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Exhibit No. ______

Worldwide Court Reporters, Inc.

Transcript of the Testimony of **111208beck**

Date: December 8, 2011
Volume: I

Case: TRANSCRIPT OF G. BECK PRESENTATION

Printed On: December 9, 2011

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TRANSCRIPT OF G. BECK PRESENTATION
RE U.S. OFFSHORE OIL EXPLORATION

February 11, 2011

MR. BECK: Good afternoon. I feel like I
drew the short straw just a little bit, being
right after the keynote lunch address. But I'll
do my best to make a few points for you today.
18:12:30 Hopefully, I can get the projector running in
the right direction, too.

I'm going to come today -- this one?
This one? Okay.

I'm going to come today from a
18:12:41 perspective of a drilling engineer. Although
I'm at Texas A & M right now, I really had just
ended or coming out of about a 25-year career in
the oil industry as a drilling engineer and
operations manager, some things that I still do.
18:12:59 And I've spent quite a bit of time, of course,
looking curiously over what happened on the
Deepwater Horizon incident and how such a thing
could happen. And, you know, where did it go
wrong I think is obviously one of the key
18:13:14 questions we're still studying. Those answers
are still out. But I do want to -- I do want to
share some thoughts, you know, specifically
about the blowout and, you know, where it leads
us in terms of future technology and some

thoughts I have on that and the regulatory environment, which I think is going to be critical going forward.

I think one comment I would like to
18:13:38 make regarding the Director's comments, I do not see the Deepwater Horizon incident as a one-in-a-million incident. I don't believe that. I think with the way the blowout occurre that there are probably many other opportunities
18:13:57 for similar events to occur and that we're going to have to be very, very thoughtful going forward to make sure that we design those opportunities out of our drilling sequence.

So with that in mind, drilling
18:14:15 engineers by nature are simplistic because a lot of times what we do is so complex we have to simplify it to get our arms around it.

Looking at a failure -- okay -- looking at a failure like the Macondo well, usually in
18:14:30 my mind you see three components to a failure. One of them would be a design. And I'm talking about design of specific equipment or materials that did not meet or function under the conditions that they were either foreseen to

function under -- or designed to function under because those conditions were different than what was foreseen, or, you know, errors in the design.

Another critical parameter is a flaw in the process. And the process would be how do you assemble the plan and the sequencing for going through a very complex operation like drilling a deep high-pressure/high-temperature well, and particularly complex if you're doing that in a deep water environment.

And then finally there's a possible human error component which quite often is very big.

Now, when you look at this simple diagram, the mirror image of this diagram are the components to success. All right? What are the components of success? A good design, good product that you're using, a good process that you're using to assemble this -- the products. And then, of course, execution, right? Flawless execution. And so those things are -- are pretty critical.

And what I want to do is take a look in

terms of those simple concepts at what, you know, apparently went wrong, I think, on this well. And then how do we go to build, you know, our practices going forward to try to keep this from going wrong again.

Okay. First off -- and this one has been overlooked and maybe not stated as clearly as I'm stating it right now. Okay? The float equipment failed in the well. To me, that's very, very obvious as a drilling person, the float equipment failed. If the well blew out up the casing, the float equipment is there as a barrier it failed.

Why did that happen? Is there a design flaw in that float equipment? Okay? Were there process flaws that were involved in the selection of that particular piece of float equipment? Right? Did something go wrong there or was there simply a human error in the installation of that float equipment that kept it from working properly?

When the float valves in the shoe track don't work following a cement job, that is not a good situation. And it's even worse when it goes unrecognized, which is apparently what happened in this well. So there's one barrier compromise. Did it cause the incident? No. It's the kick-start to the incident right there.

18:22:46 The second one that I have listed here, okay, a barrier was removed without having another tested barrier in place. Now, throughout my career, that's how I was taught or what I was taught to not do, right? I mean, one 18:23:02 of the failsafe practices and processes that we have to follow as a drilling engineer is to make sure that if you remove a barrier from a well, there's another barrier in place before you remove it. That's a process that you have to 18:23:18 follow to make sure that that works right, and that clearly failed in the Macondo. And that one is a pure process error. The sequencing of removing the drilling mud from the well and putting seawater in place was wrong and that's a 18:23:37 very severe flaw.

Now, as I'm going to show in a little while, these are -- these are issues -- when you start having process issues, these are issues that at some point the regulatory assistance or agencies have to come in and help prevent these types of process flaws.

When that happened, when the drilling mud begins to be removed, okay, you've already 18:24:01 compromised one barrier in the float equipment. You take the drilling mud out of the well, the last barrier in the well becomes the blowout preventers.

Now, another major failure, the kick 18:24:15 detection in the well failed. Okay? An ounce of prevention is worth a pound of cure. The industry is taught, drilling people are taught, identify kicks early, keep them small. You can handle them, you don't have to deal with high 18:24:29 pressures when you're doing that, or much lower pressures.

What happened with the kick detection? A major, major piece of the incident that allowed the whole process to escalate quite 18:24:43 quickly from a situation where the well could be underbalanced and flow to where it was underbalanced and began flowing. And I think that the magnitude or the lack of kick detection that allowed the incident to go on for so long before any attempt was made to control it is probably integral to the failure of the BOPs as well, because the BOPs were then asked to start performing in conditions that were very, very severe. And I'll talk about that again, of course, in a second.

And then finally the BOPs failed. From my perspective as a drilling engineer and a man that's been on the rig as the company man and has had people working for me, you know, that I've known for years as company men, that's a very terrifying thought to have a BOP fail on you because that is your failsafe.

So my question really is what happened with the BOPs? I don't know that answer yet. I haven't seen any study outcome of what happened with the BOPs. But it's a very, very worrisome function topic that you went to function the BOPs and they didn't work. Okay?

And, of course, in that system, okay, is there a design flaw? We need to know that. Is there a fundamental design flaw in the way the BOPs were thought out that doesn't work in deep water subsea environments.

Okay. Was there a process flaw? Were there process flaws in the way those BOPs were tested? You know, are we testing our BOP's correctly? And that's a comment I'll address
18:26:21 further in a just a second.

And then, of course, finally is there a human error component? And I would say in both of the cases of the kick detection and the BOPs, the kick detection, I think primarily human
18:26:34 error and process error, probably equal amounts of both of those. Okay? But with the BOPs, I think design and process are probably the two key points of those failures.

Of course, what happened now is
18:26:48 multiple successive failures -- and people said this from day one of the blowout -- this wasn't one thing that went wrong. There were multiple successive failures that led to this disaster. And these were the four, you know, successive
18:27:01 failures that happened in my mind. And this is not an overly complex set of conditions that led to the blowout. This is -- this is actually a fairly simple explanation of what went on that led to the blowout other than the BOP failure.

Okay?

But if you look at it, there are design flaws, there are process flaws and there's human error every step of the way that let us get to

18:27:29 the point of the blowout.

Now, jumping ahead we want to address the technical challenges. Without listing, you know, 25 or 30 technical challenges, I just -- I just wanted to talk about one, the blowout

18:27:49 preventer. And the one question I have on the blowout preventer stack, you know, is a subsea blowout preventer or the systems that we use today, are they suitable for drilling in frontier deepwater environments like we're going

18:28:05 to ask them to do? Okay?

Well, this gets into how do you know. Well, the way to know is to test. Well, how are we testing our BOPs? Traditionally, BOPs, of course, are not tested to failure. They're

18:28:21 tested to success, right? They're tested to a working pressure, because if you tested them to success, you'd never be able to drill, you'd be always repairing them.

There has to be a point in time, of

course, that we subject these BOP systems to more rigorous tests to failure so that we understand the long-term implications of a successful pressure test. Okay? And we can't 18:28:42 just do that at surface conditions, you know, in a shop in Houston. We're going to have to come up with a way of testing these BOP systems in conditions of pressure and temperature that they're going to be functioning at at the sea 18:29:00 floor. That is a huge challenge, of course, because how do you go create conditions of 35 or 40 degrees in 2 to 5,000 psi of pressure? To have a physical facility to do that is a challenge. But I think that's one thing that we 18:29:19 are going to have to do as a group is come up with a way of getting the subsurface equipment tested under the conditions that it's going to function at. And then I think we need to rethink our entire testing program so that when 18:29:33 you do a function test on a BOP or a pressure test on a BOP at the field level, you have some good idea of what the meaning of that test is.

How many more times is it going to function successfully? For how long a period of

time is that pressure test going to be
applicable? Okay? So that's one of the main
thoughts and technical challenges, and this is a
huge technical challenge to come up with a
18:30:03 system to be able to test these -- this
equipment like that.

The thought concurrent with that goes
back to the overall planning process on a well.
You know, a blowout preventer is a failsafe.
18:30:17 But if you hook a 15,000 psi blowout preventer
up to a 5,000 psi rated piece of casing right
below it, it doesn't do you a whole lot of good
to have a 15,000 psi blowout preventer. And
then when you subsequently test that blowout
18:30:29 preventer to 5,000 psi because that's the rating
of your casing, you're actually in my mind
diminishing the functionality of that blowout
preventer. Okay? They need to be tested to
their working pressure over and over and over
18:30:42 and I don't think we have good systems in place
in the field, okay? In the way we drill these
wells, that's an impossibility to do with the
way the subsea wellheads are built. And I think
we need to make some modifications to those.

18:31:10 But a blowout preventer is part of a big system, the entire well plan. And the entire well plan has to be assembled in a manner that allows a plan to work to contain the formation pressures that are being encountered. It's not just the cap on the well, it's the entire well.

Regulatory challenges. What are the regulatory challenges? Okay, if you look at the 18:31:26 three things I mentioned -- design flaws, process flaws and human error -- that could be rapidly translated to testing policies and processes to help with design flaws, operational policies, practices and guidelines for process 18:31:42 flaws and then training requirements and certifications for human error.

But I think one of the biggest challenges for our regulatory agency is going to be able to staff themselves with people that 18:31:56 have similar skillsets to the people they're regulating. That's going to be very, very hard to do, but I think that's going to be critical.

And a conclusion slide. You know, one question, can deep water exploratory wells be safely drilled? Yes, we've done it. Okay? There are a number of people sitting in the room saying I do this every day. Is it 100 percent? No, I don't think so. I think there are people

18:32:25 out there that don't have the capacity to do it safely well after well after well. And I think that we're going to have to work with the government, with regulatory agencies, to get the reliabilities in our designs and our processes

18:32:41 and in our people up to speed to make sure something like this never happens again.

Thank you very much.

(End of presentation.)

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MARGARET M. KRUSE, being first administered an oath, says that she is a court reporter doing business in the City of Chicago; and that she reported in shorthand the proceedings of said hearing, and that the foregoing is a true and correct transcript of her shorthand notes so taken as aforesaid, and contains the proceedings given at said hearing.

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