

From: Wall, Dave
Sent: Tue May 25 19:54:58 2010
To: Morten Haug Emilsen
Subject: FW: BOP 'Washed Out' Area
Importance: Normal
Attachments: BOP Ram & Diverter Washed Out Areas-R0.ZIP

Morten,

BOP data for the modelling exercise.

Dave

David Wall
VP HSE & IM
EPT - HSE, Operations & Engineering
[REDACTED]

From: Szafron, Kevin
Sent: 25 May 2010 14:24
To: Wall, Dave
Cc: McNeillie, Graham A; Lansdell, David
Subject: BOP 'Washed Out' Area

Dave, per your team's request, attached are the 'washed out' areas for the various BOP rams and the diverter.

The column highlighted in yellow represents the 'most likely' area for the washed out case (with 5 1/2 " drill pipe in place). I have included sketches of each so you can see the areas denoted.

Also included is the potential 'worst case' area with the BOP closed and no drill pipe in the BOP, but all seal material washed out.

Pictures, dimensions and information were courtesy of Dave Lansdell and the Cameron website.

Let me know of any questions.

Kevin Szafron
SETA Advisor-Instrument & Protective Systems
BP Exploration and Production Technology
Cellphone: [REDACTED]

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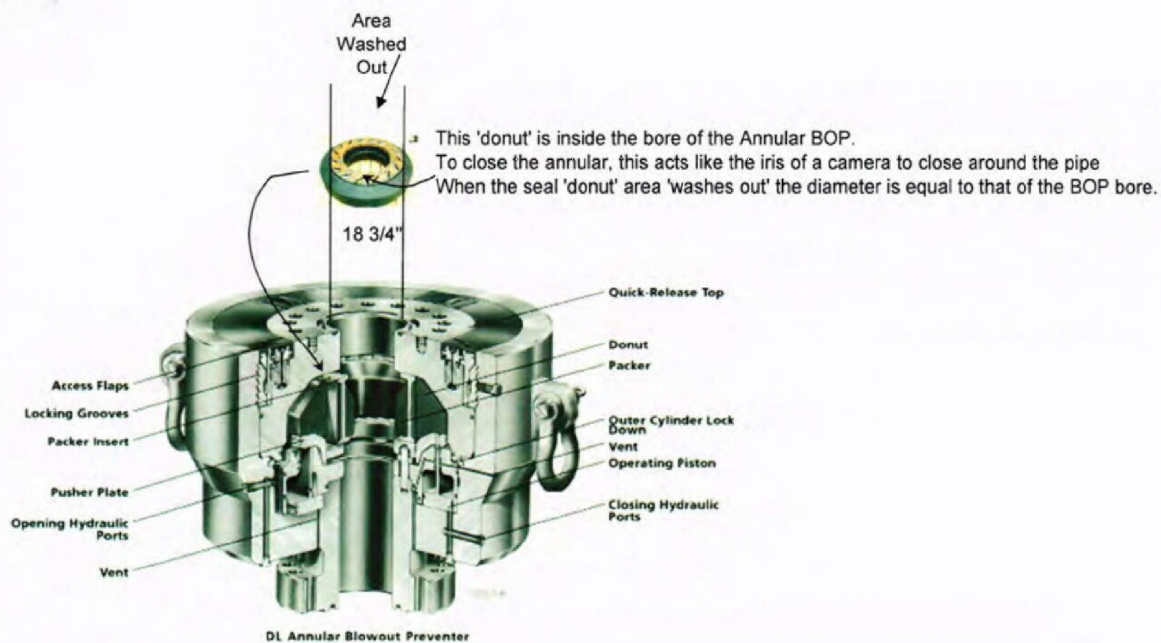
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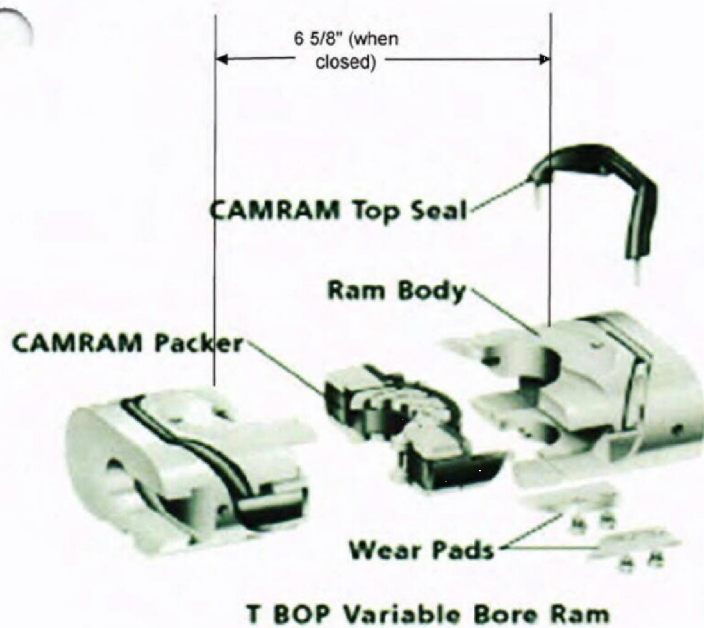
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BOP 'Washed Out' Area Summary

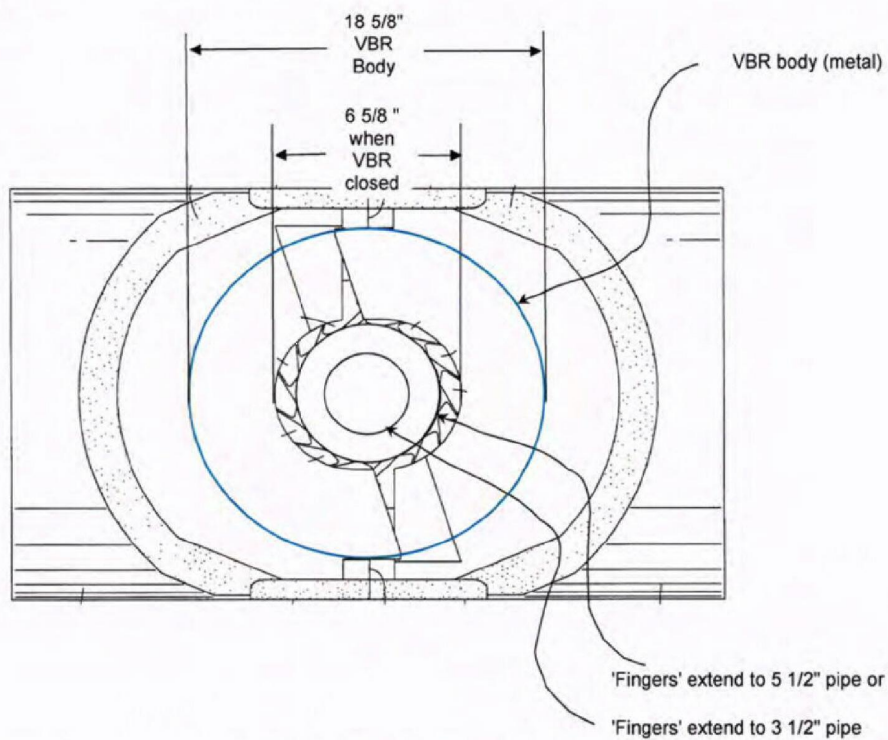
Equipment	Pipe Dia (in)	Area with no Pipe in the BOP. BOP closed, all BOP seal material washed out			Most Likely 'Washed Out' Area with Pipe in the BOP			Comment
		Bore Diameter (in)	Reference Sketch	Area (in2)	Washed Out' Diameter (in)	Reference Sketch	Flow Area (in2)	
Upper Annular	5.5	18.75	1	275.976563	18.75	1	252.2303	
Lower Annular	5.5	18.75	1	275.976563	18.75	1	252.2303	
Blind Shear	5.5		3	15		3	8	Most likely failure points are side seals with total area of approx 8 Sq inches
Casing Shear	5.5		4	9		4	NA	Super shear (Casing shear) ram closing would likely leave no annular area when there is drill pipe in the BOP
Upper VBR	5.5	18.75	2	275.976563	6.625	2	10.70789	
Middle VBR	5.5	18.75	2	275.976563	6.625	2	10.70789	
Test Ram	5.5	18.75	2	275.976563	6.625	2	10.70789	
Diverter	5.5	21	5	346.185	21	5	322.4388	



Sketch 1 - DL Annular BOP



Sketch 2a - T BOP Variable Bore Ram BOP



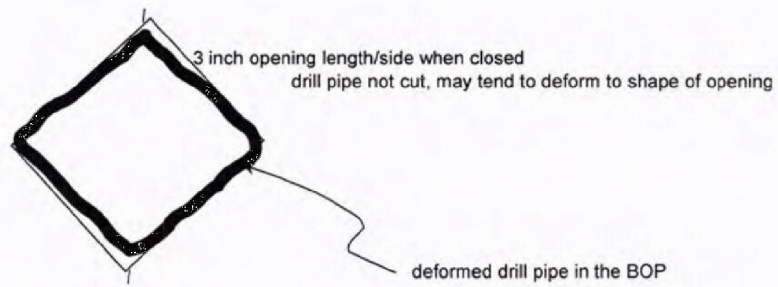
Sketch 2b - T BOP Variable Bore Ram BOP



Sketch 3 - Blind Shear Ram

Blind Shear Side Seals Area ~ 8 sq inches

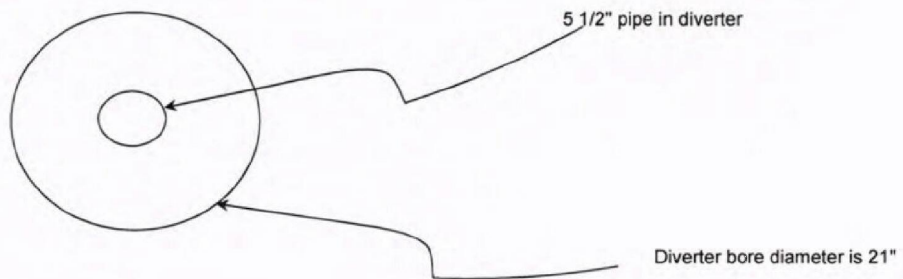
Total seal area estimated at ~ 15 sq inches



Sketch 4 - Casing Shear Ram



Hydril 21" Diverter



Sketch 5 - Diverter

