Testimony indicates poor cementing of drilling rigs is a widespread problem

Mark Seibel, McClatchy Newspapers, 11-10-10

WASHINGTON -- Drilling engineers and government officials are almost lackadaisical in their approach to the critical steps of closing down an offshore oil drilling rig and sealing it, two days of testimony before a presidential commission investigating the explosion of BP's Deepwater Horizon drilling rig indicate.

In testimony that concluded Tuesday, government officials, representatives of the companies drilling the well and outside engineers all testified to shortfalls that showed that the critical task of sealing the well with cement was filled with missteps and what commission co-chairman Bob Graham called "a series of almost inexplicable failures."

More significantly, however, the panel's deputy legal counsel, Sam Sankar, used the two days of detailed questioning to suggest that the failings aboard the Deepwater Horizon rig were not a one-time event but the result of lax oversight, inadequate regulation and inattention to detail that may exist on all deepwater drilling operations.

William K. Reilly, the panel's other co-chairman, said regretfully that he had reached the same conclusion. "It is a systemic problem," he said.

Those conclusions are likely to influence the commission's final report, which is intended to both explain what happened in the Deepwater Horizon case and propose regulations to ensure that a similar disaster doesn't take place in the future.

One example of the problems that emerged Tuesday was illustrated on BP's drilling application for the Deepwater Horizon well in the Gulf of Mexico, which Sankar said called for using only a fraction of the cement needed to seal such a well. That fact didn't trigger any questions from government engineers who approved the plan.

It was during those last phases of drilling that the Deepwater Horizon well exploded April 20, killing 11 rig workers and setting off a torrent of oil that caused billions of dollars in environmental and economic damage.

Investigators now think that the cement intended to seal the well failed and that crude oil and natural gas surged up the Deepwater Horizon's drilling pipe when the rig's crew began to remove heavy drilling mud and then replaced it with lighter seawater.

Sankar painstakingly built a case that while cementing - pouring a cement mixture into a well to block hydrocarbons from entering the pipe and the open areas surrounding it - is the most important guarantee that a well won't explode, it's often not the focus of intense engineering attention.

Worse, the operation, undertaken at the very end of a drilling job that has lasted months, often is overseen by engineers and crews who already are focused on their next assignment, not the one they're completing.

"There's a tendency for engineers to move on to the next thing," Steve Lewis, a drilling engineer for Seldovia Marine Services, which had no role in the Deepwater Horizon well, said in response to Sankar's questioning.

Lewis added that in his experience, both engineers and the rig crews on offshore rigs tend "to lose focus" as they near the end of a job.

"Vigilance tapers off at the end of the process," he said. "Temporary abandonment" - the phase the Deepwater Horizon was in - "deserves as much attention as all other aspects" of drilling a well.

In the Deepwater Horizon incident, this lack of vigilance, the testimony showed, led to a number of actions that seemed to defy best practices.

According to the testimony:

-Halliburton, the company contracted to cement the Deepwater Horizon well, began pouring the cement before tests were complete that would show whether the mixture it was using would produce a stable seal.

Projecting Halliburton's testing form on a screen in the hearing room, Sankar noted that the test had begun on April 18 and that the test takes 48 hours. But Halliburton already had begun pouring the cement before the test would have been complete.

The test was critical, because three previous tests of the cementing mixture had shown it would be unstable.

"Perhaps someone will explain to us why you didn't wait for the test results," Graham asked in his concluding remarks Monday.

-Halliburton failed to highlight in its earlier reports to BP that it believed BP's well design would allow hydrocarbons to seep into the well and didn't tell BP explicitly that tests on the cement it planned to use at the well had shown that it would not work.

Halliburton's cementing manager for the Gulf of Mexico, Richard Vargo, said Monday that BP should have understood from the March 8 report that Halliburton foresaw problems. Sankar responded by displaying copies of the Halliburton report and asking if a small green shading on a graphic of one page of the report was the information BP should have detected.

He then asked Vargo on what page that graphic appeared. When Vargo demurred, Sankar blew the page number up on the screen - 23.

-BP and Transocean, which BP had hired to drill the well, began removing heavy drilling mud from the Deepwater Horizon's drill pipe only hours after Halliburton completed the cementing job. But Sankar, in a question he put to both Halliburton's Vargo and BP's Mark Bly, who oversaw BP's internal investigation of the explosion, sought to show that the removal was premature. He asked if they didn't agree that it took 48 hours to determine if cement in a well was going to hold. Both agreed.

Sankar continued his emphasis on a lack of attention to cementing in his questioning of Walter Cruickshank, the deputy director of the agency that oversees offshore drilling, now known as the Bureau of Ocean Energy Management, Regulation and Enforcement. It was called the Minerals Management Service at the time of the Deepwater Horizon explosion.

Displaying BP's application, Sankar noted that it showed that BP planned to use 150 cubic feet of cement - an amount he said was equal to 26 barrels or 1,092 gallons - to close the well, even though federal regulations

would seem to require more. In the end, Halliburton used 60 barrels; Sankar said BP had characterized even that amount as low.

Sankar also noted that there was nothing in federal regulations that specified what sort of cement should be used to close a well or how that cement should be tested.

Finally, Sankar asked Cruickshank what MMS had done about a study it had undertaken in 2007 that showed poor cementing as the reason for a huge number of well blowouts.

Cruickshank said MMS had brought the study to the attention of the American Petroleum Institute, a lobbying organization for large oil companies, and "discussed the need for better standards." Cruickshank said API put together a committee and came up with those standards, which MMS implemented in May - a month after the Deepwater Horizon exploded.