

BP and Halliburton's Role in the Gulf Oil Disaster-Well Casing Horror Story

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Right from the beginning, it was reported right away- that Halliburton's job was to cement and seal the well casing. But I misunderstood what that meant. I took it to mean that Halliburton's job was to seal the connection between the well-head and the top of the pipe that was drilled 18,000 feet into the ground. Wrong.

Halliburton's job was to seal the well casing. When a well like the Gulf disaster well on BP's Macondo prospect oil field is drilled, they start with a big hole- about 22 inches in diameter. Then, after a few or five thousand feet, they go to a smaller diameter, say 16 inches, then 12 inches, 11 inches, 9 inches. That initial drilling hole is the well casing. It's like a several mile long inverted cone. When the well is completed, they put a heavier duty four inch pipe all the way down the well. That's what the oil is supposed to flow through.

Halliburton's job was to seal the well casing with concrete- all three plus miles of casing, so the four inch pipe was surrounded with concrete. New disclosures make it clear that BP made decisions to cut costs which reduced the safety of the job Haliburton did. A [huffingtonpost.com article reports that, as part of an investigation, congressmen Henry Waxman and Bar Stupak wrote:](#)

Despite warnings from its own engineers, "BP chose the more risky casing option, apparently because the liner option would have cost \$7 to \$10 million more and taken longer," Waxman and Stupak said.

In the brief e-mail, Morel said the company is likely to make last-minute changes in the well.

"We could be running it in 2-3 days, so need a relative quick response. Sorry for the late notice, this has been nightmare well which has everyone all over the place," Morel wrote.

BP apparently rejected advice of a subcontractor, Halliburton Inc., in preparing for a cementing job to close up the well. BP rejected Halliburton's recommendation to use 21 "centralizers" to make sure the casing ran down the center of the well bore. Instead, BP used six centralizers.

In an e-mail on April 16, a BP official involved in the decision explained: "It will take 10 hours to install them. I do not like this." Later that day, another official recognized the risks of proceeding with insufficient centralizers but commented: "who cares, it's done, end of story, will probably be fine."

Now, there is speculation from multiple sources that there were problems with the seal job. [Washingtonblog.com reports](#), using multiple sources and videos, that there is concern

that the casing may have been compromised, causing leaks far below the surface of the sea floor. They report that Cameron international, the manufacturer of the BOP at the top of the wellhead, that was supposed to shut the well, may have broken parts from the casing blocking the BOP from closing. Washingtonblog also reports,

Indeed, loss of integrity in the well itself may explain why BP is drilling its relief wells more than ten thousand feet beneath the leaking pipes on the seafloor (and see this).

Yesterday, recently-retired Shell Oil President John Hofmeister said that the well casing below the sea floor may have been compromised:

[Question] What are the chances that the well casing below the sea floor has been compromised, and that gas and oil are coming up the outside of the well casing, eroding the surrounding soft rock. Could this lead to a catastrophic geological failure, unstoppable even by the relief wells?

John Hofmeister: This is what some people fear has occurred. It is also why the “top kill” process was halted. If the casing is compromised the well is that much more difficult to shut down, including the risk that the relief wells may not be enough. If the relief wells do not result in stopping the flow, the next and drastic step is to implode the well on top of itself, which carries other risks as well.

As noted yesterday in The Engineer magazine, an official from Cameron International – the manufacturer of the blowout preventer for BP’s leaking oil drilling operation – noted that one cause of the failure of the BOP could have been damage to the well bore:

Steel casing or casing hanger could have been ejected from the well and blocked the operation of the rams.

Oil industry expert Rob Caverner believes that the casing might be damaged beneath the sea floor, noting:

The real doomsday scenario here” is if that casing gives up, and it does come through the other strings of pipe. Remember, it is concentric pipe that holds this well together. If it comes into the formation, basically, you’ve got uncontrolled [oil] flow to the sea floor. And that is the doomsday scenario.

Caverner also said BP must “keep the well flowing to minimize oil and gas going out into the formation on the side”

And prominent oil industry insider Matt Simmons believes that the well casing may have been destroyed when the oil rig exploded. Simmons was an energy adviser to President George W. Bush, is an adviser to the Oil Depletion Analysis Centre, and is a member of the National Petroleum Council and the Council on Foreign Relations.

[Business week reports](#) on details from the Waxman-Stupak congressional investigative committee letter,

Well Design Five days before the blast, BP concluded the method to secure the final 1,200 feet of well, called a liner/tieback, was too time-consuming and expensive, the lawmakers said. Using an alternative called a long-string casing would save at least three days and

about \$7 million to \$10 million.

A liner/tieback approach provided multiple barriers to block the flow of gas that could trigger an explosion. The single steel liner had two places to seal the well: at the cement on the bottom of the sea and at the wellhead.

“BP was aware of the risks of the single casing approach,” the lawmakers said.

Centering the Casing

Standard industry practice is to center the well casing to reduce the risk that channels will form in cement, letting gas flow up the well, according to the letter. BP told Halliburton on April 15 it would use six devices called centralizers on the well, while Halliburton’s modeling showed 21 were needed, the lawmakers said.

When an objection was raised, BP’s Morel wrote back that it was too late to get more equipment to the rig: “It’s a vertical hole, so hopefully the pipe stays centralized,” he said.

When 15 units were found in Houston, BP’s well team leader Gregory Walz objected. “It will take 10 hours to install them,”

Walz said, according to the letter. “I do not like this.”

Halliburton account representative Jesse Gagliano ran a computer model using seven centralizers. His April 18 report on the cementing design said the “well is considered to have a severe gas-flow problem,” according to the letter.

Cement Bond

The decision to skip the so-called cement bond log, a test to assess the integrity of the seal, “may have been driven by concerns about expense and time,” the lawmakers said. Conducting the test using a team from Schlumberger Ltd. would have cost \$128,000, while canceling the work was about \$10,000, the lawmakers said.

The committee contacted Gordon Aaker, a failure analysis consultant with Engineering Services LLP in Houston, who said it was “unheard of” not to conduct the test and called BP’s decision “horribly negligent.”

Mud Circulation

The American Petroleum Institute recommends use of weighted mud to fill a well during the drilling process before cementing, the lawmakers said. The process, which can take as long as 12 hours, lets workers test for gas influxes and eliminate debris.

“BP decided to forego this safety step,” Waxman and Stupak said.

Lockdown Sleeve

BP opted against placing a final piece of equipment to hold the well’s casing in place, called a lockdown sleeve, the lawmakers said. The device prevents the casing from floating above the head of the well and letting gases build up.

Both Transocean and Halliburton officials have told committee staff this was a key

procedural mistake, the lawmakers said.

If the casing is broken, as now seems highly likely, attempts to close the well at the top will fail. Leaks from breaks in the casing will just increase. For the same reason, it would not help to stop the well 10,000 feet below. That, it is hypothesized, is why BP is drilling the two wells, as ordered by the Obama administration, all the way down to the bottom of the well.

What we don't know is whether the casing problems were caused by Halliburton, if Halliburton did an incomplete job, not sealing large sections of the well. We now know that Halliburton accepted instructions from BP to use inadequate components- centralizers- to seal the well. That's just one factor that has bubbled up from BP's well of secrecy. When is it the contractor's responsibility, to say no when contracting company gives orders to do a job in an way that they both know is un-safe?

If the oil is leaking through breaks and openings in what we now know to be substandard, cheaper than recommended casing, which is only supposed to be very temporary, that oil could be oozing or gushing from the surface anywhere near the oil field.

Are the robotic mini-sub's searching for such leaks? Has secretive BP found any of these leaks and not reported them? If the oil is leaking through breaks in the casing then that undersea video of gushing oil coming out of the riser pipe atop the BOP, which the world has been focusing on may represent just a tiny portion of the oil that the BP well is leaking.

One geologist, Chris Landau, suggests that if the casing is broken, it will be that much more difficult to ever seal the well and the solution may be to drill MORE wells, to take the pressure off the out of control leaking well. Of course there are risks with every well drilled a mile or more deep. There are other companies besides Halliburton which do casing sealing. But are there enough mega-drilling ships like the sunken Deepwater Horizon? There are not many of these high end, \$600 million plus rigs that take upwards of three years to build, and most are under contract with Oil companies from other nations. There may not be the drilling resources to drill those additional wells.

Last night, my source inside BP sent me this note:

BP [said today](#) that their revised plan would capture up to 53,000 bbl/day of oil by 7/1.

THAT means that they acknowledge that the leak is greater than 53K bbl/day. THAT means that they've measured the flow and have known, probably since day 1, the day to day flow rate.

Further:

BP, which said that further enhancements will increase the collection capacity to as high as 80,000 barrels a day by mid-July, submitted its latest plan after Watson, the federal government's second-in-command for the spill response, told the company Friday its previous plan didn't meet the bill and gave BP a 48-hour deadline to come up with a revised scheme.

THAT means that they think the leak is greater than 53K bbl/day, and maybe up to 80K bbl/day, which would be in line with what a lot of other people in the business are saying.

After all, I think it was in 2008 that [they bragged](#) about their new flow rate measuring ability

(you can Google that).

Of course, these new higher numbers that BP now admits to only reflect the flow from the riser that they are showing. They do not include any oil leaking through the casings, coming to the sea-bed surface at other points 5,000 feet below the surface of the gulf. It would be nice to know whether the coast guard, the Navy or even James Cameron have deployed resources to explore whether there are other leaks. So many questions. Not enough answers. Not enough questions from the Obama administration.

My source inside BP also tells me that there is considerable likelihood that the gas explosion that led to the sinking of the Transocean's Deepwater Horizon drilling rig probably, like air in water pipes, probably shocked and damaged the well casing. In addition, as oil combined with mud rushes through the casing, with pockets of gas sending additional shocks to the casing system, it is likely that further erosion of the casing's structural integrity will occur. This could lead to a total breakdown of the connection of the casing to the BOP at the top, which would lead to an increase in oil flow from the 80-100,000 barrels per day most scientists estimate to 600,000 barrels a day. If the last ditch effort using the pair of deep alternate wells fails to stop the gusher, it is HIGHLY likely that this breakdown of the casing will eventually happen. That's why it's so important to drill additional wells to take pressure off the system, though even that idea is highly speculative.

I've said it before. We are not at war. There should not be secrets. There should not be what seems to be collusion between the government and BP to suppress information, minimize flow estimates and prevent the media from covering this catastrophe. We are facing a disaster that exponentially surpasses anything the USA and perhaps humanity has ever faced. It will require that President Obama and both parties in congress rise to new levels of leadership, ones that transcend partisanism. That's a non-technological challenge that may be even more difficult than the technological ones we face.

Pray that our leaders find the capacity to lead and meet challenges unlike even war presidents have faced. There have been movies about presidents failing to lead when facing apocalyptic challenges. This is the real thing. It may not destroy the world, but it could destroy the world as we know it.

But this is not a job just for Obama or the congress. All of the people of the US and the world must take action, raise their voices and rise to this challenge.

Tonight, Obama will be speaking from the Oval office. There's a test he must pass- telling the people of the world the truth that there may not be a way to stop this well- that it could gush for years. If he tries to peddle a narrative that we WILL plug this hole, he will not be telling the truth, will be attempting to sugar coat just how bad things are. We don't need that. We need truth. That is the ultimate test of his address this evening.

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