The Oil Drum
DISCUSSIONS ABOUT ENERGY AND OUR FUTURE

BP's Deepwater Oil Spill - UPDATE: The Cap is Off the Well, ROV Incident, Entering the Old Well, and Open Thread

Posted by Heading Out on June 23, 2010 - 10:00am
Topic: Environment/Sustainability
Tags: deepwater horizon, oil spill, relief well [list all tags]

UPDATE 3 pm: I have looked at the fuller comments that were apparently made at the phone conference this morning about the need to remove the plug from the Blow-Out Preventer (BOP) (sorry I missed it since I was watching MO S&T pass Calgary in the solar car race) and I am not sure that it was necessarily an ROV bumping the cap that closed a valve and caused the problem. For those reading earlier posts I have commented on how, even in fast flows, precipitation can close nozzles, and back on May 12th I posted pictures showing how precipitation can close pipes and nozzles. This blockage may thus have a similar cause, and can, in the short term possibly be remediated best by just pulling the cap to the surface, cleaning it and the feed lines and sending it back down. More at the bottom of the post. (as soon as I can write it).

UPDATE Noon EST: Oil gushing at spill site after vent damaged; Cap removed after sub hits vent; 2 cleanup workers die in separate events. More in comment thread below.

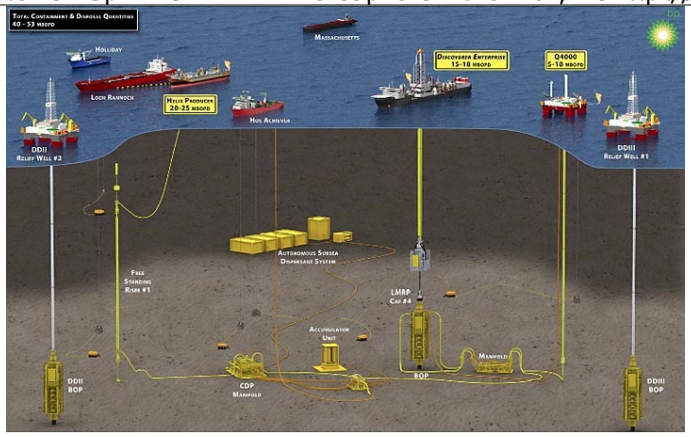
UPDATE 9:15 am The cap has been removed from the BOP - am not sure if they are replacing it with the new model, or if there has been a problem.

As the fleet above the Deepwater Horizon well begins to build, the new daily production total for oil has almost reached 26 kbd.

> For the first 12 hours on June 22 (midnight to noon), approximately 8,195 barrels of oil were collected and approximately 5,045 barrels of oil and 27.2 million cubic feet of natural gas were flared.

On June 21st, total oil recovered was approx. 25,830 barrels:

- approx. 15,560 barrels of oil were collected,
- approx. 10,270 barrels of oil were flared,
- and approx. 52.2 million cubic feet of natural gas were flared.



• The fleet above the well as the collection system begins to change. *Click for larger image*.

This comment thread is being closed. Please comment on http://www.theoildrum.com/node/6650.

UPDATE 3 pm: I have looked at the fuller comments that were apparently made at the phone conference this morning about the need to remove the plug from the Blow-Out Preventer (BOP) (sorry I missed it since I was watching MO S&T pass Calgary in the solar car race) and I am not sure that it was necessarily an ROV bumping the cap that closed a valve and caused the problem. For those reading earlier posts I have commented on how, even in fast flows, precipitation can close nozzles, and back on May 12th I posted pictures showing how precipitation can close pipes and nozzles. This blockage may thus have a similar cause, and can, in the short term possibly be remediated best by just pulling the cap to the surface, cleaning it and the feed lines and sending it back down.

UPDATE Noon EST: Oil gushing at spill site after vent damaged; Cap removed after sub hits vent; 2 cleanup workers die in separate events. More in comment thread below.

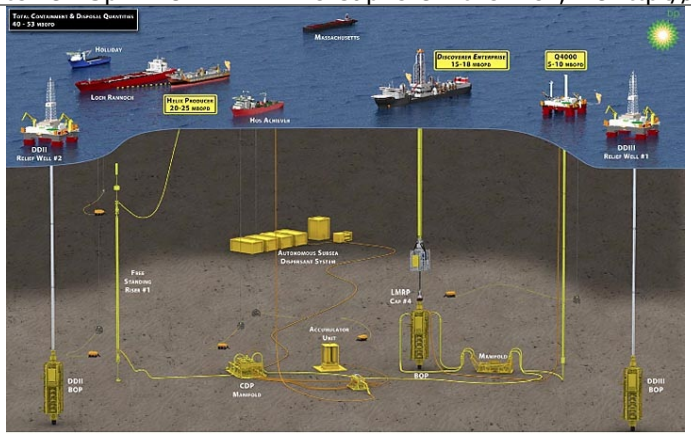
UPDATE 9:15 am The cap has been removed from the BOP - am not sure if they are replacing it with the new model, or if there has been a problem.

As the fleet above the Deepwater Horizon well begins to build, the new daily production total for oil has almost reached 26 kbd.

> For the first 12 hours on June 22 (midnight to noon), approximately 8,195 barrels of oil were collected and approximately 5,045 barrels of oil and 27.2 million cubic feet of natural gas were flared.

On June 21st, total oil recovered was approx. 25,830 barrels:

• approx. 15,560 barrels of oil were collected,
• approx. 10,270 barrels of oil were flared,
• and approx. 52.2 million cubic feet of natural gas were flared.



• The fleet above the well as the collection system begins to change. *Click for larger image*.

The Helix Producer will be collecting oil from the BOP and feeding it to the Loch Rannoch for storage. Note the preparation of underwater dispersant tanks, in case the fleet has to abandon the site due to an approaching hurricane. Speaking of which, the picture of the Gulf hasn't changed much since yesterday, questions on the possibility of a hurricane being formed by the end of next week remain in the air.

BP is giving the money from the sale of the oil to the National Fish and Wildlife Foundation, with the first check (for $5 million) already on its way.

Relief wells

I was asked today why there need to be two different ways of getting into the casing at the bottom of the existing well. And why the relief well had to make a bend to come into contact with the original well at right angles. Well, the reason that this is so, is that the initial intent is to use a milling or drilling tool to go through the steel casing. Now the casing is not that large in diameter, and so the surfaces curve away from the closest point of contact. As a result, if the relief well does not come in so that it is aligned with a diameter of the old well, then it will strike the edge of the casing at a very shallow angle.

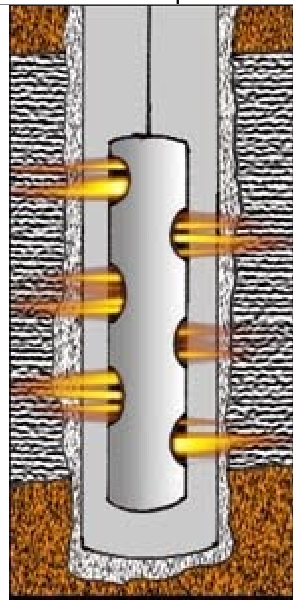
The analogy that I used was to consider that you want to drill a hole through a piece of wood. Normally you set the drill up so that it drills down perpendicular to the wood, and the hole is made. But if the drill was set at a very shallow angle to the wood (say 10 degrees or less) then as you tried to push the drill into the wood, it might bend along the wood surface instead. Push hard enough and you will break the drill bit. Starting a hole in rock is often referred to as "collaring" the hole. In jack-leg drilling, which often occurs on a relatively rough rock surface, the drill bit is held against the rock with one hand, while the other slowly starts the drill, until the "collar" is established. It is very difficult to establish a collar on a very shallow angle, particularly if the drill bit is at the end of a three-mile long piece of pipe.

This is why, if the relief well drill comes up against the side of the casing, and it is not aligned so that it can drill into the old well without glancing off the casing, that the crew has another string to their bow. (And this is taken from an earlier Tech talk on Completing and Perforating a Well)

And this is where Her Majesty's Explosive (HMX) comes in. Small, specially designed, explosive charges, known as shaped charges are now put together into specifically designed charge packages, and lowered down into the well into the completion zone.

Arrangement of shaped charges (the yellow cylinders) – when the explosive goes off the cones collapse and small liquid metal jets shoot out of the open end, through the casing, concrete and into the rock, creating a channel. (Core Labs)

Here they are detonated, sending small jets of metal against the wall of the casing and **perforating** the steel and concrete into the surrounding rock. There is an animation that shows the jet being produced (see also information here).



Representation of shaped charges firing and penetrating the casing, cement and wall (OSHA)

As I have described it, this normally gives the passage for the well to flow out of the rock and into the well bore. In this case it has, instead, opened a path from the relief well into the well, rather than the reverse. It will be through these vents that the high density mud will be injected into the well to start the kill.

ROV Camera View

Looking at the ROV cameras tonight just as I go to post this it seems as though they are starting to hoist the old broken riser to the surface, unless they are examining the riser that is currently coming out of the Enterprise – but this has been embedded in sediment, and so is likely to be the old riser. Seen through Enterprise ROV 1. The flow out of the bottom of the LMRP cap continues to get less. I can now see considerably more of the wall of the cap through Skandi ROV 2 than I have been able to see in the past, because the cloud of oil and gas is diminished.