



Technology Solutions Group
WSD - WWCI/BTI-CSI
Interoffice Memo

10633
Exhibit No. _____
Worldwide Court
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Date: 02 March 2011	Time: { TIME \@ "h:mm am/pm" }	Ref:
To: Bill Mahler	From: Pat Campbell	
CC: Freddy Gebhardt; Randy Kubota; David Barnett; Pat Cargol, Larry Sims; Terry Foster		
Subject: Your Meeting in Washington, D.C. w/ BOEMRE Director Bromwich		

Bill:

In answer to your question regarding possible questions and responses during your meeting with BOEMRE's Director Bromwich:

Exec Summary:

There has been too great an emphasis placed on putting intervention hardware in place to meet a "Macondo-like" event. This very narrow focus is likely to disappoint in future situations.

The probability of any future deepwater event being similar in terms of tactical intervention procedures and equipment selection is extremely small.

Comments:

Historical experience with subsea well control events (the body of examples is statistically small) reveals that the likelihood of being able to use the processes and equipment being compiled "Post Macondo" is unlikely at best.

Although most subsea well control event examples have occurred in water depths less than Macondo's 5000 FSW, there are definite lessons to be taken from the collective data of those events.

It isn't practical to provide the details in this brief commentary, but the likelihood of future events sharing the following conditions to Macondo is very low:

- Erect, vertical, intact BOP & wellhead
- Unimpeded free access to the BOP control system & wellhead
- Nothing damaged at or near sea floor compromising or negating use of pre-existing well equipment (at least as a pressure vessel).

An evaluation of prior events (many water depths, many discrete well bore geometries, reservoir characteristics, and other variables, suggests that:

- The Existing BOP stack, wellhead, and other components will be damaged and may be useless as an attachment point for a "Macondo Like" capping assembly
- Often the leak path at the sea floor is below the BOP rams (or other closure devices).
- In those cases,, installing a capping assembly atop this well will not accomplish or allow shut-in of the hydrocarbon flow
- Most events have resulted in a bent/inclined (non-vertical) attachment point for any capping device. The Macondo style capping equipment may not/ or will not be a suitable (or technically possible) closure device in most non-vertical situations.
- It should be noted that the Deep Water (DH) BOP and the Macondo wellhead were severely stressed by bending loads applied by relative displacement of the rig/riser while still connected to the well. ROV video at the sea floor revealed that the entire assembly was exposed to extreme bending loads prior to the rig sinking and the riser falling to the seafloor.

- Only the specific circumstances of the Macondo well, combined with the seafloor being "soft" at the drill site, allowed the entire assembly to be pulled sideways - but to remain within the "elastic range" of the casings and conductor below the wellhead - and to "spring back" to (near) vertical when the rig detached from the riser.

One hopes for the relative simplicity of the Macondo example. Ideally one will encounter vertical undamaged equipment below the riser connection, and with good sea-floor visibility and moderate currents at the workface.

In reality, compromised casing integrity, damage to sea floor equipment, inadequate cementation, and many other variable factors can result in it being unwise (or impossible) to successfully install and successfully shut-in the blown out well.

It's my view that everything that's been done, or is being done to date by MWCC, Helix Solutions, and BOEMRE are reasonable, valuable, and meaningful actions devoted to reducing the response time, increasing the hardware availability, and providing the regulatory guidance to Operators to insure successful avoidance or intervention, to the extent possible. I believe the operators and the government agencies are devoted to implementation of state-of-the-art "Best Practices". I believe each is to be commended for those efforts and the results produced up to the present time.

WWCI has been focused on meeting the operators engineering requirements of these same issues.

Assisting with equipment design and engineering considerations

Participating in the various investigations related to the Macondo event

Participating in numerous forums (private & public) for comments and recommendations

Participating with many of our clients to provide Relief Well (RW) Planning, expanding or revising Emergency Response Plans (ERP's), Blowout Contingency Plans (BCP's), Pollution Control Plans, computer based Well Control Modeling, Well Kill Planning, Site-Specific Logistics planning, calculation of Absolute Open Flow (AOF) reservoir potential for well geometries, predicting fracture gradients, and other related engineering services.

In my view, the most obvious omission in the overall efforts put forth by the parties mentioned herein is:

Failure to recognize that the body of experience suggests there is a far greater likelihood that solutions with the highest probability for implementation will be comprehensive sea floor hydrocarbon capture, collection, and disposal beginning with the seafloor containment equipment (think cofferdam, pollution dome/top-hat, and transmission or conveyance system to surface collection). This, combined with relief well intervention, has a very high probability of being the only (and perhaps fastest) solution that can be deployed.

Regards,

Pat