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Panel Suggests Signs of Trouble Before Rig Explosion

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In the hours before the Deepwater Horizon oil rig exploded last month in the Gulf of Mexico, there were strong warning signs that something was terribly wrong with the well, according to a Congressional committee that was briefed on the accident by executives from [BP](#).

Among the red flags, the panel said, were several equipment readings suggesting that gas was bubbling into the well, a potential sign of an impending blowout. Investigators also noted "other events in the 24 hours before the explosion that require further inquiry," including a critical decision to replace heavy mud in the pipe rising from the seabed with seawater, possibly increasing the risk of an explosion.

The new information, released Tuesday night in a memorandum addressed to members of the House Committee on Energy and Commerce, confirmed many of the committee's own findings from a review of documents and from statements and testimony given at Congressional hearings over the last two weeks.

The memorandum provides the most detailed accounting of the events and decisions made aboard the Deepwater Horizon before the accident on April 20 that took 11 lives and caused a so-far unchecked torrent of oil to pour into the gulf, and comes as BP prepared an ambitious "top kill" procedure in a new effort to stop the leak.

The findings are preliminary, and most come from BP, which owns the lease on the well and has at hearings pointed fingers at other companies for the problems on the rig, including [Transocean](#), the rig's owner. In a statement late Monday, Tony Hayward, BP's chief executive, said, "A number of companies are involved, including BP, and it is simply too early — and not up to us — to say who is at fault."

Although one-sided, the account of procedural and equipment failures offers one road map for

federal investigators as they try to determine who is ultimately responsible for the accident. As part of the investigation, they are also looking at the role of regulatory agencies.

Some of those who survived the explosion, including managers from BP and Transocean, are expected to testify at hearings in Louisiana to be held by the Coast Guard and the federal [Minerals Management Service](#), beginning Wednesday.

The testimony may help clear up some of the uncertainties about the day of the accident, including who was making the decisions. But the new information from BP — combined with past testimony by executives, analysis of documents by The New York Times and interviews with independent drilling experts — is beginning to paint a picture of a complex operation that went awry just as it was drawing to a close.

Drilling logs from the Deepwater Horizon suggest that shortly after midnight on the morning of the explosion, attention had turned to temporarily plugging and capping the well so the rig could disconnect and move to another job. [Halliburton](#), the contractor hired by BP to provide cementing services, had spent the past several weeks cementing each new segment of the well into place. Halliburton was also responsible for plugging it.

BP and Congressional investigators have raised questions about the cementing, suggesting that the seal might have been faulty and failed to keep gas from rising up in the well. According to BP, the cement work took longer than normal, and there were concerns that the quality of the cement might have been compromised by contamination with mud.

However, in testimony before Congressional hearings, Halliburton executives have said that the company adhered strictly to the specifications provided by BP for the cementing of the well.

BP's investigation, the memorandum said, also indicated that there might have been problems with the blowout preventer — the stack of valves and rams on the seafloor designed to seal off the well in the event of an emergency — at least five hours before the explosion. A sharp fall in fluid levels in the riser pipe that connects the well to the rig suggested that one of the seals in the preventer was leaking.

The memo from the House committee, which is led by Representative [Henry A. Waxman](#), Democrat of California, also shed more light on a series of important tests conducted that day to determine whether the cement was holding. Two hours before the explosion, an early pressure test was performed incorrectly and produced unacceptable results. The test was repeated and there was an “indicator of a very large abnormality,” BP's investigator told the committee, adding that workers might have made a “fundamental mistake” in ignoring it. Shortly before 8 p.m., two hours before the explosion, workers were “satisfied” that the test was

successful, according to BP's investigation.

The decision was then made to begin withdrawing the drilling mud, a cocktail of clay, water and minerals used to keep downward pressure on the powerful fountain of oil and gas trying to push its way up out of the tapped reservoir.

Philip W. Johnson, an engineering professor at the [University of Alabama](#) and a specialist in petroleum engineering, said in an e-mail message that with normal pressure test readings indicating a good seal on the casing and the temporary cement plug, it is not unusual to displace the mud with seawater before the cement job is finished to get a cleaner surface for the cement to adhere to. "But without a good pressure test, it would be reckless to displace," he said.

Congressional investigators and news accounts have suggested that the decision to begin removing drilling mud was a subject of intense discussion — and perhaps even disagreement — among engineers working on the rig that day.

Executives from both Transocean and BP have said in testimony before Congress that they were unfamiliar with the details of that debate. But the hearings this week in Louisiana — which will include testimony from the top managers on the rig from BP and Transocean — may provide a clearer picture of the day's deliberations.

In the final hour before the explosion, after the crew had begun withdrawing the mud, there were more signs that the well was going out of control, the memo said. They included a sharp increase in fluid coming from the well, even when the pumps were shut down — an indication, drilling experts say, of a "kick," a surge in pressure from oil and gas deep down in the well. If not controlled, such a kick can lead to a full-scale blowout, and that is exactly what happened at roughly 9:49 p.m.