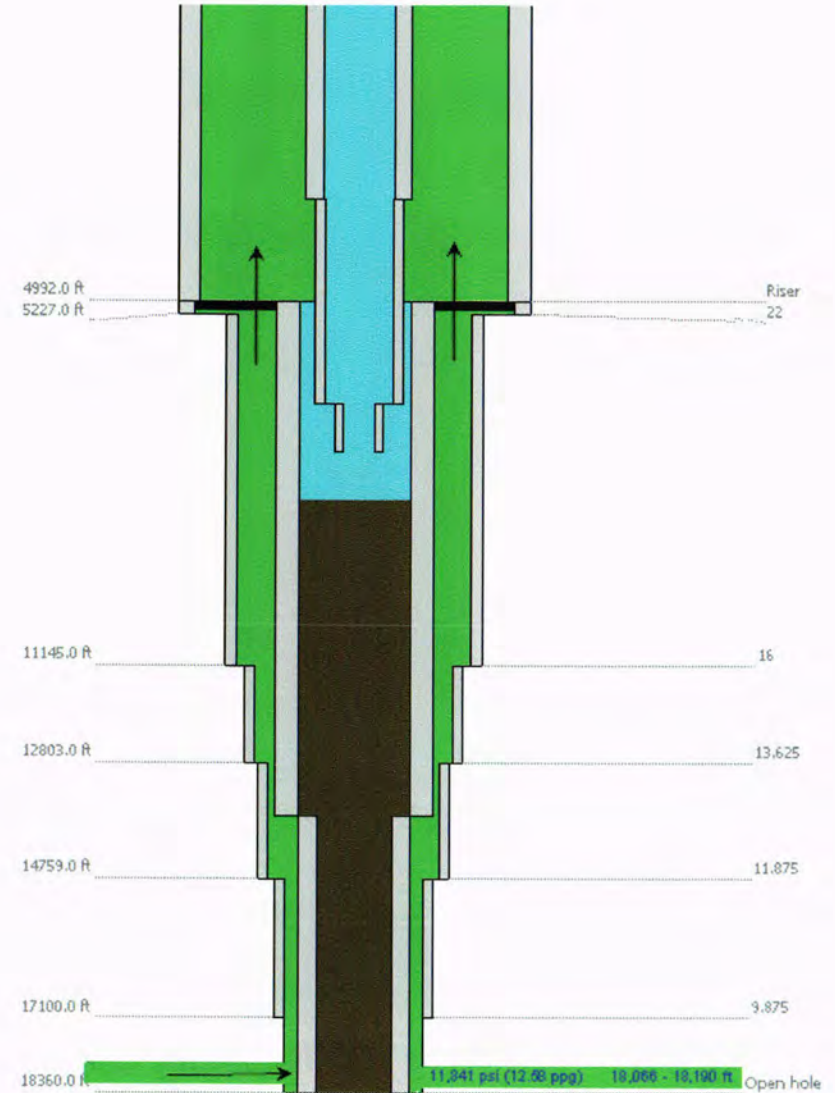
- Wellhead packer does not provide isolation.

Oil Rate

64,000 bpd

Gas Rate

91 mmsecf



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

Assumptions:

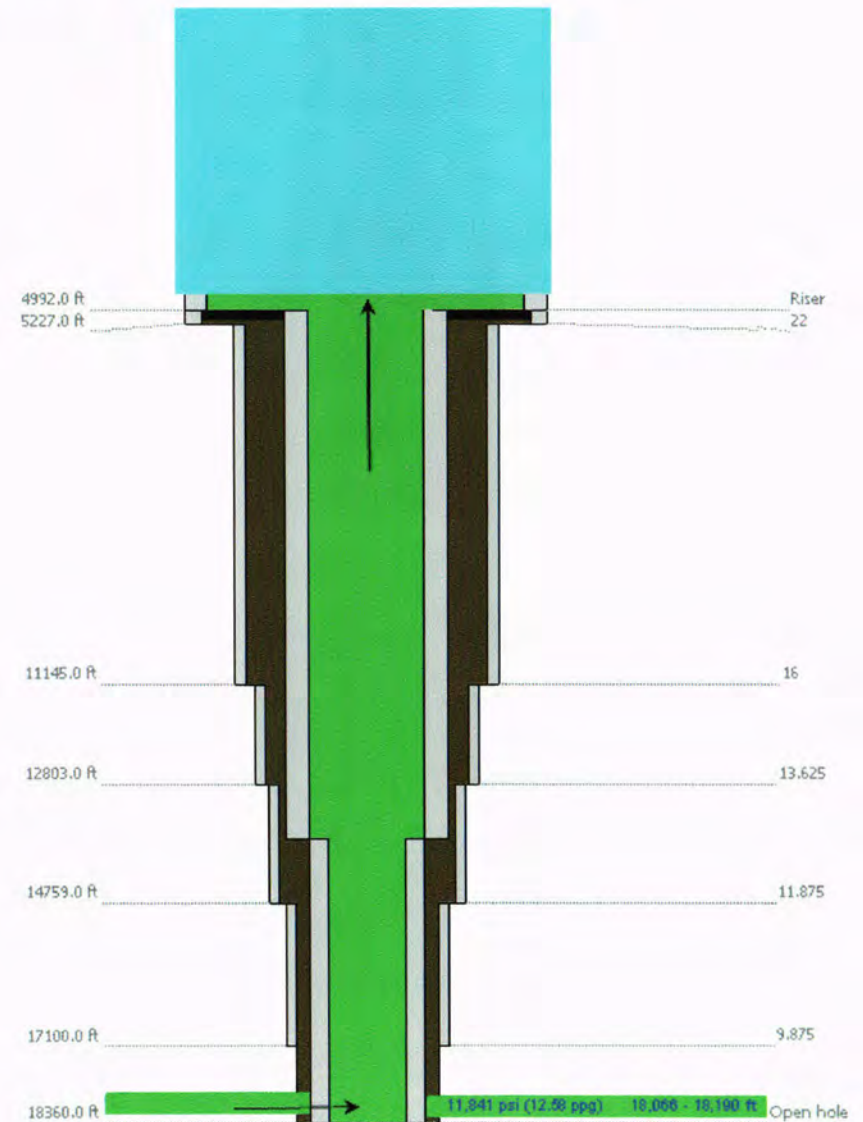
- Drillpipe was ejected out during the unloading process.
- Worst-Case Unrestricted Through Casing Subsea Scenario

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:

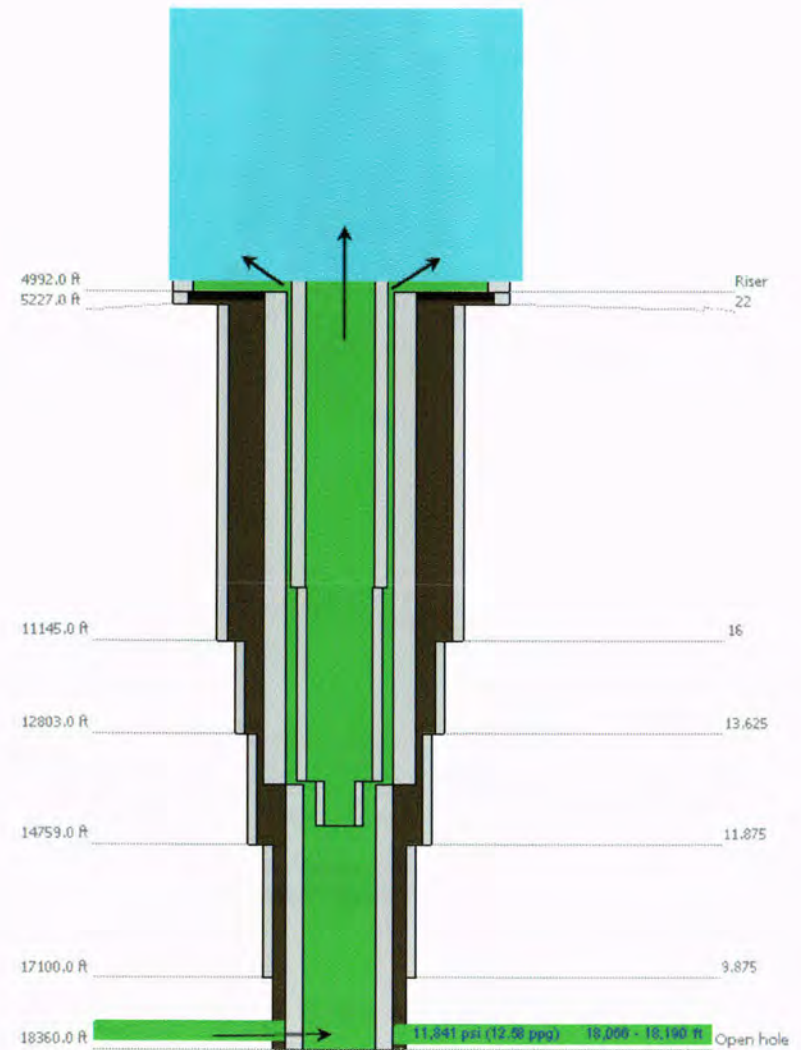
- Drillpipe was cut out during the unloading process and hangs up in the top of the 7" casing due to the 5-1/2" drill pipe tool joints being 7" OD; acts as a choke on the flow.
- ~147 ft 6-5/8" drill pipe sticking out

Oil Rate

77,000 bpd

Gas Rate

78 mm/scf



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

Assumptions:

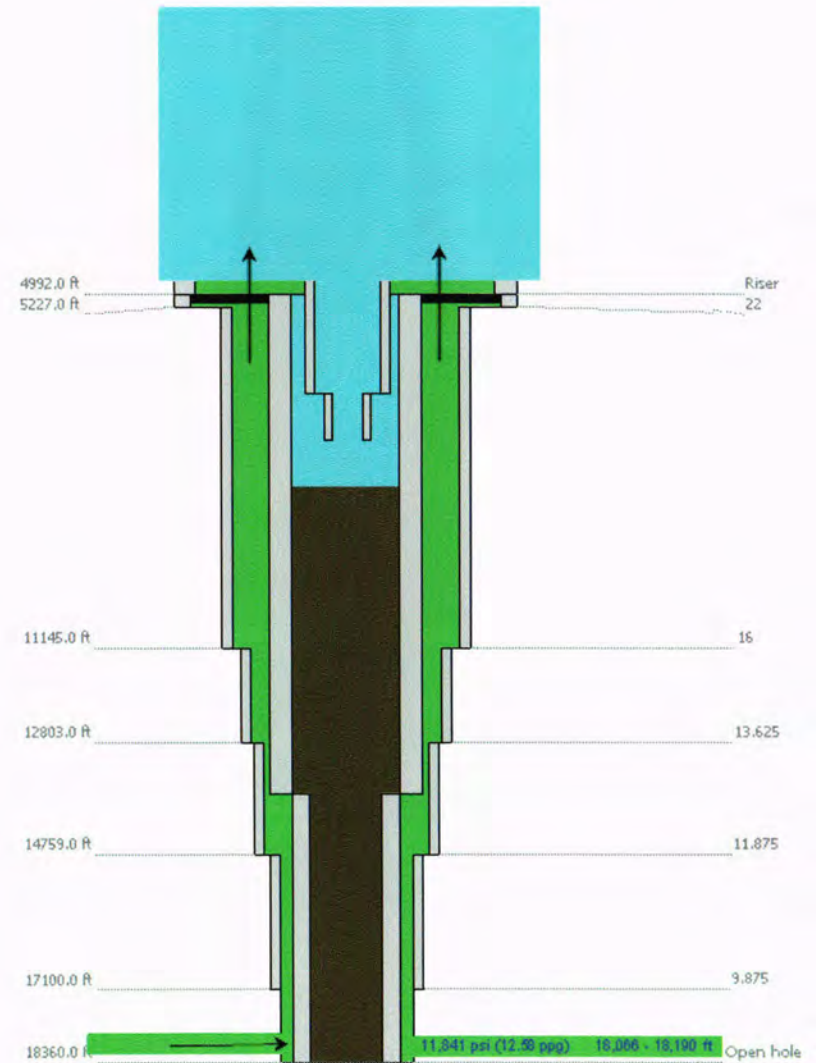
- Drillpipe inside Riser with LMRP disconnected at subsea BOP
- Worst-Case Restricted Seafloor Annulus Flow

Oil Rate

69,500 bpd

Gas Rate

70 mmscf

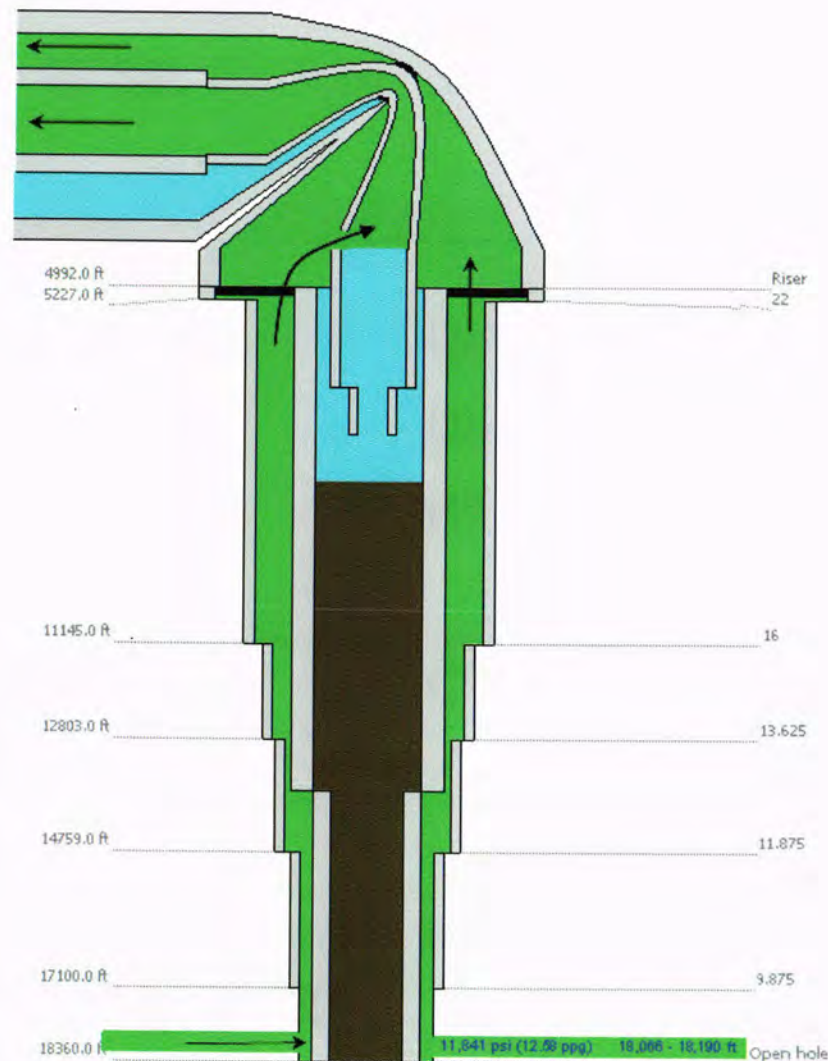


Case 8 – Seafloor Exit 7" x 9-7/8" Casing Annulus Flowpath

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
18.5"	60,500	67
16"	60,500	67
14"	60,500	67
12"	60,500	67
10"	60,200	67
7.54"	58,800	65
5.625"	54,000	59
4"	39,500	43
3"	23,600	26
2"	8,600	10
0.73"	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

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



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