



BP's Deepwater Oil Spill - The Riser is Cut, Seating the "Containment Cap," and Thurs. Open Thread 1

Posted by [Heading Out](#) on June 3, 2010 - 7:15am

Topic: [Environment/Sustainability](#)

Tags: [blowout preventer](#), [deepwater horizon](#), [lmrp](#), [oil spill](#), [shears](#) [[list all tags](#)]

Please transfer discussion to <http://www.theoil Drum.com/node/6558>.

It may be necessary to copy over some old comments, if an important discussion was started that could not be continued.

Previous thread introduction has been moved below the fold.

Please transfer discussion to <http://www.theoil Drum.com/node/6562>.

It may be necessary to copy over some old comments, if an important discussion was started that could not be continued.

Previous thread introduction has been moved below the fold.

This is a repeat of the earlier post, but see that updates have been added throughout the day both on top and under the fold--we kept the same post/information in one place since we are running through three comment threads or so a day.

(To learn more about the technical basics of LMRP, please go to this post: <http://www.theoil Drum.com/node/6531>)

There has been a lot of activity at the bottom of the Gulf, not all of it immediately successful, but all working toward the current aim of being able to field the Lower Marine Riser package. That installation requires that the broken existing riser that connects to the Blowout Preventer (BOP) has to be removed. The bent riser has been exerting some lateral pressure on the BOP, and this might be relieved when it is cut off. To minimize the damage, the first cut is therefore going to be further down the riser, [provided that they get the saw "unstuck,"](#) which it seems like [they might have done,](#) but no word yet on when cutting is to resume.

UPDATE: 5 pm Wednesday: I have added new material explaining how the diamond wire blunted, and how they might have fixed it, but now won't. They are going back to the Shear.)

UPDATE: 1 am Thursday: New plan. [They are going to go with the big shears instead of the diamond saw for the cut.](#) I have been intermittently watching for the past couple of hours, while doing something else - they were prepping the Shear, and I think reconnecting the power lines from the Shear to the power pack. Now, I believe that they are lowering the ensemble to the riser on CNN.

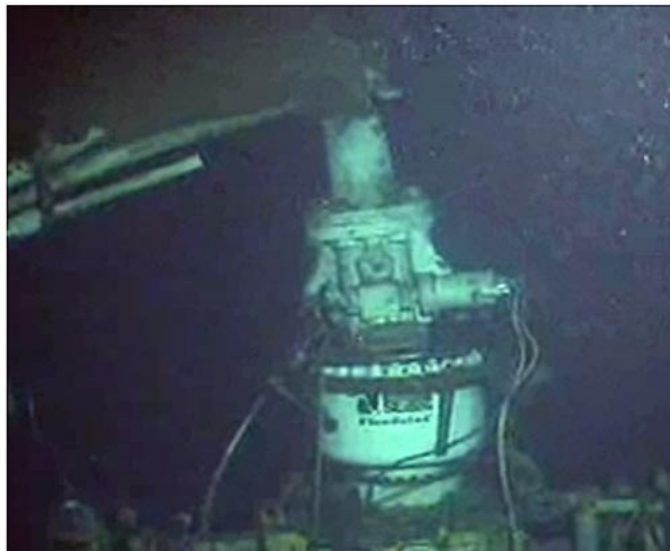
UPDATE: 10:30am: [The riser is cut](#), now on to the Top Hat/LMRP/"containment cap," or whatever they're calling it now, seating.

(My post continues after the video. Please click, "There's more".)

VIDEO BELOW FOLD

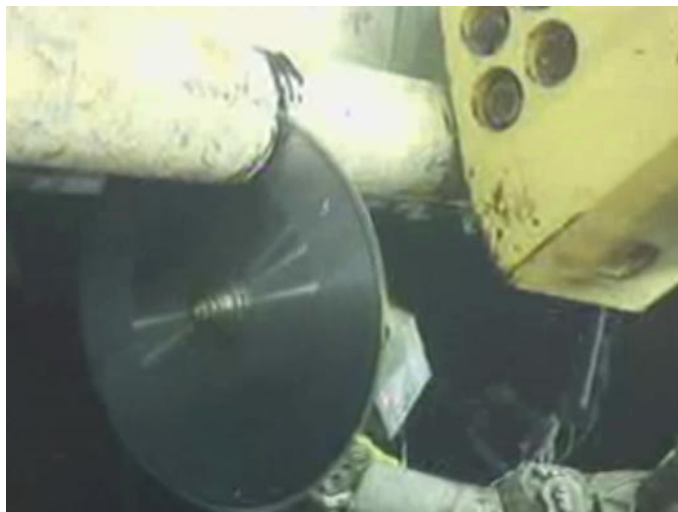
<http://www.cnn.com/video/flashLive/live.html?stream=3>

<http://www.cnn.com/video/flashLive/live.html?stream=stream/3&hpt=T1>



The Lower Riser Assembly attached to the top of the BOP, the riser has folded over to the left.

I described the plan of attack in [an earlier post](#), and what has happened, over the course of today has tried to follow that script. I say tried, because there have been a couple of glitches that developed over the course of the day. The large shearing machine (apparently [owned by BTI](#)) appeared on the scene, and in preparation for its use some of the pipes surrounding the main riser (the choke and kill lines) were first cut away using a diamond saw.

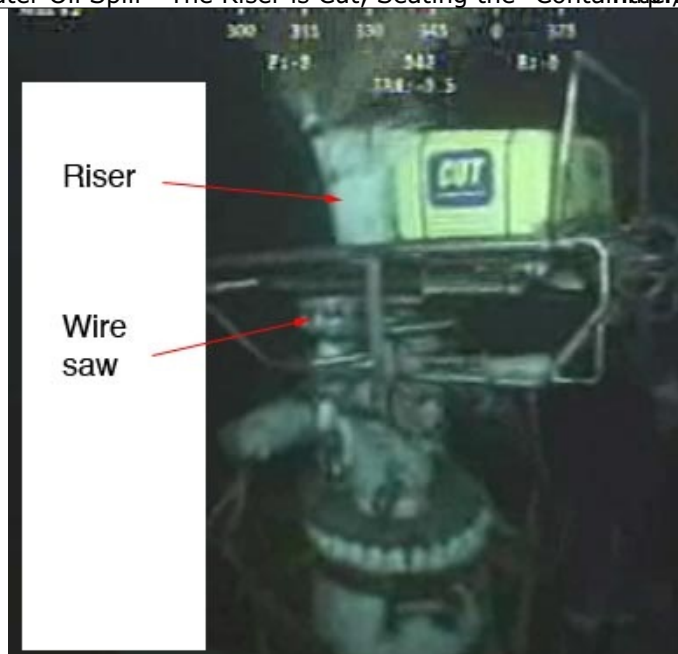


10:04 am just before the pipe was severed.

At the same time that this was going on, the wire saw that would make the final cut on the riser had been brought down to the site. The riser assembly has been cleaned of extraneous pipes already, and the wire saw would fit about the flange and below the bend.

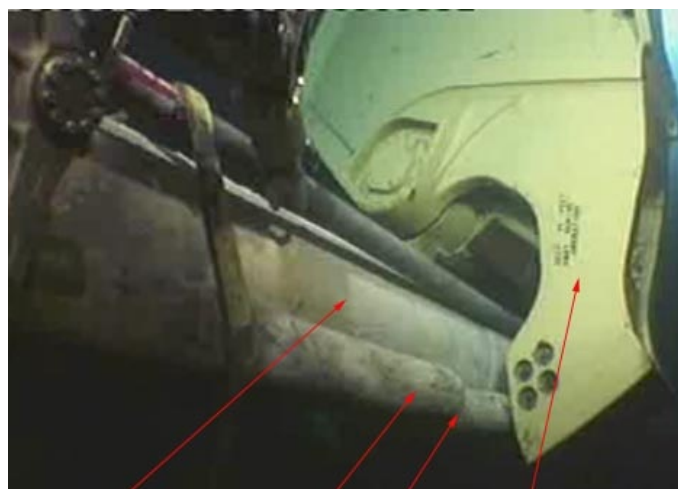


The wire saw was then located ready to make the cut.



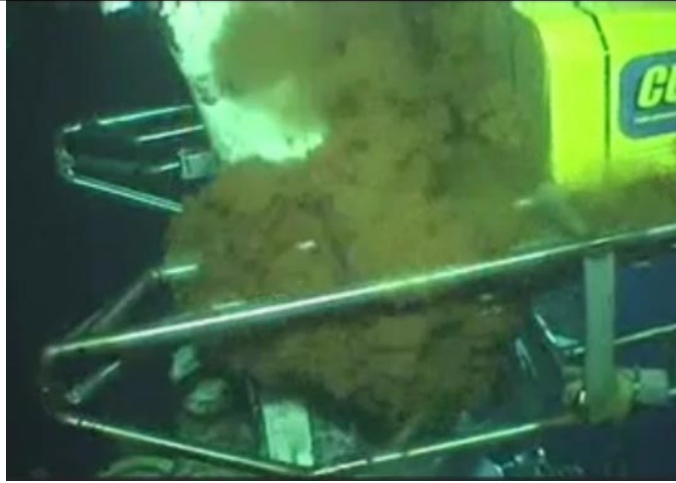
10:30 am Wire saw on riser

It was now time for the shearing machine (which I'm going to call a Shear from now on) to fit around the riser and to make the first cut through the pipe.



First shear location

Unfortunately the first cut did not appear successful, although there was a cloud of oil and gas released, indicating that the riser was at least breached. There was a pause, and the Shear moved to a new location closer to the riser. Again it tried to shear through the nest of pipes, that now included choke and kill lines. It was not successful, and returned to the surface where it was fixed, and returned to the site. UPDATE 1: Having written this post and not seeing much happening I went off for a couple of hours. On my return (and before Gail posted it), I did not check again and as the notes below show, the Shear worked at 7 pm. At 10:15 pm the wire saw was cutting through the riser. I apologize for the errors.



Wire sawing the riser.

END of UPDATE 1 UPDATE 2 below> In the meanwhile, a little calculation, based on reports that the [White House](#) has announced that the removal of the riser and drill pipe that are protruding from the Blowout Preventer (BOP) of the Deepwater Horizon well in the Gulf may increase the amount of the petroleum leak by 20% when the riser section is removed. There are two immediately obvious reasons why this might be the case.

The first of these is that there is a small amount of oil that was leaking up through the drill pipe that extended beyond the broken riser. That flow was one of the first things capped in the remedial effort. It did not have much impact on the overall flow volume, since the flow merely backed up and increased the flow through the main crack in the riser, but there may be a small increment of flow when this channel is re-opened with the cut below the fold in the riser.

The greater change in the flow, however, will likely come because the riser and DP, while not providing much increased resistance, did raise the pressure on the downstream side of the BOP by about 500 psi. We know that though the pressure down at the formation was at around [12,000 psi](#), up on the upstream side of the BOP it fluctuates in the 8,000 to 9,000 psi range. The higher resistance on the downstream side, reduces the pressure drop across the BOP by that 500 psi, and the flow rate will be reduced accordingly (the gap size through the BOP is assumed not to change).

However, if the pressure drop across the nozzle was at 6,000 psi in the current condition, (which with an orifice size of 0.6 inches, would give a flow rate of 512 gpm), then raising the pressure drop by 500 psi would only increase the flow rate to 532 gpm, or a difference of 4%--which might suggest that there is something about the drill-pipe flow that was initially capped which we don't know yet. Alternately it may be that they think that removing the bend in the riser might ease the forces on the BOP, relaxing the metal a little and increasing the orifice size. After all it has only to open up by another 0.05 inches to give the increase in flow that the White House are predicting.

UPDATE 2: Sometime about midnight it appears that the cutting wire stopped moving and may be jammed in the cut, roughly half-way through.



Possibly jammed wire at 12:30 am

UPDATE 3 I went to bed and have just checked the comments and it does not appear, at 8:00 am that the saw restarted, and finished cutting the riser. At present the ROV is looking at the end of the riser, and the Shear. Oil and gas from the cut seems to be coming up around the end making it indistinct. Does anyone have a better version of what went on overnight?

UPDATE 4: On other feeds they are showing that a second cut is now being made by the wire saw, but the camera is further away. BP is predicting that the cut will be completed today and the LMRP installed. But it doesn't look good that they are still working with the Shear, because they can't use that for a final cut, and it implies that they may be having problems with the second cut also.

UPDATE 5: Part of the problem was [apparently according to a BP spokesman](#) that the cut through the first half had dulled the blade, so that when they got it restarted it would not cut. (What we do in those circumstances, which are not uncommon with diamond blades, is to run the blade through firebrick, and this erodes the material into which the diamonds have been pushed, and sharpen it. Then we drop the cutting pressure a little.) However, BP's current answer is going to be

The technician said that rather than trying again with the saw, the plan now was to use a large shear to cut the riser. The shear, which is about 20 feet long and nearly 10 feet high, was used to make an earlier cut in the riser about 50 feet from the wellhead. Because the shear will not make as clean a cut as the wire saw, modifications would have to be made to the containment cap that is to be lowered over the cut pipe. But the technician said that even with the switch to the shear and the modifications, he expected the containment cap could be in place by Thursday.

Oh, and I mentioned earlier that an ASJ system had cut through casing and pipes at the bottom of the North Sea. I had the orientation of that cut wrong (at least for the picture below) since in this case it was from the outside in, but I am aware of it being successful the other way. And so here is the picture of casing and cement cut by an ASJ. Sadly it was so long ago - around 23 years, that I can no longer remember exactly the pressure it was cut at, but I believe it was 5,000 psi. And to answer a comment because the nozzle is non-contact, the surfaces it is cutting don't have to be cylindrical.



ASJ cuts of casing from the bottom of the North Sea



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