



BP's Deepwater Oil Spill - the Hundredth Day - and Open Thread

Posted by [Heading Out](#) on July 29, 2010 - 10:25am

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Admiral Allen [held a press conference](#) in the Gulf region (rather than recent ones held in Washington), in which he noted that the news of the rapid disappearance of the oil already emitted by the Deepwater well is raising questions as to how long to retain the different parts of the fleet assembled to deal with it. Well pressure continues to slowly build, and there are no signs that the well integrity has been breached. The problem of the skimmer fleet, and the distributed lengths of boom are non-trivial. Should a hurricane appear then the oil-contaminated boom segments can become polluting sources themselves if they are carried inland. And so they must be collected, cleaned and stored, if there is no longer a need. (Or if they are too contaminated they may need to be disposed of as hazardous waste).

The Admiral also discussed the continuing developments with both the top static kill, (waiting on the cementing of the relief well) and the progress of the relief well itself. The packer sealing the well has been released and recovered, and the well is now being cleaned, before operations restart.

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They removed the subsea containment device—which they call a packer—that was put in to protect the well while they evacuated the site before of the severe weather.

After that (was) done, they will run another drill string clear to the bottom of the relief well, and then they're going to flush the entire wellbore out to make sure there's no particles or anything—sediment from the formation. When that is done, they will be ready then to put the casing pipe in. The casing pipe is the last structural member that will go into the relief well and cement that in place.

Once that is done, that will be the cue to start the static or the top kill we've talked about, which will happen next week. Following that—then we'll be in a position, once the cement dries, to go ahead and drill into the annulus and begin the bottom kill sequence of events as I've briefed before.

Note that once the relief well (RW) is cased and cemented, then it is not necessary to have the cement harden before doing the static kill, though it will be necessary for the relief well operation to complete.

In the latter case, since the cemented casing will act as a springboard to allow the drill to advance the last one hundred feet to meet the 7-inch casing of the original well, accuracy in positioning is still critical to success. The RW is planned to run alongside the original well, slowly chewing through the original cement annulus and finding out whether that is the source of the oil, or whether its integrity is still sound. (And with lots of opinions there is yet little real data on which to give a definitive answer.)

In regard to the static kill, he answered a question on the chances of success by noting

One of the things that, as you know, has been a subject of a lot of controversy or discussion, I would say—maybe not controversy, but discussion, spirited discussion among the science team, BP engineers, and so forth—is why the pressure was so low when we capped the well itself, down in the 6,000 range.

The competing theories from that are we have depletion in the reservoir that caused the pressure to be lower or there could potentially be a leak down there.

One of the things we're going to find out when we start to put the mud in for the static kill—if there's a precipitous drop in pressure, we'll know we have a well integrity issue at that point. If there is not, and we fill that well with mud right away, and it holds pressure, I think we'll know a lot more about the condition of the well.

One of the big concerns with injecting fluid into the well lies with the strength of the rocks in the bottom of the existing well. There is some concern that if the mud injected into the well is too heavy, then it can raise the pressure in the bottom of the hole to the point that the surrounding rock fractures. At this point the build-up of pressure in the well is relieved, as the fluid can now flow into the crack generated (and there is the precipitate drop in pressure that the Admiral refers to). That (because the rest of the well is lined with a cement and steel jacket or casing) is most likely to occur in the lowest section of the well, where it was not lined with both steel and cement, but rather a full-well-length steel tube (the production casing) was cemented into place, with cement only at the bottom of the well. Further the oil bearing rock tends to be weaker than the rest.

It is thus down around the zone of the producing rock that this fracture and leakage – the loss in well integrity – is likely to occur. And it is that zone that will be penetrated by the relief well. Thus if there are problems that arise during the static kill from the top of the well, then they will likely be remediated by the following arrival of the relief well in the critical region.

Now I think there may be another complexity (and in reality there are many in this process) and that relates to the possible injection of cement at the end of the static kill as a way of sealing the well. My concern is that while the static kill will displace oil and gas in the well by pushing them back into the formation, from which they earlier escaped, that is not true with the mud. The oil and gas, having flowed out of the rock with the differential pressure having the well pressure lower, can flow back, when the well pressure is higher. Mud on the other hand, bear in mind, is designed in part to line the well and provide an impermeable liner to the well during drilling. Thus to inject cement with the intent of driving some of the mud that the cement displaces into the formation may require higher pressures than with the oil and gas. This may, in turn, bring the well pressure above that at which the formation fractures. It is for reasons such as this that I expect the process to be carried out somewhat slowly, and in stages, rather than as a sudden



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