



BP's Deepwater Oil Spill - Time is Not Our Friend - and Open Thread

Posted by [Heading Out](#) on July 21, 2010 - 10:05am

Topic: [Environment/Sustainability](#)

Tags: [deepwater horizon](#), [oil spill](#) [[list all tags](#)]

Update, 4:00 pm, EDT: Chuck Watson has a storm update, added to the end of this post.

There is a certain frustration in hearing some of the officials who act as spokesmen for the management team handling the spill from the Deepwater well in the Gulf of Mexico. Their evaluation of the situation is bound around a full collection and compilation of the existing evidence, a comprehensive and contemplative understanding through a scientific explanation of the causes of whatever anomalies and other behavior that is not following the model anticipated, and subsequently then working out the best steps forward and determining the potential benefits relative to alternative approaches.

Such an attitude works well in a scientific laboratory, where whether the results are available tomorrow or next week only really matters if there is another lab in the world that is working closely along the same lines as you are. (And if the work is relatively topical that is often the case). Unfortunately this relatively leisurely approach to making progress is not nearly as compatible with a situation where a high-pressure piece of equipment is showing signs of leakage, and where there is the possibility that, within the week, equipment is going to have to be withdrawn from the site because of the imminence of a hurricane.

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The imposition of an ultimately superior layer or more (depending on how much the White House is actually involved in decision making) of evaluation and decision making can do little beyond stretching the time over which decisions are made, eating up the time that is available for action, before the current gentle weather window closes. Now it may be that the current tropical depression will not solidify into a problem (I'll let wiser heads in those topics answer that question), but even if this one does not, there will come a time when one will, and the working interval is shrinking.

Some of the worries about seeps in the vicinity have now been put to rest, in his brief yesterday Admiral Allen noted:

The first one was to see pitch about three nautical miles (Ed. Note amended to kilometers) from the wellhead itself. We do not believe that is associated with this particular well integrity test or the Macando well.

Similarly the bubbling from the sediments around the well have not been seen as something to worry about, although the material ejected is being tested. (It proves very difficult to get a meaningful picture of this). There is, however, one leak that is due to the well, and that is in the equipment that is sitting on the well itself.

Let me just tell you right away, because this happened overnight, as you know, we had a – a connector piece of equipment that we established in to allow us to put the capping stack on. These are the three rams that are associated with the capping stack. This is a schematic of those three rams. The leakage is occurring in a flange just located right about here, and there is hydrate formation appearing on this side of the capping stack as we move forward.

We do not know, but we do not believe this is consequential at this time, nor is – doesn't appear that the hydrate formation is inhibiting any operation of the capping stack. This is something we will continue to monitor as we move forward.

He noted that

it is the collective opinion of the folks that are talking about this that the – the small seepages we are finding right now do not present, at least at this point, any indication that there is a threat to the wellbore. There is a – there's actually a metal gasket in the flange, rather than a rubber (one). It's actually a metal – metal seal in there. And that appears to be the source of (the leak). But we don't know if it's consequential to the operations of it. It's not a huge leak, but it is causing the formation of hydrates.

(Ed note I corrected some transcription errors). The lack of concern seems to focus on the possible stratification of the fluid in the wellbore, and the concentration of any sand, which could cause problems if rapidly released.

Now that in itself is somewhat revealing, since one of the things that I have discussed in the past is the concentration of sand in the fluid flow, and that, when the fluid gets to a pressure differential of 2,500 psi or more that sand will erode metal and anything else in its way, as it flows out. With the sensible admission of the presence of that sand, what BP intend, apparently and if necessary, is to bleed the pressure down sufficiently slowly that the current segregation within the well, with the lighter gas-related hydrocarbons rising to the top, can be maintained until the pressure differential is low enough that the sand would no longer cause much erosion if caught up in the fluid. (Whether this would need to take the “several days” that [Admiral Allen suggests](#) is, perhaps, debatable.

There are a couple of problems with that. The first is that the sand is not in a single size range, but likely goes all the way down to sub-micron in size. The smaller particles don't settle out that easily and thus are likely to be present to some concentration in the fluid throughout the well. Which raises the second problem which is that particles do cause erosion if they are moving over a surface at relatively high speed (caused by the pressure differential). In a much earlier post [I discussed this](#) and the effects that it might cause.

In my other life, we have dealt with the problems of having abrasive particles get into high pressure fittings, and the leaks that result. Leaks tend not to fix themselves, and get bigger over time. Expecting that they might not change over the next month, while the odd hurricane might pass by, and the relief well completion gets postponed, is not a reassuring path to take.

In Kent Wells' [review on Tuesday](#) he was, similarly to Admiral Allen, complacent about the leaks.

And then in terms of the couple of gas leaks that you probably observed on the BLP and capping stack. Those are just coming from places where we have what we call (metal) seals. Those are small leaks that are as a result of gas. Those connections have been tested to very high pressures in the case of the capping stack we actually tested it to 15,000 PSI with water and with no leaks, and it's just when we – we probably got a gas bubble that's formed up there and that's why we have that very slow leak. It's nothing that we're concerned about.

At those pressures and temperatures, the gas is still liquid and still capable of carrying sand with it.

The potential for injecting mud to kill the well, which is getting more of a hearing at the moment, could be the way forward. Once mud in any significant volume is introduced into the well, through existing lines initially designed just to do this very thing, then the pressure at the top of the well will decline. This lowers the differential pressure across any leaks, lowering the flow and extending the time period before they may fail.

But, in regard to doing this “top kill”, Admiral Allen noted

We now have a closed system, so there's back pressure. And so the question is, is there enough back pressure there where you could do basically more of a static rather than a dynamic top kill, where you could put mud in. That might suppress the hydrocarbons.

There's been some discussion about whether or not that might be possible. We're looking for BP to give us an idea of whether or not that it's possible, how they would do it. And we'll react to that when we receive it.

And BP themselves does not have a sense of urgency about moving forward with the process. From [Kent Wells](#):

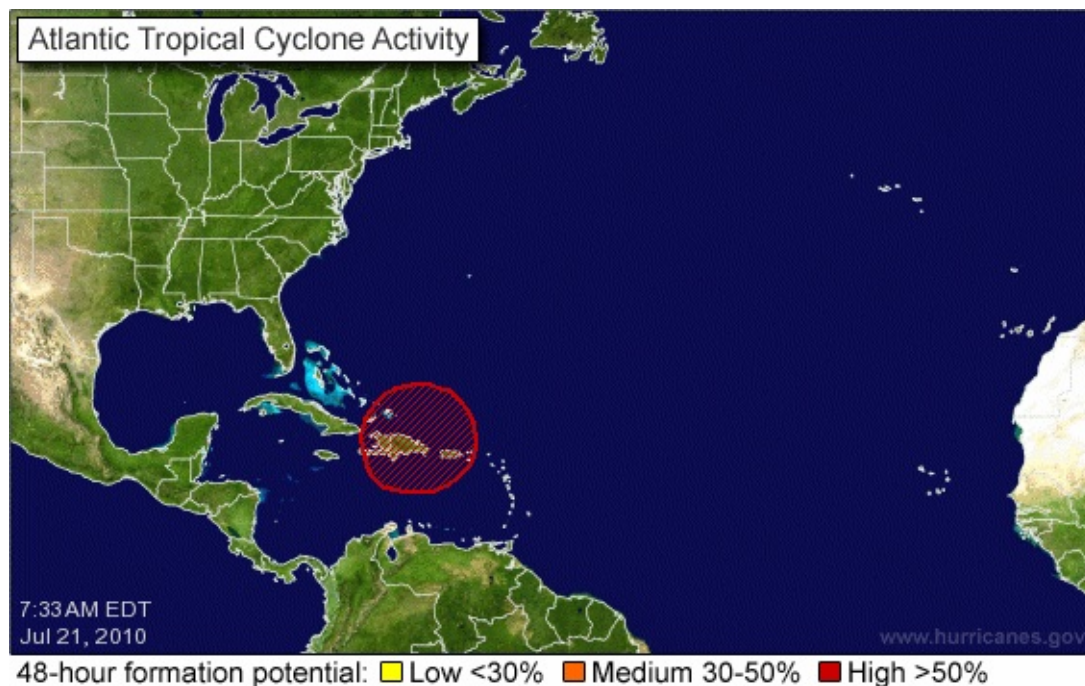
And then in terms of the static kill – and once again, I want to reinforce, no decisions have been made yet on proceeding forward with that. But we are continuing with preparation and planning. We continue to get equipment lined out, what we would want to do, making sure that we will have the right equipment out there to do it, writing procedures, starting to get procedures approved.

At the same time, we're doing testes (sic) with scientists, challenging the way we're thinking about this, what we're doing, so we've got parallel paths going on that's leading towards somewhere ideally in the next day or two that we'd be in position through

He may take a couple of days to make an animation showing how it will work. Essentially however it involves reversing the flow down one of the kill lines (originally set up to allow mud flow into the well) which are now being used to allow oil to flow out of the well and up to a service vessel. From Kent Wells:

Now, one of the things we do need to do is we need to make some changes on the Q4000 to change it from its ability to contain oil and turn it back around into the pumping facility. But that does not take us very long to make that change and of course we'll always have the ability to change back if at some point we need to do that.

It will, likely, take much longer for management to decide whether or not it should proceed. And the weather window continues to shrink.



Oh, and from the Admiral's brief, in case you missed it.

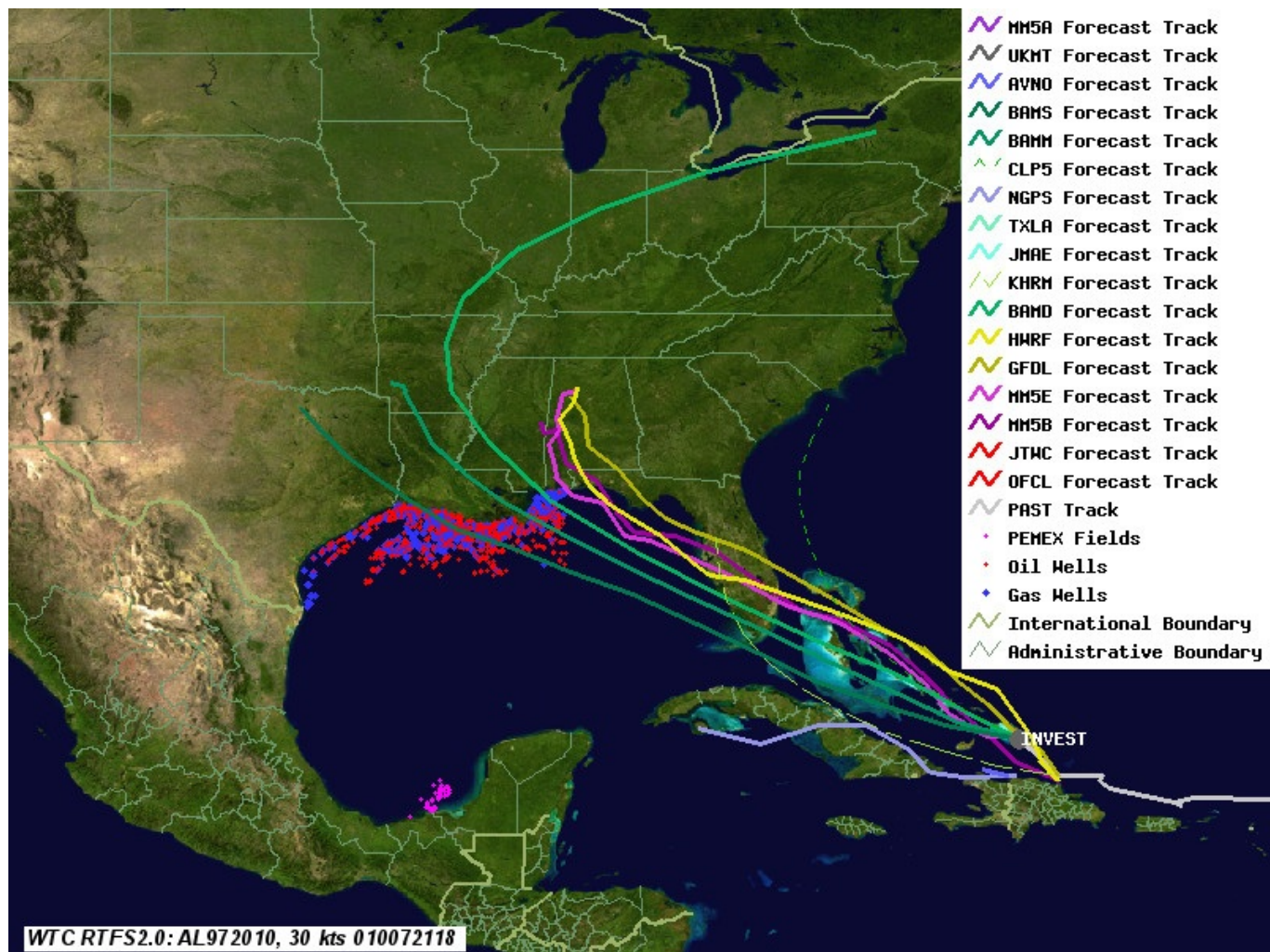
The Discoverer Enterprise is no longer on station.


Chuck Watson's update, 4:00 pm, EDT:

The tropical system just off the northern coast of Hispaniola (Dominican Republic) continues to meander west north west. It is still not well organized, and has not intensified as was forecast previously. In fact, the runs from this afternoon's model barely bring it up to 50 mph or so before Florida landfall.

Forecasts still have it crossing Florida, then brushing the eastern end of Gulf of Mexico production (including the Deepwater Horizon response area) as a minimal tropical storm. While that would be disruptive to cleanup operations, and damaging to protective barriers, a direct hit could ultimately be quite helpful to the cleanup. Vertical mixing offshore would disperse the oil, and if it is a wet system, rain to flush out the wetlands. In addition, the core computer models keep the system just to the east of the most oiled areas - that means strong offshore winds (recall that winds are counter-clockwise around a tropical system in the northern hemisphere), and minimal storm surge, also a "plus" for dealing with the oil.

As for normal operations, if there is fear of development over the Gulf this weekend, companies might shut in some wells and rigs/platforms evacuated as the system passes, causing a brief production hit. No long term impact is expected. That said, keep in mind that the storm is four days out from the area of interest, and although models are tightly grouped at the moment, position errors are large (more like 400 nautical miles for a weak system) and intensity estimates poor this far out (especially after crossing Florida).



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