Introduction

Good morning, ladies and gentlemen. My name is Jim Watson, the director of the Bureau of Safety and Environmental Enforcement at the Department of the Interior. and It's my pleasure this morning to introduce the Secretary of the Interior, Secretary Ken Salazar. And I just want to say a few words about his leadership; in my experience, working with the Department of Interior, which actually began in the relationship we had during the Deep Water Horizon disaster. As a Coast Guard officer at the time, I was very involved with the response, but needless to say, we needed leadership at the very top of the Department of the Interior in actually solving this problem. Otherwise, it was going to be a long, long clean-up.

The secretary came to town in New Orleans where I was. He is definitely a take charge guy. He initiated the investigation, initiated a series of fundamental improvements based on analysis, based on scientific work done not just by his own departments, not just by the U.S. Government, but using all of the resources that we have as a nation and that we have as a cooperative community of people working in the offshore.

So, Today, we are going to focus on just one element that came out of the many studies that have occurred, and the analysis that has been done, and build on improvements that have already been made but Recognizing we are not finished, that we are going to need to continue to tap the talent, continue to tap the engineering skills, and drilling in the offshore is going to continue to be more challenging in the future than it has been in the past. And So I want to bring Secretary Ken Salazar up to give us a few remarks. And Please pay close attention to his leadership. He is terrific. So Thank you. [applause]

Secretary of the Interior, Ken Salazar

Thank you very much. Thank you very much Jim, for the introduction and for your leadership of the Bureau of Safety and Environmental Enforcement; and to Dr. Tom Hunter, thank you for your leadership, not only during Macondo and the solution there, but your leadership on the Ocean Energy Advisory Committee. And Chris Smith, from the Department of Energy, thank you. Secretary Chu, for your able assistance and help on all the work that we do on energy. And to my deputy secretary, David Hayes, thank you for the work you do on so many different fronts, and to all of you who are here, thank you for coming today and being a part of our continuing efforts to try to make sure what we do will respect the ocean energy and oil and gas drilling in American oceans and in the world, as a gold standard, one that the government, industry, and

stakeholders -- including the conservation organizations -- can be proud of and can be sure that we are doing oil and gas production in American oceans in the safest possible way.

Let me first say that if you back up and you ask yourself: “what is it that we are doing with respect to oil and gas in America?” What are we doing with oil and gas in the oceans of America? I want to make sure there is no doubt in this room as I say the following: “Oil and gas is very much a part of President Obama's energy portfolio, when we speak about the “All of the Above” energy program for the United States of America.

We do have a significant part of that, which is very dependent of our continuing to produce as much as we can domestically with respect to both oil and with respect to gas. The statistics themselves (they will not go over all of them today) but there is a lot that’s happening both in the onshore as well as the offshore with respect to oil and gas production. Now as we know, all of us here in the room are assembled to focus in on the BOP, because we know that was one of the areas of intense focus during those days of the gulf oil spill. We were all trying to figure out for so long what it is that could be done with respect to the BOP, and when the conclusion was reached that there was not much that we could do with the BOP, how we should move forward with the capping efforts that ultimately succeeded. But there is no doubt, for all of us who lived through those 87 days of the 50,000 barrels or so a day spewing into the gulf, that we had an intense focus on what was happening with that BOP and what it is that we could do.

I remember in those meetings with Tom Hunter and Steven Chu, Thad Allen, and I and other members were a part of, we asked ourselves lots of different questions. Why is it that we don’t have the kinds of sensors and gauges capacity so that we can understand what is happening inside of that BOP? How about the remote activation of BOPs? How about the possibility of having another set of shear rounds? Could that may be have been prevented as we started looking at some of the results from some of the investigations. These were all those questions that were being asked.

And so today's forum really is an opportunity for us to try to move forward; to engage you with your best thoughts on what we ought to be doing with the next generation of BOP's. You will hear not only from the experts that are up here on this panel, but you’ll hear from other people throughout the day.

I want to make a comment just about the Gulf of Mexico. Because after all, the Macondo well was located in the Gulf of Mexico. Today, I’m proud to report, that some two years and one month after the beginning of the oil spill, that the Gulf of Mexico is back and is producing oil and gas and is exploring oil and gas in a very robust way.

Some people probably thought at the time the Macondo well oil spill was going on that we may just have to shut down oil and gas production from America’s oceans for

a long, long, long time. And yes, we put a pause in place for six months to make sure that we could do a lot of different things that needed to happen in order for us to get to a point where we could be comfortable assuring the American people that we could safely produce oil and gas in the Gulf and other places.

But we are back, and the statistics I think say it all in the following way: We are producing about one third of our domestic oil from the Gulf of Mexico today. The number of rigs as we speak here is now at a higher number of rigs working in the Gulf of Mexico than they were on average in the year of 2009. So the Rig activity, in terms of drilling, is actually higher today than it was in the average of 2009. In the last twelve months, under Jim's leadership, Tommy Boudreaux and other people in those bureaus, we have issued 67 permits to go into deep water. So we are moving forward with the permitting program; that is a good permitting program.

Importantly, we should signal to all of you who are watching, we are moving forward to make oil and gas acreage available in the Gulf of Mexico and elsewhere. And so this last December we had the first lease sale, which I attended in New Orleans, which was a record lease sale – for the Gulf of Mexico and the first lease sale after the Macondo oil spill. In June of this year, so in just about a month we will be holding a second lease sale and it will cover both a central and western Gulf of Mexico planning areas, and the amount of acreage that will be made available for companies that come in and bid on is somewhere in the neighborhood of 38 million acres -- so 38 million acres will be made available.

Now we have not just done that work in terms of moving forward with trying to make sure that we are doing everything in a safe and environmentally responsible way, but we've moved forward in some other important policy issues in the gulf, including the negotiations that just took place over a two year period, to finally resolve issues which have been outstanding for a very long time with the nation of Mexico. And that was the creation of an agreement between the U.S. and Mexico that resolves the transboundary issues in terms of how we develop those areas along the transboundary which is a significant edition for potential development of oil and gas in the Gulf. And in addition to that, besides resolving the border issue with Mexico in the Gulf, when you look at the Gulf, as I have so often at my time in this job, it really is one pond, one pond that we share with the Mexican nation. And we can do all that we want on this side of the border, but unless the Mexican authorities are able to do what they need to on their side, we will never be safe here in the U.S.

And so part of what we have done is engage in some very robust dialogue with the Mexican nation, where they are essentially following the protocols that we are developing here in the United States. And as you look at the Mexican economy and the Mexican nation, they will move into the deeper waters because they have had

significant declines in oil and gas from their current reserves in shallow water. As they do so, it is important for us to make sure the kinds of standards that they are going to employ will be the kinds of standards that we are comfortable with. So today, as you look at the question of the BOP's, I would only ask you to make sure that we're doing the very best we can here in the U.S., the areas where we govern, the areas where many of your company's drill for oil in the oceans. But I would also ask you to reflect on the fact that what we do here is very much a part of the global industry for oil. What we do here is really not going to be much different from what gets done in lots of other places, including Nigeria, Norway and so many other countries that are now drilling into the deep water.

And so for us, in June of this year, the last part of June, we will be holding the second international containment forum, where we will bring together a number of different countries, meeting in Norway, where we will discuss these same issues we're discussing here today, with respect to the Blow Out Preventer. So in conclusion the way that I see our work here at Interior is -- within the policy initiative of making sure that we are developing our domestic resources robustly and as responsibly as we can -- we need to make sure that the lessons from the *Deepwater Horizon* and Macondo oil spill are not forgotten. So for us, and our efforts with Jim Watson, and with Tommy Boudreaux, what we have done is we have said we have to do -- everything we can to prevent oil spills.

The drilling standards that are now in place, and the work place standards that are now in place and other efforts which Jim Watson and Tommy Boudreaux have instituted, they are making us get to that point where we can hopefully prevent one of these things from ever happening again. But I always remind people we can never be cautious enough. Because you remember the days before April 20 when people said there were 60,000 wells that had been drilled in the Gulf of Mexico. You cannot have an oil spill like the ones like they had in Estopa or other places around the world; it's not going to happen in the Gulf of Mexico. Well it happened and we don't want it to happen again. But knowing the lesson also Maconda that it did happen!

We need to make sure, that if it does happen that we are ready to move in quickly. And so containment becomes a major priority for us as we deal with the element of oil and gas in the Gulf of Mexico and other oceans of America. In the coming weeks and months, you will see an actual dress rehearsal of companies that have been set up in order to be able to respond quickly to a Macondo-style kind of incident.

So you have the prevention, you have the containment. Now the third leg of the stool is "What do you do with the oil spill response itself, in the event that you do have an oil spill?" and that, too, is being addressed by Jim Watson and his people. So let me finally just say this: "We have had three and half years of working through some difficult

times here in the United States, but I'm very confident about our future, and I'm very confident about oil and gas being an essential part of the future economic wherewithal of the United States."

One of the reasons I am so confident that we'll be able to right this is because of the leadership at the Department of the Interior. David has been with me from day one, but I still remember on the day of April 20, I put him on a plane to head to New Orleans to see what was going on with the ring that was on fire. And he has been with us every step of the way. Jim Watson, who spent so much time in the Gulf of Mexico leading on the front lines as we dealt with that national crisis, a unique national crisis, which had the focus of the entire nation. Now he is leading our Bureau of Safety and Environmental Enforcement. Jim spent 30-plus years in the Coast Guard as an admiral, so he knows the issues. He essentially is a cop making sure that it is getting done right. And then Tommy Boudreaux, who I know you will hear from later on today, is a part of the organization that basically does the planning. So he is the one who plans; he's the one that decides that we're going to hold this lease sale in June of this year in the Central or Western Gulf; and he's the one who's planning places on the Atlantic and places on the Arctic, and other places. And so we have a great team of people and I look forward to the dialogue with this panel as well as to the results of your forum today. Thank you all very very much. [applause]

BSEE Director James Watson

It is also my pleasure this morning to introduce David J. Hayes, the Deputy Secretary, U.S. Department of Interior. As the secretary mentioned, David Hayes was confirmed in 2009 by unanimous vote of the United States Senate, and came into the Department of the Interior along with the secretary. And so he is the second-highest ranking official in the Department of the Interior, and by statute, he serves as the department's chief operation officer. Among his many roles -- and he is a true leader -- he is in charge of promoting all of the conservation issues within the department and across our great country in the public lands. This includes the president's America's Great Outdoors agenda, encouraging renewable energy developments, developing our conventional energy resources safely and responsibly, fulfilling our trust to the American Indians and Alaskan natives, and managing our nation's water supply in a sustainable way.

In 2011, the president appointed David Hayes to chair the interagency working group on the coordination of domestic energy development and permitting in Alaska. And this is a work to organize the federal agencies to oversee the responsible development of onshore and offshore renewable and conventional energy in Alaska. And believe me, he has taken that to heart and has done a terrific job. And so I would

like to welcome this morning to the podium the Deputy Secretary David Hayes. [applause]

Panel No. 1: Technology needs identified from the Deepwater Horizon
Moderator: *David Hayes, Deputy Secretary, U.S. Department of the Interior*

- *Jim Watson, Director, Bureau of Safety and Environmental Enforcement*
- *Tom Hunter, Chairman, Ocean Energy Safety Advisory Committee*
- *Christopher A. Smith, Deptuy Asistant Secretary for Oil and natural Gas, U.S. Department of Energy*

Deputy Secretary of the Interior, David Hayes

Good morning. My primary responsibility here this morning is to moderate the first panel. I want to make just a couple of quick, introductory comments. First, to amplify a couple of points the secretary made as to why we are here today, we are here because we want your help in putting together the best proposal for a new regulation governing Blow Out Preventers.

Our plan had originally been to go slower and does an advance notice of proposed rulemaking that would have opened the door to ideas of all kinds that are certainly welcome, but that would have taken many months before we could get to a proposed rule. Under Jim Watson's leadership, we made the decision that based on the information we had from the Macondo well situation, and the potential expertise that we could gather today with your help -- and in the days to come -- that we should not wait and go through an advance notice of proposed rulemaking, but instead go to a proposed rule that obviously would be open for public comment as well, but that would get us quicker to a new regime for Blow Out Preventers. So we are looking forward to today's workshop to help us in that regard.

Secondly, we have a good idea of where we want to go with Blow Out Preventers. Last night, I was reviewing again the National Academy of Engineering report on the Macondo well incident. Don Winter is here, the chair of that esteem commission. That report, along with the Joint Investigative Report that was done by the Department of the Interior and the Coast Guard, point clearly to some serious issues that were associated with the Blow Out Preventer situation on the Macondo well. Issues that were not limited to the Macondo well. And I would suggest that as we reflect through the day, there are at least four things that we are looking for in a new proposed rule.

1. BOP's need to be able to cut whatever is in their way and completely seal off the well.
2. We need better maintenance for BOP's, like what you would expect of a jet engine, or any other very sophisticated mechanical device upon which lives depend.

3. BOP's need better sensors to tell us what is happening at the bottom of the sea.
4. Everyone working with BOP's should be fully and properly trained to handle any contingency.

Of course, it is not quite that simple, which is why we have the panel here today, to talk about the technology lessons we have learned from the Macondo well situation, as a prelude to a fuller discussion about where we should go with regulating Blow Out Preventers. I'm going to introduce the three panelists and ask them to give their remarks. After each of their remarks, at the end of their remarks, we will have a Q & A with the time remaining.

First, Jim Watson, the secretary mentioned Jim Watson's terrific pedigree. He is new to the department, as the Director of Bureau of Safety and Environmental Enforcement, being sworn in on December 1, 2011. He is not new to this field as you know. Prior to his appointment, he served as the U.S. Coast Guard Director of Prevention Policy for Marine Safety, Security, and Stewardship, where he was responsible for maritime investigations, inspections, waterway management, and commercial vessel safety. As you know or may not know, he served as the deputy commander of the Coast Guard Atlantic Area command in April 2010 until June 2010 and was an On Scene Coordinator for the government-wide response to the Deepwater Horizon oil spill in the Gulf of Mexico in 2010. He is an engineer, a graduate of the U.S. Coast Guard Academy, also has two masters of science degrees from the University of Michigan, one in Mechanical Engineering, the other in Naval Architecture. We are very fortunate to have his leadership.

Tom Hunter will be the second panelist. He is the chairman of the secretary's Ocean Energy Safety Advisory Committee. We are very fortunate to have had Tom's service. He was the chief science adviser throughout the Macondo well incident. At the time, he was president of the Sandia National Laboratory. Steven Chu brought him in to head up the team. He was absolutely instrumental in helping us work through that crisis. Despite the fact that, in theory, he is retired, he has never failed to serve all of us and this country, and has been putting in enormous time as the head of the Ocean Energy Safety Advisory Committee, which has done excellent work in helping chart the next path forward for all of us as we look at improving deep water oil production safety.

And finally, Chris Smith is here. Chris is the Deputy Assistant Secretary for Oil and Natural Gas at the Department of Energy. DOE is a key partner for us at the Interior Department on all of these issues. And Chris also has also been with us every step of the way. He served, for example, as a designated federal officer for the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling. Prior to his appointment to this administration in October 2009, he spent 11 years in the private sector with two major international oil companies. He also is an engineer, having

received his B.A. at the United States Military Academy at West Point, and MBA from Cambridge University. Without further ado, I will turn it over to Jim Watson, followed by Tom, and then Chris. Thank you. [Applause]

BSEE Director, James Watson

"Safety at all levels," for me, means from the bottom of the well to the top of that derrick. And we at BSEE have one mission, and that is to insure the integrity of that operation that goes from the deepest depths to which we have to have exploration and production of our nation's oil and gas resources offshore, to the delivery point back on shore where that is going to be handled in a downstream way. But for me, the safety at all levels also includes all levels of our organization. We need to have an outreach program, we need to have a safety culture that begins at the boardroom, begins at the executive level, and actually reaches down to each and every person out in these offshore operations.

There has to be a real meeting of the minds. And this has to go across the industry, among the contractors, among the government role, and certainly, among the corporate levels of the industry. And "all times" is tremendously important. We cannot just have safety when the inspector is there. It cannot just be a snapshot safety. We have to have some confidence that it is just as safe, just as tight, tightly managed, tightly controlled, tightly monitored, 24/7, 365 days. Every one of these operations off shore has to be safe, at all times.

The offshore petroleum industry is a dynamic industry. It pushes into new frontiers both on the exploration and production side. I have seen that just in coming here in December, and this is going to be continuing forward in the future. The Bureau of Safety and Environmental Enforcement has to get in front of this learning curve -- has to get in front of this evolution of development for exploration for production, and we have to be leaders.

This is one of the ways you get to be leaders. You bring people together and you listen to them, the people that have the most at stake by the results of our leadership. Now, since the Macondo incident, we really have had one of the most aggressive and comprehensive offshore regulatory reforms in the history of our country. And I'm going to touch on that a little bit more on the next slide.

But among the technologies that are essential, and we have heard both the secretary and deputy secretary talk about this, for the continued effort of our offshore exploration is the next generation Blow Out Preventer and the control systems and all of the technology that goes into the design and fabrication and testing and monitoring of these systems. And then we need to have the management regimes.

We have to have the regulatory processes. There is an important role for the government when we are leasing out our intercontinental shelf for this kind of activity. Let me touch on the accomplishments that we have had just since the Deepwater Horizon casualties.

The Drilling Safety Rule. This rule was done as an interim final rule; it was done in response to the 30-day report that was delivered to the secretary. It actually includes some very important Blow Out Preventer improvements that are in place right now. The bureau has been doing substantial work in monitoring the implementation of the drilling safety rule with regard to Blow Out Preventers, cementing, and other things.

Among the other rules that have come into place is the Work Place Safety Rule, the safety and environmental management system, is now in our regulations. And companies have begun to audit themselves on the implementation of this rule, and we're beginning to do our role in oversight of those auditing oversight operations. You can read the rest of these activities, the well containment program, the growth that has been necessary along with the modernization of the functions that used to be MMS, into BOEM and BSEE and ONRR, revenue collections, and we have also instituted a new training program. Not only for our inspectors, but for our petroleum and other engineers who are so critical to issuing these permits that are so necessary to do safe and sustainable development in the outer continental shelf.

So what have been the new BOP Requirements to date? Well, first of all, third-party verification of the capability of the blind sheer rams, and the BOP stack itself, that it is going to be working in accordance with the regulations, in accordance with API RP 53, and the best practices of this industry. In addition to that, there were requirements for subsea secondary intervention with ROV's that we test, before the BOP is put into service, as well as a bottom test within a specified period of time, following the deployment of BOP, to test those blind sheer rams.

And then also, we have crew training requirements. We want people offshore who know how to use this equipment, who will use the safety equipment. This is a "man in the system" system. So we have to make sure that the people are up to the task of actually using the equipment properly and making sure that it is operating at all times, at all levels, the way we expect it to be.

Of course, when you have a third party system, you have to establish the qualifications for those third-party people that you are relying on to do that oversight work. So we have written requirements and then we follow-up as a bureau, to make sure each of those third parties is actually capable of doing what we expect them to do.

So what is ahead? Well just in this first year, we will see a final drilling safety rule. This would incorporate all of those comments and some experiences we have had since

the implementation of the interim final rule, now almost a year and a half, two years later. And there will be some minor improvements to that rule; in large the standards we established the interim final rule are going to be continued moving forward. That rule will be out very soon. We also plan to have a final SEMS II rule. We had a SEMS I rule that basically made reference to API RP 75, which has actually been an industry practice for years, and we have seen good results from that. We put out some additional proposed rules to augment the SEMS I rule. And those things were out for public comment. We got some good comments, and we hope to very soon put out the final rule implementing the appropriate elements of SEMS II.

Then there is the rule making that Deputy Secretary Hayes mentioned. Secretary Salazar, we are going to go to a notice of proposed rulemaking largely based on the input that we get here, and the input that we have already received from the many analyses of the BOP status in the state of the art right now from experts throughout the industry, throughout government, and that goes straight to the notice of proposed rule for the next generation of BOP.

Also, in my committed desire to not just fight the last war, we are looking at what are the risks on the production side? And there are some and we will address them in this calendar year with a proposed rule on the production safety systems. And we intend to introduce this life cycle analysis concepts into our standards. That's the "all times" piece.

Tom Hunter, Chairman, Ocean Energy Safety Advisory Committee

I am going to spend a little time showing you a couple of slides and then I will ask you some questions. You don't have to answer them, but I'll ask them in any case. I was asked to do a short bio for this, and I submitted one, but if you really want to know the real short bio, it has one simple word in it, it says unemployed. And so I was going to mention I learned a lot from Macondo. It was a great experience. I learned that heroic things can be done when people work together and I learned to meet some very trusting and important friends in a very dire condition. What I did not learn is to avoid any further assignments from those friends. However I'm going to spend a day and talk to the Macondo experience and not go over too much with what the other panels will talk about.

Let me begin with the first slide to re-introduce myself. Deepwater drilling is not the only place where high integrity, high response systems are used. This is a picture of what I call a real closure system. It weighs 90 tons, has two 4000-pound slides, holds

15,000 psi of pressure, and the most important thing, it closes within15/1000 of a second. It was actually used in underground nuclear testing. I use it in introduction because the person on the person on the right, regrettably with a pocket protector, is the speaker [laughter] as one of the designers and patent holders.

Complex systems are not new. They are used in many places. Blow Out Preventers certainly meet that test. What I would like to do though is give you a few slides on the Mocando BOP -- I should say Deepwater Horizon BOP and then I'll ask you some questions. The slides I'm going to show you will tell you everything that you need to know, everything you're going to get to answer these questions. There is no more information, and you'll see how well you can answer the questions.

So here is the beginning, this is the flex joint near the top. The joint just above is where the capping stack was placed. This is the beginning of the LMRP. And you're going to go down through the pod. Cover the two pods that were there. Then we begin at the lower part of this picture, you see the blind shear ram, which was the ram intended to do the real closure. Following that is the casing shear and following that are the variable bore pipe rams that go immediately below that. And below that is the H4 connector which is right above the mud line. Well, this is what we had, if you recall, Mr. Secretary in the first week in May.

And it turns out that we had a lot of questions and I'll share those with you. First of all, does the data and the drawings that we have match the system that's undersea? Secondly, what are the positions of the rams? Are they closed, open? Are the locks set? What, if anything, is inside the bore? What are the pressures all along this stack? Are there any flow restrictions anywhere inside the stack? Are all of the controls hooked up? Is it stable? That is, is it going to tip over? Will it separate or come apart if we try to do that? And lastly, what is the flow going through the bore and through all the closed rams or whatever position that they're in? I can't tell you how difficult, if not impossible, it was to find that out.

The best diagnostic we ever had was when the capping stack and then the BOP was pulled off the well and then you could observe the pipes inside and get a sense of what happened with the BOP. We spent countless hours trying to understand what was happening with this system and never had anything more than a guess on the potential features and never could diagnose things like the flow until the capping stack was in place. So, the point is -- it was not a self-revealing system. It was hard to understand, and the data we needed to do the response was not available.

What I would like to turn to is talking about the functions of Blow Out Preventers, and some of the learning that I personally had during that experience. Let me list them in kind of terms of the phases of a Blow Out Preventer. I will use adjectives and adverbs

to describe characteristics and then try to summarize, in closing, what an ideal Blow Out Preventer would have in terms of characteristics.

First of all, in pre-event, which is when it serves its normal function when its used in the drilling operation and before any kind of event and even if the event is as minor as a kick or some kind of response that has to be done by the rig.

The Blow Out Preventer should always be available. That is, whenever you push a button or send a signal it should be there. It should be self-assessing and diagnosing, much like your car does when you have a problem with the ignition system it should tell you something is wrong with me and I know what it is and I will tell you what it is.

It should be repeatable. That is, when you do it many times; you should get the same response each time. It should be upgradable. That is, it should be able to have enhancements, if necessary and done safely. It should be repairable. It should be understandable. You cannot have all kinds of complicated things that drillers and people cannot understand when they have to operate. It has to be something that fit into the drilling operation and understand how it functions . And of course, it should be affordable.

If there is an event, either a small event or major event, there are some characteristics that I think would be desirable. First, it should be instantly responsive. There should not be a lag time or latency between the time you act and the time you get a response. Secondly, it should be controllable. I will remind you, that it is not clear, even though we attempted to do it in the early days of the Macondo Well, to shut the well in, it is not clear if that is the right thing to do and at what pace you might do it. You might want to do it slowly. The well could be damaged or you may damage the well -- you need to have some controllability on how you might shut in the well. You have to have full communication with the device. You have to be sure that whatever function you send down, whatever intent you have is the function it performs. You cannot have crossed wires or different signals that don’t work together.

And then everything you do has to be core relatable with the diagnostics you have. That is to say, if it says you need to have a certain response or action, you need to be able to do the corresponding action. Now if there is a major event, which we of course experienced two years ago, there are some things that I think a Blow Out Preventer can provide. First of all, transparency. It should be clear what is going on and one should not have to go through the days, if not weeks, of trying to understand the situation. All the elements should be fully diagnosable. And all the internals should be observable in some way. There should be opportunity for flow measurements and pressure measurements, temperature measurement, all of which allow you to do a full diagnosis.

And finally, if there is a containment exercise, like we saw in Deepwater Horizon, where you actually choose to collect hydrocarbons over some period of time, there should be some measure of flow control, and there should be some redundant self-capping availability, which means there should be some way that if you decide you can do it, that you can always get an additional complete closure. And I would add to that, as we go through that there should be a concept called shear certain, which means that if you have obstructions in the way, you have to have a way to clear those obstructions to get closure. Well if those are the functions you want, I would really encourage that we all come up with some fundamental design principles.

In one of my previous roles, I had to write a letter that went to the president each year that said this is the assessment of safety of the nation's nuclear weapons. And in that process we always had fundamental principles of safety that we use – which were on everyone's mind. But let me list a few that one can put on a Blow Out Preventer system. And by the way, I view Blow Out Preventers as a system and not just rams, but all the things that go with a Blow Out Preventer. They're accumulators, communications disconnects, pods, hot stabs, access points and all the things within a Blow Out Preventer. So I think it is a system framework and I always assume that was the way the design problems were approached.

Let me just close by listing a couple of things that one might choose based on which to base a design principle.

1. It would be 100% available – that means at all times, it is ready to do its desired function.
2. It would be totally controllable. That is at any time you have the ability to make an intent turned into an action.
3. It would be completely diagnosable, which means all those questions which I listed which none of us today could answer from looking at those pictures, or which we couldn't answer within the first couple of months of the Macondo could answer, that all of the diagnoses could be done.
4. would be what I call shear certain. Which means If you need to clear the way, you can clear the way?
5. Next would be that there should be a shear closure backup. That is No matter what has happened, there needs to be a mechanism where you can provide a sheared closure, if you choose to do that.
6. Lastly, and very important for our industry colleagues, these Blow Out Preventers need to be obtainable. They cannot just be complicated drawings and lines. They have to be those that can really be built.

And my understanding is that there is a significant backlog of orders on Blow Out Preventers today. And the question is how we get the requirements for Blow Out Preventers in phase with the production capacity of Blow Out Preventers. And so what I would ask is: “Whatever turns out in the rule making, whatever turns out in design requirements, that it be something that can be used and built by the industry.”

Christopher A. Smith, Deputy Assistant Secretary for Oil and Natural Gas, U.S. Department of Energy

I am going to make a couple of comments here this morning about how the Department of Energy is partnering with the Department of Interior to take care of some of these challenges. I will be approaching this from a couple of standpoints, first, as the person at the Department of Energy that manages the oil and gas portfolio, but also from my experience as the designated federal official for the commission which was created by the president to determine the root causes of the Deepwater Horizon accident, and that had the unique challenge of trying to determine what went wrong while things were still actively going wrong.

The first slide I will just put up here is a reminder for all of us. We talk a lot about safety, we talk a lot about energy security, about environmental sustainability, but also on the day this rig went down, there were 11 American workers who did not return to their families. So all the work that we do here is not only about making sure that we have a prosperous future for America, that we have the right kind of economic and energy security, but also to make sure that we are taking care of the folks that are working offshore doing this difficult and dangerous work.

I will spend just a couple of minutes talking about a slide that looks at some of the root causes that came out of the various investigations that have been made since the Deepwater Horizon disaster. This is one slide I will commonly spend a half of an hour or hour talking to.

What I want to do here on this slide is just touch upon a couple of things. First of all, as has been mentioned by the previous speakers, we are here to talk about one specific piece of this puzzle, which is the Blow Out Preventer. And it is a piece of the puzzle that is very important, has rightfully has attracted a lot of attention. But it is a piece that is interlinked with a lot of other complex factors that led to this disaster, the loss of the rig and the subsequent oil spill. So what I will do here is I won't go through all of these items, but would like to touch just on how a couple of the items are specific to items that have been mentioned by previous speakers in terms of the BOP being an important key to insuring that you prevent accidents.

As we all know, the best way to deal with accidents is to make sure we diagnose them and prevent them before they can occur. So in this long list of issues -- from the design of the well through the testing of the cementing through the changes in the abandonment plan, there are a number of items that are specifically BOP's. One of them that pops out that actually was alluded to in a couple of comments Dr. Hunter made was this inconclusive negative pressure test in which you had one pressure reading on the dual pipe, you had a separate pressure reading on the spill line.

There was that inconsistency, but also, I guess the process or the procedure or the safety mechanism to take that inconsistency, stop, and make a good decision around how that should be handled. So one thing to deal with here is organizational, its cultural, it's procedural, but also there needs to be an understanding of how can we make gauges more reliable, how we can make them more robust. Even in the cap and stack that was designed specifically to cap this well, one of the gauges, this was a brand new gauge, failed almost immediately. This is something that is going to require some more work that we need to think about a bit more.

A second point that I'll point to is this -- another item that comes back to instrumentation -- understanding what's going on at the sea floor, and ensuring that you're able to make good decisions in a real time basis. So this is the last two hours of the Sunday that came out of the Deepwater Horizon incident, and during the hearings that we held for the Deepwater Horizon during the commission work, we spent probably three or four hours looking at this particular chart and blowing it up, cropping it, rotating it, putting in arrows. There are a lot of key signals in here that would help one understand something was going badly, but what we don't have in place is something to help the person who is on, the person who is running the drilling operation interpret this highly -- complex data set in real time and help those individuals make good decisions.

So not only do we need to make sure that we are getting the right information from BOP's, but we need to make sure we have a good mechanism for getting that information up to the rig floor and that we have the right tools and we've got the right algorithms to help human beings make high pressure decisions based on voluminous but uncertain data.

And the last thing is the failure of the BOP itself. So when the BOP was triggered, we know that somewhere between the annular preventer and variable bore ram, the pipe was buckled within the BOP in such a way it was outside of the cutting surface of the blind shear rams. There are still a lot of discussions going on about exactly why that pipe buckled. As recently as the last hearing we have before the Ocean Energy Safety Committee, we are hearing additional theories about why that pipe buckled. Pressure differentials? Temperature differentials, was it rig drifting? So there are all sorts of ideas and theories about what caused the pipe to buckle. But one thing here is clear. That

when we are looking at designing BOP's and also designing the procedures, that folks running the operations used to close in the well in case of a disaster, that we need to do a little bit more thinking about what are going to be the conditions under which the BOP's going to have to operate in an actual emergency.

So there's lots of standards and procedures in place to make sure we are doing routine testing for BOP's, that you're opening them, that you're closing them, ensuring that all the instruments are working appropriately on an ongoing basis. As we look at that data, there are concerns about the regularity with which you see failures within routine operations. But certainly something that we need to make some additional recommendations on and progress, in my opinion, is ensuring that we understand the true failure states, true conditions under which the BOP's going to have to act in an emergency, and that we are designing not only the equipment from the gauging and instrumentation but also the process and procedures in such a way that's consistent with ensuring that the BOP is able to actually avert an accident, avert an emergency, in an actual emergency situation.

So one of the challenges that we have in all the work we have in Washington is there is, I think this natural tendency to, I think, to individually operate in silos. That's something that can occur here. One thing I think is always successful in this case is that we did have a seamless cooperation between agencies and Department of Energy, working together with the Department of Interior, to make sure we brought this to a successful conclusion.

One thing that we are doing within D.O.E. to support the efforts here at the Department of Interior is ensuring that the research that we do within the Department of Energy is consistent with the challenges that the rule makers have here at the Department of Interior. We are a science organization. I've got the privilege of working under a Nobel Prize - winning physicist at the Department of Energy, so we are clearly an organization that's dedicated to technology, dedicated to technological innovation. We are not the regulators, we're not the rule makers, but one thing we want to ensure we are doing in that we are designing our research programs and our processes, we want to make sure we are doing the things that are directly usable to the challenges faced by Director Watson here at BSEE and by the Department of Interior.

Another thing that was clear after the Deepwater Horizon accident was that we need to have an ongoing relationship, and ongoing collaboration with industry to ensure that the research we are doing centrally to quantify these risks are using -- or are consistent with -- the rate at which technologies move forward. This means we need to have an ongoing work program with industry whereby we are using the industry to ensure we are keeping government informed and capable on an ongoing basis.

I'll close with this slide that actually circles back to comments made by Secretary Salazar in his opening. We talk about all of the above, but one thing I like to emphasize is actually not something new. This is a continuation and a consistency in this administration's approach to all of our energy sources. So I'll point to this top quote; "I continue to believe that domestic oil production is a part of our overall strategy for energy security but I've always said that it must be done responsibly for the safety of our workers and environment." This was is a quote that the president commented back in April of 2010 shortly after the Deepwater Horizon accident. So this was a quote that was made while that well was still belching hydrocarbons off the deep waters of Mexico leaking, the cap and stack was not yet developed. The relief well was still probably months away. But even in that time there was a realization that not only can we do this safe and reliably, but we must do it for the sake of our environmental sustainability and for our nation's energy security.

So with that I'll hand the podium back to Deputy Secretary Hayes. Thank you very much.

Deputy Secretary of the Interior, David Hayes

We're going to stay on schedule, but I am going to ask the panelist one key question and then we'll set this up for the next panel to be led by Richard Sears who on behalf of the presidential commission that Chris just mentioned, did a heroic and very important effort in evaluating the root cause and that's going to be a very interesting and informative panel.

Here's my question to each of the panelists: Obviously in order to come up with good design criteria for the next generation of BOP's, there needs to be close collaboration with the industry and with the manufacturers as well in terms of meeting some of the demands and criteria that Tom Hunter mentioned of actual build ability and feasibility so that we don't have an academic exercise that can't be executed in fact. So my question to each of the panelist is: how do we forge that cooperative relationship with the industry to ensure that whatever regulatory scheme emerges from this exercise it can be implemented and it makes sense. Jim?

BSEE Director James Watson

Yes, sir. Well, this is certainly a great start and I think it doesn't --it's not the only venue that we have. I was recently at one of the manufacturers' of BOP's. I think their needs to be an exchange There needs to be an exchange personally between the engineers and the inspectors at BSEE and the designers and the fabricators of the BOP. I think this is a dynamic thing which involves not just the original equipment

manufacturers, it involves the customers, which is typically the drilling contractors and then of course the operators, the lessees of the outer continental shelf who are bringing all of this technology together.

And that's what we have here today. When we break up, we obviously have to continue that dialogue in more detail on a more one-to-one basis and continually bring that back into a written form and distribute it out.

Now I'm pretty confident that our regulatory process does a pretty good job of that. But I think that quite often there's a need for more dialogue. And so we need to take advantage of the capability that we have in the modern Internet; in the ability that we have to actually bring people into the Department of Interior on a regular basis, and I can tell you that is one of my primary jobs -- to listen in my own office to the leaders of industry as we move forward with this. And then I would say lastly we are building our organizational skills. So we are still bringing people in -- into our fold actually to do this engineering work. To actually write these regulations who quite often are looking at a position in government coming from industry. I want to emphasize that. I put it into my slides; we are trying to find the best talent of America, a portion of that, to actually work in the Department of Interior for the Bureau of Safety and Environmental Enforcement. I think that's also a very important part to getting this problem solved.

Tom Hunter, Chairman, Ocean Energy Safety Advisory Committee

Thank you Jim, Tom? Sure I'm on here, yeah you're on I think it's a very important endeavor to figure out how to make this come out right in the end. I'll just list a couple of things that I think are important: first the industry has a lot of cross cutting organizations that would be very helpful as an interface point with government. There are also engineering society which have certain ways of looking at these problems that allow them to help them work with standards and design principals; but in terms of how to approach the problem I would give a few simple things like, first get the frame work right and keep it simple; focus on the government side particularly on what and not on how; and be sure what is asked for is a system as opposed to some components, and keep the thinking at the system level and then in line with what Jim said, I think it's very important for both the industry and government to involve the talent base that will deal with these problems now and in the future so try to do everything you can to bring in good people and support good people in their development and that's exactly what Jim mentioned.

One way one way I would close in doing that is to maintain both within the industry and with the government program a vigorous R&D program which serves to have continued improvement both principle and operation.

Christopher A. Smith, Deputy Assistant Secretary for Oil and Natural Gas, U.S. Department of Energy

Thank you, Chris, I won't repeat what Jim and Tom said they pretty much summed up the most important points The one thing that I would add is this collaboration is a muscle that you need to exercise on an ongoing basis and so you do need on a real time and an ongoing basis to make sure that you're doing real work together, you have a real collaboration, that you do have a working ongoing public private partnership such that you're constantly remaining, I guess updating the capabilities of government and industry to work together in these areas. So it's not something that we should be approaching as a swat team exercise if something goes bad, it should be something that is a part of our ongoing way of doing business between the government and industry.

Thank you, thanks to our panel and we'll now go to the second panel. Thank you (applause).