Nguyen, Ngoc B

From: Ken Arnold [karnold@karnoldconsulting.com]
Sent: Thursday, May 27, 2010 2:30 PM
To: Kemkar, Neal; Black, Steve
Cc: Bud Danenberger; Ford Brett
Subject: RE: Draft Interim Measures Report for Immediate Review

Neal and Steve

I note that the transmittal letter calls for a total suspension of drilling activities for 6 months from floating rigs. There is nothing in the report I reviewed or the history presented that warrants such action. What does the Secretary plan to do with all the people who will be thrown out of work when this is adopted.

A very good report has been used to justify a decision which is unwarranted. If the Secretary were to ban future wells in over 5000 or so feet of water for 6 months, I could understand the political need, but not the technical need to do so. However, the proposed ban on all drilling from floating rigs is just not warranted based on the history presented in this report augmented by the immediate improvements recommended.

I also object to the statement that these actions will assure, "that another event like the BP oil spill can never occur again." The only way to assure this is to stop ALL offshore drilling. Even after all the recommendations are implemented, we cannot be anymore certain that a platform well will not blowup and cause a major oil spill anymore than we can assure that a well drilled from a floating platform will not once again cause a major oil spill. We can also not be sure that an airplane without terrorists aboard will never crash into the White House, unless we ban all air traffic.

The report is an excellent piece of work. The cover letter is an abomination. I am ashamed to have my name associated with it.

Ken

Kenneth E. (Ken) Arnold
K Arnold Consulting, Inc.
3031 Shadowdale
Houston, TX 77043
Cell: 832-212-0160
Home: 713-939-1034
www.karnoldconsulting.com

From: Kemkar, Neal [mailto:Neal_Kemkar@ios.doi.gov]
Sent: Tuesday, May 25, 2010 9:44 AM
To: Ken Arnold
Cc: Black, Steve
Subject: Draft Interim Measures Report for Immediate Review

Ken - please review the attached draft of the safety report and let us know, by later today, about any big picture thoughts or comments you have. The Secretary and White House are reviewing this draft. I will call you momentarily to discuss.

Thanks,
Neal

Neal Kemkar
Office of the Secretary
U.S. Department of the Interior
(202) 208-5379

Nguyen, Ngoc B

From: Ken Arnold [karnold@karnoldconsulting.com]
Sent: Thursday, May 27, 2010 2:37 PM
To: Kemkar, Neal; Black, Steve
Subject: RE: Draft Interim Measures Report for Immediate Review

Neal and Steve

I guess I should add if the President accepts this recommendation, it really makes me doubt my early and continued support of the President and of the Secretary. The owners of these rigs will have no choice but to try and find work for them in other places of the world. Once gone and committed to long term contracts it will take a long time before we can build up such a large and modern fleet again. The impact on the Federal budget and employment will last more than 6 months.

Ken

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From: Ken Arnold [mailto:karnold@karnoldconsulting.com]
Sent: Thursday, May 27, 2010 1:30 PM
To: 'Kemkar, Neal'; 'Black, Steve'
Cc: Bud Danenberger (edanenberger@gmail.com); Ford Brett (fbrett@petroskills.com)
Subject: RE: Draft Interim Measures Report for Immediate Review

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Nguyen, Ngoc B

From: Ken Arnold [karnold@karnoldconsulting.com]
Sent: Friday, May 28, 2010 2:13 PM
To: Black, Steve
Subject: Attached is a Current Draft of a Proposed Op Ed
Attachments: Logic and Not Emotions Should Govern Decisions on Offshore Drilling.docx

Steve

I am waiting to hear from you before submitting this to the NYT. They have expressed an interest in publishing it. So far we have too many authors willing to sign and will have o limit it to four.

Ken

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Logic and Not Emotions Should Govern Decisions on Offshore Drilling

The National Academy of Engineering recommended us as reviewers of the recent Department of Interior "30 Day Review" of the BP Oil Spill. We were chosen because of our broad and extensive petroleum industry expertise, and independent perspectives.

The BP Macondo blow out was a tragedy for eleven families, and an environmental disaster of worldwide scale. We believe the blowout was caused by a complex and highly improbable chain of human errors coupled with several equipment failures and was preventable. The petroleum industry will learn from this; it can and should do better. We should not be satisfied until there are no deaths and no environmental impacts offshore - ever. However, we must understand that as with any other human endeavor there will always be risks.

We broadly agree with the detailed recommendations in the report. We compliment the Department of Interior on its professionalism in creating the detailed recommendations. However, we do not agree with the six month blanket moratorium on floating drilling. A moratorium was never a draft recommendation that we considered, and was not a recommendation agreed to by our panel. The moratorium was added to the report after our final review. A blanket moratorium is not the answer.

The report highlights the safety record of the industry in drilling over 50,000 wells on the US Outer Continental Shelf of which more than 2000 were in over 1000 feet of water and 700 were in greater than 5000 feet of water. The safety of offshore workers is much better than that of the average worker in the US, and the amount of oil spilled is significantly less than that of commercial

shipping or petroleum tankers. The US offshore industry provides direct employment of over 150,000 jobs and at $6 billion a year is the second largest source of revenue to the US Government. The report outlines several steps that can be taken immediately to further decrease risk as well as other steps that should be studied to determine if they can be implemented in a way that would decrease risk even more.

This tragedy had very specific causes. A blanket moratorium is a punitive action that affects a large swath of people who were and are acting responsibly and are providing a product the nation demands. It does not address the specific causes of this tragedy. We do not believe punishing the innocent is the right thing to do. We encourage the Secretary of the Interior to overcome emotion with logic and to define what he means by a "blanket moratorium" in such a way as to be consistent with the body of the report and the interests of the nation.

Nguyen, Ngoc B

From: Ken Arnold [karnold@karnoldconsulting.com]
Sent: Saturday, May 29, 2010 9:04 AM
To: Black, Steve
Cc: Ford Brett; Tom Williams; Skip Ward
Subject: Potential Op Ed from Contributors to Secretary Salazar's 30 Day Report to The President
Attachments: Logic and Not Emotions Should Govern Decisions on Offshore Drilling.docx

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On May 28, Secretary Salazar submitted to The President a report entitled, "**Increased Safety Measures for Energy Development on the Outer Continental Shelf".** The report states, "The recommendations contained in this report have been peer-reviewed by seven experts identified by the National Academy of Engineering. Those experts, who volunteered their time and expertise, are identified in Appendix 1. The Department also consulted with a wide range of experts from government, academia and industry."

The four authors of the attached document are amongst those experts whose names are listed in the Appendix to that report. I could get more signatures, but I believe the Times limits the number of signatures to four. As you can tell we are upset with the moratorium The Secretary has proclaimed on drilling from floating rigs. This recommendation was not in the report we reviewed and we wish to disassociate ourselves from the report.

In the past month I have been helping several NYT reporters understand the technical aspects of various stories on the BP blowout. Eric Lipton suggested I send this to you.

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Sent: Friday, May 28, 2010 10:49 PM
To: 'karnold@karnoldconsulting.com'
Subject: Re: Now I need your help

Hi ken

When u have a final draft please send it to our op/ed editor.

Shipley, David
Shipley@nytimes.com

From: Ken Arnold <karnold@karnoldconsulting.com>
To: Lipton, Eric
Sent: Fri May 28 18:18:46 2010
Subject: Now I need your help
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To: 'karnold@karnoldconsulting.com'
Subject: Trying to reach you...

Hello Mr. Arnold

I was trying to reach you to ask a few questions to understand some items related to oil platforms and you were recommended as an expert I should call.

Can you ring me please

Eric

202 862 0448

Eric Lipton
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Washington Bureau
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Logic and Not Emotions Should Govern Decisions on Offshore Drilling

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We broadly agree with the detailed recommendations in the report and compliment the Department of Interior for its efforts. However, we do not agree with the six month blanket moratorium on floating drilling. A moratorium was added after the final review and was never agreed to by the contributors. A blanket moratorium is not the answer.

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The safety of offshore workers is much better than that of the average worker in the US, and the amount of oil spilled is significantly less than that of commercial shipping or petroleum tankers. The US offshore industry is vital to our energy needs. It provides 30% of our oil production, is the second largest source of revenue to the US Government ($6 Billion per year), and has a direct employment of 150,000 individuals. The report outlines several steps that can be taken immediately to further decrease risk as well as other steps that should be studied to determine if they can be implemented in a way that would decrease risk even more.

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Ford Brett, Managing Director, Petroskills

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Thomas E. Williams, The Environmentally Friendly Drilling Project

Nguyen, Ngoc B

From: Black, Steve
Sent: Saturday, May 29, 2010 3:52 PM
To: 'karnold@karnoldconsulting.com'
Cc: 'fbrett@petroskills.com'; 'Tom.Williams@Nautilus-Int.com'; 'egward@tamu.edu'
Subject: Re: Potential Op Ed from Contributors to Secretary Salazar's 30 Day Report to The President

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And to each of you, thanks again for your helpful work on the 30-day safety report.
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Sent: Sat May 29 09:03:30 2010
Subject: Potential Op Ed from Contributors to Secretary Salazar's 30 Day Report to The President

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Attachments: Our Views Are Not Appropriately Represented- Rev 1.docx

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The Primary Recommendation in the May 27, 2010 report, "INCREASED SAFETY MEASURES FOR ENERGY DEVELOPMENT ON THE OUTER CONTINENTAL SHELF" Given by Secretary Salazar to The President Misrepresents our Position

The National Academy of Engineering recommended us as contributors and reviewers of the recent Department of Interior "30 Day Review" of the BP Oil Spill. We were chosen because of our extensive petroleum industry expertise, and independent perspectives. The report states:

"The recommendations contained in this report have been peer-reviewed by seven experts identified by the National Academy of Engineering. Those experts, who volunteered their time and expertise, are identified in Appendix 1. The Department also consulted with a wide range of experts from government, academia and industry."

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We broadly agree with the detailed recommendations in the report and compliment the Department of Interior for its efforts. However, we do not agree with the six month blanket moratorium on floating drilling. A moratorium was added after the final review and was never agreed to by the contributors.

The draft which we reviewed stated:

“Along with the specific recommendations outlined in the body of the report, Secretary Salazar recommends a 6-month moratorium on permits for new exploratory wells with a depth of 1,000 feet or greater. This will allow time for implementation of the measures outlined in this report, and the consideration of information and recommendations from the Presidential Commission as well as other investigations into the accident.

“In addition, Secretary Salazar recommends a temporary pause in all current drilling operations for a sufficient length of time to perform additional blowout preventer function and pressure testing and well barrier testing for the existing 33 permitted exploratory wells currently operating in deepwater in the Gulf of Mexico. These immediate testing requirements are described in Appendix 1.”

We agree that the report and the history it describes agrees with this conclusion. Unfortunately after the review the conclusion was modified to read:

“The Secretary also recommends temporarily halting certain permitting and drilling activities. First, the Secretary recommends a six-month moratorium on permits for new wells being drilled using floating rigs. The moratorium would allow for implementation of the measures proposed in this report and for consideration of the findings from ongoing investigations, including the bipartisan National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling.

“The Secretary further recommends an immediate halt to drilling operations on the 33 permitted wells, not including the relief wells currently being drilled by BP, that are currently being drilled using

floating rigs in the Gulf of Mexico. Drilling operations should cease as soon as safely practicable for a 6-month period."

We believe the moratorium as defined in the draft report addresses the issues evident in this case. We understand the need to undertake the limited moratorium and actions described in the draft report to assure the public that something tangible is being done. A blanket moratorium is not the answer. It will not measurably reduce risk further and it will have a lasting impact on the nation's economy which may be greater than that of the oil spill.

The report highlights the safety record of the industry in drilling over 50,000 wells on the US Outer Continental Shelf of which more than 2000 were in over 1000 feet of water and 700 were in greater than 5000 feet of water. We have been using subsea blowout preventers since the mid- 1960s. The only other major pollution event from offshore drilling was 41 years ago. This was from a shallow water platform in Santa Barbara Channel drilled with a BOP on the surface of the platform.

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This tragedy had very specific causes. A blanket moratorium will have the indirect effect of harming thousands of workers and

further impact state and local economies suffering from the spill. We would in effect be punishing a large swath of people who were and are acting responsibly and are providing a product the nation demands.

A blanket moratorium does not address the specific causes of this tragedy. We do not believe punishing the innocent is the right thing to do. We encourage the Secretary of the Interior to overcome emotion with logic and to define what he means by a "blanket moratorium" in such a way as to be consistent with the body of the report and the interests of the nation.

The foregoing represents our views as individuals and does not represent the views of the National Academy of Engineering or the National Research Council or any of its committees.

Kenneth E. Arnold, NAE, Chair of the NRC Committee to Review the MMS Offshore Inspection Program

Ford Brett, Managing Director, Petroskills

Hans Juvkam-Wold, Professor Emeritus, Petroleum Engineering, Texas A&M University

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Subject: Re: Potential report to Senators from Contributors to Secretary Salazar's 30 Day Report to The President

Ken et al

I just read on bloomberg that Rigs in less than 500 ft of h2o are exempt. True?

All we need now is to alllow development drilling - any chance?

Ford Brett

(m) +1 918 408 9516

On May 29, 2010, at 5:25 PM, "Ken Arnold" <karnold@karnoldconsulting.com> wrote:

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Sent: Sunday, May 30, 2010 9:08 PM
To: 'FBrett@PetroSkills.com'; 'karnold@karnoldconsulting.com'
Cc: 'Tom.Williams@Nautilus-Int.com'; 'egward@tamu.edu'; 'juvkam-wold@pe.tamu.edu'
Subject: Re: Potential report to Senators from Contributors to Secretary Salazar's 30 Day Report to The President

Ford, we just put out a press release with an NTL clarifying the scope of the moratorium. Shallow water wells and certain development wells in deep water are allowed.

Have a good Memorial Day!

Steve

From: Ford Brett <FBrett@PetroSkills.com>
To: Ken Arnold <karnold@karnoldconsulting.com>
Cc: Black, Steve; Tom.Williams@Nautilus-Int.com <Tom.Williams@Nautilus-Int.com>; egward@tamu.edu <egward@tamu.edu>; Hans Juvkam-Wold <juvkam-wold@pe.tamu.edu>
Sent: Sat May 29 21:43:55 2010
Subject: Re: Potential report to Senators from Contributors to Secretary Salazar's 30 Day Report to The President

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Sent: Sunday, May 30, 2010 10:21 PM
To: Black, Steve; karnold@karnoldconsulting.com
Cc: Tom.Williams@Nautilus-Int.com; egward@tamu.edu; juvkam-wold@pe.tamu.edu
Subject: RE: Potential report to Senators from Contributors to Secretary Salazar's 30 Day Report to The President

Steve –

Thanks for the update – you don't need to be reading an email from me on a holiday. Hopefully, you won't see this until Tuesday. I'd like for you to know where I stand on this. This email describes my concerns. I believe they are likely similar to those of others on the panel, but I'm speaking only for myself.

The Secretary and President are entitled to take any legal action they feel appropriate for any reasons (technical, political, or even 'just because'). I understand that. If I wanted to 'cause a stink' I already would have. I think my (our?) concerns are valid and deserve some kind of formal response from the DOI.

I have three concerns (in roughly descending order of importance from my perspective) with the way this was handled.

1) We can't be having political decisions (however valid) be 'given' cover by technical experts who don't agree with (and worse haven't even reviewed) the recommendations. Processes that do that are doomed to fail. I participated in the effort in good faith. I made what I thought were helpful comments, and I believe the DOI did a very good job on the report - especially in 30 days. I think the final detailed recommendations go a bit overboard, but I can see why there's necessary. I'll even support them all because that's what the process produced. But the most important recommendation wasn't something we even looked at. That is the Secretary's prerogative – but not with our names on it. The entire process will lose credibility and (I'm afraid) you'll lose the contributions of people like me who have valuable experience to contribute. This can all be a miss-communication, a report issued in haste etc. I understand things like that. OK – but we need to 'fix' the perception that we reviewed and agreed with the six month ban. (A press release clarifying would be OK). But if panels like this are to be 'political cover' instead of 'searches for the truth' (or at least expert's consensus) then you'll have serious problems with trying to move forward with the many things still left to do. I don't want to see that. I hope you and the Secretary can see that this isn't a disagreement on what to do, but on the integrity of the process.

Brett editorial note: I know a bit about how BP works, and very interestingly to me, this kind failure of integrity in the process - in my opinion - is similar to what was going on in BP (ie. Reporting up the organization that 'all the experts agree', when, in fact, the people with the detailed knowledge did not). Don't do that – you'll have a disaster.

2) Personal integrity. Am I supposed to A) provide my professional advice to the DOI as best as I can, or B) be 'cover' for whatever decision the DOI would like to make. I am very proud, and pleased to do A) and hope I positively contribute to a solution. I will not do B).

3) I disagree with the recommendation to halt all floating drilling. Let me tell you why I think a 6 month ban is the wrong thing for our nation to do. (Editorial note: haven't been selected by the people to make this decision, but I still have "judgment about risk" based on the physics and practical operational realities in the field). If we are to have 'reviewed' this recommendation – as stated in the report - at least my concerns should have been heard.
    a) Deepwater **exploration** is where the risks are (development is way safer). Once the pore pressure and productive formations are known, operations become much, much more reliable. A blanket ban is not warranted and will drive responsible operators away from the gulf (Brett editorial comment: there is a reason why Transocean is headquartered in Switzerland and not Houston – it's has to do with legal concerns).
    b) The best rigs will get work and go else where. They won't come back. We'll end up with 'junkier' rigs (they'll still meet 'regs' – but they'll be less capable). This will have the unintended consequence of increasing our future risks.
    c) There were problems with equipment, but the root problem wasn't with the equipment – it was with a piece of paper in Houston - faulty design. By the way, we'll know more later, but it is possible the BOP worked as designed, and that, because of the faulty casing design, it simply washed out as it was trying to close. They take 45 seconds to close, and can wash out if sealing on pressure and high flow. That's because of the faulty casing design. The measures in our report – if implemented – will address both equipment and design risks.

d) Operators need to fully implement those recommendations per the report – not arbitrarily wait six months. An arbitrary six month delay on all floating drilling will penalize the responsible operators along with those who are not. How did six months come about? Why not five? Why not nine? We proposed that operators fulfill the requirements in our detailed recommendations and then proceed. Some operators might be able to do it faster than others. We need performance standards, not an arbitrary time in the 'penalty box'.
e) A second cause of this disaster was the inattention that people paid to the warning signs. No one will do that again for a long time to come. (Editorial comment: having executives not necessary for operations to go the rig for a 'safety' award is in itself unsafe – if nothing else for the helicopter ride. It caused the "C team" to be on the switch.)

I believe the blanket ban will drive responsible operators away from the Gulf of Mexico. Besides reducing lease sale income and production revenue, it will INCREASE future risk by keeping out less responsible operators and making future equipment used in the gulf be worse. We need performance standards – not arbitrary requirements – to drive what we do.

As far as I know my work on the review is done. I'll be happy to help in the future if I can, but would need my first two concerns addressed before I would be prepared to do so.

I hope you're spending time with your family and not reading this on Memorial Day, if you happen to read this – happy memorial day to you as well.

I would like some kind of reply. Thanks for your patience.

Ford Brett

PetroSkills
(o) +1 918 828 2511 *(I pick up messages frequently)*
(m) +1 918 408 9516 *(works in most of world)*
Skype Ford.Brett
or call Rozanne at +1 918 828 2505

www.PetroSkills.com

From: Black, Steve [mailto:steve_black@ios.doi.gov]
Sent: Sunday, May 30, 2010 8:08 PM
To: Ford Brett; 'karnold@karnoldconsulting.com'
Cc: 'Tom.Williams@Nautilus-Int.com'; 'egward@tamu.edu'; 'juvkam-wold@pe.tamu.edu'
Subject: Re: Potential report to Senators from Contributors to Secretary Salazar's 30 Day Report to The President

Ford, we just put out a press release with an NTL clarifying the scope of the moratorium. Shallow water wells and certain development wells in deep water are allowed.

Have a good Memorial Day!

Steve

From: Ford Brett <FBrett@PetroSkills.com>
To: Ken Arnold <karnold@karnoldconsulting.com>
Cc: Black, Steve; Tom.Williams@Nautilus-Int.com <Tom.Williams@Nautilus-Int.com>; egward@tamu.edu <egward@tamu.edu>; Hans Juvkam-Wold <juvkam-wold@pe.tamu.edu>
Sent: Sat May 29 21:43:55 2010
Subject: Re: Potential report to Senators from Contributors to Secretary Salazar's 30 Day Report to The President

Ken et al

I just read on bloomberg that Rigs in less than 500 ft of h2o are exempt. True?

All we need now is to alllow development drilling - any chance?

Ford Brett

(m) +1 918 408 9516

On May 29, 2010, at 5:25 PM, "Ken Arnold" <karnold@karnoldconsulting.com> wrote:

Steve

There has been a change in plans. The current thought is to send the attached to Senator Landry and Senator Hutchinson. We have connections at both. Please note we turned down the tone.

We are also in the process of gathering more signatures.

Ken

Kenneth E. (Ken) Arnold

K Arnold Consulting, Inc.

3031 Shadowdale

Houston, TX 77043

Cell: 832-212-0160

Home: 713-939-1034

www.karnoldconsulting.com

From: Black, Steve [mailto:steve_black@ios.doi.gov]
Sent: Saturday, May 29, 2010 2:52 PM
To: 'karnold@karnoldconsulting.com'
Cc: 'fbrett@petroskills.com'; 'Tom.Williams@Nautilus-Int.com'; 'egward@tamu.edu'
Subject: Re: Potential Op Ed from Contributors to Secretary Salazar's 30 Day Report to The President

Thanks Ken. The Secretary is traveling this weekend, but I'd be happy to talk further. I appreciate your courtesies.

And to each of you, thanks again for your helpful work on the 30-day safety report.
Steve

<Our Views Are Not Appropriately Represented- Rev 1.docx>

Nguyen, Ngoc B

From: Ken Arnold [karnold@karnoldconsulting.com]
Sent: Tuesday, June 01, 2010 4:07 PM
To: Black, Steve
Subject: latest Version
Attachments: Our Views Are Not Appropriately Represented- Rev 1.docx

Steve

Please call. Tom Williams has some specific recommendations as to Congressional committees he wants to contact with the attached document. I am under pressure to do so by close of business today. As you can tell most of the reviewers have signed on and are concerned.

Ken

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The Primary Recommendation in the May 27, 2010 report, "INCREASED SAFETY MEASURES FOR ENERGY DEVELOPMENT ON THE OUTER CONTINENTAL SHELF" Given by Secretary Salazar to The President Misrepresents our Position

The National Academy of Engineering recommended us as contributors and reviewers of the recent Department of Interior "30 Day Review" of the BP Oil Spill. We were chosen because of our extensive petroleum industry expertise, and independent perspectives. The report states:

"The recommendations contained in this report have been peer-reviewed by seven experts identified by the National Academy of Engineering. Those experts, who volunteered their time and expertise, are identified in Appendix 1. The Department also consulted with a wide range of experts from government, academia and industry."

The BP Macondo blow out was a tragedy for eleven families, and an environmental disaster of worldwide scale. We believe the blowout was caused by a complex and highly improbable chain of human errors coupled with several equipment failures and was preventable. The petroleum industry will learn from this; it can and will do better. We should not be satisfied until there are no deaths and no environmental impacts offshore - ever. However, we must understand that as with any human endeavor there will always be risks.

We broadly agree with the detailed recommendations in the report and compliment the Department of Interior for its efforts. However, we do not agree with the six month blanket moratorium on floating drilling. A moratorium was added after the final review and was never agreed to by the contributors.

The draft which we reviewed stated:

“Along with the specific recommendations outlined in the body of the report, Secretary Salazar recommends a 6-month moratorium on permits for new exploratory wells with a depth of 1,000 feet or greater. This will allow time for implementation of the measures outlined in this report, and the consideration of information and recommendations from the Presidential Commission as well as other investigations into the accident.

“In addition, Secretary Salazar recommends a temporary pause in all current drilling operations for a sufficient length of time to perform additional blowout preventer function and pressure testing and well barrier testing for the existing 33 permitted exploratory wells currently operating in deepwater in the Gulf of Mexico. These immediate testing requirements are described in Appendix 1.”

We agree that the report and the history it describes agrees with this conclusion. Unfortunately after the review the conclusion was modified to read:

“The Secretary also recommends temporarily halting certain permitting and drilling activities. First, the Secretary recommends a six-month moratorium on permits for new wells being drilled using floating rigs. The moratorium would allow for implementation of the measures proposed in this report and for consideration of the findings from ongoing investigations, including the bipartisan National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling.

“The Secretary further recommends an immediate halt to drilling operations on the 33 permitted wells, not including the relief wells currently being drilled by BP, that are currently being drilled using

floating rigs in the Gulf of Mexico. Drilling operations should cease as soon as safely practicable for a 6-month period."

We believe the moratorium as defined in the draft report addresses the issues evident in this case. We understand the need to undertake the limited moratorium and actions described in the draft report to assure the public that something tangible is being done. A blanket moratorium is not the answer. It will not measurably reduce risk further and it will have a lasting impact on the nation's economy which may be greater than that of the oil spill.

The report highlights the safety record of the industry in drilling over 50,000 wells on the US Outer Continental Shelf of which more than 2000 were in over 1000 feet of water and 700 were in greater than 5000 feet of water. We have been using subsea blowout preventers since the mid- 1960s. The only other major pollution event from offshore drilling was 41 years ago. This was from a shallow water platform in Santa Barbara Channel drilled with a BOP on the surface of the platform.

The safety of offshore workers is much better than that of the average worker in the US, and the amount of oil spilled is significantly less than that of commercial shipping or petroleum tankers. The US offshore industry is vital to our energy needs. It provides 30% of our oil production, is the second largest source of revenue to the US Government ($6 Billion per year), and has a direct employment of 150,000 individuals. The report outlines several steps that can be taken immediately to further decrease risk as well as other steps that should be studied to determine if they can be implemented in a way that would decrease risk even more.

This tragedy had very specific causes. A blanket moratorium will have the indirect effect of harming thousands of workers and

further impact state and local economies suffering from the spill. We would in effect be punishing a large swath of people who were and are acting responsibly and are providing a product the nation demands.

A blanket moratorium does not address the specific causes of this tragedy. We do not believe punishing the innocent is the right thing to do. We encourage the Secretary of the Interior to overcome emotion with logic and to define what he means by a "blanket moratorium" in such a way as to be consistent with the body of the report and the interests of the nation.

The foregoing represents our views as individuals and does not represent the views of the National Academy of Engineering or the National Research Council or any of its committees.

Kenneth E. Arnold, NAE, Chair of the NRC Committee to Review the MMS Offshore Inspection Program

Dr. Robert Bea, Department of Civil and Environmental Engineering, Univeristy of California at Berkeley

Dr. Benton Baugh, President, Radoil, Inc.

Ford Brett, Managing Director, Petroskills

Dr. Martin Chenevert, Senior Lecturer and Director of Drilling Research Program, Department of Petroleum and Geophysical Engineering, University of Texas

Dr. Hans Juvkam-Wold, Professor Emeritus, Petroleum Engineering, Texas A&M University

Dr. E.G. (Skip) Ward, Associate Director, Offshore Technology Research Center, Texas A&M University

Thomas E. Williams, The Environmentally Friendly Drilling Project

Nguyen, Ngoc B

From: Black, Steve
Sent: Tuesday, June 01, 2010 5:48 PM
To: 'karnold@karnoldconsulting.com'
Subject: Re: latest Version

Hi Ken. I've been traveling today. Will review and call as soon as possible.

Steve

From: Ken Arnold <karnold@karnoldconsulting.com>
To: Black, Steve
Sent: Tue Jun 01 16:06:51 2010
Subject: latest Version

Steve

Please call. Tom Williams has some specific recommendations as to Congressional committees he wants to contact with the attached document. I am under pressure to do so by close of business today. As you can tell most of the reviewers have signed on and are concerned.

Ken

Kenneth E. (Ken) Arnold
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Nguyen, Ngoc B

From: Black, Steve
Sent: Wednesday, June 02, 2010 6:41 PM
To: karnold@karnoldconsulting.com
Subject: Draft letter

Ken, as we discussed. Please give me any comments. Thanks for your assistance.

June 2, 2010

Mr. J. Ford Brett
Managing Director,
Petroskills, Inc.
3128 E. 66th Place
Tulsa, OK 74135

Dear Mr. Brett:
Thank you for your valuable assistance in connection with the preparation of the Secretary's May 27, 2010, report to the President, entitled "Increased Safety Measures for Energy Development on the Outer Continental Shelf." The Department is working diligently to implement each of the recommendations as soon as practicable to improve the safety of offshore oil and gas development off our Nation's coasts.

As stated in the report, each of the 22 numbered recommendations contained in the report was developed after consulting with a wide range of experts in State and Federal Governments, academic institutions, and industry and advocacy organizations. Given the technical nature of the report and its recommendations, the Department asked Dr. Peter Blair of the National Academy of Engineering to identify a group of recognized academic and industry experts in the relevant fields to provide certain information to the Department related to offshore drilling safety and blowout protection equipment and to review and comment on the proposed safety recommendations to be included in the report. We are indebted to each of you for agreeing to serve in that role and for your stated concurrence with the detailed recommendations contained in the report.

Based on the recommendations contained in the report and the devastating consequences of the ongoing oil spill, the Administration independently concluded that a 6-month moratorium on new offshore drilling was necessary to implement the safety recommendations contained in the report and to learn from the information and recommendations developed by the Presidential Commission and other ongoing investigations into the Deepwater Horizon incident and resulting BP oil spill.

By listing you as members of the NAE panel that peer-reviewed the 22 safety recommendations contained in the report, we did not mean to imply that you also agreed with the decision to impose a moratorium on all new deepwater drilling. While that recommendation and decision were based on the safety recommendations contained in the report, in particular the need for new blowout preventer and other safety equipment on subsea BOP stacks used on floating drilling rigs, and the need for better wild-well intervention techniques in the event of future emergencies like the BP oil spill, particularly in deepwater, we acknowledge that you were not asked to review or comment on the scope of the proposed moratorium. We regret any misunderstanding or confusion related to the inclusion of the recommendation to impose a 6-month moratorium on all new deepwater wells in the executive summary of the final report.

Again, the Department is grateful for your service to the United States in this extraordinary time of crisis. Your willingness to associate yourselves with the specific safety recommendations contained in the report is extremely important and will help to ensure that offshore drilling can be done safely and in an environmentally responsible manner.

Sincerely,

Steve Black
Counselor to the Secretary
U.S. Department of the Interior
1849 C Street, N.W., MS 7229
Washington, D.C. 20240
Phone: 202-208-4123
Fax: 202-208-4561
e-mail: steve_black@ios.doi.gov

Nguyen, Ngoc B

From: Black, Steve
Sent: Wednesday, June 02, 2010 6:41 PM
To: karnold@karnoldconsulting.com
Subject: Draft letter

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June 2, 2010

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Managing Director,
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3128 E. 66th Place
Tulsa, OK 74135

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Sincerely,

Steve Black
Counselor to the Secretary
U.S. Department of the Interior
1849 C Street, N.W., MS 7229
Washington, D.C. 20240
Phone: 202-208-4123
Fax: 202-208-4561
e-mail: steve_black@ios.doi.gov

Nguyen, Ngoc B

From: Ken Arnold [karnold@karnoldconsulting.com]
Sent: Wednesday, June 02, 2010 6:58 PM
To: Black, Steve
Subject: FW: Our Document is public
Attachments: asme note on the BP oil spill.pdf

Attached for your info is the Tom Williams letter to ASME which I got from a retired Sell list server. Below is the response from NAE to a letter we sent for your info if you care to see it and my take away...fair or otherwise.

Kenneth E. (Ken) Arnold
K Arnold Consulting, Inc.
3031 Shadowdale
Houston, TX 77043
Cell: 832-212-0160
Home: 713-939-1034
www.karnoldconsulting.com

From: Ken Arnold [mailto:karnold@karnoldconsulting.com]
Sent: Wednesday, June 02, 2010 3:38 PM
To: 'Godwin, Stephen'; 'Blair, Peter'; 'BSkinner@nas.edu'
Cc: 'Ford Brett'; Hans Juvkam-Wold (juvkam-wold@pe.tamu.edu); 'Bob Bea'; Skip Ward (egward@tamu.edu); 'mechenevert@austin.utexas.edu'; 'Tom Williams'; 'bbaugh@radoil.com'
Subject: Our Document is public

I just got a copy of an ASME of a letter written yesterday by Tom Williams which contains the basics of our document.

Kenneth E. (Ken) Arnold
K Arnold Consulting, Inc.
3031 Shadowdale
Houston, TX 77043
Cell: 832-212-0160
Home: 713-939-1034
www.karnoldconsulting.com

From: Ken Arnold [mailto:karnold@karnoldconsulting.com]
Sent: Wednesday, June 02, 2010 3:22 PM
To: 'Godwin, Stephen'; 'Blair, Peter'; 'BSkinner@nas.edu'
Cc: 'Ford Brett'; Hans Juvkam-Wold (juvkam-wold@pe.tamu.edu); 'Bob Bea'; Skip Ward (egward@tamu.edu); 'mechenevert@austin.utexas.edu'; 'Tom Williams'; 'bbaugh@radoil.com'
Subject: RE: Concerns about DOI report

Ford, Hans, Bob, Skip, Martin, Tom, Benton

This is the response we got from Chuck Vest, President of NAE, about our concerns that the 30 Day report says it was peer reviewed by a group of us, and yet the final version of the report had a major recommendation we never got to see, or comment on. I take from this

1. NAE has a different view of the peer review process than the one I had. That is the conclusions of a report can be altered after the peer review process without the knowledge of the reviewers, yet the reviewer's names can still be used to justify the validity of the conclusion.

2. Chuck Vest dismissed our concerns out of hand without taking the time to really understand what we were saying and perhaps without really reading the document.

3. It would be inconvenient to NAE to address our concerns and easier to just give us a condescending lecture. I had such an experience once before with Dr. Vest but had thought that was a special circumstance and did not accurately reflect his character.

I assume there was a little of all three involved in the response.

I for one am disappointed with NAE's response, but that is perhaps because I had a higher regard for what "peer reviewed" means than is warranted. I have not heard from Steve Black at DOI but he usually calls me late in the evening.

I would appreciate your thoughts on where we go from here.

Kenneth E. (Ken) Arnold
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Houston, TX 77043
Cell: 832-212-0160
Home: 713-939-1034
www.karnoldconsulting.com

From: Godwin, Stephen [mailto:SGODWIN@nas.edu]
Sent: Wednesday, June 02, 2010 10:49 AM
To: 'Ken Arnold'
Subject: FW: Concerns about DOI report

Ken,
Chuck's comments are below.
Steve

From: Vest, Charles M.
Sent: Wednesday, June 02, 2010 11:15 AM
To: Blair, Peter
Cc: Skinner, Bob; Godwin, Stephen
Subject: Re: Ken Arnold et al concerns about DOI report

Peter, Bob, and Steve,

Here are my views on this matter:

1. We (NAE) would not censor anyone's views, and in the end it is the authors' decision.

2. Having said this, I do not think it is a good idea to publish an op-ed. My concern remains, but is slightly attenuated, if it is a private communication with those in Interior that they dealt with. My view is that as a matter of national service, some or all of the authors were asked by the White House/Department of the Interior

to review materials associated with the 30-day report. I do not know the details of how this task was presented to them. They were informally recommended by the NAE/NRC because of their technical experience and expertise. My view, and I think it the common understanding, is that when asked to serve such a function at this level, you do your best to answer the questions asked of you and end it at that point. One has to realize that many factors must go into making such a major policy decision, and they are very likely to range well beyond the scope of what is typically asked of technical experts, and cannot always be expected to follow a completely technical logic.

3. What troubles me a lot in this instance is that it will be read as if the authors took advantage of the service they had been asked to give to imply extra gravitas to their broader views, in this case regarding the moratorium. In my view, this is not good for them, and will also reflect negatively on the Academies, even though they would be acting as individuals. This would not be helpful as we prepare to undertake the detailed analysis that DOI has requested.

4. Although this is only a rough analogy, in the early 90s I chaired a committee of extraordinary individuals appointed by the President to drive and review a major redesign of the the space station. We worked really hard to answer questions leading to making it a truly international endeavor, cut its cost, reorganize the NASA operations, and move more of it to the private sector. But the one question we never discussed was whether as individuals we thought the station was the right investment for the nation. In retrospect, I think this was the right way to go, and I have been thinking of this analogy since this issue of the op-ed was raised.

5. I appreciate the fact that Ken Arnold and his colleagues have asked about my views. You certainly may share them as you deem fit.

6. Finally, I want to be clear that my views here are not about the moratorium and its wisdom. Although I don't know the whole calculus involved, I have some empathy for their view and understand their disappointment at being surprised by DOI's policy recommendation. Nonetheless, I don't think they or we will be well-served by publishing or delivering this.

--Chuck

From: Skinner, Bob
Sent: Wednesday, June 02, 2010 9:54 AM
To: Vest, Charles M.; Blair, Peter
Cc: Godwin, Stephen
Subject: Ken Arnold et al concerns about DOI report

Chuck/Peter, I am forwarding the email that Steve Godwin received from Arnold last night, along with the latest version of the letter. As you will see from the email, the group is still uncertain about where to send the letter. Ken is most anxious that Chuck be made aware of their concerns and would like some sort of "appropriate response" from the NRC/NAE. Please give me or Steve a call if you would like to discuss. Bob

Robert E. Skinner, Jr.
Executive Director
Transportation Research Board

Ph: 202-334-2936
http://trb.org

From: Godwin, Stephen
Sent: Wednesday, June 02, 2010 9:26 AM
To: Skinner, Bob
Subject: FW: latest Version

Bob,
As we discussed.
Steve

From: Ken Arnold [mailto:karnold@karnoldconsulting.com]
Sent: Tuesday, June 01, 2010 8:43 PM
To: Godwin, Stephen
Subject: latest Version

Attached is latest version with the final (?) list of people endorsing. We have had no one say no, but several have not responded in writing or have said they thought their endorsement would appear self serving because of their backgrounds.

I have talked to Steve Black this evening and he is going to take the document through the DOI and let me know tomorrow if we can influence a way forward in getting an apology for the way things evolved and a redefinition of the moratorium to make it technically more consistent and alleviate some of the unnecessary economic damage.

Are you able to surface it through NRC and NAE on our behalf and make sure that Chuck Vest is aware of our concerns and brings it up to the DOI and White House in the appropriate manner.

Our plan failing an appropriate response from DOI and NAE is to submit it to some of the Congressional Committees, but we really don't want to do this. Some think it should be sent to the House Energy and Economics Committee and the House Select Committee on Energy Independence and Global Warming. One of the signers has connections to staff members on both these committees.

We won't do anything until we hear back from Steve Black tomorrow, but it would be helpful as well if you have the chance to bring this up with Chuck Vest.

Ken

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June 1, 2010

To: ASME EnComm Members:

Addressing the BP Horizon spill:

The National Academy of Engineering recommended a list of contributors and reviewers of the recent Department of Interior "30 Day Review" of the BP Oil Spill. I was involved in the review and was interviewed by officials from the White House and Department of Interior. The list of people interviewed and on the review panel have extensive petroleum industry expertise, and independent perspectives.

The report states: “The recommendations contained in this report have been peer-reviewed by seven experts identified by the National Academy of Engineering. Those experts, who volunteered their time and expertise, are identified in Appendix 1. The Department also consulted with a wide range of experts from government, academia and industry.”

The BP Macondo blow out was a tragedy for eleven families, and an environmental disaster of worldwide scale. We believe the blowout was caused by a complex and highly improbable chain of human errors coupled with several equipment failures and was preventable. The petroleum industry will learn from this; it can and will do better. We should not be satisfied until there are no deaths and no environmental impacts offshore - ever. However, we must understand that as with any human endeavor there will always be risks.

Some of the reviewers communicated after the report was released and while broadly agree with the detailed recommendations in the report; do not agree with the six month blanket moratorium on floating drilling. A moratorium was added after the final review and was never agreed to by the contributors.

The draft which we reviewed stated:

“Along with the specific recommendations outlined in the body of the report, Secretary Salazar recommends a 6-month moratorium on permits for new exploratory wells with a depth of 1,000 feet or greater. This will allow time for implementation of the measures outlined in this report, and the consideration of information and recommendations from the Presidential Commission as well as other investigations into the accident.

“In addition, Secretary Salazar recommends a temporary pause in all current drilling operations for a sufficient length of time to perform additional blowout preventer function and pressure testing and well barrier testing for the existing 33 permitted exploratory wells currently operating in deepwater in the Gulf of Mexico. These immediate testing requirements are described in Appendix 1.”

The people I have communicated with agree that the report and the history it describes agrees with this conclusion. Unfortunately after the review the conclusion was modified to read:

“The Secretary also recommends temporarily halting certain permitting and drilling activities. First, the Secretary recommends a six-month moratorium on permits for new wells being drilled

using floating rigs. The moratorium would allow for implementation of the measures proposed in this report and for consideration of the findings from ongoing investigations, including the bipartisan National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling.

"The Secretary further recommends an immediate halt to drilling operations on the 33 permitted wells, not including the relief wells currently being drilled by BP, that are currently being drilled using floating rigs in the Gulf of Mexico. Drilling operations should cease as soon as safely practicable for a 6-month period."

No one believed that a blanket moratorium is not the answer. It will not measurably reduce risk further and it will have a lasting impact on the nation's economy which may be greater than that of the oil spill.

The report highlights the safety record of the industry in drilling over 50,000 wells on the US Outer Continental Shelf of which more than 2000 were in over 1000 feet of water and 700 were in greater than 5000 feet of water. We have been using subsea blowout preventers since the mid- 1960s. The only other major pollution event from offshore drilling was 41 years ago. This was from a shallow water platform in Santa Barbara Channel drilled with a BOP on the surface of the platform.

The safety of offshore workers is much better than that of the average worker in the US, and the amount of oil spilled is significantly less than that of commercial shipping or petroleum tankers. The US offshore industry is vital to our energy needs. It provides 30% of our oil production, is the second largest source of revenue to the US Government ($6 Billion per year), and has a direct employment of 150,000 individuals. The report outlines several steps that can be taken immediately to further decrease risk as well as other steps that should be studied to determine if they can be implemented in a way that would decrease risk even more.

This tragedy had very specific causes. A blanket moratorium will have the indirect effect of harming thousands of workers and further impact state and local economies suffering from the spill. We would in effect be punishing a large swath of people who were and are acting responsibly and are providing a product the nation demands.

A blanket moratorium does not address the specific causes of this tragedy. It is in fact punishing the innocent and is the right thing to do.

These appear to me to be political decisions; one of the reviewers made the following comments I wholeheartedly agree:

- *A 6 month ban is the wrong thing for our nation to do.*
    - *Deepwater **exploration** is where the risks are highest (development is way safer). Once the pore pressure and productive formations are known, operations become much, much more reliable. A blanket ban is not warranted and will drive responsible operators away from the gulf*
- *The best rigs and the responsible drillers will get work and go elsewhere. They won't come back. We'll end up with 'junkier' rigs (they'll still meet 'regs' – but they'll be less capable). This will have the unintended consequence of increasing our future risks.*
- *Operators need to fully implement those recommendations per the report – not arbitrarily wait six months. An arbitrary six month delay on all floating drilling will penalize the*

responsible operators along with those who are not. How did six months come about? Why not five? Why not nine? We proposed that operators fulfill the requirements in our detailed recommendations and then proceed. Some operators might be able to do it faster than others. We need performance standards, not an arbitrary time in the 'penalty box'.

- *A second cause of this disaster was the inattention that people paid to the warning signs. No one will do that again for a long time to come.*

I could not have said this better myself. In the review process it was clear the people on the review team were young and inexperienced, did not understand the geology differences and the risk differences. They did not have a grasp of the technical nature involved in well planning and executions. I took good notes and sent them to the review team. There is plenty that can be done to make deepwater drilling safer. This is the time to do so.

I am on a team lead by RPSEA that has made sound recommendations to Congress to address the concerns of the public and regulators as we go forward. I have attached those recommendations and hope this ASME committee will support these as well as to encourage immediate exemptions for offshore development drilling during this 6 month moratorium.

This could turn out to the one of the largest energy policy mistake in our Country's history since Jimmy Carter administration thought we were running out of natural gas and created the Department of Energy.

Thomas E. Williams

Nguyen, Ngoc B

From: Ken Arnold [karnold@karnoldconsulting.com]
Sent: Wednesday, June 02, 2010 7:02 PM
To: Black, Steve
Subject: RE: Draft letter

I don't think anyone expected any more than this. However, I wish you could have said that one of the issues the President's Committee will address early on is to evaluate the extent of the moratorium. But perhaps that is too much to expect. At least this is better than the brush off we got from NAE which I sent by another email.

Kenneth E. (Ken) Arnold
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www.karnoldconsulting.com

From: Black, Steve [mailto:steve_black@ios.doi.gov]
Sent: Wednesday, June 02, 2010 5:41 PM
To: karnold@karnoldconsulting.com
Subject: Draft letter

Ken, as we discussed. Please give me any comments. Thanks for your assistance.

June 2, 2010

Mr. J. Ford Brett
Managing Director,
Petroskills, Inc.
3128 E. 66th Place
Tulsa, OK 74135

Dear Mr. Brett:
Thank you for your valuable assistance in connection with the preparation of the Secretary's May 27, 2010, report to the President, entitled "Increased Safety Measures for Energy Development on the Outer Continental Shelf." The Department is working diligently to implement each of the recommendations as soon as practicable to improve the safety of offshore oil and gas development off our Nation's coasts.

As stated in the report, each of the 22 numbered recommendations contained in the report was developed after consulting with a wide range of experts in State and Federal Governments, academic institutions, and industry and advocacy organizations. Given the technical nature of the report and its recommendations, the Department asked Dr. Peter Blair of the National Academy of Engineering to identify a group of recognized academic and industry experts in the relevant fields to provide certain information to the Department related to offshore drilling safety and blowout protection equipment and to review and comment on the proposed safety recommendations to be included in the report. We are indebted to each of you for agreeing to serve in that role and for your stated concurrence with the detailed recommendations contained in the report.

Based on the recommendations contained in the report and the devastating consequences of the ongoing oil spill, the Administration independently concluded that a 6-month moratorium on new offshore drilling was necessary to implement the safety recommendations contained in the report and to learn from the information and recommendations developed by the Presidential Commission and other ongoing investigations into the Deepwater Horizon incident and resulting BP oil spill.

By listing you as members of the NAE panel that peer-reviewed the 22 safety recommendations contained in the report, we did not mean to imply that you also agreed with the decision to impose a moratorium on all new deepwater drilling. While that recommendation and decision were based on the safety recommendations contained in the report, in particular the need for new blowout preventer and other safety equipment on subsea BOP stacks used on floating drilling rigs, and the need for better wild-well intervention techniques in the event of future emergencies like the BP oil spill, particularly in deepwater, we acknowledge that you were not asked to review or comment on the scope of the proposed moratorium. We regret any misunderstanding or confusion related to the inclusion of the recommendation to impose a 6-month moratorium on all new deepwater wells in the executive summary of the final report.

Again, the Department is grateful for your service to the United States in this extraordinary time of crisis. Your willingness to associate yourselves with the specific safety recommendations contained in the report is extremely important and will help to ensure that offshore drilling can be done safely and in an environmentally responsible manner.

Sincerely,

Steve Black
Counselor to the Secretary
U.S. Department of the Interior
1849 C Street, N.W., MS 7229
Washington, D.C. 20240
Phone: 202-208-4123
Fax: 202-208-4561
e-mail: steve_black@ios.doi.gov

Nguyen, Ngoc B

From: Black, Steve
Sent: Wednesday, June 02, 2010 7:11 PM
To: Ken Arnold
Subject: RE: Our Document is public

Thanks Ken. Safe travels!

From: Ken Arnold [mailto:karnold@karnoldconsulting.com]
Sent: Wednesday, June 02, 2010 6:58 PM
To: Black, Steve
Subject: FW: Our Document is public

Attached for your info is the Tom Williams letter to ASME which I got from a retired Sell list server. Below is the response from NAE to a letter we sent for your info if you care to see it and my take away…fair or otherwise.

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www.karnoldconsulting.com

From: Ken Arnold [mailto:karnold@karnoldconsulting.com]
Sent: Wednesday, June 02, 2010 3:38 PM
To: 'Godwin, Stephen'; 'Blair, Peter'; 'BSkinner@nas.edu'
Cc: 'Ford Brett'; Hans Juvkam-Wold (juvkam-wold@pe.tamu.edu); 'Bob Bea'; Skip Ward (egward@tamu.edu); 'mechenevert@austin.utexas.edu'; 'Tom Williams'; 'bbaugh@radoil.com'
Subject: Our Document is public

I just got a copy of an ASME of a letter written yesterday by Tom Williams which contains the basics of our document.

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From: Ken Arnold [mailto:karnold@karnoldconsulting.com]
Sent: Wednesday, June 02, 2010 3:22 PM
To: 'Godwin, Stephen'; 'Blair, Peter'; 'BSkinner@nas.edu'
Cc: 'Ford Brett'; Hans Juvkam-Wold (juvkam-wold@pe.tamu.edu); 'Bob Bea'; Skip Ward (egward@tamu.edu); 'mechenevert@austin.utexas.edu'; 'Tom Williams'; 'bbaugh@radoil.com'
Subject: RE: Concerns about DOI report

Ford, Hans, Bob, Skip, Martin, Tom, Benton

This is the response we got from Chuck Vest, President of NAE, about our concerns that the 30 Day report says it was peer reviewed by a group of us, and yet the final version of the report had a major recommendation we never got to see, or comment on. I take from this

1. NAE has a different view of the peer review process than the one I had. That is the conclusions of a report can be altered after the peer review process without the knowledge of the reviewers, yet the reviewer's names can still be used to justify the validity of the conclusion.

2. Chuck Vest dismissed our concerns out of hand without taking the time to really understand what we were saying and perhaps without really reading the document.

3. It would be inconvenient to NAE to address our concerns and easier to just give us a condescending lecture. I had such an experience once before with Dr. Vest but had thought that was a special circumstance and did not accurately reflect his character.

I assume there was a little of all three involved in the response.

I for one am disappointed with NAE's response, but that is perhaps because I had a higher regard for what "peer reviewed" means than is warranted. I have not heard from Steve Black at DOI but he usually calls me late in the evening.

I would appreciate your thoughts on where we go from here.

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From: Godwin, Stephen [mailto:SGODWIN@nas.edu]
Sent: Wednesday, June 02, 2010 10:49 AM
To: 'Ken Arnold'
Subject: FW: Concerns about DOI report

Ken,
Chuck's comments are below.
Steve

From: Vest, Charles M.
Sent: Wednesday, June 02, 2010 11:15 AM
To: Blair, Peter
Cc: Skinner, Bob; Godwin, Stephen
Subject: Re: Ken Arnold et al concerns about DOI report

Peter, Bob, and Steve,

Here are my views on this matter:

1. We (NAE) would not censor anyone's views, and in the end it is the authors' decision.

2. Having said this, I do not think it is a good idea to publish an op-ed. My concern remains, but is slightly attenuated, if it is a private communication with those in Interior that they dealt with. My view is that as a matter of national service, some or all of the authors were asked by the White House/Department of the Interior to review materials associated with the 30-day report. I do not know the details of how this task was presented to them. They were informally recommended by the NAE/NRC because of their technical experience and expertise. My view, and I think it the common understanding, is that when asked to serve such a function at this level, you do your best to answer the questions asked of you and end it at that point. One has to realize that many factors must go into making such a major policy decision, and they are very likely to range well beyond the scope of what is typically asked of technical experts, and cannot always be expected to follow a completely technical logic.

3. What troubles me a lot in this instance is that it will be read as if the authors took advantage of the service they had been asked to give to imply extra gravitas to their broader views, in this case regarding the moratorium. In my view, this is not good for them, and will also reflect negatively on the Academies, even though they would be acting as individuals. This would not be helpful as we prepare to undertake the detailed analysis that DOI has requested.

4. Although this is only a rough analogy, in the early 90s I chaired a committee of extraordinary individuals appointed by the President to drive and review a major redesign of the the space station. We worked really hard to answer questions leading to making it a truly international endeavor, cut its cost, reorganize the NASA operations, and move more of it to the private sector. But the one question we never discussed was whether as individuals we thought the station was the right investment for the nation. In retrospect, I think this was the right way to go, and I have been thinking of this analogy since this issue of the op-ed was raised.

5. I appreciate the fact that Ken Arnold and his colleagues have asked about my views. You certainly may share them as you deem fit.

6. Finally, I want to be clear that my views here are not about the moratorium and its wisdom. Although I don't know the whole calculus involved, I have some empathy for their view and understand their disappointment at being surprised by DOI's policy recommendation. Nonetheless, I don't think they or we will be well-served by publishing or delivering this.

--Chuck

From: Skinner, Bob
Sent: Wednesday, June 02, 2010 9:54 AM
To: Vest, Charles M.; Blair, Peter
Cc: Godwin, Stephen
Subject: Ken Arnold et al concerns about DOI report

Chuck/Peter, I am forwarding the email that Steve Godwin received from Arnold last night, along with the latest version of the letter. As you will see from the email, the group is still uncertain about where to send the letter. Ken is most anxious that Chuck be made aware of their concerns and would like some sort of "appropriate response" from the NRC/NAE. Please give me or Steve a call if you would like to discuss. Bob

Robert E. Skinner, Jr.
Executive Director

Transportation Research Board

Ph: 202-334-2936
http://trb.org

From: Godwin, Stephen
Sent: Wednesday, June 02, 2010 9:26 AM
To: Skinner, Bob
Subject: FW: latest Version

Bob,
As we discussed.
Steve

From: Ken Arnold [mailto:karnold@karnoldconsulting.com]
Sent: Tuesday, June 01, 2010 8:43 PM
To: Godwin, Stephen
Subject: latest Version

Attached is latest version with the final (?) list of people endorsing. We have had no one say no, but several have not responded in writing or have said they thought their endorsement would appear self serving because of their backgrounds.

I have talked to Steve Black this evening and he is going to take the document through the DOI and let me know tomorrow if we can influence a way forward in getting an apology for the way things evolved and a redefinition of the moratorium to make it technically more consistent and alleviate some of the unnecessary economic damage.

Are you able to surface it through NRC and NAE on our behalf and make sure that Chuck Vest is aware of our concerns and brings it up to the DOI and White House in the appropriate manner.

Our plan failing an appropriate response from DOI and NAE is to submit it to some of the Congressional Committees, but we really don't want to do this. Some think it should be sent to the House Energy and Economics Committee and the House Select Committee on Energy Independence and Global Warming. One of the signers has connections to staff members on both these committees.

We won't do anything until we hear back from Steve Black tomorrow, but it would be helpful as well if you have the chance to bring this up with Chuck Vest.

Ken

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Nguyen, Ngoc B

From: Black, Steve
Sent: Wednesday, June 02, 2010 8:30 PM
To: hans.juvkam-wold@pe.tamu.edu; bbaugh@radoil.com; FBrett@Petroskills.com; bea@ce.berkeley.edu; Per.Holand@exprosoft.com; Chenevert, Martin E; Arnold Stancell
Cc: Ken Arnold; PBlair@nas.edu; Kemkar, Neal; Hanley, Kallie
Subject: NAE letter

Dear all – on behalf of the Secretary, thank you again for your assistance with the 30-day safety report. I understand the concerns that some of you have expressed with respect to the executive summary of the final report, which includes a recommendation to impose a 6-month moratorium on all new deepwater drilling to allow time to implement the recommendations contained in the report and to consider the findings and recommendations of the Presidential Commission on the Deepwater Horizon incident. Ultimately, that was a policy decision made by the Administration. As explained below, neither the Secretary nor I intended to imply that you had concurred in that recommendation. The following letter, which each of you will receive shortly (in substantially the same form, I expect) makes that clear.

Please don't hesitate to contact me if you have any questions or concerns. Again, thank you for your valuable and continued assistance. We still have a lot of work ahead of us.

Steve Black

June 2, 2010

Mr. J. Ford Brett
Managing Director
Petroskills, Inc.
3128 E. 66th Place
Tulsa, OK 74135

Dear Mr. Brett:

Thank you for your valuable assistance in connection with the preparation of the Secretary's May 27, 2010, report to the President, entitled "Increased Safety Measures for Energy Development on the Outer Continental Shelf." The Department is working diligently to implement each of the recommendations as soon as practicable to improve the safety of offshore oil and gas development off our Nation's coasts.

As stated in the report, each of the 22 numbered recommendations contained in the report was developed after consulting with a wide range of experts in State and Federal Governments, academic institutions, and industry and advocacy organizations. Given the technical nature of the report and its recommendations, the Department asked Dr. Peter Blair of the National Academy of Engineering to identify a group of recognized academic and industry experts in the relevant fields to provide certain information to the Department related to offshore drilling safety and blowout protection equipment and to review and comment on the proposed safety recommendations to be included in the report. We are indebted to each of you for agreeing to serve in that role and for your stated concurrence with the detailed recommendations contained in the report.

Based on the recommendations contained in the report and the devastating consequences of the ongoing oil spill, the Administration independently concluded that a 6-month moratorium on new deepwater offshore drilling was necessary

to implement the safety recommendations contained in the report and to learn from the information and recommendations developed by the Presidential Commission and other ongoing investigations into the Deepwater Horizon incident and resulting BP oil spill.

By listing you as members of the NAE panel that peer-reviewed the 22 safety recommendations contained in the report, we did not mean to imply that you also agreed with the decision to impose a moratorium on all new deepwater drilling. While that recommendation and decision were based on the safety recommendations contained in the report, in particular the need for new blowout preventer and other safety equipment on subsea BOP stacks used on floating drilling rigs, and the need for better wild-well intervention techniques in the event of future emergencies like the BP oil spill, particularly in deepwater, we acknowledge that you were not asked to review or comment on the scope of the proposed moratorium. We regret any misunderstanding or confusion related to the inclusion of the recommendation to impose a 6-month moratorium on all new deepwater wells in the executive summary of the final report.

Again, the Department is grateful for your service to the United States in this extraordinary time of crisis. Your willingness to associate yourselves with the specific safety recommendations contained in the report is extremely important and will help to ensure that offshore drilling can be done safely and in an environmentally responsible manner.

Sincerely,

Steve Black
Counselor to the Secretary
U.S. Department of the Interior
1849 C Street, N.W., MS 7229
Washington, D.C. 20240
Phone: 202-208-4123
Fax: 202-208-4561
e-mail: steve_black@ios.doi.gov

Burley, Jamie L

From: Ford Brett [FBrett@PetroSkills.com]
Sent: Wednesday, June 02, 2010 10:07 PM
To: Black, Steve
Subject: Re: NAE letter

Steve

Thanks. By the way, my address is [redacted]

Tnx

Ford Brett

(m) +1 918 408 9516

On Jun 2, 2010, at 7:30 PM, "Black, Steve" <steve_black@ios.doi.gov> wrote:

> Dear all – on behalf of the Secretary, thank you again for your assistance with the 30-day safety report. I understand the concerns that some of you have expressed with respect to the executive summary of the final report, which includes a recommendation to impose a 6-month moratorium on all new deepwater drilling to allow time to implement the recommendations contained in the report and to consider the findings and recommendations of the Presidential Commission on the Deepwater Horizon incident. Ultimately, that was a policy decision made by the Administration. As explained below, neither the Secretary nor I intended to imply that you had concurred in that recommendation. The following letter, which each of you will receive shortly (in substantially the same form, I expect) makes that clear.
>
> Please don't hesitate to contact me if you have any questions or concerns. Again, thank you for your valuable and continued assistance. We still have a lot of work ahead of us.
>
> Steve Black
>
> June 2, 2010
>
> Mr. J. Ford Brett

Managing Director

Petroskills, Inc.

3128 E. 66th Place

Tulsa, OK 74135

Dear Mr. Brett:

Thank you for your valuable assistance in connection with the preparation of the Secretary's May 27, 2010, report to the President, entitled "Increased Safety Measures for Energy Development on the Outer Continental Shelf." The Department is working diligently to implement each of the recommendations as soon as practicable to improve the safety of offshore oil and gas development off our Nation's coasts.

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By listing you as members of the NAE panel that peer-reviewed the 22 safety recommendations contained in the report, we did not mean to imply that you also agreed with the decision to impose a moratorium on all new deepwater drilling. While that recommendation and decision were based on the safety recommendations contained in the report, in particular the need for new blowout preventer and other safety equipment on subsea BOP stacks used on floating drilling rigs, and the need for better wild-well intervention techniques in the event of future emergencies like the BP oil spill, particularly in deepwater, we acknowledge that you were not asked to

review or comment on the scope of the proposed moratorium. We regret any misunderstanding or confusion related to the inclusion of the recommendation to impose a 6-month moratorium on all new deepwater wells in the executive summary of the final report.

Again, the Department is grateful for your service to the United States in this extraordinary time of crisis. Your willingness to associate yourselves with the specific safety recommendations contained in the report is extremely important and will help to ensure that offshore drilling can be done safely and in an environmentally responsible manner.

Sincerely,

Steve Black

Counselor to the Secretary

U.S. Department of the Interior

1849 C Street, N.W., MS 7229

Washington, D.C. 20240

Phone: 202-208-4123

Fax: 202-208-4561

e-mail: steve_black@ios.doi.gov

Nguyen, Ngoc B

From: Black, Steve
Sent: Wednesday, June 02, 2010 10:06 PM
To: 'FBrett@PetroSkills.com'
Subject: Re: NAE letter

Good to know. Thank you.

Steve

From: Ford Brett <FBrett@PetroSkills.com>
To: Black, Steve
Sent: Wed Jun 02 22:06:50 2010
Subject: Re: NAE letter

Steve

Thanks. By the way, my address is [redacted]

Tnx

Ford Brett

(m) +1 918 408 9516

On Jun 2, 2010, at 7:30 PM, "Black, Steve" <steve_black@ios.doi.gov> wrote:

> Dear all – on behalf of the Secretary, thank you again for your assistance with the 30-day safety report. I understand the concerns that some of you have expressed with respect to the executive summary of the final report, which includes a recommendation to impose a 6-month moratorium on all new deepwater drilling to allow time to implement the recommendations contained in the report and to consider the findings and recommendations of the Presidential Commission on the Deepwater Horizon incident. Ultimately, that was a policy decision made by the Administration. As explained below, neither the Secretary nor I intended to imply that you had concurred in that recommendation. The following letter, which each of you will receive shortly (in substantially the same form, I expect) makes that clear.
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> Please don't hesitate to contact me if you have any questions or concerns. Again, thank you for your valuable and continued assistance. We still have a lot of work ahead of us.
>
> Steve Black

June 2, 2010

Mr. J. Ford Brett

Managing Director

Petroskills, Inc.

3128 E. 66th Place

Tulsa, OK 74135

Dear Mr. Brett:

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Sincerely,

Steve Black

Counselor to the Secretary

U.S. Department of the Interior

1849 C Street, N.W., MS 7229

Washington, D.C. 20240

Phone: 202-208-4123

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e-mail: steve_black@ios.doi.gov

Nguyen, Ngoc B

From: Ford Brett [FBrett@PetroSkills.com]
Sent: Wednesday, June 02, 2010 10:24 PM
To: Black, Steve
Subject: Re: NAE letter

Steve

What are you doing answering email at this time?

People can have pro/con discussion about anything (6 mo moratorium included). My concern has always been, that you can't be using experts for 'cover'. I recognize there may have been last minute, copy paste from cover leter to report. I trust it was like that, not a calculated "let's use this guys for 'cover'".

Have you guys really considered the different risks between exploration and development drilling? You can still be 'tough' and not have responsible people leave the gulf. Good folks will leave and won't come back. More risky.

Ford Brett

(m) +1 918 408 9516

On Jun 2, 2010, at 9:06 PM, "Black, Steve" <steve_black@ios.doi.gov> wrote:

> Good to know. Thank you.
>
> Steve
>
> ---
>
> **From**: Ford Brett <FBrett@PetroSkills.com>
> **To**: Black, Steve
> **Sent**: Wed Jun 02 22:06:50 2010
> **Subject**: Re: NAE letter
>
> Steve
>
> Thanks. By the way, my address is [redacted]
>
> Tnx
>
> Ford Brett
>
> (m) +1 918 408 9516
>
> On Jun 2, 2010, at 7:30 PM, "Black, Steve" <steve_black@ios.doi.gov> wrote:
>
>> Dear all – on behalf of the Secretary, thank you again for your assistance with the 30-day safety report. I understand the concerns that some of you have expressed with respect to the executive summary of the final report, which includes a

recommendation to impose a 6-month moratorium on all new deepwater drilling to allow time to implement the recommendations contained in the report and to consider the findings and recommendations of the Presidential Commission on the Deepwater Horizon incident. Ultimately, that was a policy decision made by the Administration. As explained below, neither the Secretary nor I intended to imply that you had concurred in that recommendation. The following letter, which each of you will receive shortly (in substantially the same form, I expect) makes that clear.

Please don't hesitate to contact me if you have any questions or concerns. Again, thank you for your valuable and continued assistance. We still have a lot of work ahead of us.

Steve Black

June 2, 2010

Mr. J. Ford Brett

Managing Director

Petroskills, Inc.

3128 E. 66th Place

Tulsa, OK 74135

Dear Mr. Brett:

Thank you for your valuable assistance in connection with the preparation of the Secretary's May 27, 2010, report to the President, entitled "Increased Safety Measures for Energy Development on the Outer Continental Shelf." The Department is working diligently to implement each of the recommendations as soon as practicable to improve the safety of offshore oil and gas development off our Nation's coasts.

As stated in the report, each of the 22 numbered recommendations contained in the report was developed after consulting with a wide range of experts in State and Federal Governments, academic institutions, and industry and advocacy organizations. Given the technical nature of the report and its recommendations, the Department asked Dr. Peter Blair of the National Academy of Engineering to identify a group of recognized academic and industry experts in the relevant fields to provide certain information to the Department related to offshore drilling safety and blowout protection equipment and to review and comment on the proposed safety recommendations to be included in the report. We are indebted to each of you for agreeing to serve in that role and for your stated concurrence with the detailed recommendations contained in the report.

Based on the recommendations contained in the report and the devastating consequences of the ongoing oil spill, the Administration independently concluded that a 6-month moratorium on new deepwater offshore drilling was necessary to implement the safety recommendations contained in the report and to learn from the information and recommendations developed by the Presidential Commission and other ongoing investigations into the Deepwater Horizon incident and resulting BP oil spill.

By listing you as members of the NAE panel that peer-reviewed the 22 safety recommendations contained in the report, we did not mean to imply that you also agreed with the decision to impose a moratorium on all new deepwater drilling. While that recommendation and decision were based on the safety recommendations contained in the report, in particular the need for new blowout preventer and other safety equipment on subsea BOP stacks used on floating drilling rigs, and the need for better wild-well intervention techniques in the event of future emergencies like the BP oil spill, particularly in deepwater, we acknowledge that you were not asked to review or comment on the scope of the proposed moratorium. We regret any misunderstanding or confusion related to the inclusion of the recommendation to impose a 6-month moratorium on all new deepwater wells in the executive summary of the final report.

Again, the Department is grateful for your service to the United States in this extraordinary time of crisis. Your willingness to associate yourselves with the specific safety recommendations contained in the report is extremely important and will help to ensure that offshore drilling can be done safely and in an environmentally responsible manner.

Sincerely,

Steve Black

Counselor to the Secretary

U.S. Department of the Interior

1849 C Street, N.W., MS 7229

Washington, D.C. 20240

Phone: 202-208-4123

Fax: 202-208-4561

e-mail: steve_black@ios.doi.gov

Nguyen, Ngoc B

From: Black, Steve
Sent: Wednesday, June 02, 2010 10:34 PM
To: 'FBrett@PetroSkills.com'
Subject: Re: NAE letter

Am a bit of a workaholic like my boss. It goes with the territory.

We absolutely did not make the decision to use your or any other expert's review for cover. It would have been preferable to discuss this with all of you in the few hours before the report was finalized.

Yes, we have considered the relative risks and consequences, but as always I would welcome your input. We don't intend to send good operators overseas.

Let's keep talking,

Steve

From: Ford Brett <FBrett@PetroSkills.com>
To: Black, Steve
Sent: Wed Jun 02 22:23:50 2010
Subject: Re: NAE letter

Steve

What are you doing answering email at this time?

People can have pro/con discussion about anything (6 mo moratorium included). My concern has always been, that you can't be using experts for 'cover'. I recognize there may have been last minute, copy paste from cover leter to report. I trust it was like that, not a calculated "let's use this guys for 'cover'".

Have you guys really considered the different risks between exploration and development drilling? You can still be 'tough' and not have responsible people leave the gulf. Good folks will leave and won't come back. More risky.

Ford Brett

(m) +1 918 408 9516

On Jun 2, 2010, at 9:06 PM, "Black, Steve" <steve_black@ios.doi.gov> wrote:

> Good to know. Thank you.
>
> Steve
>
> ---
>
> **From**: Ford Brett <FBrett@PetroSkills.com>
> **To**: Black, Steve
> **Sent**: Wed Jun 02 22:06:50 2010
> **Subject**: Re: NAE letter

Steve

Thanks. By the way, my address is [redacted]

Tnx

Ford Brett

(m) +1 918 408 9516

On Jun 2, 2010, at 7:30 PM, "Black, Steve" <steve_black@ios.doi.gov> wrote:

> Dear all – on behalf of the Secretary, thank you again for your assistance with the 30-day safety report. I understand the concerns that some of you have expressed with respect to the executive summary of the final report, which includes a recommendation to impose a 6-month moratorium on all new deepwater drilling to allow time to implement the recommendations contained in the report and to consider the findings and recommendations of the Presidential Commission on the Deepwater Horizon incident. Ultimately, that was a policy decision made by the Administration. As explained below, neither the Secretary nor I intended to imply that you had concurred in that recommendation. The following letter, which each of you will receive shortly (in substantially the same form, I expect) makes that clear.
>
> Please don't hesitate to contact me if you have any questions or concerns. Again, thank you for your valuable and continued assistance. We still have a lot of work ahead of us.
>
> Steve Black
>
> June 2, 2010
>
> Mr. J. Ford Brett
>
> Managing Director
>
> Petroskills, Inc.

3128 E. 66th Place

Tulsa, OK 74135

Dear Mr. Brett:

Thank you for your valuable assistance in connection with the preparation of the Secretary's May 27, 2010, report to the President, entitled "Increased Safety Measures for Energy Development on the Outer Continental Shelf." The Department is working diligently to implement each of the recommendations as soon as practicable to improve the safety of offshore oil and gas development off our Nation's coasts.

As stated in the report, each of the 22 numbered recommendations contained in the report was developed after consulting with a wide range of experts in State and Federal Governments, academic institutions, and industry and advocacy organizations. Given the technical nature of the report and its recommendations, the Department asked Dr. Peter Blair of the National Academy of Engineering to identify a group of recognized academic and industry experts in the relevant fields to provide certain information to the Department related to offshore drilling safety and blowout protection equipment and to review and comment on the proposed safety recommendations to be included in the report. We are indebted to each of you for agreeing to serve in that role and for your stated concurrence with the detailed recommendations contained in the report.

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By listing you as members of the NAE panel that peer-reviewed the 22 safety recommendations contained in the report, we did not mean to imply that you also agreed with the decision to impose a moratorium on all new deepwater drilling. While that recommendation and decision were based on the safety recommendations contained in the report, in particular the need for new blowout preventer and other safety equipment on subsea BOP stacks used on floating drilling rigs, and the need for better wild-well intervention techniques in the event of future emergencies like the BP oil spill, particularly in deepwater, we

acknowledge that you were not asked to review or comment on the scope of the proposed moratorium. We regret any misunderstanding or confusion related to the inclusion of the recommendation to impose a 6-month moratorium on all new deepwater wells in the executive summary of the final report.

Again, the Department is grateful for your service to the United States in this extraordinary time of crisis. Your willingness to associate yourselves with the specific safety recommendations contained in the report is extremely important and will help to ensure that offshore drilling can be done safely and in an environmentally responsible manner.

Sincerely,

Steve Black

Counselor to the Secretary

U.S. Department of the Interior

1849 C Street, N.W., MS 7229

Washington, D.C. 20240

Phone: 202-208-4123

Fax: 202-208-4561

e-mail: steve_black@ios.doi.gov

Nguyen, Ngoc B

From: Ken Arnold [karnold@karnoldconsulting.com]
Sent: Thursday, June 03, 2010 8:56 AM
To: Black, Steve
Subject: RE: NAE letter

Steve

I know this is the least of your concerns but I thought I should assure you I have not charged the DOI for an hour of my time since Wednesday May 26 when I finished my last assigned task of reviewing the final draft.

Ken

Kenneth E. (Ken) Arnold
K Arnold Consulting, Inc.
3031 Shadowdale
Houston, TX 77043
Cell: 832-212-0160
Home: 713-939-1034
www.karnoldconsulting.com

From: Black, Steve [mailto:steve_black@ios.doi.gov]
Sent: Wednesday, June 02, 2010 7:30 PM
To: hans.juvkam-wold@pe.tamu.edu; bbaugh@radoil.com; FBrett@Petroskills.com; bea@ce.berkeley.edu; Per.Holand@exprosoft.com; Chenevert, Martin E; Arnold Stancell
Cc: Ken Arnold; PBlair@nas.edu; Kemkar, Neal; Hanley, Kallie
Subject: NAE letter

Dear all – on behalf of the Secretary, thank you again for your assistance with the 30-day safety report. I understand the concerns that some of you have expressed with respect to the executive summary of the final report, which includes a recommendation to impose a 6-month moratorium on all new deepwater drilling to allow time to implement the recommendations contained in the report and to consider the findings and recommendations of the Presidential Commission on the Deepwater Horizon incident. Ultimately, that was a policy decision made by the Administration. As explained below, neither the Secretary nor I intended to imply that you had concurred in that recommendation. The following letter, which each of you will receive shortly (in substantially the same form, I expect) makes that clear.

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Steve Black

June 2, 2010

Mr. J. Ford Brett
Managing Director
Petroskills, Inc.

3128 E. 66th Place
Tulsa, OK 74135

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Sincerely,

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1849 C Street, N.W., MS 7229
Washington, D.C. 20240
Phone: 202-208-4123
Fax: 202-208-4561

e-mail: steve_black@ios.doi.gov

Nguyen, Ngoc B

From: Benton Baugh [bbaugh@radoil.com]
Sent: Monday, June 14, 2010 7:17 PM
To: Hanley, Kallie
Cc: Dubin, Lindsay; Kemkar, Neal; Black, Steve
Subject: RE: Call tomorrow 6.15.10 with Secretary Salazar

I will be able to participate.

Regards,

Benton F. Baugh

Radoil, Inc.

ISO 9001:2008

12551 FM 529 RD
Houston, TX 77041
office: (713) 937-4494
cell: (713) 419-8683
bbaugh@radoil.com
www.radoil.com

The information contained in this e-mail may contain confidential or privileged mater and is intended only for the stated addressee(s). Ifyou are not a valid addressee, the use, disclosure, copying or distribution of this information is prohibited and may be unlawful. If you have received this message in error, please notify the sender immediately and delete all copies of the message from your computer.

From: Hanley, Kallie [mailto:Kallie_Hanley@ios.doi.gov]
Sent: Monday, June 14, 2010 6:01 PM
To: Hanley, Kallie
Cc: Dubin, Lindsay; Kemkar, Neal; Black, Steve
Subject: Call tomorrow 6.15.10 with Secretary Salazar

Good evening,

Interior Secretary Ken Salazar hopes that you can participate in a conference call at 4:15pm EASTERN tomorrow, June 15, 2010 regarding the 30-day report on Increased Safety Measures for Energy Development on the Outer Continental Shelf. The Secretary would like to thank you for your contributions to the report and discuss follow-up implementation plans. This conference call is limited to the people who have received this email. Please let Lindsay Dubin (cc'd) and me know by 12:00pm EASTERN tomorrow if you will be able to participate in this call. We will send you a conference call number upon our receipt of your participation.

Thank you,

Kallie Hanley
Office of the White House Liaison | The U.S. Department of the Interior
desk: (202) 208-5397 | cell: (202) 374-7694 | kallie_hanley@ios.doi.gov

Nguyen, Ngoc B

From: Ford Brett [FBrett@PetroSkills.com]
Sent: Monday, June 14, 2010 8:00 PM
To: Hanley, Kallie
Cc: Dubin, Lindsay; Kemkar, Neal; Black, Steve
Subject: RE: Call tomorrow 6.15.10 with Secretary Salazar

Kallie –

I will be able to attend the call.

I'm in Kuala Lumpur right now, but will be up early anyway.

Ford Brett

PetroSkills
(o) +1 918 828 2511 *(I pick up messages frequently)*
(m) +1 918 408 9516 *(works in most of world)*
Skype Ford.Brett
or call Rozanne at +1 918 828 2505

www.PetroSkills.com

From: Hanley, Kallie [mailto:Kallie_Hanley@ios.doi.gov]
Sent: Monday, June 14, 2010 6:01 PM
To: Hanley, Kallie
Cc: Dubin, Lindsay; Kemkar, Neal; Black, Steve
Subject: Call tomorrow 6.15.10 with Secretary Salazar

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Office of the White House Liaison | The U.S. Department of the Interior
desk: (202) 208-5397 | cell: (202) 374-7694 | kallie_hanley@ios.doi.gov

Nguyen, Ngoc B

From: Ken Arnold [karnold@karnoldconsulting.com]
Sent: Monday, June 14, 2010 9:33 PM
To: Hanley, Kallie
Cc: Dubin, Lindsay; Kemkar, Neal; Black, Steve
Subject: RE: Call tomorrow 6.15.10 with Secretary Salazar

I will be able to participate

Kenneth E. (Ken) Arnold
K Arnold Consulting, Inc.
3031 Shadowdale
Houston, TX 77043
Cell: 832-212-0160
Home: 713-939-1034
www.karnoldconsulting.com

From: Hanley, Kallie [mailto:Kallie_Hanley@ios.doi.gov]
Sent: Monday, June 14, 2010 6:01 PM
To: Hanley, Kallie
Cc: Dubin, Lindsay; Kemkar, Neal; Black, Steve
Subject: Call tomorrow 6.15.10 with Secretary Salazar

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Thank you,

Kallie Hanley
Office of the White House Liaison | The U.S. Department of the Interior
desk: (202) 208-5397 | cell: (202) 374-7694 | kallie_hanley@ios.doi.gov

Nguyen, Ngoc B

From: Ken Arnold [karnold@karnoldconsulting.com]
Sent: Monday, June 14, 2010 9:35 PM
To: Hanley, Kallie
Cc: Dubin, Lindsay; Kemkar, Neal; Black, Steve
Subject: RE: Call tomorrow 6.15.10 with Secretary Salazar

I am sorry. I made a mistake for some reason I thought the call was later in the day. I will be on an airplane flying from NYC to Houston which lands n Houston at 1:21 PM Houston time.

Kenneth E. (Ken) Arnold
K Arnold Consulting, Inc.
3031 Shadowdale
Houston, TX 77043
Cell: 832-212-0160
Home: 713-939-1034
www.karnoldconsulting.com

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Sent: Monday, June 14, 2010 6:01 PM
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Kallie Hanley
Office of the White House Liaison | The U.S. Department of the Interior
desk: (202) 208-5397 | cell: (202) 374-7694 | kallie_hanley@ios.doi.gov

Nguyen, Ngoc B

From: Ken Arnold [karnold@karnoldconsulting.com]
Sent: Monday, June 14, 2010 9:38 PM
To: Hanley, Kallie
Cc: Dubin, Lindsay; Kemkar, Neal; Black, Steve
Subject: RE: Call tomorrow 6.15.10 with Secretary Salazar

Sorry once again. I now see the call is at 4:15 PM Eastern which is 3:15 Houston time. God and Continental willing I can participate.

Kenneth E. (Ken) Arnold
K Arnold Consulting, Inc.
3031 Shadowdale
Houston, TX 77043
Cell: 832-212-0160
Home: 713-939-1034
www.karnoldconsulting.com

From: Ken Arnold [mailto:karnold@karnoldconsulting.com]
Sent: Monday, June 14, 2010 8:35 PM
To: 'Hanley, Kallie'
Cc: 'Dubin, Lindsay'; 'Kemkar, Neal'; 'Black, Steve'
Subject: RE: Call tomorrow 6.15.10 with Secretary Salazar

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Home: 713-939-1034
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From: Hanley, Kallie [mailto:Kallie_Hanley@ios.doi.gov]
Sent: Monday, June 14, 2010 6:01 PM
To: Hanley, Kallie
Cc: Dubin, Lindsay; Kemkar, Neal; Black, Steve
Subject: Call tomorrow 6.15.10 with Secretary Salazar

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Office of the White House Liaison | The U.S. Department of the Interior
desk: (202) 208-5397 | cell: (202) 374-7694 | kallie_hanley@ios.doi.gov

Nguyen, Ngoc B

From: Chenevert, Martin E [mechenevert@austin.utexas.edu]
Sent: Tuesday, June 15, 2010 11:42 AM
To: Hanley, Kallie
Cc: Dubin, Lindsay; Kemkar, Neal; Black, Steve
Subject: RE: Call tomorrow 6.15.10 with Secretary Salazar

Dear Kallie:
I just arrived in my office. If it is still possible, please include me in this call.
Sincerely,
Martin E. Chenevert

From: Hanley, Kallie [mailto:Kallie_Hanley@ios.doi.gov]
Sent: Monday, June 14, 2010 6:01 PM
To: Hanley, Kallie
Cc: Dubin, Lindsay; Kemkar, Neal; Black, Steve
Subject: Call tomorrow 6.15.10 with Secretary Salazar

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Thank you,

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desk: (202) 208-5397 | cell: (202) 374-7694 | kallie_hanley@ios.doi.gov

Nguyen, Ngoc B

From: Arnold Stancell [acstancell@msn.com]
Sent: Tuesday, June 15, 2010 2:25 PM
To: Hanley, Kallie
Cc: Dubin, Lindsay; Black, Steve; Kemkar, Neal
Subject: Re: Call today with Secretary Salazar

Kallie,

I can participate in the conference call.

Best regards,
Arnie

----- Original Message -----
From: Hanley, Kallie
To: Hanley, Kallie
Cc: Dubin, Lindsay ; Black, Steve ; Kemkar, Neal
Sent: Tuesday, June 15, 2010 8:00 AM
Subject: Call today with Secretary Salazar

Good Morning,

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Thank you,

Kallie Hanley

Office of the White House Liaison | The U.S. Department of the Interior

desk: (202) 208-5397 | cell: (202) 374-7694 | kallie_hanley@ios.doi.gov

Nguyen, Ngoc B

From: Ken Arnold [karnold@karnoldconsulting.com]
Sent: Thursday, June 17, 2010 6:45 PM
To: Dubin, Lindsay
Cc: Black, Steve; Kemkar, Neal; Hanley, Kallie
Subject: RE: Meeting with Secretary Salazar Monday 6.21.10

I will attend in person. Please let me know who else was invited.

Kenneth E. (Ken) Arnold
K Arnold Consulting, Inc.
3031 Shadowdale
Houston, TX 77043
Cell: 832-212-0160
Home: 713-939-1034
www.karnoldconsulting.com

From: Dubin, Lindsay [mailto:Lindsay_Dubin@ios.doi.gov]
Sent: Thursday, June 17, 2010 5:23 PM
To: Dubin, Lindsay
Cc: Black, Steve; Kemkar, Neal; Hanley, Kallie
Subject: Meeting with Secretary Salazar Monday 6.21.10

Good evening,

Interior Secretary Ken Salazar hopes that you can participate in a meeting at 10:00am EASTERN Monday, June 21, 2010 as a follow-up to Tuesday's conference call regarding the 30-day report on Increased Safety Measures for Energy Development on the Outer Continental Shelf. For those of you who are unable to join this meeting in person, there will be a call-in option for you to participate remotely. This meeting/conference call is limited to the people who have received this email. Please let Kallie Hanley (cc'd) and me know by 3:00pm EASTERN tomorrow if you will be able to participate. Please be sure to indicate whether you will be attending in person or via phone. We will reach out to you with arrival instructions or a conference call number following our receipt of your participation.

Thank you,

Lindsay Dubin
Special Assistant
Office of Scheduling and Advance
The U.S. Department of the Interior
p: (202) 208-7551 | f: (202) 208-4694
lindsay_dubin@ios.doi.gov

Nguyen, Ngoc B

From: Ford Brett [FBrett@PetroSkills.com]
Sent: Thursday, June 17, 2010 7:29 PM
To: Dubin, Lindsay
Cc: Black, Steve; Kemkar, Neal; Hanley, Kallie
Subject: RE: Meeting with Secretary Salazar Monday 6.21.10

Lindsay – I will be able to participate – let me know the dial in. I'm sorry I won't be able to attend in person.

Thanks,

Ford Brett

PetroSkills
(o) +1 918 828 2511 *(I pick up messages frequently)*
(m) +1 918 408 9516 *(works in most of world)*
Skype Ford.Brett
or call Rozanne at +1 918 828 2505

www.PetroSkills.com

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Thank you,

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Special Assistant
Office of Scheduling and Advance
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Nguyen, Ngoc B

From: Benton Baugh [bbaugh@radoil.com]
Sent: Thursday, June 17, 2010 8:43 PM
To: Dubin, Lindsay
Cc: Black, Steve; Kemkar, Neal; Hanley, Kallie
Subject: RE: Meeting with Secretary Salazar Monday 6.21.10

I will be attending in person.

Regards,

Benton F. Baugh

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From: Dubin, Lindsay [mailto:Lindsay_Dubin@ios.doi.gov]
Sent: Thursday, June 17, 2010 5:23 PM
To: Dubin, Lindsay
Cc: Black, Steve; Kemkar, Neal; Hanley, Kallie
Subject: Meeting with Secretary Salazar Monday 6.21.10

Good evening,

Interior Secretary Ken Salazar hopes that you can participate in a meeting at 10:00am EASTERN Monday, June 21, 2010 as a follow-up to Tuesday's conference call regarding the 30-day report on Increased Safety Measures for Energy Development on the Outer Continental Shelf. For those of you who are unable to join this meeting in person, there will be a call-in option for you to participate remotely. This meeting/conference call is limited to the people who have received this email. Please let Kallie Hanley (cc'd) and me know by 3:00pm EASTERN tomorrow if you will be able to participate. Please be sure to indicate whether you will be attending in person or via phone. We will reach out to you with arrival instructions or a conference call number following our receipt of your participation.

Thank you,

Lindsay Dubin
Special Assistant

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Nguyen, Ngoc B

From: Chenevert, Martin E [mechenevert@austin.utexas.edu]
Sent: Friday, June 18, 2010 2:40 PM
To: Dubin, Lindsay
Cc: Black, Steve; Kemkar, Neal; Hanley, Kallie
Subject: RE: Meeting with Secretary Salazar Monday 6.21.10
Attachments: GEST FORECASTED_ACTIVITY_11.pdf; Gulf of Mexico Analysis and Summary_updated+Sources.ppt; LMOGA.pdf; LMOGAers.pdf; NOIA.doc

Sirs:
Unfortunately I am unable to attend the meeting in person. Please provide me with the call in number.
I have attached several resources that I plan to introduce at the Monday meeting. It would be useful for Secretary Salazar to have these in hand for reference during the meeting.
Sincerely,
Martin E. Chenevert

From: Dubin, Lindsay [mailto:Lindsay_Dubin@ios.doi.gov]
Sent: Thursday, June 17, 2010 5:23 PM
To: Dubin, Lindsay
Cc: Black, Steve; Kemkar, Neal; Hanley, Kallie
Subject: Meeting with Secretary Salazar Monday 6.21.10

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Thank you,

Lindsay Dubin
Special Assistant
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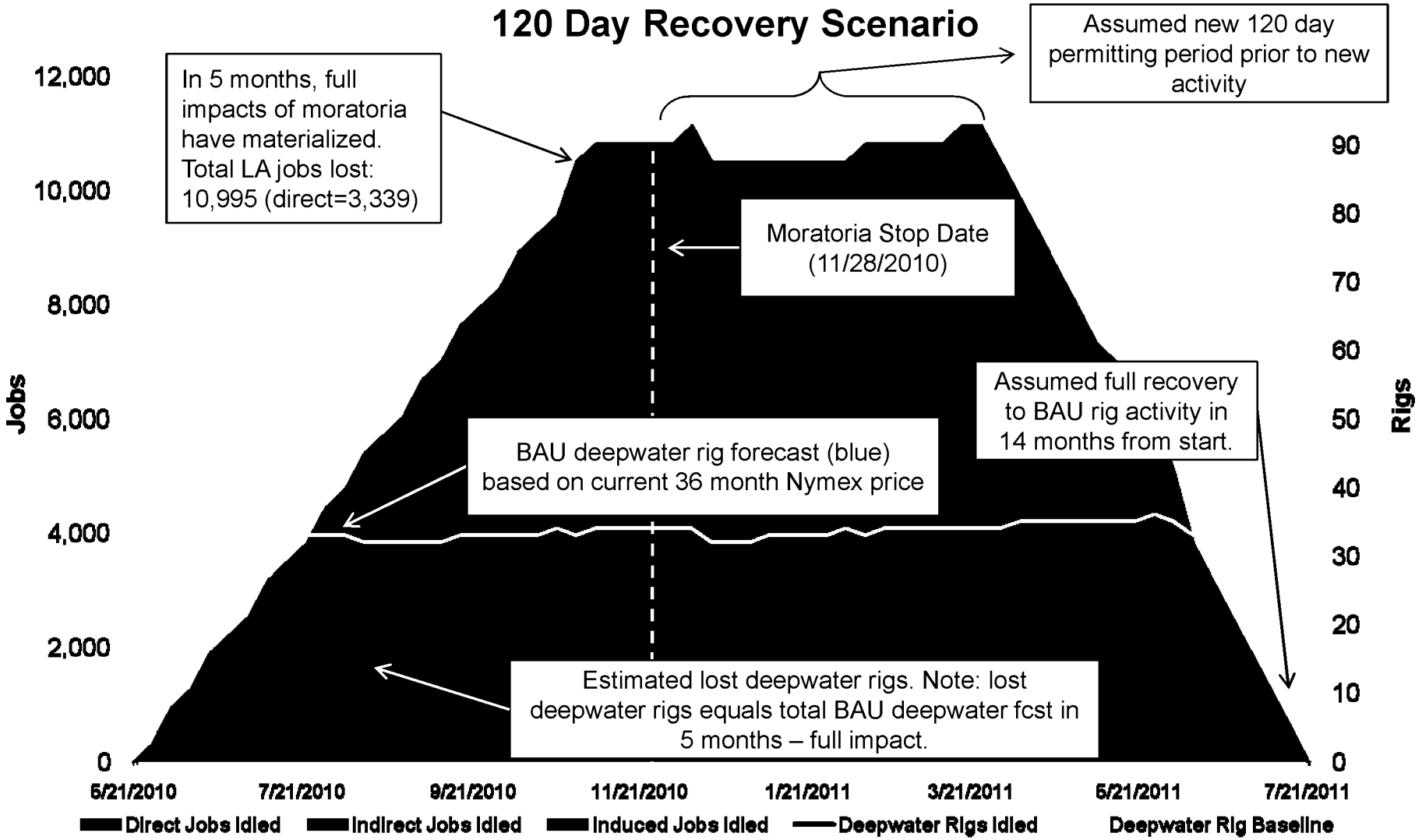
lindsay_dubin@ios.doi.gov

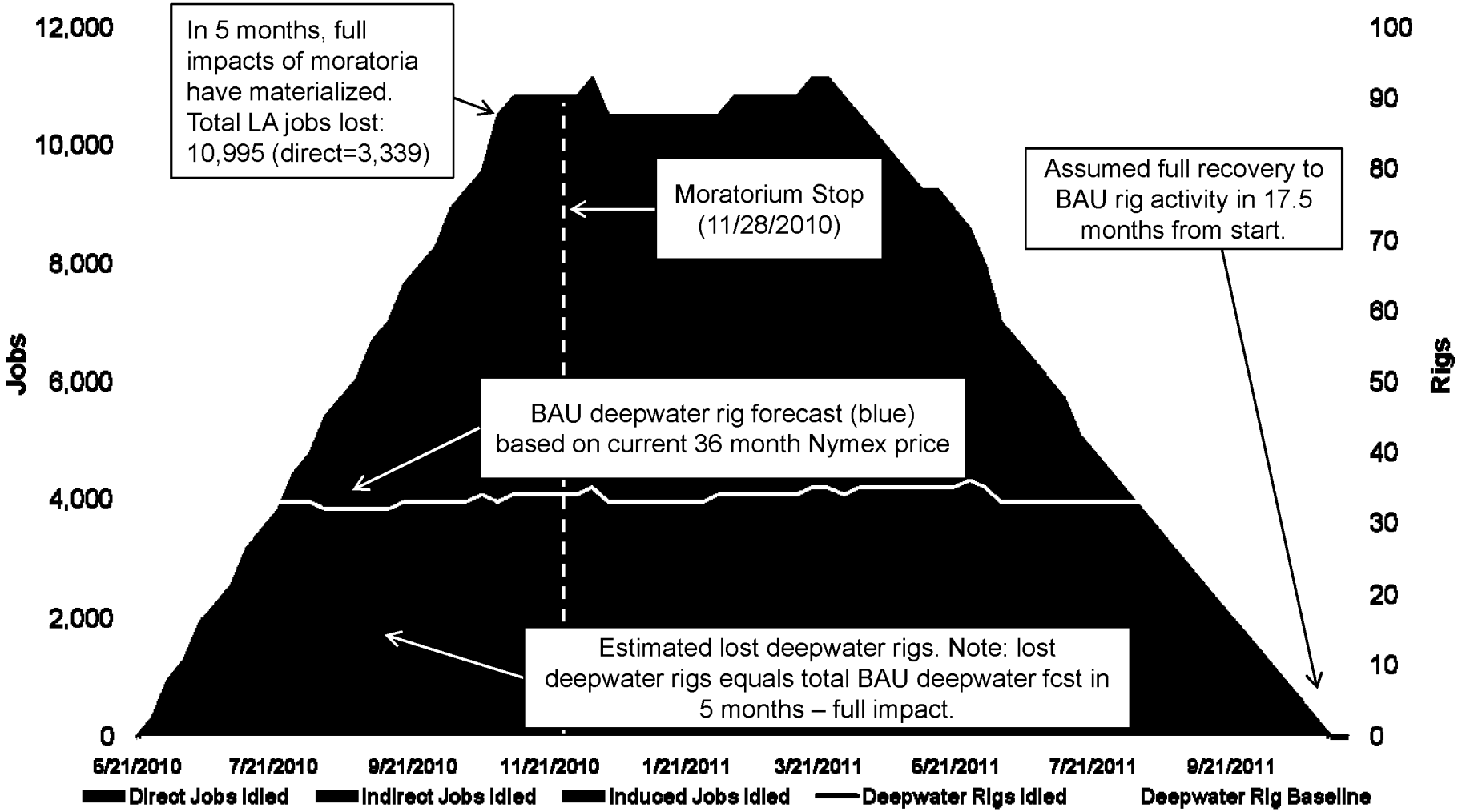
Gulf of Mexico Offshore Deepwater Moratoria Employment Impacts (Louisiana-Only)



Sources: Dept. of Interior, Energy Information Administration, Baker Hughes, CME Group (NYMEX)

Gulf of Mexico Offshore Deepwater Moratoria Employment Impacts (Louisiana-Only)

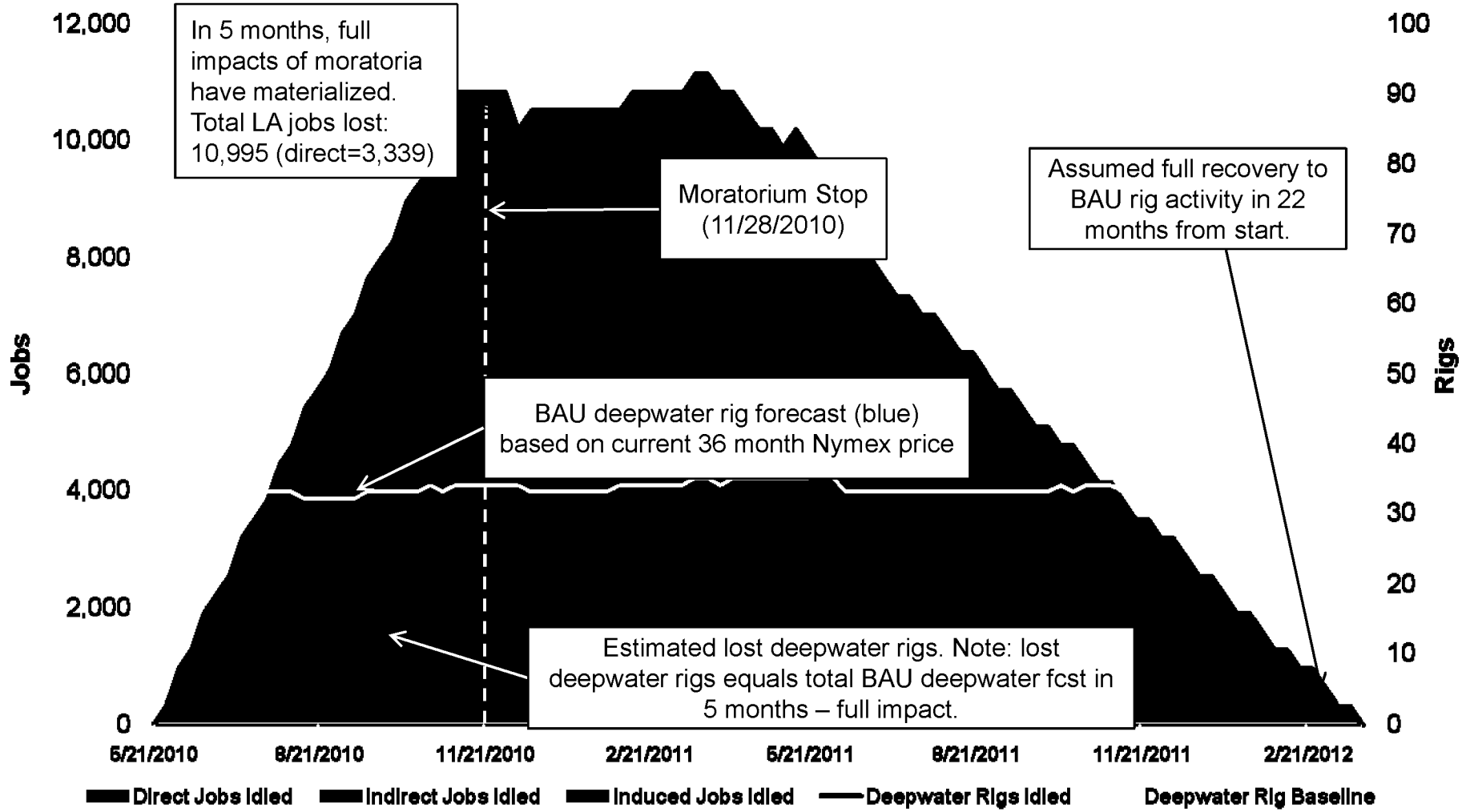
8 Month Recovery Scenario



Sources: Dept. of Interior, Energy Information Administration, Baker Hughes, CME Group (NYMEX)

Gulf of Mexico Offshore Deepwater Moratoria Employment Impacts (Louisiana-Only)

1 Year Recovery Scenario



Sources: Dept. of Interior, Energy Information Administration, Baker Hughes, CME Group (NYMEX)

Gulf of Mexico Analysis & Summary

- Gulf States Economic Sector Analysis
- Summary of Third Party Production Analyses and Economic

Gulf States* GDP Contributions

Bureua of Economic Analysis	Real GDP Millions of Chained 2000 $			
	2004	2005	2006	2007
Tourism Related				
Accomodation	16,058	16,643	16,812	17,046
Amusement, gambling, and recreation	11,930	12,245	12,630	13,010
Food services and drinking places	33,957	35,317	36,726	37,630
Tourism Total	61,945	64,205	66,168	67,686
Oil and gas extraction	48,600	44,134	46,397	46,271
Forestry, fishing, and related activities	5,446	5,851	5,775	5,558
Total	115,991	114,190	118,340	119,515

GDP by NAICS Classifications**

Data Considerations:

- **State level data is only available through 2007**
- **Bureau of Economic Analysis Data can only be pulled under certain categories**
  - **Oil and Gas extraction includes both onshore and offshore development**
  - **Individual fishing data is not available, included in data segment shown**
  - **No separate tourism category available, must be assembled from separate groups**

*Alabama, Florida, Louisiana, Mississippi, & Texas

**North America Industry Classification System definitions in backup

Deepwater Drilling Halt
Production Impact – 3rd Party Analysis

80% of the Gulf of Mexico's oil and 45% of its natural gas is from deepwater operations (more than 1000 feet of water).[1]

LMOGA estimates show the six-month halt would defer 4% of anticipated 2011 deepwater Gulf of Mexico production (80,000 bbls per day), and likely render seven current discoveries sub-economic.[2]

A 6 month halt in new drilling would defer 80,000 boe/d, or 4% of 2011 deepwater Gulf of Mexico production.[3]

Delays in current project timeframes potentially defer over 350,000 boe/d (almost 19%) of 2015 and 2016 deepwater Gulf of Mexico production.[3]

Deferred production begins to recover in 2019. However, we can assume that the slowdown in activity rates might also defer exploration activity, thereby pushing back production from Yet-to-Find fields. The overall effect could be to defer expected production over the next 10 years by significant amounts.[3]

We have included the following delays to Probable Developments: one year for near-term projects; two years for projects that are either more challenging (for example, Lower Miocene or Lower Tertiary), or those that are at an early stage of appraisal.[3]

According to IHS data, US GOM production accounted for 30% of 2009 crude oil production (1.6 MBD out of 5.3 MBD). This 1.6 MBD of Gulf supply was the result of a 33%, or 399,000 barrels per day, increase in output from 2008. Most of the production increase was due to new production from 5 deepwater fields.[4]

The fall in US demand was the most important factor that reduced US foreign oil imports in 2009, but higher domestic production, mostly from deepwater, also played a role.[4]

Deepwater Drilling Halt
Economic Impact – 3rd Party Analysis

- Between $250,000 and $500,000 per rig, per day results in roughly $8,250,000 to $16,500,000 per day in costs for the 33 idle rigs[1]
- Each drilling platform supports 800 to 1400 jobs at risk per idle rig[1]
- The average wage for these jobs is $1,800 per week; the potential for lost wages is between $5,000,000 and $10,000,000 for one month for each drilling platform[1]
- A 6 month halt in drilling could result in total lost wages of between $990,000,000 and $1,800,000,000 for all 33 platforms[1]
- In Louisiana alone there could potentially be 3,000 to 6,000 lost jobs in the next two to three weeks and over 10,000 jobs lost in the coming months[5]

Deepwater Drilling Halt
Cost Impact – 3rd Party Analysis

Higher drilling costs might jeopardize exploration in frontier areas. More immediately, we estimate that seven current discoveries could be rendered sub-economic, putting $7.6 billion in future government revenues at risk.[3]

If tightened regulation and new drilling practices cause longer drill times, both exploration and development well costs will increase. Driving up exploration costs in frontier areas that are already economically marginal could dampen appetites for exploring these areas, which are vital for long-term output from deepwater GOM.[3]

Another threat to smaller companies is the proposal floated in Washington DC to increase the cap on oil companies' liability for oil spill damages from $75 million to $10 billion. Higher insurance bills following the hurricane season of 2005 had already chased some smaller companies off the GOM shelf.[3]

At the time of the blowout there were 67 rigs active in the GOM, both jackup rigs (37 rigs) and semisubmersibles or drill ships (30 rigs). The total semisubmersible GOM fleet is 30 rigs, the moratorium will affect 16 rigs and will leave only 14 actively drilling for production.[4]

The impact of 16 additional rigs coming onto the market looking for opportunities to keep rigs and crews active is likely to depress rig rates (likely drop 10% by third quarter 2010 and potential to drop up to 20% in day rates).[4]

Backup

Oil and Gas Economic Data

Bureau of Economic Analysis – Oil and Gas extraction includes both onshore and offshore development

211 Oil and Gas Extraction*

Industries in the Oil and Gas Extraction subsector operate and/or develop oil and gas field properties. Such activities may include exploration for crude petroleum and natural gas; drilling, completing, and equipping wells; operating separators, emulsion breakers, desilting equipment, and field gathering lines for crude petroleum and natural gas; and all other activities in the preparation of oil and gas up to the point of shipment from the producing property. This subsector includes the production of crude petroleum, the mining and extraction of oil from oil shale and oil sands, and the production of natural gas, sulfur recovery from natural gas, and recovery of hydrocarbon liquids.

Establishments in this subsector include those that operate oil and gas wells on their own account or for others on a contract or fee basis. Establishments primarily engaged in providing support services, on a fee or contract basis, required for the drilling or operation of oil and gas wells (except geophysical surveying and mapping, mine site preparation, and construction of oil/gas pipelines) are classified in Subsector 213, Support Activities for Mining.

07 North America Industry Classification System codes for data

Fishing Economic Data

Bureau of Economic Analysis – Individual fishing data is not available: it is included within data segment incorporating the following three sectors

113 Forestry and Logging*

Industries in the Forestry and Logging subsector grow and harvest timber on a long production cycle (i.e., of 10 years or more). Long production cycles use different production processes than short production cycles, which require more horticultural interventions prior to harvest, resulting in processes more similar to those found in the Crop Production subsector. Consequently, Christmas tree production and other production involving production cycles of less than 10 years, are classified in the Crop Production subsector.

114 Fishing, Hunting and Trapping*

Industries in the Fishing, Hunting, and Trapping subsector harvest fish and other wild animals from their natural habitats and are dependent upon a continued supply of the natural resource. The harvesting of fish is the predominant economic activity of this subsector and it usually requires specialized vessels that, by the nature of their size, configuration and equipment, are not suitable for any other type of production, such as transportation.

115 Support Activities for Agriculture and Forestry*

Industries in the Support Activities for Agriculture and Forestry subsector provide support services that are an essential part of agricultural and forestry production. These support activities may be performed by the agriculture or forestry producing establishment or conducted independently as an alternative source of inputs required for the production process for a given crop, animal, or forestry industry. Establishments that primarily perform these activities independent of the agriculture or forestry producing establishment are in this subsector.

07 North America Industry Classification System codes for data

Tourism Economic Data

Bureau of Economic Analysis – Individual data available that will include tourism: no separate tourism category available

713 Amusement, Gambling, and Recreation Industries*

Industries in the Amusement, Gambling, and Recreation Industries subsector (1) operate facilities where patrons can primarily engage in sports, recreation, amusement, or gambling activities and/or (2) provide other amusement and recreation services, such as supplying and servicing amusement devices in places of business operated by others; operating sports teams, clubs, or leagues engaged in playing games for recreational purposes; and guiding tours without using transportation equipment.

721 Accommodation*

Industries in the Accommodation subsector provide lodging or short-term accommodations for travelers, vacationers, and others. There is a wide range of establishments in these industries. Some provide lodging only; while others provide meals, laundry services, and recreational facilities, as well as lodging. Lodging establishments are classified in this subsector even if the provision of complementary services generates more revenue. The types of complementary services provided vary from establishment to establishment.

722 Food Services and Drinking Places*

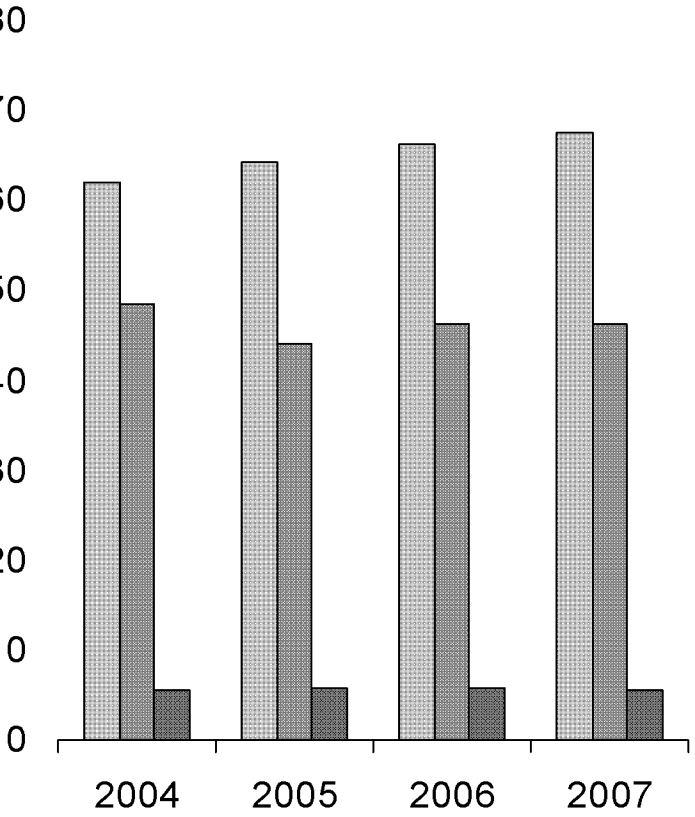
Industries in the Food Services and Drinking Places subsector prepare meals, snacks, and beverages to customer order for immediate on-premises and off-premises consumption. There is a wide range of establishments in these industries. Some provide food and drink only; while others provide various combinations of seating space, waiter/waitress services and incidental amenities, such as limited entertainment. The industries in the subsector are grouped based on the type and level of services provided. The industry groups are full-service restaurants; limited-service eating places; special food services, such as food service contractors, caterers, and mobile food services; and drinking places.

07 North America Industry Classification System codes for data

Gulf States* GDP Contributions

DP Contributions by Industrial Category

lion 2000 $



- **Tourism Related Activities**
  - NAICS** code 713, 721 and 722
    - Amusement, Gambling and Recreation Services
    - Accommodation
    - Food Services and Drinking Places
- **Oil and Gas Extraction**
  - NAICS** code 211
    - Crude Petroleum and Natural Gas Extraction
    - Natural Gas Liquid Extraction
- **Forestry, Fishing, and Related Activities**
  - NAICS** codes 113 through 115
    - Forestry and Logging
    - Fishing, Hunting and Trapping
    - Support Activities for Agriculture and Forestry

abama, Florida, Louisiana, Mississippi, & Texas

Resources:

1. *Louisiana Mid-Continent Oil and Gas Association*

- **The Energy Sector: Still A Giant Economic Engine for The Louisiana Economy**
  The Louisiana Oil and Gas Industry has a $70 billion impact upon the state, according to an economic study conducted by Dr. Loren Scott on behalf of the Louisiana Mid-Continent Oil and Gas Association. The most recent study shows that each petroleum industry job supports 4.5 additional jobs in the state. The industry pays $1.4 billion in state taxes and fees and more than $4 billion in wages.

- http://www.lmoga.com/overview.html

- http://www.lmoga.com/erfull.pdf

- http://www.lmoga.com/ers.pdf

2. *National Ocean Industries Association*

- http://www.noia.org/website/article.asp?id=38566

Resources:

NOIA site:
http://video.nytimes.com/video/2010/06/11/us/1247468032713/the-roughnecks-lament.html

3. Wood MacKenzie: *Deepwater Horizon* tragedy: near-term and long-term implications in deepwater Gulf of Mexico* Contact Information:

- julie.wilson@woodmac.com +1 713 470 1627
- john.dean@woodmac.com +1 713 470 1688
- mark.oberstoetter@woodmac.com +1 713 470 1822

4. CERA: *Oil Well Blowout and the Future of Deepwater E&P* and *The Gulf of Mexico Blowout**

IHS CERA Houston
5333 Westheimer Road
Houston, Texas 77056 USA
Tel: +1 713-840-8282
Fax: +1 713-599-9111

ailable by subscription

Resources:

5. Louisiana Department of Economic Development

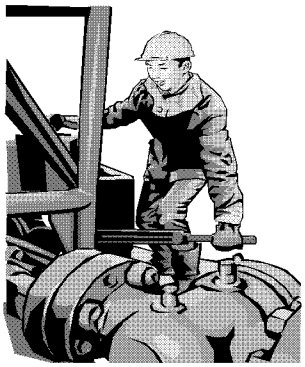
- http://emergency.louisiana.gov/Releases/06102010-moratorium.html

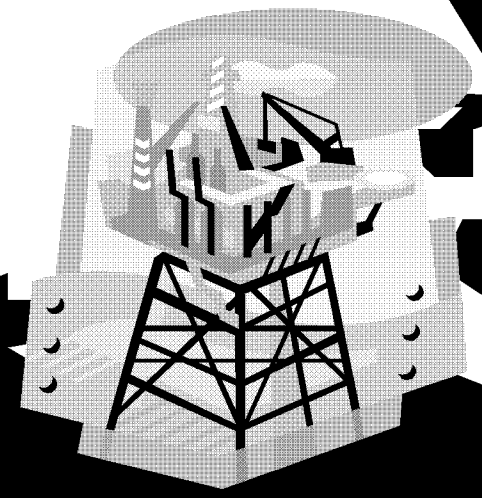
Bureau of Economic Analysis: GDP by Region

- http://www.bea.gov/regional/gsp/

The Energy Sector:

Still A Giant Economic Engine For The Louisiana Economy





By Loren C. Scott, Ph.D.

September 2007

THE "ENERGY" SECTOR: STILL A GIANT ECONOMIC ENGINE FOR THE LOUISIANA ECONOMY

by

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Baton Rouge, Louisiana 70810
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July 2007

for

Mid-Continent Oil and Gas Association
801 North Boulevard
Baton Rouge, Louisiana 70802

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EXECUTIVE SUMMARY

This study is an update of a study done for Mid-Continent Oil and Gas in 2002 entitled, "The 'Energy Sector': A Giant Economic Engine for the Louisiana Economy." Our conclusions from this review of the impact of the extraction, refining, and pipeline industries can be summarized in a series of bullet points:

- Louisiana, through the luck of natural resource distribution, is the nation's **number one producer of crude oil and the number two producer of natural gas** among the 50 states.

- Louisiana ranks **number two among the states in petroleum refining** capacity.

- There are over **83,000 miles of pipelines** transporting crude petroleum and natural gas within the state and in its offshore area of the Gulf of Mexico.

- Through both their direct and multiplier effects **these three industries supported $70.2 billion in sales in Louisiana firms, generated over $12.7 billion in household earnings for Louisianans, and supported 320,280 jobs in the state in 2005.** The $12.7 billion in earnings represented 15.4 percent of total earnings in Louisiana in that year. At least four countries listed in the **Statistical Abstract of the U.S.** have smaller gross domestic products.

- On average **the job multiplier for these two industries was 5.5**. That is, for every job created in these sectors 4.5 additional jobs are created in other sectors in the state. The job multiplier for the oil and gas extraction industry is about 3.9 and for the very capital-intensive refinery industry it is about 11.7.

- These three industries **directly paid over $1.4 billion in state taxes and fees** in FY06, or about 14.4 percent of total state taxes, licenses, and fees collected.

- A very conservative estimate is that these three industries paid **$172.6 million in ad valorem taxes to local governments** in the state in 2005. In 31 of the state's 64 parishes, these ad valorem taxes exceeded $1 million. In 12 parishes the number exceeded $5 million.

- Through the $12.7 billion in household earnings generated by these three industries, **state government was able to collect an estimated $890,939,000 in taxes in FY06.**

- The $12.7 billion in household earnings generated by these three industries added approximately **$560,018,800---over one half billion dollars---to the treasuries of local governments** in FY06.

- In 2006, there were **58,278 workers employed** in the extraction, pipeline, and refining industries---a number approximately equivalent to the 2005 population of Acadia Parish, the 19th most populous parish in the state. Fifty-four of Louisiana's 64 parishes had total covered employment smaller than this number in 2005.

- These three industries paid nearly **$4.2 billion in wages** for Louisiana households in 2006---a figure equivalent to 6.4 percent of total covered wages in the state that year.

- In the third quarter of 2006, the average weekly wage in Louisiana's manufacturing sector was $984. **In refining it was 59 percent higher at $1,567 and the extraction sector paid $1,804 weekly---83 percent higher than the average in manufacturing. Weekly wages in the pipeline industry were $1,345---37 percent higher than the average manufacturing wage.**

- **Energy jobs and earnings are found in all of Louisiana's 64 parishes in 2006**. There were 14 parishes where more than 1,000 workers were employed in these three industries. In Lafayette Parish (the highest employment parish), 15,241 workers were directly employed in these energy sectors.

- Value added is a broader measure of the total income created directly in an industry. In 2002 (latest data available), **Louisiana's oil and gas extraction sector produced over $24.6 billion in total income**. That figure exceeds the **sum** of all the state's manufacturing sectors except petroleum and coal products. We have roughly estimated the extraction sector's value added in 2005 (when energy prices were much higher than 2002) to be about $47.5 billion.

- The refining sector's value added in 2005 was a huge $34.3 billion. That figure exceeds the **sum** of all the state's other manufacturing sectors.

THE "ENERGY" SECTOR: STILL A GIANT ECONOMIC ENGINE FOR THE LOUISIANA ECONOMY

I. Introduction: It's the Engine That Matters

Survey car owners and you will find a consensus on one issue: It is the engine that makes the difference. A weak, undependable engine gets you nowhere. It is a drag on your attempts to get things done. On the other hand a strong, powerful engine gets you where you need to go quickly and dependably. Much gets accomplished.

In the world of economics, some states have only weak engines for economic growth. Their basic industries are either non-existent or are made up of slow-growing, low-wage manufacturing firms. These states are doomed to remain at the bottom rung of the economic ladder, and their prospects for growth are lackluster at best. Examples would be the states of Arkansas and West Virginia.

Other states, either because of the sheer luck of the draw in resource distribution and/or because of innovative development policies, have attracted industries that are veritable dynamos of energy---creating high-wage jobs and spillover business for all kinds of firms. These states not only enjoy the benefits of healthy jobs and income, but also state and local government treasuries get a boost from taxes and fees these industries generate both directly and indirectly.

Louisiana Was Lucky

When it came to the geographical distribution of natural resources, Louisiana "won the flip"so to speak. Below her borders, and in the waters of the adjoining Gulf of Mexico, lies a virtual mother-lode of oil and natural gas. Table 1 details Louisiana's oil production relative to her sister states. **Louisiana is the nation's number one producer of oil, producing nearly 1.4 million**

barrels a day in 2007 (this figure includes the federal outer continental shelf production). This represents 26.4 percent of the nation's crude oil production, just ahead of Texas, with Alaska in a distant third place.[1]

Louisiana was ranked third in this category back in 1995, behind both Texas and Alaska. However, declining reserves in those two states, coupled with larger finds in Louisiana's offshore region, have pushed Louisiana up to the number one slot.

Table 1
Crude Oil & Lease Condensate Production in U.S.: 2007
(1,000 Barrels per Day)

Area	Production	Percent U.S.
United States	5,164	100.0%
Louisiana*	***1,362***	***26.4%***
Texas	1,317	25.5%
Alaska	778	15.1%
California	669	13.0%

*Includes Federal offshore production

The U.S. is also heavily reliant on Louisiana as a source of natural gas. As Table 2 shows, **nearly a fifth of the nation's natural gas comes from Louisiana**. Our state's production of nearly 6.2 trillion cubic feet in 2005 (including federal OCS) ranked it number two behind Texas. **Actually, the value of natural gas produced in Louisiana exceeds the value of the crude oil lifted.**

Table 2
Marketed Value of Natural Gas in U.S.: 2005
(Billions of Cubic Feet)

Area	Production	Percent U.S.
United States	18,951	100.0%
Texas	6,220	32.8%
Louisiana*	***3,471***	***18.3%***
Oklahoma	1,670	8.8%
New Mexico	1,645	8.7%

*Includes Federal offshore production. Source: http://tonto.eia.doe.gov/dnav/ng/hist and http://dnr.louisiana.gov.

Refineries

The tasks of exploring for and lifting these two resources to the surface---what economists label oil and gas extraction---have created thousands of jobs and billions in household income for Louisianans each year. It has also attracted closely related industries to the state as well. For example, **Louisiana ranks number two among the 50 states in petroleum refining capacity** (see Table 3). Louisiana ranks below Texas and ahead of California by this measure.

Table 3
Petroleum Refining Capacity: 2006
(Millions of Barrels per Calendar Day)

Area	Refinery Capacity	Number	Percent U.S.
United Sates	17.370	149	100.0%
Texas	4.678	26	27.0%
Louisiana	*2.901*	*16*	*16.7%*
California	2.027	21	11.7%
Illinois	0.904	4	5.2%

Source: http:/tonto.eia.doe.gov/state/state_energy_profiles

It is interesting to note that our refining industry is quite different from that of California. California uses 21 refineries to refine its 2.0 million barrels of crude a day. Louisiana, on the other hand, uses 16 refineries to handle 45 percent more crude per day (2.9 million barrels). California refines its crude in relatively small refineries. Louisiana uses much larger refineries. Indeed, the ExxonMobil refinery in Baton Rouge is the second largest refinery in the country and the tenth

largest in the world.[2] In addition, California refineries serve only California, while Louisiana refineries serve Louisiana, Texas, Mississippi, Illinois and the eastern seaboard.

Pipelines

A second closely related industry to oil and gas extraction is the **pipeline industry**. Because pipelines are effectively hidden from view, Louisianans are little aware of the massive amount of oil and gas products that move underground in this state. Consider these figures:

- There are 41,320 miles of pipelines in onshore Louisiana.[3] These pipelines carry crude oil, natural gas, petrochemical products, LPG/NGL, and refined products.
- There were 41,689 miles of pipelines in offshore Louisiana, outside the state's jurisdictional boundaries.[4]

These 83,009 miles of pipelines are the ones for which reasonable data are available because they fall under direct state or federal regulation. These do not include the thousands of miles of flow lines and gathering lines that move gas and oil from the wellhead to separating facilities; nor do they include pipelines transporting chemical products with no petroleum base. It is believed that the pipeline industry may be at least twice as large as the numbers in the bulleted points above.

The Trip Ahead

How has such a massive industry affected the economic lives of Louisiana citizens? If the extraction, refining, and pipeline industries are lumped under one heading---the energy industry---has it been a weak or powerful economic engine? Has the whole state benefited from its presence, or have any economic effects been limited to only a few parishes? Are the multiplier effects on other industries in Louisiana small or large? Has the industry's impact on state and local treasuries been trivial or significant?

These are the topics covered in the sections to follow. Section II is devoted to the direct income and employment effects of the energy industry. How many people are employed in it and what is the nature of the wages paid its employees? Section III uses an input/output table to estimate the multiplier impacts of the energy industry. In which sectors are employees benefiting the most from these possible spillover effects? In section IV, the contribution to state and local treasuries is measured along with a discussion of the ten-year industrial tax exemption program. Section V presents tantalizing evidence about remarkable technological changes in these industries. Section VI contains the summary and conclusions. Appendix A contains an analysis of the impact of Hurricanes Katrina and Rita on the industry and its record of recovery from those two horrendous storms.

II. The Direct Employment and Income Impacts

A helpful way to think about an industry's impact on a state is to think of the state's economy like a large economic pond. Into this pond we are going to drop a rock labeled "oil and gas extraction, refining and pipeline industries". Would such a rock make much of a splash in the pond? It is these **direct impacts** that we attempt to measure in this section. In section III, we will examine the extent of the ripples (the multiplier effects) this rock makes in the pond as the ripples work their way to the shore.

"Covered" Employment and Wages

By far the most detailed and reliable information on employment and wages in these three industries are the data gathered by the Louisiana Department of Labor on "covered" employees, i.e., covered by unemployment compensation regulations. Because of legal reporting requirements, detailed data are available down to the parish level in most cases.

Covered Employment

Table 4 contains information on covered employment and annual wages paid in these four energy industries. **In 2006, there were 58,278 covered workers employed in the oil and gas extraction, support activities for mining, refining, and pipeline industries.**[5] To get some idea of the relative size of this number, in 2006 fifty-four of Louisiana's 64 parishes had total covered employment less than 58,278.[6] **The number of persons employed in these industries is approximately equivalent to the 2005 population of Acadia Parish (latest data available), the 19th most populous parish in the state.**[7]

Table 4
Employment and Annual Wages Paid
in Petroleum-Related Industries: Louisiana
2006

Sector	Employment[a]	Annual Wages Paid[b]
Oil & Gas Extraction	7,508	$78,260,409
Support Activities for Mining	38,050	2,305,704,812
Petroleum Refining[c]	10,350	905,228,136
Pipelines	2,370	171,704,658
TOTAL	**58,278**	**$4,170,898,015**

Source: www.Laworks.net. Go to LMI section. [a]Third quarter data. [b]Annual estimate based on three quarters of data. [c]Data are for "petroleum & coal products" sector which is 98 percent petroleum refining.

Covered Annual Wages

What is more remarkable is the impact of these three industries on the incomes of Louisianans who work in these four sectors. According to the data in Table 4, **these three industries generated nearly $4.2 billion in covered wages for these workers in 2006.** These four industries, through their direct effects alone, **generated 6.4 percent of the total covered wages earned in Louisiana in 2006.**[8]

Comparative Weekly Wage Rates

One reason these annual wage numbers are so large is because these four sectors are some of the highest wage industries in the state. Table 5 provides data on the average weekly earnings in these four sectors and Louisiana's manufacturing industries in the third quarter of 2006.

Table 5
Average Weekly Wage – Third Quarter 2006
Louisiana Petroleum-Related Industries & Manufacturing

Sector	Average Weekly Wage
Oil & Gas Extraction	*$1,804*
Petroleum & Coal Products(98% Refinery)	*1,567*
Chemicals & Allied Products	1,499
Pipeline Transportation	*1,345*
Paper Manufacturing	1,213
Support Activities for Mining	*1,209*
Transportation Equipment	1,073
Primary Metals Manufacturing	1,019
Computers & Electronics	927
Machinery Manufacturing	908
Fabricated Metals	810
Non-metallic Minerals	750
Plastics & Rubber Products	727
Wood Products	710
Beverage & Tobacco Products	672
Printing & Related Products	626
Food manufacturing	595
Miscellaneous Manufacturing	527
Furniture Manufacturing	509
Textile Products	472
Apparel Products	440
Average Manufacturing Wage	$984
Average Wage in All Sectors	$683

Source: www.Laworks.net. Go to LMI section.

Note that the oil and gas extraction and refining sectors rank #1 and #2, respectively among the industries listed, with pipeline wages ranking #4 and support activities for mining ranking #6.

Oil and gas extraction's weekly wage of $1,804 is a whopping 83 percent higher than the average wage in manufacturing ($984). Even more telling is that oil and gas extraction wages are almost triple the average wage earned by a Louisiana worker ($683 per week). Refining wages are 59 percent higher than the average manufacturing wage. Both oil and gas extraction and refining are unusually capital-intensive industries requiring very skilled labor for their operations.

Our review of the direct wage and employment impacts of these industries reveal something important about the energy sector. This economic engine is far from small. **It has been a powerful factor for creating thousands of high-wage jobs in Louisiana.**

Job Distribution across the State

Have the benefits of these excellent jobs been narrowly confined to just one area of the state, or have they been more widely distributed across Louisiana? One advantage of the covered employment data is they are available by parish, except where disclosure rules prevent their release.

Table 6 contains the distribution of reporting units, employment, and annual wages paid in the three energy industries by parish for 2000. The data to construct this table were provided by the Research and Statistics Unit of the Louisiana Department of Labor. The Department cannot release data at the parish level unless there are a minimal number of reporting units. Too few a number of reporting units kicks in "disclosure rules" which ensure that an individual firm's employment and wage data cannot be identified.

The most important message from Table 6 is that the benefits of the energy sector are widespread across Louisiana. **Energy jobs and income are found in all of Louisiana's 64 parishes in 2006.** There were 14 parishes where more than 1,000 persons were employed in the energy sector, and in Lafayette Parish there were 15,241 persons working directly in the energy

sector. There were 12 parishes where between 300 and 999 persons were directly employed in the energy sector.

Table 6

Number of Reporting Units, Employment, and Annual Wages in
Oil and Gas Extraction, Refining and Pipeline Industries by Parish: 2006

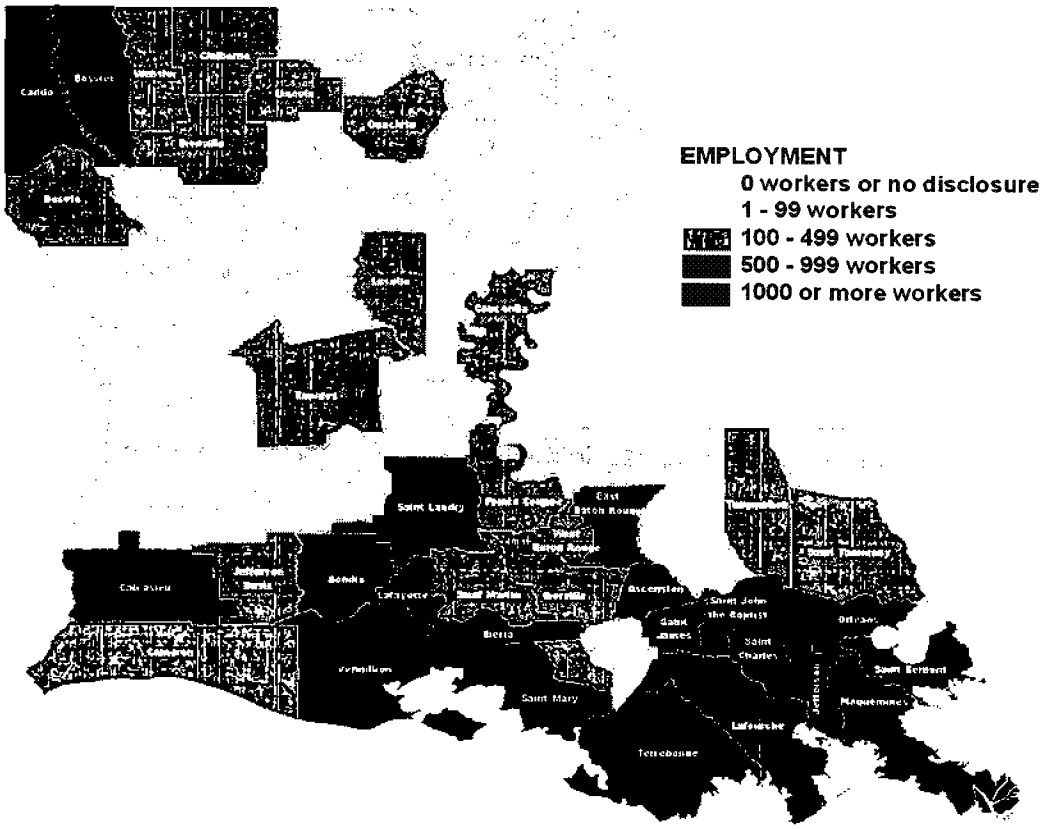
Parish	Units	Employment	Annual Wages
Acadia	45	742	$ 43,795,076
Allen	3	90	$ 6,036,364
Ascension	14	814	$ 56,678,332
Assumption	9	32	$ 2,271,676
Avoyelles	8	19	$ 440,164
Beauregard	8	70	$ 4,523,740
Bienville	16	167	$ 10,052,988
Bossier	39	1,265	$ 73,155,980
Caddo	206	2,413	$ 124,379,924
Calcasieu	62	3,762	$ 256,365,956
Caldwell	6	57	$ 3,704,524
Cameron	26	235	$ 15,521,964
Catahoula	7	47	$ 1,270,316
Claiborne	19	323	$ 15,348,264
Concordia	10	195	$ 10,696,824
Desoto	14	314	$ 16,687,036
E. Baton Rouge	55	2,339	$ 188,105,124
E. Carroll	4	3	$ 206,572
E. Feliciana	3	30	$ 1,961,976
Evangeline	8	24	$ 543,192
Franklin	3	19	$ 1,213,816
Grant	2	2	$ 29,024
Iberia	60	3,127	$ 201,898,428
Iberville	11	200	$ 9,020,768
Jackson	2	18	$ 1,807,424
Jefferson	83	2,315	$ 163,093,552
Jefferson Davis	14	256	$ 9,169,596
Lafayette	343	15,241	$1,075,400,448
Lafourche	52	752	$ 50,544,756
LaSalle	22	395	$ 16,538,736
Lincoln	18	177	$ 9,877,024
Livingston	7	25	$ 1,011,988
Madison	1	57	$ 2,074,388
Morehouse	3	16	$ 1,340,020
Natchitoches	8	49	$ 2,848,892
Orleans	83	3,731	$ 404,175,192

Ouachita	32	167	$ 10,243,516
Plaquemines	64	2,356	$ 158,928,400
Pointe Coupee	6	133	$ 8,656,328
Rapides	9	120	$ 8,253,612
Red River	1	12	$ 262,064
Richland	7	32	$ 1,528,184
Sabine	8	60	$ 1,716,572
St. Bernard	16	849	$ 84,723,156
St. Charles	9	1,381	$ 120,449,440
St. Helena	2	20	$ 1,132,976
St. James	9	883	$ 86,346,252
St. John	7	1,033	$ 75,065,004
St. Landry	25	896	$ 60,571,896
St. Martin	23	451	$ 23,139,420
St. Mary	54	1,391	$ 87,545,688
St. Tammany	38	264	$ 23,690,976
Tangipahoa	9	363	$ 13,920,584
Tensas	2	9	$ 240,380
Terrebonne	128	6,229	$ 402,691,696
Union	3	25	$ 671,072
Vermillion	47	1,137	$ 77,825,988
Vernon	6	77	$ 4,500,020
Washington	6	23	$ 1,274,924
Webster	23	463	$ 23,932,552
W. Baton Rouge	5	224	$ 16,682,424
W. Carroll	4	21	$ 1,108,968
W. Feliciana	3	51	$ 4,270,640
Winn	4	25	$ 1,513,496
Total	**1,824**	**58,016**	**$4,082,676,272**

Source: Louisiana Department of Labor

Map 1 provides a visual illustration of the distribution of energy jobs across the 64 parishes. From this map it appears there is some concentration of the energy sector in the southern portion of the state, but there are still several parishes in the northern and central regions with 500 or more energy employees. For example, Caddo Parish employed 2,413 people in these three industries, while Bossier Parish employed 1,265.

Map 1
Distribution Across Louisiana Parishes of Covered Employment in the Oil & Gas Extraction, Refining and Pipeline Industries: 2006



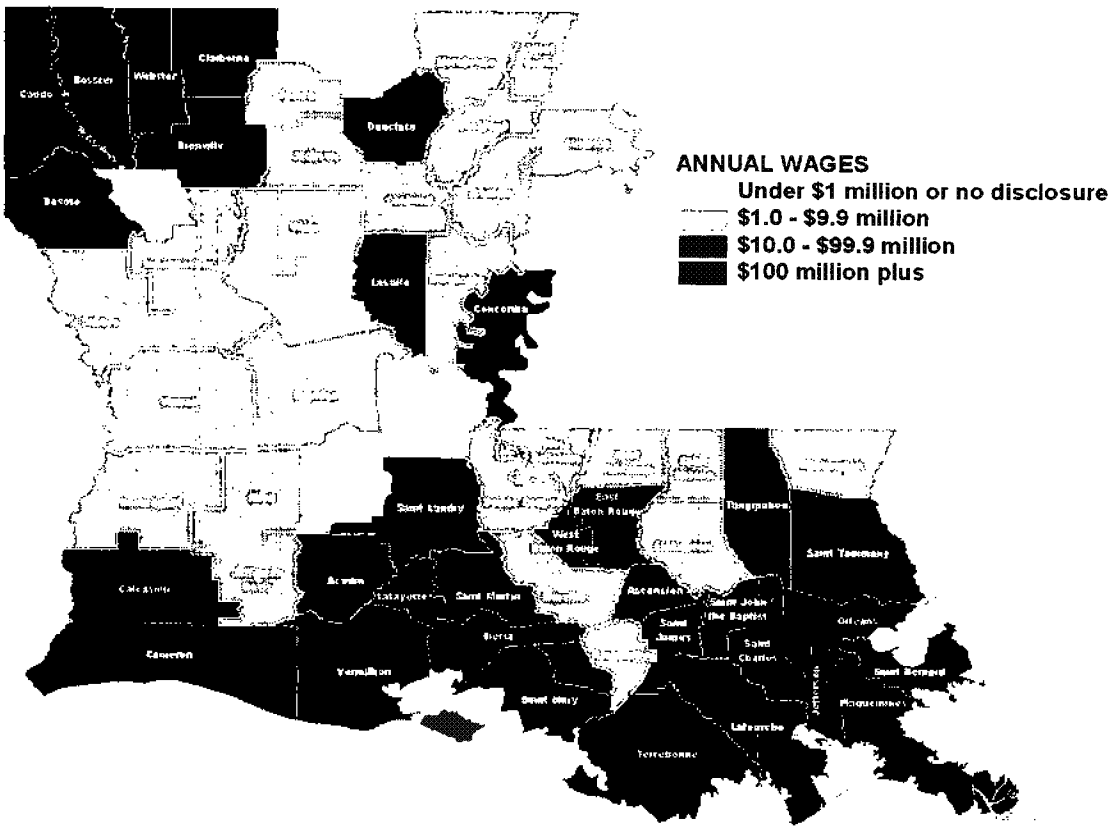
Distribution across the State: Annual Wages

The last column of Table 6 contains annual covered wage data by parish. Map 2 provides a visual illustration of the distribution of covered wages. These data detail what is in some cases a massive injection of earnings into a parish's economy. Note for example that in 2006:

- There were 57 parishes where energy wages exceeded $1 million a year.
- There were 10 parishes where energy wages exceeded $100 million.
- In Lafayette Parish energy wages exceeded $1 billion dollars, and in Orleans and Terrebonne Parishes, annual energy wages totaled over $400 million dollars.
- Equally important, **over $4 billion in direct wages was paid to workers in these energy sectors across all parishes in 2006**.

Clearly, the energy sector is vitally important to the economic health of these parishes. It is also important to note that these are only the **direct** effects of the energy sector on these economies. They do not include the additional multiplier or spillover effects that will be estimated later in this report.

Map 2
Distribution Across Louisiana Parishes of Covered Wages Earned in the Oil & Gas Extraction, Refining and Pipeline Industries: 2006



A Broader Income Measure: Value Added

Care has been taken in the material above to describe the wage data as pertaining to "covered" employment in the three energy industries. While this measure will fairly comprehensively include most wage and salary workers, it will not include wages and salaries paid to self employed individuals or unpaid family members---probably a small set within total wage and salary workers in these industries.

However, it is important to realize that wages and salaries are only one component of the income generated for Louisiana citizens by these industries. Not included in the tables above are other labor income, rental incomes, profits, and interest earnings.

One of the best measures of the **total income** created by an industry is its **value added**. Unfortunately, value added data by industry are rather scarce. One useful source is the various industrial censuses and surveys that are taken by the U.S. Bureau of the Census. The Bureau of the Census conducted an **Annual Survey of Manufactures** in 2005 which provides value added data for all of the state's manufacturing sectors for that year. Unfortunately, the Bureau does not conduct an annual survey of the mining sector. The agency does conduct a census of the mining sector every five years. The latest of these censuses is the Louisiana **Census of Mineral Industries: 2002.** Unfortunately, though there is a census of transportation specifically for Louisiana, value added data are not provided specifically for the pipeline industry.

Value added data for Louisiana's manufacturing industries and its extraction sector are provided in Table 7. Note that the manufacturing data are for 2005 and the oil and gas extraction data are for 2002. Without question comparable 2005 oil and gas extraction value added data would

be much higher than the 2002 figure shown in Table 7 because of the very large increase in oil and natural gas prices that occurred between 2002 and 2005.

Table 7

Value Added in Louisiana Manufacturing Sectors in 2005
And in Louisiana Oil and Gas Extraction in 2002

Sector	Value Added (Millions)	Percent of Manufacturing Total
Petroleum & Coal Products	***$34,293.00***	***49.1***
Chemicals	21,318.30	30.5
Food Manufacturing	2,903.90	4.2
Transportation Equipment	2,830.50	4.0
Paper Manufacturing	2,159.00	3.1
Fabricated Metals	1,713.40	2.5
Wood Products	806.90	1.2
Machinery Manufacturing	798.40	1.1
Plastics & Rubber Products	603.50	0.9
Nonmetallic Mineral Products	510.60	0.7
Primary Metals	453.00	0.6
Beverage & Tobacco	246.90	0.4
Printing & Related Products	224.40	0.3
Electrical Equipment	139.30	0.2
Textile Products	D	NA
Apparel Manufacturing	D	NA
Computers & Electronics	D	NA
Total Manufacturing	$69,910.60	100
Oil & Gas Extraction*	***$24,658.70***	***NA***

Source: 2005 Survey of Manufactures, U.S. Bureau of Census and 2002 Economic Census for Louisiana: Mining. D = not shown due to disclosure rules. NA = Not Applicable. *Data are for 2002. **The petroleum & coal products sector is 98 percent refining.**

There are several striking conclusions that arise from examining these data.

- Note in the bottom line of Table 7 **that nearly $25 billion in income was created by Louisiana's oil and gas extraction sector in 2002.** This figure exceeds that of every manufacturing sector in Louisiana except petroleum and coal products, and this figure

occurred three years earlier than the manufacturing data in Table 7. Given what happened to oil and natural gas prices and production between 2002 and 2005, **we suspect the value added for oil and gas extraction in 2005 is close to $47.5 billion**[9], an amount that substantially exceeds the sum of the value added of all manufacturing sectors except petroleum and coal products.

- **With nearly $34.3 billion in value added, petroleum refining is the largest source of income in Louisiana's manufacturing sector**. Indeed, almost half (49.1 percent) of Louisiana's value added is derived from the refining sector. While there are some coal mines in this category, 2002 Census of Manufactures data indicate that 98 percent of this value added is derived from refining.
- We estimate that **in 2005 the extraction and refining sectors combined created a remarkable $81.8 billion of income in Louisiana**.

III. Indirect or Multiplier Effects of the Industry

Earlier in this report it was mentioned that a helpful way to think of the energy sector's impact on the Louisiana economy was to think of the state as one large economic pond. Into this pond a rock is dropped labeled "energy industries". Section II of this report has provided estimates of the effect on the state of the initial splash made when the rock hit the pond---what has been referred to as the **direct** impacts of the industry.

Ripples in the Pond: The Multiplier Effect

However, when this rock hits it will also send out ripples to the edge of the pond---what are called the **multiplier** or indirect effects of the industry. For example, the extraction industry will

order offshore platforms from Louisiana fabricators such as J. Ray McDermott or Gulf Island Fabricators. This creates sales, income, and jobs in those firms, which in turn call their suppliers and order sheet steel, pipes, electrical generators, etc., which creates sales, income, and jobs in those firms, and so on. The employees that are hired in the extraction industry are paid wages and salaries which they then spend at car dealerships, grocery stores, eating establishments, etc., which generates new sales, income, and jobs there, etc., etc.

As it turns out, there is a useful tool for measuring these multiplier effects for the industries. It is called an **input-output (I/O) table**. Such a table has been constructed for the Louisiana economy by the Bureau of Economic Analysis (BEA) in the U.S. Department of Commerce. The BEA is the same governmental agency that is responsible for tabulating the gross domestic product statistics that are released on the economy quarterly.

To use the I/O tables we went to the 2005 Louisiana gross state product (GSP) statistics provided by the BEA. This agency estimated that in 2005, refining generated $16,780 million or 9.3 percent in Louisiana GSP. The BEA also reported that oil and gas extraction and support activities for mining added another $23,218 million to state GSP---12.9 percent of the total. These were the figures we inserted into the I/O tables. The multiplier effects on business sales, household earnings, and jobs in Louisiana are documented for the oil and gas extraction sector in Table 8, and the multiplier effects for the refining sector are shown later in Table 9.

Table 8

Direct and Multiplier Effects of Oil and Gas Extraction Sector: 2005

Sector	Direct and Multiplier Effects on:		
	Output (millions)	Household Income (millions)	Jobs
Agriculture, forestry, hunting and fishing	$110.8	$15.7	1,348
Mining	$23,081.5	$2,900.2	51,633
Utilities	$791.4	$144.6	1,721
Construction	$104.5	$39.1	1,155
Manufacturing	$2,469.7	$391.6	9,003
Wholesale trade	$846.9	$264.6	6,478
Retail trade	$1,095.2	$366.1	18,828
Transportation and warehousing	$863.4	$264.0	6,528
Information	$474.9	$125.1	2,463
Finance and insurance	$902.7	$221.1	6,299
Real estate and rental and leasing	$3,891.9	$322.1	10,252
Professional, scientific & technical services	$981.7	$451.4	9,850
Management of companies & enterprises	$1,759.5	$869.5	16,809
Admin. & waste management services	$345.3	$136.5	6,843
Educational services	$205.5	$91.0	3,629
Health care and social services	$1,314.9	$630.7	19,596
Arts, entertainment and recreation	$153.7	$62.6	2,673
Accommodation and food services	$586.7	$222.3	13,848
Other services	$574.9	$183.3	8,884
Households	$0.0	$15.7	2,056
Total	**$40,555.0**	**$ 7,717.2**	**199,895**

Source: Louisiana Input-Output Table, Bureau of Economic Analysis, U.S. Department of Commerce, Washington, D.C., 2004.

Ripple Effects of the Extraction Industry

Table 8 contains the estimated multiplier effects of the extraction industry from the I/O table. The I/O table enables one to estimate the impact of an industry on three key variables in the state: (1) sales at firms; (2) household incomes; and (3) jobs.

Any question about whether or not the extraction industry is a weak or strong engine for economic activity in Louisiana should be completely answered by the numbers in this table. By any reasonable measure, these spillover impacts are huge. **According to the I/O table, extraction industry activity in 1997 created nearly $40.6 billion in sales at Louisiana firms.**

Table 8 provides detail on how these sales are distributed across firms in different industries. The greatest beneficiary is the crude petroleum and natural gas industry---where the "rock" is, so to speak. But notice that multi-millions of dollars in sales are enjoyed by firms in many other sectors of the Louisiana economy. The **real estate industry** does particularly well ($3.9 billion) not only because the earnings created by this industry allows Louisianans to purchase homes and boosts the demand for shopping centers and other business establishments, but also because the extraction industry purchases a lot of property for drilling and production purposes. Over one billion dollars in sales are created in each of the following industries: manufacturing ($2.5 billion), management of companies & enterprises ($1.8 billion), health care ($1.3 billion), and retail trade ($1.1 billion).

For most citizens, the key numbers in Table 8 are the ones in the middle column---the ones dealing with household income. **According to the I/O table, the extraction industry pumped over $7.7 billion into the bank accounts of Louisiana citizens.** Persons that worked in the extraction industry earned the biggest fraction of this money---nearly $3.0 billion---but note that there were 14 sectors of the economy where household earnings exceeded $100 million in 2005.

Employees in the "management of companies & enterprises" sector were the second largest gainers ($869.5 million), followed by health services employees ($630.7 million) and professional, technical, and scientific workers ($451.4 million).

Finally, the last column of Table 8 provides the jobs impact of the oil and gas extraction sector. Here, the numbers are particularly impressive. According to the I/O table **a total of 199,895 jobs in Louisiana in 2005 could be traced directly or indirectly to the presence of the extraction industry**---and this is only from the portion of extraction activity associated with products exported from the state's borders. Not surprisingly, the bigger impacts again are in the principal industry---extraction (51,633 jobs)---which includes the direct job impacts as well.

But notice that thousands of jobs are supported in many other sectors of the Louisiana economy because of extraction's presence here. The health care and retail trade sectors especially benefit from these spillover impacts with 19,596 and 18,828 jobs created, respectively. In excess of 10,000 jobs are supported in each of the following industries: management of companies & enterprises (16,809), accommodations & food services (13,848), and real estate (10,252).

Ripple Effects of the Refining Industry

The existence of a mother lode of petroleum beneath our borders, and beneath the waters in our coastal Gulf of Mexico, has attracted to Louisiana an industry that operates immediately down stream from oil and gas production---refineries. Table 9 contains the I/O estimates of the spillover effects of this industry. It is important to note that we were careful not to double count the impact of this industry by including the extraction sector effects. That is why the "mining" sector in Table 9 contains zeros.

Table 9

Direct and Multiplier Effects the Refinery Sector in Louisiana: 2005

Sector	Direct and Multiplier Effects on:		
	Output (millions)	Household Income (millions)	Jobs
Agriculture, forestry, hunting and fishing	$75.5	$10.1	903
Mining	$0.0	$0.0	0
Utilities	$761.8	$129.2	1,580
Construction	$90.6	$33.6	991
Manufacturing	$19,594.0	$2,037.1	26,480
Wholesale trade	$1,169.6	$364.1	8,948
Retail trade	$706.4	$236.6	12,141
Transportation and warehousing	$1,250.1	$333.9	6,065
Information	$273.5	$70.5	1,406
Finance and insurance	$639.3	$154.4	4,431
Real estate and rental and leasing	$1,527.0	$107.4	4,359
Professional, scientific & technical services	$733.3	$320.5	7,603
Management of companies & enterprises	$573.9	$283.6	5,485
Admin. & waste management services	$323.9	$125.9	6,056
Educational services	$137.6	$60.4	2,401
Health care and social services	$805.4	$385.9	11,985
Arts, entertainment and recreation	$94.0	$38.6	1,657
Accommodation and food services	$421.2	$159.4	9,857
Other services	$463.1	$149.3	6,780
Households		$10.1	1,258
Total	**$29,640.2**	**$5,010.5**	**120,385**

Source:Louisiana Input-Output Table, Bureau of Economic Analysis, U.S. Department of Commerce, Washington, D.C., 2004

Note the bottom line of the first column of Table 9. **The existence of the refining industry in Louisiana created $29.6 billion in sales at Louisiana firms in 2005**. Clearly, this industry has had a very powerful economic effect on the Louisiana economy. Almost two-thirds of these sales

($19.6 billion) occurred in the manufacturing sector---a sector which includes the refinery sales in that year associated with "dropping the rock in the pond".

There are three other sectors where over $1 billion in sales can be traced back to the refining industry: real estate ($1.5 billion), transportation & warehousing ($1.3 billion), and wholesale trade ($1.2 billion). The transportation sector is a big winner because that sector that includes the pipeline industry, the next immediate downstream step in getting the refined product to the market. Note that there are six other sectors of the Louisiana economy where businesses can track over one-half billion in annual sales back to the presence of the refinery industry.

Column two of Table 9 reveals the impact of the refining industry on household incomes of Louisianans in 1997. **Over $5 billion in earnings were injected into the Louisiana economy through both the direct and indirect effects of the refining industry in that year**. Over a $2 billion of this income went to workers in the manufacturing sector where the refineries are located. Note that there were 12 other sectors in Louisiana that saw their workers' earnings boosted in excess of $100 million in 2005 through spillover effects of the refining industry.

The jobs impacts were equally impressive. According to the last column in Table 9, **there were 120,385 jobs in Louisiana in 2005 that could be traced directly or indirectly to the refining industry**. Some 26,480 of those jobs were in the manufacturing sector, which includes the direct jobs in the refining industry. In excess of 10,000 jobs were supported in transportation and warehousing (12,141) and health care (11,985), with the accommodations and food services sector coming close to that mark with 9,857 jobs traceable to the refining industry. There were six other sectors where more than 5,000 jobs were related to refining activities in 2005.

The Total Impact: More than "Ripples"

A large number of figures are contained in Tables 8 and 9. Table 10 presents a handy summary of the bottom line from those two tables. According to the I/O table, **the energy industry in Louisiana supports $70.2 billion in sales at firms in the state, over $12.7 billion in household earnings for Louisianans, and 320,280 jobs**. (Note: the sales impact number is slightly lower than the figure in the previous study due to a modeling error in the earlier work.) The term "ripple" hardly does justice to the magnitude of these impacts. These are more like small waves.

Table 10

Summary of Input-Output Results Across Industries: 2005

Industry	Direct and Multiplier Effects on:		
	Sales (millions)	Household Income (millions)	Jobs
Oil & Natural Gas Extraction	$40,555.0	$ 7,717.2	199,895
Refineries	29,640.2	5,010.5	120,385
Totals	**$70,195.2**	**$12,727.7**	**320,280**

Source: Louisiana Input-Output Table

Numbers in the "billions" are used so frequently in society today that it is difficult to get a grasp on what they really mean. Table 10 shows that the industry created $12.7 billion in <u>household earnings</u> in 2005. Perhaps a few comparisons will put these numbers in perspective.

- That is 15.4 percent of the total earnings of Louisianans in that year.[10]
- This number exceeds the total earnings of persons in each of every single parish in the state in 2005. The parish that came the closest to matching this total was East Baton Rouge Parish at $9.1 billion.[11]
- The **Statistical Abstract of the United States - 2002** contains a table listing the gross domestic product (GNP) of 66 countries in the world in 2000.[12] Four of those countries have gross domestic products smaller than $12.7 billion.

Table 10 shows that the jobs of 320,280 Louisianans are dependent on the presence of the energy industry in this state. By way of reference:

- This number represented 16.9 percent of non-agricultural wage and salary employment in 2005 in Louisiana.[13]
- Recall from Table 4 that 58,278 people are employed directly in the energy industries in the state. **This means the job multiplier for these two industries is 5.5**, a figure which includes the direct jobs. **This means for each job created in these two industries, 4.5 additional jobs are created elsewhere in the state.**

What these numbers reveal is that the economic impact of the energy industry is both huge and widespread. Clearly, it has been a powerful influence for economic growth in Louisiana.

IV. Tax Impacts of the Energy Industry

Our analysis of the employment and earnings impacts of these energy industries reveals an economic engine with extensive job and income creating powers. It should come as no surprise then

that both state and local governments enjoy a nice boost to their treasuries from the presence of the extraction, refining and pipeline industries in our state.

These industries influence tax payments to these two governmental units in two ways. First, there are the taxes paid **directly** by the industry to state and local governments in the form of corporate income and franchise taxes, sales taxes, royalties, rentals, bonuses, property taxes, fees, etc. However, there is a second major source of revenues generated by the industries' presence. Recall that in section III, it was determined that almost $12.7 billion in household earnings was created in the state both directly and through the multiplier effects of these industries' activities (see Table 10). State and local governments collect additional taxes via these earnings as well.

Direct State Taxes

Table 11 documents the direct state taxes and fees paid by the extraction, refining, and pipeline industries in fiscal year 2005-06 (FY06). **The energy industry paid $1,447,181,000 in state taxes in FY06 or about 14.4 percent of total taxes, licenses, and fees collected by the state.** Clearly, if this sector did not exist in Louisiana, our citizens would be able to do far less in terms of infrastructure, education, care for the poor, etc., than it is doing today. One point four billion dollars can correct a lot of social problems.

Table 11
Direct State Taxes Collected From Oil & Gas Extraction, Refining,
And Pipeline Industries: Fiscal Year 2005-06

Tax Category	Taxes Paid Thousands of Dollars
Severance Taxes	$709,270
Royalties, Rentals, Bonuses, Leases	497,870
Corporate Income Taxes	44,230
Corporate Franchise Taxes	57,257
Sales Taxes[1]	85,331[2]
Natural Gas Franchise Tax	4,450
Direct Fees to Dept. of Natural Resources	9,072
Royalties Paid to 8g Fund	30,768
Fees Paid to Dept. of Environmental Quality	8,933
TOTAL DIRECT TAXES PAID	**$1,447,181**
Total State Taxes, Licenses & Fees	$10,027,890
Total Direct Taxes as Percent of Total State Taxes, Licenses, Fees	**14.4%**

Source: Departments of Revenue, Environmental Quality, Natural Resources, and Legislative Fiscal Office. Total State Taxes, Licenses, and Fees do not include some agency receipts included in direct taxes paid by the industry.

[1]These represent sales taxes collected by the industry on sales it made. It does not reflect sales taxes paid by the industry to vendors when the industry made purchases.

By far the largest portion of these tax collections are mineral taxes and payments such as severance taxes, royalties, rentals, and bonuses. Counting payments to the 8g fund, these mineral taxes totaled over $1.2 billion or 86 percent of total direct taxes paid by this sector. The next biggest set of taxes was the corporate franchise and income taxes which came to $101.5 million in FY06.

Ad Valorem Taxes to Local Governments

From data tabulated by the Louisiana Tax Commission it is possible to derive a very conservative estimate of the property taxes collected from the energy industries by local governments in Louisiana. The phrase "very conservative" was used in that last sentence because the Tax Commission has reliable data on the assessed value of pipelines, drilling rigs, oil and gas surface equipment, and oil and gas wells from which property tax payments can be derived. In addition, a survey was conducted of the 16 largest refineries in the state to obtain their property tax payments in FY05.

However, what is not available are data on the assessed value of business furniture and fixtures, leased equipment, buildings and land, machinery and equipment owned, and inventories in all of the pipeline and extraction companies. This would no doubt be quite a large figure. Because these items cannot be isolated from the Tax Commission data, our property tax numbers for the industry will be at the very lower limit of total property taxes paid.

Table 12 contains a wealth of data on ad valorem taxes paid in Louisiana. This table shows total ad valorem taxes paid, how much went to schools, our "very conservative" estimate of taxes paid by the extraction, refining, and pipeline industries, and what percent of total ad valorem taxes in each parish was paid by these three energy industries.

Table 12

Ad Valorem Taxes Paid by Parish and Amount Paid
By Oil & Gas, Refining, and Pipeline Industries: 2005

Parish	Ad Valorem Taxes	Total School Taxes	Taxes Paid by Oil/Gas Refining, & Pipelines	Percent of Total Paid by Oil/Gas Refining, Pipelines
Acadia	$ 14,069,266	$ 6,141,022	$ 2,679,527	19.0
Allen	$ 10,615,008	$ 3,253,384	$ 970,839	9.1
Ascension	$ 52,390,916	$ 28,932,481	$ 484,662	0.9
Assumption	$ 9,011,756	$ 3,780,684	$ 957,557	10.6
Avoyelles	$ 4,510,072	$ 1,111,751	$ 108,058	2.4
Beauregard	$ 16,261,636	$ 7,186,083	$ 919,219	5.7
Bienville	$ 16,562,367	$ 9,633,215	$ 3,280,369	19.8
Bossier	$ 52,449,881	$ 28,505,130	$ 4,452,577	8.5
Caddo	$ 158,347,601	$ 88,177,768	$ 4,366,473	2.8
Calcasieu	$ 120,654,980	$ 37,460,082	$ 11,293,008	9.4
Caldwell	$ 3,551,176	$ 1,139,451	$ 118,586	3.3
Cameron	$ 24,885,886	$ 9,236,249	$ 6,352,124	25.5
Catahoula	$ 2,860,957	$ 867,615	$ 56,029	2.0
Claiborne	$ 7,125,374	$ 3,693,277	$ 2,361,859	33.1
Concordia	$ 9,607,947	$ 3,969,335	$ 107,386	1.1
Desoto	$ 22,395,351	$ 12,072,270	$ 4,231,580	18.9
E. Baton Rouge	$ 264,529,268	$ 108,481,330	$ 13,557,732	5.1
E. Carroll	$ 2,872,210	$ 404,019	$ -	0.0
E. Feliciana	$ 3,243,061	$ 1,211,328	$ 53,683	1.7
Evangeline	$ 8,244,080	$ 3,110,543	$ 667,524	8.1
Franklin	$ 4,322,250	$ 684,598	$ 11,404	0.3
Grant	$ 4,567,183	$ 1,346,557	$ 52,989	1.2
Iberia	$ 22,751,499	$ 10,872,684	$ 1,692,029	7.4
Iberville	$ 26,995,293	$ 12,335,878	$ 1,079,303	4.0
Jackson	$ 10,849,146	$ 3,107,754	$ 5,271,461	48.6
Jefferson	$ 241,089,570	$ 52,402,789	$ 1,488,399	0.6
Jefferson Davis	$ 16,468,540	$ 5,591,870	$ 1,584,052	9.6
Lafayette	$ 84,408,344	$ 34,009,661	$ 870,175	1.0
Lafourche	$ 53,224,301	$ 19,081,547	$ 6,509,115	12.2
LaSalle	$ 7,190,102	$ 2,137,458	$ 669,236	9.3
Lincoln	$ 21,376,748	$ 10,847,612	$ 1,169,741	5.5
Livingston	$ 28,734,445	$ 8,945,245	$ 149,658	0.5
Madison	$ 4,151,791	$ 960,534	$ -	0.0
Morehouse	$ 9,559,808	$ 5,319,047	$ 143,372	1.5
Natchitoches	$ 14,713,335	$ 6,458,834	$ 77,608	0.5

Orleans	$ 314,318,880	$ 97,713,552	$ -	0.0
Ouachita	$ 68,878,892	$ 31,001,841	$ 448,783	0.7
Plaquemines	$ 37,492,865	$ 13,996,097	$ 14,203,178	37.9
Pointe Coupee	$ 13,801,776	$ 4,485,014	$ 1,418,668	10.3
Rapides	$ 53,554,139	$ 24,138,295	$ 1,383,673	2.6
Red River	$ 3,549,617	$ 2,331,661	$ 127,895	3.6
Richland	$ 5,818,981	$ 2,666,368	$ 30,219	0.5
Sabine	$ 7,883,953	$ 3,868,427	$ 267,143	3.4
St. Bernard	$ 23,867,311	$ 10,544,297	$ 11,939,992	50.0
St. Charles	$ 92,181,123	$ 45,635,520	$ 14,170,727	15.4
St. Helena	$ 4,025,777	$ 634,558	$ 240,897	6.0
St. James	$ 29,193,555	$ 11,516,093	$ 11,581,442	39.7
St. John	$ 26,659,357	$ 9,771,623	$ 11,710,160	43.9
St. Landry	$ 30,312,195	$ 13,439,894	$ 1,205,073	4.0
St. Martin	$ 15,562,434	$ 5,212,184	$ 1,619,053	10.4
St. Mary	$ 29,218,843	$ 11,455,555	$ 3,073,601	10.5
St. Tammany	$ 144,858,854	$ 68,313,412	$ -	0.0
Tangipahoa	$ 26,515,041	$ 4,756,942	$ 123	0.0
Tensas	$ 3,526,799	$ 1,288,839	$ 67,712	1.9
Terrebonne	$ 45,305,132	$ 6,948,124	$ 8,337,345	18.4
Union	$ 5,930,299	$ 2,185,983	$ 615,772	10.4
Vermillion	$ 21,006,046	$ 8,653,157	$ 5,084,938	24.2
Vernon	$ 11,787,620	$ 5,433,774	$ 3,294,400	27.9
Washington	$ 14,488,874	$ 7,399,931	$ 47,858	0.3
Webster	$ 15,728,690	$ 8,348,854	$ 2,681,794	17.1
W. Baton Rouge	$ 17,466,122	$ 6,024,840	$ 1,125,738	6.4
W. Carroll	$ 2,805,329	$ 1,153,178	$ -	0.0
W. Feliciana	$ 19,363,432	$ 3,664,193	$ 18,052	0.1
Winn	$ 5,405,651	$ 2,356,267	$ 154,859	2.9
Total	**$ 2,442,098,768**	**$ 947,407,558**	**$ 172,636,429**	**7.1**

Source: Louisiana Tax Commission & industry survey

According to these data, the extraction, refining, and pipeline industries paid at least $172.6 million in ad valorem taxes to local governments in 2005. In 31 of the 64 parishes, ad valorem taxes paid by the industries exceeded $1 million. In 12 parishes, the figure exceeded $5 million. The distribution of high-tax-collection parishes for these industries correlates closely with the distribution of earnings and employment shown back in Maps 1 and 2.

Plaquemines Parish, with both refineries and huge exploration activities, was in the top spot at $14.203 million. A close second in this ranking was St. Charles Parish with $14.170 million in property taxes paid. This parish contains two large refineries. Those very capital intensive industries have an abundance of property subject to the ad valorem tax. St. James, St. John the Baptist, St. Bernard, Calcasieu, and East Baton Rouge Parishes, which also contain large refineries, each collected over $11 million in property taxes from these industries.

It is apparent from the numbers in the last column of Table 12 that some parishes would face some very serious financial problems if for some reason these energy industries vanished from their borders. In nine of the parishes over one-fifth of property taxes came from energy firms. In 21 of the parishes over ten percent of property taxes came from energy firms. In St. Bernard Parish one-half of ad valorem taxes came from energy firms. As seen at the bottom of the last column in Table 12, the energy industry paid an estimated 7.1 percent of all property taxes collected by local governmental agencies in 2005---up from 5.7 percent in 1999.

Some readers may be surprised at the numbers in Table 12. They believe that the 10-year industrial tax exemption (TYITE) protected these industries from paying much in the way of property taxes. First of all, the TYITE applies for the most part only to **manufacturing firms**. Thus, while it would apply to refineries, it is not available to pipelines or to the extraction industry.

Secondly, it is a **ten year** exemption. At the end of that 10-year period, the property rolls off the exemption schedule and onto the taxable rolls. Table 13 provides data by parish on the value of TYITE in force as of December, 2005 and the portion of that which applies to refineries. Of the $32.6 billion in exemptions in force as of that date, about $5.4 billion, or 16.7 percent of the total, was for refineries.

Table 13

Total Value of 10-Year Industrial Tax Exemptions in Force in 2005, Value for Refineries, and Amount of Refinery Exemptions Expiring over 2005-09

Parish	Ten-Year Contracts in Force in 2005	Oil Refining Contracts in Force in 2005	Oil Refining Contracts Expiring, 2005-09
Acadia Parish	$670,248,106	$0	$0
Allen Parish	$21,858,400	$0	$0
Ascension Parish	$4,520,585,388	$5,859,285	$0
Assumption Parish	$87,602,668	$0	$0
Avoyelles Parish	$10,810,882	$0	$0
Beauregard Parish	$284,399,079	$2,554,388	$0
Bienville Parish	$39,219,785	$0	$0
Bossier Parish	$121,169,960	$16,867,092	$12,556,856
Caddo Parish	$1,374,180,935	$52,389,708	$23,900,787
Calcasieu Parish	$4,646,002,731	$2,034,644,231	$1,210,047,492
Caldwell Parish	$179,902	$0	$0
Cameron Parish	$739,101,557	$0	$0
Catahoula Parish	$4,103,668	$0	$0
Claiborne Parish	$3,911,011	$0	$0
Concordia Parish	$4,610,188	$0	$0
De Soto Parish	$549,765,670	$0	$0
East Baton Rouge Parish	$3,095,415,468	$956,759,404	$587,443,031
East Carroll Parish	$24,125	$0	$0
East Feliciana Parish	$6,485,439	$0	$0
Evangeline Parish	$357,538,112	$0	$0
Franklin Parish	$3,024,696	$0	$0
Grant Parish	$11,588,045	$0	$0
Iberia Parish	$154,910,563	$0	$0
Iberville Parish	$2,594,745,914	$0	$0
Jackson Parish	$41,382,051	$0	$0
Jefferson Parish	$681,519,756	$0	$0
Jefferson Davis Parish	$229,090	$0	$0
Lafayette Parish	$197,379,375	$0	$0
Lafourche Parish	$176,368,950	$0	$0
La Salle Parish	$2,015,677	$0	$0
Lincoln Parish	$215,742,372	$0	$0
Livingston Parish	$38,537,963	$0	$0
Madison Parish	$1,819,051	$0	$0
Morehouse Parish	$179,199,427	$0	$0
Natchitoches Parish	$472,848,963	$0	$0
Orleans Parish	$494,200,822	$598,732	$0
Ouachita Parish	$1,403,755,302	$0	$0
Plaquemines Parish	$396,653,793	$187,083,448	$139,246,160
Pointe Coupee Parish	$186,145,289	$0	$0
Rapides Parish	$370,394,925	$0	$0

Red River Parish	$13,514,254	$0	$0
Richland Parish	$7,662,919	$0	$0
Sabine Parish	$107,425,138	$0	$0
St. Bernard Parish	$334,327,305	$249,324,230	$133,708,480
St. Charles Parish	$4,103,543,110	$914,088,030	$344,176,674
St. Helena Parish	$14,276,216	$0	$0
St. James Parish	$862,926,101	$429,623,420	$90,461,534
St. John the Baptist Parish	$821,095,194	$523,617,098	$146,178,978
St. Landry Parish	$124,045,685	$18,771,940	$11,446,525
St. Martin Parish	$45,240,237	$0	$0
St. Mary Parish	$351,799,398	$0	$0
St. Tammany Parish	$7,620,132	$0	$0
Tangipahoa Parish	$41,298,824	$0	$0
Tensas Parish	$163,192	$0	$0
Terrebonne Parish	$49,465,460	$0	0
Union Parish	$55,502,764	$0	$0
Vermilion Parish	$2,871,724	$0	$0
Vernon Parish	$3,194,781	$0	$0
Washington Parish	$352,653,887	$0	$0
Webster Parish	$156,258,849	$23,468,699	$20,470,861
West Baton Rouge Parish	$641,721,352	$26,865,945	$10,068,318
West Carroll Parish	$2,480,286	$0	$0
West Feliciana Parish	$264,772,394	$0	$0
Winn Parish	$110,147,542	$0	$0
State Total	**$32,633,681,842**	**$5,442,515,650**	**$2,729,705,696**

Source: Louisiana Department of Economic Development

The last column of Table 13 indicates that exemptions on nearly $2.8 billion of refinery property will expire over the five-year period from 2005-09. Calcasieu Parish, in particular, will experience a taxable property bonanza during this period as over $1.2 billion in refinery property becomes taxable. In East Baton Rouge Parish over one-half billion dollars in new property will come on the taxable rolls over 2005-09, and in St. Charles Parish the figure is approximately one-third of a billion dollars.

The local taxes paid by these three energy industries that are listed in the third column of Table 12 are "very conservative" for two reasons. They include only **parish** property taxes. They do not include (1) **municipal property taxes** nor (2) **local sales taxes** paid by these industries when they buy products in the parishes. Unfortunately, neither of these taxes paid to local governments are tabulated by industry group.

After this review of the direct state and local taxes paid by these industries it is logical to ask, "Is this level of taxes in some sense 'fair'?" Fair, of course, is in the eye of the beholder, but at least one objective measure of the level of fairness is to compare taxes on these industries to taxes imposed in other states. LSU's Center for Energy Studies has actually conducted such a study comparing tax burdens on the extraction industry across the 11 largest producing states. Their conclusion: "...the differences in state and local tax bills among states that compete for E&P activity are not significant enough to be a major determinant of E&P activity, given the magnitude of other uncertainties involved in such decisions."[14] This same Center compared the level of taxation between refineries in Louisiana versus those in the top refining capacity state---Texas. Their principal finding was "...the offset of higher sales and corporate taxes in Louisiana by lower property taxes, and vice versa in Texas, results in nearly total tax equivalence in the two states.[15] This suggests that for both the extraction and refining industries, the tax rates are competitive with neighboring states.

A second measure of "fairness" might be to compare an industry's share of state taxes to its share of earnings created in the state. According to Table 11, the energy industry produced 14.4 percent of total state taxes collected. According to Table 4, total wages in this industry was $4.2

billion in 2006, which is about 6.4 percent of total state wage and salaries.[16] By this measure, the industry is paying significantly more than its fair share of state taxes.

These measures should clearly be considered when discussions arise about additional taxes on the industry. In addition, there is another very crucial issue to consider. The refinery industry sells its product in an international market. When it sells, say gasoline, it is in direct competition with refineries in Mississippi, Illinois, Texas, and other countries. This competition effectively **prevents the industry from shifting any new taxes forward to its customers**. Thus, if Louisiana alone levies a processing tax on its refineries, the Louisiana refineries will have to absorb that tax within their income statements. The obvious incentive is to not only stop expanding in Louisiana, but also to start the process of moving operations to states with a lower tax burden. Most citizens would not like to witness the demise of an industry with the earnings and job creation power of refineries that was described earlier in this report.

Indirect Taxes Generated

The taxes detailed in Tables 11-12 are only those for which firms in these industries have to write out a check. But the presence of the extraction, refining, and pipeline industries generated $12,727,700,000 in household earnings in 2005 through both the direct salaries paid and indirect earning produced through the multiplier effects (see Table 10). These earnings are subject to the state income tax. When spent, these household earnings generate gasoline taxes, sales taxes (both state and local), beer/soft drink/tobacco taxes, etc.

According to the Legislative Fiscal Office, the state of Louisiana collects seven cents in revenues (excluding mineral revenues) for every dollar earned by households in the state. **Thus the**

extraction, refining, and pipeline industries---through the direct and indirect creation of household earnings---were responsible for generating an estimated $890,939,000---a billion dollars---in tax collections for the state of Louisiana in FY06.

What about local taxes paid via these household earnings? Local governments collect approximately 4.4 cents for every dollar earned by a Louisiana household. **Thus, the $12.7 billion in household earnings generated by the three energy industries through direct and multiplier effects added approximately $560,018, 800---over half a billion dollars---to the coffers of local governments in FY06.**

State and local tax dollars in Louisiana support a wide variety of social goods and services, such as elementary, secondary, and higher education, highways, the charity hospital system, economic development efforts, tourism promotion, public safety, and many others. If the extraction, refining, and pipeline industries suddenly vanished from our borders, the provision of these social goods and services would have to be dramatically retrenched. The impact of these three industries goes far beyond just jobs and incomes.

V. Technological Changes

What is truly exciting about this industry are the **technological changes** which are dramatically improving the success rate in wildcat drilling and significantly boosting the total recovery from a field once the petroleum is found. Among these advances are **3-D and 4-D** (i.e., tracking a field with 3-D over time) **seismic** techniques which allow explorers to see what is below the surface much more efficiently. Back in the early 80s, drillers might have to drill 10 wells to hit

a producer; using 3-D and 4-D, only three wells are needed. Thus, the risk factor in this business has been significantly reduced. Also, recent advances in computing power have made seismic surveys easier and more accurate, allowing firms to see pockets of oil and natural gas at great depths. This advancement was crucial in the discovery of the lower tertiary formation associated with the deep water "Jack" Field.

Once the fields are discovered, **horizontal drilling** permits much more oil to be lifted from a discovery than in the past. For example, using older seismic and drilling techniques exploration companies were able to lift only about 35 percent of the oil in place. Adding 3-D and horizontal drilling raised that percentage to 40-50 percent. Then using 4-D there is a further improvement to 65-75 percent.

A third major technological advance has been in **drilling and producing in great water depths**. Deepwater drillships are now capable of drilling in water depths in excess of 10,000 feet. In 2006, Chevron successfully completed a record setting production test in the Gulf of Mexico in its "Jack Field". This well was drilled in 7,000 feet of water and more than 20,000 feet under the ocean floor.

Ingenious developments in production platforms have further enhanced the ability of exploration companies to plum the depths of the very productive Gulf of Mexico. In 1996, Shell Oil put in place the Mars platform in 2,940 feet of water, another new record for production platforms. Mars is a **tension leg platform** (tlp) rather than a fixed leg platform. Mars is basically tethered to the ocean bottom by very large metal tendons. From ocean bottom to the crown of the platform it was the tallest man-made structure ever built, equivalent to two Sears Towers end-to-end.

The Mars field is projected to yield 700 million barrels of oil, the largest domestic find since Alaska's Prudhoe Bay discovery 30 years ago.

Serious advancements are being made in drill pipes---a crucial step if drilling is to take place in very deep waters and at very great depths. The Department of Energy as announced the development of IntelliPipe, a drill pipe with built in telemetry that can operate thousands of feet below the surface via a coupler embedded in connections between pipe sections. The coupler permits data to be sent across small gaps between pipe sections through a cable attached to an inner pipe wall. The DOE also announced the development of a new composite drill pipe made from carbon fiber resins that are lighter, stronger, and more flexible than steel.[17] Composite tendons have also been developed which are used to tether tension leg platforms and spars to the ocean floor. These too are lighter and stronger than tendons made with steel.[18]

ExxonMobil announced recently another technological advancement that will help speed up the drilling process. The optimization process---deemed the "Fast Drill Process"---uses real-time computer analysis of the drilling system's energy consumption, which helps improve the management of factors that determine the drilling rate, such as weight on the drill bit, rotary speed, and torque.[19]

Another interesting aspect of exploration in the Gulf is how **productive the fields are**. We have already referenced the projected output from Mars. By way of comparison, the onshore record for a single gas well is one in the Sweet Lake Field near Lake Charles, producing 50-55 million cubic feet (mmcf) per day. One well in the Gulf last year was producing at three times that rate. Oil production rates are also huge and the oil is flowing unusually fast. In many of these fields the oil is

in **sheet sand** as opposed to sand stone. The former is much more porous, so the oil flows out easier and faster.

In early 2002, the Minerals Management Service approved the use of **Floating Production Storage Offloading** (FPSOs) vessels in the Gulf of Mexico. Rather than using a platform to produce oil, with pipelines tied back to the shore, these FPSOs lift the oil to the surface to a large ship. The oil is stored there and then offloaded on to a barge which can take the oil ashore to the port paying the highest price. These FPSOs are typically "dynamically positioned." That is, there are thrusters on the sides of the ship controlled by satellites that keep the ship within a small movement area, even in hurricane force winds.

Lastly, at least one major technological change is enabling pipe to be laid much more efficiently in the Gulf---the **spool ship**. A spool ship designed by Global Industries has a 110 foot diameter spool of pipe on it that it simply reels off the pipe into the ocean. Welding the spool on shore is much cheaper than welding at sea, and a strand of pipe that took eight days to lay, may now take only one day.

Given this review, it is easy to see why there is considerable optimism about the future of the exploration sector in Louisiana.

VI. Summary and Conclusions

This study is an update of a study done for Mid-Continent Oil and Gas in 1996 entitled, "The 'Energy Sector': A Giant Economic Engine for the Louisiana Economy." Our conclusions from this review of the impact of the extraction, refining, and pipeline industries can be summarized in a series of bullet points:

- Louisiana, through the luck of natural resource distribution, is the nation's **number one producer of crude oil and the number two producer of natural gas** among the 50 states.

- Louisiana ranks **number two among the states in petroleum refining** capacity.

- There are over **83,000 miles of pipelines** transporting crude petroleum and natural gas within the state and in its offshore area of the Gulf of Mexico.

- Through both their direct and multiplier effects **these three industries supported $70.2 billion in sales in Louisiana firms, generated over $12.7 billion in household earnings for Louisianans, and supported 320,280 jobs in the state in 2005.** The $12.7 billion in earnings represented 15.4 percent of total earnings in Louisiana in that year. At least four countries listed in the **Statistical Abstract of the U.S.** have smaller gross domestic products.

- On average **the job multiplier for these two industries was 5.5**. That is, for every job created in these sectors 4.5 additional jobs are created in other sectors in the state. The job multiplier for the oil and gas extraction industry is about 3.9 and for the very capital-intensive refinery industry it is about 11.7.

- These three industries **directly paid over $1.4 billion in state taxes and fees** in FY06, or about 14.4 percent of total state taxes, licenses, and fees collected.

- A very conservative estimate is that these three industries paid **$172.6 million in ad valorem taxes to local governments** in the state in 2005. In 31 of the state's 64 parishes, these ad valorem taxes exceeded $1 million. In 12 parishes the number exceeded $5 million.

- Through the $12.7 billion in household earnings generated by these three industries, **state government was able to collect an estimated $890,939,000 in taxes in FY06.**

- The $12.7 billion in household earnings generated by these three industries added approximately **$560,018,800---over one half billion dollars---to the treasuries of local governments** in FY06.

- In 2006, there were **58,278 workers employed** in the extraction, pipeline, and refining industries---a number approximately equivalent to the 2005 population of Acadia Parish, the 19th most populous parish in the state. Fifty-four of Louisiana's 64 parishes had total covered employment smaller than this number in 2005.

- These three industries paid nearly **$4.2 billion in wages** for Louisiana households in 2006---a figure equivalent to 6.4 percent of total covered wages in the state that year.

- In the third quarter of 2006, the average weekly wage in Louisiana's manufacturing sector was $984. **In refining it was 59 percent higher at $1,567 and the extraction sector paid $1,804 weekly---83 percent higher than the average in manufacturing. Weekly wages in**

the pipeline industry were $1,345---37 percent higher than the average manufacturing wage.

- **Energy jobs and earnings are found in all of Louisiana's 64 parishes in 2006**. There were 14 parishes where more than 1,000 workers were employed in these three industries. In Lafayette Parish (the highest employment parish), 15,241 workers were directly employed in these energy sectors.

- Value added is a broader measure of the total income created directly in an industry. In 2002 (latest data available), **Louisiana's oil and gas extraction sector produced over $24.6 billion in total income**. That figure exceeds the **sum** of all the state's manufacturing sectors except petroleum and coal products. We have roughly estimated the extraction sector's value added in 2005 (when energy prices were much higher than 2002) to be about $47.5 billion.

- The refining sector's value added in 2005 was a huge $34.3 billion. That figure exceeds the **sum** of all the state's other manufacturing sectors.

This report began with the statement: "It is the engine that makes the difference." For Louisiana, the presence of the extraction, refining, and pipeline industries have indeed made all the difference. The energy industry, and its accompanying multiplier effects, has been a powerful engine for economic growth in Louisiana.

APPENDIX A

The Impact of and Recovery from Hurricanes Katrina and Rita

Hurricanes Katrina and Rita cut a swath right through the heart of the Gulf of Mexico (GOM) offshore oil and natural gas production activity. Consider these facts about this important energy-producing region:

- Within this area are 819 manned platforms and another 4,000+ unmanned platforms;
- This is the location of LOOP---the Louisiana Offshore Oil Port---the nation's only superport. This port is where very large crude carriers offload their cargoes of crude oil to be placed in underwater pipelines connected to receiving terminals onshore. From there, the crude is typically pushed farther through pipelines to refineries;
- Approximately 1.5 mmbd of crude are produced in the GOM. This represents about 29 percent of total U.S. production;
- Approximately 10 bcfd of natural gas is produced in this region, or about 19 percent of total U.S. natural gas production.

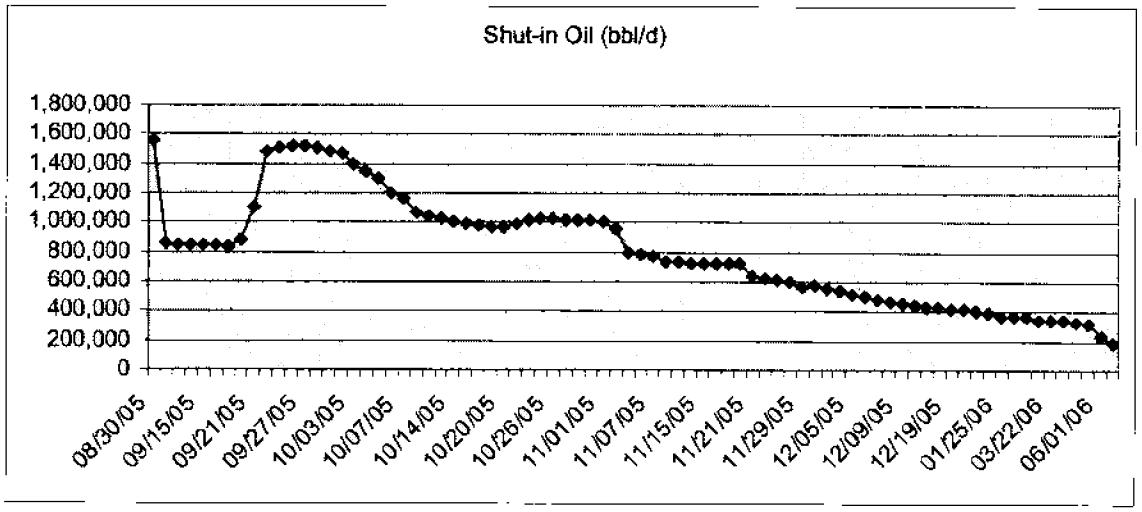
The Impact of the Hurricanes on Production

When a hurricane like Katrina is poised to enter this region of the GOM, energy companies begin the process of shutting down the offshore platforms and evacuating personnel. How many platforms are evacuated depends on the path of the storm.

Figures A-1 and A-2 track the shut-in statistics for crude oil and natural gas produced in the GOM. Shut-in oil and natural gas refers to output that was being produced but is not now because of damaged platforms, pipelines or onshore receiving units. In the case of Katrina, 95.2 percent of the crude oil and 88 percent of the natural gas production was shut-in by August 30, 2005. By September 9th, the shut-in rates had dropped to about 56-58 percent for oil and about 33-37 percent for natural gas. Then the improvement stabilized. When Rita appeared, because it made landfall

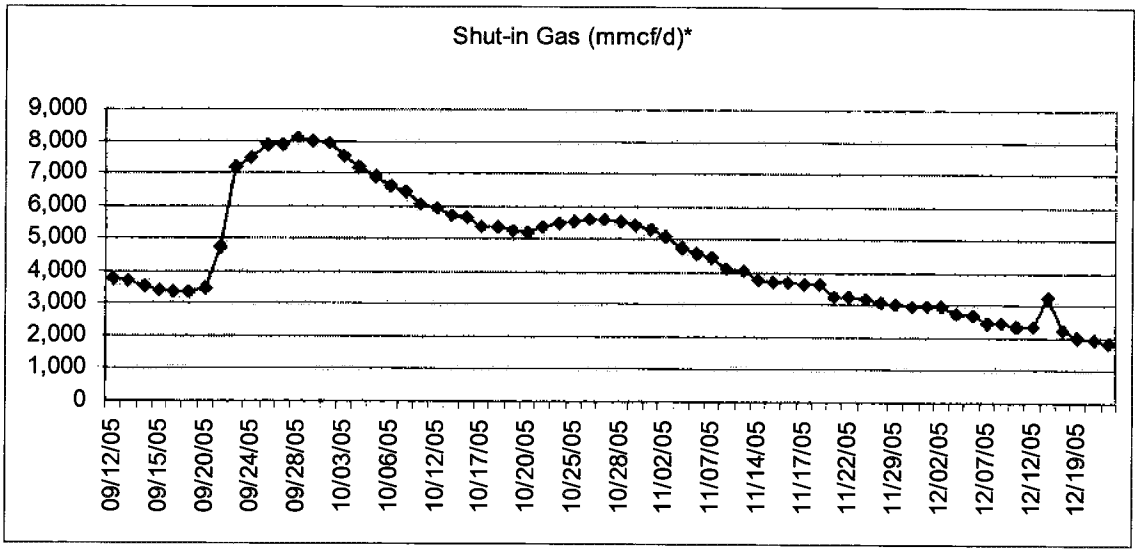
further to the west and more into the center of the GOM production region, 100 percent of crude and 80 percent of natural gas was shut-in. By early January 2006, 26.5 percent of crude oil and 18.1 percent of natural gas remained shut-in. **The latest, and last, Minerals Management Service report on shut-in data in the Gulf showed that as of June 6, 2006, 12 percent of the oil and 9.3 percent of natural gas production remained shut-in.**

Figure A-1
Shut-in Oil Production in the Gulf of Mexico



Source: Minerals management Service

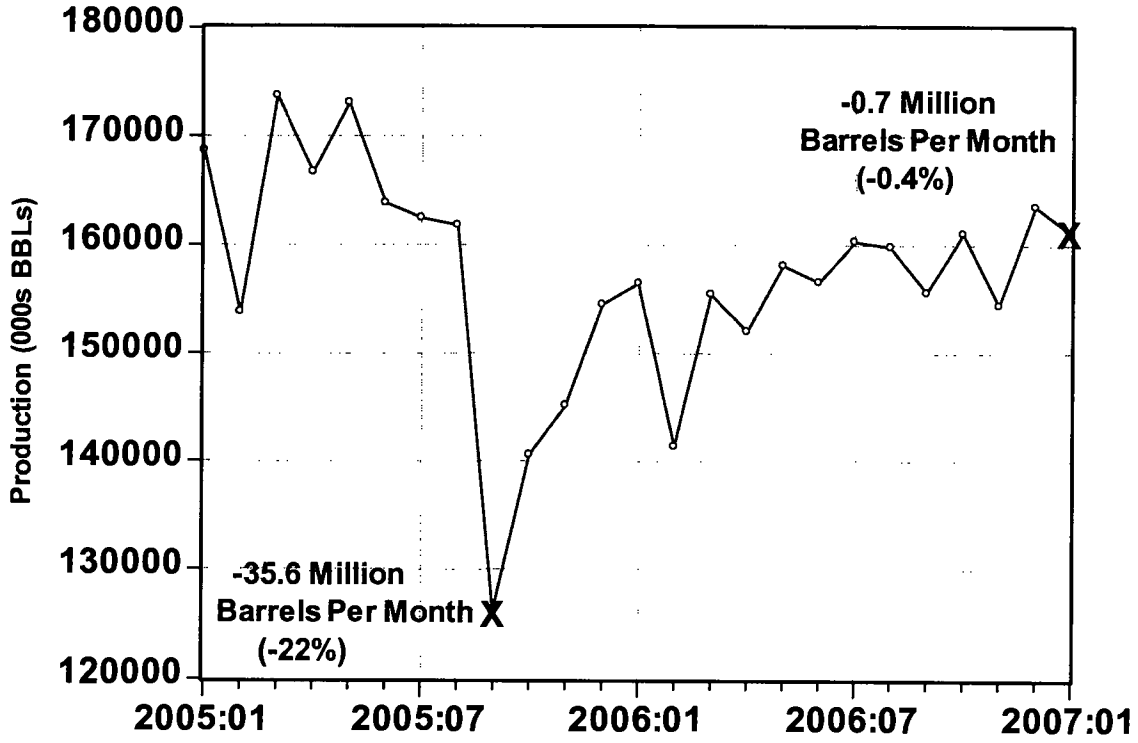
Figure A-2
Shut-In Natural Gas Production in the Gulf of Mexico



Source: Minerals management Service

Though shut-in data were not provided by the MMS after June 2006, we do have another indicator of progress in restoring the damage in the Gulf caused by these two storms. Figure A-3 illustrates what has happened to U.S. oil production just prior to and since the storms. Note that U.S. oil production dropped dramatically in the two months after the storms hit, declining a total of about 35.6 million barrels per month. There was a significant increase in the two months just after the storms as many previously shut-in wells were inspected and authorized to become active again. Then there has been the steady period of gains as repair work continued in the Gulf. **As of the end of December, production had recovered to the point of being down only 0.7 million barrels per month or 0.4 percent below the pre-storms peak.**

Figure A-3: U.S. Oil Production (Thousands of Barrels)



Why the Sustained, and Higher, Shut-In Rate?

In the case of both of these storms, return to total production was not very swift. In fact, the shut-in rate for Katrina initially stabilized almost twice as high as was the case for Hurricane Ivan in 2004. For example, crude oil production after Ivan stabilized at about 480,000 bd while the comparable figure for Katrina was closer to 850,000 bd.

Why wasn't crude and natural gas production immediately restored to their pre-hurricane levels? Think of this production occurring in three primary zones---(1) offshore platforms, (2) underwater pipelines, and (3) onshore receiving units. Each of these suffered damages that needed repair before production could be restarted.

Zone 1: Offshore Platforms. One reason that production was not immediately restored was because of damage to offshore platforms. As seen in Table A-1, Hurricanes Katrina and Rita---because they were stronger storms that hit more in the heart of the GOM production region---caused far more damage to these platforms than did Ivan which hit farther east.

Table O&G-1
Impact on Offshore Platforms of
Hurricanes Ivan, Katrina, and Rita

Impact	Ivan	Katrina	Rita
Destroyed	7	47	66
Damaged	20	20	32

Source: Office of Electricity Delivery and Energy Reliability, U.S. Department of Energy, www.doe.gov, October 7, 2005, p.2.

Of the platforms destroyed by Katrina and Rita, most were older platforms that were built under pre-1988 upgraded design standards, and were located on the "shelf" (shallow waters), where the wells were fairly depleted and producing little product. Still, there were a number of the larger, deepwater platforms that suffered major damages. For example, as a result of Katrina there were four deepwater platforms that accounted for about 10 percent of offshore crude oil production that were severely damaged. Among these were Mars, Ursa, Mansa, and West 143---all owned by Shell Oil Company. Among the casualties of Rita was Chevron's Typhoon TLP (tension leg platform) which was turned upside down by the storm and this $1.2 billion investment was determined to be a total loss.

It is actually quite a testimony to the engineering skills of the people working in this industry that only 165 of nearly 5,000 platforms were destroyed or badly damaged. This is especially so considering that the Naval Research Lab measured some waves at 131 feet tall during these storms.

That so many platforms survived in this basically unprotected environment speaks volumes about technological advancements in this industry.

Zone 2: Underwater Pipelines. Damage to underwater pipelines was one of the greatest concerns to the energy sector because checking and repairing these pipelines requires some of the scarcest resources in the oil patch---divers, boats, and power. Underwater mudslides caused by Ivan wiped out 102 pipeline systems. A total of 655 pipelines (about 20,000 miles worth) were destroyed by Katrina and Rita.

The good news is that this pipeline damage occurred in 2005 and not prior to the late 1990s. Prior to that time, pipelines were repaired by taking a pipe laying barge into the Gulf, welding strands of pipe together on board, and feeding the pipe into the water. Today, this same function can be done 10-15 times faster using a **spool ship**. A spool ship has a large reel on the back of the ship around which is wound a string of pipe that has been welded together onshore---a much more efficient process than welding on the water. Once out in the Gulf, the pipe is then unwound off the spool and fed into the Gulf, at great savings in time and money.

Zone 3: The Onshore Receiving Units. Once the crude oil and natural gas reach shore, these fuels are received by refineries, gas processing plants and onshore pipelines. The first two sets were the most problematic. Katrina caused the closure of eight **refineries**. Within two weeks after the storm passed, four of these had power restored and were refining crude oil. Four others not only lost power but were also damaged and flooded. Three were in Louisiana: (1) the 350,000 bd ConocoPhillips Refinery; (2) the 183,000 bd Chalmette Refinery, and the 122,000 bd Murphy Oil Refinery. These three units are located in the heavily flooded areas of St. Bernard and Plaquemines

Parishes. With the exception of Murphy Oil Refinery, all were open by the end of 2005 and Murphy Refinery opened later in 2006.

Rita closed three other refineries in the Lake Charles MSA: (1) Citgo (324,000 bd); ConocoPhillips (239,400 bd), and (3) Calcasieu (30,000 bd). These three units had mostly minor wind damage and power loss but fortunately, no flooding. They were all three back up by November 2005.

What received little attention from the press was the damage to **gas processing plants** in the region. Natural gas produced offshore tends to be high in hydrogen sulfide and water. The processing plants refine these impurities out. Three were located near the mouth of the Mississippi River and were severely damaged by both wind and flood. Dynergy's plant in Venice is so badly damaged that some pipelines were rerouted from it to other processing plants---again, the spool ship technology made such re-routing financially feasible. Together these three plants process about 2.8 bcfd of natural gas. Rita added another six plants to these three, though these six were not as badly damaged as the Katrina victims. One plant badly damaged by Rita was the Henry Hub, the center for natural gas trading.

Oil Spills from Katrina & Rita

Another remarkable testament to the technological advancements in the extraction industry is the oil spill record as a result of these two huge storms. In their report "Setting the Record Straight", the Mineral Management Service had the following to say about spills post-storms:

- As of January 25, 2007, MMS identified 125 spills of petroleum products totaling 16,302 barrels that were lost from platforms, rigs, and pipelines on the Federal Outer Continental Shelf (OCS) as a result of damages from Hurricanes Katrina and Rita in 2005.

- Those spills did not occur due to loss of control of the producing wells.

- There were no major spills (2,381 barrels per spill or greater) according to USCG official standards. The USCG defines offshore spills of less than 10,000 gallons (238 barrels) as "MINOR"; offshore spills of 10,000 to 99,999 gallons (238 to 2,380 barrels) as "MEDIUM"; and offshore spills of 100,000 gallons, (2,381 barrels) and greater as "MAJOR".

- According to a report on "Oil in the Sea" from the National Academy of Sciences (1995), far more oil enters the ocean from natural, underwater seeps than from offshore production platforms. In fact, the seeps introduce about 1700 barrels of oil a day into U.S. marine waters, which is about 150 times the amount from oil and gas activities.

- Over the past 20 years, less than .001 percent of the oil produced in U.S. state and federal waters have been spilled.

- The loss of oil from the Federal OCS wells themselves was minimal due to the successful operation of the safety valves that are required by the Minerals Management Service (MMS) to be installed on every well at least 100 feet below the ocean floor.

- All facilities on the Outer Continental Shelf in areas threatened by the hurricanes are "shut in" prior to a storm's arrival, meaning that pipelines are closed and platforms are secured for heavy weather.

- Oil losses were mostly limited to the oil stored on platforms that were damaged or oil contained in individual segments of pipelines that were damaged.

- There were no accounts of spills from facilities on the OCS that reached the shoreline, or oiled birds or mammals, or involved any large volumes of oil to be collected or cleaned up.

- The five largest spills were estimated to be between 1,000 barrels and 2,000 barrels. Two of the five spills may have only been a couple of hundred barrels. These five spills represent only 4 percent of all the spills but total 8,428 barrels and 52 percent of the total spillage.[20]

The bottom line is these two huge storms came right through the heart of the offshore oil and gas industry and there were virtually no significant spills offshore. One policy implication is that the United States is the only country on earth that restricts oil and gas exploration in some of its offshore area (the East Coast, West Coast, West Coast of Florida, and coastal areas of Alaska). What

residents along these coasts fear the most is coastal damage from oil spills. The aftereffects of Katrina and Rita should go a long ways towards dispelling those fears.

ENDNOTES

[1]Oil and Gas Journal, June 11, 2007, p. 69.

[2]Oil and Gas Journal, December 18, 2006, p. 62.

[3]Email from Michelle Barnes in the Center for Energy Studies at LSU, July 2, 2007.

[4]Ibid.

[5] Note that the category "support activities for mining" contains companies that drill for oil and provide service work (seismic, well servicing, etc.) to the industry.

[6]www.Laworks.net. Go to LMI.

[7] www.bea.gov/bea/regional/reis/drill.cfm.

[8]www.Laworks.net/Downloads/LMI.

[9] This figure was estimated by estimating total revenues from oil extraction (oil price times oil production) and natural gas revenues (gas prices times gas production) in both 2002 and 2005 and calculating the total increase in revenues over this time period. The result is a 92.8 percent increase.

[10]Regional Economics Information System, Bureau of Economic Analysis, CD-ROM, April 2007.

[11]Ibid.

[12]Statistical Abstract of the United States: 2002, 122nd Edition, p. 833.

[13]www.bls.gov.

[14]Allan G. Pulsipher, Robert H. Baumann, and Wumni O. Iledare, "Overall Tax Levels Similar Across 11 Producing States," Oil and Gas Journal, October 11, 1993, p. 89.

[15]Allan G. Pulsipher and Robert H. Baumann, Louisiana's Petroleum Refining Industry," Center for Energy Studies, Louisiana State University, February, 1993, p. 36.

[16]Wage and salary disbursements in 1999 (latest year available) were $53.6 billion. Regional Economic Information System, Bureau of Economic Analysis, May 2001, CD-ROM.

[17]Oil and Gas Journal, July 18, 2005, p.17.

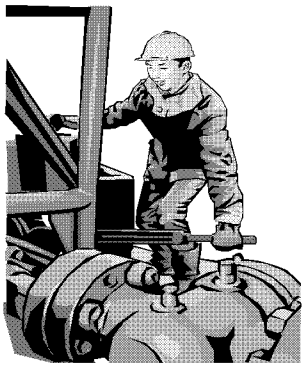
[18]Oil and gas Journal, August 15, 2005, p. 39.

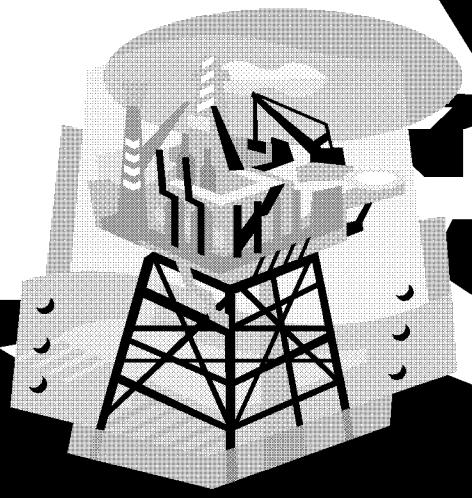
[19]Go Gulf Magazine, 2005, p. 24.

[20]www.mms.gov. Go to SettingtheRecordstraight/Estimatedoil%20SpillsAsAResultofHurricanesKatrinaand Rita.

The Energy Sector:

Still A Giant Economic Engine For The Louisiana Economy





By Loren C. Scott, Ph.D.

September 2007

EXECUTIVE SUMMARY

This study is an update of a study done for Mid-Continent Oil and Gas in 2002 entitled, "The 'Energy Sector': A Giant Economic Engine for the Louisiana Economy." Our conclusions from this review of the impact of the extraction, refining, and pipeline industries can be summarized in a series of bullet points:

- Louisiana, through the luck of natural resource distribution, is the nation's **number one producer of crude oil and the number two producer of natural gas** among the 50 states.

- Louisiana ranks **number two among the states in petroleum refining** capacity.

- There are over **83,000 miles of pipelines** transporting crude petroleum and natural gas within the state and in its offshore area of the Gulf of Mexico.

- Through both their direct and multiplier effects **these three industries supported $70.2 billion in sales in Louisiana firms, generated over $12.7 billion in household earnings for Louisianans, and supported 320,280 jobs in the state in 2005.** The $12.7 billion in earnings represented 15.4 percent of total earnings in Louisiana in that year. At least four countries listed in the **Statistical Abstract of the U.S.** have smaller gross domestic products.

- On average **the job multiplier for these two industries was 5.5**. That is, for every job created in these sectors 4.5 additional jobs are created in other sectors in the state. The job multiplier for the oil and gas extraction industry is about 3.9 and for the very capital-intensive refinery industry it is about 11.7.

- These three industries **directly paid over $1.4 billion in state taxes and fees** in FY06, or about 14.4 percent of total state taxes, licenses, and fees collected.

- A very conservative estimate is that these three industries paid **$172.6 million in ad valorem taxes to local governments** in the state in 2005. In 31 of the state's 64 parishes, these ad valorem taxes exceeded $1 million. In 12 parishes the number exceeded $5 million.

- Through the $12.7 billion in household earnings generated by these three industries, **state government was able to collect an estimated $890,939,000 in taxes in FY06.**

- The $12.7 billion in household earnings generated by these three industries added approximately **$560,018,800---over one half billion dollars---to the treasuries of local governments** in FY06.

- In 2006, there were **58,278 workers employed** in the extraction, pipeline, and refining industries---a number approximately equivalent to the 2005 population of Acadia Parish, the 19th most populous parish in the state. Fifty-four of Louisiana's 64 parishes had total covered employment smaller than this number in 2005.

- These three industries paid nearly **$4.2 billion in wages** for Louisiana households in 2006---a figure equivalent to 6.4 percent of total covered wages in the state that year.

- In the third quarter of 2006, the average weekly wage in Louisiana's manufacturing sector was $984. **In refining it was 59 percent higher at $1,567 and the extraction sector paid $1,804 weekly---83 percent higher than the average in manufacturing. Weekly wages in the pipeline industry were $1,345---37 percent higher than the average manufacturing wage.**

- **Energy jobs and earnings are found in all of Louisiana's 64 parishes in 2006**. There were 14 parishes where more than 1,000 workers were employed in these three industries. In Lafayette Parish (the highest employment parish), 15,241 workers were directly employed in these energy sectors.

- Value added is a broader measure of the total income created directly in an industry. In 2002 (latest data available), **Louisiana's oil and gas extraction sector produced over $24.6 billion in total income**. That figure exceeds the **sum** of all the state's manufacturing sectors except petroleum and coal products. We have roughly estimated the extraction sector's value added in 2005 (when energy prices were much higher than 2002) to be about $47.5 billion.

- The refining sector's value added in 2005 was a huge $34.3 billion. That figure exceeds the **sum** of all the state's other manufacturing sectors.

For Immediate Release: **Contact: Nicolette Nye**

Friday, June 11, 2010 (202) 347-6900

NOIA Member Companies Feel Impacts of Drilling Moratorium,

Applauds Landrieu's Efforts to Save Jobs

WASHINGTON, DC – The decision to halt deep water exploration activity and the uncertain status of shallow water operations in the Gulf of Mexico is already having profound impacts on the offshore energy industry, and these impacts will only worsen the longer the pause continues. Since the Gulf region depends on the offshore industry for thousands of jobs and billions of dollars in revenue, the impacts of the "one size fits all" moratorium will add further job loss and economic woes to a region already suffering from these same hits to its seafood and tourism industries.

Fearing that the blanket drilling moratorium "could exacerbate, rather than alleviate, the impacts of this spill upon both our economy and our environment," U.S. Senator Mary Landrieu of Louisiana has sent a letter to the President requesting that the blanket moratorium on drilling be lifted. In a June 11 letter the Senator wrote, "The immediate impacts to the economy are devastating enough: idling the 33 rigs currently permitted to drill in the deepwater Gulf would immediately impact employment for roughly 38,000 crewmen, deck hands, engineers, welders, ROV operators, caterers, helicopter pilots, and others who operate and service these vessels. That's like closing 12 large motor vehicle assembly plants in one state, all at once".

NOIA strongly echoes the Senator's sentiments and applauds her efforts to look at the full scope of interwoven industries and communities that make the Gulf of Mexico economy strong. We plan to continue working with the Senator to ensure that jobs and revenues in the region aren't an unintended casualty of the response to the Deepwater Horizon spill.

NOIA member companies are feeling the impact of the blanket moratorium, and several share their stories below:

Aker Solutions

- Aker Solutions is a leading global provider of engineering and construction services, technology products and integrated solutions to the offshore oil and gas industry.
- The moratorium will impact Aker Solutions' offshore related operations on the Gulf Coast which include about 750 employees in Texas and Alabama.

- The company has already started to refocus their efforts to international projects that hopefully can replace some of the void.
- Some of their offshore services work is coming to a halt already; and unless they can refocus that workforce, including vessels and tools, to international projects they are at risk of losing jobs in Texas over the next few months.
- Manufacturing jobs in Alabama are at risk from early 2011, as the backlog runs out with no new orders of deepwater subsea equipment coming in.
- Engineering jobs in Houston are at risk of being reduced, but may be able to be refocused internationally.
- In summary, part of their workforce will be affected directly or indirectly by the moratorium. Their goal is to try to mitigate this by securing international projects.

ATP Oil & Gas Corporation

- ATP Oil & Gas Corporation is an independent oil and gas producer headquartered in Houston, Texas.
- The moratorium has caused ATP to stop the drilling of a natural gas development well (the Mississippi Canyon 305 # 2 well) and release the deepwater drilling rig. The MC 305 #2 well would have produced approximately 40 million cubic feet of gas per day with a very small amount of condensate.
- Additionally, ATP will not be able to drill and complete two development wells (MC 941 #4 well and MC 942 # 2 well) using a drilling configuration with two blowout prevention (BOP) stacks, one on the seafloor and one at the surface. This is a new design for improved safety, a first in the US Gulf of Mexico and one that the company planned 3 years ago.
- These wells were originally planned to be completed and placed on production in 2010 at a combined rate of approximately 14,000 barrels of oil per day using a platform drilling rig attached to the ATP Titan platform.
- As a result of the moratorium and the suspension of operations, ATP expects to incur additional costs of approximately $30,000,000 that otherwise would not have been spent.
- Additionally, ATP will defer revenues of more than $1,000,000 per day as a result of not being able to drill and complete the development wells planned for 2010.

Bollinger Shipyards, Inc.

- Bollinger Shipyards, Inc. and its affiliated companies are the leading provider of quality marine construction, repair and conversion products, servicing both the military and commercial marine industry. They also own and operate a fleet of Offshore Supply Vessels that service the deepwater activities of the OCS. Family owned and operated since 1946, Bollinger Shipyards employs 3,000 people.

- "In the 64 years of our existence, we have never been faced with such an uncertain future. This moratorium has created an environment leaving Bollinger Shipyards no choice but to downsize our company thereby eliminating good paying jobs."

Broadpoint, Inc.

- Broadpoint is a 27 year old privately held company with a 100 employees based along the Gulf Coast with its headquarters in Houston and a Network Operations Center in New Orleans with an additional office in Lafayette, LA.

- Their operations are 99% directly related to providing telecommunication services in the Gulf of Mexico through satellite communications and the ownership and management of a 100,000 square mile GSM/GPRS/Edge network operating in the Gulf.

- Broadpoint and its clients will be adversely affected as a result of this shutdown and it will directly affect their ability to operate. Reliable communications is essential for the health and safety of individuals in the Gulf of Mexico.

CapRock Communications, Inc.

- CapRock Communications is a 29 year old privately held company employing 750 employees globally with headquarters in Houston and operational offices in Lafayette and New Orleans, LA.

- Their operations are related to providing satellite communication solutions that enable the oil and gas industry to operate more efficiently in today's environment, serving the communications needs of rig owners, service companies and operators working on drilling rigs, production platforms and other assets in the Gulf.

- They currently have over 50 field service and operations personnel supporting clients in the Gulf of Mexico and this shutdown will directly impact their ability to maintain operations.

- Their field service personnel install and manage communication systems onboard drilling rigs and energy support vessels throughout the Gulf of Mexico. As their customers are now required to cease or limit their operations, the amount of business their company receives and the work they have for their personnel in the region significantly declines.

- They will be forced to redeploy personnel to different regions or support them in finding other opportunities.

C&C Technologies, Inc.

- C & C provides a wide range of survey and mapping services for the land and offshore oil and gas industry, the telecommunications industry and the U.S. government.
- C&C expects to lay off approximately 10 employees as a result of the moratorium, and will not be hiring the dozen or so workers they expected to hire in the coming months.

Cobalt International Energy, Inc

- Cobalt International Energy, Inc. (Cobalt) is an independent oil and gas exploration and production company focused on the deepwater U.S. Gulf of Mexico and the deepwater offshore Angola and Gabon.
- Cobalt was formed in 2005 and is headquarters in Houston, Texas with an operational base in Port Fourchon, L.A. for their deepwater GOM exploration activities, and an (soon to be established) operational base in Luanda Angola for their Angola exploration activities. At present Cobalt have some 65 employees and 25 consultants.
- The GOM Drilling Moratorium has significantly impacted Cobalt's GOM deepwater 2010 exploration and appraisal program from a multitude of perspectives:
    - Cobalt's exploration and appraisal drilling program for the remainder of 2010 (3 wells of which 1 had all of the necessary permits/insurance in place) is now on hold. Thus, the exploration drilling rigs, services, vessels, tools, people etc. that were contracted to support the drilling programs have been released.
    - Cobalt invoked the Force Majeure provision in a recent rig contract, thus the company is paying capital for a period of time while the rig is idle as well as the associated key services (e.g. vessels). Cobalt has also experienced unanticipated legal costs as a result.
    - There is a follow-on impact in the form of delay in executing their 2011 exploration and appraisal program (approx 9 wells) in the deepwater GOM. Thus the program has been extended further/delayed into the future which will affect the timing and thus cash flow they would have anticipated sooner.
    - As the deepwater GOM is a key focus area for Cobalt in light of the position established (some 227 deepwater leases) in the last few years, the

company stock has been significantly impacted (dropped 40%) amid concerns regarding the GOM Drilling Moratorium; the value of the company has thus been impacted by some $1.5 billion in the market.

- Cobalt will shift its capital spending program and resources to their West Africa business. Resumption of their investment program in the United States is completely dependent on the termination of the GOM Drilling Moratorium.

Davis-Lynch, Inc.

- Davis-Lynch is a privately owned company founded in 1947 that manufactures, sells, and services down-hole equipment for the offshore oil and gas industry.
- They employed over 300 people in 2009, but reduced their workforce by approximately 100 people as a result of an industry downturn. In 2010 with an upswing in business they have recalled some of the people released in 2009.
- Approximately 20% of their business is dedicated to providing products and services to the offshore drilling industry in the Gulf of Mexico, with a large portion associated with water depths greater than 500 feet.
- The moratorium leaves them no alternative other than to implement another reduction in their workforce in locations including Lafayette, LA; Houston, TX; and Corpus Christi, TX.

Delmar Systems, Inc.

- Delmar Systems, Inc. is a leader in offshore mooring, providing mooring solutions for the offshore oil and gas industry.
- Delmar is a 42 year old privately held company employing 300 employees based along the gulf coast with a technical office in Houston and large operational base at Port Fourchon, LA.
- Operations are 100% directly related to mooring deepwater semi-submersibles in the Gulf of Mexico and as a result of this shutdown, will directly affect ability to operate.
- Thirteen of the thirty three deepwater wells involved "moored" or anchor semi-submersible rigs owned by four drilling contractors.

Heerema Marine Contractors

- Heerema is a 48 year old privately held Dutch company who has been working in the Gulf of Mexico for 32 years and has installed approximately 75% of all deep water facilities currently producing in the Gulf. They own and operate three of the four largest construction vessels in the world and the US Gulf has always been a significant part of the revenue stream of their company.

- They currently employ 50 people between offices in Houston, TX and an operational base at Port Fourchon, LA.

- Their U.S. operations are directly related to installation of new facilities and sub sea infrastructure in the deep water Gulf of Mexico and as a result of this shutdown, their business future is in a state of uncertainty here in the US.

Laborde Marine, LLC

- Laborde Marine is a family-owned business headquartered in New Orleans which owns and/or operate 21 vessels, all built in U.S. shipyards; while employing over 300 people with a $14 million annual payroll.

- They invested over $150 million to build or acquire thisfleet.

- The moratorium is essentially telling them to "park" their vessels for six months.

- For Laborde to move internationally, they would have to compete with vessels built in foreign ship yards at a much lower cost and often subsidized by foreign governments.

- "The moratorium may well be the death-knell for U.S. businesses engaged in the energy service sector."

J. Ray McDermott, Inc.

- J. Ray McDermott is a Houston headquartered Company with approximately 1,200 employees in Morgan City and New Orleans, Louisiana and Houston, Texas.

- The company provides engineering and construction services to the offshore energy sector worldwide as well as in the Gulf of Mexico through the engineering, construction and offshore installation of the infrastructure necessary to develop and produce offshore oil and gas fields.

- According to the company, the shutdown of deepwater drilling in the Gulf of Mexico will create a domino effect (movement of rigs and other equipment out of the area, loss of jobs, etc.) that will no doubt affect the timing of future developments and the economic recovery of the region for years to come.

Oceaneering International, Inc.

- Oceaneering is a global oilfield provider of engineered services and products, primarily to the offshore oil and gas industry, with a focus on deepwater applications.

- Oceaneering reduced its 2010 earnings forecast on expectations that the U.S. government's moratorium on deepwater drilling activity in the Gulf of Mexico will hurt demand for its deepwater services.
- The oilfield-services and products company said it expects the moratorium will cut second-half earnings by 45 cents a share and is now looking for 2010 profit of $2.80 to $3.10 a share.
- Nearly one-quarter of Oceaneering's remotely-operated vehicles operate in the Gulf, with about half of those in drilling support services.
- The company anticipates some early terminations and revised contracts.
- The stock is down 27% this year amid concerns about the Gulf oil spill.

Otto Candies, LLC

- Otto Candies is a marine transportation company started 68 years ago with a fleet of 40 vessels.
- 500 of their 600 U.S.-based employees could be impacted by the moratorium, with some possibly needing to be relocated to Brazil, Mexico, or West Africa.

Stone Energy Corporation

- Stone Energy Corporation is an independent oil and natural gas exploration and production company headquartered in Lafayette, Louisiana, with additional offices in Houston, Texas and Morgantown, West Virginia.
- Stone has already experienced a 40% drop in the value of their company in anticipation of punitive legislation and regulation.
- They will be forced to reduce jobs as will other operators.
- Stone has a shelf platform rig at MC 109 which has been shut down, wasting over $10 million dollars by having an idle rig sitting there doing nothing.
- This cash cost will be far exceeded by the lost revenue of the five wells being drilled from the facility.
- The 5 wells were anticipated to each produce approximately 1,000 barrels per day, assuming $70 per barrel, resulting in $350,000 per day in potential lost revenues.
- Stone also has a half-dozen exploratory wells that will be delayed a year or more. This hurts their ability to sustain reserves to convert to future production and growth.
- One rig that was going to be used in this exploratory program, the Deepwater Mariannas, is expected to be leaving the Gulf for opportunities in foreign countries.

Southern States Offshore, Inc.

- Southern States Offshore, Inc. is a privately held company incorporated in 1996 and wholly owning and operating seven offshore service and supply vessels, six of which were built and delivered in Louisiana and Alabama in 1998, 2005, 2007, 2009 and 2010 at a cost of 48 million dollars.

- They employ 53 mariners who live in Texas, Louisiana and Alabama; with an office staff in Houston, Texas of ten employees, all Texas residents.

- According to the company, their employees, their families, the ship yards, vendors, tax authorities, etc. that depend on this industry to pay their mortgage, health care bills, cloth their families and send their children to school all are at risk of losing everything.

Zupt, LLC

- Zupt is a privately owned, international service and manufacturing company specializing in the integration and application of inertial technologies to onshore and offshore survey and positioning services to make operations more efficient.

- Were under contract with an operator who was 8 to 12 days away from completing a well and Zupt was preparing to conduct the metrology survey work when the operator was told to shut the well. No metrology survey was conducted, an immediate loss of revenue.

- One of Zupt's engineers was laid off due to the near term lost revenue.

- During the moratorium the company is forced to seek work in West Africa and the North Sea, and if unsuccessful they anticipated being out of business within four months.

###

NOIA is the only national trade association representing all segments of the offshore industry with an interest in the exploration and production of both traditional and renewable energy resources on the nation's outer continental shelf. The NOIA membership comprises more than 250 companies engaged in business activities ranging from producing to drilling, engineering to marine and air transport, offshore construction to equipment manufacture and supply, telecommunications to finance and insurance.

Nguyen, Ngoc B

From: Juvkam-Wold, Hans [juvkam-wold@pe.tamu.edu]
Sent: Friday, June 18, 2010 2:50 PM
To: Dubin, Lindsay
Cc: Black, Steve; Kemkar, Neal; Hanley, Kallie
Subject: RE: Meeting with Secretary Salazar Monday 6.21.10

Lindsay,

I will not be able to attend the meeting on Monday morning, but plan to call in.

Hans

From: Dubin, Lindsay [mailto:Lindsay_Dubin@ios.doi.gov]
Sent: Thursday, June 17, 2010 5:23 PM
To: Dubin, Lindsay
Cc: Black, Steve; Kemkar, Neal; Hanley, Kallie
Subject: Meeting with Secretary Salazar Monday 6.21.10

Good evening,

Interior Secretary Ken Salazar hopes that you can participate in a meeting at 10:00am EASTERN Monday, June 21, 2010 as a follow-up to Tuesday's conference call regarding the 30-day report on Increased Safety Measures for Energy Development on the Outer Continental Shelf. For those of you who are unable to join this meeting in person, there will be a call-in option for you to participate remotely. This meeting/conference call is limited to the people who have received this email. Please let Kallie Hanley (cc'd) and me know by 3:00pm EASTERN tomorrow if you will be able to participate. Please be sure to indicate whether you will be attending in person or via phone. We will reach out to you with arrival instructions or a conference call number following our receipt of your participation.

Thank you,

Lindsay Dubin
Special Assistant
Office of Scheduling and Advance
The U.S. Department of the Interior
p: (202) 208-7551 | f: (202) 208-4694
lindsay_dubin@ios.doi.gov

Nguyen, Ngoc B

From: Ken Arnold [karnold@karnoldconsulting.com]
Sent: Friday, June 18, 2010 3:43 PM
To: Dubin, Lindsay
Cc: Black, Steve; Kemkar, Neal; Hanley, Kallie
Subject: RE: Meeting with Secretary Salazar Monday 6.21.10
Attachments: Presentation to Secretary of Interior - Rev2 (2).pptx

Attached is a current draft of a power point presentation we are preparing for the Secretary and staff for Friday's meeting. It is till be reviewed by the Group of 8, but I thought I would send it ahead in the event any of you would want to look at it ahead of Monday's meeting.

Kenneth E. (Ken) Arnold
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3031 Shadowdale
Houston, TX 77043
Cell: 832-212-0160
Home: 713-939-1034
www.karnoldconsulting.com

From: Dubin, Lindsay [mailto:Lindsay_Dubin@ios.doi.gov]
Sent: Thursday, June 17, 2010 5:23 PM
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Subject: Meeting with Secretary Salazar Monday 6.21.10

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Special Assistant
Office of Scheduling and Advance
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lindsay_dubin@ios.doi.gov

Presentation to Secretary of Interior

June 21, 2010

Outline of the Discussion

1. Why we are here
2. Comments on the Secretary of Interior, May 27, 2010 Report "Increased Safety Measures for Energy Development on the Outer Continental Shelf"
3. Comments on the NTL NO2010-NO5, June 8, 2010
4. Measures that should be taken now to improve safety in the GOM

Why we are here

- We were not asked to provide analysis of the Horizon incident, but as information has been discovered it is clear best practices were not followed.
- We are here nor are we going to provide an economic justification – jobs, revenue lost, etc. That is the job for economists.
- We feel safety will be compromised if the 6 month ban is extended to all wells in the GoM over 500 feet in water depth.
- This is the time we all need to work together and we understand the job at hand.
- This is not the time to punish the innocent nor further harm the public's interest .

The good

Safety Record of Drilling on the OCS

Over 50,000 wells drilled. 2500 in over 1000 feet of water.

Last major incident resulting in oil coming assure in 1969. 41 years ago.

From 1970 until April 2010 a total of 1800 barrels of oil spilled due to blowouts.

All measurements of safety indices have shown a steady level of improvement since modern MMS regulations came into effect in 1970.

Record is better than or equal to that or any other region of the world.

Crude Oil Spills from Platform and Rigs from Federal OCS Activities

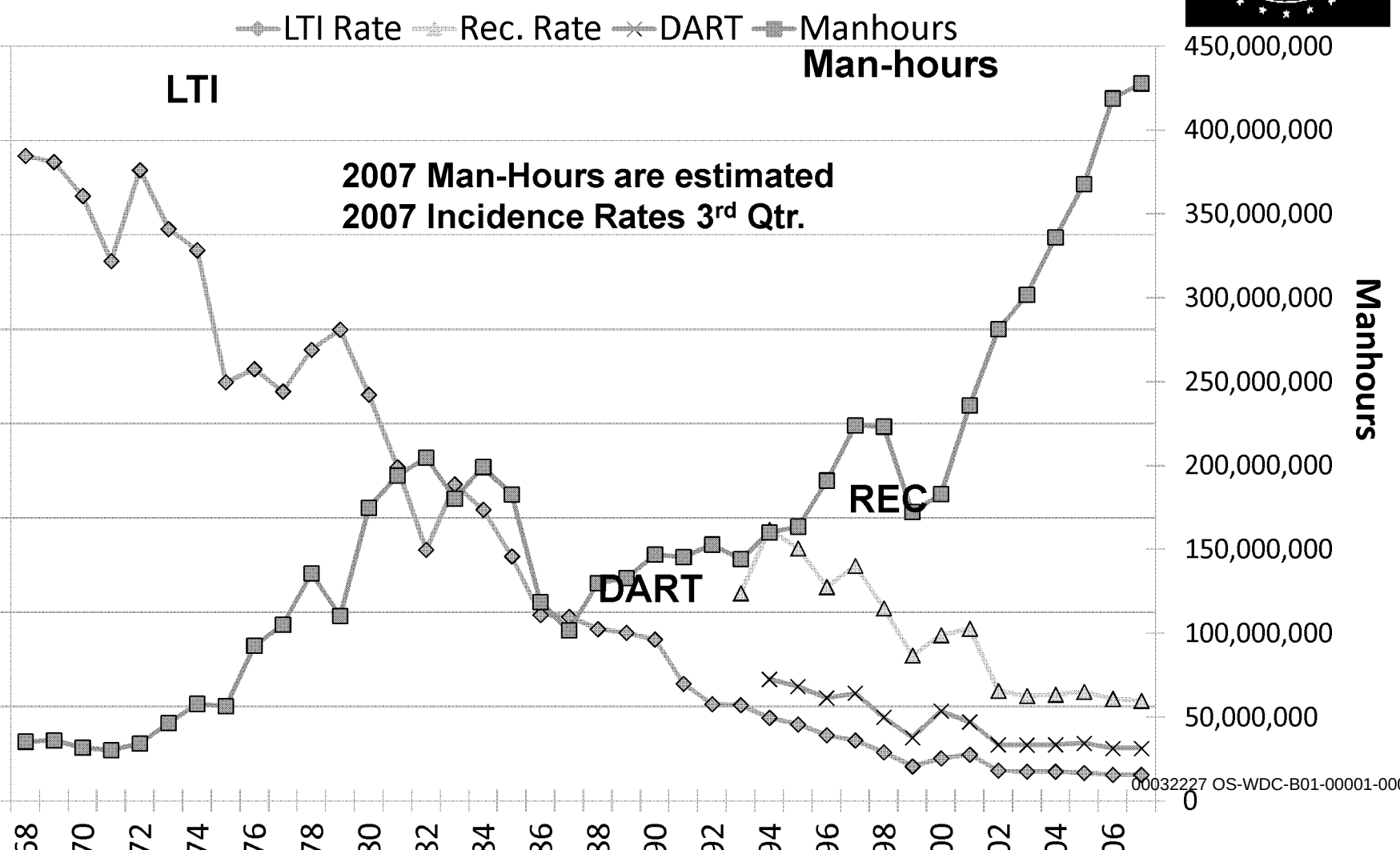
ears	**Production** (Thousand BBls)	**Number of Spills**	**Barrels Spilled** (Thousand BBls)
960-1969	1,460,000	13	99
970-1979	3,455,000	32	106
980-1989	3,387,000	38	7
990-1999	4,051,000	15	2
000-2009	5,450,000	72	18

lowout Events Exceeding 1,000 Barrels on OCS

- Two blowouts associated with a hurricane event that destroyed four platforms. Total of 10,280 barrels crude oil spilled.
- One blowout associated with drilling. 1,688 barrels condensate spilled.
- One blowout that occurred when a supply vessel collided with a drilling rig during a storm and sheared the wellhead.
- 2,500 barrels crude oil spilled.
- One blowout (Santa Barbara) was associated with drilling.
- 80,000 barrels spilled.
- One blowout was caused by a fire in the production area that resulted in the loss of control of 12 wells on the platform.
- 30,000 barrels crude oil spilled.
- One blowout associated with wireline work during workover operations. 53,000 barrels spilled.

om 1971 through 2009, a total of 1,784 barrels was spilled as a

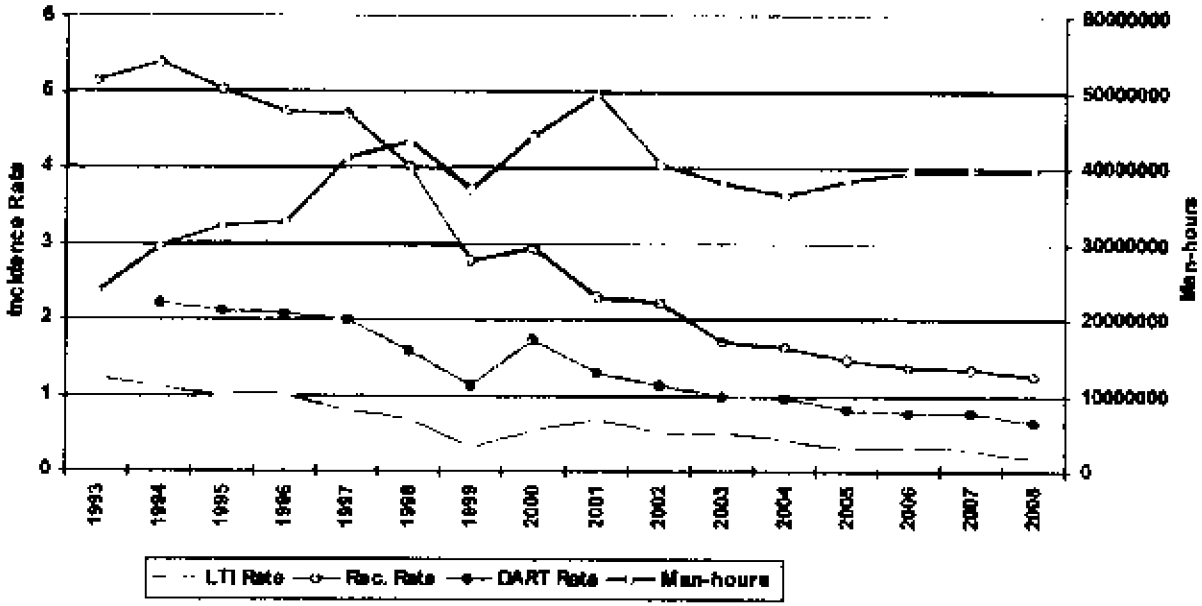
TOTAL INDUSTRY INCIDENCE RATES



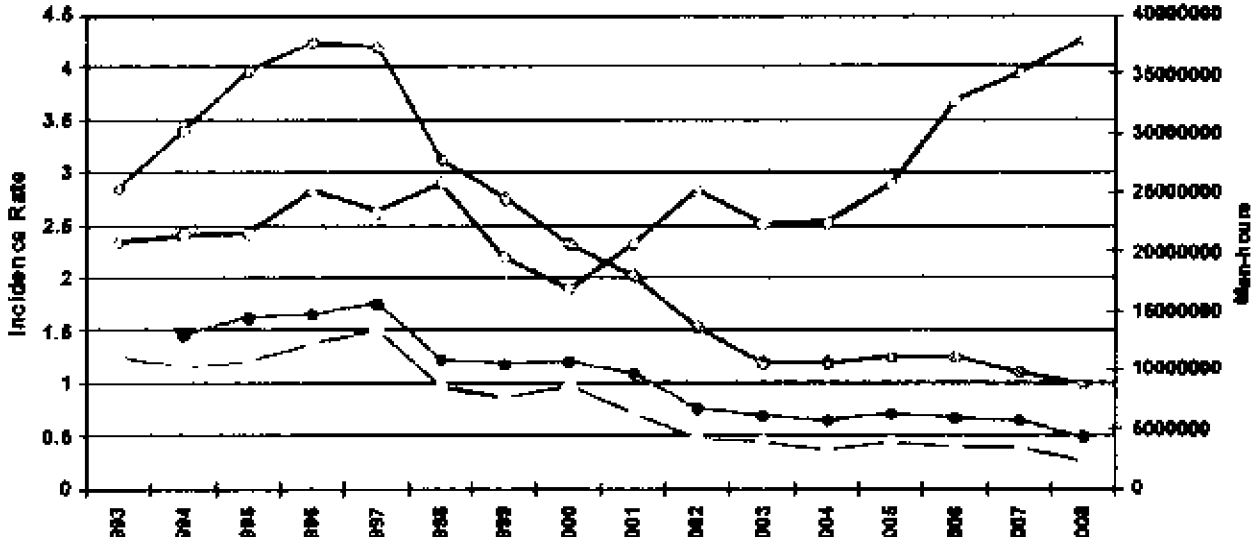
C 2008 US Water Totals		IADC 2008 European Water Totals	
l Man-hours	**39,665,580**	Total Man-hours	**38,049,523**
l Medical Treatment Incidents	**118**	Total Medical Treatment Incidents	**95**
l Restricted Work Incidents	**100**	Total Restricted Work Incidents	**43**
l Lost Time Incidents	**26**	Total Lost Time Incidents	**51**
l Fatalities	**3**	Total Fatalities	**0**
l Recordables	**247**	Total Recordables	**189**
ncidence Rate	**0.15**	LTI Incidence Rate	**0.27**
Frequency Rate	**0.73**	LTI Frequency Rate	**1.34**

st Time Incidence Rate = LTIs + FTLs X 200,000

US Water Total LTI & Recordable Incidence Rates vs Man-hours (Figure 1)

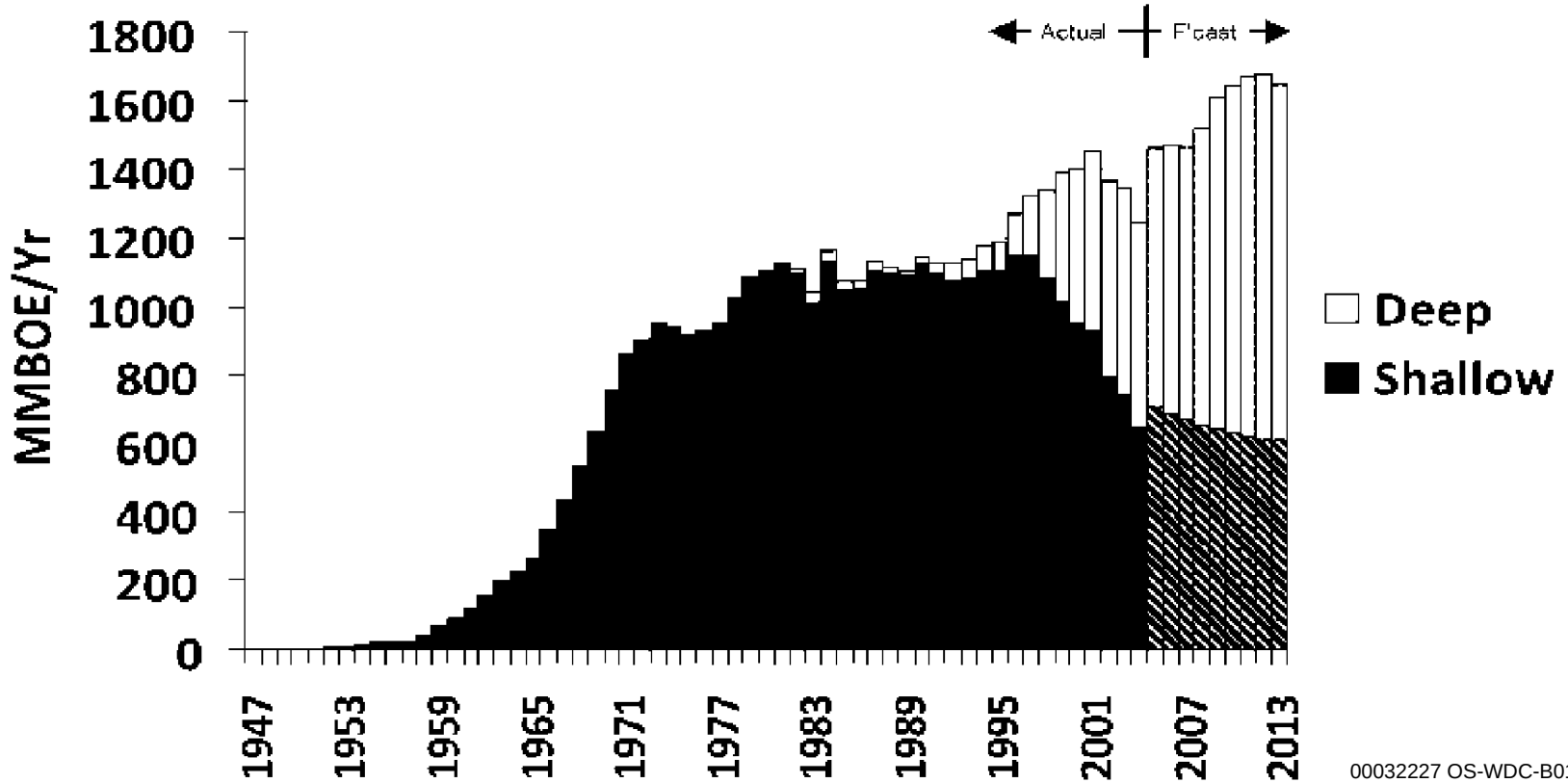


European Water Total Incidence Rates vs Man-hours (Figure 1)



GOM Offshore Production Increasingly from Deepwater

US GOM Offshore



Source: OCS Report MMS 2006-022

The bad

Understanding the Moratorium

You experts agreed to a list of recommendations which are needed to make drilling safer. Some of these recommendations take time to study and make into regulations to assure compliance. In some cases you agreed with time frames of as long as 6 months and even in one or two cases longer. How can I face the American people and say drilling is safe before I can assure them that your own recommendations are carried out? By not allowing drilling until all the recommendations you told me are necessary to make drilling safe are in place I am honoring your technical analysis.

The Four Negatives of the Moratorium

The reasons for this are complicated, the moratorium will increase risk by:

- 1) requiring all drilling rigs to stop immediately and then re-enter wells at some future undefined date,
- 2) affecting the mix of rigs available for drilling once the moratorium is lifted- the best rigs are the first to go and last to return,
- 3) reducing the experience level of drilling staff as they go overseas or leave the industry, and
- 4) starting today increasing the amount of oil we have to import by tanker which history shows has a greater potential for spills

Effects of Moratorium on Rigs and Experienced Personnel

Best rigs and people will leave the Gulf

Recruitment of new people will stop – dealing with the unknown, and the best and brightest do not apply for uncertain jobs

Workforce significantly impacted, including the thousands of support workers and service providers who support the drilling operations and must adhere to the safety standards – best of them will get work internationally or other industries/jobs.

While some additional training and certification can and will take place during this time – as with the baseball offseason, players need a spring training to get back in shape – "we can't afford safety wise to have a spring training."

The time to get back to drilling, remobilize, new well planning and inspection requirements with be several additional months/years; depending on how many rigs leave the gulf.

The industry feels the safest and most effective rig operations and personnel are being punished.

Manage risk

What is not in the report.

The level of risk varies significantly between well types based on exploration, geology, and categories

The highest risk wells warrant additional time to assure the risk can be managed and drilling these wells are warranted.

- Deepwater exploration wells
  - We have seen it is not just the drilling but the completion of these wells that pose risk
- Unknown pore pressure
- Extremely high pressure and/or high temperature wells

The Key to Increasing Safety

Require some modifications immediately

Provide a mechanism to allow rigs to remain in the Gulf of Mexico

Define a class of wells (other than workover, waterflood, gas injection or water disposal wells) which can be drilled safely. That is, wells where any increased risk by not waiting for all the recommendations to be implemented is lower than the risk of the "Four Negatives"

Potential Steps to Re-Define the Moratorium to INCREASE Safety

Allow rigs to complete the work they are currently doing

Require implementation of the key recommendations of the interim report which can be done within 30 days before ANY new wells can be drilled on the OCS (independent of water depth)

Maintain the moratorium on the more risky wells.

Risky Wells

Exploration

Deepening existing wells

Less Risky Wells which Can be Drilled

Less risky to more risky:

- Wells which are abandoned before reaching producing zones (surface casings and top sections only)
- Water Disposal to Non-Producing Reservoirs
- Re-entries and Sidetracks
- Water Disposal to Producing Reservoirs, Waterflood, Gas Injection
- Wells to Known Reservoirs
- Workovers
- Delineation Wells to Non-producing Reservoirs

30-Day Recommendations Already in NTL

Section III Recommendation 1 – Compliance erification for Existing Regulations and April 30, 2010, National Safety Alert

Implement through NTL within 30 days

hin 30 days of the date of this report, the Department, in conjunction with the Department of Homeland urity, will ensure that operators are required to verify compliance with existing regulations and National ety Alert (issued April 30, 2010), which issued the following safety recommendations to operators and ing contractors:

- Examine all well-control equipment (both surface and subsea) currently being used to ensure that it has been properly maintained and is capable of shutting in the well during emergency operations. Ensure that the ROV hot-stabs are function-tested and are capable of actuating the BOP.
- Review all rig drilling/casing/completion practices to ensure that well-control contingencies are not compromised at <u>any</u> point while the BOP is installed on the wellhead.
- Review all emergency shutdown and dynamic positioning procedures that interface with emergency well control operations.
- Inspect lifesaving and firefighting equipment for compliance with federal requirements.
- Ensure that all crew members are familiar with emergency/firefighting equipment, as well as participate in an abandon ship drill. Operators are reminded that the review of emergency equipment and drills should be conducted after each crew change out.
- Exercise emergency power equipment to ensure proper operation.
- Ensure that all personnel involved in well operations are properly trained and capable of performing their tasks under both normal drilling and emergency well control operations.

Section I Recommendation 1 – Order One-Time Only Re-rtification of All BOP Equipment Used in New Floating Drilling Operations

Implement through NTL within 30 days

fore spudding any new well from a floating vessel, the operator will be quired to obtain and deliver to the Department of the Interior a written and ned certification from an independent third-party attesting that, on or er the date of this report, a detailed physical inspection and design review the BOP has been conducted by the equipment manufacturer and owner in cordance with the Original Equipment Manufacturer (OEM) specifications d that (i) the BOP will operate as originally designed; and (ii) any odifications or upgrades to the BOP stack conducted after delivery have not mpromised the design or operation of the BOP.

or to deploying the BOP, the operator must also verify that any odifications or upgrades to the BOP are approved by the Department of the erior and that documentation showing that the BOP has been maintained d inspected according to the requirements in API RP 53 and 30 CFR 0.446(a) is on file with the Department of the Interior or available for pection.

ection I Recommendation 2 – Order BOP Equipment ompatibility Verification for Each Floating Vessel and for Each New Well

Implement through NTL within 30 days

s part of a structured risk management process, the perator will be required to obtain an independent ird-party verification that the BOP will operate ith the drilling rig equipment and that the BOP is ompatible with the specific well location and well asis of design and well execution plan, i.e., in the vent of a well control event the BOP will provide a eal and contain wellbore pressure under all onditions expected in the wellbore.

Section I Recommendation 5– Develop Secondary Control System Requirements and Guidelines

Implement through rulemaking within 120 days

- Minimum ROV intervention capabilities for secondary control of all subsea BOP stacks, including the ability to close all shear and pipe rams, close the choke and kill valves and unlatch the lower marine riser package (LMRP).
- Minimum requirements for an emergency back-up BOP control system that is powered by a separate and independent accumulator bank with sufficient capacity to open and close one annular-type preventer and all ram-type preventers, including the blind shear ram. Such safety systems must include ***at least two*** of the following: autoshear, deadman, emergency disconnect system, and/or an acoustic activation system.
- Guidelines for arming and disarming the secondary BOP control system.
- Guidelines for documentation of BOP maintenance and repair (including any modifications to the BOP stack and control systems).

Section I Recommendation 7 – Develop New Testing Guidelines

Implement through NTL within 30 days

ird-party verification or documentation necessary to show at blind-shear rams will function and are capable of earing the drill pipe that is in use on the rig.

Implement partially through NTL within 30 days, then rulemaking within 120 days

inimum ROV performance testing standards, including rface and subsea function testing of ROV intervention ports d ROV pumps, to ensure compatibility with the BOP stack d that the ROV can close all shear and pipe rams, close the oke and kill valves, and unlatch the lower marine riser ckage.

Section I Recommendation 7 – Develop New Testing Guidelines

Implement through NTL within 30 days

andatory inspection and testing of BOP stack if any omponents are used in an emergency, *e.g.,* use of pipe casing shear rams or circulating out a well kick. This sting should involve a full pressure test of the BOP ter the situation is fully controlled, with the BOP on e wellhead.

Section I Recommendation 8 – Develop New Inspection Procedures and Reporting Requirements

Implement through NTL within 30 days

eginning no later than 60 days after the date of this port, all operators of floating drilling equipment will port to the Department of the Interior the following: (i) OP and well control system configuration, (ii) BOP and ell control system test results, including any anomalies testing or operation of critical BOP components, (iii) OP and well control incidents, and (iv) BOP and well ontrol system downtime for the last three years of illing operations.

Section II Recommendation 3 – New Casing And Cement Design Requirements: Two Independent Tested Barriers

Implement through NTL within 30 days

efore spudding any new floating drilling operation, all ell casing and cement designs must be signed by a rofessional Engineer, verifying that there will be at ast two independent tested barriers, including one echanical barrier, across each flow path during well ompletion and abandonment activities and that casing esign is appropriate for the purpose for which it is tended under reasonably expected wellbore onditions.

Section II Recommendation 5 – New Casing Installation Procedures

Implement through NTL within 30 days

he Department will ensure the requirement of the llowing BAST practices:

- Casing hanger latching mechanisms or lock down mechanisms must be engaged at the time the casing is installed in the subsea wellhead.
- For the final casing string, the operator must verify the installation of dual mechanical barriers (*e.g.,* dual floats or one float and a mechanical plug) in addition to cement, to prevent flow in the event of a failure in the cement.

Recommendations Which Could be Implemented But Are Not Currently in NTL

Section I Recommendation 7 – Develop New Testing Guidelines

Implement through NTL within 30 days

linimum surface and subsea function and ressure testing requirements to simulate (i) nintended disconnect of the lower marine riser ackage (LMRP), and (ii) loss of surface control e.g., electric and hydraulic power) of the subsea OP stack.

Section I Recommendation 8 – Develop New Inspection Procedures and Reporting Requirements

nplement in accordance with internal Departmental Guidance issued within 30 days

- The Department will evaluate and revise the manner in which it conducts its drilling inspections.
- Revised drilling inspections should include the witnessing of actual tests of BOP equipment, including the new requirements and guidance that address the surface and subsea testing of ROV and BOP stack capabilities.
- The Department will also develop methods to increase transparency and public availability of the results of inspections as well as routine reporting.
- The Department will work with Congress to obtain the necessary resources to implement these recommendations.

ection II Recommendation 2 – New Fluid Displacement Procedures

Implement through NTL within 30 days

or to displacement of kill-weight drilling fluid from the wellbore, the operator must ependently verify that:

- The BOPs are closed during displacement to underbalanced fluid columns to prevent gas entry into the riser should a seal failure occur during displacement.
- Two independent barriers, including one mechanical barrier, are in place for each flow path (i.e., casing and annulus).
- If the shoe track (the cement plug and check valves that remain inside the bottom of casing after cementing) is to be used as one of these barriers, it is negatively tested prior to the setting of the subsequent casing barrier. A negative test should also be performed prior to setting the surface plug.
- Negative tests are made to a differential pressure equal to or greater than the anticipated pressure after displacement. Each casing barrier is positively tested to a pressure that exceeds the highest estimated integrity of the casing shoes below the barrier.
- Displacement of the riser and casing to fluid columns that are underbalanced to the formation pressure in the wellbore is conducted in separate operations. In both cases, BOPs should be closed on the drill string and circulation established through the choke line to isolate the riser, which is not a rated barrier. During displacement, volumes in and out must be accurately monitored.
- Drill string components positioned in the shear rams during displacement must be capable

Section II Recommendation 7 – Enforce Tighter Primary Cementing Practices

Implement through a rulemaking within 120 days

he Department will institute a rulemaking to onsider the adoption of API RP 65 Part 2:

- Isolating potential flow zones during well construction (addressing previously identified gaps in primary cementing practices).

Section III Recommendation 3 –Adopt Final Safety and Environmental Management Systems Rule

Implement through publication of final rule within 30 days

OCS Safety Oversight Board will ensure the promulgation of a final SEMS Rule with full implementation of lements, along with provisions for public availability of information developed and collected under the rule ncrease transparency and accountability.

IS is a structured and comprehensive method for applying operational, safety and environmental protection ciples to offshore activities by focusing on personnel and ensuring accountability for operations throughout organization in the following specific areas:

1. Safety & Environmental Information
2. Hazards Analysis
3. Management of Change
4. Operating Procedures
5. Safe Work Practices
6. Training
7. Mechanical Integrity
8. Pre-Startup Review
9. Emergency Response & Control
10. Investigation of Accidents
11. Auditing the Program
12. Records & Documentation

Recommendations to be Implemented After 30 Days

Section I Recommendation 3 – Study Formal Equipment Certification Requirements

Implement recommendations through the Department workgroup within one year

e Department will immediately establish an independent technical orkgroup to review current, and investigate new, certification requirements BOP equipment and other components of the BOP stack such as control nels, communication pods, accumulator systems, and choke and kill lines. addition, this workgroup will recommend ways to make BOP certifications blicly available in order to increase transparency and accountability.

e establishment of a technical workgroup to examine the need for rtification of BOP systems and components is important; even when a BOP ck has all the above mentioned systems and components, it is of little use t does not function properly to prevent a well blowout.

Section I Recommendation 4 – New Blind Shear Ram Redundancy Requirement

Implement through rulemaking within 120 days

Within one year from the date of this report, all floating drilling operations will be required to have two sets of blind shear rams spaced at least 4 feet apart (to prevent system failure if drill pipe joint or drill tool is across one set of rams during an emergency).

Section I Recommendation 6 – Develop New ROV Operating Capabilities

Implement recommendations through the Department workgroup within one year

e Department will immediately establish an independent technical rkgroup to develop further improvements to ROV operating capabilities luding the following:

- Standardized hydraulic and electrical interfaces for all subsea BOP stacks so that they are accessible by any available ROV.
- Visual mechanical indicator or redundant telemetry channel to confirm ram closure (*e.g.,* a position indicator).
- Methods of subsea testing that would avoid detrimental effects of seawater in BOP system (*e.g.,* ROV with external hydraulic supply).
- An ROV interface with a valve below the lowest ram on the BOP stack to allow well-killing operations.

Section I Recommendation 7 – Develop New Testing Guidelines

No later than 180 days after the date of this report

- Department will develop clear requirements and guidelines
t address the surface and subsea testing of ROV and BOP stack
abilities.

Implement through rulemaking within 120 days

- Protocols for function testing, autoshear, deadman, emergency
disconnect systems and acoustic activation systems.

Section I Recommendation 8 – Develop New Inspection Procedures and Reporting Requirements

Implement through rulemaking within 120 days

here feasible, the electronic log from the BOP control system ould be transmitted online to a secure location onshore and ade available for inspection by the Department of the Interior.

Section II Recommendation 1 – Establish Deepwater Well-Control Procedure Guidelines

Implement through rulemaking within 120 days

ithin 120 days of the date of this report, the Department will sure that requirements and guidelines for deepwater well-ntrol procedures are established.

Section II Recommendation 4 – Study Formal Personnel Training Requirements for Casing and Cementing Operations

Implement recommendations through the Department workgroup within one year

The Department will immediately establish an independent technical workgroup, with appropriate academic, agency, industry and other stakeholder participation, to study whether to establish new training and certification requirements for rig personnel specifically related to casing and cementing operations.

Section II Recommendation 6 – Develop Additional Requirements or Guidelines for Casing Installation

Implement recommendations through a the Department workgroup within one year

he Department will provide for the immediate stablishment of a workgroup, to establish specific equirements or guidelines for the following rocedures and practices:

- Positive and negative test procedures and use of test results for evaluation of casing integrity.
- Use of float valves and other mechanical plugs in the final casing string or liner.

Section II Recommendation 7 – Enforce Tighter Primary Cementing Practices

Implement recommendations through a Department workgroup within one year

- The Department will study whether to determine specific cementing requirements.

Section II Recommendation 8 – Develop Additional Requirements or Guidelines for Evaluation of Cement Integrity

Implement recommendations through Department workgroup within one year

- The Department will immediately establish an independent technical workgroup to evaluate whether and under what circumstances the use of cement bond logs is feasible and practical and will increase safety.

Section II Recommendation 9 –Increase Federal Government Wild-Well Intervention Capabilities

own out, or “wild” wells, involve the uncontrolled release of ude oil or natural gas from an oil well where pressure ntrol systems have failed.

e Federal government should assess its current capability to eal with such emergency situations, particularly in deep ater, and develop a plan to increase its capabilities for direct ld-well intervention, should such be required, in future mergency situations.

ements to be considered include an inventory of existing ethods to stop a blowout and handle escaping wellbore uids, including but not limited to coffer dams, highly-capable OVs, portable hydraulic line hook-ups, and pressure-reading ols.

Section II Recommendation 10 – Study Innovative Wild-Well Intervention, Response Techniques and Response Planning

ddition, the Department will immediately establish a DOI workgroup to study methods to p a blowout and handle escaping wellbore fluids. The technical workgroup will take a fresh k at how to deal with a deepwater blowout. The conventional last resort method to control a wout is to drill a relief well. In deep water this can take several months. But the reality of ng several months to stop a high flowing well at deep water depths was difficult to imagine il the BP oil spill. The offshore oil and gas industry, learning from the BP Oil Spill response erience, should work toward being able to stop a spill resulting from a deepwater blowout. erators should work to be in a position to submit, with their Exploration or Development ns, an emergency response plan that addresses resources (including common resources) that uld be deployed in the event of a serious emergency, even if assessed as low probability.

e technical workgroup should also address operators' ability, on a regional or industry-wide is, to develop and procure a response package for deep water incidents, to include diagnostic l measurement equipment, pre-fabricated systems for deep water oil capture, logistical and nmunications support, and plans and concepts of operations that can quickly be deployed in event of an unanticipated blowout. Assess and certify potential options, e.g., deep water persant injection.

ection III Recommendation 2 – The Department Will Adopt Safety Case Requirements for Floating Drilling Operations on the OCS

Implement through rulemaking within 120 days

- Within 120 days of the date of this report, the Department will assure the adoption of appropriate safety case requirements based on IADC Health, Safety and Environmental Case Guidelines for Mobile Offshore Drilling Units (2009), which will include well construction safety assessment prior to approval of APD.
- This “safety case” should establish risk assessment and mitigation processes to manage a drilling contractor’s controls related to the health, safety and environmental aspects of their operations.
- In addition to the safety case, a separate bridging document should be required to connect the safety case to existing well design and construction documents.
- Such a proposed Well Construction Interfacing Document will include all of the elements in a conventional bridging document plus alignment of the drilling contractor’s management of change (MOC) and risk assessment to the lease operator’s MOC and well execution risk assessments.

Section III Recommendation 4 – Study Additional Safety Training and Certification Requirements

mplement recommendations through a Department workgroup within one year

- The Department will immediately establish a workgroup to investigate safety training requirements for floating drilling rig personnel and possible requirements for independent or more frequent certification and testing of personnel and safety systems.
- Establish an oil production safety program or institute (similar to NRC reactor safety program).
- Consider establishing a formalized analytical methodology to assess performance of safety systems in the event of multiple component failure or excursions outside normal environmental ranges.
- Strengthen technical support to the Department of the Interior and other regulatory authorities, including the resources necessary to obtain independent technical review of regulations and standards.
- Consider chartering a longer-term technical review of BOP reliability.
- Consider importing best practices from other agencies with similar responsibility for safety regulation of technically complex systems, e.g. FAA and NRC.

Nguyen, Ngoc B

From: Black, Steve
Sent: Friday, June 18, 2010 10:18 PM
To: 'karnold@karnoldconsulting.com'; Dubin, Lindsay
Cc: Kemkar, Neal; Hanley, Kallie
Subject: Re: Meeting with Secretary Salazar Monday 6.21.10

Thanks Ken. Will you please be sure to send the final before Monday?

I appreciate your courtesies.

Steve

From: Ken Arnold <karnold@karnoldconsulting.com>
To: Dubin, Lindsay
Cc: Black, Steve; Kemkar, Neal; Hanley, Kallie
Sent: Fri Jun 18 15:43:02 2010
Subject: RE: Meeting with Secretary Salazar Monday 6.21.10

Attached is a current draft of a power point presentation we are preparing for the Secretary and staff for Friday's meeting. It is till be reviewed by the Group of 8, but I thought I would send it ahead in the event any of you would want to look at it ahead of Monday's meeting.

Kenneth E. (Ken) Arnold
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Cell: 832-212-0160
Home: 713-939-1034
www.karnoldconsulting.com

From: Dubin, Lindsay [mailto:Lindsay_Dubin@ios.doi.gov]
Sent: Thursday, June 17, 2010 5:23 PM
To: Dubin, Lindsay
Cc: Black, Steve; Kemkar, Neal; Hanley, Kallie
Subject: Meeting with Secretary Salazar Monday 6.21.10

Good evening,

Interior Secretary Ken Salazar hopes that you can participate in a meeting at 10:00am EASTERN Monday, June 21, 2010 as a follow-up to Tuesday's conference call regarding the 30-day report on Increased Safety Measures for Energy Development on the Outer Continental Shelf. For those of you who are unable to join this meeting in person, there will be a call-in option for you to participate remotely. This meeting/conference call is limited to the people who have received this email. Please let Kallie Hanley (cc'd) and me know by 3:00pm EASTERN tomorrow if you will be able to participate. Please be sure to indicate whether you will be attending in person or via phone. We will reach out to you with arrival instructions or a conference call number following our receipt of your participation.

Thank you,

Lindsay Dubin

Special Assistant
Office of Scheduling and Advance
The U.S. Department of the Interior
p: (202) 208-7551 | f: (202) 208-4694
lindsay_dubin@ios.doi.gov

Nguyen, Ngoc B

From: Ken Arnold [karnold@karnoldconsulting.com]
Sent: Saturday, June 19, 2010 4:48 PM
To: Benton Baugh; Bob Bea; Ford Brett; Hans Juvkam-Wold; Ken Arnold; Martin Chenevert; Per Holand; Skip Ward; Tom Williams
Cc: Black, Steve; Hanley, Kallie; Kemkar, Neal
Subject: Meeting Monday
Attachments: Presentation to Secretary of Interior - Rev 3.pptx

I have modified the power point based on comments received. I have put the detail listing of various levels of recommendations in the appendix and clarified the outline of the discussion. I will take another run at simplifying and clarifying so keep the cards and letters coming.

I am trying to get statistics on the percent of oil spilled from OCS operations and percent of oil spilled from tanker transportation. I have it for the OCS and I have average oil spilled per year from tankers in North America (30,000 barrels per year from 1990-1999) as opposed to an average of 3300 barrels/year from platforms and rigs (1970-2009 including two bad hurricane decades). The problem is I don't know how much of the 30,000 barrels to attribute to US alone (I am guessing 75% or 22,000). And I don't know how much oil and products are imported each year by tanker. If I assume twice as much is transported by tanker than produced on the OCS, than the ratio of 11,000 to 3300 is a measure of riskiness of importing by tanker rather than producing. It seems to be about 3 to 1. It gets even more complicated if you include bilge water and spills at offloading terminals on the one hand and produced water discharges from platforms on the other but let's not get into that. Sounds like a good Masters thesis and I don't have the time today.

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Presentation to Secretary of Interior

June 21, 2010

Outline of the Discussion

1. Why We Are Here
2. Putting the Risks in Context
3. Putting the Moratorium in Context
4. Measures that should be taken now to improve safety in the GOM

Why Are We Here

We are not here to provide an economic justification – jobs, revenue lost, etc. That is the job for economists.

We feel safety will be compromised if the 6 month ban is extended to all wells in the GoM over 500 feet in water depth.

This is the time we all need to work together and we understand the job at hand.

This is not the time to punish the innocent nor further harm the public's interest .

Why Are We Here

The moratorium as currently defined INCREASES risk when drilling is eventually resumed.

- 1. Stopping operations in the middle
- 2. Exporting best rigs
- 3. Loss of experienced drilling staff
- 4. Increased tanker traffic

We believe a moratorium is needed, but we believe it can be re-defined to reduce risk

- 1. Remove requirement for stopping operations
- 2. Require the implementation of many of the recommendations of the interim report including some not already included in NTL 05.
- 3. Allow drilling of “low risk” wells to maintain GOM drilling equipment and expertise.

Putting The Risks in Context

BP Oil Spill Disaster

We were not asked to provide analysis of the Horizon incident, but as information has been discovered it is clear best practices were not followed.

- The well design was marginal
- Human errors in judgment were made at very key operational decision points
- Warning signs were overlooked on the rig
- There may have been some failure of equipment

This was all preventable by following currently in place standard practices.

Safety Record of Drilling on the OCS

Over 50,000 wells drilled. 4000 in over 1000 feet of water.

Last major incident resulting in oil coming ashore in 1969. 41 years ago.

From 1970 until April 2010 a total of 1800 barrels of oil spilled due to blowouts.

All measurements of safety indices have shown a steady level of improvement since modern MMS regulations came into effect in 1970.

Record is better than or equal to that or any other region of the world.

Crude Oil Spills from Platform and Rigs from Federal OCS Activities

ears	**Production** (Thousand BBls)	**Number of Spills**	**Barrels Spilled** (Thousand BBls)
960-1969	1,460,000	13	99
970-1979	3,455,000	32	106
980-1989	3,387,000	38	7
990-1999	4,051,000	15	2
000-2009	5,450,000	72	18

lowout Events Exceeding 1,000 Barrels on OCS

Two blowouts associated with a hurricane event that destroyed four platforms. Total of 10,280 barrels crude oil spilled.

One blowout associated with drilling. 1,688 barrels condensate spilled.

One blowout that occurred when a supply vessel collided with a drilling rig during a storm and sheared the wellhead.

2,500 barrels crude oil spilled.

One blowout (Santa Barbara) was associated with drilling.

80,000 barrels spilled.

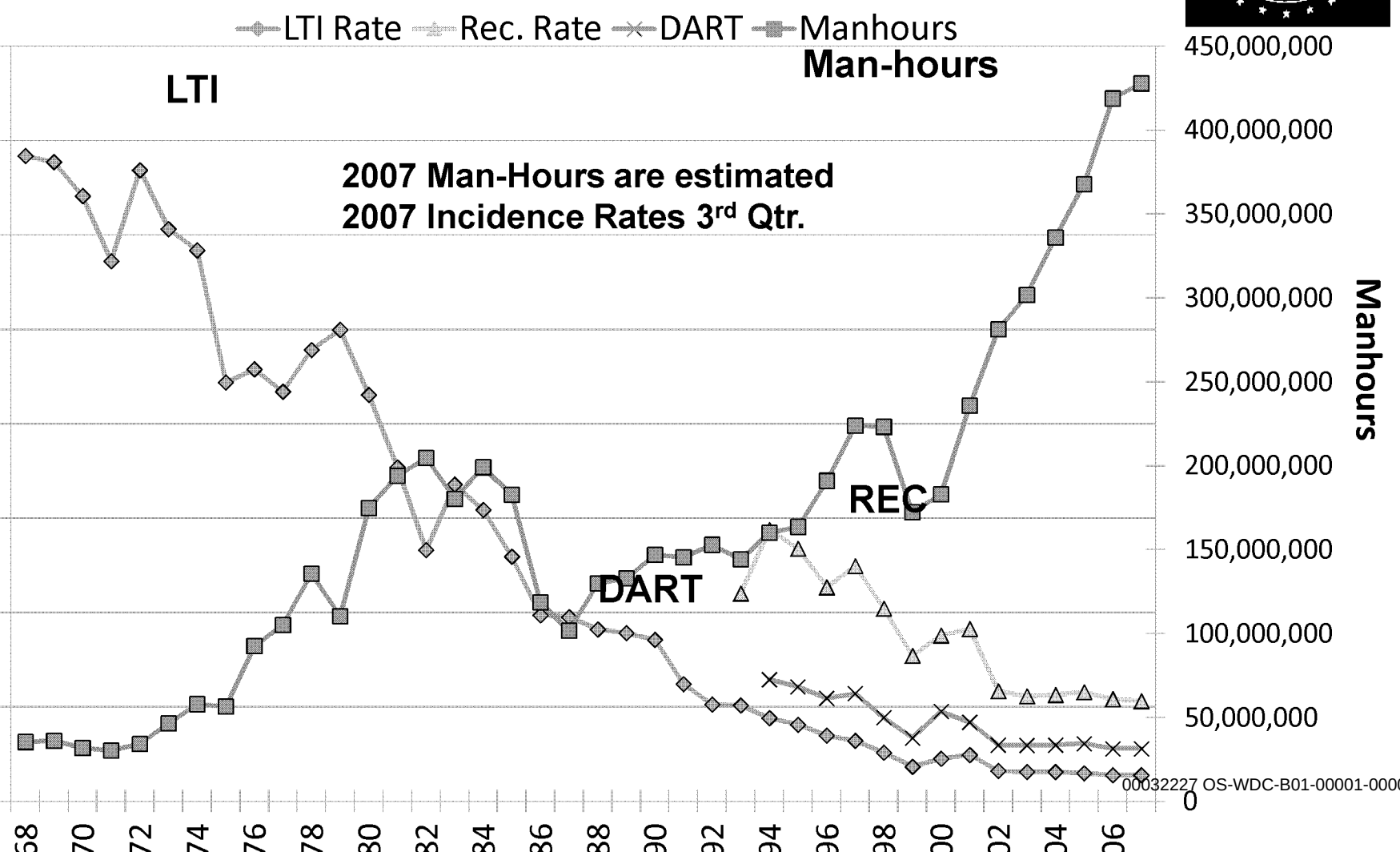
One blowout was caused by a fire in the production area that resulted in the loss of control of 12 wells on the platform.

30,000 barrels crude oil spilled.

One blowout associated with wireline work during workover operations. 53,000 barrels spilled.

om 1971 through 2009, a total of 1,784 barrels was spilled as a

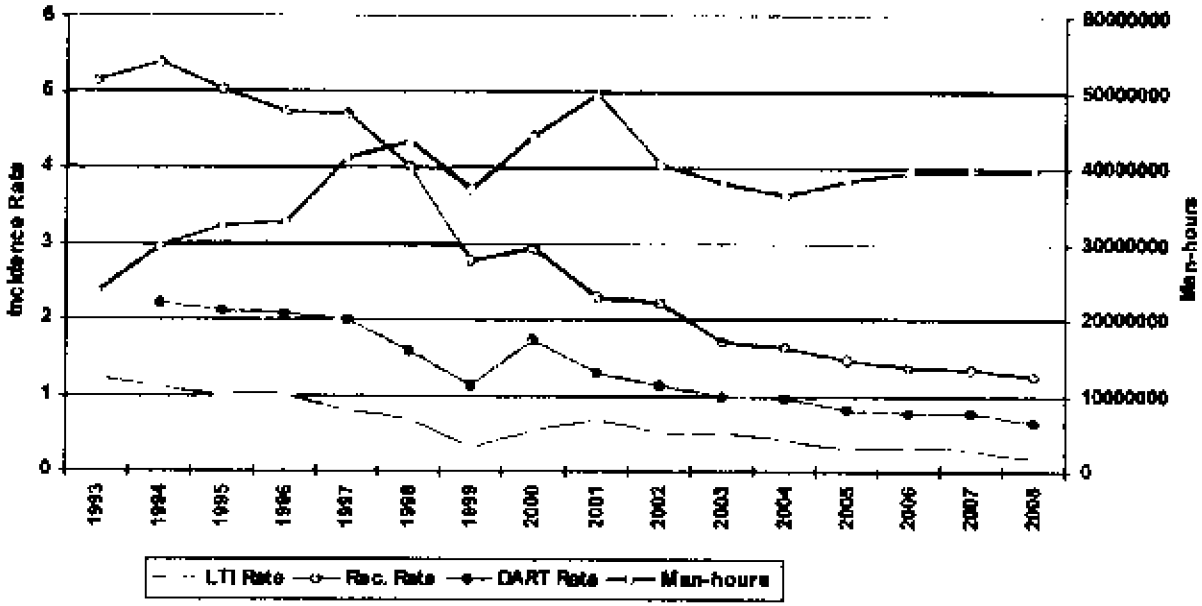
TOTAL INDUSTRY INCIDENCE RATES



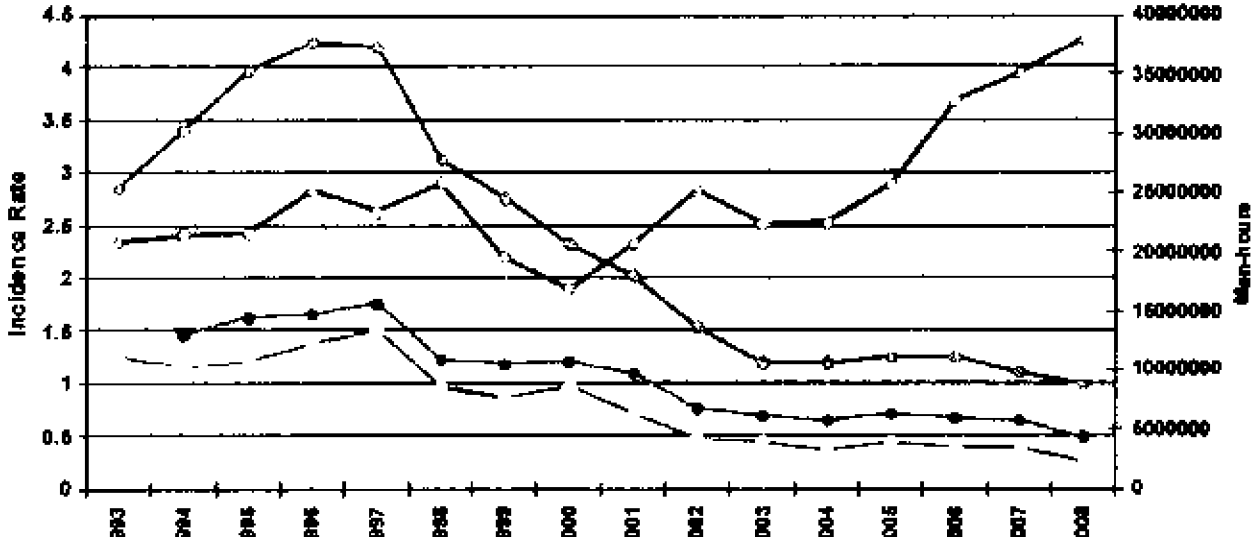
C 2008 US Water Totals		IADC 2008 European Water Totals	
l Man-hours	**39,665,580**	Total Man-hours	**38,049,523**
l Medical Treatment Incidents	**118**	Total Medical Treatment Incidents	**95**
l Restricted Work Incidents	**100**	Total Restricted Work Incidents	**43**
l Lost Time Incidents	**26**	Total Lost Time Incidents	**51**
l Fatalities	**3**	Total Fatalities	**0**
l Recordables	**247**	Total Recordables	**189**
ncidence Rate	**0.15**	LTI Incidence Rate	**0.27**
Frequency Rate	**0.73**	LTI Frequency Rate	**1.34**

st Time Incidence Rate = LTIs + FTLs X 200,000

US Water Total LTI & Recordable Incidence Rates vs Man-hours (Figure 1)

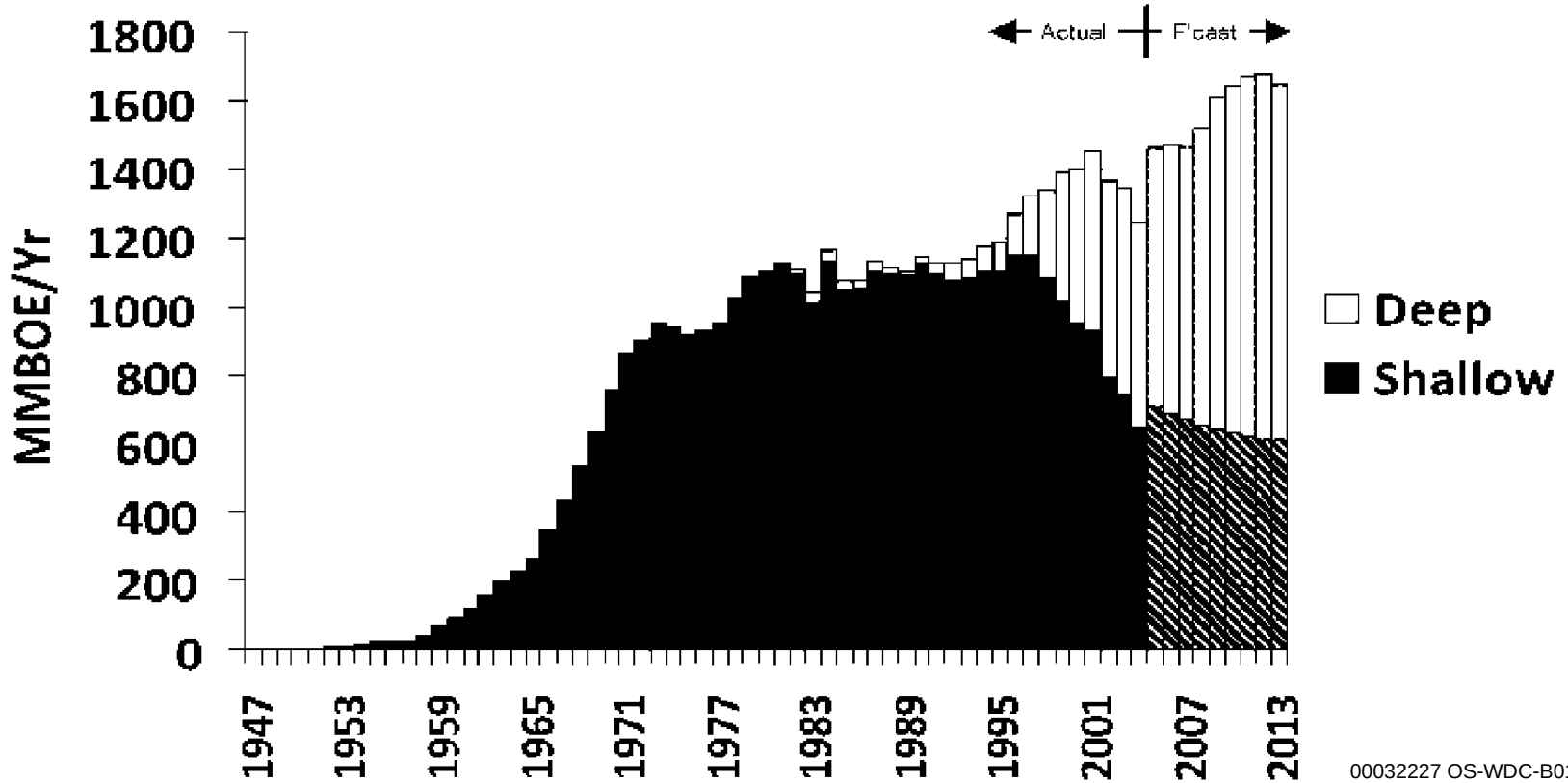


European Water Total Incidence Rates vs Man-hours (Figure 1)



GOM Offshore Production Increasingly from Deepwater

US GOM Offshore



Source: OCS Report MMS 2006-022

Understanding the Risks Summary

Even under existing conditions the record is good and improving at the same time that we are moving more and more into deep water

The Interim Report recommendations which can be implemented immediately (within 30 Days) should reduce the risk further but as the risks are low this is a marginal step

The Interim Report recommendations which take more time (up to 6 Months) should reduce the risks even further but in an even more marginal amount.

Putting the Moratorium in Context

Rationale for a Moratorium

We experts agreed to a list of recommendations which are needed to make drilling safer. Some of these recommendations take time to study and make into regulations to assure compliance. In some cases we agreed with time frames of as long as 6 months and even in one or two cases longer. How can we face the American people and say drilling is safe before all of our own recommendations can be carried out?

By not allowing drilling until all the recommendations we told the DOI are necessary for safety are in place the DOI is honoring our technical analysis.

The “Four Negatives” of the Moratorium

The Moratorium itself increases risk by:

- 1. Stopping operations in the middle
- 2. Exporting best rigs
- 3. Loss of experienced drilling staff
- 4. Increased tanker traffic

To reduce overall risk, the risk reductions which occur as a result of the Moratorium need to outweigh the added risks of the “four negatives”

As currently defined the Moratorium does not accomplish this objective

The Moratorium can be redefined to reduce risk

Effects of Stopping Operations

In any project risks are introduced when an appropriately planned operation is temporarily abandoned and then re-started at some future undetermined date.

- Macondo Well was being temporarily abandoned
- Montara Well was being re=entered after having been temporarily abandoned for four months

The Effect of the Moratorium on Rigs

Best rigs will leave the Gulf first and come back last. This has a marginal negative impact on the overall safety of the fleet.

Rigs will leave on long term contracts (2-5 years) and it will take a long time after the moratorium ends to get them back.

The time to remobilize will take several additional months/years after the Moratorium is lifted and new rules in place.

Effects of Moratorium on Experienced Personnel

- Best people will leave the Gulf
- Workforce significantly impacted, including the thousands of support workers and service providers who support the drilling operations and must adhere to the safety standards – best of them will get work internationally or other industries/jobs.
- Recruitment of new people will stop – the best and brightest do not apply for uncertain jobs
- While some additional training and certification can and will take place during this time – as with the baseball offseason, players need a spring training to get back in shape – "From a safety standpoint we can't afford to have a spring training."
- The industry feels the safest and most effective rig operations and personnel are being punished.

Measures that should be taken now to improve safety in the GOM

Manage Risk

The level of risk varies significantly between well types based on knowledge of formations being drilled and category of well

The highest risk wells warrant additional time to assure the risk can be managed and drilling these wells are warranted:

- Deepwater exploration wells
  - We have seen it is not just the drilling but the completion of these wells that pose risk
- Unknown pore pressure
- Extremely high pressure and/or high temperature wells

The Key to Increasing Safety

Require adoption of some Interim Report recommendations immediately

Provide a mechanism to allow rigs to remain working in the Gulf of Mexico

- Define a class of wells (other than workover, waterflood, gas injection or water disposal wells) which can be drilled safely. That is, wells where any increased risk by not waiting for all the recommendations to be implemented is lower than the risk of the "Four Negatives"

Maintain Moratorium on "Risky Wells"

Steps to Re-Define the Moratorium to INCREASE Safety

- Allow rigs to complete the work they are currently doing
- Require implementation of the key recommendations of the interim report which can be done within 30 days before ANY new wells can be drilled on the OCS (independent of water depth)
  - 8 Recommendations Already in NTL 05
  - 5 Additional Recommendations which could be added
- Maintain the moratorium on the more risky wells
  - Remaining Recommendations requiring additional study.

Risky Wells

Exploration wells to previously undrilled strata

Deepening existing wells to previously undrilled strata

HP/HT Wells

Less Risky Wells which Can be Drilled

Listed in increasing degree of risk:

- Wells which are abandoned before reaching producing zones (surface casings and top sections only)
- Water Disposal to Non-Producing Reservoirs
- Re-entries and Sidetracks
- Water Disposal to Producing Reservoirs, Waterflood and Gas Injection
- Wells to Known Reservoirs
- Workovers
- Delineation Wells to Non-producing Reservoirs

Wells in red above are already exempted from the moratorium by NTL 04

Conclusions

A moratorium is needed

It needs be defined taking into account ALL elements of risk, including the risks derived from the moratorium itself

Drilling can be made safer quickly by implementing many of the recommendations of the Interim Report

We should not ignore the “four Negatives” of the moratorium

It is justifiable to put a moratorium on “Risky Wells” to allow further thought and study

Appendices

30-Day Recommendations Already in NTL

Recommendations Which Could be Implemented But Are Not Currently in NTL

Recommendations to be Implemented After 30 Days

30-Day Recommendations Already in NTL

Section III Recommendation 1 – Compliance erification for Existing Regulations and April 30, 2010, National Safety Alert

Implement through NTL within 30 days

hin 30 days of the date of this report, the Department, in conjunction with the Department of Homeland urity, will ensure that operators are required to verify compliance with existing regulations and National ety Alert (issued April 30, 2010), which issued the following safety recommendations to operators and ing contractors:

- Examine all well-control equipment (both surface and subsea) currently being used to ensure that it has been properly maintained and is capable of shutting in the well during emergency operations. Ensure that the ROV hot-stabs are function-tested and are capable of actuating the BOP.
- Review all rig drilling/casing/completion practices to ensure that well-control contingencies are not compromised at <u>any</u> point while the BOP is installed on the wellhead.
- Review all emergency shutdown and dynamic positioning procedures that interface with emergency well control operations.
- Inspect lifesaving and firefighting equipment for compliance with federal requirements.
- Ensure that all crew members are familiar with emergency/firefighting equipment, as well as participate in an abandon ship drill. Operators are reminded that the review of emergency equipment and drills should be conducted after each crew change out.
- Exercise emergency power equipment to ensure proper operation.
- Ensure that all personnel involved in well operations are properly trained and capable of performing their tasks under both normal drilling and emergency well control operations.

Section I Recommendation 1 – Order One-Time Only Re-rtification of All BOP Equipment Used in New Floating Drilling Operations

Implement through NTL within 30 days

fore spudding any new well from a floating vessel, the operator will be quired to obtain and deliver to the Department of the Interior a written and ned certification from an independent third-party attesting that, on or er the date of this report, a detailed physical inspection and design review the BOP has been conducted by the equipment manufacturer and owner in cordance with the Original Equipment Manufacturer (OEM) specifications d that (i) the BOP will operate as originally designed; and (ii) any odifications or upgrades to the BOP stack conducted after delivery have not mpromised the design or operation of the BOP.

or to deploying the BOP, the operator must also verify that any odifications or upgrades to the BOP are approved by the Department of the erior and that documentation showing that the BOP has been maintained d inspected according to the requirements in API RP 53 and 30 CFR 0.446(a) is on file with the Department of the Interior or available for pection.

ection I Recommendation 2 – Order BOP Equipment ompatibility Verification for Each Floating Vessel and for Each New Well

Implement through NTL within 30 days

s part of a structured risk management process, the perator will be required to obtain an independent ird-party verification that the BOP will operate ith the drilling rig equipment and that the BOP is ompatible with the specific well location and well asis of design and well execution plan, i.e., in the vent of a well control event the BOP will provide a eal and contain wellbore pressure under all onditions expected in the wellbore.

Section I Recommendation 5– Develop Secondary Control System Requirements and Guidelines

Implement through rulemaking within 120 days

- Minimum ROV intervention capabilities for secondary control of all subsea BOP stacks, including the ability to close all shear and pipe rams, close the choke and kill valves and unlatch the lower marine riser package (LMRP).
- Minimum requirements for an emergency back-up BOP control system that is powered by a separate and independent accumulator bank with sufficient capacity to open and close one annular-type preventer and all ram-type preventers, including the blind shear ram. Such safety systems must include ***at least two*** of the following: autoshear, deadman, emergency disconnect system, and/or an acoustic activation system.
- Guidelines for arming and disarming the secondary BOP control system.
- Guidelines for documentation of BOP maintenance and repair (including any modifications to the BOP stack and control systems).

Section I Recommendation 7 – Develop New Testing Guidelines

Implement through NTL within 30 days

ird-party verification or documentation necessary to show at blind-shear rams will function and are capable of earing the drill pipe that is in use on the rig.

Implement partially through NTL within 30 days, then rulemaking within 120 days

inimum ROV performance testing standards, including rface and subsea function testing of ROV intervention ports d ROV pumps, to ensure compatibility with the BOP stack d that the ROV can close all shear and pipe rams, close the oke and kill valves, and unlatch the lower marine riser ckage.

Section I Recommendation 7 – Develop New Testing Guidelines

Implement through NTL within 30 days

andatory inspection and testing of BOP stack if any omponents are used in an emergency, *e.g.,* use of pipe casing shear rams or circulating out a well kick. This sting should involve a full pressure test of the BOP ter the situation is fully controlled, with the BOP on e wellhead.

Section I Recommendation 8 – Develop New Inspection Procedures and Reporting Requirements

Implement through NTL within 30 days

eginning no later than 60 days after the date of this port, all operators of floating drilling equipment will port to the Department of the Interior the following: (i) OP and well control system configuration, (ii) BOP and ell control system test results, including any anomalies testing or operation of critical BOP components, (iii) OP and well control incidents, and (iv) BOP and well ontrol system downtime for the last three years of illing operations.

Section II Recommendation 3 – New Casing And Cement Design Requirements: Two Independent Tested Barriers

Implement through NTL within 30 days

efore spudding any new floating drilling operation, all ell casing and cement designs must be signed by a rofessional Engineer, verifying that there will be at ast two independent tested barriers, including one echanical barrier, across each flow path during well ompletion and abandonment activities and that casing esign is appropriate for the purpose for which it is tended under reasonably expected wellbore onditions.

Section II Recommendation 5 – New Casing Installation Procedures

Implement through NTL within 30 days

he Department will ensure the requirement of the llowing BAST practices:

- Casing hanger latching mechanisms or lock down mechanisms must be engaged at the time the casing is installed in the subsea wellhead.
- For the final casing string, the operator must verify the installation of dual mechanical barriers (*e.g.,* dual floats or one float and a mechanical plug) in addition to cement, to prevent flow in the event of a failure in the cement.

Recommendations Which Could be Implemented But Are Not Currently in NTL

Section I Recommendation 7 – Develop New Testing Guidelines

Implement through NTL within 30 days

linimum surface and subsea function and ressure testing requirements to simulate (i) nintended disconnect of the lower marine riser ackage (LMRP), and (ii) loss of surface control e.g., electric and hydraulic power) of the subsea OP stack.

Section I Recommendation 8 – Develop New Inspection Procedures and Reporting Requirements

nplement in accordance with internal Departmental Guidance issued within 30 days

- The Department will evaluate and revise the manner in which it conducts its drilling inspections.
- Revised drilling inspections should include the witnessing of actual tests of BOP equipment, including the new requirements and guidance that address the surface and subsea testing of ROV and BOP stack capabilities.
- The Department will also develop methods to increase transparency and public availability of the results of inspections as well as routine reporting.
- The Department will work with Congress to obtain the necessary resources to implement these recommendations.

ection II Recommendation 2 – New Fluid Displacement Procedures

Implement through NTL within 30 days

or to displacement of kill-weight drilling fluid from the wellbore, the operator must ependently verify that:

- The BOPs are closed during displacement to underbalanced fluid columns to prevent gas entry into the riser should a seal failure occur during displacement.
- Two independent barriers, including one mechanical barrier, are in place for each flow path (i.e., casing and annulus).
- If the shoe track (the cement plug and check valves that remain inside the bottom of casing after cementing) is to be used as one of these barriers, it is negatively tested prior to the setting of the subsequent casing barrier. A negative test should also be performed prior to setting the surface plug.
- Negative tests are made to a differential pressure equal to or greater than the anticipated pressure after displacement. Each casing barrier is positively tested to a pressure that exceeds the highest estimated integrity of the casing shoes below the barrier.
- Displacement of the riser and casing to fluid columns that are underbalanced to the formation pressure in the wellbore is conducted in separate operations. In both cases, BOPs should be closed on the drill string and circulation established through the choke line to isolate the riser, which is not a rated barrier. During displacement, volumes in and out must be accurately monitored.
- Drill string components positioned in the shear rams during displacement must be capable

Section II Recommendation 7 – Enforce Tighter Primary Cementing Practices

Implement through a rulemaking within 120 days

he Department will institute a rulemaking to onsider the adoption of API RP 65 Part 2:

- Isolating potential flow zones during well construction (addressing previously identified gaps in primary cementing practices).

Section III Recommendation 3 –Adopt Final Safety and Environmental Management Systems Rule

Implement through publication of final rule within 30 days

OCS Safety Oversight Board will ensure the promulgation of a final SEMS Rule with full implementation of lements, along with provisions for public availability of information developed and collected under the rule ncrease transparency and accountability.

IS is a structured and comprehensive method for applying operational, safety and environmental protection ciples to offshore activities by focusing on personnel and ensuring accountability for operations throughout organization in the following specific areas:

1. Safety & Environmental Information
2. Hazards Analysis
3. Management of Change
4. Operating Procedures
5. Safe Work Practices
6. Training
7. Mechanical Integrity
8. Pre-Startup Review
9. Emergency Response & Control
10. Investigation of Accidents
11. Auditing the Program
12. Records & Documentation

Recommendations to be Implemented After 30 Days

Section I Recommendation 3 – Study Formal Equipment Certification Requirements

Implement recommendations through the Department workgroup within one year

e Department will immediately establish an independent technical orkgroup to review current, and investigate new, certification requirements BOP equipment and other components of the BOP stack such as control nels, communication pods, accumulator systems, and choke and kill lines. addition, this workgroup will recommend ways to make BOP certifications blicly available in order to increase transparency and accountability.

e establishment of a technical workgroup to examine the need for rtification of BOP systems and components is important; even when a BOP ck has all the above mentioned systems and components, it is of little use t does not function properly to prevent a well blowout.

Section I Recommendation 4 – New Blind Shear Ram Redundancy Requirement

Implement through rulemaking within 120 days

Within one year from the date of this report, all floating drilling operations will be required to have two sets of blind shear rams spaced at least 4 feet apart (to prevent system failure if drill pipe joint or drill tool is across one set of rams during an emergency).

Section I Recommendation 6 – Develop New ROV Operating Capabilities

Implement recommendations through the Department workgroup within one year

e Department will immediately establish an independent technical rkgroup to develop further improvements to ROV operating capabilities luding the following:

- Standardized hydraulic and electrical interfaces for all subsea BOP stacks so that they are accessible by any available ROV.
- Visual mechanical indicator or redundant telemetry channel to confirm ram closure (*e.g.,* a position indicator).
- Methods of subsea testing that would avoid detrimental effects of seawater in BOP system (*e.g.,* ROV with external hydraulic supply).
- An ROV interface with a valve below the lowest ram on the BOP stack to allow well-killing operations.

Section I Recommendation 7 – Develop New Testing Guidelines

No later than 180 days after the date of this report

- Department will develop clear requirements and guidelines
t address the surface and subsea testing of ROV and BOP stack
abilities.

Implement through rulemaking within 120 days

- Protocols for function testing, autoshear, deadman, emergency
disconnect systems and acoustic activation systems.

Section I Recommendation 8 – Develop New Inspection Procedures and Reporting Requirements

Implement through rulemaking within 120 days

here feasible, the electronic log from the BOP control system ould be transmitted online to a secure location onshore and ade available for inspection by the Department of the Interior.

Section II Recommendation 1 – Establish Deepwater Well-Control Procedure Guidelines

Implement through rulemaking within 120 days

ithin 120 days of the date of this report, the Department will sure that requirements and guidelines for deepwater well-ntrol procedures are established.

Section II Recommendation 4 – Study Formal Personnel Training Requirements for Casing and Cementing Operations

Implement recommendations through the Department workgroup within one year

The Department will immediately establish an independent technical workgroup, with appropriate academic, agency, industry and other stakeholder participation, to study whether to establish new training and certification requirements for rig personnel specifically related to casing and cementing operations.

Section II Recommendation 6 – Develop Additional Requirements or Guidelines for Casing Installation

Implement recommendations through a the Department workgroup within one year

he Department will provide for the immediate stablishment of a workgroup, to establish specific equirements or guidelines for the following rocedures and practices:

- Positive and negative test procedures and use of test results for evaluation of casing integrity.
- Use of float valves and other mechanical plugs in the final casing string or liner.

Section II Recommendation 7 – Enforce Tighter Primary Cementing Practices

Implement recommendations through a Department workgroup within one year

- The Department will study whether to determine specific cementing requirements.

Section II Recommendation 8 – Develop Additional Requirements or Guidelines for Evaluation of Cement Integrity

Implement recommendations through Department workgroup within one year

- The Department will immediately establish an independent technical workgroup to evaluate whether and under what circumstances the use of cement bond logs is feasible and practical and will increase safety.

Section II Recommendation 9 –Increase Federal Government Wild-Well Intervention Capabilities

own out, or “wild” wells, involve the uncontrolled release of ude oil or natural gas from an oil well where pressure ntrol systems have failed.

e Federal government should assess its current capability to eal with such emergency situations, particularly in deep ater, and develop a plan to increase its capabilities for direct ld-well intervention, should such be required, in future mergency situations.

ements to be considered include an inventory of existing ethods to stop a blowout and handle escaping wellbore uids, including but not limited to coffer dams, highly-capable OVs, portable hydraulic line hook-ups, and pressure-reading ols.

Section II Recommendation 10 – Study Innovative Wild-Well Intervention, Response Techniques and Response Planning

ddition, the Department will immediately establish a DOI workgroup to study methods to p a blowout and handle escaping wellbore fluids. The technical workgroup will take a fresh k at how to deal with a deepwater blowout. The conventional last resort method to control a wout is to drill a relief well. In deep water this can take several months. But the reality of ng several months to stop a high flowing well at deep water depths was difficult to imagine il the BP oil spill. The offshore oil and gas industry, learning from the BP Oil Spill response erience, should work toward being able to stop a spill resulting from a deepwater blowout. erators should work to be in a position to submit, with their Exploration or Development ns, an emergency response plan that addresses resources (including common resources) that uld be deployed in the event of a serious emergency, even if assessed as low probability.

e technical workgroup should also address operators' ability, on a regional or industry-wide is, to develop and procure a response package for deep water incidents, to include diagnostic l measurement equipment, pre-fabricated systems for deep water oil capture, logistical and nmunications support, and plans and concepts of operations that can quickly be deployed in event of an unanticipated blowout. Assess and certify potential options, e.g., deep water persant injection.

ection III Recommendation 2 – The Department Will Adopt Safety Case Requirements for Floating Drilling Operations on the OCS

Implement through rulemaking within 120 days

- Within 120 days of the date of this report, the Department will assure the adoption of appropriate safety case requirements based on IADC Health, Safety and Environmental Case Guidelines for Mobile Offshore Drilling Units (2009), which will include well construction safety assessment prior to approval of APD.
- This “safety case” should establish risk assessment and mitigation processes to manage a drilling contractor’s controls related to the health, safety and environmental aspects of their operations.
- In addition to the safety case, a separate bridging document should be required to connect the safety case to existing well design and construction documents.
- Such a proposed Well Construction Interfacing Document will include all of the elements in a conventional bridging document plus alignment of the drilling contractor’s management of change (MOC) and risk assessment to the lease operator’s MOC and well execution risk assessments.

Section III Recommendation 4 – Study Additional Safety Training and Certification Requirements

mplement recommendations through a Department workgroup within one year

- The Department will immediately establish a workgroup to investigate safety training requirements for floating drilling rig personnel and possible requirements for independent or more frequent certification and testing of personnel and safety systems.
- Establish an oil production safety program or institute (similar to NRC reactor safety program).
- Consider establishing a formalized analytical methodology to assess performance of safety systems in the event of multiple component failure or excursions outside normal environmental ranges.
- Strengthen technical support to the Department of the Interior and other regulatory authorities, including the resources necessary to obtain independent technical review of regulations and standards.
- Consider chartering a longer-term technical review of BOP reliability.
- Consider importing best practices from other agencies with similar responsibility for safety regulation of technically complex systems, e.g. FAA and NRC.

Nguyen, Ngoc B

From: Black, Steve
Sent: Saturday, June 19, 2010 4:49 PM
To: Ken Arnold
Subject: Out of Office: Meeting Monday

Thank you for your e-mail. I will be out of the office and unable to check or reply to e-mails until Thursday June 24, 2010. If you need immediate assistance, please contact Janea Scott (janea_scott@ios.doi.gov) or Neal Kemkar (neal_kemkar@ios.doi.gov) in the Office of the Secretary. You may also leave a message with my Executive Assistant, Doris Johnston, at 202-208-4123. Thanks.

Nguyen, Ngoc B

From: Benton Baugh [bbaugh@radoil.com]
Sent: Saturday, June 19, 2010 6:16 PM
To: tom.williams@nautilus-int.com; 'Ken Arnold'; 'Bob Bea'; 'Ford Brett'; 'Hans Juvkam-Wold'; 'Martin Chenevert'; 'Per Holand'; 'Skip Ward'
Cc: Black, Steve; Hanley, Kallie; Kemkar, Neal
Subject: RE: Meeting Monday

I would be surprised if he has a 15 minute attention span. It would be appropriate to clearly state the case by slide 2 that he could say yes or no to. I suspect that our only sellable point is that it is safer to continue drilling than restarting later. All the rest demonstrates that due diligence has been done.

Benton

From: Tom Williams [mailto:tom.williams@nautilus-int.com]
Sent: Saturday, June 19, 2010 4:38 PM
To: Ken Arnold; Benton Baugh; Bob Bea; Ford Brett; Hans Juvkam-Wold; Martin Chenevert; Per Holand; Skip Ward
Cc: Steve Black; Kallie Hanley; 'Kemkar, Neal'
Subject: Re: Meeting Monday

Thanks Ken and all the comments are appreciated. Good power points to leave behind. I spoke to a long time friend that works for a mostly democrat and well respected law firm in DC; strong colorado connections; he has known Salazar for a long time:
15 min attention span; well over his head; overwhelmed with the job he has; his staffers are obama worshipers; a relative weak manager and is dictated by the white house (browner); has little understanding of energy business, hates big oil - good news is he is a nice guy and likes smart guys so all of you will be well received. Suggestion was make an offer up front he can't refuse. Details are left for follow ons.

Sent via BlackBerry by AT&T

From: "Ken Arnold" <karnold@karnoldconsulting.com>
Date: Sat, 19 Jun 2010 15:48:09 -0500
To: Benton Baugh<bbaugh@radoil.com>; Bob Bea<bea@ce.berkeley.edu>; Ford Brett<fbrett@petroskills.com>; Hans Juvkam-Wold<juvkam-wold@pe.tamu.edu>; Ken Arnold<karnold@karnoldconsulting.com>; Martin Chenevert<mechenevert@austin.utexas.edu>; Per Holand<Per.holand@exprosoft.com>; Skip Ward<egward@tamu.edu>; Tom Williams<Tom.Williams@Nautilus-Int.com>
Cc: 'Black, Steve'<steve_black@ios.doi.gov>; 'Hanley, Kallie'<Kallie_Hanley@ios.doi.gov>; 'Kemkar, Neal'<Neal_Kemkar@ios.doi.gov>
Subject: Meeting Monday

I have modified the power point based on comments received. I have put the detail listing of various levels of recommendations in the appendix and clarified the outline of the discussion. I will take another run at simplifying and clarifying so keep the cards and letters coming.

I am trying to get statistics on the percent of oil spilled from OCS operations and percent of oil spilled from tanker transportation. I have it for the OCS and I have average oil spilled per year from tankers in North America (30,000 barrels per year from 1990-1999) as opposed to an average of 3300 barrels/year from platforms and rigs (1970-2009

including two bad hurricane decades). The problem is I don't know how much of the 30,000 barrels to attribute to US alone (I am guessing 75% or 22,000). And I don't know how much oil and products are imported each year by tanker. If I assume twice as much is transported by tanker than produced on the OCS, than the ratio of 11,000 to 3300 is a measure of riskiness of importing by tanker rather than producing. It seems to be about 3 to 1. It gets even more complicated if you include bilge water and spills at offloading terminals on the one hand and produced water discharges from platforms on the other but let's not get into that. Sounds like a good Masters thesis and I don't have the time today.

Kenneth E. (Ken) Arnold
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Nguyen, Ngoc B

From: Juvkam-Wold, Hans [juvkam-wold@pe.tamu.edu]
Sent: Sunday, June 20, 2010 9:11 AM
To: Dubin, Lindsay
Cc: Black, Steve; Kemkar, Neal; Hanley, Kallie
Subject: RE: Meeting with Secretary Salazar Monday 6.21.10

Lindsay,

Thanks for sending the call-in information. The meeting starts at 10 a.m. Washington time, is that correct?

Hans

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know by 3:00pm EASTERN tomorrow if you will be able to participate. Please be sure to indicate whether you will be attending in person or via phone. We will reach out to you with arrival instructions or a conference call number following our receipt of your participation.

Thank you,

Lindsay Dubin
Special Assistant
Office of Scheduling and Advance
The U.S. Department of the Interior
p: (202) 208-7551 | f: (202) 208-4694
lindsay_dubin@ios.doi.gov<mailto:brian_screnar@ios.doi.gov>

Nguyen, Ngoc B

From: Ken Arnold [karnold@karnoldconsulting.com]
Sent: Monday, June 21, 2010 5:06 PM
To: Hayes, David
Cc: Black, Steve; 'Godwin, Stephen'
Subject: Power Point, Answers to the Secretary's Challenge and Questions About my NRC Committee
Attachments: Presentation to Secretary of Interior - Rev 4.pptx

David

Attached is a copy of the power point we presented at today's meeting with the Secretary. Please disregard all past versions of this power point. Neal Kemkar has a copy as well.

Two other thoughts:

1. The Secretary's concerns about our ability to handle a leak from a blowout preventer in deep water are reasonable. However, we are in the midst of a very fast learning curve and test program much better than any research project that could be in this regard. Once BP is finished with the devices they have used, they will be available to industry if maintained by Clean Gulf Associates, MSRC or similar organization. Some of these devices which did not work on this well could work on a future well which had a slightly different problem. Since we can't anticipate what the situation of that well could be, we should keep all these mechanisms in our bag of tricks. In a future incident, if there ever is one, some modification will be necessary to fit this equipment to the situation. But that will always be the case. The MMS could certainly put a group together to start with this equipment and build additional potential equipment after further study. It would probably take a year to think of other pieces of equipment which might be useful and to fabricate them in such a way that they could be stored and deployed quickly.

2. I met with Steve Godwin and others at the NRC about the future of the Committee to Evaluate the MMS Offshore Inspection System of which I am chair. I suggested to them that it will be impossible for us to proceed given the number of investigations going forward. We could not get the oil companies to meet with us last month and I think it will be even harder now. Our committee has some good people and we have done some good work to date. I think that MMS or DOI needs to re-think how we can help and not just get in the way. I am not sure how to vet this through the DOI but perhaps DOI should at least consider talking to the Steve Godwin at the NRC about this issue.

Thanks for your attention this morning.

Ken

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Presentation to Secretary of Interior

June 21, 2010

Outline of the Discussion

1. Why We Are Here
2. Putting the Risks in Context
3. Putting the Moratorium in Context
4. Measures that should be taken now to improve safety in the GOM
5. Conclusions
6. Appendices

Why Are We Here

We are not here to provide an economic justification – jobs, revenue lost, etc. That is the job for economists.

We feel safety will be compromised if the 6 month ban is extended to all wells in the GoM over 500 feet in water depth.

This is the time we all need to work together and we understand the job at hand.

This is not the time to punish the innocent nor further harm the public's interest .

Why Are We Here

The moratorium as currently defined INCREASES risk when drilling is eventually resumed.

- 1. Stopping operations in the middle
- 2. Exporting best rigs
- 3. Loss of experienced drilling staff
- 4. Increased tanker traffic

We believe a moratorium is needed, but we believe it can be re-defined to reduce risk

- 1. Remove requirement for stopping operations
- 2. Require the implementation of many of the recommendations of the interim report including some not already included in NTL 05.
- 3. Allow drilling of “low risk” wells to maintain GOM drilling equipment and expertise.

Putting The Risks in Context

BP Oil Spill Disaster

We were not asked to provide analysis of the Horizon incident, but as information has been discovered it is clear best practices were not followed.

- The well design was marginal
- Human errors in judgment were made at very key operational decision points
- Warning signs were overlooked on the rig
- There may have been some failure of equipment

This was all preventable by following currently in place standard practices.

Safety Record of Drilling on the OCS

Over 50,000 wells drilled. 4000 in over 1000 feet of water.

Last major incident resulting in oil coming ashore in 1969. 41 years ago.

From 1970 until April 2010 a total of 1800 barrels of oil spilled due to blowouts.

All measurements of safety indices have shown a steady level of improvement since modern MMS regulations came into effect in 1970.

Record is better than or equal to that or any other region of the world.

Crude Oil Spills from Platform and Rigs from Federal OCS Activities

ears	**Production** (Thousand BBls)	**Number of Spills**	**Barrels Spilled** (Thousand BBls)
960-1969	1,460,000	13	99
970-1979	3,455,000	32	106
980-1989	3,387,000	38	7
990-1999	4,051,000	15	2
000-2009	5,450,000	72	18

lowout Events Exceeding 1,000 Barrels on OCS

Two blowouts associated with a hurricane event that destroyed four platforms. Total of 10,280 barrels crude oil spilled.

One blowout associated with drilling. 1,688 barrels condensate spilled.

One blowout that occurred when a supply vessel collided with a drilling rig during a storm and sheared the wellhead.

2,500 barrels crude oil spilled.

One blowout (Santa Barbara) was associated with drilling.

80,000 barrels spilled.

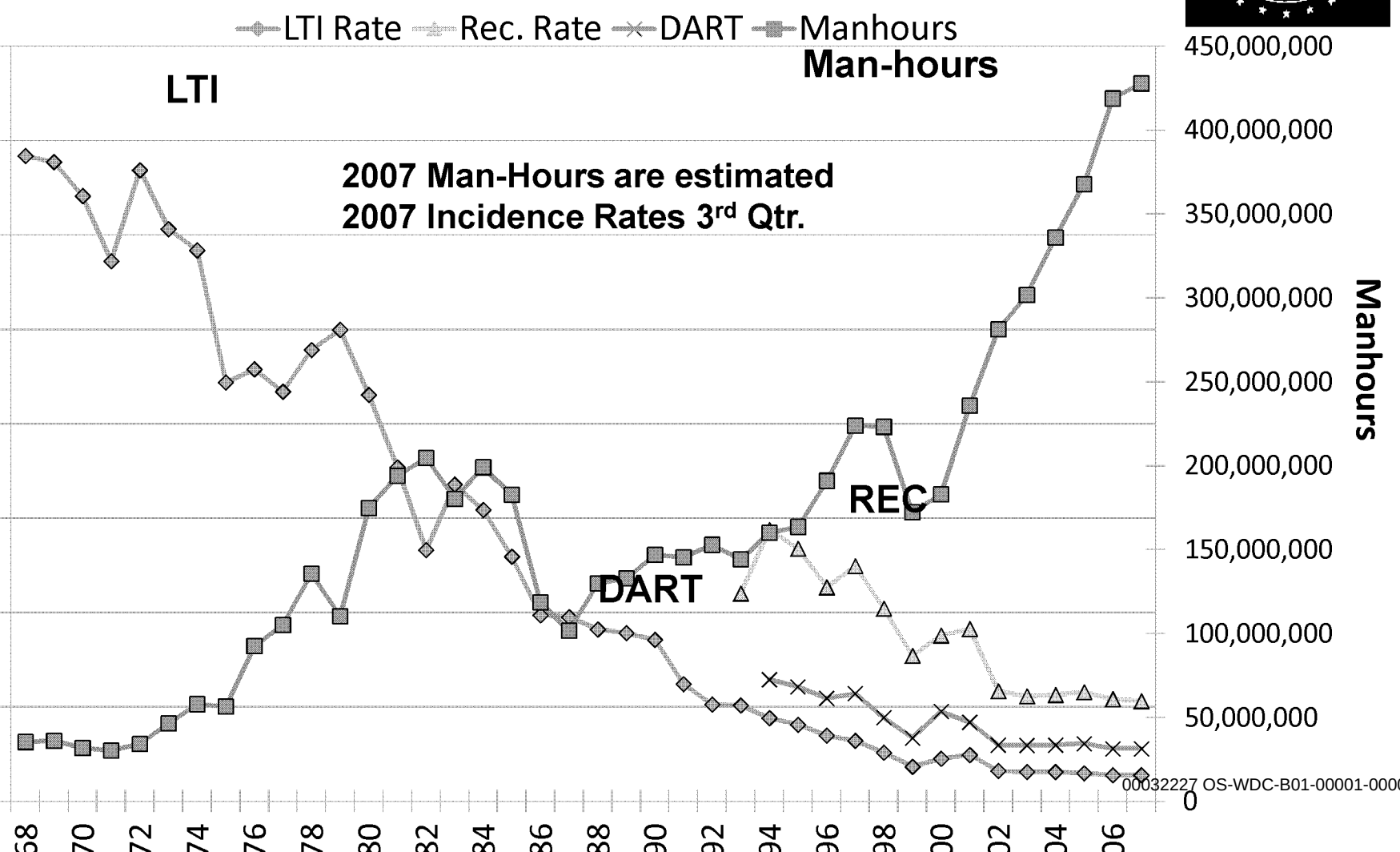
One blowout was caused by a fire in the production area that resulted in the loss of control of 12 wells on the platform.

30,000 barrels crude oil spilled.

One blowout associated with wireline work during workover operations. 53,000 barrels spilled.

om 1971 through 2009, a total of 1,784 barrels was spilled as a

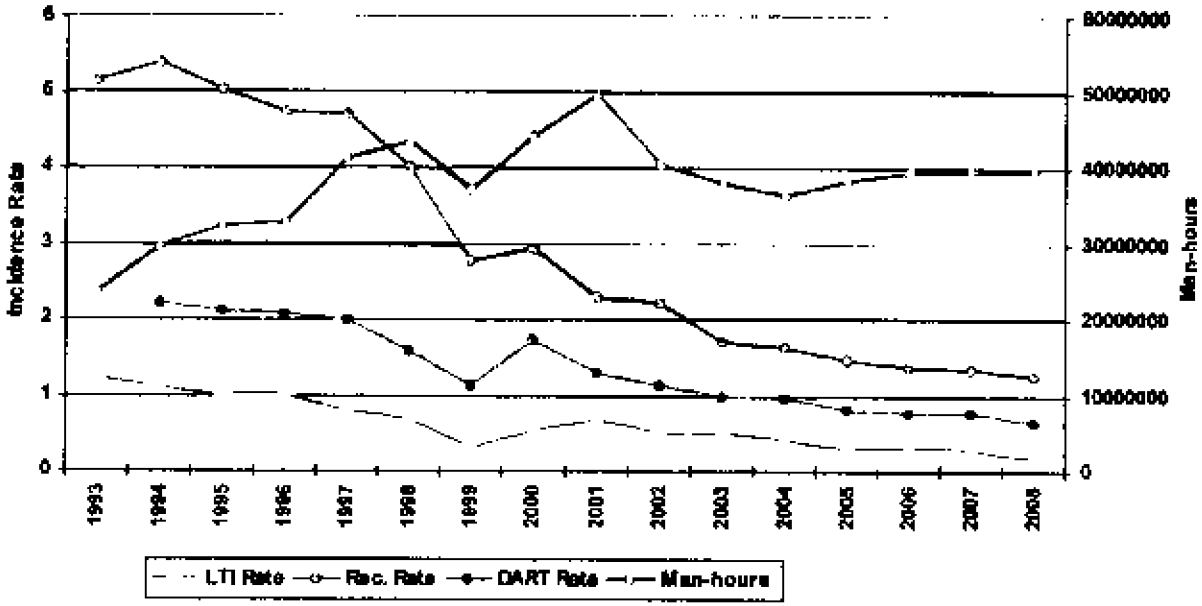
TOTAL INDUSTRY INCIDENCE RATES



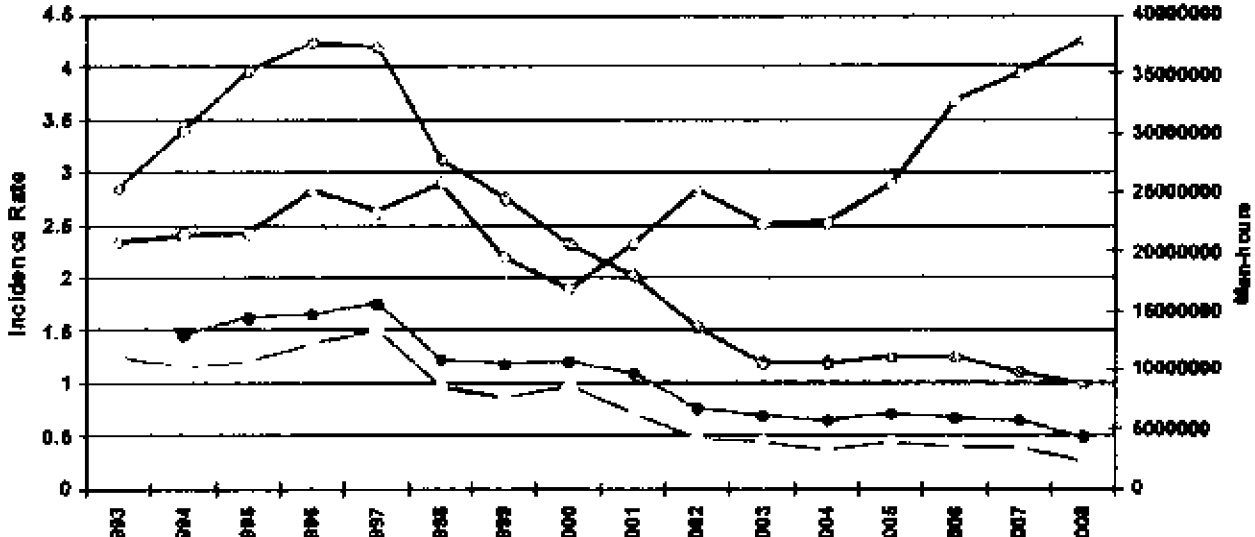
C 2008 US Water Totals		IADC 2008 European Water Totals	
l Man-hours	**39,665,580**	Total Man-hours	**38,049,523**
l Medical Treatment Incidents	**118**	Total Medical Treatment Incidents	**95**
l Restricted Work Incidents	**100**	Total Restricted Work Incidents	**43**
l Lost Time Incidents	**26**	Total Lost Time Incidents	**51**
l Fatalities	**3**	Total Fatalities	**0**
l Recordables	**247**	Total Recordables	**189**
ncidence Rate	**0.15**	LTI Incidence Rate	**0.27**
Frequency Rate	**0.73**	LTI Frequency Rate	**1.34**

st Time Incidence Rate = LTIs + FTLs X 200,000

US Water Total LTI & Recordable Incidence Rates vs Man-hours (Figure 1)

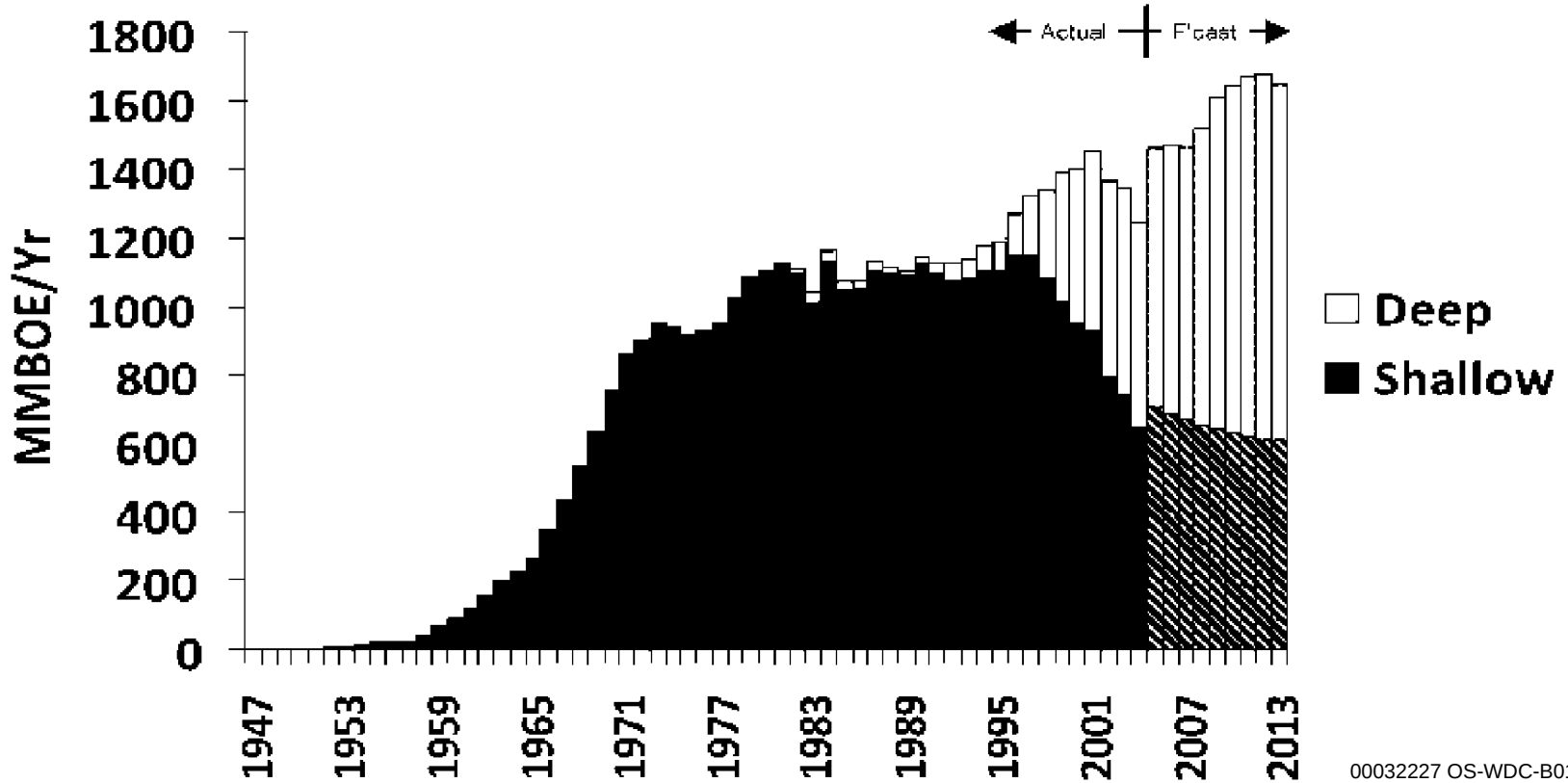


European Water Total Incidence Rates vs Man-hours (Figure 1)



GOM Offshore Production Increasingly from Deepwater

US GOM Offshore



Source: OCS Report MMS 2006-022

Understanding the Risks Summary

Even under existing conditions the record is good and improving at the same time that we are moving more and more into deep water

The Interim Report recommendations which can be implemented immediately (within 30 Days) should reduce the risk further but as the risks are low this is a marginal step

The Interim Report recommendations which take more time (up to 6 Months) should reduce the risks even further but in an even more marginal amount.

Putting the Moratorium in Context

Rationale for a Moratorium

We experts agreed to a list of recommendations which are needed to make drilling safer. Some of these recommendations take time to study and make into regulations to assure compliance. In some cases we agreed with time frames of as long as 6 months and even in one or two cases longer. How can we face the American people and say drilling is safe before all of our own recommendations can be carried out?

By not allowing drilling until all the recommendations we told the DOI are necessary for safety are in place the DOI is honoring our technical analysis.

The “Four Negatives” of the Moratorium

The Moratorium itself increases risk by:

- 1. Stopping operations in the middle
- 2. Exporting best rigs
- 3. Loss of experienced drilling staff
- 4. Increased tanker traffic

To reduce overall risk, the risk reductions which occur as a result of the Moratorium need to outweigh the added risks of the “four negatives”

As currently defined the Moratorium does not accomplish this objective

The Moratorium can be redefined to reduce risk

Effects of Stopping Operations

In any project risks are introduced when an appropriately planned operation is temporarily abandoned and then re-started at some future undetermined date.

- Macondo Well was being temporarily abandoned
- Montara Well was being re=entered after having been temporarily abandoned for four months

The Effect of the Moratorium on Rigs

Best rigs will leave the Gulf first and come back last. This has a marginal negative impact on the overall safety of the fleet.

Rigs will leave on long term contracts (2-5 years) and it will take a long time after the moratorium ends to get them back.

The time to remobilize will take several additional months/years after the Moratorium is lifted and new rules in place.

Effects of Moratorium on Experienced Personnel

- Best people will leave the Gulf
- Workforce significantly impacted, including the thousands of support workers and service providers who support the drilling operations and must adhere to the safety standards – best of them will get work internationally or other industries/jobs.
- Recruitment of new people will stop – the best and brightest do not apply for uncertain jobs
- While some additional training and certification can and will take place during this time – as with the baseball offseason, players need a spring training to get back in shape – "From a safety standpoint we can't afford to have a spring training."
- The industry feels the safest and most effective rig operations and personnel are being punished.

Effects of Moratorium on Tanker Spills

- Source: NRC, “Oil in the Seas”, 2003
- Data for the period 1990-1999 (no one time disaster like Exxon Valdez or BP Macondo)
- Average Best Estimate of Oil Spilled in US waters from offshore platforms and pipelines: 7,000 barrels per year
- Average Best Estimate of Oil Spilled <u>in US waters</u> from tankers: 26,000 barrels per year
  - Does not include spills from US bound tankers in foreign or international waters
  - Does not include spills from marine terminals, refineries and storage tanks
  - Does not include spills at international loading terminals or in producing the oil transported

Measures that should be taken now to improve safety in the GOM

Manage Risk

The level of risk varies significantly between well types based on knowledge of formations being drilled and category of well

The highest risk wells warrant additional time to assure the risk can be managed and drilling these wells are warranted:

- Deepwater exploration wells
  - We have seen it is not just the drilling but the completion of these wells that pose risk
- Unknown pore pressure
- Extremely high pressure and/or high temperature wells

The Key to Increasing Safety

Require adoption of some Interim Report recommendations immediately

Provide a mechanism to allow rigs to remain working in the Gulf of Mexico

- Define a class of wells (other than workover, waterflood, gas injection or water disposal wells) which can be drilled safely. That is, wells where any increased risk by not waiting for all the recommendations to be implemented is lower than the risk of the "Four Negatives"

Maintain Moratorium on "Risky Wells"

Steps to Re-Define the Moratorium to INCREASE Safety

- Allow rigs to complete the work they are currently doing
- Require implementation of the key recommendations of the interim report which can be done within 30 days before ANY new wells can be drilled on the OCS (independent of water depth)
  - 8 Recommendations Already in NTL 05
  - 5 Additional Recommendations which could be added
- Maintain the moratorium on the more risky wells
  - Remaining Recommendations requiring additional study.

Risky Wells

Exploration wells to previously undrilled strata

Deepening existing wells to previously undrilled strata

HP/HT Wells

Less Risky Wells which Can be Drilled

Listed in increasing degree of risk:

- Wells which are abandoned before reaching producing zones (surface casings and top sections only)
- Water Disposal to Non-Producing Reservoirs
- Re-entries and Sidetracks
- Water Disposal to Producing Reservoirs, Waterflood and Gas Injection
- Development Wells to Known Reservoirs
- Workovers
- Drilling to the base of the salt section in deep exploration wells
- Delineation Wells to Non-producing Reservoirs

Wells in red above are already exempted from the moratorium by NTL 04

Conclusions

A moratorium is needed

It needs be defined taking into account ALL elements of risk, including the risks derived from the moratorium itself

Drilling can be made safer quickly by implementing many of the recommendations of the Interim Report

We should not ignore the “Four Negatives” of the moratorium

Allow drilling of “Less Risky Wells” to avoid the Four Negatives

It is justifiable to put a moratorium on “Risky Wells” to allow further thought and study

Appendices

30-Day Recommendations Already in NTL

Recommendations Which Could be Implemented But Are Not Currently in NTL

Recommendations to be Implemented After 30 Days

30-Day Recommendations Already in NTL

Section III Recommendation 1 – Compliance erification for Existing Regulations and April 30, 2010, National Safety Alert

Implement through NTL within 30 days

hin 30 days of the date of this report, the Department, in conjunction with the Department of Homeland urity, will ensure that operators are required to verify compliance with existing regulations and National ety Alert (issued April 30, 2010), which issued the following safety recommendations to operators and ing contractors:

- Examine all well-control equipment (both surface and subsea) currently being used to ensure that it has been properly maintained and is capable of shutting in the well during emergency operations. Ensure that the ROV hot-stabs are function-tested and are capable of actuating the BOP.
- Review all rig drilling/casing/completion practices to ensure that well-control contingencies are not compromised at <u>any</u> point while the BOP is installed on the wellhead.
- Review all emergency shutdown and dynamic positioning procedures that interface with emergency well control operations.
- Inspect lifesaving and firefighting equipment for compliance with federal requirements.
- Ensure that all crew members are familiar with emergency/firefighting equipment, as well as participate in an abandon ship drill. Operators are reminded that the review of emergency equipment and drills should be conducted after each crew change out.
- Exercise emergency power equipment to ensure proper operation.
- Ensure that all personnel involved in well operations are properly trained and capable of performing their tasks under both normal drilling and emergency well control operations.

Section I Recommendation 1 – Order One-Time Only Re-rtification of All BOP Equipment Used in New Floating Drilling Operations

Implement through NTL within 30 days

fore spudding any new well from a floating vessel, the operator will be quired to obtain and deliver to the Department of the Interior a written and ned certification from an independent third-party attesting that, on or er the date of this report, a detailed physical inspection and design review the BOP has been conducted by the equipment manufacturer and owner in cordance with the Original Equipment Manufacturer (OEM) specifications d that (i) the BOP will operate as originally designed; and (ii) any odifications or upgrades to the BOP stack conducted after delivery have not mpromised the design or operation of the BOP.

or to deploying the BOP, the operator must also verify that any odifications or upgrades to the BOP are approved by the Department of the erior and that documentation showing that the BOP has been maintained d inspected according to the requirements in API RP 53 and 30 CFR 0.446(a) is on file with the Department of the Interior or available for pection.

ection I Recommendation 2 – Order BOP Equipment ompatibility Verification for Each Floating Vessel and for Each New Well

Implement through NTL within 30 days

s part of a structured risk management process, the perator will be required to obtain an independent hird-party verification that the BOP will operate ith the drilling rig equipment and that the BOP is ompatible with the specific well location and well asis of design and well execution plan, i.e., in the vent of a well control event the BOP will provide a eal and contain wellbore pressure under all onditions expected in the wellbore.

Section I Recommendation 5– Develop Secondary Control System Requirements and Guidelines

Implement through rulemaking within 120 days

- Minimum ROV intervention capabilities for secondary control of all subsea BOP stacks, including the ability to close all shear and pipe rams, close the choke and kill valves and unlatch the lower marine riser package (LMRP).
- Minimum requirements for an emergency back-up BOP control system that is powered by a separate and independent accumulator bank with sufficient capacity to open and close one annular-type preventer and all ram-type preventers, including the blind shear ram. Such safety systems must include ***at least two*** of the following: autoshear, deadman, emergency disconnect system, and/or an acoustic activation system.
- Guidelines for arming and disarming the secondary BOP control system.
- Guidelines for documentation of BOP maintenance and repair (including any modifications to the BOP stack and control systems).

Section I Recommendation 7 – Develop New Testing Guidelines

Implement through NTL within 30 days

ird-party verification or documentation necessary to show at blind-shear rams will function and are capable of earing the drill pipe that is in use on the rig.

Implement partially through NTL within 30 days, then rulemaking within 120 days

inimum ROV performance testing standards, including rface and subsea function testing of ROV intervention ports d ROV pumps, to ensure compatibility with the BOP stack d that the ROV can close all shear and pipe rams, close the oke and kill valves, and unlatch the lower marine riser ckage.

Section I Recommendation 7 – Develop New Testing Guidelines

Implement through NTL within 30 days

andatory inspection and testing of BOP stack if any omponents are used in an emergency, *e.g.,* use of pipe casing shear rams or circulating out a well kick. This sting should involve a full pressure test of the BOP ter the situation is fully controlled, with the BOP on e wellhead.

Section I Recommendation 8 – Develop New Inspection Procedures and Reporting Requirements

Implement through NTL within 30 days

eginning no later than 60 days after the date of this port, all operators of floating drilling equipment will port to the Department of the Interior the following: (i) OP and well control system configuration, (ii) BOP and ell control system test results, including any anomalies testing or operation of critical BOP components, (iii) OP and well control incidents, and (iv) BOP and well ontrol system downtime for the last three years of illing operations.

Section II Recommendation 3 – New Casing And Cement Design Requirements: Two Independent Tested Barriers

Implement through NTL within 30 days

efore spudding any new floating drilling operation, all ell casing and cement designs must be signed by a rofessional Engineer, verifying that there will be at ast two independent tested barriers, including one echanical barrier, across each flow path during well ompletion and abandonment activities and that casing esign is appropriate for the purpose for which it is tended under reasonably expected wellbore onditions.

Section II Recommendation 5 – New Casing Installation Procedures

Implement through NTL within 30 days

he Department will ensure the requirement of the llowing BAST practices:

- Casing hanger latching mechanisms or lock down mechanisms must be engaged at the time the casing is installed in the subsea wellhead.
- For the final casing string, the operator must verify the installation of dual mechanical barriers (*e.g.,* dual floats or one float and a mechanical plug) in addition to cement, to prevent flow in the event of a failure in the cement.

Recommendations Which Could be Implemented But Are Not Currently in NTL

Section I Recommendation 7 – Develop New Testing Guidelines

Implement through NTL within 30 days

linimum surface and subsea function and ressure testing requirements to simulate (i) nintended disconnect of the lower marine riser ackage (LMRP), and (ii) loss of surface control e.g., electric and hydraulic power) of the subsea OP stack.

Section I Recommendation 8 – Develop New Inspection Procedures and Reporting Requirements

nplement in accordance with internal Departmental Guidance issued within 30 days

- The Department will evaluate and revise the manner in which it conducts its drilling inspections.
- Revised drilling inspections should include the witnessing of actual tests of BOP equipment, including the new requirements and guidance that address the surface and subsea testing of ROV and BOP stack capabilities.
- The Department will also develop methods to increase transparency and public availability of the results of inspections as well as routine reporting.
- The Department will work with Congress to obtain the necessary resources to implement these recommendations.

ection II Recommendation 2 – New Fluid Displacement Procedures

Implement through NTL within 30 days

or to displacement of kill-weight drilling fluid from the wellbore, the operator must ependently verify that:

- The BOPs are closed during displacement to underbalanced fluid columns to prevent gas entry into the riser should a seal failure occur during displacement.
- Two independent barriers, including one mechanical barrier, are in place for each flow path (i.e., casing and annulus).
- If the shoe track (the cement plug and check valves that remain inside the bottom of casing after cementing) is to be used as one of these barriers, it is negatively tested prior to the setting of the subsequent casing barrier. A negative test should also be performed prior to setting the surface plug.
- Negative tests are made to a differential pressure equal to or greater than the anticipated pressure after displacement. Each casing barrier is positively tested to a pressure that exceeds the highest estimated integrity of the casing shoes below the barrier.
- Displacement of the riser and casing to fluid columns that are underbalanced to the formation pressure in the wellbore is conducted in separate operations. In both cases, BOPs should be closed on the drill string and circulation established through the choke line to isolate the riser, which is not a rated barrier. During displacement, volumes in and out must be accurately monitored.
- Drill string components positioned in the shear rams during displacement must be capable

Section II Recommendation 7 – Enforce Tighter Primary Cementing Practices

Implement through a rulemaking within 120 days

he Department will institute a rulemaking to onsider the adoption of API RP 65 Part 2:

- Isolating potential flow zones during well construction (addressing previously identified gaps in primary cementing practices).

Section III Recommendation 3 –Adopt Final Safety and Environmental Management Systems Rule

Implement through publication of final rule within 30 days

OCS Safety Oversight Board will ensure the promulgation of a final SEMS Rule with full implementation of lements, along with provisions for public availability of information developed and collected under the rule ncrease transparency and accountability.

IS is a structured and comprehensive method for applying operational, safety and environmental protection ciples to offshore activities by focusing on personnel and ensuring accountability for operations throughout organization in the following specific areas:

1. Safety & Environmental Information
2. Hazards Analysis
3. Management of Change
4. Operating Procedures
5. Safe Work Practices
6. Training
7. Mechanical Integrity
8. Pre-Startup Review
9. Emergency Response & Control
10. Investigation of Accidents
11. Auditing the Program
12. Records & Documentation

Recommendations to be Implemented After 30 Days

Section I Recommendation 3 – Study Formal Equipment Certification Requirements

Implement recommendations through the Department workgroup within one year

e Department will immediately establish an independent technical orkgroup to review current, and investigate new, certification requirements BOP equipment and other components of the BOP stack such as control nels, communication pods, accumulator systems, and choke and kill lines. addition, this workgroup will recommend ways to make BOP certifications blicly available in order to increase transparency and accountability.

e establishment of a technical workgroup to examine the need for rtification of BOP systems and components is important; even when a BOP ck has all the above mentioned systems and components, it is of little use t does not function properly to prevent a well blowout.

Section I Recommendation 4 – New Blind Shear Ram Redundancy Requirement

Implement through rulemaking within 120 days

Within one year from the date of this report, all oating drilling operations will be required to ave two sets of blind shear rams spaced at ast 4 feet apart (to prevent system failure if rill pipe joint or drill tool is across one set of ams during an emergency).

Section I Recommendation 6 – Develop New ROV Operating Capabilities

Implement recommendations through the Department workgroup within one year

e Department will immediately establish an independent technical
rkgroup to develop further improvements to ROV operating capabilities
luding the following:

- Standardized hydraulic and electrical interfaces for all subsea BOP stacks so that they are accessible by any available ROV.
- Visual mechanical indicator or redundant telemetry channel to confirm ram closure (*e.g.,* a position indicator).
- Methods of subsea testing that would avoid detrimental effects of seawater in BOP system (*e.g.,* ROV with external hydraulic supply).
- An ROV interface with a valve below the lowest ram on the BOP stack to allow well-killing operations.

Section I Recommendation 7 – Develop New Testing Guidelines

No later than 180 days after the date of this report

- Department will develop clear requirements and guidelines
t address the surface and subsea testing of ROV and BOP stack
abilities.

Implement through rulemaking within 120 days

- Protocols for function testing, autoshear, deadman, emergency
disconnect systems and acoustic activation systems.

Section I Recommendation 8 – Develop New Inspection Procedures and Reporting Requirements

Implement through rulemaking within 120 days

here feasible, the electronic log from the BOP control system ould be transmitted online to a secure location onshore and ade available for inspection by the Department of the Interior.

Section II Recommendation 1 – Establish Deepwater Well-Control Procedure Guidelines

Implement through rulemaking within 120 days

ithin 120 days of the date of this report, the Department will sure that requirements and guidelines for deepwater well-ntrol procedures are established.

Section II Recommendation 4 – Study Formal Personnel Training Requirements for Casing and Cementing Operations

Implement recommendations through the Department workgroup within one year

The Department will immediately establish an independent technical workgroup, with appropriate academic, agency, industry and other stakeholder participation, to study whether to establish new training and certification requirements for rig personnel specifically related to casing and cementing operations.

Section II Recommendation 6 – Develop Additional Requirements or Guidelines for Casing Installation

Implement recommendations through a the Department workgroup within one year

he Department will provide for the immediate stablishment of a workgroup, to establish specific equirements or guidelines for the following rocedures and practices:

- Positive and negative test procedures and use of test results for evaluation of casing integrity.
- Use of float valves and other mechanical plugs in the final casing string or liner.

Section II Recommendation 7 – Enforce Tighter Primary Cementing Practices

Implement recommendations through a Department workgroup within one year

- The Department will study whether to determine specific cementing requirements.

Section II Recommendation 8 – Develop Additional Requirements or Guidelines for Evaluation of Cement Integrity

Implement recommendations through Department workgroup within one year

- The Department will immediately establish an independent technical workgroup to evaluate whether and under what circumstances the use of cement bond logs is feasible and practical and will increase safety.

Section II Recommendation 9 –Increase Federal Government Wild-Well Intervention Capabilities

own out, or “wild” wells, involve the uncontrolled release of ude oil or natural gas from an oil well where pressure ntrol systems have failed.

e Federal government should assess its current capability to eal with such emergency situations, particularly in deep ater, and develop a plan to increase its capabilities for direct ld-well intervention, should such be required, in future mergency situations.

ements to be considered include an inventory of existing ethods to stop a blowout and handle escaping wellbore uids, including but not limited to coffer dams, highly-capable OVs, portable hydraulic line hook-ups, and pressure-reading ols.

Section II Recommendation 10 – Study Innovative Wild-Well Intervention, Response Techniques and Response Planning

ddition, the Department will immediately establish a DOI workgroup to study methods to p a blowout and handle escaping wellbore fluids. The technical workgroup will take a fresh k at how to deal with a deepwater blowout. The conventional last resort method to control a wout is to drill a relief well. In deep water this can take several months. But the reality of ng several months to stop a high flowing well at deep water depths was difficult to imagine il the BP oil spill. The offshore oil and gas industry, learning from the BP Oil Spill response erience, should work toward being able to stop a spill resulting from a deepwater blowout. erators should work to be in a position to submit, with their Exploration or Development ns, an emergency response plan that addresses resources (including common resources) that uld be deployed in the event of a serious emergency, even if assessed as low probability.

e technical workgroup should also address operators' ability, on a regional or industry-wide is, to develop and procure a response package for deep water incidents, to include diagnostic l measurement equipment, pre-fabricated systems for deep water oil capture, logistical and nmunications support, and plans and concepts of operations that can quickly be deployed in event of an unanticipated blowout. Assess and certify potential options, e.g., deep water persant injection.

ection III Recommendation 2 – The Department Will Adopt Safety Case Requirements for Floating Drilling Operations on the OCS

Implement through rulemaking within 120 days

- Within 120 days of the date of this report, the Department will assure the adoption of appropriate safety case requirements based on IADC Health, Safety and Environmental Case Guidelines for Mobile Offshore Drilling Units (2009), which will include well construction safety assessment prior to approval of APD.
- This “safety case” should establish risk assessment and mitigation processes to manage a drilling contractor’s controls related to the health, safety and environmental aspects of their operations.
- In addition to the safety case, a separate bridging document should be required to connect the safety case to existing well design and construction documents.
- Such a proposed Well Construction Interfacing Document will include all of the elements in a conventional bridging document plus alignment of the drilling contractor’s management of change (MOC) and risk assessment to the lease operator’s MOC and well execution risk assessments.

Section III Recommendation 4 – Study Additional Safety Training and Certification Requirements

mplement recommendations through a Department workgroup within one year

- The Department will immediately establish a workgroup to investigate safety training requirements for floating drilling rig personnel and possible requirements for independent or more frequent certification and testing of personnel and safety systems.
- Establish an oil production safety program or institute (similar to NRC reactor safety program).
- Consider establishing a formalized analytical methodology to assess performance of safety systems in the event of multiple component failure or excursions outside normal environmental ranges.
- Strengthen technical support to the Department of the Interior and other regulatory authorities, including the resources necessary to obtain independent technical review of regulations and standards.
- Consider chartering a longer-term technical review of BOP reliability.
- Consider importing best practices from other agencies with similar responsibility for safety regulation of technically complex systems, e.g. FAA and NRC.

Nguyen, Ngoc B

From: Ken Arnold [karnold@karnoldconsulting.com]
Sent: Tuesday, June 22, 2010 8:44 AM
To: Black, Steve; Kemkar, Neal; Hanley, Kallie
Cc: Benton Baugh; Bob Bea; Ford Brett; Hans Juvkam-Wold; Ken Arnold; Martin Chenevert; Per Holand; Skip Ward; Tom Williams
Subject: FW: DOI report

In the email below you can see I have been asked to forward a copy of the power point. I suggested the staff person contact DOI direct. In the meantime, I have also been contacted by several reporters for copies. I am reluctant to do so as our group wants to work with the Secretary to help redefine the moratorium and not be as negative as we are being portrayed in the media. We do not want to take an action which will be thought of as hostile.

On the other hand, today's NYT story (http://nyti.ms/c2NiZv) seems to indicate the administration's mind is made up and the moratorium will extend with no changes into next year. If this is the case we are inclined to release the power point.

Please **reply to all** with your thoughts.

Ken

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From: Moore, Kristina [mailto:Kristina.Moore@mail.house.gov]
Sent: Monday, June 21, 2010 1:07 PM
To: karnold@karnoldconsulting.com
Subject: DOI report

Mr. Arnold,

Thank you for your time this afternoon. As I mentioned on the phone, I am a senior investigator for Ranking Member Darrell Issa of the House Oversight and Government Reform Committee. The Wall Street Journal article, "Crude Politics," which discusses your concern for an increased safety risk associated with the six month moratorium, caught his eye. Accordingly, I have been instructed to learn more about possible alternatives to the moratorium that would not increase the risk to future drilling operations. In particular, he has expressed interest in proposals such as the "drill but not tap" strategy, which could have the benefit of keeping rigs operating, thereby reducing their incentive to leave the Gulf.

As such, I am very interested in obtaining a copy of the power point presentation you provided to the Department of Interior with these recommendations, as well as any other information that can help inform this discussion. Our standard operating procedure is to notify the source before any public dissemination of documents provided to the Committee and otherwise accommodate specific requests for confidential treatment.

Additionally, I am happy to make the identical request of the Department of Interior. However, you should know that the Department has been less than responsive to pretty much any Congressional investigation, relying heavily on the explanation that "all hands are on deck" responding to the crisis. If you could provide me with identifying characteristics of

the report (date, time, location, of the presentation, and the title of the presentation) that could help facilitate the processing of our request.

I am happy to respond to any questions that you may have and hope that we can start an open dialogue as we work to respond to the disaster in the Gulf.

Many Thanks,

Kristina Moore

Kristina M. Moore

Senior Counsel

Rep. Darrell Issa

Ranking Member of House Oversight and Government Reform

(202) 226-6080

Kristina.Moore@mail.house.gov

Nguyen, Ngoc B

From: Ken Arnold [karnold@karnoldconsulting.com]
Sent: Wednesday, June 23, 2010 7:47 PM
To: Benton Baugh; Bob Bea; Ford Brett; Hans Juvkam-Wold; Ken Arnold; Martin Chenevert; Per Holand; Skip Ward; Tom Williams
Cc: Black, Steve; Kemkar, Neal; Hanley, Kallie
Subject: Power Point Presented to Secretary Salazar on 6/21/2010
Attachments: Presentation to Secretary of Interior - Rev 4.pptx

You are receiving this because you expressed an interest in having a copy of the subject report. DOI has been asked if they have a problem with us distributing this to whomever asks and have not expressed an objection. Those present at the meeting or by phone were the original signers of the Group of 8, plus Per Holland and Arnold Stancell. Bob Bea and Skip Ward were unable to participate. From DOI attendees beside the Secretary included David Hayes, Tom Strickland, The new Director of the MMS Mike B (please excuse my inability to spell his last name as I am traveling and don't really have time to look it up).

The people contributing to this power point besides myself are:

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The list of those getting this is as follows, but I have copied only two at a time so it is not blocked by a spam filter:

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The Secretary has expressed an interest in meeting with us in two weeks with a wider audience.

Please be advised I am in SE Asia and will return to Houston Tuesday the 30th in the afternoon. Do not call my cell phone unless it is important as it is an expensive call for me. Also I have been unable to pick up my phone messages since leaving the US. I may be able to pick them up when I leave Viet Nom for Singapore Sunday but am not sure.

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Presentation to Secretary of Interior

June 21, 2010

Outline of the Discussion

1. Why We Are Here
2. Putting the Risks in Context
3. Putting the Moratorium in Context
4. Measures that should be taken now to improve safety in the GOM
5. Conclusions
6. Appendices

Why Are We Here

We are not here to provide an economic justification – jobs, revenue lost, etc. That is the job for economists.

We feel safety will be compromised if the 6 month ban is extended to all wells in the GoM over 500 feet in water depth.

This is the time we all need to work together and we understand the job at hand.

This is not the time to punish the innocent nor further harm the public's interest .

Why Are We Here

The moratorium as currently defined INCREASES risk when drilling is eventually resumed.

- 1. Stopping operations in the middle
- 2. Exporting best rigs
- 3. Loss of experienced drilling staff
- 4. Increased tanker traffic

We believe a moratorium is needed, but we believe it can be re-defined to reduce risk

- 1. Remove requirement for stopping operations
- 2. Require the implementation of many of the recommendations of the interim report including some not already included in NTL 05.
- 3. Allow drilling of “low risk” wells to maintain GOM drilling equipment and expertise.

Putting The Risks in Context

BP Oil Spill Disaster

We were not asked to provide analysis of the Horizon incident, but as information has been discovered it is clear best practices were not followed.

- The well design was marginal
- Human errors in judgment were made at very key operational decision points
- Warning signs were overlooked on the rig
- There may have been some failure of equipment

This was all preventable by following currently in place standard practices.

Safety Record of Drilling on the OCS

Over 50,000 wells drilled. 4000 in over 1000 feet of water.

Last major incident resulting in oil coming ashore in 1969. 41 years ago.

From 1970 until April 2010 a total of 1800 barrels of oil spilled due to blowouts.

All measurements of safety indices have shown a steady level of improvement since modern MMS regulations came into effect in 1970.

Record is better than or equal to that or any other region of the world.

Crude Oil Spills from Platform and Rigs from Federal OCS Activities

ears	**Production** (Thousand BBls)	**Number of Spills**	**Barrels Spilled** (Thousand BBls)
960-1969	1,460,000	13	99
970-1979	3,455,000	32	106
980-1989	3,387,000	38	7
990-1999	4,051,000	15	2
000-2009	5,450,000	72	18

lowout Events Exceeding 1,000 Barrels on OCS

Two blowouts associated with a hurricane event that destroyed four platforms. Total of 10,280 barrels crude oil spilled.

One blowout associated with drilling. 1,688 barrels condensate spilled.

One blowout that occurred when a supply vessel collided with a drilling rig during a storm and sheared the wellhead.

2,500 barrels crude oil spilled.

One blowout (Santa Barbara) was associated with drilling.

80,000 barrels spilled.

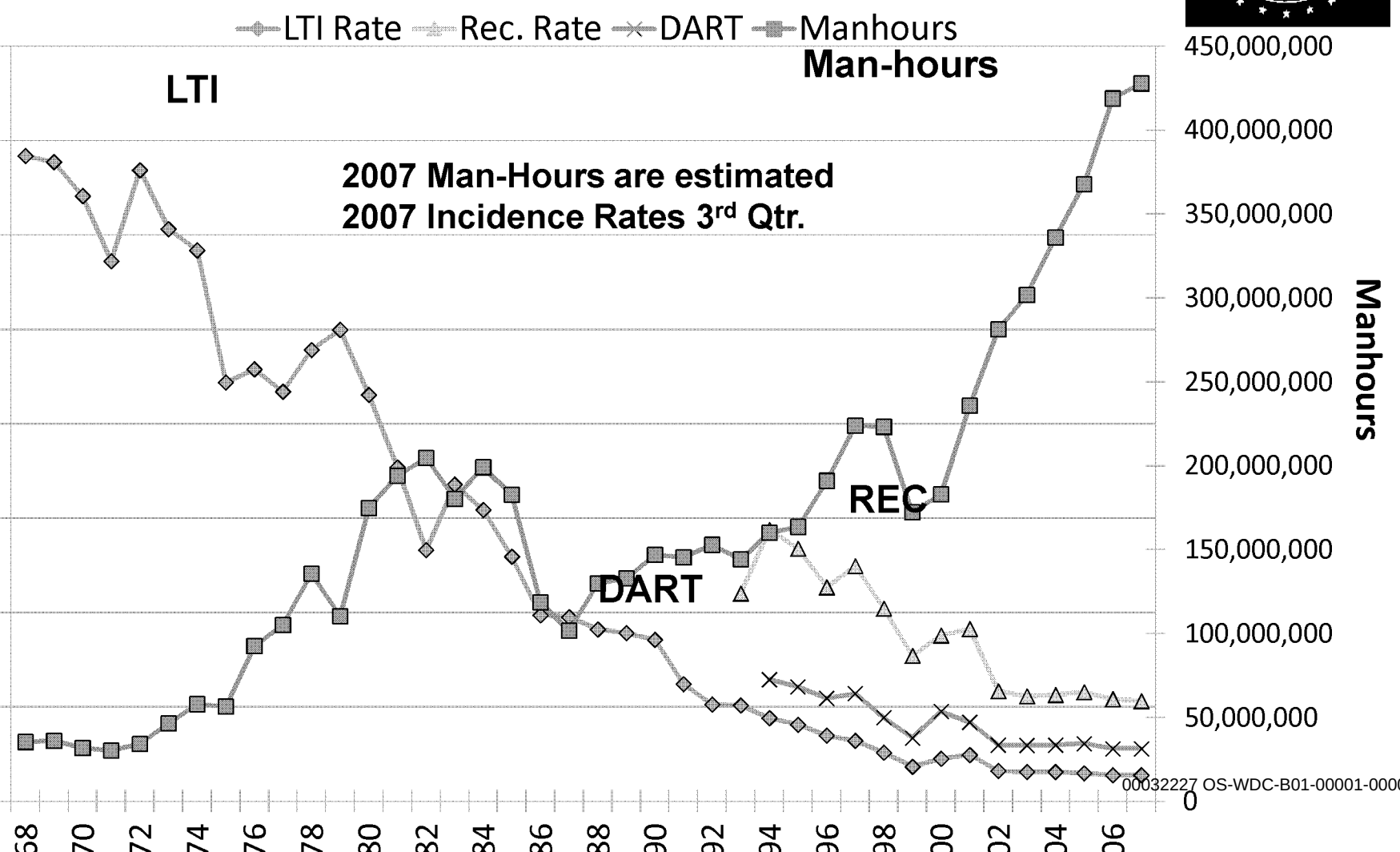
One blowout was caused by a fire in the production area that resulted in the loss of control of 12 wells on the platform.

30,000 barrels crude oil spilled.

One blowout associated with wireline work during workover operations. 53,000 barrels spilled.

om 1971 through 2009, a total of 1,784 barrels was spilled as a

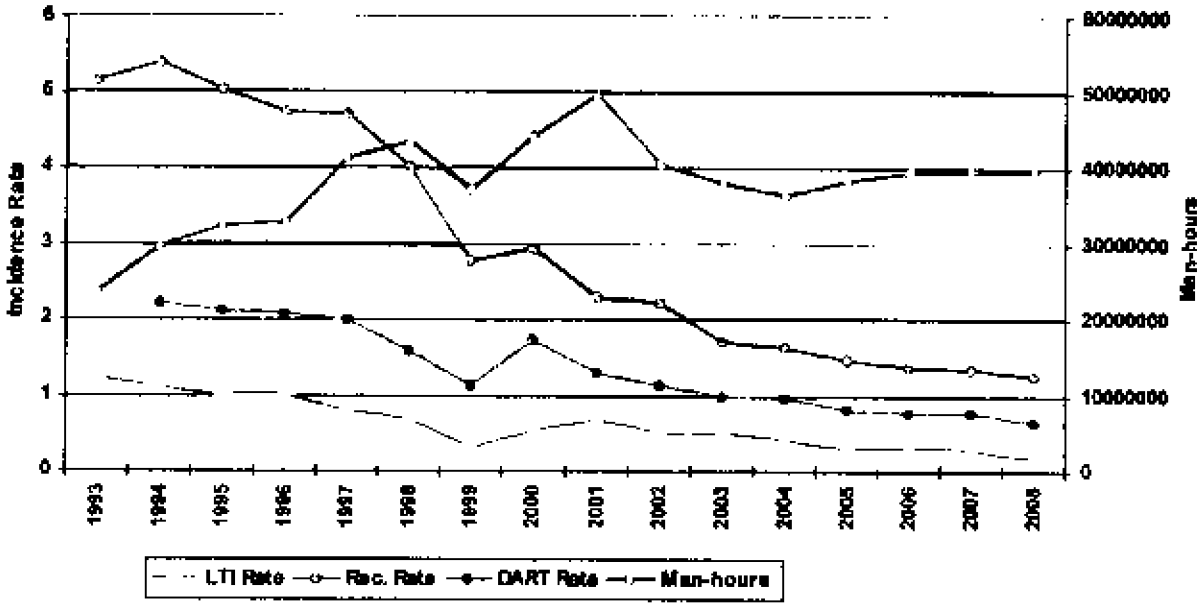
TOTAL INDUSTRY INCIDENCE RATES



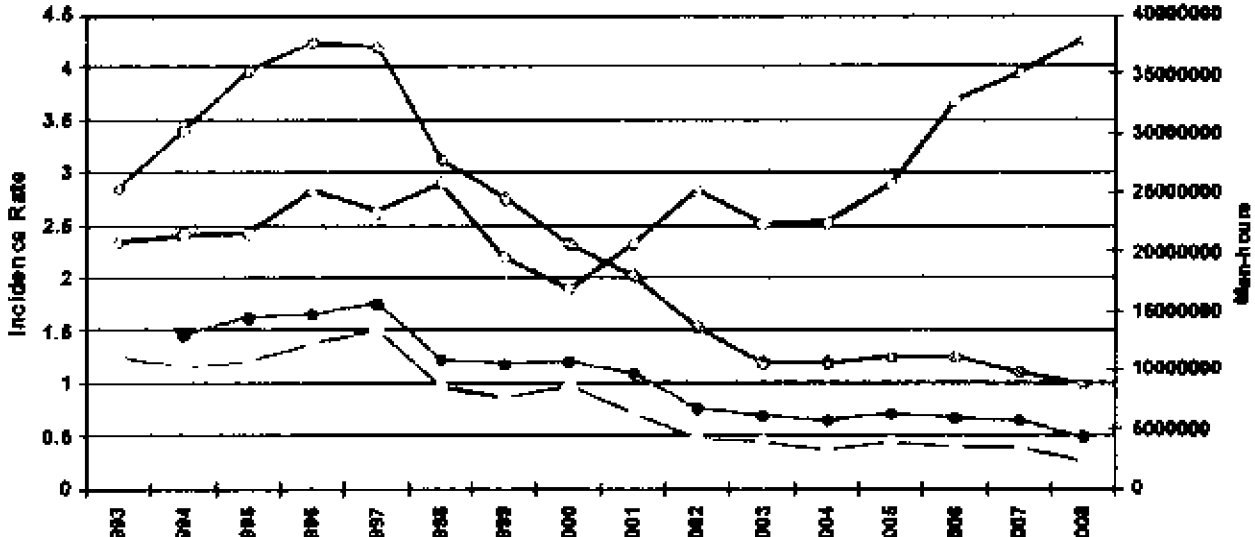
C 2008 US Water Totals		IADC 2008 European Water Totals	
l Man-hours	**39,665,580**	Total Man-hours	**38,049,523**
l Medical Treatment Incidents	**118**	Total Medical Treatment Incidents	**95**
l Restricted Work Incidents	**100**	Total Restricted Work Incidents	**43**
l Lost Time Incidents	**26**	Total Lost Time Incidents	**51**
l Fatalities	**3**	Total Fatalities	**0**
l Recordables	**247**	Total Recordables	**189**
ncidence Rate	**0.15**	LTI Incidence Rate	**0.27**
Frequency Rate	**0.73**	LTI Frequency Rate	**1.34**

st Time Incidence Rate = LTIs + FTLs X 200,000

US Water Total LTI & Recordable Incidence Rates vs Man-hours (Figure 1)

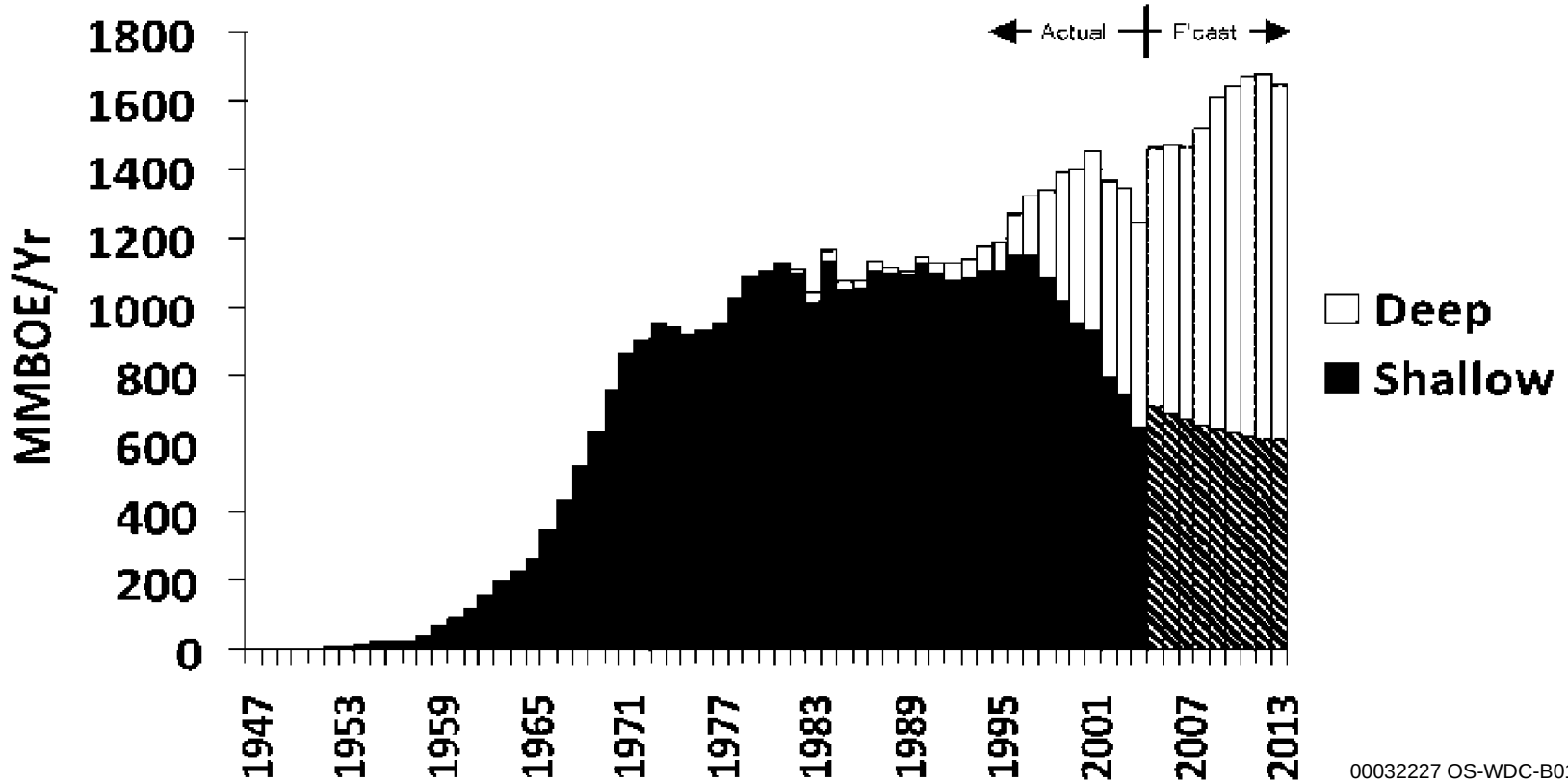


European Water Total Incidence Rates vs Man-hours (Figure 1)



GOM Offshore Production Increasingly from Deepwater

US GOM Offshore



Source: OCS Report MMS 2006-022

Understanding the Risks Summary

Even under existing conditions the record is good and improving at the same time that we are moving more and more into deep water

The Interim Report recommendations which can be implemented immediately (within 30 Days) should reduce the risk further but as the risks are low this is a marginal step

The Interim Report recommendations which take more time (up to 6 Months) should reduce the risks even further but in an even more marginal amount.

Putting the Moratorium in Context

Rationale for a Moratorium

We experts agreed to a list of recommendations which are needed to make drilling safer. Some of these recommendations take time to study and make into regulations to assure compliance. In some cases we agreed with time frames of as long as 6 months and even in one or two cases longer. How can we face the American people and say drilling is safe before all of our own recommendations can be carried out?

By not allowing drilling until all the recommendations we told the DOI are necessary for safety are in place the DOI is honoring our technical analysis.

The “Four Negatives” of the Moratorium

The Moratorium itself increases risk by:

- 1. Stopping operations in the middle
- 2. Exporting best rigs
- 3. Loss of experienced drilling staff
- 4. Increased tanker traffic

To reduce overall risk, the risk reductions which occur as a result of the Moratorium need to outweigh the added risks of the “four negatives”

As currently defined the Moratorium does not accomplish this objective

The Moratorium can be redefined to reduce risk

Effects of Stopping Operations

In any project risks are introduced when an appropriately planned operation is temporarily abandoned and then re-started at some future undetermined date.

- Macondo Well was being temporarily abandoned
- Montara Well was being re=entered after having been temporarily abandoned for four months

The Effect of the Moratorium on Rigs

- Best rigs will leave the Gulf first and come back last. This has a marginal negative impact on the overall safety of the fleet.
- Rigs will leave on long term contracts (2-5 years) and it will take a long time after the moratorium ends to get them back.
- The time to remobilize will take several additional months/years after the Moratorium is lifted and new rules in place.

Effects of Moratorium on Experienced Personnel

- Best people will leave the Gulf
- Workforce significantly impacted, including the thousands of support workers and service providers who support the drilling operations and must adhere to the safety standards – best of them will get work internationally or other industries/jobs.
- Recruitment of new people will stop – the best and brightest do not apply for uncertain jobs
- While some additional training and certification can and will take place during this time – as with the baseball offseason, players need a spring training to get back in shape – "From a safety standpoint we can't afford to have a spring training."
- The industry feels the safest and most effective rig operations and personnel are being punished.

Effects of Moratorium on Tanker Spills

- Source: NRC, “Oil in the Seas”, 2003
- Data for the period 1990-1999 (no one time disaster like Exxon Valdez or BP Macondo)
- Average Best Estimate of Oil Spilled in US waters from offshore platforms and pipelines: 7,000 barrels per year
- Average Best Estimate of Oil Spilled <u>in US waters</u> from tankers: 26,000 barrels per year
  - Does not include spills from US bound tankers in foreign or international waters
  - Does not include spills from marine terminals, refineries and storage tanks
  - Does not include spills at international loading terminals or in producing the oil transported

Measures that should be taken now to improve safety in the GOM

Manage Risk

The level of risk varies significantly between well types based on knowledge of formations being drilled and category of well

The highest risk wells warrant additional time to assure the risk can be managed and drilling these wells are warranted:

- Deepwater exploration wells
  - We have seen it is not just the drilling but the completion of these wells that pose risk
- Unknown pore pressure
- Extremely high pressure and/or high temperature wells

The Key to Increasing Safety

Require adoption of some Interim Report recommendations immediately

Provide a mechanism to allow rigs to remain working in the Gulf of Mexico

- Define a class of wells (other than workover, waterflood, gas injection or water disposal wells) which can be drilled safely. That is, wells where any increased risk by not waiting for all the recommendations to be implemented is lower than the risk of the "Four Negatives"

Maintain Moratorium on "Risky Wells"

Steps to Re-Define the Moratorium to INCREASE Safety

- Allow rigs to complete the work they are currently doing
- Require implementation of the key recommendations of the interim report which can be done within 30 days before ANY new wells can be drilled on the OCS (independent of water depth)
  - 8 Recommendations Already in NTL 05
  - 5 Additional Recommendations which could be added
- Maintain the moratorium on the more risky wells
  - Remaining Recommendations requiring additional study.

Risky Wells

Exploration wells to previously undrilled strata

Deepening existing wells to previously undrilled strata

HP/HT Wells

Less Risky Wells which Can be Drilled

Listed in increasing degree of risk:

- Wells which are abandoned before reaching producing zones (surface casings and top sections only)
- Water Disposal to Non-Producing Reservoirs
- Re-entries and Sidetracks
- Water Disposal to Producing Reservoirs, Waterflood and Gas Injection
- Development Wells to Known Reservoirs
- Workovers
- Drilling to the base of the salt section in deep exploration wells
- Delineation Wells to Non-producing Reservoirs

Wells in red above are already exempted from the moratorium by NTL 04

Conclusions

A moratorium is needed

It needs be defined taking into account ALL elements of risk, including the risks derived from the moratorium itself

Drilling can be made safer quickly by implementing many of the recommendations of the Interim Report

We should not ignore the “Four Negatives” of the moratorium

Allow drilling of “Less Risky Wells” to avoid the Four Negatives

It is justifiable to put a moratorium on “Risky Wells” to allow further thought and study

Appendices

30-Day Recommendations Already in NTL

Recommendations Which Could be Implemented But Are Not Currently in NTL

Recommendations to be Implemented After 30 Days

30-Day Recommendations Already in NTL

Section III Recommendation 1 – Compliance erification for Existing Regulations and April 30, 2010, National Safety Alert

Implement through NTL within 30 days

hin 30 days of the date of this report, the Department, in conjunction with the Department of Homeland urity, will ensure that operators are required to verify compliance with existing regulations and National ety Alert (issued April 30, 2010), which issued the following safety recommendations to operators and ing contractors:

- Examine all well-control equipment (both surface and subsea) currently being used to ensure that it has been properly maintained and is capable of shutting in the well during emergency operations. Ensure that the ROV hot-stabs are function-tested and are capable of actuating the BOP.
- Review all rig drilling/casing/completion practices to ensure that well-control contingencies are not compromised at <u>any</u> point while the BOP is installed on the wellhead.
- Review all emergency shutdown and dynamic positioning procedures that interface with emergency well control operations.
- Inspect lifesaving and firefighting equipment for compliance with federal requirements.
- Ensure that all crew members are familiar with emergency/firefighting equipment, as well as participate in an abandon ship drill. Operators are reminded that the review of emergency equipment and drills should be conducted after each crew change out.
- Exercise emergency power equipment to ensure proper operation.
- Ensure that all personnel involved in well operations are properly trained and capable of performing their tasks under both normal drilling and emergency well control operations.

Section I Recommendation 1 – Order One-Time Only Re-rtification of All BOP Equipment Used in New Floating Drilling Operations

Implement through NTL within 30 days

fore spudding any new well from a floating vessel, the operator will be quired to obtain and deliver to the Department of the Interior a written and ned certification from an independent third-party attesting that, on or er the date of this report, a detailed physical inspection and design review the BOP has been conducted by the equipment manufacturer and owner in cordance with the Original Equipment Manufacturer (OEM) specifications d that (i) the BOP will operate as originally designed; and (ii) any odifications or upgrades to the BOP stack conducted after delivery have not mpromised the design or operation of the BOP.

or to deploying the BOP, the operator must also verify that any odifications or upgrades to the BOP are approved by the Department of the erior and that documentation showing that the BOP has been maintained d inspected according to the requirements in API RP 53 and 30 CFR 0.446(a) is on file with the Department of the Interior or available for pection.

ection I Recommendation 2 – Order BOP Equipment ompatibility Verification for Each Floating Vessel and for Each New Well

Implement through NTL within 30 days

s part of a structured risk management process, the perator will be required to obtain an independent hird-party verification that the BOP will operate ith the drilling rig equipment and that the BOP is ompatible with the specific well location and well asis of design and well execution plan, i.e., in the vent of a well control event the BOP will provide a eal and contain wellbore pressure under all onditions expected in the wellbore.

Section I Recommendation 5– Develop Secondary Control System Requirements and Guidelines

Implement through rulemaking within 120 days

- Minimum ROV intervention capabilities for secondary control of all subsea BOP stacks, including the ability to close all shear and pipe rams, close the choke and kill valves and unlatch the lower marine riser package (LMRP).
- Minimum requirements for an emergency back-up BOP control system that is powered by a separate and independent accumulator bank with sufficient capacity to open and close one annular-type preventer and all ram-type preventers, including the blind shear ram. Such safety systems must include ***at least two*** of the following: autoshear, deadman, emergency disconnect system, and/or an acoustic activation system.
- Guidelines for arming and disarming the secondary BOP control system.
- Guidelines for documentation of BOP maintenance and repair (including any modifications to the BOP stack and control systems).

Section I Recommendation 7 – Develop New Testing Guidelines

Implement through NTL within 30 days

ird-party verification or documentation necessary to show at blind-shear rams will function and are capable of earing the drill pipe that is in use on the rig.

Implement partially through NTL within 30 days, then rulemaking within 120 days

inimum ROV performance testing standards, including rface and subsea function testing of ROV intervention ports d ROV pumps, to ensure compatibility with the BOP stack d that the ROV can close all shear and pipe rams, close the oke and kill valves, and unlatch the lower marine riser ckage.

Section I Recommendation 7 – Develop New Testing Guidelines

Implement through NTL within 30 days

andatory inspection and testing of BOP stack if any omponents are used in an emergency, *e.g.,* use of pipe casing shear rams or circulating out a well kick. This sting should involve a full pressure test of the BOP ter the situation is fully controlled, with the BOP on e wellhead.

Section I Recommendation 8 – Develop New Inspection Procedures and Reporting Requirements

Implement through NTL within 30 days

eginning no later than 60 days after the date of this port, all operators of floating drilling equipment will port to the Department of the Interior the following: (i) OP and well control system configuration, (ii) BOP and ell control system test results, including any anomalies testing or operation of critical BOP components, (iii) OP and well control incidents, and (iv) BOP and well ontrol system downtime for the last three years of illing operations.

Section II Recommendation 3 – New Casing And Cement Design Requirements: Two Independent Tested Barriers

Implement through NTL within 30 days

efore spudding any new floating drilling operation, all ell casing and cement designs must be signed by a rofessional Engineer, verifying that there will be at ast two independent tested barriers, including one echanical barrier, across each flow path during well ompletion and abandonment activities and that casing esign is appropriate for the purpose for which it is tended under reasonably expected wellbore onditions.

Section II Recommendation 5 – New Casing Installation Procedures

Implement through NTL within 30 days

he Department will ensure the requirement of the llowing BAST practices:

- Casing hanger latching mechanisms or lock down mechanisms must be engaged at the time the casing is installed in the subsea wellhead.
- For the final casing string, the operator must verify the installation of dual mechanical barriers (*e.g.,* dual floats or one float and a mechanical plug) in addition to cement, to prevent flow in the event of a failure in the cement.

Recommendations Which Could be Implemented But Are Not Currently in NTL

Section I Recommendation 7 – Develop New Testing Guidelines

Implement through NTL within 30 days

linimum surface and subsea function and ressure testing requirements to simulate (i) nintended disconnect of the lower marine riser ackage (LMRP), and (ii) loss of surface control e.g., electric and hydraulic power) of the subsea OP stack.

Section I Recommendation 8 – Develop New Inspection Procedures and Reporting Requirements

nplement in accordance with internal Departmental Guidance issued within 30 days

- The Department will evaluate and revise the manner in which it conducts its drilling inspections.
- Revised drilling inspections should include the witnessing of actual tests of BOP equipment, including the new requirements and guidance that address the surface and subsea testing of ROV and BOP stack capabilities.
- The Department will also develop methods to increase transparency and public availability of the results of inspections as well as routine reporting.
- The Department will work with Congress to obtain the necessary resources to implement these recommendations.

ection II Recommendation 2 – New Fluid Displacement Procedures

Implement through NTL within 30 days

or to displacement of kill-weight drilling fluid from the wellbore, the operator must ependently verify that:

- The BOPs are closed during displacement to underbalanced fluid columns to prevent gas entry into the riser should a seal failure occur during displacement.
- Two independent barriers, including one mechanical barrier, are in place for each flow path (i.e., casing and annulus).
- If the shoe track (the cement plug and check valves that remain inside the bottom of casing after cementing) is to be used as one of these barriers, it is negatively tested prior to the setting of the subsequent casing barrier. A negative test should also be performed prior to setting the surface plug.
- Negative tests are made to a differential pressure equal to or greater than the anticipated pressure after displacement. Each casing barrier is positively tested to a pressure that exceeds the highest estimated integrity of the casing shoes below the barrier.
- Displacement of the riser and casing to fluid columns that are underbalanced to the formation pressure in the wellbore is conducted in separate operations. In both cases, BOPs should be closed on the drill string and circulation established through the choke line to isolate the riser, which is not a rated barrier. During displacement, volumes in and out must be accurately monitored.
- Drill string components positioned in the shear rams during displacement must be capable

Section II Recommendation 7 – Enforce Tighter Primary Cementing Practices

Implement through a rulemaking within 120 days

he Department will institute a rulemaking to onsider the adoption of API RP 65 Part 2:

- Isolating potential flow zones during well construction (addressing previously identified gaps in primary cementing practices).

Section III Recommendation 3 –Adopt Final Safety and Environmental Management Systems Rule

Implement through publication of final rule within 30 days

OCS Safety Oversight Board will ensure the promulgation of a final SEMS Rule with full implementation of lements, along with provisions for public availability of information developed and collected under the rule ncrease transparency and accountability.

IS is a structured and comprehensive method for applying operational, safety and environmental protection ciples to offshore activities by focusing on personnel and ensuring accountability for operations throughout organization in the following specific areas:

1. Safety & Environmental Information
2. Hazards Analysis
3. Management of Change
4. Operating Procedures
5. Safe Work Practices
6. Training
7. Mechanical Integrity
8. Pre-Startup Review
9. Emergency Response & Control
10. Investigation of Accidents
11. Auditing the Program
12. Records & Documentation

Recommendations to be Implemented After 30 Days

Section I Recommendation 3 – Study Formal Equipment Certification Requirements

Implement recommendations through the Department workgroup within one year

e Department will immediately establish an independent technical orkgroup to review current, and investigate new, certification requirements BOP equipment and other components of the BOP stack such as control nels, communication pods, accumulator systems, and choke and kill lines. addition, this workgroup will recommend ways to make BOP certifications blicly available in order to increase transparency and accountability.

e establishment of a technical workgroup to examine the need for rtification of BOP systems and components is important; even when a BOP ck has all the above mentioned systems and components, it is of little use t does not function properly to prevent a well blowout.

Section I Recommendation 4 – New Blind Shear Ram Redundancy Requirement

Implement through rulemaking within 120 days

Within one year from the date of this report, all floating drilling operations will be required to have two sets of blind shear rams spaced at least 4 feet apart (to prevent system failure if drill pipe joint or drill tool is across one set of rams during an emergency).

Section I Recommendation 6 – Develop New ROV Operating Capabilities

Implement recommendations through the Department workgroup within one year

e Department will immediately establish an independent technical
rkgroup to develop further improvements to ROV operating capabilities
luding the following:

- Standardized hydraulic and electrical interfaces for all subsea BOP stacks so that they are accessible by any available ROV.
- Visual mechanical indicator or redundant telemetry channel to confirm ram closure (*e.g.,* a position indicator).
- Methods of subsea testing that would avoid detrimental effects of seawater in BOP system (*e.g.,* ROV with external hydraulic supply).
- An ROV interface with a valve below the lowest ram on the BOP stack to allow well-killing operations.

Section I Recommendation 7 – Develop New Testing Guidelines

No later than 180 days after the date of this report

- Department will develop clear requirements and guidelines
t address the surface and subsea testing of ROV and BOP stack
abilities.

Implement through rulemaking within 120 days

- Protocols for function testing, autoshear, deadman, emergency
disconnect systems and acoustic activation systems.

Section I Recommendation 8 – Develop New Inspection Procedures and Reporting Requirements

Implement through rulemaking within 120 days

here feasible, the electronic log from the BOP control system ould be transmitted online to a secure location onshore and ade available for inspection by the Department of the Interior.

Section II Recommendation 1 – Establish Deepwater Well-Control Procedure Guidelines

Implement through rulemaking within 120 days

ithin 120 days of the date of this report, the Department will sure that requirements and guidelines for deepwater well-ntrol procedures are established.

Section II Recommendation 4 – Study Formal Personnel Training Requirements for Casing and Cementing Operations

Implement recommendations through the Department workgroup within one year

The Department will immediately establish an independent technical workgroup, with appropriate academic, agency, industry and other stakeholder participation, to study whether to establish new training and certification requirements for rig personnel specifically related to casing and cementing operations.

Section II Recommendation 6 – Develop Additional Requirements or Guidelines for Casing Installation

Implement recommendations through a the Department workgroup within one year

he Department will provide for the immediate stablishment of a workgroup, to establish specific equirements or guidelines for the following rocedures and practices:

- Positive and negative test procedures and use of test results for evaluation of casing integrity.
- Use of float valves and other mechanical plugs in the final casing string or liner.

Section II Recommendation 7 – Enforce Tighter Primary Cementing Practices

Implement recommendations through a Department workgroup within one year

- The Department will study whether to determine specific cementing requirements.

Section II Recommendation 8 – Develop Additional Requirements or Guidelines for Evaluation of Cement Integrity

Implement recommendations through Department workgroup within one year

- The Department will immediately establish an independent technical workgroup to evaluate whether and under what circumstances the use of cement bond logs is feasible and practical and will increase safety.

Section II Recommendation 9 –Increase Federal Government Wild-Well Intervention Capabilities

own out, or “wild” wells, involve the uncontrolled release of ude oil or natural gas from an oil well where pressure ntrol systems have failed.

e Federal government should assess its current capability to eal with such emergency situations, particularly in deep ater, and develop a plan to increase its capabilities for direct ld-well intervention, should such be required, in future mergency situations.

ements to be considered include an inventory of existing ethods to stop a blowout and handle escaping wellbore uids, including but not limited to coffer dams, highly-capable OVs, portable hydraulic line hook-ups, and pressure-reading ols.

Section II Recommendation 10 – Study Innovative Wild-Well Intervention, Response Techniques and Response Planning

ddition, the Department will immediately establish a DOI workgroup to study methods to p a blowout and handle escaping wellbore fluids. The technical workgroup will take a fresh k at how to deal with a deepwater blowout. The conventional last resort method to control a wout is to drill a relief well. In deep water this can take several months. But the reality of ng several months to stop a high flowing well at deep water depths was difficult to imagine il the BP oil spill. The offshore oil and gas industry, learning from the BP Oil Spill response erience, should work toward being able to stop a spill resulting from a deepwater blowout. erators should work to be in a position to submit, with their Exploration or Development ns, an emergency response plan that addresses resources (including common resources) that uld be deployed in the event of a serious emergency, even if assessed as low probability.

e technical workgroup should also address operators' ability, on a regional or industry-wide is, to develop and procure a response package for deep water incidents, to include diagnostic l measurement equipment, pre-fabricated systems for deep water oil capture, logistical and nmunications support, and plans and concepts of operations that can quickly be deployed in event of an unanticipated blowout. Assess and certify potential options, e.g., deep water persant injection.

ection III Recommendation 2 – The Department Will Adopt Safety Case Requirements for Floating Drilling Operations on the OCS

Implement through rulemaking within 120 days

- Within 120 days of the date of this report, the Department will assure the adoption of appropriate safety case requirements based on IADC Health, Safety and Environmental Case Guidelines for Mobile Offshore Drilling Units (2009), which will include well construction safety assessment prior to approval of APD.
- This “safety case” should establish risk assessment and mitigation processes to manage a drilling contractor’s controls related to the health, safety and environmental aspects of their operations.
- In addition to the safety case, a separate bridging document should be required to connect the safety case to existing well design and construction documents.
- Such a proposed Well Construction Interfacing Document will include all of the elements in a conventional bridging document plus alignment of the drilling contractor’s management of change (MOC) and risk assessment to the lease operator’s MOC and well execution risk assessments.

Section III Recommendation 4 – Study Additional Safety Training and Certification Requirements

mplement recommendations through a Department workgroup within one year

- The Department will immediately establish a workgroup to investigate safety training requirements for floating drilling rig personnel and possible requirements for independent or more frequent certification and testing of personnel and safety systems.
- Establish an oil production safety program or institute (similar to NRC reactor safety program).
- Consider establishing a formalized analytical methodology to assess performance of safety systems in the event of multiple component failure or excursions outside normal environmental ranges.
- Strengthen technical support to the Department of the Interior and other regulatory authorities, including the resources necessary to obtain independent technical review of regulations and standards.
- Consider chartering a longer-term technical review of BOP reliability.
- Consider importing best practices from other agencies with similar responsibility for safety regulation of technically complex systems, e.g. FAA and NRC.

Nguyen, Ngoc B

From: Ken Arnold [karnold@karnoldconsulting.com]
Sent: Wednesday, June 23, 2010 7:47 PM
To: Benton Baugh; Bob Bea; Ford Brett; Hans Juvkam-Wold; Ken Arnold; Martin Chenevert; Per Holand; Skip Ward; Tom Williams
Cc: Black, Steve; Kemkar, Neal; Hanley, Kallie
Subject: Power Point Presented to Secretary Salazar on 6/21/2010
Attachments: Presentation to Secretary of Interior - Rev 4.pptx

You are receiving this because you expressed an interest in having a copy of the subject report. DOI has been asked if they have a problem with us distributing this to whomever asks and have not expressed an objection. Those present at the meeting or by phone were the original signers of the Group of 8, plus Per Holland and Arnold Stancell. Bob Bea and Skip Ward were unable to participate. From DOI attendees beside the Secretary included David Hayes, Tom Strickland, The new Director of the MMS Mike B (please excuse my inability to spell his last name as I am traveling and don't really have time to look it up).

The people contributing to this power point besides myself are:

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The list of those getting this is as follows, but I have copied only two at a time so it is not blocked by a spam filter:

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The Secretary has expressed an interest in meeting with us in two weeks with a wider audience.

Please be advised I am in SE Asia and will return to Houston Tuesday the 30th in the afternoon. Do not call my cell phone unless it is important as it is an expensive call for me. Also I have been unable to pick up my phone messages since leaving the US. I may be able to pick them up when I leave Viet Nom for Singapore Sunday but am not sure.

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Presentation to Secretary of Interior

June 21, 2010

Outline of the Discussion

1. Why We Are Here
2. Putting the Risks in Context
3. Putting the Moratorium in Context
4. Measures that should be taken now to improve safety in the GOM
5. Conclusions
6. Appendices

Why Are We Here

- We are not here to provide an economic justification – jobs, revenue lost, etc. That is the job for economists.
- We feel safety will be compromised if the 6 month ban is extended to all wells in the GoM over 500 feet in water depth.
- This is the time we all need to work together and we understand the job at hand.
- This is not the time to punish the innocent nor further harm the public's interest .

Why Are We Here

The moratorium as currently defined INCREASES risk when drilling is eventually resumed.

- 1. Stopping operations in the middle
- 2. Exporting best rigs
- 3. Loss of experienced drilling staff
- 4. Increased tanker traffic

We believe a moratorium is needed, but we believe it can be re-defined to reduce risk

- 1. Remove requirement for stopping operations
- 2. Require the implementation of many of the recommendations of the interim report including some not already included in NTL 05.
- 3. Allow drilling of “low risk” wells to maintain GOM drilling equipment and expertise.

Putting The Risks in Context

BP Oil Spill Disaster

We were not asked to provide analysis of the Horizon incident, but as information has been discovered it is clear best practices were not followed.

- The well design was marginal
- Human errors in judgment were made at very key operational decision points
- Warning signs were overlooked on the rig
- There may have been some failure of equipment

This was all preventable by following currently in place standard practices.

Safety Record of Drilling on the OCS

Over 50,000 wells drilled. 4000 in over 1000 feet of water.

Last major incident resulting in oil coming ashore in 1969. 41 years ago.

From 1970 until April 2010 a total of 1800 barrels of oil spilled due to blowouts.

All measurements of safety indices have shown a steady level of improvement since modern MMS regulations came into effect in 1970.

Record is better than or equal to that or any other region of the world.

Crude Oil Spills from Platform and Rigs from Federal OCS Activities

ears	**Production** (Thousand BBls)	**Number of Spills**	**Barrels Spilled** (Thousand BBls)
960-1969	1,460,000	13	99
970-1979	3,455,000	32	106
980-1989	3,387,000	38	7
990-1999	4,051,000	15	2
000-2009	5,450,000	72	18

lowout Events Exceeding 1,000 Barrels on OCS

Two blowouts associated with a hurricane event that destroyed four platforms. Total of 10,280 barrels crude oil spilled.

One blowout associated with drilling. 1,688 barrels condensate spilled.

One blowout that occurred when a supply vessel collided with a drilling rig during a storm and sheared the wellhead.

2,500 barrels crude oil spilled.

One blowout (Santa Barbara) was associated with drilling.

80,000 barrels spilled.

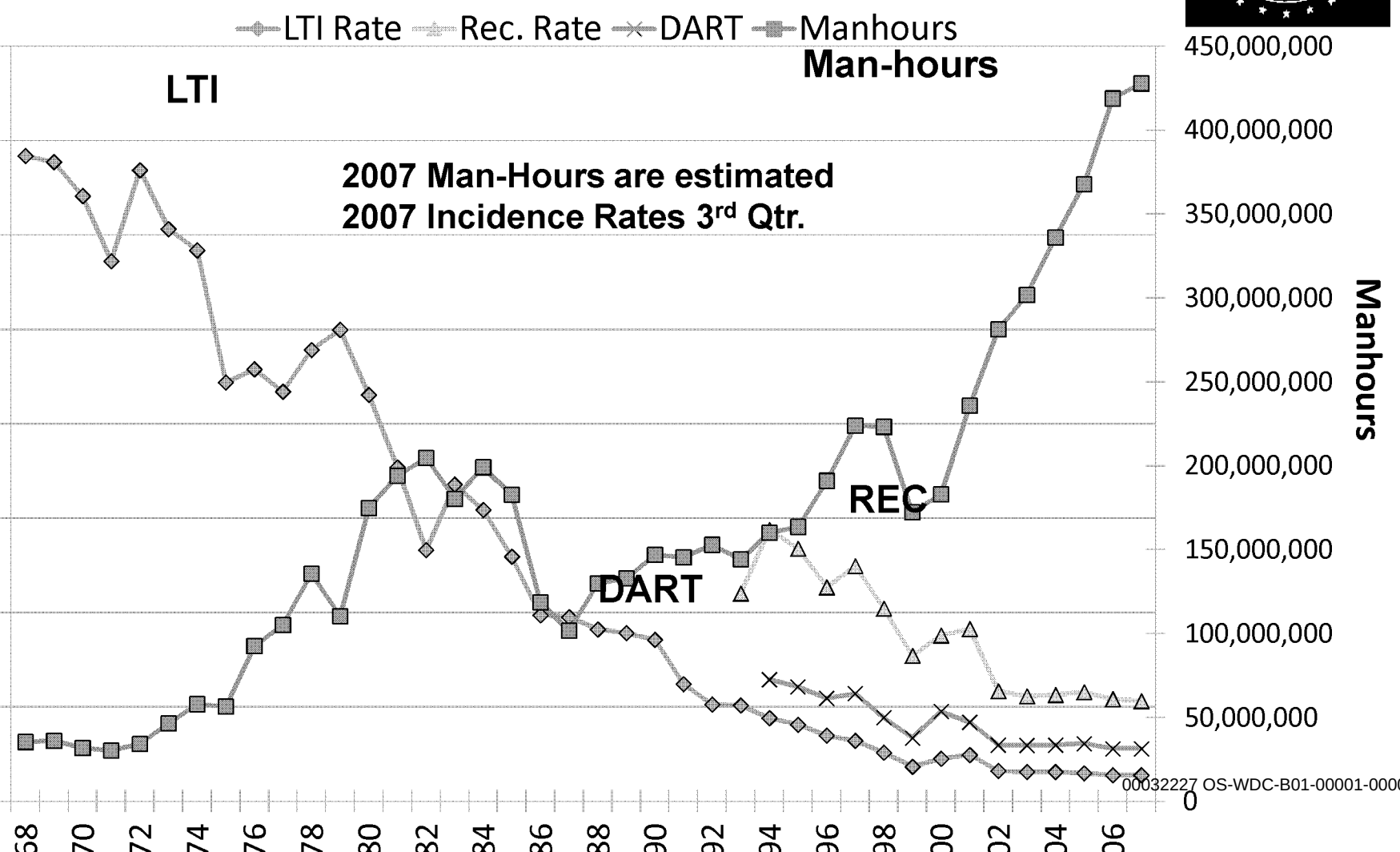
One blowout was caused by a fire in the production area that resulted in the loss of control of 12 wells on the platform.

30,000 barrels crude oil spilled.

One blowout associated with wireline work during workover operations. 53,000 barrels spilled.

om 1971 through 2009, a total of 1,784 barrels was spilled as a

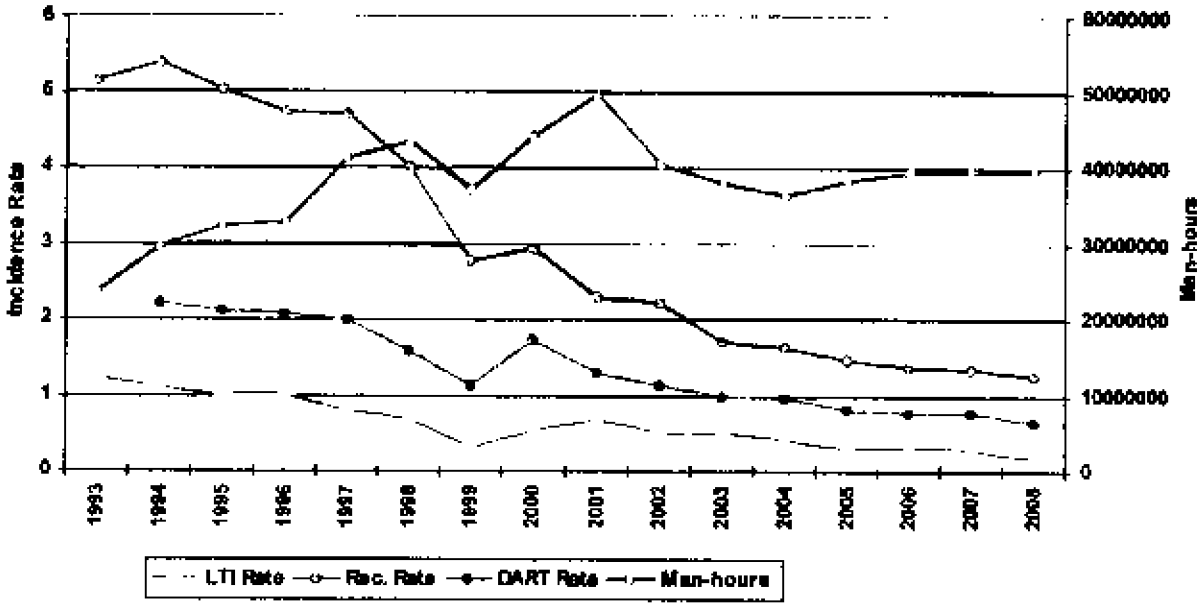
TOTAL INDUSTRY INCIDENCE RATES



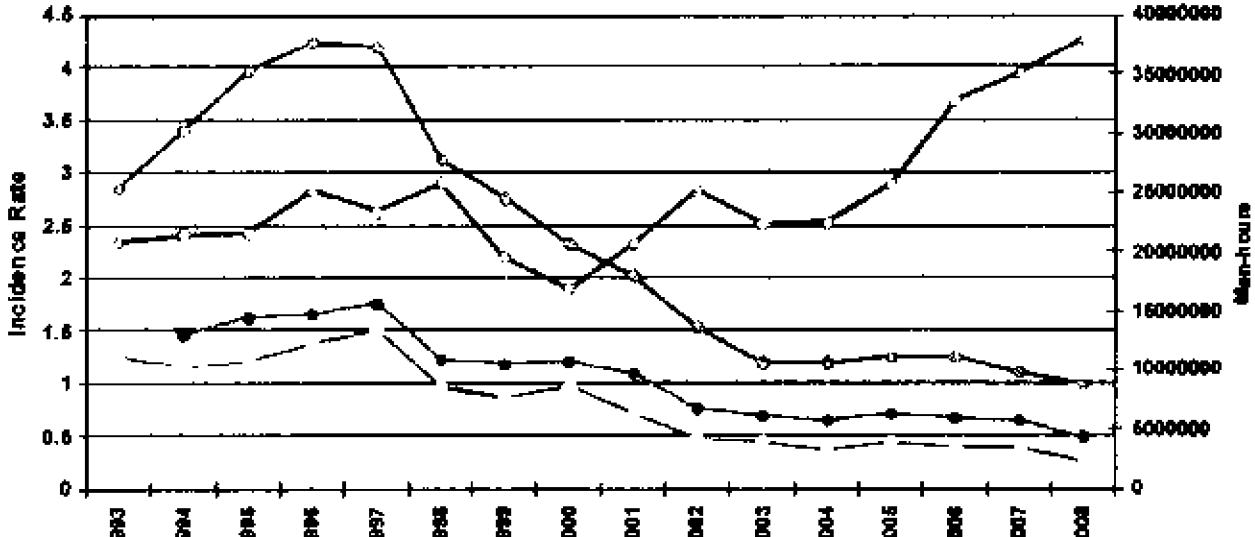
C 2008 US Water Totals		IADC 2008 European Water Totals	
l Man-hours	**39,665,580**	Total Man-hours	**38,049,523**
l Medical Treatment Incidents	**118**	Total Medical Treatment Incidents	**95**
l Restricted Work Incidents	**100**	Total Restricted Work Incidents	**43**
l Lost Time Incidents	**26**	Total Lost Time Incidents	**51**
l Fatalities	**3**	Total Fatalities	**0**
l Recordables	**247**	Total Recordables	**189**
ncidence Rate	**0.15**	LTI Incidence Rate	**0.27**
Frequency Rate	**0.73**	LTI Frequency Rate	**1.34**

st Time Incidence Rate = LTIs + FTLs X 200,000

US Water Total LTI & Recordable Incidence Rates vs Man-hours (Figure 1)

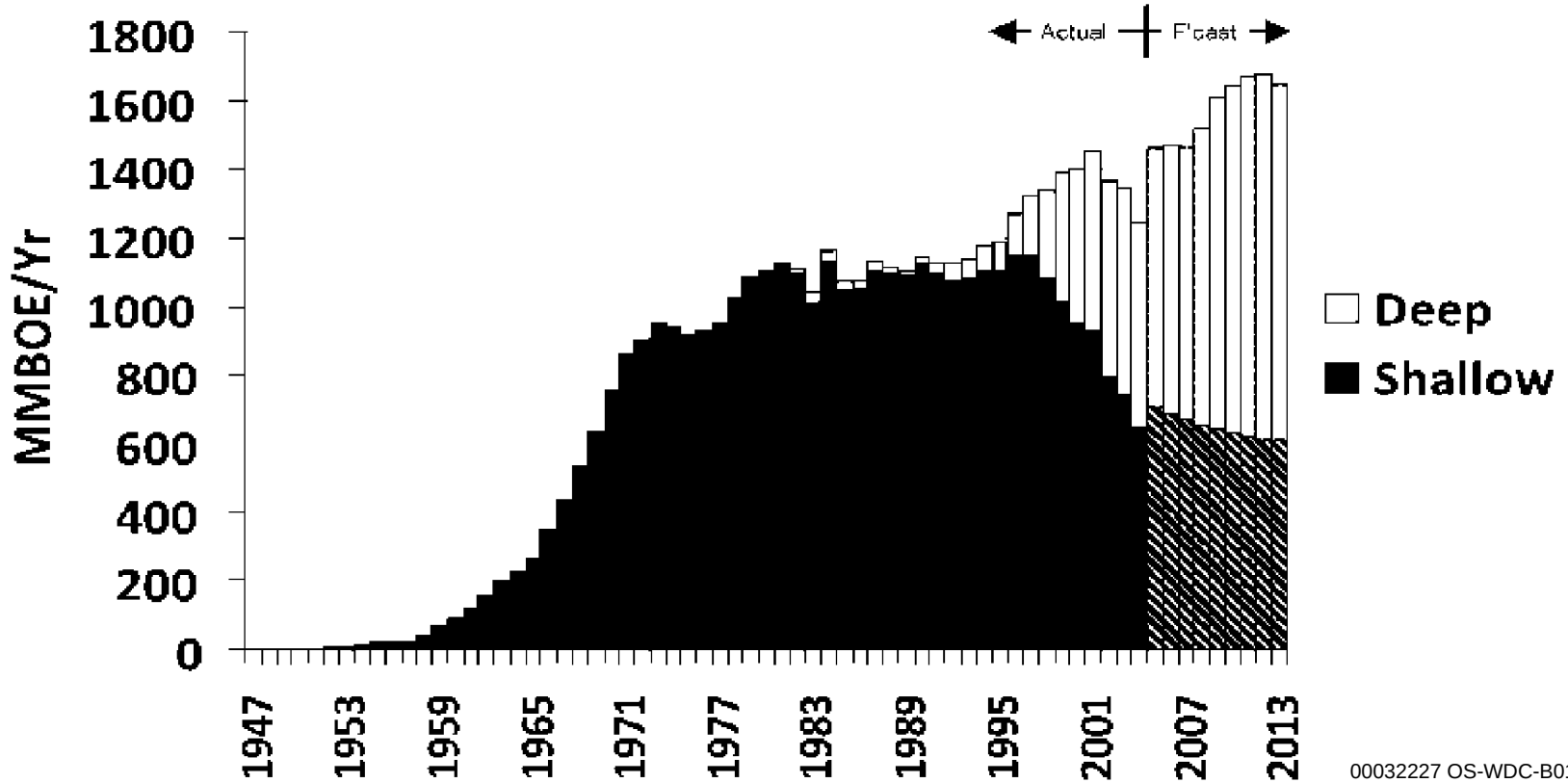


European Water Total Incidence Rates vs Man-hours (Figure 1)



GOM Offshore Production Increasingly from Deepwater

US GOM Offshore



Source: OCS Report MMS 2006-022

Understanding the Risks Summary

Even under existing conditions the record is good and improving at the same time that we are moving more and more into deep water

The Interim Report recommendations which can be implemented immediately (within 30 Days) should reduce the risk further but as the risks are low this is a marginal step

The Interim Report recommendations which take more time (up to 6 Months) should reduce the risks even further but in an even more marginal amount.

Putting the Moratorium in Context

Rationale for a Moratorium

We experts agreed to a list of recommendations which are needed to make drilling safer. Some of these recommendations take time to study and make into regulations to assure compliance. In some cases we agreed with time frames of as long as 6 months and even in one or two cases longer. How can we face the American people and say drilling is safe before all of our own recommendations can be carried out?

By not allowing drilling until all the recommendations we told the DOI are necessary for safety are in place the DOI is honoring our technical analysis.

The “Four Negatives” of the Moratorium

The Moratorium itself increases risk by:

- 1. Stopping operations in the middle
- 2. Exporting best rigs
- 3. Loss of experienced drilling staff
- 4. Increased tanker traffic

To reduce overall risk, the risk reductions which occur as a result of the Moratorium need to outweigh the added risks of the “four negatives”

As currently defined the Moratorium does not accomplish this objective

The Moratorium can be redefined to reduce risk

Effects of Stopping Operations

In any project risks are introduced when an appropriately planned operation is temporarily abandoned and then re-started at some future undetermined date.

- Macondo Well was being temporarily abandoned
- Montara Well was being re=entered after having been temporarily abandoned for four months

The Effect of the Moratorium on Rigs

Best rigs will leave the Gulf first and come back last. This has a marginal negative impact on the overall safety of the fleet.

Rigs will leave on long term contracts (2-5 years) and it will take a long time after the moratorium ends to get them back.

The time to remobilize will take several additional months/years after the Moratorium is lifted and new rules in place.

Effects of Moratorium on Experienced Personnel

- Best people will leave the Gulf
- Workforce significantly impacted, including the thousands of support workers and service providers who support the drilling operations and must adhere to the safety standards – best of them will get work internationally or other industries/jobs.
- Recruitment of new people will stop – the best and brightest do not apply for uncertain jobs
- While some additional training and certification can and will take place during this time – as with the baseball offseason, players need a spring training to get back in shape – "From a safety standpoint we can't afford to have a spring training."
- The industry feels the safest and most effective rig operations and personnel are being punished.

Effects of Moratorium on Tanker Spills

- Source: NRC, “Oil in the Seas”, 2003
- Data for the period 1990-1999 (no one time disaster like Exxon Valdez or BP Macondo)
- Average Best Estimate of Oil Spilled in US waters from offshore platforms and pipelines: 7,000 barrels per year
- Average Best Estimate of Oil Spilled <u>in US waters</u> from tankers: 26,000 barrels per year
  - Does not include spills from US bound tankers in foreign or international waters
  - Does not include spills from marine terminals, refineries and storage tanks
  - Does not include spills at international loading terminals or in producing the oil transported

Measures that should be taken now to improve safety in the GOM

Manage Risk

The level of risk varies significantly between well types based on knowledge of formations being drilled and category of well

The highest risk wells warrant additional time to assure the risk can be managed and drilling these wells are warranted:

- Deepwater exploration wells
  - We have seen it is not just the drilling but the completion of these wells that pose risk
- Unknown pore pressure
- Extremely high pressure and/or high temperature wells

The Key to Increasing Safety

Require adoption of some Interim Report recommendations immediately

Provide a mechanism to allow rigs to remain working in the Gulf of Mexico

- Define a class of wells (other than workover, waterflood, gas injection or water disposal wells) which can be drilled safely. That is, wells where any increased risk by not waiting for all the recommendations to be implemented is lower than the risk of the "Four Negatives"

Maintain Moratorium on "Risky Wells"

Steps to Re-Define the Moratorium to INCREASE Safety

- Allow rigs to complete the work they are currently doing
- Require implementation of the key recommendations of the interim report which can be done within 30 days before ANY new wells can be drilled on the OCS (independent of water depth)
  - 8 Recommendations Already in NTL 05
  - 5 Additional Recommendations which could be added
- Maintain the moratorium on the more risky wells
  - Remaining Recommendations requiring additional study.

Risky Wells

Exploration wells to previously undrilled strata

Deepening existing wells to previously undrilled strata

HP/HT Wells

Less Risky Wells which Can be Drilled

Listed in increasing degree of risk:

- Wells which are abandoned before reaching producing zones (surface casings and top sections only)
- Water Disposal to Non-Producing Reservoirs
- Re-entries and Sidetracks
- Water Disposal to Producing Reservoirs, Waterflood and Gas Injection
- Development Wells to Known Reservoirs
- Workovers
- Drilling to the base of the salt section in deep exploration wells
- Delineation Wells to Non-producing Reservoirs

Wells in red above are already exempted from the moratorium by NTL 04

Conclusions

A moratorium is needed

It needs be defined taking into account ALL elements of risk, including the risks derived from the moratorium itself

Drilling can be made safer quickly by implementing many of the recommendations of the Interim Report

We should not ignore the “Four Negatives” of the moratorium

Allow drilling of “Less Risky Wells” to avoid the Four Negatives

It is justifiable to put a moratorium on “Risky Wells” to allow further thought and study

Appendices

30-Day Recommendations Already in NTL

Recommendations Which Could be Implemented But Are Not Currently in NTL

Recommendations to be Implemented After 30 Days

30-Day Recommendations Already in NTL

Section III Recommendation 1 – Compliance erification for Existing Regulations and April 30, 2010, National Safety Alert

Implement through NTL within 30 days

hin 30 days of the date of this report, the Department, in conjunction with the Department of Homeland urity, will ensure that operators are required to verify compliance with existing regulations and National ety Alert (issued April 30, 2010), which issued the following safety recommendations to operators and ing contractors:

- Examine all well-control equipment (both surface and subsea) currently being used to ensure that it has been properly maintained and is capable of shutting in the well during emergency operations. Ensure that the ROV hot-stabs are function-tested and are capable of actuating the BOP.
- Review all rig drilling/casing/completion practices to ensure that well-control contingencies are not compromised at <u>any</u> point while the BOP is installed on the wellhead.
- Review all emergency shutdown and dynamic positioning procedures that interface with emergency well control operations.
- Inspect lifesaving and firefighting equipment for compliance with federal requirements.
- Ensure that all crew members are familiar with emergency/firefighting equipment, as well as participate in an abandon ship drill. Operators are reminded that the review of emergency equipment and drills should be conducted after each crew change out.
- Exercise emergency power equipment to ensure proper operation.
- Ensure that all personnel involved in well operations are properly trained and capable of performing their tasks under both normal drilling and emergency well control operations.

Section I Recommendation 1 – Order One-Time Only Re-rtification of All BOP Equipment Used in New Floating Drilling Operations

Implement through NTL within 30 days

fore spudding any new well from a floating vessel, the operator will be quired to obtain and deliver to the Department of the Interior a written and ned certification from an independent third-party attesting that, on or er the date of this report, a detailed physical inspection and design review the BOP has been conducted by the equipment manufacturer and owner in cordance with the Original Equipment Manufacturer (OEM) specifications d that (i) the BOP will operate as originally designed; and (ii) any odifications or upgrades to the BOP stack conducted after delivery have not mpromised the design or operation of the BOP.

or to deploying the BOP, the operator must also verify that any odifications or upgrades to the BOP are approved by the Department of the erior and that documentation showing that the BOP has been maintained d inspected according to the requirements in API RP 53 and 30 CFR 0.446(a) is on file with the Department of the Interior or available for pection.

ection I Recommendation 2 – Order BOP Equipment ompatibility Verification for Each Floating Vessel and for Each New Well

Implement through NTL within 30 days

s part of a structured risk management process, the perator will be required to obtain an independent ird-party verification that the BOP will operate ith the drilling rig equipment and that the BOP is ompatible with the specific well location and well asis of design and well execution plan, i.e., in the vent of a well control event the BOP will provide a eal and contain wellbore pressure under all onditions expected in the wellbore.

Section I Recommendation 5– Develop Secondary Control System Requirements and Guidelines

Implement through rulemaking within 120 days

- Minimum ROV intervention capabilities for secondary control of all subsea BOP stacks, including the ability to close all shear and pipe rams, close the choke and kill valves and unlatch the lower marine riser package (LMRP).
- Minimum requirements for an emergency back-up BOP control system that is powered by a separate and independent accumulator bank with sufficient capacity to open and close one annular-type preventer and all ram-type preventers, including the blind shear ram. Such safety systems must include ***at least two*** of the following: autoshear, deadman, emergency disconnect system, and/or an acoustic activation system.
- Guidelines for arming and disarming the secondary BOP control system.
- Guidelines for documentation of BOP maintenance and repair (including any modifications to the BOP stack and control systems).

Section I Recommendation 7 – Develop New Testing Guidelines

Implement through NTL within 30 days

ird-party verification or documentation necessary to show at blind-shear rams will function and are capable of earing the drill pipe that is in use on the rig.

Implement partially through NTL within 30 days, then rulemaking within 120 days

inimum ROV performance testing standards, including rface and subsea function testing of ROV intervention ports d ROV pumps, to ensure compatibility with the BOP stack d that the ROV can close all shear and pipe rams, close the oke and kill valves, and unlatch the lower marine riser ckage.

Section I Recommendation 7 – Develop New Testing Guidelines

Implement through NTL within 30 days

andatory inspection and testing of BOP stack if any omponents are used in an emergency, *e.g.,* use of pipe casing shear rams or circulating out a well kick. This sting should involve a full pressure test of the BOP ter the situation is fully controlled, with the BOP on e wellhead.

Section I Recommendation 8 – Develop New Inspection Procedures and Reporting Requirements

Implement through NTL within 30 days

eginning no later than 60 days after the date of this port, all operators of floating drilling equipment will port to the Department of the Interior the following: (i) OP and well control system configuration, (ii) BOP and ell control system test results, including any anomalies testing or operation of critical BOP components, (iii) OP and well control incidents, and (iv) BOP and well ontrol system downtime for the last three years of illing operations.

Section II Recommendation 3 – New Casing And Cement Design Requirements: Two Independent Tested Barriers

Implement through NTL within 30 days

efore spudding any new floating drilling operation, all ell casing and cement designs must be signed by a rofessional Engineer, verifying that there will be at ast two independent tested barriers, including one echanical barrier, across each flow path during well ompletion and abandonment activities and that casing esign is appropriate for the purpose for which it is tended under reasonably expected wellbore onditions.

Section II Recommendation 5 – New Casing Installation Procedures

Implement through NTL within 30 days

he Department will ensure the requirement of the llowing BAST practices:

- Casing hanger latching mechanisms or lock down mechanisms must be engaged at the time the casing is installed in the subsea wellhead.
- For the final casing string, the operator must verify the installation of dual mechanical barriers (*e.g.,* dual floats or one float and a mechanical plug) in addition to cement, to prevent flow in the event of a failure in the cement.

Recommendations Which Could be Implemented But Are Not Currently in NTL

Section I Recommendation 7 – Develop New Testing Guidelines

Implement through NTL within 30 days

linimum surface and subsea function and ressure testing requirements to simulate (i) nintended disconnect of the lower marine riser ackage (LMRP), and (ii) loss of surface control e.g., electric and hydraulic power) of the subsea OP stack.

Section I Recommendation 8 – Develop New Inspection Procedures and Reporting Requirements

nplement in accordance with internal Departmental Guidance issued within 30 days

- The Department will evaluate and revise the manner in which it conducts its drilling inspections.
- Revised drilling inspections should include the witnessing of actual tests of BOP equipment, including the new requirements and guidance that address the surface and subsea testing of ROV and BOP stack capabilities.
- The Department will also develop methods to increase transparency and public availability of the results of inspections as well as routine reporting.
- The Department will work with Congress to obtain the necessary resources to implement these recommendations.

ection II Recommendation 2 – New Fluid Displacement Procedures

Implement through NTL within 30 days

or to displacement of kill-weight drilling fluid from the wellbore, the operator must ependently verify that:

- The BOPs are closed during displacement to underbalanced fluid columns to prevent gas entry into the riser should a seal failure occur during displacement.
- Two independent barriers, including one mechanical barrier, are in place for each flow path (i.e., casing and annulus).
- If the shoe track (the cement plug and check valves that remain inside the bottom of casing after cementing) is to be used as one of these barriers, it is negatively tested prior to the setting of the subsequent casing barrier. A negative test should also be performed prior to setting the surface plug.
- Negative tests are made to a differential pressure equal to or greater than the anticipated pressure after displacement. Each casing barrier is positively tested to a pressure that exceeds the highest estimated integrity of the casing shoes below the barrier.
- Displacement of the riser and casing to fluid columns that are underbalanced to the formation pressure in the wellbore is conducted in separate operations. In both cases, BOPs should be closed on the drill string and circulation established through the choke line to isolate the riser, which is not a rated barrier. During displacement, volumes in and out must be accurately monitored.
- Drill string components positioned in the shear rams during displacement must be capable

Section II Recommendation 7 – Enforce Tighter Primary Cementing Practices

Implement through a rulemaking within 120 days

he Department will institute a rulemaking to onsider the adoption of API RP 65 Part 2:

- Isolating potential flow zones during well construction (addressing previously identified gaps in primary cementing practices).

Section III Recommendation 3 –Adopt Final Safety and Environmental Management Systems Rule

Implement through publication of final rule within 30 days

OCS Safety Oversight Board will ensure the promulgation of a final SEMS Rule with full implementation of lements, along with provisions for public availability of information developed and collected under the rule ncrease transparency and accountability.

IS is a structured and comprehensive method for applying operational, safety and environmental protection ciples to offshore activities by focusing on personnel and ensuring accountability for operations throughout organization in the following specific areas:

1. Safety & Environmental Information
2. Hazards Analysis
3. Management of Change
4. Operating Procedures
5. Safe Work Practices
6. Training
7. Mechanical Integrity
8. Pre-Startup Review
9. Emergency Response & Control
10. Investigation of Accidents
11. Auditing the Program
12. Records & Documentation

Recommendations to be Implemented After 30 Days

Section I Recommendation 3 – Study Formal Equipment Certification Requirements

Implement recommendations through the Department workgroup within one year

e Department will immediately establish an independent technical orkgroup to review current, and investigate new, certification requirements BOP equipment and other components of the BOP stack such as control nels, communication pods, accumulator systems, and choke and kill lines. addition, this workgroup will recommend ways to make BOP certifications blicly available in order to increase transparency and accountability.

e establishment of a technical workgroup to examine the need for rtification of BOP systems and components is important; even when a BOP ck has all the above mentioned systems and components, it is of little use t does not function properly to prevent a well blowout.

Section I Recommendation 4 – New Blind Shear Ram Redundancy Requirement

Implement through rulemaking within 120 days

Within one year from the date of this report, all oating drilling operations will be required to ave two sets of blind shear rams spaced at ast 4 feet apart (to prevent system failure if rill pipe joint or drill tool is across one set of ms during an emergency).

Section I Recommendation 6 – Develop New ROV Operating Capabilities

Implement recommendations through the Department workgroup within one year

e Department will immediately establish an independent technical
rkgroup to develop further improvements to ROV operating capabilities
luding the following:

- Standardized hydraulic and electrical interfaces for all subsea BOP stacks so that they are accessible by any available ROV.
- Visual mechanical indicator or redundant telemetry channel to confirm ram closure (*e.g.,* a position indicator).
- Methods of subsea testing that would avoid detrimental effects of seawater in BOP system (*e.g.,* ROV with external hydraulic supply).
- An ROV interface with a valve below the lowest ram on the BOP stack to allow well-killing operations.

Section I Recommendation 7 – Develop New Testing Guidelines

No later than 180 days after the date of this report

- Department will develop clear requirements and guidelines
t address the surface and subsea testing of ROV and BOP stack
abilities.

Implement through rulemaking within 120 days

- Protocols for function testing, autoshear, deadman, emergency
disconnect systems and acoustic activation systems.

Section I Recommendation 8 – Develop New Inspection Procedures and Reporting Requirements

Implement through rulemaking within 120 days

here feasible, the electronic log from the BOP control system ould be transmitted online to a secure location onshore and ade available for inspection by the Department of the Interior.

Section II Recommendation 1 – Establish Deepwater Well-Control Procedure Guidelines

Implement through rulemaking within 120 days

ithin 120 days of the date of this report, the Department will sure that requirements and guidelines for deepwater well-ntrol procedures are established.

Section II Recommendation 4 – Study Formal Personnel Training Requirements for Casing and Cementing Operations

Implement recommendations through the Department workgroup within one year

The Department will immediately establish an independent technical workgroup, with appropriate academic, agency, industry and other stakeholder participation, to study whether to establish new training and certification requirements for rig personnel specifically related to casing and cementing operations.

Section II Recommendation 6 – Develop Additional Requirements or Guidelines for Casing Installation

Implement recommendations through a the Department workgroup within one year

he Department will provide for the immediate stablishment of a workgroup, to establish specific equirements or guidelines for the following rocedures and practices:

- Positive and negative test procedures and use of test results for evaluation of casing integrity.
- Use of float valves and other mechanical plugs in the final casing string or liner.

Section II Recommendation 7 – Enforce Tighter Primary Cementing Practices

Implement recommendations through a Department workgroup within one year

- The Department will study whether to determine specific cementing requirements.

Section II Recommendation 8 – Develop Additional Requirements or Guidelines for Evaluation of Cement Integrity

Implement recommendations through Department workgroup within one year

- The Department will immediately establish an independent technical workgroup to evaluate whether and under what circumstances the use of cement bond logs is feasible and practical and will increase safety.

Section II Recommendation 9 –Increase Federal Government Wild-Well Intervention Capabilities

own out, or “wild” wells, involve the uncontrolled release of ude oil or natural gas from an oil well where pressure ntrol systems have failed.

e Federal government should assess its current capability to eal with such emergency situations, particularly in deep ater, and develop a plan to increase its capabilities for direct ld-well intervention, should such be required, in future mergency situations.

ements to be considered include an inventory of existing ethods to stop a blowout and handle escaping wellbore uids, including but not limited to coffer dams, highly-capable OVs, portable hydraulic line hook-ups, and pressure-reading ols.

Section II Recommendation 10 – Study Innovative Wild-Well Intervention, Response Techniques and Response Planning

ddition, the Department will immediately establish a DOI workgroup to study methods to p a blowout and handle escaping wellbore fluids. The technical workgroup will take a fresh k at how to deal with a deepwater blowout. The conventional last resort method to control a wout is to drill a relief well. In deep water this can take several months. But the reality of ng several months to stop a high flowing well at deep water depths was difficult to imagine il the BP oil spill. The offshore oil and gas industry, learning from the BP Oil Spill response erience, should work toward being able to stop a spill resulting from a deepwater blowout. erators should work to be in a position to submit, with their Exploration or Development ns, an emergency response plan that addresses resources (including common resources) that uld be deployed in the event of a serious emergency, even if assessed as low probability.

e technical workgroup should also address operators' ability, on a regional or industry-wide is, to develop and procure a response package for deep water incidents, to include diagnostic l measurement equipment, pre-fabricated systems for deep water oil capture, logistical and nmunications support, and plans and concepts of operations that can quickly be deployed in event of an unanticipated blowout. Assess and certify potential options, e.g., deep water persant injection.

ection III Recommendation 2 – The Department Will Adopt Safety Case Requirements for Floating Drilling Operations on the OCS

Implement through rulemaking within 120 days

- Within 120 days of the date of this report, the Department will assure the adoption of appropriate safety case requirements based on IADC Health, Safety and Environmental Case Guidelines for Mobile Offshore Drilling Units (2009), which will include well construction safety assessment prior to approval of APD.
- This “safety case” should establish risk assessment and mitigation processes to manage a drilling contractor’s controls related to the health, safety and environmental aspects of their operations.
- In addition to the safety case, a separate bridging document should be required to connect the safety case to existing well design and construction documents.
- Such a proposed Well Construction Interfacing Document will include all of the elements in a conventional bridging document plus alignment of the drilling contractor’s management of change (MOC) and risk assessment to the lease operator’s MOC and well execution risk assessments.

Section III Recommendation 4 – Study Additional Safety Training and Certification Requirements

mplement recommendations through a Department workgroup within one year

- The Department will immediately establish a workgroup to investigate safety training requirements for floating drilling rig personnel and possible requirements for independent or more frequent certification and testing of personnel and safety systems.
- Establish an oil production safety program or institute (similar to NRC reactor safety program).
- Consider establishing a formalized analytical methodology to assess performance of safety systems in the event of multiple component failure or excursions outside normal environmental ranges.
- Strengthen technical support to the Department of the Interior and other regulatory authorities, including the resources necessary to obtain independent technical review of regulations and standards.
- Consider chartering a longer-term technical review of BOP reliability.
- Consider importing best practices from other agencies with similar responsibility for safety regulation of technically complex systems, e.g. FAA and NRC.

Nguyen, Ngoc B

From: Ford Brett [FBrett@PetroSkills.com]
Sent: Wednesday, June 23, 2010 8:05 PM
To: Ken Arnold
Cc: Benton Baugh; Bob Bea; Hans Juvkam-Wold; Ken Arnold; Martin Chenevert; Per Holand; Skip Ward; Tom Williams; Black, Steve; Kemkar, Neal; Hanley, Kallie
Subject: Re: Power Point Presented to Secretary Salazar on 6/21/2010

Ken - thanks.

All - my cell works in Vietnam (see below) at lowish (bearable) cost. Ken and I will be at the same Society of Petroleum Engineers meeting. If you need to contact him urgently, I'll be happy to be his recording secretary.

Ford Brett

(m) +1 918 408 9516

On Jun 23, 2010, at 6:48 PM, "Ken Arnold" <karnold@karnoldconsulting.com> wrote:

> You are receiving this because you expressed an interest in having a
> copy of the subject report. DOI has been asked if they have a problem
> with us distributing this to whomever asks and have not expressed an
> objection.
> Those present at the meeting or by phone were the original signers of
> the Group of 8, plus Per Holland and Arnold Stancell. Bob Bea and
> Skip Ward were unable to participate. From DOI attendees beside the
> Secretary included David Hayes, Tom Strickland, The new Director of
> the MMS Mike B (please excuse my inability to spell his last name as I
> am traveling and don't really have time to look it up).
>
>
>
> The people contributing to this power point besides myself are:
>
>
>
> Benton Baugh (bbaugh@radoil.com)
>
> Bob Bea (bea@ce.berkeley.edu)
>
> Ford Brett (fbrett@petroskills.com)
>
> Hans Juvkam-Wold (juvkam-wold@pe.tamu.edu)
>
> Martin Chenevert (mechenevert@austin.utexas.edu)
>
> Per Holand (Per.holand@exprosoft.com)
>
> Skip Ward (egward@tamu.edu)
>
> Tom Williams (Tom.Williams@Nautilus-Int.com)
>
>

>
> The list of those getting this is as follows, but I have copied only
> two at a time so it is not blocked by a spam filter:
>
>
>
> Robert Arnold (rarnold@kprc.com)
>
> Ted Oberg (ted.oberg@abc.com)
>
> Power, Stephen [Stephen.Power@wsj.com]
>
> Naomi Lopez Bauman [naomi_lopez_bauman@yahoo.com]
>
> V. Peyton Bruns [vpeytonbruns@aol.com]
>
> KENDALL KULPER, BLOOMBERG/ NEWSROOM: [kkulper1@bloomberg.net]
>
> Guarino, Mark [GuarinoM@csmonitor.com]
>
> Rosenblum, Carl [crosenblum@joneswalker.com]
>
>
>
> The Secretary has expressed an interest in meeting with us in two
> weeks with a wider audience.
>
>
>
> Please be advised I am in SE Asia and will return to Houston Tuesday
> the 30th in the afternoon. Do not call my cell phone unless it is
> important as it is an expensive call for me. Also I have been unable
> to pick up my phone messages since leaving the US. I may be able to
> pick them up when I leave Viet Nom for Singapore Sunday but am not
> sure.
>
>
>
> Kenneth E. (Ken) Arnold
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> K Arnold Consulting, Inc.
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> 3031 Shadowdale
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> Houston, TX 77043
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> Cell: 832-212-0160
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> Home: 713-939-1034
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> www.karnoldconsulting.com
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>
>
> <Presentation to Secretary of Interior - Rev 4.pptx>

Nguyen, Ngoc B

From: Ken Arnold [karnold@karnoldconsulting.com]
Sent: Thursday, May 27, 2010 2:30 PM
To: Kemkar, Neal; Black, Steve
Cc: Bud Danenberger; Ford Brett
Subject: RE: Draft Interim Measures Report for Immediate Review

Neal and Steve

I note that the transmittal letter calls for a total suspension of drilling activities for 6 months from floating rigs. There is nothing in the report I reviewed or the history presented that warrants such action. What does the Secretary plan to do with all the people who will be thrown out of work when this is adopted.

A very good report has been used to justify a decision which is unwarranted. If the Secretary were to ban future wells in over 5000 or so feet of water for 6 months, I could understand the political need, but not the technical need to do so. However, the proposed ban on all drilling from floating rigs is just not warranted based on the history presented in this report augmented by the immediate improvements recommended.

I also object to the statement that these actions will assure, "that another event like the BP oil spill can never occur again." The only way to assure this is to stop ALL offshore drilling. Even after all the recommendations are implemented, we cannot be anymore certain that a platform well will not blowup and cause a major oil spill anymore than we can assure that a well drilled from a floating platform will not once again cause a major oil spill. We can also not be sure that an airplane without terrorists aboard will never crash into the White House, unless we ban all air traffic.

The report is an excellent piece of work. The cover letter is an abomination. I am ashamed to have my name associated with it.

Ken

Kenneth E. (Ken) Arnold
K Arnold Consulting, Inc.
3031 Shadowdale
Houston, TX 77043
Cell: 832-212-0160
Home: 713-939-1034
www.karnoldconsulting.com

From: Kemkar, Neal [mailto:Neal_Kemkar@ios.doi.gov]
Sent: Tuesday, May 25, 2010 9:44 AM
To: Ken Arnold
Cc: Black, Steve
Subject: Draft Interim Measures Report for Immediate Review

Ken - please review the attached draft of the safety report and let us know, by later today, about any big picture thoughts or comments you have. The Secretary and White House are reviewing this draft. I will call you momentarily to discuss.

Thanks,
Neal

Neal Kemkar
Office of the Secretary
U.S. Department of the Interior
(202) 208-5379

Nguyen, Ngoc B

From: Ken Arnold [karnold@karnoldconsulting.com]
Sent: Thursday, May 27, 2010 2:37 PM
To: Kemkar, Neal; Black, Steve
Subject: RE: Draft Interim Measures Report for Immediate Review

Neal and Steve

I guess I should add if the President accepts this recommendation, it really makes me doubt my early and continued support of the President and of the Secretary. The owners of these rigs will have no choice but to try and find work for them in other places of the world. Once gone and committed to long term contracts it will take a long time before we can build up such a large and modern fleet again. The impact on the Federal budget and employment will last more than 6 months.

Ken

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Home: 713-939-1034
www.karnoldconsulting.com

From: Ken Arnold [mailto:karnold@karnoldconsulting.com]
Sent: Thursday, May 27, 2010 1:30 PM
To: 'Kemkar, Neal'; 'Black, Steve'
Cc: Bud Danenberger (edanenberger@gmail.com); Ford Brett (fbrett@petroskills.com)
Subject: RE: Draft Interim Measures Report for Immediate Review

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U.S. Department of the Interior
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Nguyen, Ngoc B

From: Ford Brett [FBrett@PetroSkills.com]
Sent: Saturday, May 29, 2010 9:44 PM
To: Ken Arnold
Cc: Black, Steve; Tom.Williams@Nautilus-Int.com; egward@tamu.edu; Hans Juvkam-Wold
Subject: Re: Potential report to Senators from Contributors to Secretary Salazar's 30 Day Report to The President

Ken et al

I just read on bloomberg that Rigs in less than 500 ft of h2o are exempt. True?

All we need now is to alllow development drilling - any chance?

Ford Brett

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> Steve
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> There has been a change in plans. The current thought is to send the attached to Senator Landry and Senator Hutchinson. We have connections at both. Please note we turned down the tone.
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From: Black, Steve [mailto:steve_black@ios.doi.gov]
Sent: Saturday, May 29, 2010 2:52 PM
To: 'karnold@karnoldconsulting.com'
Cc: 'fbrett@petroskills.com'; 'Tom.Williams@Nautilus-Int.com'; 'egward@tamu.edu'
Subject: Re: Potential Op Ed from Contributors to Secretary Salazar's 30 Day Report to The President

Thanks Ken. The Secretary is traveling this weekend, but I'd be happy to talk further. I appreciate your courtesies.

And to each of you, thanks again for your helpful work on the 30-day safety report.
Steve

<Our Views Are Not Appropriately Represented- Rev 1.docx>

Nguyen, Ngoc B

From: Ford Brett [FBrett@PetroSkills.com]
Sent: Sunday, May 30, 2010 10:21 PM
To: Black, Steve; karnold@karnoldconsulting.com
Cc: Tom.Williams@Nautilus-Int.com; egward@tamu.edu; juvkam-wold@pe.tamu.edu
Subject: RE: Potential report to Senators from Contributors to Secretary Salazar's 30 Day Report to The President

Steve –

Thanks for the update – you don't need to be reading an email from me on a holiday. Hopefully, you won't see this until Tuesday. I'd like for you to know where I stand on this. This email describes my concerns. I believe they are likely similar to those of others on the panel, but I'm speaking only for myself.

The Secretary and President are entitled to take any legal action they feel appropriate for any reasons (technical, political, or even 'just because'). I understand that. If I wanted to 'cause a stink' I already would have. I think my (our?) concerns are valid and deserve some kind of formal response from the DOI.

I have three concerns (in roughly descending order of importance from my perspective) with the way this was handled.

1) We can't be having political decisions (however valid) be 'given' cover by technical experts who don't agree with (and worse haven't even reviewed) the recommendations. Processes that do that are doomed to fail. I participated in the effort in good faith. I made what I thought were helpful comments, and I believe the DOI did a very good job on the report - especially in 30 days. I think the final detailed recommendations go a bit overboard, but I can see why there's necessary. I'll even support them all because that's what the process produced. But the most important recommendation wasn't something we even looked at. That is the Secretary's prerogative – but not with our names on it. The entire process will lose credibility and (I'm afraid) you'll lose the contributions of people like me who have valuable experience to contribute. This can all be a miss-communication, a report issued in haste etc. I understand things like that. OK – but we need to 'fix' the perception that we reviewed and agreed with the six month ban. (A press release clarifying would be OK). But if panels like this are to be 'political cover' instead of 'searches for the truth' (or at least expert's consensus) then you'll have serious problems with trying to move forward with the many things still left to do. I don't want to see that. I hope you and the Secretary can see that this isn't a disagreement on what to do, but on the integrity of the process.

Brett editorial note: I know a bit about how BP works, and very interestingly to me, this kind failure of integrity in the process - in my opinion - is similar to what was going on in BP (ie. Reporting up the organization that 'all the experts agree', when, in fact, the people with the detailed knowledge did not). Don't do that – you'll have a disaster.

2) Personal integrity. Am I supposed to A) provide my professional advice to the DOI as best as I can, or B) be 'cover' for whatever decision the DOI would like to make. I am very proud, and pleased to do A) and hope I positively contribute to a solution. I will not do B).

3) I disagree with the recommendation to halt all floating drilling. Let me tell you why I think a 6 month ban is the wrong thing for our nation to do. (Editorial note: haven't been selected by the people to make this decision, but I still have "judgment about risk" based on the physics and practical operational realities in the field). If we are to have 'reviewed' this recommendation – as stated in the report - at least my concerns should have been heard.
    a) Deepwater **exploration** is where the risks are (development is way safer). Once the pore pressure and productive formations are known, operations become much, much more reliable. A blanket ban is not warranted and will drive responsible operators away from the gulf (Brett editorial comment: there is a reason why Transocean is headquartered in Switzerland and not Houston – it's has to do with legal concerns).
    b) The best rigs will get work and go else where. They won't come back. We'll end up with 'junkier' rigs (they'll still meet 'regs' – but they'll be less capable). This will have the unintended consequence of increasing our future risks.
    c) There were problems with equipment, but the root problem wasn't with the equipment – it was with a piece of paper in Houston - faulty design. By the way, we'll know more later, but it is possible the BOP worked as designed, and that, because of the faulty casing design, it simply washed out as it was trying to close. They take 45 seconds to close, and can wash out if sealing on pressure and high flow. That's because of the faulty casing design. The measures in our report – if implemented – will address both equipment and design risks.

d) Operators need to fully implement those recommendations per the report – not arbitrarily wait six months. An arbitrary six month delay on all floating drilling will penalize the responsible operators along with those who are not. How did six months come about? Why not five? Why not nine? We proposed that operators fulfill the requirements in our detailed recommendations and then proceed. Some operators might be able to do it faster than others. We need performance standards, not an arbitrary time in the 'penalty box'.
e) A second cause of this disaster was the inattention that people paid to the warning signs. No one will do that again for a long time to come. (Editorial comment: having executives not necessary for operations to go the rig for a 'safety' award is in itself unsafe – if nothing else for the helicopter ride. It caused the "C team" to be on the switch.)

I believe the blanket ban will drive responsible operators away from the Gulf of Mexico. Besides reducing lease sale income and production revenue, it will INCREASE future risk by keeping out less responsible operators and making future equipment used in the gulf be worse. We need performance standards – not arbitrary requirements – to drive what we do.

As far as I know my work on the review is done. I'll be happy to help in the future if I can, but would need my first two concerns addressed before I would be prepared to do so.

I hope you're spending time with your family and not reading this on Memorial Day, if you happen to read this – happy memorial day to you as well.

I would like some kind of reply. Thanks for your patience.

Ford Brett

PetroSkills
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(m) +1 918 408 9516 *(works in most of world)*
Skype Ford.Brett
or call Rozanne at +1 918 828 2505

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From: Black, Steve [mailto:steve_black@ios.doi.gov]
Sent: Sunday, May 30, 2010 8:08 PM
To: Ford Brett; 'karnold@karnoldconsulting.com'
Cc: 'Tom.Williams@Nautilus-Int.com'; 'egward@tamu.edu'; 'juvkam-wold@pe.tamu.edu'
Subject: Re: Potential report to Senators from Contributors to Secretary Salazar's 30 Day Report to The President

Ford, we just put out a press release with an NTL clarifying the scope of the moratorium. Shallow water wells and certain development wells in deep water are allowed.

Have a good Memorial Day!

Steve

From: Ford Brett <FBrett@PetroSkills.com>
To: Ken Arnold <karnold@karnoldconsulting.com>
Cc: Black, Steve; Tom.Williams@Nautilus-Int.com <Tom.Williams@Nautilus-Int.com>; egward@tamu.edu <egward@tamu.edu>; Hans Juvkam-Wold <juvkam-wold@pe.tamu.edu>
Sent: Sat May 29 21:43:55 2010
Subject: Re: Potential report to Senators from Contributors to Secretary Salazar's 30 Day Report to The President

Ken et al

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Ford Brett

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Subject: Re: Potential Op Ed from Contributors to Secretary Salazar's 30 Day Report to The President

Thanks Ken. The Secretary is traveling this weekend, but I'd be happy to talk further. I appreciate your courtesies.

And to each of you, thanks again for your helpful work on the 30-day safety report.
Steve

<Our Views Are Not Appropriately Represented- Rev 1.docx>

Nguyen, Ngoc B

From: E.G.(Skip) Ward [egward@otrc.tamu.edu]
Sent: Tuesday, June 01, 2010 10:54 AM
To: 'Ken Arnold'; Black, Steve
Cc: fbrett@petroskills.com; Tom.Williams@Nautilus-Int.com; egward@tamu.edu; 'Hans Juvkam-Wold'
Subject: RE: Potential report to Senators from Contributors to Secretary Salazar's 30 Day Report to The President

Ken, The version prepared for the senators looks fine to me. I do wonder how this will help our plight, notwithstanding concerns re: specific senators.

I agree with the concerns Fred expressed very well in his email on 5/30/10.

Skip

E.G.(Skip) Ward, Associate Director
Offshore Technology Research Center
Texas A&M University
Tel.(979) 777-7063 (c)
Email: egward@otrc.tamu.edu

From: Ken Arnold [mailto:karnold@karnoldconsulting.com]
Sent: Saturday, May 29, 2010 5:25 PM
To: 'Black, Steve'
Cc: fbrett@petroskills.com; Tom.Williams@Nautilus-Int.com; egward@tamu.edu; Hans Juvkam-Wold
Subject: RE: Potential report to Senators from Contributors to Secretary Salazar's 30 Day Report to The President

Steve

There has been a change in plans. The current thought is to send the attached to Senator Landry and Senator Hutchinson. We have connections at both. Please note we turned down the tone.

We are also in the process of gathering more signatures.

Ken

Kenneth E. (Ken) Arnold
K Arnold Consulting, Inc.
3031 Shadowdale
Houston, TX 77043
Cell: 832-212-0160
Home: 713-939-1034
www.karnoldconsulting.com

From: Black, Steve [mailto:steve_black@ios.doi.gov]
Sent: Saturday, May 29, 2010 2:52 PM
To: 'karnold@karnoldconsulting.com'
Cc: 'fbrett@petroskills.com'; 'Tom.Williams@Nautilus-Int.com'; 'egward@tamu.edu'
Subject: Re: Potential Op Ed from Contributors to Secretary Salazar's 30 Day Report to The President

Thanks Ken. The Secretary is traveling this weekend, but I'd be happy to talk further. I appreciate your courtesies.

And to each of you, thanks again for your helpful work on the 30-day safety report.
Steve

Nguyen, Ngoc B

From: Hanley, Kallie
Sent: Monday, June 14, 2010 7:01 PM
To: Hanley, Kallie
Cc: Dubin, Lindsay; Kemkar, Neal; Black, Steve
Subject: Call tomorrow 6.15.10 with Secretary Salazar

Good evening,

Interior Secretary Ken Salazar hopes that you can participate in a conference call at 4:15pm EASTERN tomorrow, June 15, 2010 regarding the 30-day report on Increased Safety Measures for Energy Development on the Outer Continental Shelf. The Secretary would like to thank you for your contributions to the report and discuss follow-up implementation plans. This conference call is limited to the people who have received this email. Please let Lindsay Dubin (cc'd) and me know by 12:00pm EASTERN tomorrow if you will be able to participate in this call. We will send you a conference call number upon our receipt of your participation.

Thank you,

Kallie Hanley
Office of the White House Liaison | The U.S. Department of the Interior
desk: (202) 208-5397 | cell: (202) 374-7694 | kallie_hanley@ios.doi.gov

Nguyen, Ngoc B

From: Benton Baugh [bbaugh@radoil.com]
Sent: Monday, June 14, 2010 7:17 PM
To: Hanley, Kallie
Cc: Dubin, Lindsay; Kemkar, Neal; Black, Steve
Subject: RE: Call tomorrow 6.15.10 with Secretary Salazar

I will be able to participate.

Regards,

Benton F. Baugh

Radoil, Inc.

ISO 9001:2008

12551 FM 529 RD
Houston, TX 77041
office: (713) 937-4494
cell: (713) 419-8683
bbaugh@radoil.com
www.radoil.com

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From: Hanley, Kallie [mailto:Kallie_Hanley@ios.doi.gov]
Sent: Monday, June 14, 2010 6:01 PM
To: Hanley, Kallie
Cc: Dubin, Lindsay; Kemkar, Neal; Black, Steve
Subject: Call tomorrow 6.15.10 with Secretary Salazar

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Nguyen, Ngoc B

From: Ford Brett [FBrett@PetroSkills.com]
Sent: Monday, June 14, 2010 8:00 PM
To: Hanley, Kallie
Cc: Dubin, Lindsay; Kemkar, Neal; Black, Steve
Subject: RE: Call tomorrow 6.15.10 with Secretary Salazar

Kallie –

I will be able to attend the call.

I'm in Kuala Lumpur right now, but will be up early anyway.

Ford Brett

PetroSkills
(o) +1 918 828 2511 *(I pick up messages frequently)*
(m) +1 918 408 9516 *(works in most of world)*
Skype Ford.Brett
or call Rozanne at +1 918 828 2505

www.PetroSkills.com

From: Hanley, Kallie [mailto:Kallie_Hanley@ios.doi.gov]
Sent: Monday, June 14, 2010 6:01 PM
To: Hanley, Kallie
Cc: Dubin, Lindsay; Kemkar, Neal; Black, Steve
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Nguyen, Ngoc B

From: Ken Arnold [karnold@karnoldconsulting.com]
Sent: Monday, June 14, 2010 9:33 PM
To: Hanley, Kallie
Cc: Dubin, Lindsay; Kemkar, Neal; Black, Steve
Subject: RE: Call tomorrow 6.15.10 with Secretary Salazar

I will be able to participate

Kenneth E. (Ken) Arnold
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Nguyen, Ngoc B

From: Ken Arnold [karnold@karnoldconsulting.com]
Sent: Monday, June 14, 2010 9:35 PM
To: Hanley, Kallie
Cc: Dubin, Lindsay; Kemkar, Neal; Black, Steve
Subject: RE: Call tomorrow 6.15.10 with Secretary Salazar

I am sorry. I made a mistake for some reason I thought the call was later in the day. I will be on an airplane flying from NYC to Houston which lands n Houston at 1:21 PM Houston time.

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desk: (202) 208-5397 | cell: (202) 374-7694 | kallie_hanley@ios.doi.gov

Nguyen, Ngoc B

From: Ken Arnold [karnold@karnoldconsulting.com]
Sent: Monday, June 14, 2010 9:38 PM
To: Hanley, Kallie
Cc: Dubin, Lindsay; Kemkar, Neal; Black, Steve
Subject: RE: Call tomorrow 6.15.10 with Secretary Salazar

Sorry once again. I now see the call is at 4:15 PM Eastern which is 3:15 Houston time. God and Continental willing I can participate.

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Houston, TX 77043
Cell: 832-212-0160
Home: 713-939-1034
www.karnoldconsulting.com

From: Ken Arnold [mailto:karnold@karnoldconsulting.com]
Sent: Monday, June 14, 2010 8:35 PM
To: 'Hanley, Kallie'
Cc: 'Dubin, Lindsay'; 'Kemkar, Neal'; 'Black, Steve'
Subject: RE: Call tomorrow 6.15.10 with Secretary Salazar

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From: Hanley, Kallie [mailto:Kallie_Hanley@ios.doi.gov]
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Nguyen, Ngoc B

From: Juvkam-Wold, Hans [juvkam-wold@pe.tamu.edu]
Sent: Tuesday, June 15, 2010 3:07 AM
To: Hanley, Kallie
Cc: Dubin, Lindsay; Kemkar, Neal; Black, Steve; juvkamwold@gmail.com
Subject: RE: Call tomorrow 6.15.10 with Secretary Salazar

All,

I plan to call in.

Hans

~~~
~~~

Nguyen, Ngoc B

From: Hanley, Kallie
Sent: Tuesday, June 15, 2010 8:17 AM
To: 'karnold@karnoldconsulting.com'
Cc: Dubin, Lindsay; Kemkar, Neal; Black, Steve
Subject: Re: Call tomorrow 6.15.10 with Secretary Salazar

Ken,

The conference call info is below:

4:15pm EASTERN
Call in number: 866-816-2568
Participant Code: 8242482

Best,

Kallie

From: Ken Arnold <karnold@karnoldconsulting.com>
To: Hanley, Kallie
Cc: Dubin, Lindsay; Kemkar, Neal; Black, Steve
Sent: Mon Jun 14 21:38:27 2010
Subject: RE: Call tomorrow 6.15.10 with Secretary Salazar

Sorry once again. I now see the call is at 4:15 PM Eastern which is 3:15 Houston time. God and Continental willing I can participate.

Kenneth E. (Ken) Arnold
K Arnold Consulting, Inc.
3031 Shadowdale
Houston, TX 77043
Cell: 832-212-0160
Home: 713-939-1034
www.karnoldconsulting.com

From: Ken Arnold [mailto:karnold@karnoldconsulting.com]
Sent: Monday, June 14, 2010 8:35 PM
To: 'Hanley, Kallie'
Cc: 'Dubin, Lindsay'; 'Kemkar, Neal'; 'Black, Steve'
Subject: RE: Call tomorrow 6.15.10 with Secretary Salazar

I am sorry. I made a mistake for some reason I thought the call was later in the day. I will be on an airplane flying from NYC to Houston which lands n Houston at 1:21 PM Houston time.

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From: Hanley, Kallie [mailto:Kallie_Hanley@ios.doi.gov]
Sent: Monday, June 14, 2010 6:01 PM
To: Hanley, Kallie
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desk: (202) 208-5397 | cell: (202) 374-7694 | kallie_hanley@ios.doi.gov

Nguyen, Ngoc B

From: Chenevert, Martin E [mechenevert@austin.utexas.edu]
Sent: Tuesday, June 15, 2010 11:42 AM
To: Hanley, Kallie
Cc: Dubin, Lindsay; Kemkar, Neal; Black, Steve
Subject: RE: Call tomorrow 6.15.10 with Secretary Salazar

Dear Kallie:
I just arrived in my office. If it is still possible, please include me in this call.
Sincerely,
Martin E. Chenevert

From: Hanley, Kallie [mailto:Kallie_Hanley@ios.doi.gov]
Sent: Monday, June 14, 2010 6:01 PM
To: Hanley, Kallie
Cc: Dubin, Lindsay; Kemkar, Neal; Black, Steve
Subject: Call tomorrow 6.15.10 with Secretary Salazar

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Nguyen, Ngoc B

From: Ken Arnold [karnold@karnoldconsulting.com]
Sent: Wednesday, June 16, 2010 9:58 AM
To: Hanley, Kallie; Kemkar, Neal
Subject: Meeting Monday

Kallie

Do you have a list of those who are invited to attend Monday's meeting with the Secretary, their email addresses and phone numbers. I think it would be a good idea if we shared some information prior to the meeting.

I am arriving Sunday night. Is it possible for someone to make hotel reservations for us so we get the Government rate. If not do you have a recommendation where we can stay.

Ken

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Houston, TX 77043
Cell: 832-212-0160
Home: 713-939-1034
www.karnoldconsulting.com

Nguyen, Ngoc B

From: Hanley, Kallie
Sent: Wednesday, June 16, 2010 2:34 PM
To: Ken Arnold; Kemkar, Neal
Subject: RE: Meeting Monday

Hi Ken

I do not have a list of who is attending the meeting. As far as hotel reservations I believe we are legally prohibited from making reservations for you or advising you where to stay (so to avoid endorsing any accommodations).

Sorry I cannot be more helpful.

Best Regards,

Kallie Hanley
Office of the White House Liaison | The U.S. Department of the Interior
desk: (202) 208-5397 | cell: (202) 374-7694 | kallie_hanley@ios.doi.gov

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Nguyen, Ngoc B

From: Dubin, Lindsay
Sent: Thursday, June 17, 2010 6:23 PM
To: Dubin, Lindsay
Cc: Black, Steve; Kemkar, Neal; Hanley, Kallie
Subject: Meeting with Secretary Salazar Monday 6.21.10

Good evening,

Interior Secretary Ken Salazar hopes that you can participate in a meeting at 10:00am EASTERN Monday, June 21, 2010 as a follow-up to Tuesday's conference call regarding the 30-day report on Increased Safety Measures for Energy Development on the Outer Continental Shelf. For those of you who are unable to join this meeting in person, there will be a call-in option for you to participate remotely. This meeting/conference call is limited to the people who have received this email. Please let Kallie Hanley (cc'd) and me know by 3:00pm EASTERN tomorrow if you will be able to participate. Please be sure to indicate whether you will be attending in person or via phone. We will reach out to you with arrival instructions or a conference call number following our receipt of your participation.

Thank you,

Lindsay Dubin
Special Assistant
Office of Scheduling and Advance
The U.S. Department of the Interior
p: (202) 208-7551 | f: (202) 208-4694
lindsay_dubin@ios.doi.gov

Nguyen, Ngoc B

From: Ken Arnold [karnold@karnoldconsulting.com]
Sent: Thursday, June 17, 2010 6:45 PM
To: Dubin, Lindsay
Cc: Black, Steve; Kemkar, Neal; Hanley, Kallie
Subject: RE: Meeting with Secretary Salazar Monday 6.21.10

I will attend in person. Please let me know who else was invited.

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From: Dubin, Lindsay [mailto:Lindsay_Dubin@ios.doi.gov]
Sent: Thursday, June 17, 2010 5:23 PM
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Nguyen, Ngoc B

From: Ford Brett [FBrett@PetroSkills.com]
Sent: Thursday, June 17, 2010 7:29 PM
To: Dubin, Lindsay
Cc: Black, Steve; Kemkar, Neal; Hanley, Kallie
Subject: RE: Meeting with Secretary Salazar Monday 6.21.10

Lindsay – I will be able to participate – let me know the dial in. I'm sorry I won't be able to attend in person.

Thanks,

Ford Brett

PetroSkills
(o) +1 918 828 2511 *(I pick up messages frequently)*
(m) +1 918 408 9516 *(works in most of world)*
Skype Ford.Brett
or call Rozanne at +1 918 828 2505

www.PetroSkills.com

From: Dubin, Lindsay [mailto:Lindsay_Dubin@ios.doi.gov]
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To: Dubin, Lindsay
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Nguyen, Ngoc B

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Regards,

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Radoil, Inc.

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bbaugh@radoil.com
www.radoil.com

The information contained in this e-mail may contain confidential or privileged mater and is intended only for the stated addressee(s). Ifyou are not a valid addressee, the use, disclosure, copying or distribution of this information is prohibited and may be unlawful. If you have received this message in error, please notify the sender immediately and delete all copies of the message from your computer.

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Special Assistant

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The U.S. Department of the Interior
p: (202) 208-7551 | f: (202) 208-4694
lindsay_dubin@ios.doi.gov

Nguyen, Ngoc B

From: Dubin, Lindsay
Sent: Friday, June 18, 2010 10:27 AM
To: Ken Arnold
Cc: Black, Steve; Kemkar, Neal; Hanley, Kallie; Morlandt, Christopher
Subject: RE: Meeting with Secretary Salazar Monday 6.21.10

Hi Ken,

Glad to hear that you will be attending. Christopher Morlandt from the Secretary's office, who is cc'd, will be reaching out to you today with arrival instructions.

Look forward to seeing you Monday,

Lindsay

From: Ken Arnold [mailto:karnold@karnoldconsulting.com]
Sent: Thursday, June 17, 2010 6:45 PM
To: Dubin, Lindsay
Cc: Black, Steve; Kemkar, Neal; Hanley, Kallie
Subject: RE: Meeting with Secretary Salazar Monday 6.21.10

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Subject: Meeting with Secretary Salazar Monday 6.21.10

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Interior Secretary Ken Salazar hopes that you can participate in a meeting at 10:00am EASTERN Monday, June 21, 2010 as a follow-up to Tuesday's conference call regarding the 30-day report on Increased Safety Measures for Energy Development on the Outer Continental Shelf. For those of you who are unable to join this meeting in person, there will be a call-in option for you to participate remotely. This meeting/conference call is limited to the people who have received this email. Please let Kallie Hanley (cc'd) and me know by 3:00pm EASTERN tomorrow if you will be able to participate. Please be sure to indicate whether you will be attending in person or via phone. We will reach out to you with arrival instructions or a conference call number following our receipt of your participation.

Thank you,

Lindsay Dubin
Special Assistant
Office of Scheduling and Advance
The U.S. Department of the Interior
p: (202) 208-7551 | f: (202) 208-4694
lindsay_dubin@ios.doi.gov

Nguyen, Ngoc B

From: Morlandt, Christopher
Sent: Friday, June 18, 2010 11:10 AM
To: Ken Arnold
Cc: Hanley, Kallie; Dubin, Lindsay
Subject: RE: Meeting with Secretary Salazar Monday 6.21.10

Good morning Mr. Arnold,

My name is Chris Morlandt and I will be assisting you with the entry into our building on Monday 6-21-2010. We are located at 1849 C st. NW directly across from DAR Constitution hall. I have notified our security team of your arrival and so there will be no need to sign in / go through metal detectors. I will personally meet you downstairs in our C st. lobby entrance and escort you up to the meeting. If you have any questions whatsoever -- please do not hesitate to give me a call. I look forward to meeting you on Monday and I hope you have a wonderful weekend.

Respectfully,

Chris Morlandt
(202)-257-2645

From: Dubin, Lindsay
Sent: Friday, June 18, 2010 10:27 AM
To: Ken Arnold
Cc: Black, Steve; Kemkar, Neal; Hanley, Kallie; Morlandt, Christopher
Subject: RE: Meeting with Secretary Salazar Monday 6.21.10

Hi Ken,

Glad to hear that you will be attending. Christopher Morlandt from the Secretary's office, who is cc'd, will be reaching out to you today with arrival instructions.

Look forward to seeing you Monday,

Lindsay

From: Ken Arnold [mailto:karnold@karnoldconsulting.com]
Sent: Thursday, June 17, 2010 6:45 PM
To: Dubin, Lindsay
Cc: Black, Steve; Kemkar, Neal; Hanley, Kallie
Subject: RE: Meeting with Secretary Salazar Monday 6.21.10

I will attend in person. Please let me know who else was invited.

Kenneth E. (Ken) Arnold
K Arnold Consulting, Inc.
3031 Shadowdale
Houston, TX 77043
Cell: 832-212-0160
Home: 713-939-1034

From: Dubin, Lindsay [mailto:Lindsay_Dubin@ios.doi.gov]
Sent: Thursday, June 17, 2010 5:23 PM
To: Dubin, Lindsay
Cc: Black, Steve; Kemkar, Neal; Hanley, Kallie
Subject: Meeting with Secretary Salazar Monday 6.21.10

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Office of Scheduling and Advance
The U.S. Department of the Interior
p: (202) 208-7551 | f: (202) 208-4694
lindsay_dubin@ios.doi.gov

Nguyen, Ngoc B

From: Chenevert, Martin E [mechenevert@austin.utexas.edu]
Sent: Friday, June 18, 2010 2:40 PM
To: Dubin, Lindsay
Cc: Black, Steve; Kemkar, Neal; Hanley, Kallie
Subject: RE: Meeting with Secretary Salazar Monday 6.21.10
Attachments: GEST FORECASTED_ACTIVITY_11.pdf; Gulf of Mexico Analysis and Summary_updated+Sources.ppt; LMOGA.pdf; LMOGAers.pdf; NOIA.doc

Sirs:
Unfortunately I am unable to attend the meeting in person. Please provide me with the call in number.
I have attached several resources that I plan to introduce at the Monday meeting. It would be useful for Secretary Salazar to have these in hand for reference during the meeting.
Sincerely,
Martin E. Chenevert

From: Dubin, Lindsay [mailto:Lindsay_Dubin@ios.doi.gov]
Sent: Thursday, June 17, 2010 5:23 PM
To: Dubin, Lindsay
Cc: Black, Steve; Kemkar, Neal; Hanley, Kallie
Subject: Meeting with Secretary Salazar Monday 6.21.10

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Thank you,

Lindsay Dubin
Special Assistant
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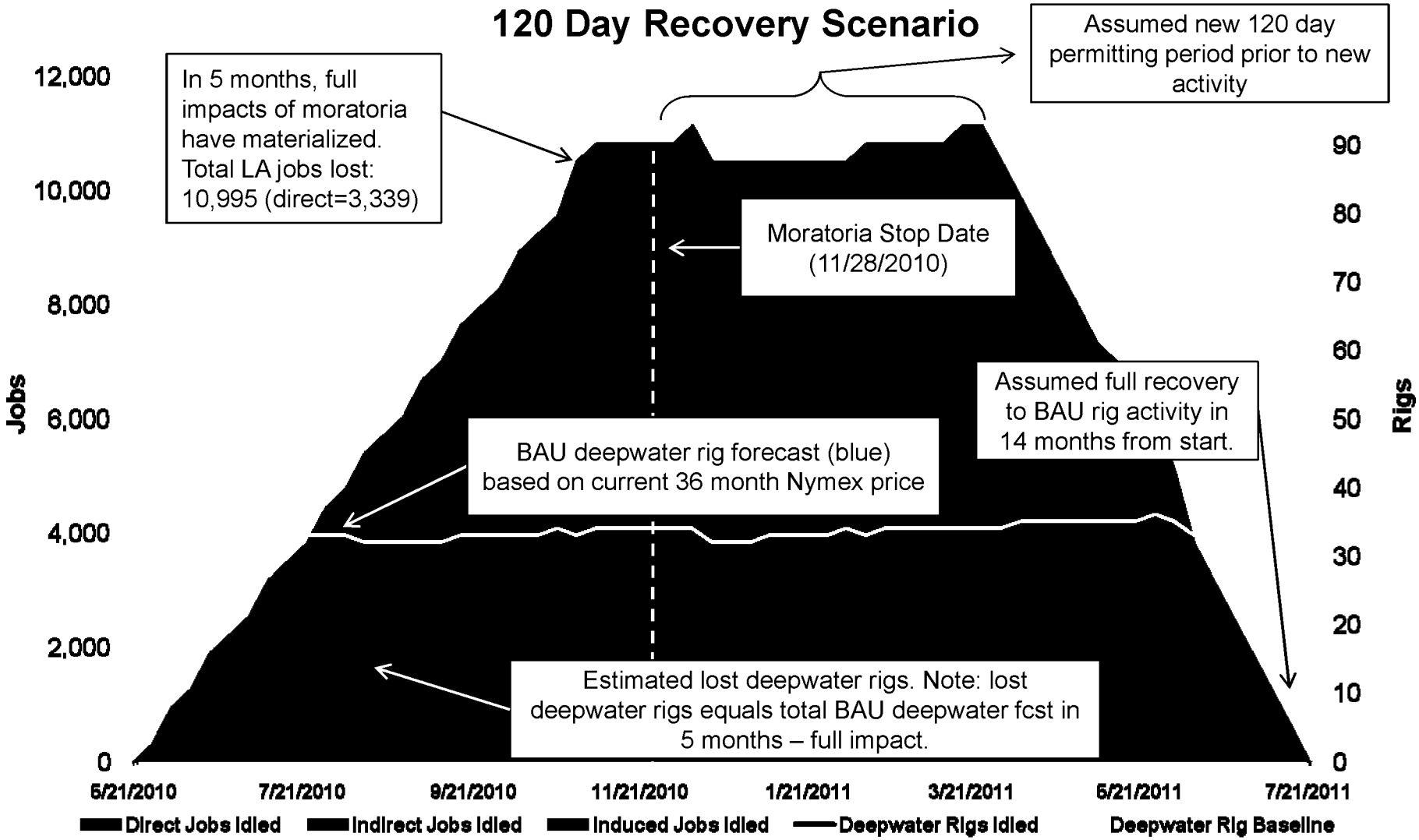
The U.S. Department of the Interior
p: (202) 208-7551 | f: (202) 208-4694
lindsay_dubin@ios.doi.gov

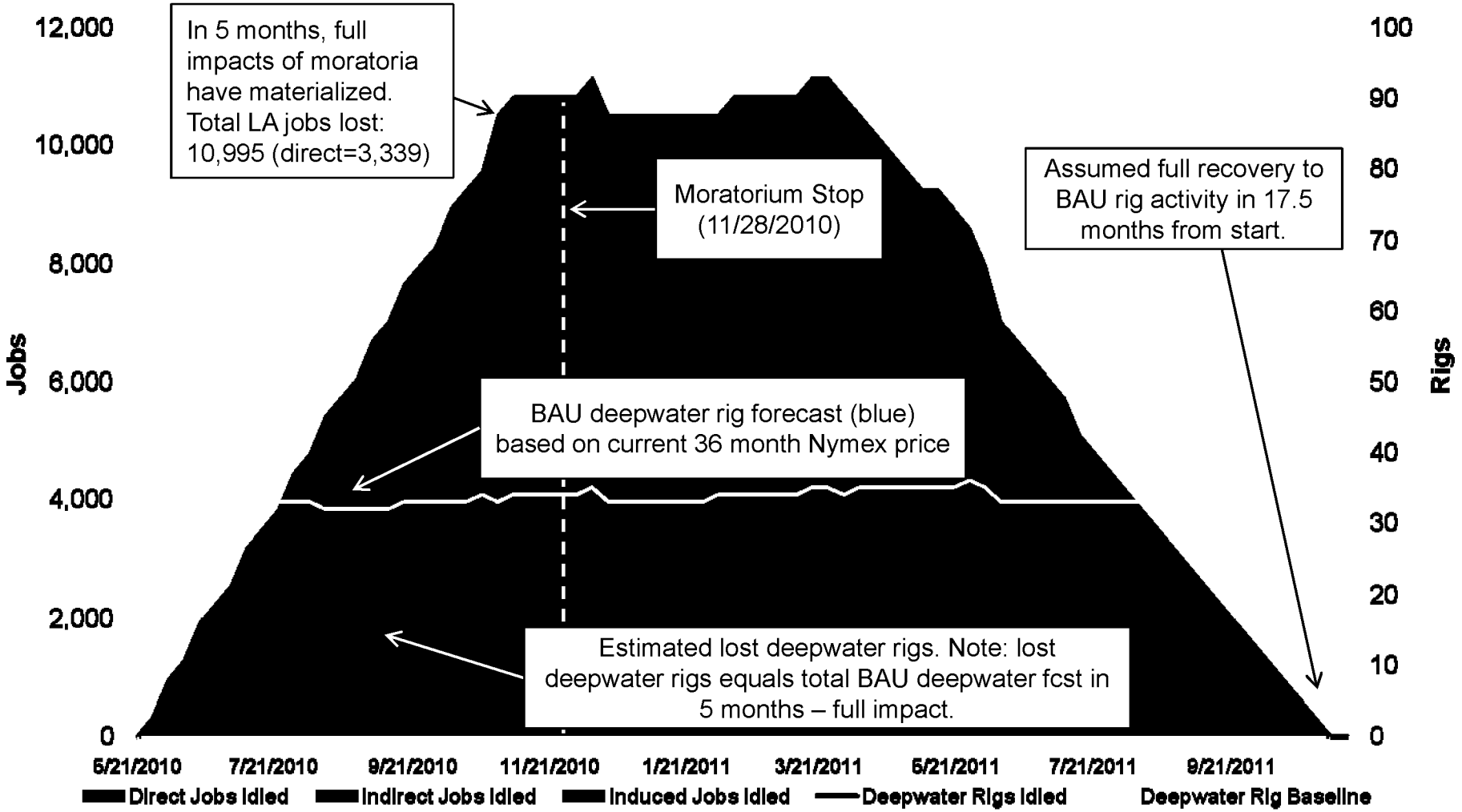
Gulf of Mexico Offshore Deepwater Moratoria Employment Impacts (Louisiana-Only)



Sources: Dept. of Interior, Energy Information Administration, Baker Hughes, CME Group (NYMEX)

Gulf of Mexico Offshore Deepwater Moratoria Employment Impacts (Louisiana-Only)

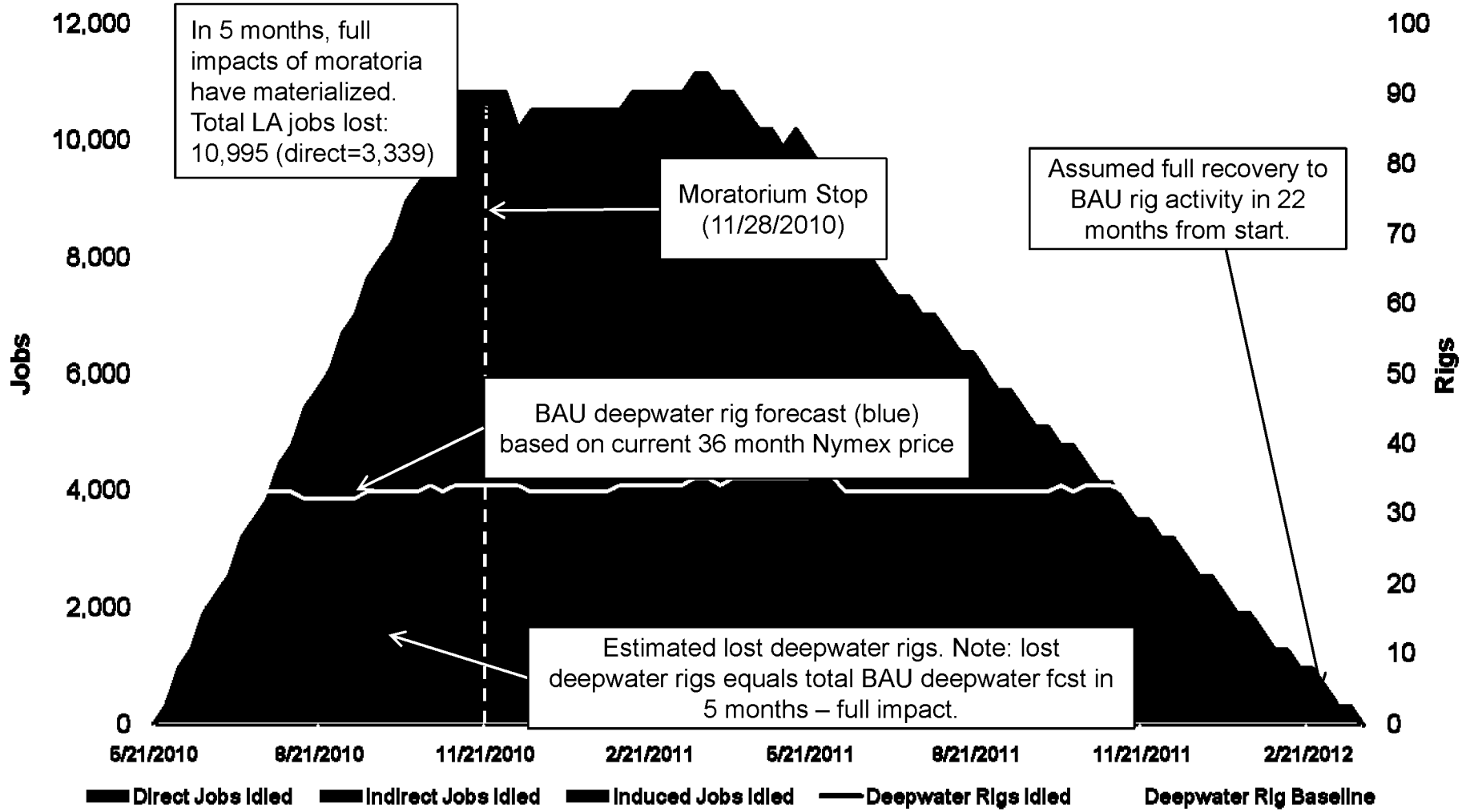
8 Month Recovery Scenario



Sources: Dept. of Interior, Energy Information Administration, Baker Hughes, CME Group (NYMEX)

Gulf of Mexico Offshore Deepwater Moratoria Employment Impacts (Louisiana-Only)

1 Year Recovery Scenario



Sources: Dept. of Interior, Energy Information Administration, Baker Hughes, CME Group (NYMEX)

Gulf of Mexico Analysis & Summary

- Gulf States Economic Sector Analysis
- Summary of Third Party Production Analyses and Economic

Gulf States* GDP Contributions

Bureua of Economic Analysis	Real GDP Millions of Chained 2000 $			
	2004	2005	2006	2007
Tourism Related				
Accomodation	16,058	16,643	16,812	17,046
Amusement, gambling, and recreation	11,930	12,245	12,630	13,010
Food services and drinking places	33,957	35,317	36,726	37,630
Tourism Total	61,945	64,205	66,168	67,686
Oil and gas extraction	48,600	44,134	46,397	46,271
Forestry, fishing, and related activities	5,446	5,851	5,775	5,558
Total	115,991	114,190	118,340	119,515

GDP by NAICS Classifications**

Data Considerations:

- **State level data is only available through 2007**
- **Bureau of Economic Analysis Data can only be pulled under certain categories**
  - **Oil and Gas extraction includes both onshore and offshore development**
  - **Individual fishing data is not available, included in data segment shown**
  - **No separate tourism category available, must be assembled from separate groups**

*Alabama, Florida, Louisiana, Mississippi, & Texas

**North America Industry Classification System definitions in backup

Deepwater Drilling Halt
Production Impact – 3rd Party Analysis

80% of the Gulf of Mexico's oil and 45% of its natural gas is from deepwater operations (more than 1000 feet of water).[1]

LMOGA estimates show the six-month halt would defer 4% of anticipated 2011 deepwater Gulf of Mexico production (80,000 bbls per day), and likely render seven current discoveries sub-economic.[2]

A 6 month halt in new drilling would defer 80,000 boe/d, or 4% of 2011 deepwater Gulf of Mexico production.[3]

Delays in current project timeframes potentially defer over 350,000 boe/d (almost 19%) of 2015 and 2016 deepwater Gulf of Mexico production.[3]

Deferred production begins to recover in 2019. However, we can assume that the slowdown in activity rates might also defer exploration activity, thereby pushing back production from Yet-to-Find fields. The overall effect could be to defer expected production over the next 10 years by significant amounts.[3]

We have included the following delays to Probable Developments: one year for near-term projects; two years for projects that are either more challenging (for example, Lower Miocene or Lower Tertiary), or those that are at an early stage of appraisal.[3]

According to IHS data, US GOM production accounted for 30% of 2009 crude oil production (1.6 MBD out of 5.3 MBD). This 1.6 MBD of Gulf supply was the result of a 33%, or 399,000 barrels per day, increase in output from 2008. Most of the production increase was due to new production from 5 deepwater fields.[4]

The fall in US demand was the most important factor that reduced US foreign oil imports in 2009, but higher domestic production, mostly from deepwater, also played a role.[4]

Deepwater Drilling Halt
Economic Impact – 3rd Party Analysis

- Between $250,000 and $500,000 per rig, per day results in roughly $8,250,000 to $16,500,000 per day in costs for the 33 idle rigs[1]
- Each drilling platform supports 800 to 1400 jobs at risk per idle rig[1]
- The average wage for these jobs is $1,800 per week; the potential for lost wages is between $5,000,000 and $10,000,000 for one month for each drilling platform[1]
- A 6 month halt in drilling could result in total lost wages of between $990,000,000 and $1,800,000,000 for all 33 platforms[1]
- In Louisiana alone there could potentially be 3,000 to 6,000 lost jobs in the next two to three weeks and over 10,000 jobs lost in the coming months[5]

Deepwater Drilling Halt
Cost Impact – 3rd Party Analysis

Higher drilling costs might jeopardize exploration in frontier areas. More immediately, we estimate that seven current discoveries could be rendered sub-economic, putting $7.6 billion in future government revenues at risk.[3]

If tightened regulation and new drilling practices cause longer drill times, both exploration and development well costs will increase. Driving up exploration costs in frontier areas that are already economically marginal could dampen appetites for exploring these areas, which are vital for long-term output from deepwater GOM.[3]

Another threat to smaller companies is the proposal floated in Washington DC to increase the cap on oil companies' liability for oil spill damages from $75 million to $10 billion. Higher insurance bills following the hurricane season of 2005 had already chased some smaller companies off the GOM shelf.[3]

At the time of the blowout there were 67 rigs active in the GOM, both jackup rigs (37 rigs) and semisubmersibles or drill ships (30 rigs). The total semisubmersible GOM fleet is 30 rigs, the moratorium will affect 16 rigs and will leave only 14 actively drilling for production.[4]

The impact of 16 additional rigs coming onto the market looking for opportunities to keep rigs and crews active is likely to depress rig rates (likely drop 10% by third quarter 2010 and potential to drop up to 20% in day rates).[4]

Backup

Oil and Gas Economic Data

Bureau of Economic Analysis – Oil and Gas extraction includes both onshore and offshore development

211 Oil and Gas Extraction*

Industries in the Oil and Gas Extraction subsector operate and/or develop oil and gas field properties. Such activities may include exploration for crude petroleum and natural gas; drilling, completing, and equipping wells; operating separators, emulsion breakers, desilting equipment, and field gathering lines for crude petroleum and natural gas; and all other activities in the preparation of oil and gas up to the point of shipment from the producing property. This subsector includes the production of crude petroleum, the mining and extraction of oil from oil shale and oil sands, and the production of natural gas, sulfur recovery from natural gas, and recovery of hydrocarbon liquids.

Establishments in this subsector include those that operate oil and gas wells on their own account or for others on a contract or fee basis. Establishments primarily engaged in providing support services, on a fee or contract basis, required for the drilling or operation of oil and gas wells (except geophysical surveying and mapping, mine site preparation, and construction of oil/gas pipelines) are classified in Subsector 213, Support Activities for Mining.

07 North America Industry Classification System codes for data

Fishing Economic Data

Bureau of Economic Analysis – Individual fishing data is not available: it is included within data segment incorporating the following three sectors

113 Forestry and Logging*

Industries in the Forestry and Logging subsector grow and harvest timber on a long production cycle (i.e., of 10 years or more). Long production cycles use different production processes than short production cycles, which require more horticultural interventions prior to harvest, resulting in processes more similar to those found in the Crop Production subsector. Consequently, Christmas tree production and other production involving production cycles of less than 10 years, are classified in the Crop Production subsector.

114 Fishing, Hunting and Trapping*

Industries in the Fishing, Hunting, and Trapping subsector harvest fish and other wild animals from their natural habitats and are dependent upon a continued supply of the natural resource. The harvesting of fish is the predominant economic activity of this subsector and it usually requires specialized vessels that, by the nature of their size, configuration and equipment, are not suitable for any other type of production, such as transportation.

115 Support Activities for Agriculture and Forestry*

Industries in the Support Activities for Agriculture and Forestry subsector provide support services that are an essential part of agricultural and forestry production. These support activities may be performed by the agriculture or forestry producing establishment or conducted independently as an alternative source of inputs required for the production process for a given crop, animal, or forestry industry. Establishments that primarily perform these activities independent of the agriculture or forestry producing establishment are in this subsector.

07 North America Industry Classification System codes for data

Tourism Economic Data

Bureau of Economic Analysis – Individual data available that will include tourism: no separate tourism category available

713 Amusement, Gambling, and Recreation Industries*

Industries in the Amusement, Gambling, and Recreation Industries subsector (1) operate facilities where patrons can primarily engage in sports, recreation, amusement, or gambling activities and/or (2) provide other amusement and recreation services, such as supplying and servicing amusement devices in places of business operated by others; operating sports teams, clubs, or leagues engaged in playing games for recreational purposes; and guiding tours without using transportation equipment.

721 Accommodation*

Industries in the Accommodation subsector provide lodging or short-term accommodations for travelers, vacationers, and others. There is a wide range of establishments in these industries. Some provide lodging only; while others provide meals, laundry services, and recreational facilities, as well as lodging. Lodging establishments are classified in this subsector even if the provision of complementary services generates more revenue. The types of complementary services provided vary from establishment to establishment.

722 Food Services and Drinking Places*

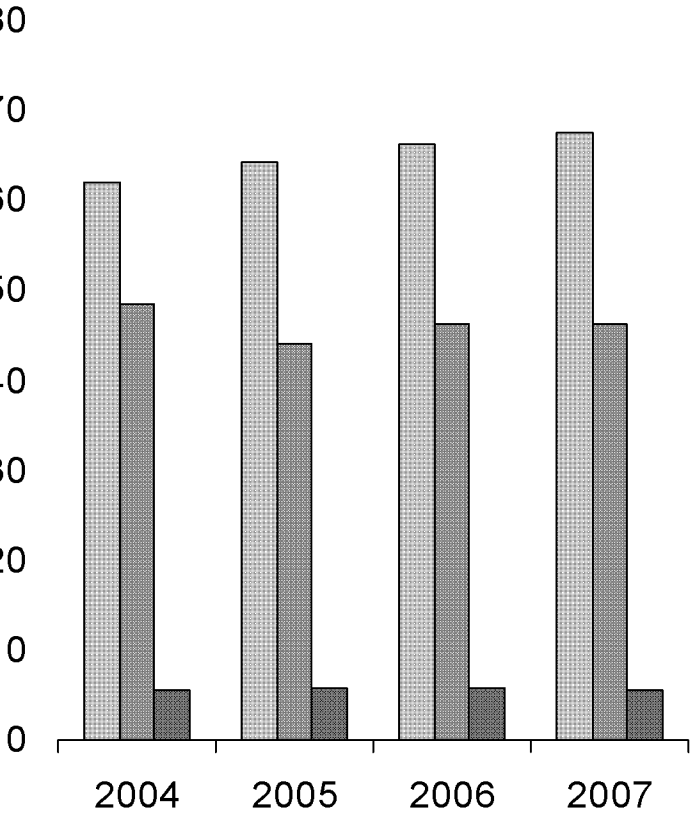
Industries in the Food Services and Drinking Places subsector prepare meals, snacks, and beverages to customer order for immediate on-premises and off-premises consumption. There is a wide range of establishments in these industries. Some provide food and drink only; while others provide various combinations of seating space, waiter/waitress services and incidental amenities, such as limited entertainment. The industries in the subsector are grouped based on the type and level of services provided. The industry groups are full-service restaurants; limited-service eating places; special food services, such as food service contractors, caterers, and mobile food services; and drinking places.

07 North America Industry Classification System codes for data

Gulf States* GDP Contributions

DP Contributions by Industrial Category

lion 2000 $



- **Tourism Related Activities**
  - NAICS** code 713, 721 and 722
    - Amusement, Gambling and Recreation Services
    - Accommodation
    - Food Services and Drinking Places
- **Oil and Gas Extraction**
  - NAICS** code 211
    - Crude Petroleum and Natural Gas Extraction
    - Natural Gas Liquid Extraction
- **Forestry, Fishing, and Related Activities**
  - NAICS** codes 113 through 115
    - Forestry and Logging
    - Fishing, Hunting and Trapping
    - Support Activities for Agriculture and Forestry

abama, Florida, Louisiana, Mississippi, & Texas

Resources:

1. *Louisiana Mid-Continent Oil and Gas Association*

- **The Energy Sector: Still A Giant Economic Engine for The Louisiana Economy**
  The Louisiana Oil and Gas Industry has a $70 billion impact upon the state, according to an economic study conducted by Dr. Loren Scott on behalf of the Louisiana Mid-Continent Oil and Gas Association. The most recent study shows that each petroleum industry job supports 4.5 additional jobs in the state. The industry pays $1.4 billion in state taxes and fees and more than $4 billion in wages.

- http://www.lmoga.com/overview.html

- http://www.lmoga.com/erfull.pdf

- http://www.lmoga.com/ers.pdf

2. *National Ocean Industries Association*

- http://www.noia.org/website/article.asp?id=38566

Resources:

NOIA site:
http://video.nytimes.com/video/2010/06/11/us/1247468032713/the-roughnecks-lament.html

3. Wood MacKenzie: *Deepwater Horizon* tragedy: near-term and long-term implications in deepwater Gulf of Mexico* Contact Information:

- julie.wilson@woodmac.com +1 713 470 1627
- john.dean@woodmac.com +1 713 470 1688
- mark.oberstoetter@woodmac.com +1 713 470 1822

4. CERA: *Oil Well Blowout and the Future of Deepwater E&P* and *The Gulf of Mexico Blowout**

IHS CERA Houston
5333 Westheimer Road
Houston, Texas 77056 USA
Tel: +1 713-840-8282
Fax: +1 713-599-9111

ailable by subscription

Resources:

5. Louisiana Department of Economic Development

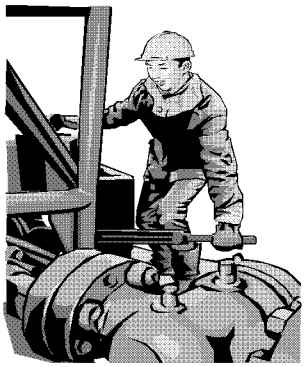
- http://emergency.louisiana.gov/Releases/06102010-moratorium.html

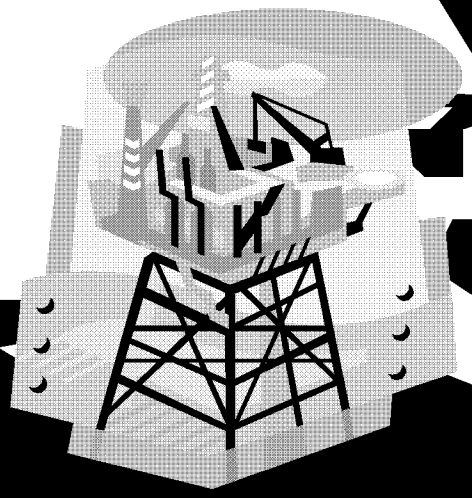
Bureau of Economic Analysis: GDP by Region

- http://www.bea.gov/regional/gsp/

The Energy Sector:

Still A Giant Economic Engine For The Louisiana Economy





By Loren C. Scott, Ph.D.

September 2007

THE "ENERGY" SECTOR: STILL A GIANT ECONOMIC ENGINE FOR THE LOUISIANA ECONOMY

by

Loren C. Scott, Ph.D.
Loren C. Scott and Associates, Inc.
743 Woodview Court
Baton Rouge, Louisiana 70810
lorencscott@aol.com

July 2007

for

Mid-Continent Oil and Gas Association
801 North Boulevard
Baton Rouge, Louisiana 70802

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EXECUTIVE SUMMARY

This study is an update of a study done for Mid-Continent Oil and Gas in 2002 entitled, "The 'Energy Sector': A Giant Economic Engine for the Louisiana Economy." Our conclusions from this review of the impact of the extraction, refining, and pipeline industries can be summarized in a series of bullet points:

- Louisiana, through the luck of natural resource distribution, is the nation's **number one producer of crude oil and the number two producer of natural gas** among the 50 states.

- Louisiana ranks **number two among the states in petroleum refining** capacity.

- There are over **83,000 miles of pipelines** transporting crude petroleum and natural gas within the state and in its offshore area of the Gulf of Mexico.

- Through both their direct and multiplier effects **these three industries supported $70.2 billion in sales in Louisiana firms, generated over $12.7 billion in household earnings for Louisianans, and supported 320,280 jobs in the state in 2005.** The $12.7 billion in earnings represented 15.4 percent of total earnings in Louisiana in that year. At least four countries listed in the **Statistical Abstract of the U.S.** have smaller gross domestic products.

- On average **the job multiplier for these two industries was 5.5**. That is, for every job created in these sectors 4.5 additional jobs are created in other sectors in the state. The job multiplier for the oil and gas extraction industry is about 3.9 and for the very capital-intensive refinery industry it is about 11.7.

- These three industries **directly paid over $1.4 billion in state taxes and fees** in FY06, or about 14.4 percent of total state taxes, licenses, and fees collected.

- A very conservative estimate is that these three industries paid **$172.6 million in ad valorem taxes to local governments** in the state in 2005. In 31 of the state's 64 parishes, these ad valorem taxes exceeded $1 million. In 12 parishes the number exceeded $5 million.

- Through the $12.7 billion in household earnings generated by these three industries, **state government was able to collect an estimated $890,939,000 in taxes in FY06.**

- The $12.7 billion in household earnings generated by these three industries added approximately **$560,018,800---over one half billion dollars---to the treasuries of local governments** in FY06.

- In 2006, there were **58,278 workers employed** in the extraction, pipeline, and refining industries---a number approximately equivalent to the 2005 population of Acadia Parish, the 19th most populous parish in the state. Fifty-four of Louisiana's 64 parishes had total covered employment smaller than this number in 2005.

- These three industries paid nearly **$4.2 billion in wages** for Louisiana households in 2006---a figure equivalent to 6.4 percent of total covered wages in the state that year.

- In the third quarter of 2006, the average weekly wage in Louisiana's manufacturing sector was $984. **In refining it was 59 percent higher at $1,567 and the extraction sector paid $1,804 weekly---83 percent higher than the average in manufacturing. Weekly wages in the pipeline industry were $1,345---37 percent higher than the average manufacturing wage.**

- **Energy jobs and earnings are found in all of Louisiana's 64 parishes in 2006**. There were 14 parishes where more than 1,000 workers were employed in these three industries. In Lafayette Parish (the highest employment parish), 15,241 workers were directly employed in these energy sectors.

- Value added is a broader measure of the total income created directly in an industry. In 2002 (latest data available), **Louisiana's oil and gas extraction sector produced over $24.6 billion in total income**. That figure exceeds the **sum** of all the state's manufacturing sectors except petroleum and coal products. We have roughly estimated the extraction sector's value added in 2005 (when energy prices were much higher than 2002) to be about $47.5 billion.

- The refining sector's value added in 2005 was a huge $34.3 billion. That figure exceeds the **sum** of all the state's other manufacturing sectors.

THE "ENERGY" SECTOR: STILL A GIANT ECONOMIC ENGINE FOR THE LOUISIANA ECONOMY

I. Introduction: It's the Engine That Matters

Survey car owners and you will find a consensus on one issue: It is the engine that makes the difference. A weak, undependable engine gets you nowhere. It is a drag on your attempts to get things done. On the other hand a strong, powerful engine gets you where you need to go quickly and dependably. Much gets accomplished.

In the world of economics, some states have only weak engines for economic growth. Their basic industries are either non-existent or are made up of slow-growing, low-wage manufacturing firms. These states are doomed to remain at the bottom rung of the economic ladder, and their prospects for growth are lackluster at best. Examples would be the states of Arkansas and West Virginia.

Other states, either because of the sheer luck of the draw in resource distribution and/or because of innovative development policies, have attracted industries that are veritable dynamos of energy---creating high-wage jobs and spillover business for all kinds of firms. These states not only enjoy the benefits of healthy jobs and income, but also state and local government treasuries get a boost from taxes and fees these industries generate both directly and indirectly.

Louisiana Was Lucky

When it came to the geographical distribution of natural resources, Louisiana "won the flip"so to speak. Below her borders, and in the waters of the adjoining Gulf of Mexico, lies a virtual mother-lode of oil and natural gas. Table 1 details Louisiana's oil production relative to her sister states. **Louisiana is the nation's number one producer of oil, producing nearly 1.4 million**

barrels a day in 2007 (this figure includes the federal outer continental shelf production). This represents 26.4 percent of the nation's crude oil production, just ahead of Texas, with Alaska in a distant third place.[1]

Louisiana was ranked third in this category back in 1995, behind both Texas and Alaska. However, declining reserves in those two states, coupled with larger finds in Louisiana's offshore region, have pushed Louisiana up to the number one slot.

Table 1
Crude Oil & Lease Condensate Production in U.S.: 2007
(1,000 Barrels per Day)

Area	Production	Percent U.S.
United States	5,164	100.0%
Louisiana*	***1,362***	***26.4%***
Texas	1,317	25.5%
Alaska	778	15.1%
California	669	13.0%

*Includes Federal offshore production

The U.S. is also heavily reliant on Louisiana as a source of natural gas. As Table 2 shows, **nearly a fifth of the nation's natural gas comes from Louisiana**. Our state's production of nearly 6.2 trillion cubic feet in 2005 (including federal OCS) ranked it number two behind Texas. **Actually, the value of natural gas produced in Louisiana exceeds the value of the crude oil lifted.**

Table 2
Marketed Value of Natural Gas in U.S.: 2005
(Billions of Cubic Feet)

Area	Production	Percent U.S.
United States	18,951	100.0%
Texas	6,220	32.8%
Louisiana*	***3,471***	***18.3%***
Oklahoma	1,670	8.8%
New Mexico	1,645	8.7%

*Includes Federal offshore production. Source: http://tonto.eia.doe.gov/dnav/ng/hist and http://dnr.louisiana.gov.

Refineries

The tasks of exploring for and lifting these two resources to the surface---what economists label oil and gas extraction---have created thousands of jobs and billions in household income for Louisianans each year. It has also attracted closely related industries to the state as well. For example, **Louisiana ranks number two among the 50 states in petroleum refining capacity** (see Table 3). Louisiana ranks below Texas and ahead of California by this measure.

Table 3
Petroleum Refining Capacity: 2006
(Millions of Barrels per Calendar Day)

Area	Refinery Capacity	Number	Percent U.S.
United Sates	17.370	149	100.0%
Texas	4.678	26	27.0%
Louisiana	*2.901*	*16*	*16.7%*
California	2.027	21	11.7%
Illinois	0.904	4	5.2%

Source: http:/tonto.eia.doe.gov/state/state_energy_profiles

It is interesting to note that our refining industry is quite different from that of California. California uses 21 refineries to refine its 2.0 million barrels of crude a day. Louisiana, on the other hand, uses 16 refineries to handle 45 percent more crude per day (2.9 million barrels). California refines its crude in relatively small refineries. Louisiana uses much larger refineries. Indeed, the ExxonMobil refinery in Baton Rouge is the second largest refinery in the country and the tenth

largest in the world.[2] In addition, California refineries serve only California, while Louisiana refineries serve Louisiana, Texas, Mississippi, Illinois and the eastern seaboard.

Pipelines

A second closely related industry to oil and gas extraction is the **pipeline industry**. Because pipelines are effectively hidden from view, Louisianans are little aware of the massive amount of oil and gas products that move underground in this state. Consider these figures:

- There are 41,320 miles of pipelines in onshore Louisiana.[3] These pipelines carry crude oil, natural gas, petrochemical products, LPG/NGL, and refined products.
- There were 41,689 miles of pipelines in offshore Louisiana, outside the state's jurisdictional boundaries.[4]

These 83,009 miles of pipelines are the ones for which reasonable data are available because they fall under direct state or federal regulation. These do not include the thousands of miles of flow lines and gathering lines that move gas and oil from the wellhead to separating facilities; nor do they include pipelines transporting chemical products with no petroleum base. It is believed that the pipeline industry may be at least twice as large as the numbers in the bulleted points above.

The Trip Ahead

How has such a massive industry affected the economic lives of Louisiana citizens? If the extraction, refining, and pipeline industries are lumped under one heading---the energy industry---has it been a weak or powerful economic engine? Has the whole state benefited from its presence, or have any economic effects been limited to only a few parishes? Are the multiplier effects on other industries in Louisiana small or large? Has the industry's impact on state and local treasuries been trivial or significant?

These are the topics covered in the sections to follow. Section II is devoted to the direct income and employment effects of the energy industry. How many people are employed in it and what is the nature of the wages paid its employees? Section III uses an input/output table to estimate the multiplier impacts of the energy industry. In which sectors are employees benefiting the most from these possible spillover effects? In section IV, the contribution to state and local treasuries is measured along with a discussion of the ten-year industrial tax exemption program. Section V presents tantalizing evidence about remarkable technological changes in these industries. Section VI contains the summary and conclusions. Appendix A contains an analysis of the impact of Hurricanes Katrina and Rita on the industry and its record of recovery from those two horrendous storms.

II. The Direct Employment and Income Impacts

A helpful way to think about an industry's impact on a state is to think of the state's economy like a large economic pond. Into this pond we are going to drop a rock labeled "oil and gas extraction, refining and pipeline industries". Would such a rock make much of a splash in the pond? It is these **direct impacts** that we attempt to measure in this section. In section III, we will examine the extent of the ripples (the multiplier effects) this rock makes in the pond as the ripples work their way to the shore.

"Covered" Employment and Wages

By far the most detailed and reliable information on employment and wages in these three industries are the data gathered by the Louisiana Department of Labor on "covered" employees, i.e., covered by unemployment compensation regulations. Because of legal reporting requirements, detailed data are available down to the parish level in most cases.

Covered Employment

Table 4 contains information on covered employment and annual wages paid in these four energy industries. **In 2006, there were 58,278 covered workers employed in the oil and gas extraction, support activities for mining, refining, and pipeline industries.**[5] To get some idea of the relative size of this number, in 2006 fifty-four of Louisiana's 64 parishes had total covered employment less than 58,278.[6] **The number of persons employed in these industries is approximately equivalent to the 2005 population of Acadia Parish (latest data available), the 19th most populous parish in the state.**[7]

Table 4
Employment and Annual Wages Paid
in Petroleum-Related Industries: Louisiana
2006

Sector	Employment[a]	Annual Wages Paid[b]
Oil & Gas Extraction	7,508	$78,260,409
Support Activities for Mining	38,050	2,305,704,812
Petroleum Refining[c]	10,350	905,228,136
Pipelines	2,370	171,704,658
TOTAL	**58,278**	**$4,170,898,015**

Source: www.Laworks.net. Go to LMI section. [a]Third quarter data. [b]Annual estimate based on three quarters of data. [c]Data are for "petroleum & coal products" sector which is 98 percent petroleum refining.

Covered Annual Wages

What is more remarkable is the impact of these three industries on the incomes of Louisianans who work in these four sectors. According to the data in Table 4, **these three industries generated nearly $4.2 billion in covered wages for these workers in 2006.** These four industries, through their direct effects alone, **generated 6.4 percent of the total covered wages earned in Louisiana in 2006.**[8]

Comparative Weekly Wage Rates

One reason these annual wage numbers are so large is because these four sectors are some of the highest wage industries in the state. Table 5 provides data on the average weekly earnings in these four sectors and Louisiana's manufacturing industries in the third quarter of 2006.

Table 5
Average Weekly Wage – Third Quarter 2006
Louisiana Petroleum-Related Industries & Manufacturing

Sector	Average Weekly Wage
Oil & Gas Extraction	*$1,804*
Petroleum & Coal Products(98% Refinery)	*1,567*
Chemicals & Allied Products	1,499
Pipeline Transportation	*1,345*
Paper Manufacturing	1,213
Support Activities for Mining	*1,209*
Transportation Equipment	1,073
Primary Metals Manufacturing	1,019
Computers & Electronics	927
Machinery Manufacturing	908
Fabricated Metals	810
Non-metallic Minerals	750
Plastics & Rubber Products	727
Wood Products	710
Beverage & Tobacco Products	672
Printing & Related Products	626
Food manufacturing	595
Miscellaneous Manufacturing	527
Furniture Manufacturing	509
Textile Products	472
Apparel Products	440
Average Manufacturing Wage	$984
Average Wage in All Sectors	$683

Source: www.Laworks.net. Go to LMI section.

Note that the oil and gas extraction and refining sectors rank #1 and #2, respectively among the industries listed, with pipeline wages ranking #4 and support activities for mining ranking #6.

Oil and gas extraction's weekly wage of $1,804 is a whopping 83 percent higher than the average wage in manufacturing ($984). Even more telling is that oil and gas extraction wages are almost triple the average wage earned by a Louisiana worker ($683 per week). Refining wages are 59 percent higher than the average manufacturing wage. Both oil and gas extraction and refining are unusually capital-intensive industries requiring very skilled labor for their operations.

Our review of the direct wage and employment impacts of these industries reveal something important about the energy sector. This economic engine is far from small. **It has been a powerful factor for creating thousands of high-wage jobs in Louisiana.**

Job Distribution across the State

Have the benefits of these excellent jobs been narrowly confined to just one area of the state, or have they been more widely distributed across Louisiana? One advantage of the covered employment data is they are available by parish, except where disclosure rules prevent their release.

Table 6 contains the distribution of reporting units, employment, and annual wages paid in the three energy industries by parish for 2000. The data to construct this table were provided by the Research and Statistics Unit of the Louisiana Department of Labor. The Department cannot release data at the parish level unless there are a minimal number of reporting units. Too few a number of reporting units kicks in "disclosure rules" which ensure that an individual firm's employment and wage data cannot be identified.

The most important message from Table 6 is that the benefits of the energy sector are widespread across Louisiana. **Energy jobs and income are found in all of Louisiana's 64 parishes in 2006.** There were 14 parishes where more than 1,000 persons were employed in the energy sector, and in Lafayette Parish there were 15,241 persons working directly in the energy

sector. There were 12 parishes where between 300 and 999 persons were directly employed in the energy sector.

Table 6

Number of Reporting Units, Employment, and Annual Wages in
Oil and Gas Extraction, Refining and Pipeline Industries by Parish: 2006

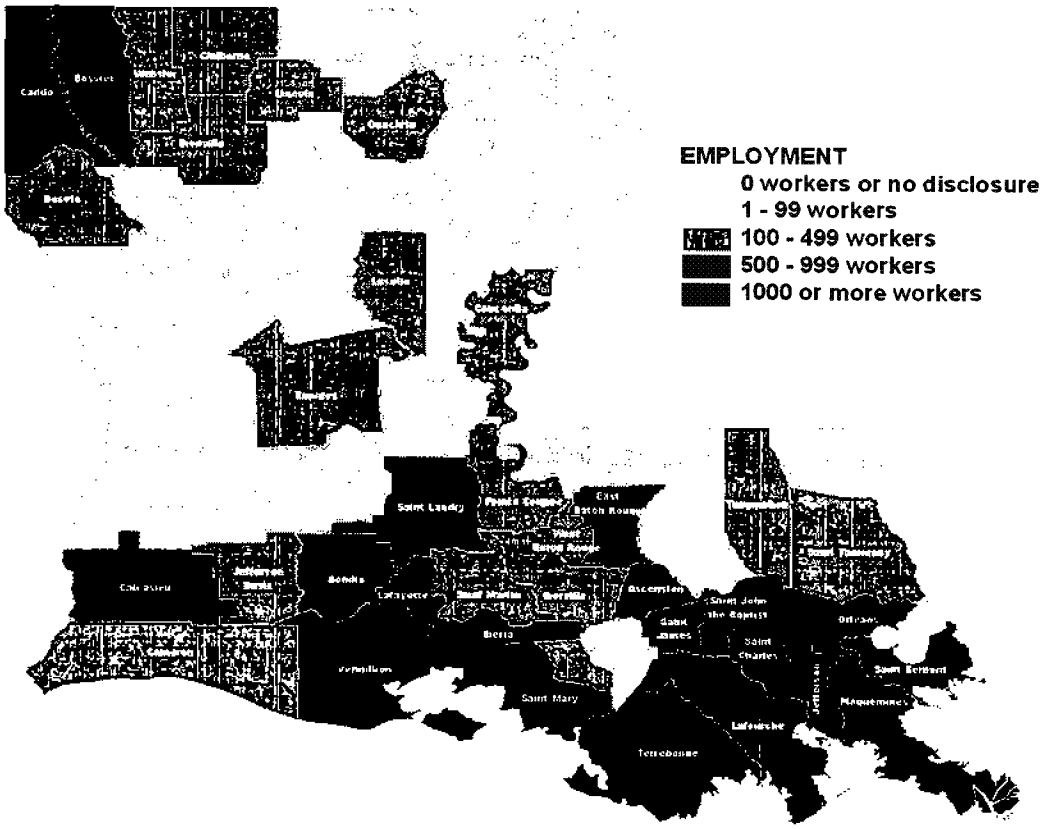
Parish	Units	Employment	Annual Wages
Acadia	45	742	$ 43,795,076
Allen	3	90	$ 6,036,364
Ascension	14	814	$ 56,678,332
Assumption	9	32	$ 2,271,676
Avoyelles	8	19	$ 440,164
Beauregard	8	70	$ 4,523,740
Bienville	16	167	$ 10,052,988
Bossier	39	1,265	$ 73,155,980
Caddo	206	2,413	$ 124,379,924
Calcasieu	62	3,762	$ 256,365,956
Caldwell	6	57	$ 3,704,524
Cameron	26	235	$ 15,521,964
Catahoula	7	47	$ 1,270,316
Claiborne	19	323	$ 15,348,264
Concordia	10	195	$ 10,696,824
Desoto	14	314	$ 16,687,036
E. Baton Rouge	55	2,339	$ 188,105,124
E. Carroll	4	3	$ 206,572
E. Feliciana	3	30	$ 1,961,976
Evangeline	8	24	$ 543,192
Franklin	3	19	$ 1,213,816
Grant	2	2	$ 29,024
Iberia	60	3,127	$ 201,898,428
Iberville	11	200	$ 9,020,768
Jackson	2	18	$ 1,807,424
Jefferson	83	2,315	$ 163,093,552
Jefferson Davis	14	256	$ 9,169,596
Lafayette	343	15,241	$1,075,400,448
Lafourche	52	752	$ 50,544,756
LaSalle	22	395	$ 16,538,736
Lincoln	18	177	$ 9,877,024
Livingston	7	25	$ 1,011,988
Madison	1	57	$ 2,074,388
Morehouse	3	16	$ 1,340,020
Natchitoches	8	49	$ 2,848,892
Orleans	83	3,731	$ 404,175,192

Ouachita	32	167	$ 10,243,516
Plaquemines	64	2,356	$ 158,928,400
Pointe Coupee	6	133	$ 8,656,328
Rapides	9	120	$ 8,253,612
Red River	1	12	$ 262,064
Richland	7	32	$ 1,528,184
Sabine	8	60	$ 1,716,572
St. Bernard	16	849	$ 84,723,156
St. Charles	9	1,381	$ 120,449,440
St. Helena	2	20	$ 1,132,976
St. James	9	883	$ 86,346,252
St. John	7	1,033	$ 75,065,004
St. Landry	25	896	$ 60,571,896
St. Martin	23	451	$ 23,139,420
St. Mary	54	1,391	$ 87,545,688
St. Tammany	38	264	$ 23,690,976
Tangipahoa	9	363	$ 13,920,584
Tensas	2	9	$ 240,380
Terrebonne	128	6,229	$ 402,691,696
Union	3	25	$ 671,072
Vermillion	47	1,137	$ 77,825,988
Vernon	6	77	$ 4,500,020
Washington	6	23	$ 1,274,924
Webster	23	463	$ 23,932,552
W. Baton Rouge	5	224	$ 16,682,424
W. Carroll	4	21	$ 1,108,968
W. Feliciana	3	51	$ 4,270,640
Winn	4	25	$ 1,513,496
Total	**1,824**	**58,016**	**$4,082,676,272**

Source: Louisiana Department of Labor

Map 1 provides a visual illustration of the distribution of energy jobs across the 64 parishes. From this map it appears there is some concentration of the energy sector in the southern portion of the state, but there are still several parishes in the northern and central regions with 500 or more energy employees. For example, Caddo Parish employed 2,413 people in these three industries, while Bossier Parish employed 1,265.

Map 1
Distribution Across Louisiana Parishes of Covered Employment in the Oil & Gas Extraction, Refining and Pipeline Industries: 2006



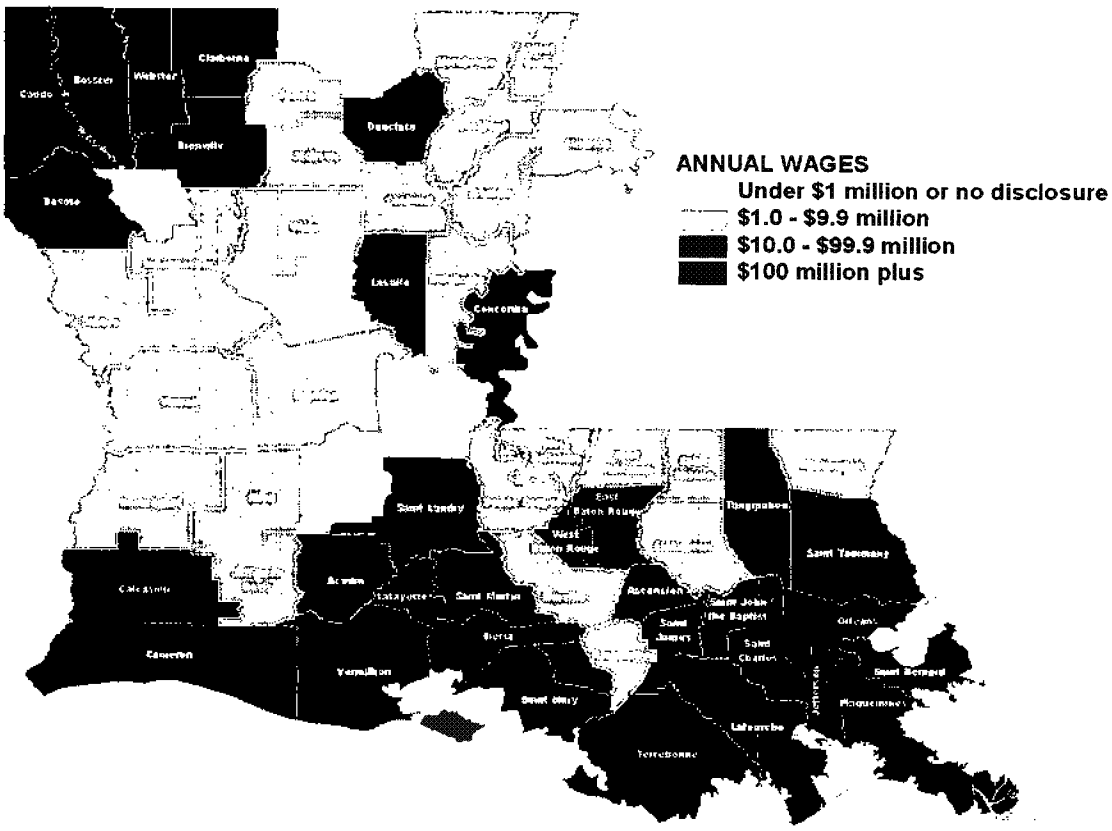
Distribution across the State: Annual Wages

The last column of Table 6 contains annual covered wage data by parish. Map 2 provides a visual illustration of the distribution of covered wages. These data detail what is in some cases a massive injection of earnings into a parish's economy. Note for example that in 2006:

- There were 57 parishes where energy wages exceeded $1 million a year.
- There were 10 parishes where energy wages exceeded $100 million.
- In Lafayette Parish energy wages exceeded $1 billion dollars, and in Orleans and Terrebonne Parishes, annual energy wages totaled over $400 million dollars.
- Equally important, **over $4 billion in direct wages was paid to workers in these energy sectors across all parishes in 2006**.

Clearly, the energy sector is vitally important to the economic health of these parishes. It is also important to note that these are only the **direct** effects of the energy sector on these economies. They do not include the additional multiplier or spillover effects that will be estimated later in this report.

Map 2
Distribution Across Louisiana Parishes of Covered Wages Earned in the Oil & Gas Extraction, Refining and Pipeline Industries: 2006



A Broader Income Measure: Value Added

Care has been taken in the material above to describe the wage data as pertaining to "covered" employment in the three energy industries. While this measure will fairly comprehensively include most wage and salary workers, it will not include wages and salaries paid to self employed individuals or unpaid family members---probably a small set within total wage and salary workers in these industries.

However, it is important to realize that wages and salaries are only one component of the income generated for Louisiana citizens by these industries. Not included in the tables above are other labor income, rental incomes, profits, and interest earnings.

One of the best measures of the **total income** created by an industry is its **value added**. Unfortunately, value added data by industry are rather scarce. One useful source is the various industrial censuses and surveys that are taken by the U.S. Bureau of the Census. The Bureau of the Census conducted an **Annual Survey of Manufactures** in 2005 which provides value added data for all of the state's manufacturing sectors for that year. Unfortunately, the Bureau does not conduct an annual survey of the mining sector. The agency does conduct a census of the mining sector every five years. The latest of these censuses is the Louisiana **Census of Mineral Industries: 2002.** Unfortunately, though there is a census of transportation specifically for Louisiana, value added data are not provided specifically for the pipeline industry.

Value added data for Louisiana's manufacturing industries and its extraction sector are provided in Table 7. Note that the manufacturing data are for 2005 and the oil and gas extraction data are for 2002. Without question comparable 2005 oil and gas extraction value added data would

be much higher than the 2002 figure shown in Table 7 because of the very large increase in oil and natural gas prices that occurred between 2002 and 2005.

Table 7

Value Added in Louisiana Manufacturing Sectors in 2005
And in Louisiana Oil and Gas Extraction in 2002

Sector	Value Added (Millions)	Percent of Manufacturing Total
Petroleum & Coal Products	***$34,293.00***	***49.1***
Chemicals	21,318.30	30.5
Food Manufacturing	2,903.90	4.2
Transportation Equipment	2,830.50	4.0
Paper Manufacturing	2,159.00	3.1
Fabricated Metals	1,713.40	2.5
Wood Products	806.90	1.2
Machinery Manufacturing	798.40	1.1
Plastics & Rubber Products	603.50	0.9
Nonmetallic Mineral Products	510.60	0.7
Primary Metals	453.00	0.6
Beverage & Tobacco	246.90	0.4
Printing & Related Products	224.40	0.3
Electrical Equipment	139.30	0.2
Textile Products	D	NA
Apparel Manufacturing	D	NA
Computers & Electronics	D	NA
Total Manufacturing	$69,910.60	100
Oil & Gas Extraction*	***$24,658.70***	***NA***

Source: 2005 Survey of Manufactures, U.S. Bureau of Census and 2002 Economic Census for Louisiana: Mining. D = not shown due to disclosure rules. NA = Not Applicable. *Data are for 2002. **The petroleum & coal products sector is 98 percent refining.**

There are several striking conclusions that arise from examining these data.

- Note in the bottom line of Table 7 **that nearly $25 billion in income was created by Louisiana's oil and gas extraction sector in 2002.** This figure exceeds that of every manufacturing sector in Louisiana except petroleum and coal products, and this figure

occurred three years earlier than the manufacturing data in Table 7. Given what happened to oil and natural gas prices and production between 2002 and 2005, **we suspect the value added for oil and gas extraction in 2005 is close to $47.5 billion**[9], an amount that substantially exceeds the sum of the value added of all manufacturing sectors except petroleum and coal products.

- **With nearly $34.3 billion in value added, petroleum refining is the largest source of income in Louisiana's manufacturing sector**. Indeed, almost half (49.1 percent) of Louisiana's value added is derived from the refining sector. While there are some coal mines in this category, 2002 Census of Manufactures data indicate that 98 percent of this value added is derived from refining.
- We estimate that **in 2005 the extraction and refining sectors combined created a remarkable $81.8 billion of income in Louisiana**.

III. Indirect or Multiplier Effects of the Industry

Earlier in this report it was mentioned that a helpful way to think of the energy sector's impact on the Louisiana economy was to think of the state as one large economic pond. Into this pond a rock is dropped labeled "energy industries". Section II of this report has provided estimates of the effect on the state of the initial splash made when the rock hit the pond---what has been referred to as the **direct** impacts of the industry.

Ripples in the Pond: The Multiplier Effect

However, when this rock hits it will also send out ripples to the edge of the pond---what are called the **multiplier** or indirect effects of the industry. For example, the extraction industry will

order offshore platforms from Louisiana fabricators such as J. Ray McDermott or Gulf Island Fabricators. This creates sales, income, and jobs in those firms, which in turn call their suppliers and order sheet steel, pipes, electrical generators, etc., which creates sales, income, and jobs in those firms, and so on. The employees that are hired in the extraction industry are paid wages and salaries which they then spend at car dealerships, grocery stores, eating establishments, etc., which generates new sales, income, and jobs there, etc., etc.

As it turns out, there is a useful tool for measuring these multiplier effects for the industries. It is called an **input-output (I/O) table**. Such a table has been constructed for the Louisiana economy by the Bureau of Economic Analysis (BEA) in the U.S. Department of Commerce. The BEA is the same governmental agency that is responsible for tabulating the gross domestic product statistics that are released on the economy quarterly.

To use the I/O tables we went to the 2005 Louisiana gross state product (GSP) statistics provided by the BEA. This agency estimated that in 2005, refining generated $16,780 million or 9.3 percent in Louisiana GSP. The BEA also reported that oil and gas extraction and support activities for mining added another $23,218 million to state GSP---12.9 percent of the total. These were the figures we inserted into the I/O tables. The multiplier effects on business sales, household earnings, and jobs in Louisiana are documented for the oil and gas extraction sector in Table 8, and the multiplier effects for the refining sector are shown later in Table 9.

Table 8

Direct and Multiplier Effects of Oil and Gas Extraction Sector: 2005

Sector	Direct and Multiplier Effects on:		
	Output (millions)	Household Income (millions)	Jobs
Agriculture, forestry, hunting and fishing	$110.8	$15.7	1,348
Mining	$23,081.5	$2,900.2	51,633
Utilities	$791.4	$144.6	1,721
Construction	$104.5	$39.1	1,155
Manufacturing	$2,469.7	$391.6	9,003
Wholesale trade	$846.9	$264.6	6,478
Retail trade	$1,095.2	$366.1	18,828
Transportation and warehousing	$863.4	$264.0	6,528
Information	$474.9	$125.1	2,463
Finance and insurance	$902.7	$221.1	6,299
Real estate and rental and leasing	$3,891.9	$322.1	10,252
Professional, scientific & technical services	$981.7	$451.4	9,850
Management of companies & enterprises	$1,759.5	$869.5	16,809
Admin. & waste management services	$345.3	$136.5	6,843
Educational services	$205.5	$91.0	3,629
Health care and social services	$1,314.9	$630.7	19,596
Arts, entertainment and recreation	$153.7	$62.6	2,673
Accommodation and food services	$586.7	$222.3	13,848
Other services	$574.9	$183.3	8,884
Households	$0.0	$15.7	2,056
Total	**$40,555.0**	**$ 7,717.2**	**199,895**

Source: Louisiana Input-Output Table, Bureau of Economic Analysis, U.S. Department of Commerce, Washington, D.C., 2004.

Ripple Effects of the Extraction Industry

Table 8 contains the estimated multiplier effects of the extraction industry from the I/O table. The I/O table enables one to estimate the impact of an industry on three key variables in the state: (1) sales at firms; (2) household incomes; and (3) jobs.

Any question about whether or not the extraction industry is a weak or strong engine for economic activity in Louisiana should be completely answered by the numbers in this table. By any reasonable measure, these spillover impacts are huge. **According to the I/O table, extraction industry activity in 1997 created nearly $40.6 billion in sales at Louisiana firms.**

Table 8 provides detail on how these sales are distributed across firms in different industries. The greatest beneficiary is the crude petroleum and natural gas industry---where the "rock" is, so to speak. But notice that multi-millions of dollars in sales are enjoyed by firms in many other sectors of the Louisiana economy. The **real estate industry** does particularly well ($3.9 billion) not only because the earnings created by this industry allows Louisianans to purchase homes and boosts the demand for shopping centers and other business establishments, but also because the extraction industry purchases a lot of property for drilling and production purposes. Over one billion dollars in sales are created in each of the following industries: manufacturing ($2.5 billion), management of companies & enterprises ($1.8 billion), health care ($1.3 billion), and retail trade ($1.1 billion).

For most citizens, the key numbers in Table 8 are the ones in the middle column---the ones dealing with household income. **According to the I/O table, the extraction industry pumped over $7.7 billion into the bank accounts of Louisiana citizens.** Persons that worked in the extraction industry earned the biggest fraction of this money---nearly $3.0 billion---but note that there were 14 sectors of the economy where household earnings exceeded $100 million in 2005.

Employees in the "management of companies & enterprises" sector were the second largest gainers ($869.5 million), followed by health services employees ($630.7 million) and professional, technical, and scientific workers ($451.4 million).

Finally, the last column of Table 8 provides the jobs impact of the oil and gas extraction sector. Here, the numbers are particularly impressive. According to the I/O table **a total of 199,895 jobs in Louisiana in 2005 could be traced directly or indirectly to the presence of the extraction industry**---and this is only from the portion of extraction activity associated with products exported from the state's borders. Not surprisingly, the bigger impacts again are in the principal industry---extraction (51,633 jobs)---which includes the direct job impacts as well.

But notice that thousands of jobs are supported in many other sectors of the Louisiana economy because of extraction's presence here. The health care and retail trade sectors especially benefit from these spillover impacts with 19,596 and 18,828 jobs created, respectively. In excess of 10,000 jobs are supported in each of the following industries: management of companies & enterprises (16,809), accommodations & food services (13,848), and real estate (10,252).

Ripple Effects of the Refining Industry

The existence of a mother lode of petroleum beneath our borders, and beneath the waters in our coastal Gulf of Mexico, has attracted to Louisiana an industry that operates immediately down stream from oil and gas production---refineries. Table 9 contains the I/O estimates of the spillover effects of this industry. It is important to note that we were careful not to double count the impact of this industry by including the extraction sector effects. That is why the "mining" sector in Table 9 contains zeros.

Table 9

Direct and Multiplier Effects the Refinery Sector in Louisiana: 2005

Sector	Direct and Multiplier Effects on:		
	Output (millions)	Household Income (millions)	Jobs
Agriculture, forestry, hunting and fishing	$75.5	$10.1	903
Mining	$0.0	$0.0	0
Utilities	$761.8	$129.2	1,580
Construction	$90.6	$33.6	991
Manufacturing	$19,594.0	$2,037.1	26,480
Wholesale trade	$1,169.6	$364.1	8,948
Retail trade	$706.4	$236.6	12,141
Transportation and warehousing	$1,250.1	$333.9	6,065
Information	$273.5	$70.5	1,406
Finance and insurance	$639.3	$154.4	4,431
Real estate and rental and leasing	$1,527.0	$107.4	4,359
Professional, scientific & technical services	$733.3	$320.5	7,603
Management of companies & enterprises	$573.9	$283.6	5,485
Admin. & waste management services	$323.9	$125.9	6,056
Educational services	$137.6	$60.4	2,401
Health care and social services	$805.4	$385.9	11,985
Arts, entertainment and recreation	$94.0	$38.6	1,657
Accommodation and food services	$421.2	$159.4	9,857
Other services	$463.1	$149.3	6,780
Households		$10.1	1,258
Total	**$29,640.2**	**$5,010.5**	**120,385**

Source:Louisiana Input-Output Table, Bureau of Economic Analysis, U.S. Department of Commerce, Washington, D.C., 2004

Note the bottom line of the first column of Table 9. **The existence of the refining industry in Louisiana created $29.6 billion in sales at Louisiana firms in 2005**. Clearly, this industry has had a very powerful economic effect on the Louisiana economy. Almost two-thirds of these sales

($19.6 billion) occurred in the manufacturing sector---a sector which includes the refinery sales in that year associated with "dropping the rock in the pond".

There are three other sectors where over $1 billion in sales can be traced back to the refining industry: real estate ($1.5 billion), transportation & warehousing ($1.3 billion), and wholesale trade ($1.2 billion). The transportation sector is a big winner because that sector that includes the pipeline industry, the next immediate downstream step in getting the refined product to the market. Note that there are six other sectors of the Louisiana economy where businesses can track over one-half billion in annual sales back to the presence of the refinery industry.

Column two of Table 9 reveals the impact of the refining industry on household incomes of Louisianans in 1997. **Over $5 billion in earnings were injected into the Louisiana economy through both the direct and indirect effects of the refining industry in that year**. Over a $2 billion of this income went to workers in the manufacturing sector where the refineries are located. Note that there were 12 other sectors in Louisiana that saw their workers' earnings boosted in excess of $100 million in 2005 through spillover effects of the refining industry.

The jobs impacts were equally impressive. According to the last column in Table 9, **there were 120,385 jobs in Louisiana in 2005 that could be traced directly or indirectly to the refining industry**. Some 26,480 of those jobs were in the manufacturing sector, which includes the direct jobs in the refining industry. In excess of 10,000 jobs were supported in transportation and warehousing (12,141) and health care (11,985), with the accommodations and food services sector coming close to that mark with 9,857 jobs traceable to the refining industry. There were six other sectors where more than 5,000 jobs were related to refining activities in 2005.

The Total Impact: More than "Ripples"

A large number of figures are contained in Tables 8 and 9. Table 10 presents a handy summary of the bottom line from those two tables. According to the I/O table, **the energy industry in Louisiana supports $70.2 billion in sales at firms in the state, over $12.7 billion in household earnings for Louisianans, and 320,280 jobs**. (Note: the sales impact number is slightly lower than the figure in the previous study due to a modeling error in the earlier work.) The term "ripple" hardly does justice to the magnitude of these impacts. These are more like small waves.

Table 10

Summary of Input-Output Results Across Industries: 2005

Industry	Direct and Multiplier Effects on:		
	Sales (millions)	Household Income (millions)	Jobs
Oil & Natural Gas Extraction	$40,555.0	$ 7,717.2	199,895
Refineries	29,640.2	5,010.5	120,385
Totals	**$70,195.2**	**$12,727.7**	**320,280**

Source: Louisiana Input-Output Table

Numbers in the "billions" are used so frequently in society today that it is difficult to get a grasp on what they really mean. Table 10 shows that the industry created $12.7 billion in household earnings in 2005. Perhaps a few comparisons will put these numbers in perspective.

- That is 15.4 percent of the total earnings of Louisianans in that year.[10]
- This number exceeds the total earnings of persons in each of every single parish in the state in 2005. The parish that came the closest to matching this total was East Baton Rouge Parish at $9.1 billion.[11]
- The **Statistical Abstract of the United States - 2002** contains a table listing the gross domestic product (GNP) of 66 countries in the world in 2000.[12] Four of those countries have gross domestic products smaller than $12.7 billion.

Table 10 shows that the jobs of 320,280 Louisianans are dependent on the presence of the energy industry in this state. By way of reference:

- This number represented 16.9 percent of non-agricultural wage and salary employment in 2005 in Louisiana.[13]
- Recall from Table 4 that 58,278 people are employed directly in the energy industries in the state. **This means the job multiplier for these two industries is 5.5**, a figure which includes the direct jobs. **This means for each job created in these two industries, 4.5 additional jobs are created elsewhere in the state.**

What these numbers reveal is that the economic impact of the energy industry is both huge and widespread. Clearly, it has been a powerful influence for economic growth in Louisiana.

IV. Tax Impacts of the Energy Industry

Our analysis of the employment and earnings impacts of these energy industries reveals an economic engine with extensive job and income creating powers. It should come as no surprise then

that both state and local governments enjoy a nice boost to their treasuries from the presence of the extraction, refining and pipeline industries in our state.

These industries influence tax payments to these two governmental units in two ways. First, there are the taxes paid **directly** by the industry to state and local governments in the form of corporate income and franchise taxes, sales taxes, royalties, rentals, bonuses, property taxes, fees, etc. However, there is a second major source of revenues generated by the industries' presence. Recall that in section III, it was determined that almost $12.7 billion in household earnings was created in the state both directly and through the multiplier effects of these industries' activities (see Table 10). State and local governments collect additional taxes via these earnings as well.

Direct State Taxes

Table 11 documents the direct state taxes and fees paid by the extraction, refining, and pipeline industries in fiscal year 2005-06 (FY06). **The energy industry paid $1,447,181,000 in state taxes in FY06 or about 14.4 percent of total taxes, licenses, and fees collected by the state.** Clearly, if this sector did not exist in Louisiana, our citizens would be able to do far less in terms of infrastructure, education, care for the poor, etc., than it is doing today. One point four billion dollars can correct a lot of social problems.

Table 11
Direct State Taxes Collected From Oil & Gas Extraction, Refining,
And Pipeline Industries: Fiscal Year 2005-06

Tax Category	Taxes Paid Thousands of Dollars
Severance Taxes	$709,270
Royalties, Rentals, Bonuses, Leases	497,870
Corporate Income Taxes	44,230
Corporate Franchise Taxes	57,257
Sales Taxes[1]	85,331[2]
Natural Gas Franchise Tax	4,450
Direct Fees to Dept. of Natural Resources	9,072
Royalties Paid to 8g Fund	30,768
Fees Paid to Dept. of Environmental Quality	8,933
TOTAL DIRECT TAXES PAID	**$1,447,181**
Total State Taxes, Licenses & Fees	$10,027,890
Total Direct Taxes as Percent of Total State Taxes, Licenses, Fees	**14.4%**

Source: Departments of Revenue, Environmental Quality, Natural Resources, and Legislative Fiscal Office. Total State Taxes, Licenses, and Fees do not include some agency receipts included in direct taxes paid by the industry.

[1]These represent sales taxes collected by the industry on sales it made. It does not reflect sales taxes paid by the industry to vendors when the industry made purchases.

By far the largest portion of these tax collections are mineral taxes and payments such as severance taxes, royalties, rentals, and bonuses. Counting payments to the 8g fund, these mineral taxes totaled over $1.2 billion or 86 percent of total direct taxes paid by this sector. The next biggest set of taxes was the corporate franchise and income taxes which came to $101.5 million in FY06.

Ad Valorem Taxes to Local Governments

From data tabulated by the Louisiana Tax Commission it is possible to derive a very conservative estimate of the property taxes collected from the energy industries by local governments in Louisiana. The phrase "very conservative" was used in that last sentence because the Tax Commission has reliable data on the assessed value of pipelines, drilling rigs, oil and gas surface equipment, and oil and gas wells from which property tax payments can be derived. In addition, a survey was conducted of the 16 largest refineries in the state to obtain their property tax payments in FY05.

However, what is not available are data on the assessed value of business furniture and fixtures, leased equipment, buildings and land, machinery and equipment owned, and inventories in all of the pipeline and extraction companies. This would no doubt be quite a large figure. Because these items cannot be isolated from the Tax Commission data, our property tax numbers for the industry will be at the very lower limit of total property taxes paid.

Table 12 contains a wealth of data on ad valorem taxes paid in Louisiana. This table shows total ad valorem taxes paid, how much went to schools, our "very conservative" estimate of taxes paid by the extraction, refining, and pipeline industries, and what percent of total ad valorem taxes in each parish was paid by these three energy industries.

Table 12

Ad Valorem Taxes Paid by Parish and Amount Paid
By Oil & Gas, Refining, and Pipeline Industries: 2005

Parish	Ad Valorem Taxes	Total School Taxes	Taxes Paid by Oil/Gas Refining, & Pipelines	Percent of Total Paid by Oil/Gas Refining, Pipelines
Acadia	$ 14,069,266	$ 6,141,022	$ 2,679,527	19.0
Allen	$ 10,615,008	$ 3,253,384	$ 970,839	9.1
Ascension	$ 52,390,916	$ 28,932,481	$ 484,662	0.9
Assumption	$ 9,011,756	$ 3,780,684	$ 957,557	10.6
Avoyelles	$ 4,510,072	$ 1,111,751	$ 108,058	2.4
Beauregard	$ 16,261,636	$ 7,186,083	$ 919,219	5.7
Bienville	$ 16,562,367	$ 9,633,215	$ 3,280,369	19.8
Bossier	$ 52,449,881	$ 28,505,130	$ 4,452,577	8.5
Caddo	$ 158,347,601	$ 88,177,768	$ 4,366,473	2.8
Calcasieu	$ 120,654,980	$ 37,460,082	$ 11,293,008	9.4
Caldwell	$ 3,551,176	$ 1,139,451	$ 118,586	3.3
Cameron	$ 24,885,886	$ 9,236,249	$ 6,352,124	25.5
Catahoula	$ 2,860,957	$ 867,615	$ 56,029	2.0
Claiborne	$ 7,125,374	$ 3,693,277	$ 2,361,859	33.1
Concordia	$ 9,607,947	$ 3,969,335	$ 107,386	1.1
Desoto	$ 22,395,351	$ 12,072,270	$ 4,231,580	18.9
E. Baton Rouge	$ 264,529,268	$ 108,481,330	$ 13,557,732	5.1
E. Carroll	$ 2,872,210	$ 404,019	$ -	0.0
E. Feliciana	$ 3,243,061	$ 1,211,328	$ 53,683	1.7
Evangeline	$ 8,244,080	$ 3,110,543	$ 667,524	8.1
Franklin	$ 4,322,250	$ 684,598	$ 11,404	0.3
Grant	$ 4,567,183	$ 1,346,557	$ 52,989	1.2
Iberia	$ 22,751,499	$ 10,872,684	$ 1,692,029	7.4
Iberville	$ 26,995,293	$ 12,335,878	$ 1,079,303	4.0
Jackson	$ 10,849,146	$ 3,107,754	$ 5,271,461	48.6
Jefferson	$ 241,089,570	$ 52,402,789	$ 1,488,399	0.6
Jefferson Davis	$ 16,468,540	$ 5,591,870	$ 1,584,052	9.6
Lafayette	$ 84,408,344	$ 34,009,661	$ 870,175	1.0
Lafourche	$ 53,224,301	$ 19,081,547	$ 6,509,115	12.2
LaSalle	$ 7,190,102	$ 2,137,458	$ 669,236	9.3
Lincoln	$ 21,376,748	$ 10,847,612	$ 1,169,741	5.5
Livingston	$ 28,734,445	$ 8,945,245	$ 149,658	0.5
Madison	$ 4,151,791	$ 960,534	$ -	0.0
Morehouse	$ 9,559,808	$ 5,319,047	$ 143,372	1.5
Natchitoches	$ 14,713,335	$ 6,458,834	$ 77,608	0.5

Orleans	$ 314,318,880	$ 97,713,552	$ -	0.0
Ouachita	$ 68,878,892	$ 31,001,841	$ 448,783	0.7
Plaquemines	$ 37,492,865	$ 13,996,097	$ 14,203,178	37.9
Pointe Coupee	$ 13,801,776	$ 4,485,014	$ 1,418,668	10.3
Rapides	$ 53,554,139	$ 24,138,295	$ 1,383,673	2.6
Red River	$ 3,549,617	$ 2,331,661	$ 127,895	3.6
Richland	$ 5,818,981	$ 2,666,368	$ 30,219	0.5
Sabine	$ 7,883,953	$ 3,868,427	$ 267,143	3.4
St. Bernard	$ 23,867,311	$ 10,544,297	$ 11,939,992	50.0
St. Charles	$ 92,181,123	$ 45,635,520	$ 14,170,727	15.4
St. Helena	$ 4,025,777	$ 634,558	$ 240,897	6.0
St. James	$ 29,193,555	$ 11,516,093	$ 11,581,442	39.7
St. John	$ 26,659,357	$ 9,771,623	$ 11,710,160	43.9
St. Landry	$ 30,312,195	$ 13,439,894	$ 1,205,073	4.0
St. Martin	$ 15,562,434	$ 5,212,184	$ 1,619,053	10.4
St. Mary	$ 29,218,843	$ 11,455,555	$ 3,073,601	10.5
St. Tammany	$ 144,858,854	$ 68,313,412	$ -	0.0
Tangipahoa	$ 26,515,041	$ 4,756,942	$ 123	0.0
Tensas	$ 3,526,799	$ 1,288,839	$ 67,712	1.9
Terrebonne	$ 45,305,132	$ 6,948,124	$ 8,337,345	18.4
Union	$ 5,930,299	$ 2,185,983	$ 615,772	10.4
Vermillion	$ 21,006,046	$ 8,653,157	$ 5,084,938	24.2
Vernon	$ 11,787,620	$ 5,433,774	$ 3,294,400	27.9
Washington	$ 14,488,874	$ 7,399,931	$ 47,858	0.3
Webster	$ 15,728,690	$ 8,348,854	$ 2,681,794	17.1
W. Baton Rouge	$ 17,466,122	$ 6,024,840	$ 1,125,738	6.4
W. Carroll	$ 2,805,329	$ 1,153,178	$ -	0.0
W. Feliciana	$ 19,363,432	$ 3,664,193	$ 18,052	0.1
Winn	$ 5,405,651	$ 2,356,267	$ 154,859	2.9
Total	**$ 2,442,098,768**	**$ 947,407,558**	**$ 172,636,429**	**7.1**

Source: Louisiana Tax Commission & industry survey

According to these data, the extraction, refining, and pipeline industries paid at least $172.6 million in ad valorem taxes to local governments in 2005. In 31 of the 64 parishes, ad valorem taxes paid by the industries exceeded $1 million. In 12 parishes, the figure exceeded $5 million. The distribution of high-tax-collection parishes for these industries correlates closely with the distribution of earnings and employment shown back in Maps 1 and 2.

Plaquemines Parish, with both refineries and huge exploration activities, was in the top spot at $14.203 million. A close second in this ranking was St. Charles Parish with $14.170 million in property taxes paid. This parish contains two large refineries. Those very capital intensive industries have an abundance of property subject to the ad valorem tax. St. James, St. John the Baptist, St. Bernard, Calcasieu, and East Baton Rouge Parishes, which also contain large refineries, each collected over $11 million in property taxes from these industries.

It is apparent from the numbers in the last column of Table 12 that some parishes would face some very serious financial problems if for some reason these energy industries vanished from their borders. In nine of the parishes over one-fifth of property taxes came from energy firms. In 21 of the parishes over ten percent of property taxes came from energy firms. In St. Bernard Parish one-half of ad valorem taxes came from energy firms. As seen at the bottom of the last column in Table 12, the energy industry paid an estimated 7.1 percent of all property taxes collected by local governmental agencies in 2005---up from 5.7 percent in 1999.

Some readers may be surprised at the numbers in Table 12. They believe that the 10-year industrial tax exemption (TYITE) protected these industries from paying much in the way of property taxes. First of all, the TYITE applies for the most part only to **manufacturing firms**. Thus, while it would apply to refineries, it is not available to pipelines or to the extraction industry.

Secondly, it is a **ten year** exemption. At the end of that 10-year period, the property rolls off the exemption schedule and onto the taxable rolls. Table 13 provides data by parish on the value of TYITE in force as of December, 2005 and the portion of that which applies to refineries. Of the $32.6 billion in exemptions in force as of that date, about $5.4 billion, or 16.7 percent of the total, was for refineries.

Table 13

Total Value of 10-Year Industrial Tax Exemptions in Force in 2005, Value for Refineries, and Amount of Refinery Exemptions Expiring over 2005-09

Parish	Ten-Year Contracts in Force in 2005	Oil Refining Contracts in Force in 2005	Oil Refining Contracts Expiring, 2005-09
Acadia Parish	$670,248,106	$0	$0
Allen Parish	$21,858,400	$0	$0
Ascension Parish	$4,520,585,388	$5,859,285	$0
Assumption Parish	$87,602,668	$0	$0
Avoyelles Parish	$10,810,882	$0	$0
Beauregard Parish	$284,399,079	$2,554,388	$0
Bienville Parish	$39,219,785	$0	$0
Bossier Parish	$121,169,960	$16,867,092	$12,556,856
Caddo Parish	$1,374,180,935	$52,389,708	$23,900,787
Calcasieu Parish	$4,646,002,731	$2,034,644,231	$1,210,047,492
Caldwell Parish	$179,902	$0	$0
Cameron Parish	$739,101,557	$0	$0
Catahoula Parish	$4,103,668	$0	$0
Claiborne Parish	$3,911,011	$0	$0
Concordia Parish	$4,610,188	$0	$0
De Soto Parish	$549,765,670	$0	$0
East Baton Rouge Parish	$3,095,415,468	$956,759,404	$587,443,031
East Carroll Parish	$24,125	$0	$0
East Feliciana Parish	$6,485,439	$0	$0
Evangeline Parish	$357,538,112	$0	$0
Franklin Parish	$3,024,696	$0	$0
Grant Parish	$11,588,045	$0	$0
Iberia Parish	$154,910,563	$0	$0
Iberville Parish	$2,594,745,914	$0	$0
Jackson Parish	$41,382,051	$0	$0
Jefferson Parish	$681,519,756	$0	$0
Jefferson Davis Parish	$229,090	$0	$0
Lafayette Parish	$197,379,375	$0	$0
Lafourche Parish	$176,368,950	$0	$0
La Salle Parish	$2,015,677	$0	$0
Lincoln Parish	$215,742,372	$0	$0
Livingston Parish	$38,537,963	$0	$0
Madison Parish	$1,819,051	$0	$0
Morehouse Parish	$179,199,427	$0	$0
Natchitoches Parish	$472,848,963	$0	$0
Orleans Parish	$494,200,822	$598,732	$0
Ouachita Parish	$1,403,755,302	$0	$0
Plaquemines Parish	$396,653,793	$187,083,448	$139,246,160
Pointe Coupee Parish	$186,145,289	$0	$0
Rapides Parish	$370,394,925	$0	$0

Red River Parish	$13,514,254	$0	$0
Richland Parish	$7,662,919	$0	$0
Sabine Parish	$107,425,138	$0	$0
St. Bernard Parish	$334,327,305	$249,324,230	$133,708,480
St. Charles Parish	$4,103,543,110	$914,088,030	$344,176,674
St. Helena Parish	$14,276,216	$0	$0
St. James Parish	$862,926,101	$429,623,420	$90,461,534
St. John the Baptist Parish	$821,095,194	$523,617,098	$146,178,978
St. Landry Parish	$124,045,685	$18,771,940	$11,446,525
St. Martin Parish	$45,240,237	$0	$0
St. Mary Parish	$351,799,398	$0	$0
St. Tammany Parish	$7,620,132	$0	$0
Tangipahoa Parish	$41,298,824	$0	$0
Tensas Parish	$163,192	$0	$0
Terrebonne Parish	$49,465,460	$0	0
Union Parish	$55,502,764	$0	$0
Vermilion Parish	$2,871,724	$0	$0
Vernon Parish	$3,194,781	$0	$0
Washington Parish	$352,653,887	$0	$0
Webster Parish	$156,258,849	$23,468,699	$20,470,861
West Baton Rouge Parish	$641,721,352	$26,865,945	$10,068,318
West Carroll Parish	$2,480,286	$0	$0
West Feliciana Parish	$264,772,394	$0	$0
Winn Parish	$110,147,542	$0	$0
State Total	**$32,633,681,842**	**$5,442,515,650**	**$2,729,705,696**

Source: Louisiana Department of Economic Development

The last column of Table 13 indicates that exemptions on nearly $2.8 billion of refinery property will expire over the five-year period from 2005-09. Calcasieu Parish, in particular, will experience a taxable property bonanza during this period as over $1.2 billion in refinery property becomes taxable. In East Baton Rouge Parish over one-half billion dollars in new property will come on the taxable rolls over 2005-09, and in St. Charles Parish the figure is approximately one-third of a billion dollars.

The local taxes paid by these three energy industries that are listed in the third column of Table 12 are "very conservative" for two reasons. They include only **parish** property taxes. They do not include (1) **municipal property taxes** nor (2) **local sales taxes** paid by these industries when they buy products in the parishes. Unfortunately, neither of these taxes paid to local governments are tabulated by industry group.

After this review of the direct state and local taxes paid by these industries it is logical to ask, "Is this level of taxes in some sense 'fair'?" Fair, of course, is in the eye of the beholder, but at least one objective measure of the level of fairness is to compare taxes on these industries to taxes imposed in other states. LSU's Center for Energy Studies has actually conducted such a study comparing tax burdens on the extraction industry across the 11 largest producing states. Their conclusion: "...the differences in state and local tax bills among states that compete for E&P activity are not significant enough to be a major determinant of E&P activity, given the magnitude of other uncertainties involved in such decisions."[14] This same Center compared the level of taxation between refineries in Louisiana versus those in the top refining capacity state---Texas. Their principal finding was "...the offset of higher sales and corporate taxes in Louisiana by lower property taxes, and vice versa in Texas, results in nearly total tax equivalence in the two states.[15] This suggests that for both the extraction and refining industries, the tax rates are competitive with neighboring states.

A second measure of "fairness" might be to compare an industry's share of state taxes to its share of earnings created in the state. According to Table 11, the energy industry produced 14.4 percent of total state taxes collected. According to Table 4, total wages in this industry was $4.2

billion in 2006, which is about 6.4 percent of total state wage and salaries.[16] By this measure, the industry is paying significantly more than its fair share of state taxes.

These measures should clearly be considered when discussions arise about additional taxes on the industry. In addition, there is another very crucial issue to consider. The refinery industry sells its product in an international market. When it sells, say gasoline, it is in direct competition with refineries in Mississippi, Illinois, Texas, and other countries. This competition effectively **prevents the industry from shifting any new taxes forward to its customers**. Thus, if Louisiana alone levies a processing tax on its refineries, the Louisiana refineries will have to absorb that tax within their income statements. The obvious incentive is to not only stop expanding in Louisiana, but also to start the process of moving operations to states with a lower tax burden. Most citizens would not like to witness the demise of an industry with the earnings and job creation power of refineries that was described earlier in this report.

Indirect Taxes Generated

The taxes detailed in Tables 11-12 are only those for which firms in these industries have to write out a check. But the presence of the extraction, refining, and pipeline industries generated $12,727,700,000 in household earnings in 2005 through both the direct salaries paid and indirect earning produced through the multiplier effects (see Table 10). These earnings are subject to the state income tax. When spent, these household earnings generate gasoline taxes, sales taxes (both state and local), beer/soft drink/tobacco taxes, etc.

According to the Legislative Fiscal Office, the state of Louisiana collects seven cents in revenues (excluding mineral revenues) for every dollar earned by households in the state. **Thus the**

extraction, refining, and pipeline industries---through the direct and indirect creation of household earnings---were responsible for generating an estimated $890,939,000---a billion dollars---in tax collections for the state of Louisiana in FY06.

What about local taxes paid via these household earnings? Local governments collect approximately 4.4 cents for every dollar earned by a Louisiana household. **Thus, the $12.7 billion in household earnings generated by the three energy industries through direct and multiplier effects added approximately $560,018, 800---over half a billion dollars---to the coffers of local governments in FY06.**

State and local tax dollars in Louisiana support a wide variety of social goods and services, such as elementary, secondary, and higher education, highways, the charity hospital system, economic development efforts, tourism promotion, public safety, and many others. If the extraction, refining, and pipeline industries suddenly vanished from our borders, the provision of these social goods and services would have to be dramatically retrenched. The impact of these three industries goes far beyond just jobs and incomes.

V. Technological Changes

What is truly exciting about this industry are the **technological changes** which are dramatically improving the success rate in wildcat drilling and significantly boosting the total recovery from a field once the petroleum is found. Among these advances are **3-D and 4-D** (i.e., tracking a field with 3-D over time) **seismic** techniques which allow explorers to see what is below the surface much more efficiently. Back in the early 80s, drillers might have to drill 10 wells to hit

a producer; using 3-D and 4-D, only three wells are needed. Thus, the risk factor in this business has been significantly reduced. Also, recent advances in computing power have made seismic surveys easier and more accurate, allowing firms to see pockets of oil and natural gas at great depths. This advancement was crucial in the discovery of the lower tertiary formation associated with the deep water "Jack" Field.

Once the fields are discovered, **horizontal drilling** permits much more oil to be lifted from a discovery than in the past. For example, using older seismic and drilling techniques exploration companies were able to lift only about 35 percent of the oil in place. Adding 3-D and horizontal drilling raised that percentage to 40-50 percent. Then using 4-D there is a further improvement to 65-75 percent.

A third major technological advance has been in **drilling and producing in great water depths**. Deepwater drillships are now capable of drilling in water depths in excess of 10,000 feet. In 2006, Chevron successfully completed a record setting production test in the Gulf of Mexico in its "Jack Field". This well was drilled in 7,000 feet of water and more than 20,000 feet under the ocean floor.

Ingenious developments in production platforms have further enhanced the ability of exploration companies to plum the depths of the very productive Gulf of Mexico. In 1996, Shell Oil put in place the Mars platform in 2,940 feet of water, another new record for production platforms. Mars is a **tension leg platform** (tlp) rather than a fixed leg platform. Mars is basically tethered to the ocean bottom by very large metal tendons. From ocean bottom to the crown of the platform it was the tallest man-made structure ever built, equivalent to two Sears Towers end-to-end.

The Mars field is projected to yield 700 million barrels of oil, the largest domestic find since Alaska's Prudhoe Bay discovery 30 years ago.

Serious advancements are being made in drill pipes---a crucial step if drilling is to take place in very deep waters and at very great depths. The Department of Energy as announced the development of IntelliPipe, a drill pipe with built in telemetry that can operate thousands of feet below the surface via a coupler embedded in connections between pipe sections. The coupler permits data to be sent across small gaps between pipe sections through a cable attached to an inner pipe wall. The DOE also announced the development of a new composite drill pipe made from carbon fiber resins that are lighter, stronger, and more flexible than steel.[17] Composite tendons have also been developed which are used to tether tension leg platforms and spars to the ocean floor. These too are lighter and stronger than tendons made with steel.[18]

ExxonMobil announced recently another technological advancement that will help speed up the drilling process. The optimization process---deemed the "Fast Drill Process"---uses real-time computer analysis of the drilling system's energy consumption, which helps improve the management of factors that determine the drilling rate, such as weight on the drill bit, rotary speed, and torque.[19]

Another interesting aspect of exploration in the Gulf is how **productive the fields are**. We have already referenced the projected output from Mars. By way of comparison, the onshore record for a single gas well is one in the Sweet Lake Field near Lake Charles, producing 50-55 million cubic feet (mmcf) per day. One well in the Gulf last year was producing at three times that rate. Oil production rates are also huge and the oil is flowing unusually fast. In many of these fields the oil is

in **sheet sand** as opposed to sand stone. The former is much more porous, so the oil flows out easier and faster.

In early 2002, the Minerals Management Service approved the use of **Floating Production Storage Offloading** (FPSOs) vessels in the Gulf of Mexico. Rather than using a platform to produce oil, with pipelines tied back to the shore, these FPSOs lift the oil to the surface to a large ship. The oil is stored there and then offloaded on to a barge which can take the oil ashore to the port paying the highest price. These FPSOs are typically "dynamically positioned." That is, there are thrusters on the sides of the ship controlled by satellites that keep the ship within a small movement area, even in hurricane force winds.

Lastly, at least one major technological change is enabling pipe to be laid much more efficiently in the Gulf---the **spool ship**. A spool ship designed by Global Industries has a 110 foot diameter spool of pipe on it that it simply reels off the pipe into the ocean. Welding the spool on shore is much cheaper than welding at sea, and a strand of pipe that took eight days to lay, may now take only one day.

Given this review, it is easy to see why there is considerable optimism about the future of the exploration sector in Louisiana.

VI. Summary and Conclusions

This study is an update of a study done for Mid-Continent Oil and Gas in 1996 entitled, "The 'Energy Sector': A Giant Economic Engine for the Louisiana Economy." Our conclusions from this review of the impact of the extraction, refining, and pipeline industries can be summarized in a series of bullet points:

- Louisiana, through the luck of natural resource distribution, is the nation's **number one producer of crude oil and the number two producer of natural gas** among the 50 states.

- Louisiana ranks **number two among the states in petroleum refining** capacity.

- There are over **83,000 miles of pipelines** transporting crude petroleum and natural gas within the state and in its offshore area of the Gulf of Mexico.

- Through both their direct and multiplier effects **these three industries supported $70.2 billion in sales in Louisiana firms, generated over $12.7 billion in household earnings for Louisianans, and supported 320,280 jobs in the state in 2005.** The $12.7 billion in earnings represented 15.4 percent of total earnings in Louisiana in that year. At least four countries listed in the **Statistical Abstract of the U.S.** have smaller gross domestic products.

- On average **the job multiplier for these two industries was 5.5**. That is, for every job created in these sectors 4.5 additional jobs are created in other sectors in the state. The job multiplier for the oil and gas extraction industry is about 3.9 and for the very capital-intensive refinery industry it is about 11.7.

- These three industries **directly paid over $1.4 billion in state taxes and fees** in FY06, or about 14.4 percent of total state taxes, licenses, and fees collected.

- A very conservative estimate is that these three industries paid **$172.6 million in ad valorem taxes to local governments** in the state in 2005. In 31 of the state's 64 parishes, these ad valorem taxes exceeded $1 million. In 12 parishes the number exceeded $5 million.

- Through the $12.7 billion in household earnings generated by these three industries, **state government was able to collect an estimated $890,939,000 in taxes in FY06.**

- The $12.7 billion in household earnings generated by these three industries added approximately **$560,018,800---over one half billion dollars---to the treasuries of local governments** in FY06.

- In 2006, there were **58,278 workers employed** in the extraction, pipeline, and refining industries---a number approximately equivalent to the 2005 population of Acadia Parish, the 19th most populous parish in the state. Fifty-four of Louisiana's 64 parishes had total covered employment smaller than this number in 2005.

- These three industries paid nearly **$4.2 billion in wages** for Louisiana households in 2006---a figure equivalent to 6.4 percent of total covered wages in the state that year.

- In the third quarter of 2006, the average weekly wage in Louisiana's manufacturing sector was $984. **In refining it was 59 percent higher at $1,567 and the extraction sector paid $1,804 weekly---83 percent higher than the average in manufacturing. Weekly wages in**

the pipeline industry were $1,345---37 percent higher than the average manufacturing wage.

- **Energy jobs and earnings are found in all of Louisiana's 64 parishes in 2006**. There were 14 parishes where more than 1,000 workers were employed in these three industries. In Lafayette Parish (the highest employment parish), 15,241 workers were directly employed in these energy sectors.

- Value added is a broader measure of the total income created directly in an industry. In 2002 (latest data available), **Louisiana's oil and gas extraction sector produced over $24.6 billion in total income**. That figure exceeds the **sum** of all the state's manufacturing sectors except petroleum and coal products. We have roughly estimated the extraction sector's value added in 2005 (when energy prices were much higher than 2002) to be about $47.5 billion.

- The refining sector's value added in 2005 was a huge $34.3 billion. That figure exceeds the **sum** of all the state's other manufacturing sectors.

This report began with the statement: "It is the engine that makes the difference." For Louisiana, the presence of the extraction, refining, and pipeline industries have indeed made all the difference. The energy industry, and its accompanying multiplier effects, has been a powerful engine for economic growth in Louisiana.

APPENDIX A

The Impact of and Recovery from Hurricanes Katrina and Rita

Hurricanes Katrina and Rita cut a swath right through the heart of the Gulf of Mexico (GOM) offshore oil and natural gas production activity. Consider these facts about this important energy-producing region:

- Within this area are 819 manned platforms and another 4,000+ unmanned platforms;
- This is the location of LOOP---the Louisiana Offshore Oil Port---the nation's only superport. This port is where very large crude carriers offload their cargoes of crude oil to be placed in underwater pipelines connected to receiving terminals onshore. From there, the crude is typically pushed farther through pipelines to refineries;
- Approximately 1.5 mmbd of crude are produced in the GOM. This represents about 29 percent of total U.S. production;
- Approximately 10 bcfd of natural gas is produced in this region, or about 19 percent of total U.S. natural gas production.

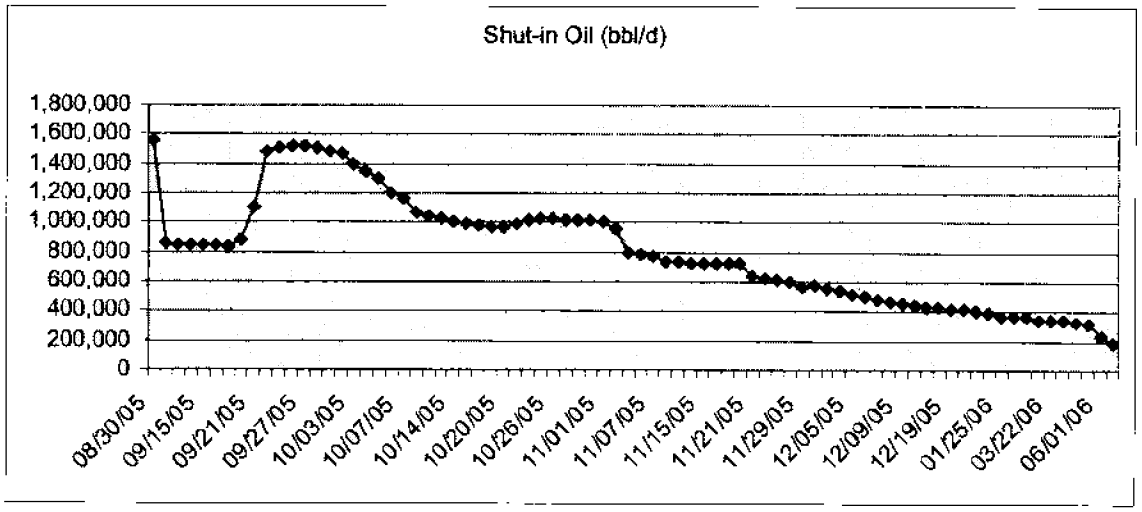
The Impact of the Hurricanes on Production

When a hurricane like Katrina is poised to enter this region of the GOM, energy companies begin the process of shutting down the offshore platforms and evacuating personnel. How many platforms are evacuated depends on the path of the storm.

Figures A-1 and A-2 track the shut-in statistics for crude oil and natural gas produced in the GOM. Shut-in oil and natural gas refers to output that was being produced but is not now because of damaged platforms, pipelines or onshore receiving units. In the case of Katrina, 95.2 percent of the crude oil and 88 percent of the natural gas production was shut-in by August 30, 2005. By September 9th, the shut-in rates had dropped to about 56-58 percent for oil and about 33-37 percent for natural gas. Then the improvement stabilized. When Rita appeared, because it made landfall

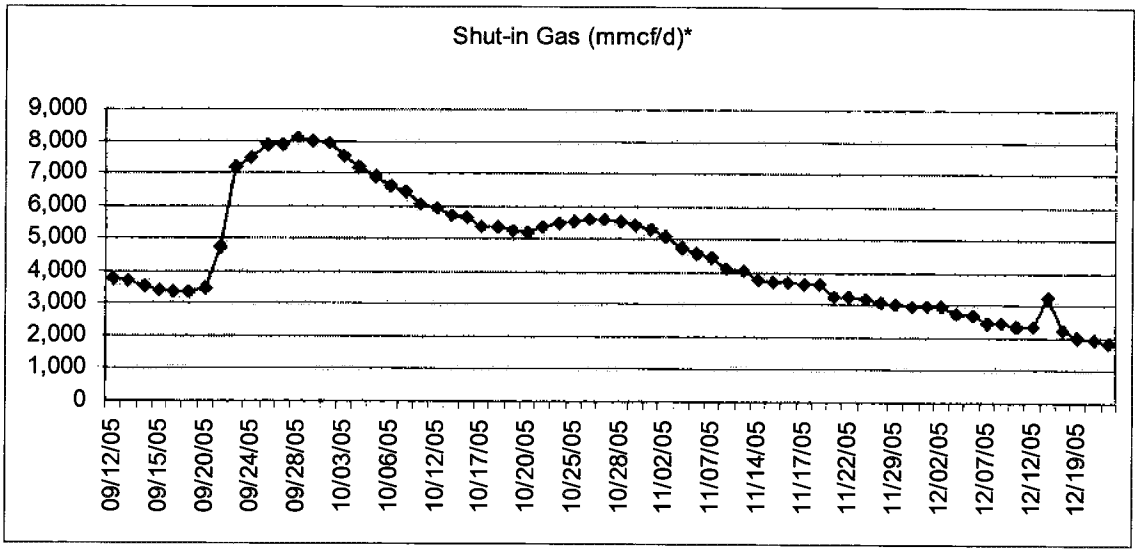
further to the west and more into the center of the GOM production region, 100 percent of crude and 80 percent of natural gas was shut-in. By early January 2006, 26.5 percent of crude oil and 18.1 percent of natural gas remained shut-in. **The latest, and last, Minerals Management Service report on shut-in data in the Gulf showed that as of June 6, 2006, 12 percent of the oil and 9.3 percent of natural gas production remained shut-in.**

Figure A-1
Shut-in Oil Production in the Gulf of Mexico



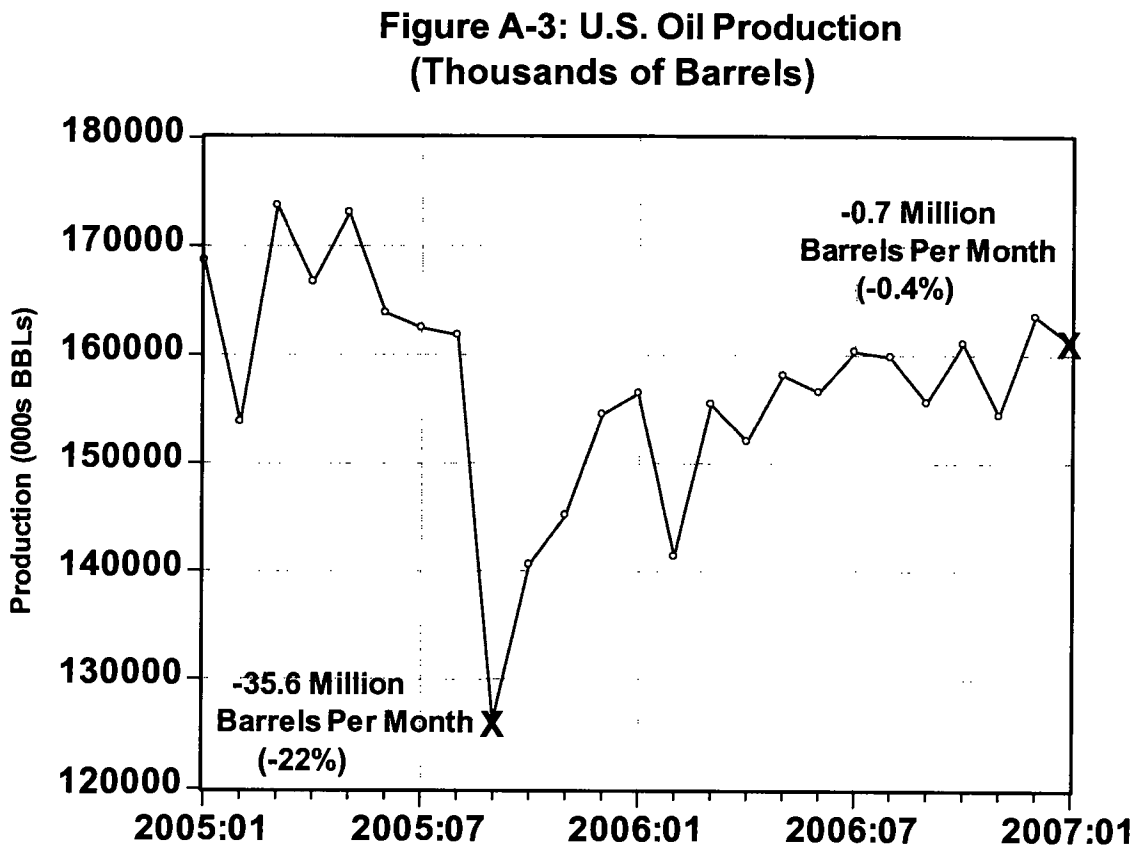
Source: Minerals management Service

Figure A-2
Shut-In Natural Gas Production in the Gulf of Mexico



Source: Minerals management Service

Though shut-in data were not provided by the MMS after June 2006, we do have another indicator of progress in restoring the damage in the Gulf caused by these two storms. Figure A-3 illustrates what has happened to U.S. oil production just prior to and since the storms. Note that U.S. oil production dropped dramatically in the two months after the storms hit, declining a total of about 35.6 million barrels per month. There was a significant increase in the two months just after the storms as many previously shut-in wells were inspected and authorized to become active again. Then there has been the steady period of gains as repair work continued in the Gulf. **As of the end of December, production had recovered to the point of being down only 0.7 million barrels per month or 0.4 percent below the pre-storms peak.**



Why the Sustained, and Higher, Shut-In Rate?

In the case of both of these storms, return to total production was not very swift. In fact, the shut-in rate for Katrina initially stabilized almost twice as high as was the case for Hurricane Ivan in 2004. For example, crude oil production after Ivan stabilized at about 480,000 bd while the comparable figure for Katrina was closer to 850,000 bd.

Why wasn't crude and natural gas production immediately restored to their pre-hurricane levels? Think of this production occurring in three primary zones---(1) offshore platforms, (2) underwater pipelines, and (3) onshore receiving units. Each of these suffered damages that needed repair before production could be restarted.

Zone 1: Offshore Platforms. One reason that production was not immediately restored was because of damage to offshore platforms. As seen in Table A-1, Hurricanes Katrina and Rita---because they were stronger storms that hit more in the heart of the GOM production region---caused far more damage to these platforms than did Ivan which hit farther east.

Table O&G-1
Impact on Offshore Platforms of
Hurricanes Ivan, Katrina, and Rita

Impact	Ivan	Katrina	Rita
Destroyed	7	47	66
Damaged	20	20	32

Source: Office of Electricity Delivery and Energy Reliability, U.S. Department of Energy, www.doe.gov, October 7, 2005, p.2.

Of the platforms destroyed by Katrina and Rita, most were older platforms that were built under pre-1988 upgraded design standards, and were located on the "shelf" (shallow waters), where the wells were fairly depleted and producing little product. Still, there were a number of the larger, deepwater platforms that suffered major damages. For example, as a result of Katrina there were four deepwater platforms that accounted for about 10 percent of offshore crude oil production that were severely damaged. Among these were Mars, Ursa, Mansa, and West 143---all owned by Shell Oil Company. Among the casualties of Rita was Chevron's Typhoon TLP (tension leg platform) which was turned upside down by the storm and this $1.2 billion investment was determined to be a total loss.

It is actually quite a testimony to the engineering skills of the people working in this industry that only 165 of nearly 5,000 platforms were destroyed or badly damaged. This is especially so considering that the Naval Research Lab measured some waves at 131 feet tall during these storms.

That so many platforms survived in this basically unprotected environment speaks volumes about technological advancements in this industry.

Zone 2: Underwater Pipelines. Damage to underwater pipelines was one of the greatest concerns to the energy sector because checking and repairing these pipelines requires some of the scarcest resources in the oil patch---divers, boats, and power. Underwater mudslides caused by Ivan wiped out 102 pipeline systems. A total of 655 pipelines (about 20,000 miles worth) were destroyed by Katrina and Rita.

The good news is that this pipeline damage occurred in 2005 and not prior to the late 1990s. Prior to that time, pipelines were repaired by taking a pipe laying barge into the Gulf, welding strands of pipe together on board, and feeding the pipe into the water. Today, this same function can be done 10-15 times faster using a **spool ship**. A spool ship has a large reel on the back of the ship around which is wound a string of pipe that has been welded together onshore---a much more efficient process than welding on the water. Once out in the Gulf, the pipe is then unwound off the spool and fed into the Gulf, at great savings in time and money.

Zone 3: The Onshore Receiving Units. Once the crude oil and natural gas reach shore, these fuels are received by refineries, gas processing plants and onshore pipelines. The first two sets were the most problematic. Katrina caused the closure of eight **refineries**. Within two weeks after the storm passed, four of these had power restored and were refining crude oil. Four others not only lost power but were also damaged and flooded. Three were in Louisiana: (1) the 350,000 bd ConocoPhillips Refinery; (2) the 183,000 bd Chalmette Refinery, and the 122,000 bd Murphy Oil Refinery. These three units are located in the heavily flooded areas of St. Bernard and Plaquemines

Parishes. With the exception of Murphy Oil Refinery, all were open by the end of 2005 and Murphy Refinery opened later in 2006.

Rita closed three other refineries in the Lake Charles MSA: (1) Citgo (324,000 bd); ConocoPhillips (239,400 bd), and (3) Calcasieu (30,000 bd). These three units had mostly minor wind damage and power loss but fortunately, no flooding. They were all three back up by November 2005.

What received little attention from the press was the damage to **gas processing plants** in the region. Natural gas produced offshore tends to be high in hydrogen sulfide and water. The processing plants refine these impurities out. Three were located near the mouth of the Mississippi River and were severely damaged by both wind and flood. Dynergy's plant in Venice is so badly damaged that some pipelines were rerouted from it to other processing plants---again, the spool ship technology made such re-routing financially feasible. Together these three plants process about 2.8 bcfd of natural gas. Rita added another six plants to these three, though these six were not as badly damaged as the Katrina victims. One plant badly damaged by Rita was the Henry Hub, the center for natural gas trading.

Oil Spills from Katrina & Rita

Another remarkable testament to the technological advancements in the extraction industry is the oil spill record as a result of these two huge storms. In their report "Setting the Record Straight", the Mineral Management Service had the following to say about spills post-storms:

- As of January 25, 2007, MMS identified 125 spills of petroleum products totaling 16,302 barrels that were lost from platforms, rigs, and pipelines on the Federal Outer Continental Shelf (OCS) as a result of damages from Hurricanes Katrina and Rita in 2005.

- Those spills did not occur due to loss of control of the producing wells.

- There were no major spills (2,381 barrels per spill or greater) according to USCG official standards. The USCG defines offshore spills of less than 10,000 gallons (238 barrels) as "MINOR"; offshore spills of 10,000 to 99,999 gallons (238 to 2,380 barrels) as "MEDIUM"; and offshore spills of 100,000 gallons, (2,381 barrels) and greater as "MAJOR".

- According to a report on "Oil in the Sea" from the National Academy of Sciences (1995), far more oil enters the ocean from natural, underwater seeps than from offshore production platforms. In fact, the seeps introduce about 1700 barrels of oil a day into U.S. marine waters, which is about 150 times the amount from oil and gas activities.

- Over the past 20 years, less than .001 percent of the oil produced in U.S. state and federal waters have been spilled.

- The loss of oil from the Federal OCS wells themselves was minimal due to the successful operation of the safety valves that are required by the Minerals Management Service (MMS) to be installed on every well at least 100 feet below the ocean floor.

- All facilities on the Outer Continental Shelf in areas threatened by the hurricanes are "shut in" prior to a storm's arrival, meaning that pipelines are closed and platforms are secured for heavy weather.

- Oil losses were mostly limited to the oil stored on platforms that were damaged or oil contained in individual segments of pipelines that were damaged.

- There were no accounts of spills from facilities on the OCS that reached the shoreline, or oiled birds or mammals, or involved any large volumes of oil to be collected or cleaned up.

- The five largest spills were estimated to be between 1,000 barrels and 2,000 barrels. Two of the five spills may have only been a couple of hundred barrels. These five spills represent only 4 percent of all the spills but total 8,428 barrels and 52 percent of the total spillage.[20]

The bottom line is these two huge storms came right through the heart of the offshore oil and gas industry and there were virtually no significant spills offshore. One policy implication is that the United States is the only country on earth that restricts oil and gas exploration in some of its offshore area (the East Coast, West Coast, West Coast of Florida, and coastal areas of Alaska). What

residents along these coasts fear the most is coastal damage from oil spills. The aftereffects of Katrina and Rita should go a long ways towards dispelling those fears.

ENDNOTES

[1]Oil and Gas Journal, June 11, 2007, p. 69.

[2]Oil and Gas Journal, December 18, 2006, p. 62.

[3]Email from Michelle Barnes in the Center for Energy Studies at LSU, July 2, 2007.

[4]Ibid.

[5] Note that the category "support activities for mining" contains companies that drill for oil and provide service work (seismic, well servicing, etc.) to the industry.

[6]www.Laworks.net. Go to LMI.

[7] www.bea.gov/bea/regional/reis/drill.cfm.

[8]www.Laworks.net/Downloads/LMI.

[9] This figure was estimated by estimating total revenues from oil extraction (oil price times oil production) and natural gas revenues (gas prices times gas production) in both 2002 and 2005 and calculating the total increase in revenues over this time period. The result is a 92.8 percent increase.

[10]Regional Economics Information System, Bureau of Economic Analysis, CD-ROM, April 2007.

[11]Ibid.

[12]Statistical Abstract of the United States: 2002, 122nd Edition, p. 833.

[13]www.bls.gov.

[14]Allan G. Pulsipher, Robert H. Baumann, and Wumni O. Iledare, "Overall Tax Levels Similar Across 11 Producing States," Oil and Gas Journal, October 11, 1993, p. 89.

[15]Allan G. Pulsipher and Robert H. Baumann, Louisiana's Petroleum Refining Industry," Center for Energy Studies, Louisiana State University, February, 1993, p. 36.

[16]Wage and salary disbursements in 1999 (latest year available) were $53.6 billion. Regional Economic Information System, Bureau of Economic Analysis, May 2001, CD-ROM.

[17]Oil and Gas Journal, July 18, 2005, p.17.

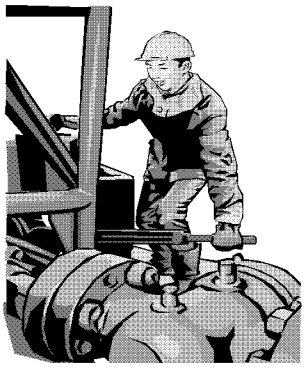
[18]Oil and gas Journal, August 15, 2005, p. 39.

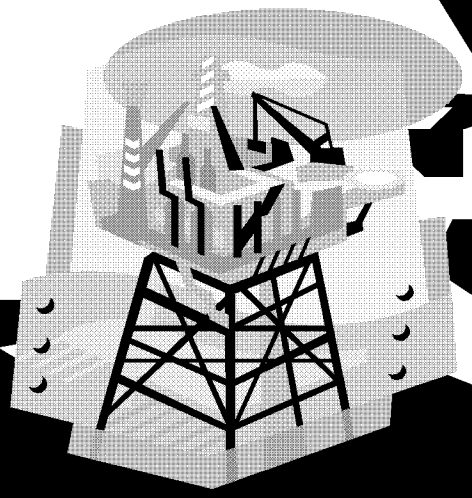
[19]Go Gulf Magazine, 2005, p. 24.

[20]www.mms.gov. Go to SettingtheRecordstraight/Estimatedoil%20SpillsAsAResultofHurricanesKatrinaand Rita.

The Energy Sector:

Still A Giant Economic Engine For The Louisiana Economy





By Loren C. Scott, Ph.D.

September 2007

EXECUTIVE SUMMARY

This study is an update of a study done for Mid-Continent Oil and Gas in 2002 entitled, "The 'Energy Sector': A Giant Economic Engine for the Louisiana Economy." Our conclusions from this review of the impact of the extraction, refining, and pipeline industries can be summarized in a series of bullet points:

- Louisiana, through the luck of natural resource distribution, is the nation's **number one producer of crude oil and the number two producer of natural gas** among the 50 states.

- Louisiana ranks **number two among the states in petroleum refining** capacity.

- There are over **83,000 miles of pipelines** transporting crude petroleum and natural gas within the state and in its offshore area of the Gulf of Mexico.

- Through both their direct and multiplier effects **these three industries supported $70.2 billion in sales in Louisiana firms, generated over $12.7 billion in household earnings for Louisianans, and supported 320,280 jobs in the state in 2005.** The $12.7 billion in earnings represented 15.4 percent of total earnings in Louisiana in that year. At least four countries listed in the **Statistical Abstract of the U.S.** have smaller gross domestic products.

- On average **the job multiplier for these two industries was 5.5**. That is, for every job created in these sectors 4.5 additional jobs are created in other sectors in the state. The job multiplier for the oil and gas extraction industry is about 3.9 and for the very capital-intensive refinery industry it is about 11.7.

- These three industries **directly paid over $1.4 billion in state taxes and fees** in FY06, or about 14.4 percent of total state taxes, licenses, and fees collected.

- A very conservative estimate is that these three industries paid **$172.6 million in ad valorem taxes to local governments** in the state in 2005. In 31 of the state's 64 parishes, these ad valorem taxes exceeded $1 million. In 12 parishes the number exceeded $5 million.

- Through the $12.7 billion in household earnings generated by these three industries, **state government was able to collect an estimated $890,939,000 in taxes in FY06.**

- The $12.7 billion in household earnings generated by these three industries added approximately **$560,018,800---over one half billion dollars---to the treasuries of local governments** in FY06.

00032227 OS-WDC-B01-00002-000049 Page 2 of 3

- In 2006, there were **58,278 workers employed** in the extraction, pipeline, and refining industries---a number approximately equivalent to the 2005 population of Acadia Parish, the 19th most populous parish in the state. Fifty-four of Louisiana's 64 parishes had total covered employment smaller than this number in 2005.

- These three industries paid nearly **$4.2 billion in wages** for Louisiana households in 2006---a figure equivalent to 6.4 percent of total covered wages in the state that year.

- In the third quarter of 2006, the average weekly wage in Louisiana's manufacturing sector was $984. **In refining it was 59 percent higher at $1,567 and the extraction sector paid $1,804 weekly---83 percent higher than the average in manufacturing. Weekly wages in the pipeline industry were $1,345---37 percent higher than the average manufacturing wage.**

- **Energy jobs and earnings are found in all of Louisiana's 64 parishes in 2006**. There were 14 parishes where more than 1,000 workers were employed in these three industries. In Lafayette Parish (the highest employment parish), 15,241 workers were directly employed in these energy sectors.

- Value added is a broader measure of the total income created directly in an industry. In 2002 (latest data available), **Louisiana's oil and gas extraction sector produced over $24.6 billion in total income**. That figure exceeds the **sum** of all the state's manufacturing sectors except petroleum and coal products. We have roughly estimated the extraction sector's value added in 2005 (when energy prices were much higher than 2002) to be about $47.5 billion.

- The refining sector's value added in 2005 was a huge $34.3 billion. That figure exceeds the **sum** of all the state's other manufacturing sectors.

For Immediate Release: **Contact: Nicolette Nye**

Friday, June 11, 2010 (202) 347-6900

NOIA Member Companies Feel Impacts of Drilling Moratorium,

Applauds Landrieu's Efforts to Save Jobs

WASHINGTON, DC – The decision to halt deep water exploration activity and the uncertain status of shallow water operations in the Gulf of Mexico is already having profound impacts on the offshore energy industry, and these impacts will only worsen the longer the pause continues. Since the Gulf region depends on the offshore industry for thousands of jobs and billions of dollars in revenue, the impacts of the "one size fits all" moratorium will add further job loss and economic woes to a region already suffering from these same hits to its seafood and tourism industries.

Fearing that the blanket drilling moratorium "could exacerbate, rather than alleviate, the impacts of this spill upon both our economy and our environment," U.S. Senator Mary Landrieu of Louisiana has sent a letter to the President requesting that the blanket moratorium on drilling be lifted. In a June 11 letter the Senator wrote, "The immediate impacts to the economy are devastating enough: idling the 33 rigs currently permitted to drill in the deepwater Gulf would immediately impact employment for roughly 38,000 crewmen, deck hands, engineers, welders, ROV operators, caterers, helicopter pilots, and others who operate and service these vessels. That's like closing 12 large motor vehicle assembly plants in one state, all at once".

NOIA strongly echoes the Senator's sentiments and applauds her efforts to look at the full scope of interwoven industries and communities that make the Gulf of Mexico economy strong. We plan to continue working with the Senator to ensure that jobs and revenues in the region aren't an unintended casualty of the response to the Deepwater Horizon spill.

NOIA member companies are feeling the impact of the blanket moratorium, and several share their stories below:

Aker Solutions

- Aker Solutions is a leading global provider of engineering and construction services, technology products and integrated solutions to the offshore oil and gas industry.
- The moratorium will impact Aker Solutions' offshore related operations on the Gulf Coast which include about 750 employees in Texas and Alabama.

- The company has already started to refocus their efforts to international projects that hopefully can replace some of the void.
- Some of their offshore services work is coming to a halt already; and unless they can refocus that workforce, including vessels and tools, to international projects they are at risk of losing jobs in Texas over the next few months.
- Manufacturing jobs in Alabama are at risk from early 2011, as the backlog runs out with no new orders of deepwater subsea equipment coming in.
- Engineering jobs in Houston are at risk of being reduced, but may be able to be refocused internationally.
- In summary, part of their workforce will be affected directly or indirectly by the moratorium. Their goal is to try to mitigate this by securing international projects.

ATP Oil & Gas Corporation

- ATP Oil & Gas Corporation is an independent oil and gas producer headquartered in Houston, Texas.
- The moratorium has caused ATP to stop the drilling of a natural gas development well (the Mississippi Canyon 305 # 2 well) and release the deepwater drilling rig. The MC 305 #2 well would have produced approximately 40 million cubic feet of gas per day with a very small amount of condensate.
- Additionally, ATP will not be able to drill and complete two development wells (MC 941 #4 well and MC 942 # 2 well) using a drilling configuration with two blowout prevention (BOP) stacks, one on the seafloor and one at the surface. This is a new design for improved safety, a first in the US Gulf of Mexico and one that the company planned 3 years ago.
- These wells were originally planned to be completed and placed on production in 2010 at a combined rate of approximately 14,000 barrels of oil per day using a platform drilling rig attached to the ATP Titan platform.
- As a result of the moratorium and the suspension of operations, ATP expects to incur additional costs of approximately $30,000,000 that otherwise would not have been spent.
- Additionally, ATP will defer revenues of more than $1,000,000 per day as a result of not being able to drill and complete the development wells planned for 2010.

Bollinger Shipyards, Inc.

- Bollinger Shipyards, Inc. and its affiliated companies are the leading provider of quality marine construction, repair and conversion products, servicing both the military and commercial marine industry. They also own and operate a fleet of Offshore Supply Vessels that service the deepwater activities of the OCS. Family owned and operated since 1946, Bollinger Shipyards employs 3,000 people.

- "In the 64 years of our existence, we have never been faced with such an uncertain future. This moratorium has created an environment leaving Bollinger Shipyards no choice but to downsize our company thereby eliminating good paying jobs."

Broadpoint, Inc.

- Broadpoint is a 27 year old privately held company with a 100 employees based along the Gulf Coast with its headquarters in Houston and a Network Operations Center in New Orleans with an additional office in Lafayette, LA.

- Their operations are 99% directly related to providing telecommunication services in the Gulf of Mexico through satellite communications and the ownership and management of a 100,000 square mile GSM/GPRS/Edge network operating in the Gulf.

- Broadpoint and its clients will be adversely affected as a result of this shutdown and it will directly affect their ability to operate. Reliable communications is essential for the health and safety of individuals in the Gulf of Mexico.

CapRock Communications, Inc.

- CapRock Communications is a 29 year old privately held company employing 750 employees globally with headquarters in Houston and operational offices in Lafayette and New Orleans, LA.

- Their operations are related to providing satellite communication solutions that enable the oil and gas industry to operate more efficiently in today's environment, serving the communications needs of rig owners, service companies and operators working on drilling rigs, production platforms and other assets in the Gulf.

- They currently have over 50 field service and operations personnel supporting clients in the Gulf of Mexico and this shutdown will directly impact their ability to maintain operations.

- Their field service personnel install and manage communication systems onboard drilling rigs and energy support vessels throughout the Gulf of Mexico. As their customers are now required to cease or limit their operations, the amount of business their company receives and the work they have for their personnel in the region significantly declines.

- They will be forced to redeploy personnel to different regions or support them in finding other opportunities.

C&C Technologies, Inc.

- C & C provides a wide range of survey and mapping services for the land and offshore oil and gas industry, the telecommunications industry and the U.S. government.
- C&C expects to lay off approximately 10 employees as a result of the moratorium, and will not be hiring the dozen or so workers they expected to hire in the coming months.

Cobalt International Energy, Inc

- Cobalt International Energy, Inc. (Cobalt) is an independent oil and gas exploration and production company focused on the deepwater U.S. Gulf of Mexico and the deepwater offshore Angola and Gabon.
- Cobalt was formed in 2005 and is headquarters in Houston, Texas with an operational base in Port Fourchon, L.A. for their deepwater GOM exploration activities, and an (soon to be established) operational base in Luanda Angola for their Angola exploration activities. At present Cobalt have some 65 employees and 25 consultants.
- The GOM Drilling Moratorium has significantly impacted Cobalt's GOM deepwater 2010 exploration and appraisal program from a multitude of perspectives:
    - Cobalt's exploration and appraisal drilling program for the remainder of 2010 (3 wells of which 1 had all of the necessary permits/insurance in place) is now on hold. Thus, the exploration drilling rigs, services, vessels, tools, people etc. that were contracted to support the drilling programs have been released.
    - Cobalt invoked the Force Majeure provision in a recent rig contract, thus the company is paying capital for a period of time while the rig is idle as well as the associated key services (e.g. vessels). Cobalt has also experienced unanticipated legal costs as a result.
    - There is a follow-on impact in the form of delay in executing their 2011 exploration and appraisal program (approx 9 wells) in the deepwater GOM. Thus the program has been extended further/delayed into the future which will affect the timing and thus cash flow they would have anticipated sooner.
    - As the deepwater GOM is a key focus area for Cobalt in light of the position established (some 227 deepwater leases) in the last few years, the

company stock has been significantly impacted (dropped 40%) amid concerns regarding the GOM Drilling Moratorium; the value of the company has thus been impacted by some $1.5 billion in the market.

- Cobalt will shift its capital spending program and resources to their West Africa business. Resumption of their investment program in the United States is completely dependent on the termination of the GOM Drilling Moratorium.

Davis-Lynch, Inc.

- Davis-Lynch is a privately owned company founded in 1947 that manufactures, sells, and services down-hole equipment for the offshore oil and gas industry.
- They employed over 300 people in 2009, but reduced their workforce by approximately 100 people as a result of an industry downturn. In 2010 with an upswing in business they have recalled some of the people released in 2009.
- Approximately 20% of their business is dedicated to providing products and services to the offshore drilling industry in the Gulf of Mexico, with a large portion associated with water depths greater than 500 feet.
- The moratorium leaves them no alternative other than to implement another reduction in their workforce in locations including Lafayette, LA; Houston, TX; and Corpus Christi, TX.

Delmar Systems, Inc.

- Delmar Systems, Inc. is a leader in offshore mooring, providing mooring solutions for the offshore oil and gas industry.
- Delmar is a 42 year old privately held company employing 300 employees based along the gulf coast with a technical office in Houston and large operational base at Port Fourchon, LA.
- Operations are 100% directly related to mooring deepwater semi-submersibles in the Gulf of Mexico and as a result of this shutdown, will directly affect ability to operate.
- Thirteen of the thirty three deepwater wells involved "moored" or anchor semi-submersible rigs owned by four drilling contractors.

Heerema Marine Contractors

- Heerema is a 48 year old privately held Dutch company who has been working in the Gulf of Mexico for 32 years and has installed approximately 75% of all deep water facilities currently producing in the Gulf. They own and operate three of the four largest construction vessels in the world and the US Gulf has always been a significant part of the revenue stream of their company.

- They currently employ 50 people between offices in Houston, TX and an operational base at Port Fourchon, LA.

- Their U.S. operations are directly related to installation of new facilities and sub sea infrastructure in the deep water Gulf of Mexico and as a result of this shutdown, their business future is in a state of uncertainty here in the US.

Laborde Marine, LLC

- Laborde Marine is a family-owned business headquartered in New Orleans which owns and/or operate 21 vessels, all built in U.S. shipyards; while employing over 300 people with a $14 million annual payroll.

- They invested over $150 million to build or acquire thisfleet.

- The moratorium is essentially telling them to "park" their vessels for six months.

- For Laborde to move internationally, they would have to compete with vessels built in foreign ship yards at a much lower cost and often subsidized by foreign governments.

- "The moratorium may well be the death-knell for U.S. businesses engaged in the energy service sector."

J. Ray McDermott, Inc.

- J. Ray McDermott is a Houston headquartered Company with approximately 1,200 employees in Morgan City and New Orleans, Louisiana and Houston, Texas.

- The company provides engineering and construction services to the offshore energy sector worldwide as well as in the Gulf of Mexico through the engineering, construction and offshore installation of the infrastructure necessary to develop and produce offshore oil and gas fields.

- According to the company, the shutdown of deepwater drilling in the Gulf of Mexico will create a domino effect (movement of rigs and other equipment out of the area, loss of jobs, etc.) that will no doubt affect the timing of future developments and the economic recovery of the region for years to come.

Oceaneering International, Inc.

- Oceaneering is a global oilfield provider of engineered services and products, primarily to the offshore oil and gas industry, with a focus on deepwater applications.

- Oceaneering reduced its 2010 earnings forecast on expectations that the U.S. government's moratorium on deepwater drilling activity in the Gulf of Mexico will hurt demand for its deepwater services.
- The oilfield-services and products company said it expects the moratorium will cut second-half earnings by 45 cents a share and is now looking for 2010 profit of $2.80 to $3.10 a share.
- Nearly one-quarter of Oceaneering's remotely-operated vehicles operate in the Gulf, with about half of those in drilling support services.
- The company anticipates some early terminations and revised contracts.
- The stock is down 27% this year amid concerns about the Gulf oil spill.

Otto Candies, LLC

- Otto Candies is a marine transportation company started 68 years ago with a fleet of 40 vessels.
- 500 of their 600 U.S.-based employees could be impacted by the moratorium, with some possibly needing to be relocated to Brazil, Mexico, or West Africa.

Stone Energy Corporation

- Stone Energy Corporation is an independent oil and natural gas exploration and production company headquartered in Lafayette, Louisiana, with additional offices in Houston, Texas and Morgantown, West Virginia.
- Stone has already experienced a 40% drop in the value of their company in anticipation of punitive legislation and regulation.
- They will be forced to reduce jobs as will other operators.
- Stone has a shelf platform rig at MC 109 which has been shut down, wasting over $10 million dollars by having an idle rig sitting there doing nothing.
- This cash cost will be far exceeded by the lost revenue of the five wells being drilled from the facility.
- The 5 wells were anticipated to each produce approximately 1,000 barrels per day, assuming $70 per barrel, resulting in $350,000 per day in potential lost revenues.
- Stone also has a half-dozen exploratory wells that will be delayed a year or more. This hurts their ability to sustain reserves to convert to future production and growth.
- One rig that was going to be used in this exploratory program, the Deepwater Mariannas, is expected to be leaving the Gulf for opportunities in foreign countries.

Southern States Offshore, Inc.

- Southern States Offshore, Inc. is a privately held company incorporated in 1996 and wholly owning and operating seven offshore service and supply vessels, six of which were built and delivered in Louisiana and Alabama in 1998, 2005, 2007, 2009 and 2010 at a cost of 48 million dollars.

- They employ 53 mariners who live in Texas, Louisiana and Alabama; with an office staff in Houston, Texas of ten employees, all Texas residents.

- According to the company, their employees, their families, the ship yards, vendors, tax authorities, etc. that depend on this industry to pay their mortgage, health care bills, cloth their families and send their children to school all are at risk of losing everything.

Zupt, LLC

- Zupt is a privately owned, international service and manufacturing company specializing in the integration and application of inertial technologies to onshore and offshore survey and positioning services to make operations more efficient.

- Were under contract with an operator who was 8 to 12 days away from completing a well and Zupt was preparing to conduct the metrology survey work when the operator was told to shut the well. No metrology survey was conducted, an immediate loss of revenue.

- One of Zupt's engineers was laid off due to the near term lost revenue.

- During the moratorium the company is forced to seek work in West Africa and the North Sea, and if unsuccessful they anticipated being out of business within four months.

###

NOIA is the only national trade association representing all segments of the offshore industry with an interest in the exploration and production of both traditional and renewable energy resources on the nation's outer continental shelf. The NOIA membership comprises more than 250 companies engaged in business activities ranging from producing to drilling, engineering to marine and air transport, offshore construction to equipment manufacture and supply, telecommunications to finance and insurance.

Nguyen, Ngoc B

From: Juvkam-Wold, Hans [juvkam-wold@pe.tamu.edu]
Sent: Friday, June 18, 2010 2:50 PM
To: Dubin, Lindsay
Cc: Black, Steve; Kemkar, Neal; Hanley, Kallie
Subject: RE: Meeting with Secretary Salazar Monday 6.21.10

Lindsay,

I will not be able to attend the meeting on Monday morning, but plan to call in.

Hans

From: Dubin, Lindsay [mailto:Lindsay_Dubin@ios.doi.gov]
Sent: Thursday, June 17, 2010 5:23 PM
To: Dubin, Lindsay
Cc: Black, Steve; Kemkar, Neal; Hanley, Kallie
Subject: Meeting with Secretary Salazar Monday 6.21.10

Good evening,

Interior Secretary Ken Salazar hopes that you can participate in a meeting at 10:00am EASTERN Monday, June 21, 2010 as a follow-up to Tuesday's conference call regarding the 30-day report on Increased Safety Measures for Energy Development on the Outer Continental Shelf. For those of you who are unable to join this meeting in person, there will be a call-in option for you to participate remotely. This meeting/conference call is limited to the people who have received this email. Please let Kallie Hanley (cc'd) and me know by 3:00pm EASTERN tomorrow if you will be able to participate. Please be sure to indicate whether you will be attending in person or via phone. We will reach out to you with arrival instructions or a conference call number following our receipt of your participation.

Thank you,

Lindsay Dubin
Special Assistant
Office of Scheduling and Advance
The U.S. Department of the Interior
p: (202) 208-7551 | f: (202) 208-4694
lindsay_dubin@ios.doi.gov

Nguyen, Ngoc B

From: Ken Arnold [karnold@karnoldconsulting.com]
Sent: Friday, June 18, 2010 3:43 PM
To: Dubin, Lindsay
Cc: Black, Steve; Kemkar, Neal; Hanley, Kallie
Subject: RE: Meeting with Secretary Salazar Monday 6.21.10
Attachments: Presentation to Secretary of Interior - Rev2 (2).pptx

Attached is a current draft of a power point presentation we are preparing for the Secretary and staff for Friday's meeting. It is till be reviewed by the Group of 8, but I thought I would send it ahead in the event any of you would want to look at it ahead of Monday's meeting.

Kenneth E. (Ken) Arnold
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Home: 713-939-1034
www.karnoldconsulting.com

From: Dubin, Lindsay [mailto:Lindsay_Dubin@ios.doi.gov]
Sent: Thursday, June 17, 2010 5:23 PM
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Subject: Meeting with Secretary Salazar Monday 6.21.10

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Lindsay Dubin
Special Assistant
Office of Scheduling and Advance
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lindsay_dubin@ios.doi.gov

Presentation to Secretary of Interior

June 21, 2010

Outline of the Discussion

1. Why we are here
2. Comments on the Secretary of Interior, May 27, 2010 Report "Increased Safety Measures for Energy Development on the Outer Continental Shelf"
3. Comments on the NTL NO2010-NO5, June 8, 2010
4. Measures that should be taken now to improve safety in the GOM

Why we are here

We were not asked to provide analysis of the Horizon incident, but as information has been discovered it is clear best practices were not followed.

We are here nor are we going to provide an economic justification – jobs, revenue lost, etc. That is the job for economists.

We feel safety will be compromised if the 6 month ban is extended to all wells in the GoM over 500 feet in water depth.

This is the time we all need to work together and we understand the job at hand.

This is not the time to punish the innocent nor further harm the public's interest .

The good

Safety Record of Drilling on the OCS

Over 50,000 wells drilled. 2500 in over 1000 feet of water.

Last major incident resulting in oil coming assure in 1969. 41 years ago.

From 1970 until April 2010 a total of 1800 barrels of oil spilled due to blowouts.

All measurements of safety indices have shown a steady level of improvement since modern MMS regulations came into effect in 1970.

Record is better than or equal to that or any other region of the world.

Crude Oil Spills from Platform and Rigs from Federal OCS Activities

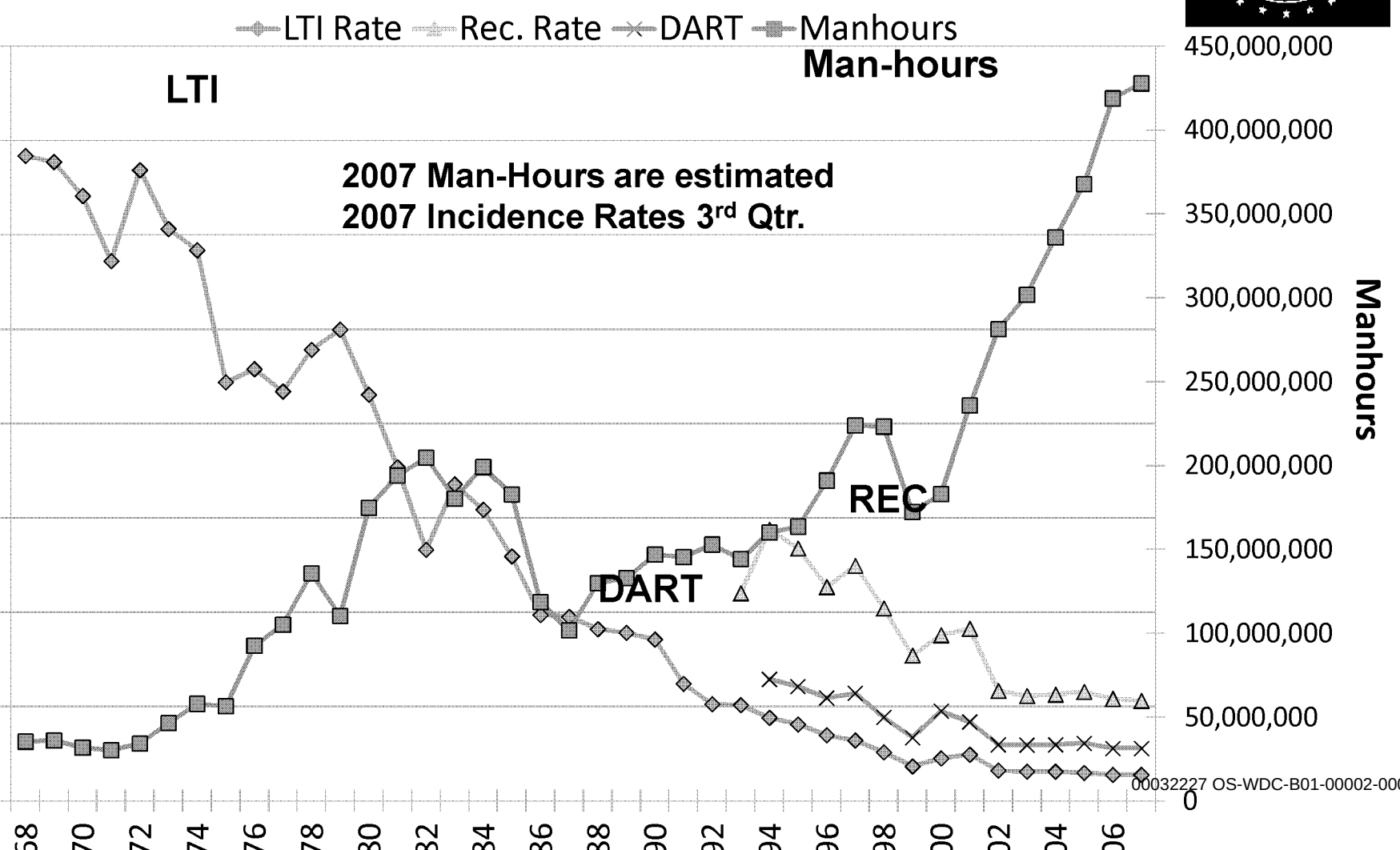
ears	**Production** (Thousand BBls)	**Number of Spills**	**Barrels Spilled** (Thousand BBls)
960-1969	1,460,000	13	99
970-1979	3,455,000	32	106
980-1989	3,387,000	38	7
990-1999	4,051,000	15	2
000-2009	5,450,000	72	18

lowout Events Exceeding 1,000 Barrels on OCS

- Two blowouts associated with a hurricane event that destroyed four platforms. Total of 10,280 barrels crude oil spilled.
- One blowout associated with drilling. 1,688 barrels condensate spilled.
- One blowout that occurred when a supply vessel collided with a drilling rig during a storm and sheared the wellhead.
- 2,500 barrels crude oil spilled.
- One blowout (Santa Barbara) was associated with drilling.
- 80,000 barrels spilled.
- One blowout was caused by a fire in the production area that resulted in the loss of control of 12 wells on the platform.
- 30,000 barrels crude oil spilled.
- One blowout associated with wireline work during workover operations. 53,000 barrels spilled.

om 1971 through 2009, a total of 1,784 barrels was spilled as a

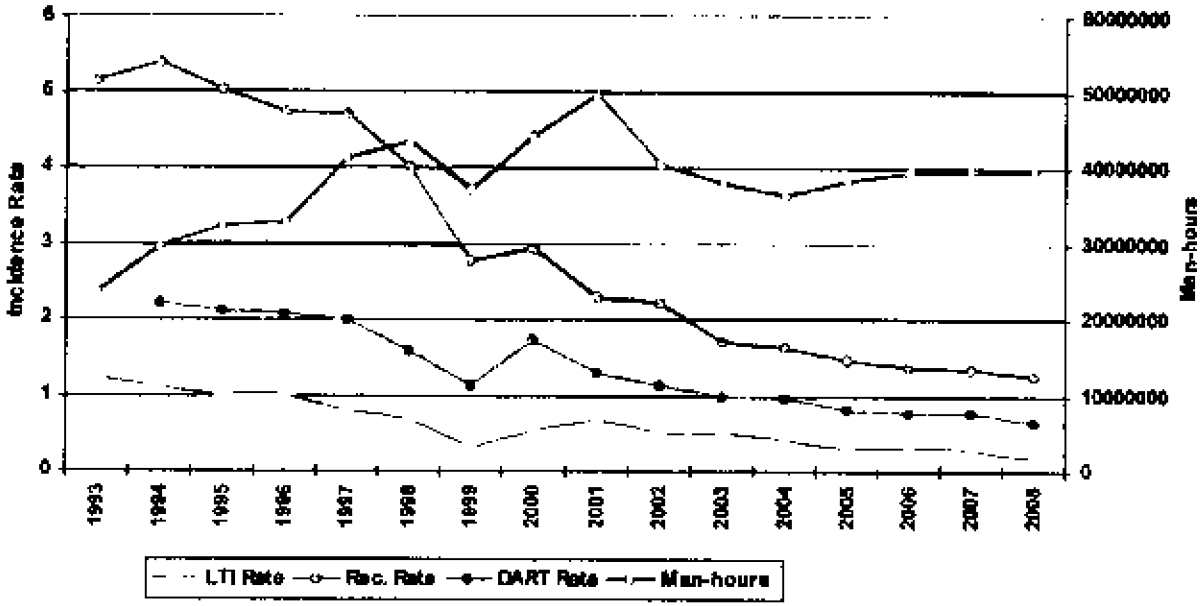
TOTAL INDUSTRY INCIDENCE RATES



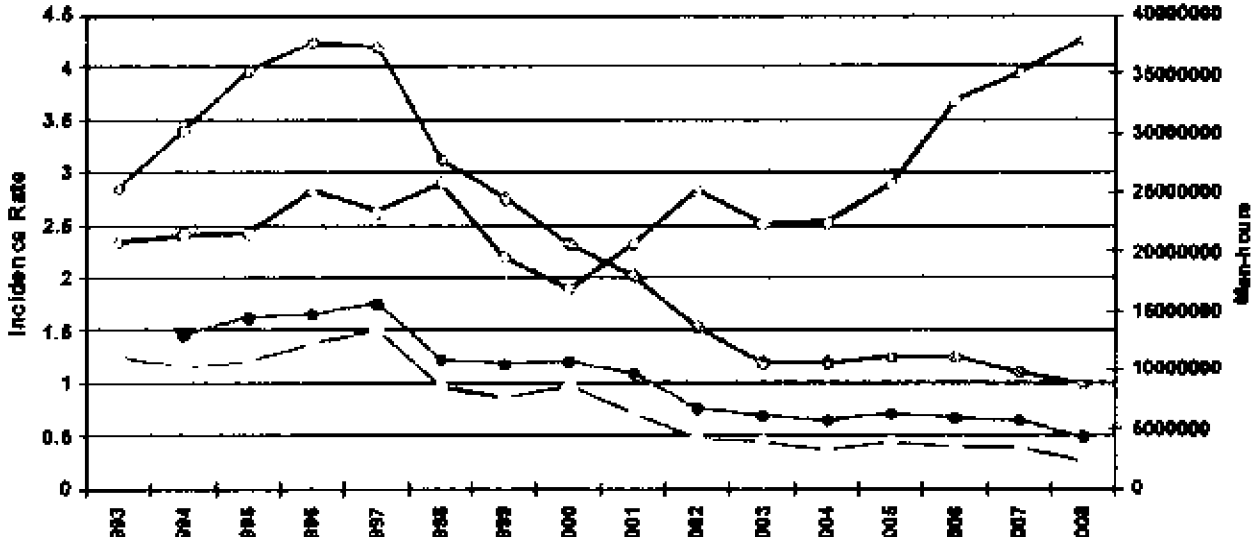
C 2008 US Water Totals		IADC 2008 European Water Totals	
l Man-hours	**39,665,580**	Total Man-hours	**38,049,523**
l Medical Treatment Incidents	**118**	Total Medical Treatment Incidents	**95**
l Restricted Work Incidents	**100**	Total Restricted Work Incidents	**43**
l Lost Time Incidents	**26**	Total Lost Time Incidents	**51**
l Fatalities	**3**	Total Fatalities	**0**
l Recordables	**247**	Total Recordables	**189**
ncidence Rate	**0.15**	LTI Incidence Rate	**0.27**
Frequency Rate	**0.73**	LTI Frequency Rate	**1.34**

st Time Incidence Rate = LTIs + FTLs X 200,000

US Water Total LTI & Recordable Incidence Rates vs Man-hours (Figure 1)

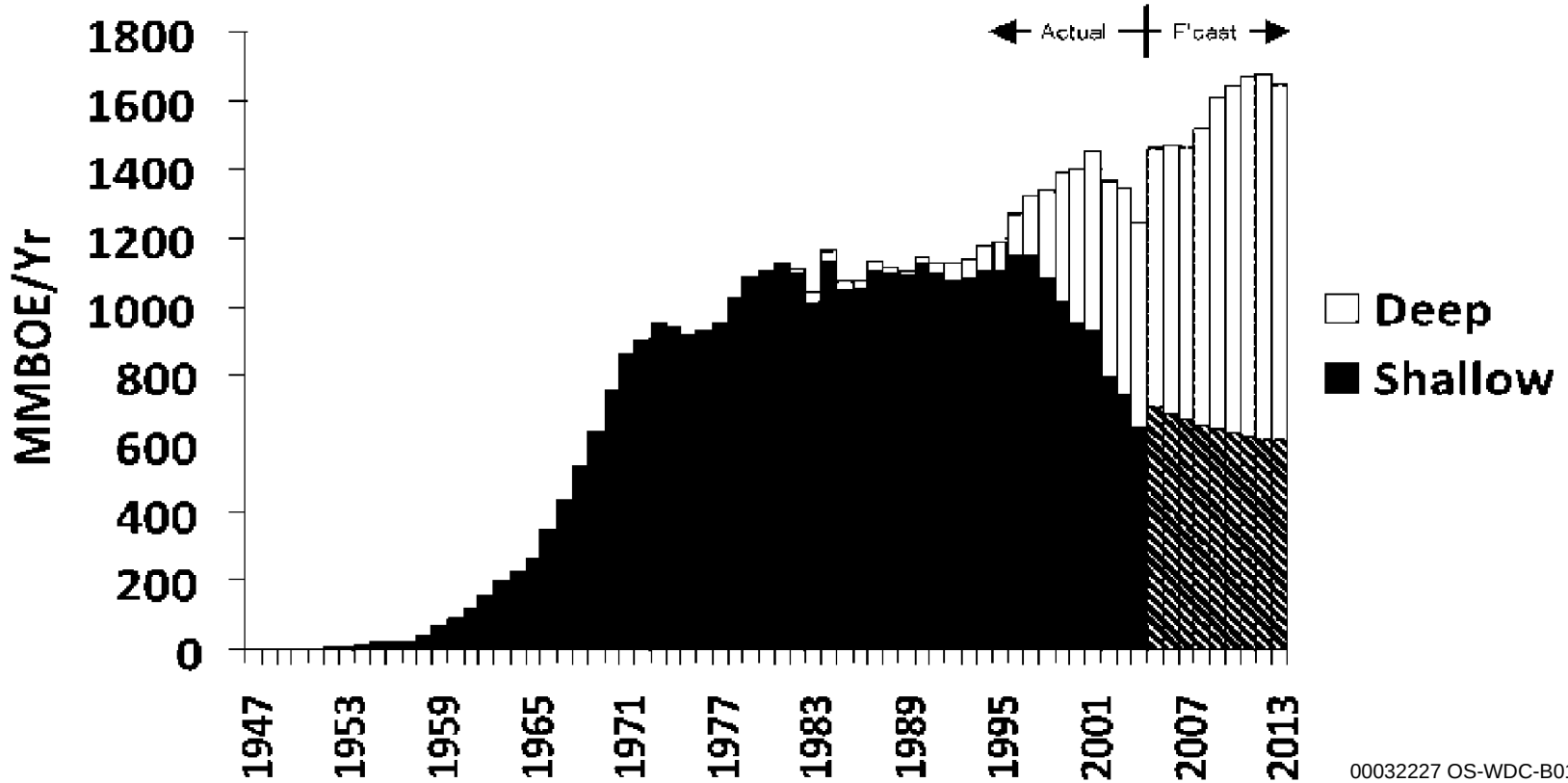


European Water Total Incidence Rates vs Man-hours (Figure 1)



GOM Offshore Production Increasingly from Deepwater

US GOM Offshore



Source: OCS Report MMS 2006-022

The bad

Understanding the Moratorium

You experts agreed to a list of recommendations which are needed to make drilling safer. Some of these recommendations take time to study and make into regulations to assure compliance. In some cases you agreed with time frames of as long as 6 months and even in one or two cases longer. How can I face the American people and say drilling is safe before I can assure them that your own recommendations are carried out? By not allowing drilling until all the recommendations you told me are necessary to make drilling safe are in place I am honoring your technical analysis.

The Four Negatives of the Moratorium

The reasons for this are complicated, the moratorium will increase risk by:

- 1) requiring all drilling rigs to stop immediately and then re-enter wells at some future undefined date,
- 2) affecting the mix of rigs available for drilling once the moratorium is lifted- the best rigs are the first to go and last to return,
- 3) reducing the experience level of drilling staff as they go overseas or leave the industry, and
- 4) starting today increasing the amount of oil we have to import by tanker which history shows has a greater potential for spills

Effects of Moratorium on Rigs and Experienced Personnel

Best rigs and people will leave the Gulf

Recruitment of new people will stop – dealing with the unknown, and the best and brightest do not apply for uncertain jobs

Workforce significantly impacted, including the thousands of support workers and service providers who support the drilling operations and must adhere to the safety standards – best of them will get work internationally or other industries/jobs.

While some additional training and certification can and will take place during this time – as with the baseball offseason, players need a spring training to get back in shape – "we can't afford safety wise to have a spring training."

The time to get back to drilling, remobilize, new well planning and inspection requirements with be several additional months/years; depending on how many rigs leave the gulf.

The industry feels the safest and most effective rig operations and personnel are being punished.

Manage risk

What is not in the report.

The level of risk varies significantly between well types based on exploration, geology, and categories

The highest risk wells warrant additional time to assure the risk can be managed and drilling these wells are warranted.

- Deepwater exploration wells
  - We have seen it is not just the drilling but the completion of these wells that pose risk
- Unknown pore pressure
- Extremely high pressure and/or high temperature wells

The Key to Increasing Safety

Require some modifications immediately

Provide a mechanism to allow rigs to remain in the Gulf of Mexico

Define a class of wells (other than workover, waterflood, gas injection or water disposal wells) which can be drilled safely. That is, wells where any increased risk by not waiting for all the recommendations to be implemented is lower than the risk of the "Four Negatives"

Potential Steps to Re-Define the Moratorium to INCREASE Safety

Allow rigs to complete the work they are currently doing

Require implementation of the key recommendations of the interim report which can be done within 30 days before ANY new wells can be drilled on the OCS (independent of water depth)

Maintain the moratorium on the more risky wells.

Risky Wells

Exploration

Deepening existing wells

Less Risky Wells which Can be Drilled

Less risky to more risky:

- Wells which are abandoned before reaching producing zones (surface casings and top sections only)
- Water Disposal to Non-Producing Reservoirs
- Re-entries and Sidetracks
- Water Disposal to Producing Reservoirs, Waterflood, Gas Injection
- Wells to Known Reservoirs
- Workovers
- Delineation Wells to Non-producing Reservoirs

30-Day Recommendations Already in NTL

Section III Recommendation 1 – Compliance erification for Existing Regulations and April 30, 2010, National Safety Alert

Implement through NTL within 30 days

hin 30 days of the date of this report, the Department, in conjunction with the Department of Homeland urity, will ensure that operators are required to verify compliance with existing regulations and National ety Alert (issued April 30, 2010), which issued the following safety recommendations to operators and ing contractors:

- Examine all well-control equipment (both surface and subsea) currently being used to ensure that it has been properly maintained and is capable of shutting in the well during emergency operations. Ensure that the ROV hot-stabs are function-tested and are capable of actuating the BOP.
- Review all rig drilling/casing/completion practices to ensure that well-control contingencies are not compromised at <u>any</u> point while the BOP is installed on the wellhead.
- Review all emergency shutdown and dynamic positioning procedures that interface with emergency well control operations.
- Inspect lifesaving and firefighting equipment for compliance with federal requirements.
- Ensure that all crew members are familiar with emergency/firefighting equipment, as well as participate in an abandon ship drill. Operators are reminded that the review of emergency equipment and drills should be conducted after each crew change out.
- Exercise emergency power equipment to ensure proper operation.
- Ensure that all personnel involved in well operations are properly trained and capable of performing their tasks under both normal drilling and emergency well control operations.

Section I Recommendation 1 – Order One-Time Only Re-rtification of All BOP Equipment Used in New Floating Drilling Operations

Implement through NTL within 30 days

fore spudding any new well from a floating vessel, the operator will be quired to obtain and deliver to the Department of the Interior a written and ned certification from an independent third-party attesting that, on or er the date of this report, a detailed physical inspection and design review the BOP has been conducted by the equipment manufacturer and owner in cordance with the Original Equipment Manufacturer (OEM) specifications d that (i) the BOP will operate as originally designed; and (ii) any odifications or upgrades to the BOP stack conducted after delivery have not mpromised the design or operation of the BOP.

or to deploying the BOP, the operator must also verify that any odifications or upgrades to the BOP are approved by the Department of the erior and that documentation showing that the BOP has been maintained d inspected according to the requirements in API RP 53 and 30 CFR 0.446(a) is on file with the Department of the Interior or available for pection.

ection I Recommendation 2 – Order BOP Equipment ompatibility Verification for Each Floating Vessel and for Each New Well

Implement through NTL within 30 days

s part of a structured risk management process, the perator will be required to obtain an independent ird-party verification that the BOP will operate ith the drilling rig equipment and that the BOP is ompatible with the specific well location and well asis of design and well execution plan, i.e., in the vent of a well control event the BOP will provide a eal and contain wellbore pressure under all onditions expected in the wellbore.

Section I Recommendation 5– Develop Secondary Control System Requirements and Guidelines

Implement through rulemaking within 120 days

- Minimum ROV intervention capabilities for secondary control of all subsea BOP stacks, including the ability to close all shear and pipe rams, close the choke and kill valves and unlatch the lower marine riser package (LMRP).
- Minimum requirements for an emergency back-up BOP control system that is powered by a separate and independent accumulator bank with sufficient capacity to open and close one annular-type preventer and all ram-type preventers, including the blind shear ram. Such safety systems must include ***at least two*** of the following: autoshear, deadman, emergency disconnect system, and/or an acoustic activation system.
- Guidelines for arming and disarming the secondary BOP control system.
- Guidelines for documentation of BOP maintenance and repair (including any modifications to the BOP stack and control systems).

Section I Recommendation 7 – Develop New Testing Guidelines

Implement through NTL within 30 days

ird-party verification or documentation necessary to show at blind-shear rams will function and are capable of earing the drill pipe that is in use on the rig.

Implement partially through NTL within 30 days, then rulemaking within 120 days

inimum ROV performance testing standards, including rface and subsea function testing of ROV intervention ports d ROV pumps, to ensure compatibility with the BOP stack d that the ROV can close all shear and pipe rams, close the oke and kill valves, and unlatch the lower marine riser ckage.

Section I Recommendation 7 – Develop New Testing Guidelines

Implement through NTL within 30 days

andatory inspection and testing of BOP stack if any omponents are used in an emergency, *e.g.,* use of pipe casing shear rams or circulating out a well kick. This sting should involve a full pressure test of the BOP ter the situation is fully controlled, with the BOP on e wellhead.

Section I Recommendation 8 – Develop New Inspection Procedures and Reporting Requirements

Implement through NTL within 30 days

eginning no later than 60 days after the date of this port, all operators of floating drilling equipment will port to the Department of the Interior the following: (i) OP and well control system configuration, (ii) BOP and ell control system test results, including any anomalies testing or operation of critical BOP components, (iii) OP and well control incidents, and (iv) BOP and well ontrol system downtime for the last three years of illing operations.

Section II Recommendation 3 – New Casing And Cement Design Requirements: Two Independent Tested Barriers

Implement through NTL within 30 days

efore spudding any new floating drilling operation, all ell casing and cement designs must be signed by a rofessional Engineer, verifying that there will be at ast two independent tested barriers, including one echanical barrier, across each flow path during well ompletion and abandonment activities and that casing esign is appropriate for the purpose for which it is tended under reasonably expected wellbore onditions.

Section II Recommendation 5 – New Casing Installation Procedures

Implement through NTL within 30 days

he Department will ensure the requirement of the llowing BAST practices:

- Casing hanger latching mechanisms or lock down mechanisms must be engaged at the time the casing is installed in the subsea wellhead.
- For the final casing string, the operator must verify the installation of dual mechanical barriers (*e.g.,* dual floats or one float and a mechanical plug) in addition to cement, to prevent flow in the event of a failure in the cement.

Recommendations Which Could be Implemented But Are Not Currently in NTL

Section I Recommendation 7 – Develop New Testing Guidelines

Implement through NTL within 30 days

linimum surface and subsea function and ressure testing requirements to simulate (i) nintended disconnect of the lower marine riser ackage (LMRP), and (ii) loss of surface control e.g., electric and hydraulic power) of the subsea OP stack.

Section I Recommendation 8 – Develop New Inspection Procedures and Reporting Requirements

nplement in accordance with internal Departmental Guidance issued within 30 days

- The Department will evaluate and revise the manner in which it conducts its drilling inspections.
- Revised drilling inspections should include the witnessing of actual tests of BOP equipment, including the new requirements and guidance that address the surface and subsea testing of ROV and BOP stack capabilities.
- The Department will also develop methods to increase transparency and public availability of the results of inspections as well as routine reporting.
- The Department will work with Congress to obtain the necessary resources to implement these recommendations.

ection II Recommendation 2 – New Fluid Displacement Procedures

Implement through NTL within 30 days

or to displacement of kill-weight drilling fluid from the wellbore, the operator must ependently verify that:

- The BOPs are closed during displacement to underbalanced fluid columns to prevent gas entry into the riser should a seal failure occur during displacement.
- Two independent barriers, including one mechanical barrier, are in place for each flow path (i.e., casing and annulus).
- If the shoe track (the cement plug and check valves that remain inside the bottom of casing after cementing) is to be used as one of these barriers, it is negatively tested prior to the setting of the subsequent casing barrier. A negative test should also be performed prior to setting the surface plug.
- Negative tests are made to a differential pressure equal to or greater than the anticipated pressure after displacement. Each casing barrier is positively tested to a pressure that exceeds the highest estimated integrity of the casing shoes below the barrier.
- Displacement of the riser and casing to fluid columns that are underbalanced to the formation pressure in the wellbore is conducted in separate operations. In both cases, BOPs should be closed on the drill string and circulation established through the choke line to isolate the riser, which is not a rated barrier. During displacement, volumes in and out must be accurately monitored.
- Drill string components positioned in the shear rams during displacement must be capable

Section II Recommendation 7 – Enforce Tighter Primary Cementing Practices

Implement through a rulemaking within 120 days

he Department will institute a rulemaking to onsider the adoption of API RP 65 Part 2:

- Isolating potential flow zones during well construction (addressing previously identified gaps in primary cementing practices).

Section III Recommendation 3 –Adopt Final Safety and Environmental Management Systems Rule

Implement through publication of final rule within 30 days

OCS Safety Oversight Board will ensure the promulgation of a final SEMS Rule with full implementation of lements, along with provisions for public availability of information developed and collected under the rule ncrease transparency and accountability.

IS is a structured and comprehensive method for applying operational, safety and environmental protection ciples to offshore activities by focusing on personnel and ensuring accountability for operations throughout organization in the following specific areas:

1. Safety & Environmental Information
2. Hazards Analysis
3. Management of Change
4. Operating Procedures
5. Safe Work Practices
6. Training
7. Mechanical Integrity
8. Pre-Startup Review
9. Emergency Response & Control
10. Investigation of Accidents
11. Auditing the Program
12. Records & Documentation

Recommendations to be Implemented After 30 Days

Section I Recommendation 3 – Study Formal Equipment Certification Requirements

Implement recommendations through the Department workgroup within one year

e Department will immediately establish an independent technical orkgroup to review current, and investigate new, certification requirements BOP equipment and other components of the BOP stack such as control nels, communication pods, accumulator systems, and choke and kill lines. addition, this workgroup will recommend ways to make BOP certifications blicly available in order to increase transparency and accountability.

e establishment of a technical workgroup to examine the need for rtification of BOP systems and components is important; even when a BOP ck has all the above mentioned systems and components, it is of little use t does not function properly to prevent a well blowout.

Section I Recommendation 4 – New Blind Shear Ram Redundancy Requirement

Implement through rulemaking within 120 days

Within one year from the date of this report, all floating drilling operations will be required to have two sets of blind shear rams spaced at least 4 feet apart (to prevent system failure if drill pipe joint or drill tool is across one set of rams during an emergency).

Section I Recommendation 6 – Develop New ROV Operating Capabilities

Implement recommendations through the Department workgroup within one year

e Department will immediately establish an independent technical
rkgroup to develop further improvements to ROV operating capabilities
luding the following:

- Standardized hydraulic and electrical interfaces for all subsea BOP stacks so that they are accessible by any available ROV.
- Visual mechanical indicator or redundant telemetry channel to confirm ram closure (*e.g.,* a position indicator).
- Methods of subsea testing that would avoid detrimental effects of seawater in BOP system (*e.g.,* ROV with external hydraulic supply).
- An ROV interface with a valve below the lowest ram on the BOP stack to allow well-killing operations.

Section I Recommendation 7 – Develop New Testing Guidelines

No later than 180 days after the date of this report

- Department will develop clear requirements and guidelines
t address the surface and subsea testing of ROV and BOP stack
abilities.

Implement through rulemaking within 120 days

- Protocols for function testing, autoshear, deadman, emergency
disconnect systems and acoustic activation systems.

Section I Recommendation 8 – Develop New Inspection Procedures and Reporting Requirements

Implement through rulemaking within 120 days

here feasible, the electronic log from the BOP control system ould be transmitted online to a secure location onshore and ade available for inspection by the Department of the Interior.

Section II Recommendation 1 – Establish Deepwater Well-Control Procedure Guidelines

Implement through rulemaking within 120 days

ithin 120 days of the date of this report, the Department will sure that requirements and guidelines for deepwater well-ntrol procedures are established.

Section II Recommendation 4 – Study Formal Personnel Training Requirements for Casing and Cementing Operations

Implement recommendations through the Department workgroup within one year

The Department will immediately establish an independent technical workgroup, with appropriate academic, agency, industry and other stakeholder participation, to study whether to establish new training and certification requirements for rig personnel specifically related to casing and cementing operations.

Section II Recommendation 6 – Develop Additional Requirements or Guidelines for Casing Installation

Implement recommendations through a the Department workgroup within one year

he Department will provide for the immediate stablishment of a workgroup, to establish specific equirements or guidelines for the following rocedures and practices:

- Positive and negative test procedures and use of test results for evaluation of casing integrity.
- Use of float valves and other mechanical plugs in the final casing string or liner.

Section II Recommendation 7 – Enforce Tighter Primary Cementing Practices

Implement recommendations through a Department workgroup within one year

- The Department will study whether to determine specific cementing requirements.

Section II Recommendation 8 – Develop Additional Requirements or Guidelines for Evaluation of Cement Integrity

Implement recommendations through Department workgroup within one year

- The Department will immediately establish an independent technical workgroup to evaluate whether and under what circumstances the use of cement bond logs is feasible and practical and will increase safety.

Section II Recommendation 9 –Increase Federal Government Wild-Well Intervention Capabilities

own out, or “wild” wells, involve the uncontrolled release of ude oil or natural gas from an oil well where pressure ntrol systems have failed.

e Federal government should assess its current capability to eal with such emergency situations, particularly in deep ater, and develop a plan to increase its capabilities for direct ld-well intervention, should such be required, in future mergency situations.

ements to be considered include an inventory of existing ethods to stop a blowout and handle escaping wellbore uids, including but not limited to coffer dams, highly-capable OVs, portable hydraulic line hook-ups, and pressure-reading ols.

Section II Recommendation 10 – Study Innovative Wild-Well Intervention, Response Techniques and Response Planning

ddition, the Department will immediately establish a DOI workgroup to study methods to p a blowout and handle escaping wellbore fluids. The technical workgroup will take a fresh k at how to deal with a deepwater blowout. The conventional last resort method to control a wout is to drill a relief well. In deep water this can take several months. But the reality of ng several months to stop a high flowing well at deep water depths was difficult to imagine il the BP oil spill. The offshore oil and gas industry, learning from the BP Oil Spill response erience, should work toward being able to stop a spill resulting from a deepwater blowout. erators should work to be in a position to submit, with their Exploration or Development ns, an emergency response plan that addresses resources (including common resources) that uld be deployed in the event of a serious emergency, even if assessed as low probability.

e technical workgroup should also address operators' ability, on a regional or industry-wide is, to develop and procure a response package for deep water incidents, to include diagnostic l measurement equipment, pre-fabricated systems for deep water oil capture, logistical and nmunications support, and plans and concepts of operations that can quickly be deployed in event of an unanticipated blowout. Assess and certify potential options, e.g., deep water persant injection.

ection III Recommendation 2 – The Department Will Adopt Safety Case Requirements for Floating Drilling Operations on the OCS

Implement through rulemaking within 120 days

- Within 120 days of the date of this report, the Department will assure the adoption of appropriate safety case requirements based on IADC Health, Safety and Environmental Case Guidelines for Mobile Offshore Drilling Units (2009), which will include well construction safety assessment prior to approval of APD.
- This “safety case” should establish risk assessment and mitigation processes to manage a drilling contractor’s controls related to the health, safety and environmental aspects of their operations.
- In addition to the safety case, a separate bridging document should be required to connect the safety case to existing well design and construction documents.
- Such a proposed Well Construction Interfacing Document will include all of the elements in a conventional bridging document plus alignment of the drilling contractor’s management of change (MOC) and risk assessment to the lease operator’s MOC and well execution risk assessments.

Section III Recommendation 4 – Study Additional Safety Training and Certification Requirements

mplement recommendations through a Department workgroup within one year

- The Department will immediately establish a workgroup to investigate safety training requirements for floating drilling rig personnel and possible requirements for independent or more frequent certification and testing of personnel and safety systems.
- Establish an oil production safety program or institute (similar to NRC reactor safety program).
- Consider establishing a formalized analytical methodology to assess performance of safety systems in the event of multiple component failure or excursions outside normal environmental ranges.
- Strengthen technical support to the Department of the Interior and other regulatory authorities, including the resources necessary to obtain independent technical review of regulations and standards.
- Consider chartering a longer-term technical review of BOP reliability.
- Consider importing best practices from other agencies with similar responsibility for safety regulation of technically complex systems, e.g. FAA and NRC.

Nguyen, Ngoc B

From: Ken Arnold [karnold@karnoldconsulting.com]
Sent: Saturday, June 19, 2010 4:48 PM
To: Benton Baugh; Bob Bea; Ford Brett; Hans Juvkam-Wold; Ken Arnold; Martin Chenevert; Per Holand; Skip Ward; Tom Williams
Cc: Black, Steve; Hanley, Kallie; Kemkar, Neal
Subject: Meeting Monday
Attachments: Presentation to Secretary of Interior - Rev 3.pptx

I have modified the power point based on comments received. I have put the detail listing of various levels of recommendations in the appendix and clarified the outline of the discussion. I will take another run at simplifying and clarifying so keep the cards and letters coming.

I am trying to get statistics on the percent of oil spilled from OCS operations and percent of oil spilled from tanker transportation. I have it for the OCS and I have average oil spilled per year from tankers in North America (30,000 barrels per year from 1990-1999) as opposed to an average of 3300 barrels/year from platforms and rigs (1970-2009 including two bad hurricane decades). The problem is I don't know how much of the 30,000 barrels to attribute to US alone (I am guessing 75% or 22,000). And I don't know how much oil and products are imported each year by tanker. If I assume twice as much is transported by tanker than produced on the OCS, than the ratio of 11,000 to 3300 is a measure of riskiness of importing by tanker rather than producing. It seems to be about 3 to 1. It gets even more complicated if you include bilge water and spills at offloading terminals on the one hand and produced water discharges from platforms on the other but let's not get into that. Sounds like a good Masters thesis and I don't have the time today.

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Presentation to Secretary of Interior

June 21, 2010

Outline of the Discussion

1. Why We Are Here
2. Putting the Risks in Context
3. Putting the Moratorium in Context
4. Measures that should be taken now to improve safety in the GOM

Why Are We Here

We are not here to provide an economic justification – jobs, revenue lost, etc. That is the job for economists.

We feel safety will be compromised if the 6 month ban is extended to all wells in the GoM over 500 feet in water depth.

This is the time we all need to work together and we understand the job at hand.

This is not the time to punish the innocent nor further harm the public's interest .

Why Are We Here

The moratorium as currently defined INCREASES risk when drilling is eventually resumed.

- 1. Stopping operations in the middle
- 2. Exporting best rigs
- 3. Loss of experienced drilling staff
- 4. Increased tanker traffic

We believe a moratorium is needed, but we believe it can be re-defined to reduce risk

- 1. Remove requirement for stopping operations
- 2. Require the implementation of many of the recommendations of the interim report including some not already included in NTL 05.
- 3. Allow drilling of “low risk” wells to maintain GOM drilling equipment and expertise.

Putting The Risks in Context

BP Oil Spill Disaster

We were not asked to provide analysis of the Horizon incident, but as information has been discovered it is clear best practices were not followed.

- The well design was marginal
- Human errors in judgment were made at very key operational decision points
- Warning signs were overlooked on the rig
- There may have been some failure of equipment

This was all preventable by following currently in place standard practices.

Safety Record of Drilling on the OCS

Over 50,000 wells drilled. 4000 in over 1000 feet of water.

Last major incident resulting in oil coming ashore in 1969. 41 years ago.

From 1970 until April 2010 a total of 1800 barrels of oil spilled due to blowouts.

All measurements of safety indices have shown a steady level of improvement since modern MMS regulations came into effect in 1970.

Record is better than or equal to that or any other region of the world.

Crude Oil Spills from Platform and Rigs from Federal OCS Activities

ears	**Production** (Thousand BBls)	**Number of Spills**	**Barrels Spilled** (Thousand BBls)
960-1969	1,460,000	13	99
970-1979	3,455,000	32	106
980-1989	3,387,000	38	7
990-1999	4,051,000	15	2
000-2009	5,450,000	72	18

lowout Events Exceeding 1,000 Barrels on OCS

Two blowouts associated with a hurricane event that destroyed four platforms. Total of 10,280 barrels crude oil spilled.

One blowout associated with drilling. 1,688 barrels condensate spilled.

One blowout that occurred when a supply vessel collided with a drilling rig during a storm and sheared the wellhead.

2,500 barrels crude oil spilled.

One blowout (Santa Barbara) was associated with drilling.

80,000 barrels spilled.

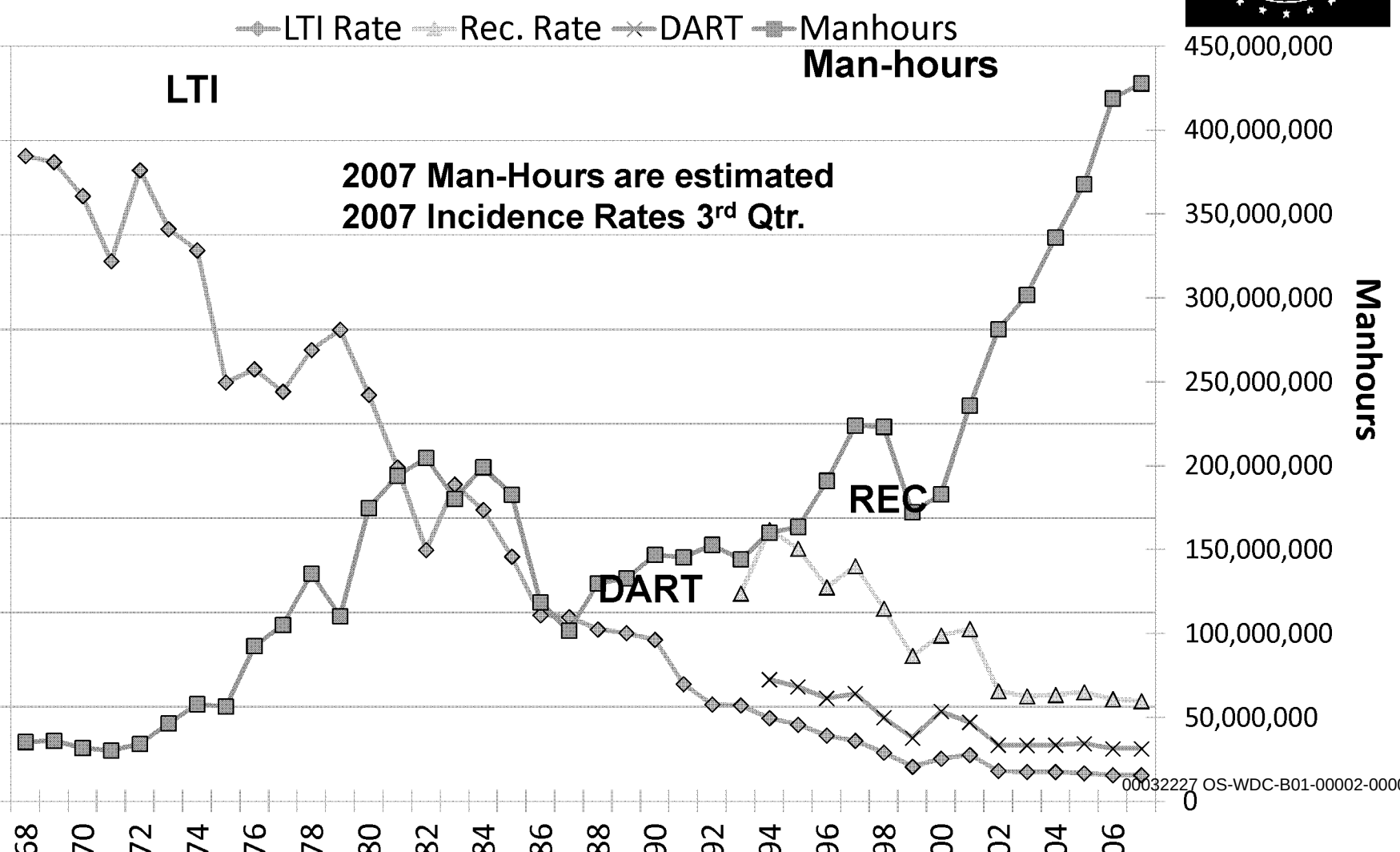
One blowout was caused by a fire in the production area that resulted in the loss of control of 12 wells on the platform.

30,000 barrels crude oil spilled.

One blowout associated with wireline work during workover operations. 53,000 barrels spilled.

om 1971 through 2009, a total of 1,784 barrels was spilled as a

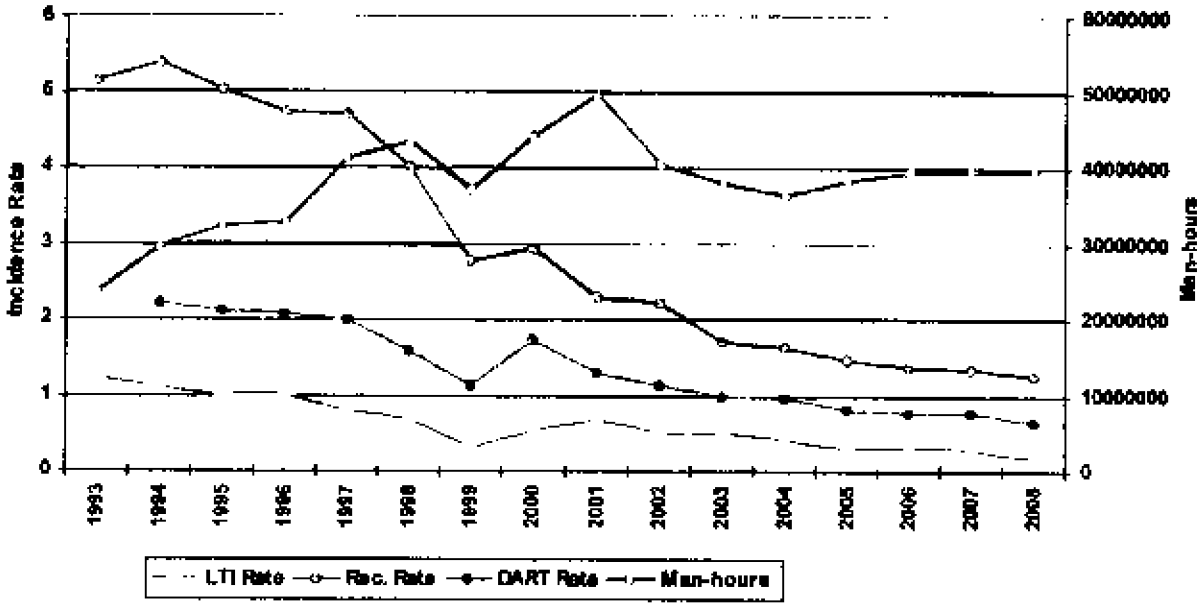
TOTAL INDUSTRY INCIDENCE RATES



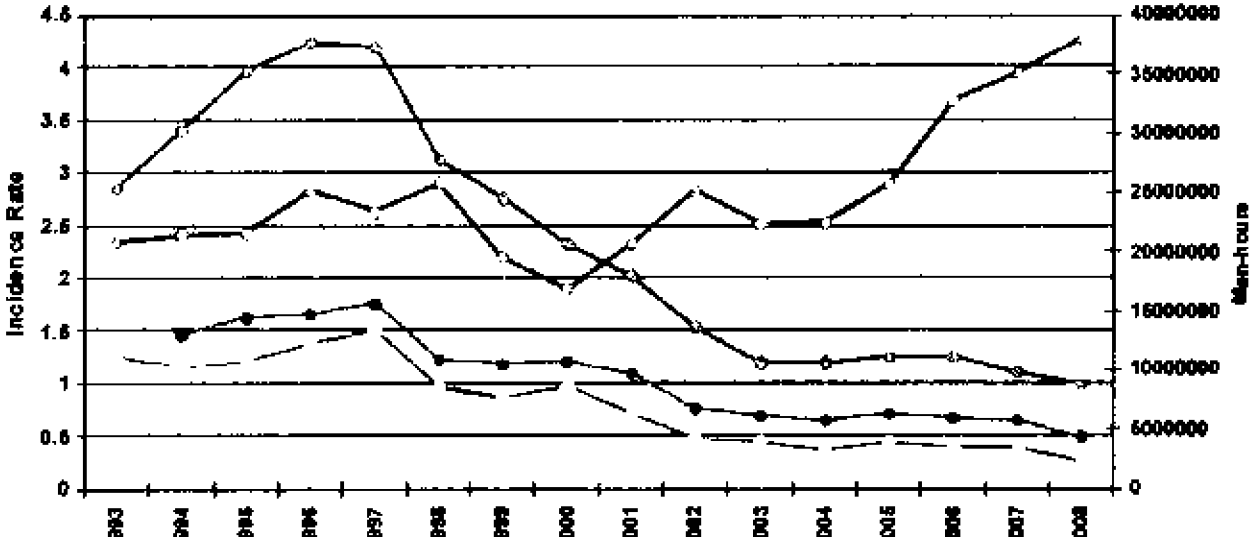
C 2008 US Water Totals		IADC 2008 European Water Totals	
l Man-hours	**39,665,580**	Total Man-hours	**38,049,523**
l Medical Treatment Incidents	**118**	Total Medical Treatment Incidents	**95**
l Restricted Work Incidents	**100**	Total Restricted Work Incidents	**43**
l Lost Time Incidents	**26**	Total Lost Time Incidents	**51**
l Fatalities	**3**	Total Fatalities	**0**
l Recordables	**247**	Total Recordables	**189**
ncidence Rate	**0.15**	LTI Incidence Rate	**0.27**
Frequency Rate	**0.73**	LTI Frequency Rate	**1.34**

st Time Incidence Rate = LTIs + FTLs X 200,000

US Water Total LTI & Recordable Incidence Rates vs Man-hours (Figure 1)

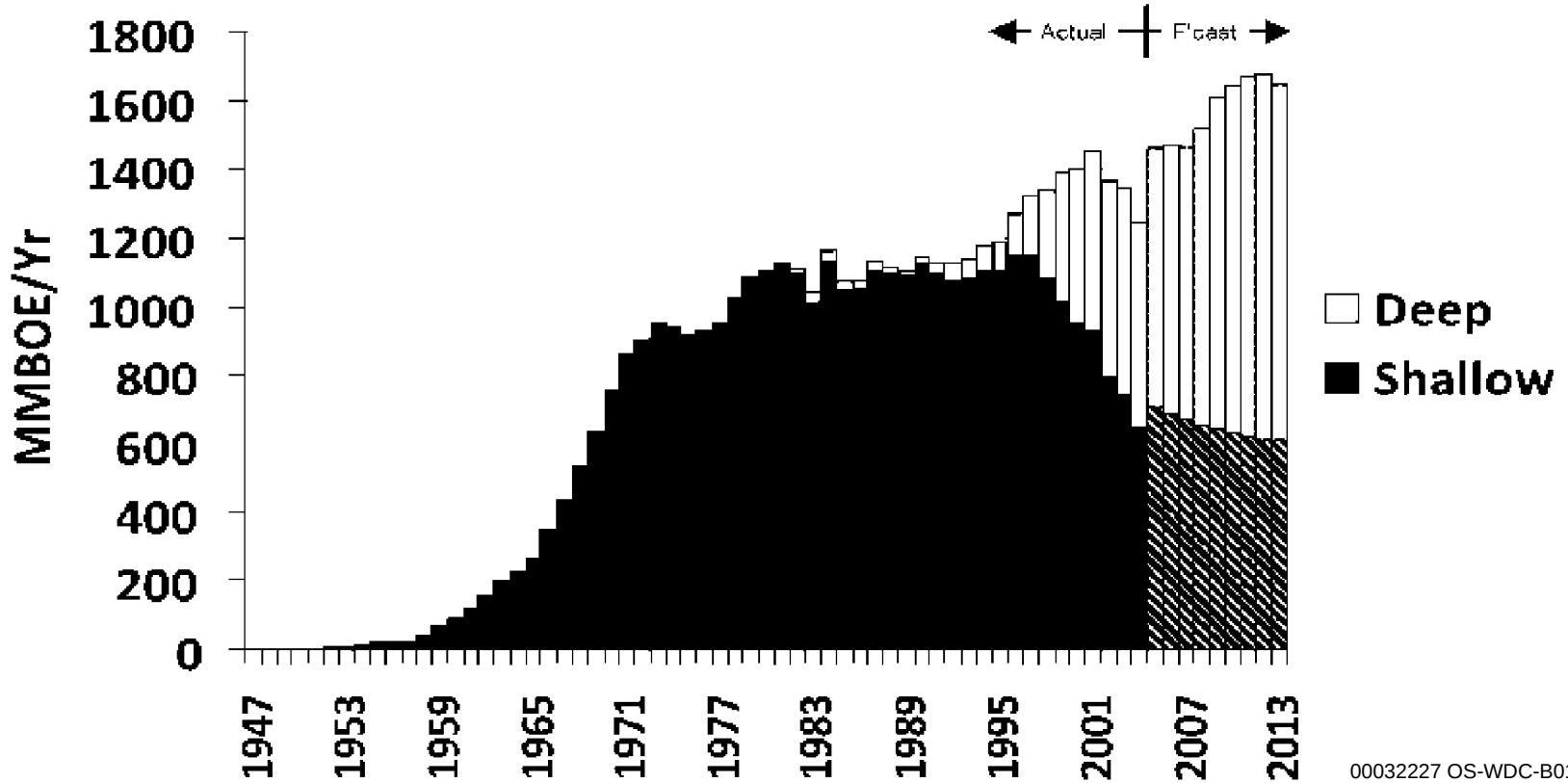


European Water Total Incidence Rates vs Man-hours (Figure 1)



GOM Offshore Production Increasingly from Deepwater

US GOM Offshore



Source: OCS Report MMS 2006-022

Understanding the Risks Summary

Even under existing conditions the record is good and improving at the same time that we are moving more and more into deep water

The Interim Report recommendations which can be implemented immediately (within 30 Days) should reduce the risk further but as the risks are low this is a marginal step

The Interim Report recommendations which take more time (up to 6 Months) should reduce the risks even further but in an even more marginal amount.

Putting the Moratorium in Context

Rationale for a Moratorium

We experts agreed to a list of recommendations which are needed to make drilling safer. Some of these recommendations take time to study and make into regulations to assure compliance. In some cases we agreed with time frames of as long as 6 months and even in one or two cases longer. How can we face the American people and say drilling is safe before all of our own recommendations can be carried out?

By not allowing drilling until all the recommendations we told the DOI are necessary for safety are in place the DOI is honoring our technical analysis.

The “Four Negatives” of the Moratorium

The Moratorium itself increases risk by:

- 1. Stopping operations in the middle
- 2. Exporting best rigs
- 3. Loss of experienced drilling staff
- 4. Increased tanker traffic

To reduce overall risk, the risk reductions which occur as a result of the Moratorium need to outweigh the added risks of the “four negatives”

As currently defined the Moratorium does not accomplish this objective

The Moratorium can be redefined to reduce risk

Effects of Stopping Operations

In any project risks are introduced when an appropriately planned operation is temporarily abandoned and then re-started at some future undetermined date.

- Macondo Well was being temporarily abandoned
- Montara Well was being re=entered after having been temporarily abandoned for four months

The Effect of the Moratorium on Rigs

Best rigs will leave the Gulf first and come back last. This has a marginal negative impact on the overall safety of the fleet.

Rigs will leave on long term contracts (2-5 years) and it will take a long time after the moratorium ends to get them back.

The time to remobilize will take several additional months/years after the Moratorium is lifted and new rules in place.

Effects of Moratorium on Experienced Personnel

- Best people will leave the Gulf
- Workforce significantly impacted, including the thousands of support workers and service providers who support the drilling operations and must adhere to the safety standards – best of them will get work internationally or other industries/jobs.
- Recruitment of new people will stop – the best and brightest do not apply for uncertain jobs
- While some additional training and certification can and will take place during this time – as with the baseball offseason, players need a spring training to get back in shape – "From a safety standpoint we can't afford to have a spring training."
- The industry feels the safest and most effective rig operations and personnel are being punished.

Measures that should be taken now to improve safety in the GOM

Manage Risk

The level of risk varies significantly between well types based on knowledge of formations being drilled and category of well

The highest risk wells warrant additional time to assure the risk can be managed and drilling these wells are warranted:

- Deepwater exploration wells
  - We have seen it is not just the drilling but the completion of these wells that pose risk
- Unknown pore pressure
- Extremely high pressure and/or high temperature wells

The Key to Increasing Safety

Require adoption of some Interim Report recommendations immediately

Provide a mechanism to allow rigs to remain working in the Gulf of Mexico

- Define a class of wells (other than workover, waterflood, gas injection or water disposal wells) which can be drilled safely. That is, wells where any increased risk by not waiting for all the recommendations to be implemented is lower than the risk of the "Four Negatives"

Maintain Moratorium on "Risky Wells"

Steps to Re-Define the Moratorium to INCREASE Safety

- Allow rigs to complete the work they are currently doing
- Require implementation of the key recommendations of the interim report which can be done within 30 days before ANY new wells can be drilled on the OCS (independent of water depth)
  - 8 Recommendations Already in NTL 05
  - 5 Additional Recommendations which could be added
- Maintain the moratorium on the more risky wells
  - Remaining Recommendations requiring additional study.

Risky Wells

Exploration wells to previously undrilled strata

Deepening existing wells to previously undrilled strata

HP/HT Wells

Less Risky Wells which Can be Drilled

Listed in increasing degree of risk:

- Wells which are abandoned before reaching producing zones (surface casings and top sections only)
- Water Disposal to Non-Producing Reservoirs
- Re-entries and Sidetracks
- Water Disposal to Producing Reservoirs, Waterflood and Gas Injection
- Wells to Known Reservoirs
- Workovers
- Delineation Wells to Non-producing Reservoirs

Wells in red above are already exempted from the moratorium by NTL 04

Conclusions

A moratorium is needed

It needs be defined taking into account ALL elements of risk, including the risks derived from the moratorium itself

Drilling can be made safer quickly by implementing many of the recommendations of the Interim Report

We should not ignore the “four Negatives” of the moratorium

It is justifiable to put a moratorium on “Risky Wells” to allow further thought and study

Appendices

30-Day Recommendations Already in NTL

Recommendations Which Could be Implemented But Are Not Currently in NTL

Recommendations to be Implemented After 30 Days

30-Day Recommendations Already in NTL

Section III Recommendation 1 – Compliance erification for Existing Regulations and April 30, 2010, National Safety Alert

Implement through NTL within 30 days

hin 30 days of the date of this report, the Department, in conjunction with the Department of Homeland urity, will ensure that operators are required to verify compliance with existing regulations and National ety Alert (issued April 30, 2010), which issued the following safety recommendations to operators and ing contractors:

- Examine all well-control equipment (both surface and subsea) currently being used to ensure that it has been properly maintained and is capable of shutting in the well during emergency operations. Ensure that the ROV hot-stabs are function-tested and are capable of actuating the BOP.
- Review all rig drilling/casing/completion practices to ensure that well-control contingencies are not compromised at <u>any</u> point while the BOP is installed on the wellhead.
- Review all emergency shutdown and dynamic positioning procedures that interface with emergency well control operations.
- Inspect lifesaving and firefighting equipment for compliance with federal requirements.
- Ensure that all crew members are familiar with emergency/firefighting equipment, as well as participate in an abandon ship drill. Operators are reminded that the review of emergency equipment and drills should be conducted after each crew change out.
- Exercise emergency power equipment to ensure proper operation.
- Ensure that all personnel involved in well operations are properly trained and capable of performing their tasks under both normal drilling and emergency well control operations.

Section I Recommendation 1 – Order One-Time Only Re-rtification of All BOP Equipment Used in New Floating Drilling Operations

Implement through NTL within 30 days

fore spudding any new well from a floating vessel, the operator will be quired to obtain and deliver to the Department of the Interior a written and ned certification from an independent third-party attesting that, on or er the date of this report, a detailed physical inspection and design review the BOP has been conducted by the equipment manufacturer and owner in cordance with the Original Equipment Manufacturer (OEM) specifications d that (i) the BOP will operate as originally designed; and (ii) any odifications or upgrades to the BOP stack conducted after delivery have not mpromised the design or operation of the BOP.

or to deploying the BOP, the operator must also verify that any odifications or upgrades to the BOP are approved by the Department of the erior and that documentation showing that the BOP has been maintained d inspected according to the requirements in API RP 53 and 30 CFR 0.446(a) is on file with the Department of the Interior or available for pection.

ection I Recommendation 2 – Order BOP Equipment ompatibility Verification for Each Floating Vessel and for Each New Well

Implement through NTL within 30 days

s part of a structured risk management process, the perator will be required to obtain an independent ird-party verification that the BOP will operate ith the drilling rig equipment and that the BOP is ompatible with the specific well location and well asis of design and well execution plan, i.e., in the vent of a well control event the BOP will provide a eal and contain wellbore pressure under all onditions expected in the wellbore.

Section I Recommendation 5– Develop Secondary Control System Requirements and Guidelines

Implement through rulemaking within 120 days

- Minimum ROV intervention capabilities for secondary control of all subsea BOP stacks, including the ability to close all shear and pipe rams, close the choke and kill valves and unlatch the lower marine riser package (LMRP).
- Minimum requirements for an emergency back-up BOP control system that is powered by a separate and independent accumulator bank with sufficient capacity to open and close one annular-type preventer and all ram-type preventers, including the blind shear ram. Such safety systems must include ***at least two*** of the following: autoshear, deadman, emergency disconnect system, and/or an acoustic activation system.
- Guidelines for arming and disarming the secondary BOP control system.
- Guidelines for documentation of BOP maintenance and repair (including any modifications to the BOP stack and control systems).

Section I Recommendation 7 – Develop New Testing Guidelines

Implement through NTL within 30 days

ird-party verification or documentation necessary to show at blind-shear rams will function and are capable of earing the drill pipe that is in use on the rig.

Implement partially through NTL within 30 days, then rulemaking within 120 days

inimum ROV performance testing standards, including rface and subsea function testing of ROV intervention ports d ROV pumps, to ensure compatibility with the BOP stack d that the ROV can close all shear and pipe rams, close the oke and kill valves, and unlatch the lower marine riser ckage.

Section I Recommendation 7 – Develop New Testing Guidelines

Implement through NTL within 30 days

andatory inspection and testing of BOP stack if any omponents are used in an emergency, *e.g.,* use of pipe casing shear rams or circulating out a well kick. This sting should involve a full pressure test of the BOP ter the situation is fully controlled, with the BOP on e wellhead.

Section I Recommendation 8 – Develop New Inspection Procedures and Reporting Requirements

Implement through NTL within 30 days

eginning no later than 60 days after the date of this port, all operators of floating drilling equipment will port to the Department of the Interior the following: (i) OP and well control system configuration, (ii) BOP and ell control system test results, including any anomalies testing or operation of critical BOP components, (iii) OP and well control incidents, and (iv) BOP and well ontrol system downtime for the last three years of illing operations.

Section II Recommendation 3 – New Casing And Cement Design Requirements: Two Independent Tested Barriers

Implement through NTL within 30 days

efore spudding any new floating drilling operation, all ell casing and cement designs must be signed by a rofessional Engineer, verifying that there will be at ast two independent tested barriers, including one echanical barrier, across each flow path during well ompletion and abandonment activities and that casing esign is appropriate for the purpose for which it is tended under reasonably expected wellbore onditions.

Section II Recommendation 5 – New Casing Installation Procedures

Implement through NTL within 30 days

he Department will ensure the requirement of the llowing BAST practices:

- Casing hanger latching mechanisms or lock down mechanisms must be engaged at the time the casing is installed in the subsea wellhead.
- For the final casing string, the operator must verify the installation of dual mechanical barriers (*e.g.,* dual floats or one float and a mechanical plug) in addition to cement, to prevent flow in the event of a failure in the cement.

Recommendations Which Could be Implemented But Are Not Currently in NTL

Section I Recommendation 7 – Develop New Testing Guidelines

Implement through NTL within 30 days

linimum surface and subsea function and ressure testing requirements to simulate (i) nintended disconnect of the lower marine riser ackage (LMRP), and (ii) loss of surface control e.g., electric and hydraulic power) of the subsea OP stack.

Section I Recommendation 8 – Develop New Inspection Procedures and Reporting Requirements

nplement in accordance with internal Departmental Guidance issued within 30 days

- The Department will evaluate and revise the manner in which it conducts its drilling inspections.
- Revised drilling inspections should include the witnessing of actual tests of BOP equipment, including the new requirements and guidance that address the surface and subsea testing of ROV and BOP stack capabilities.
- The Department will also develop methods to increase transparency and public availability of the results of inspections as well as routine reporting.
- The Department will work with Congress to obtain the necessary resources to implement these recommendations.

ection II Recommendation 2 – New Fluid Displacement Procedures

Implement through NTL within 30 days

or to displacement of kill-weight drilling fluid from the wellbore, the operator must ependently verify that:

- The BOPs are closed during displacement to underbalanced fluid columns to prevent gas entry into the riser should a seal failure occur during displacement.
- Two independent barriers, including one mechanical barrier, are in place for each flow path (i.e., casing and annulus).
- If the shoe track (the cement plug and check valves that remain inside the bottom of casing after cementing) is to be used as one of these barriers, it is negatively tested prior to the setting of the subsequent casing barrier. A negative test should also be performed prior to setting the surface plug.
- Negative tests are made to a differential pressure equal to or greater than the anticipated pressure after displacement. Each casing barrier is positively tested to a pressure that exceeds the highest estimated integrity of the casing shoes below the barrier.
- Displacement of the riser and casing to fluid columns that are underbalanced to the formation pressure in the wellbore is conducted in separate operations. In both cases, BOPs should be closed on the drill string and circulation established through the choke line to isolate the riser, which is not a rated barrier. During displacement, volumes in and out must be accurately monitored.
- Drill string components positioned in the shear rams during displacement must be capable

Section II Recommendation 7 – Enforce Tighter Primary Cementing Practices

Implement through a rulemaking within 120 days

he Department will institute a rulemaking to onsider the adoption of API RP 65 Part 2:

- Isolating potential flow zones during well construction (addressing previously identified gaps in primary cementing practices).

Section III Recommendation 3 –Adopt Final Safety and Environmental Management Systems Rule

Implement through publication of final rule within 30 days

OCS Safety Oversight Board will ensure the promulgation of a final SEMS Rule with full implementation of lements, along with provisions for public availability of information developed and collected under the rule ncrease transparency and accountability.

IS is a structured and comprehensive method for applying operational, safety and environmental protection ciples to offshore activities by focusing on personnel and ensuring accountability for operations throughout organization in the following specific areas:

1. Safety & Environmental Information
2. Hazards Analysis
3. Management of Change
4. Operating Procedures
5. Safe Work Practices
6. Training
7. Mechanical Integrity
8. Pre-Startup Review
9. Emergency Response & Control
10. Investigation of Accidents
11. Auditing the Program
12. Records & Documentation

Recommendations to be Implemented After 30 Days

Section I Recommendation 3 – Study Formal Equipment Certification Requirements

Implement recommendations through the Department workgroup within one year

e Department will immediately establish an independent technical orkgroup to review current, and investigate new, certification requirements BOP equipment and other components of the BOP stack such as control nels, communication pods, accumulator systems, and choke and kill lines. addition, this workgroup will recommend ways to make BOP certifications blicly available in order to increase transparency and accountability.

e establishment of a technical workgroup to examine the need for rtification of BOP systems and components is important; even when a BOP ck has all the above mentioned systems and components, it is of little use t does not function properly to prevent a well blowout.

Section I Recommendation 4 – New Blind Shear Ram Redundancy Requirement

Implement through rulemaking within 120 days

Within one year from the date of this report, all oating drilling operations will be required to ave two sets of blind shear rams spaced at ast 4 feet apart (to prevent system failure if rill pipe joint or drill tool is across one set of ams during an emergency).

Section I Recommendation 6 – Develop New ROV Operating Capabilities

Implement recommendations through the Department workgroup within one year

e Department will immediately establish an independent technical rkgroup to develop further improvements to ROV operating capabilities luding the following:

- Standardized hydraulic and electrical interfaces for all subsea BOP stacks so that they are accessible by any available ROV.
- Visual mechanical indicator or redundant telemetry channel to confirm ram closure (*e.g.,* a position indicator).
- Methods of subsea testing that would avoid detrimental effects of seawater in BOP system (*e.g.,* ROV with external hydraulic supply).
- An ROV interface with a valve below the lowest ram on the BOP stack to allow well-killing operations.

Section I Recommendation 7 – Develop New Testing Guidelines

No later than 180 days after the date of this report

- Department will develop clear requirements and guidelines
t address the surface and subsea testing of ROV and BOP stack
abilities.

Implement through rulemaking within 120 days

- Protocols for function testing, autoshear, deadman, emergency
disconnect systems and acoustic activation systems.

Section I Recommendation 8 – Develop New Inspection Procedures and Reporting Requirements

Implement through rulemaking within 120 days

here feasible, the electronic log from the BOP control system ould be transmitted online to a secure location onshore and ade available for inspection by the Department of the Interior.

Section II Recommendation 1 – Establish Deepwater Well-Control Procedure Guidelines

Implement through rulemaking within 120 days

ithin 120 days of the date of this report, the Department will sure that requirements and guidelines for deepwater well-ntrol procedures are established.

Section II Recommendation 4 – Study Formal Personnel Training Requirements for Casing and Cementing Operations

Implement recommendations through the Department workgroup within one year

The Department will immediately establish an independent technical workgroup, with appropriate academic, agency, industry and other stakeholder participation, to study whether to establish new training and certification requirements for rig personnel specifically related to casing and cementing operations.

Section II Recommendation 6 – Develop Additional Requirements or Guidelines for Casing Installation

Implement recommendations through a the Department workgroup within one year

he Department will provide for the immediate stablishment of a workgroup, to establish specific equirements or guidelines for the following rocedures and practices:

- Positive and negative test procedures and use of test results for evaluation of casing integrity.
- Use of float valves and other mechanical plugs in the final casing string or liner.

Section II Recommendation 7 – Enforce Tighter Primary Cementing Practices

Implement recommendations through a Department workgroup within one year

- The Department will study whether to determine specific cementing requirements.

Section II Recommendation 8 – Develop Additional Requirements or Guidelines for Evaluation of Cement Integrity

Implement recommendations through Department workgroup within one year

- The Department will immediately establish an independent technical workgroup to evaluate whether and under what circumstances the use of cement bond logs is feasible and practical and will increase safety.

Section II Recommendation 9 –Increase Federal Government Wild-Well Intervention Capabilities

own out, or “wild” wells, involve the uncontrolled release of ude oil or natural gas from an oil well where pressure ntrol systems have failed.

e Federal government should assess its current capability to eal with such emergency situations, particularly in deep ater, and develop a plan to increase its capabilities for direct ld-well intervention, should such be required, in future mergency situations.

ements to be considered include an inventory of existing ethods to stop a blowout and handle escaping wellbore uids, including but not limited to coffer dams, highly-capable OVs, portable hydraulic line hook-ups, and pressure-reading ols.

Section II Recommendation 10 – Study Innovative Wild-Well Intervention, Response Techniques and Response Planning

ddition, the Department will immediately establish a DOI workgroup to study methods to p a blowout and handle escaping wellbore fluids. The technical workgroup will take a fresh k at how to deal with a deepwater blowout. The conventional last resort method to control a wout is to drill a relief well. In deep water this can take several months. But the reality of ng several months to stop a high flowing well at deep water depths was difficult to imagine il the BP oil spill. The offshore oil and gas industry, learning from the BP Oil Spill response erience, should work toward being able to stop a spill resulting from a deepwater blowout. erators should work to be in a position to submit, with their Exploration or Development ns, an emergency response plan that addresses resources (including common resources) that uld be deployed in the event of a serious emergency, even if assessed as low probability.

e technical workgroup should also address operators' ability, on a regional or industry-wide is, to develop and procure a response package for deep water incidents, to include diagnostic l measurement equipment, pre-fabricated systems for deep water oil capture, logistical and nmunications support, and plans and concepts of operations that can quickly be deployed in event of an unanticipated blowout. Assess and certify potential options, e.g., deep water persant injection.

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- Within 120 days of the date of this report, the Department will assure the adoption of appropriate safety case requirements based on IADC Health, Safety and Environmental Case Guidelines for Mobile Offshore Drilling Units (2009), which will include well construction safety assessment prior to approval of APD.
- This “safety case” should establish risk assessment and mitigation processes to manage a drilling contractor’s controls related to the health, safety and environmental aspects of their operations.
- In addition to the safety case, a separate bridging document should be required to connect the safety case to existing well design and construction documents.
- Such a proposed Well Construction Interfacing Document will include all of the elements in a conventional bridging document plus alignment of the drilling contractor’s management of change (MOC) and risk assessment to the lease operator’s MOC and well execution risk assessments.

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mplement recommendations through a Department workgroup within one year

- The Department will immediately establish a workgroup to investigate safety training requirements for floating drilling rig personnel and possible requirements for independent or more frequent certification and testing of personnel and safety systems.
- Establish an oil production safety program or institute (similar to NRC reactor safety program).
- Consider establishing a formalized analytical methodology to assess performance of safety systems in the event of multiple component failure or excursions outside normal environmental ranges.
- Strengthen technical support to the Department of the Interior and other regulatory authorities, including the resources necessary to obtain independent technical review of regulations and standards.
- Consider chartering a longer-term technical review of BOP reliability.
- Consider importing best practices from other agencies with similar responsibility for safety regulation of technically complex systems, e.g. FAA and NRC.

Nguyen, Ngoc B

From: Tom Williams [tom.williams@nautilus-int.com]
Sent: Saturday, June 19, 2010 5:38 PM
To: Ken Arnold; Benton Baugh; Bob Bea; Ford Brett; Hans Juvkam-Wold; Martin Chenevert; Per Holand; Skip Ward
Cc: Black, Steve; Hanley, Kallie; Kemkar, Neal
Subject: Re: Meeting Monday

Thanks Ken and all the comments are appreciated. Good power points to leave behind. I spoke to a long time friend that works for a mostly democrat and well respected law firm in DC; strong colorado connections; he has known Salazar for a long time:
15 min attention span; well over his head; overwhelmed with the job he has; his staffers are obama worshipers; a relative weak manager and is dictated by the white house (browner); has little understanding of energy business, hates big oil - good news is he is a nice guy and likes smart guys so all of you will be well received. Suggestion was make an offer up front he can't refuse. Details are left for follow ons.

Sent via BlackBerry by AT&T

From: "Ken Arnold" <karnold@karnoldconsulting.com>
Date: Sat, 19 Jun 2010 15:48:09 -0500
To: Benton Baugh<bbaugh@radoil.com>; Bob Bea<bea@ce.berkeley.edu>; Ford Brett<fbrett@petroskills.com>; Hans Juvkam-Wold<juvkam-wold@pe.tamu.edu>; Ken Arnold<karnold@karnoldconsulting.com>; Martin Chenevert<mechenevert@austin.utexas.edu>; Per Holand<Per.holand@exprosoft.com>; Skip Ward<egward@tamu.edu>; Tom Williams<Tom.Williams@Nautilus-Int.com>
Cc: 'Black, Steve'<steve_black@ios.doi.gov>; 'Hanley, Kallie'<Kallie_Hanley@ios.doi.gov>; 'Kemkar, Neal'<Neal_Kemkar@ios.doi.gov>
Subject: Meeting Monday

I have modified the power point based on comments received. I have put the detail listing of various levels of recommendations in the appendix and clarified the outline of the discussion. I will take another run at simplifying and clarifying so keep the cards and letters coming.

I am trying to get statistics on the percent of oil spilled from OCS operations and percent of oil spilled from tanker transportation. I have it for the OCS and I have average oil spilled per year from tankers in North America (30,000 barrels per year from 1990-1999) as opposed to an average of 3300 barrels/year from platforms and rigs (1970-2009 including two bad hurricane decades). The problem is I don't know how much of the 30,000 barrels to attribute to US alone (I am guessing 75% or 22,000). And I don't know how much oil and products are imported each year by tanker. If I assume twice as much is transported by tanker than produced on the OCS, than the ratio of 11,000 to 3300 is a measure of riskiness of importing by tanker rather than producing. It seems to be about 3 to 1. It gets even more complicated if you include bilge water and spills at offloading terminals on the one hand and produced water discharges from platforms on the other but let's not get into that. Sounds like a good Masters thesis and I don't have the time today.

Kenneth E. (Ken) Arnold
K Arnold Consulting, Inc.
3031 Shadowdale
Houston, TX 77043
Cell: 832-212-0160
Home: 713-939-1034

Nguyen, Ngoc B

From: Benton Baugh [bbaugh@radoil.com]
Sent: Saturday, June 19, 2010 6:16 PM
To: tom.williams@nautilus-int.com; 'Ken Arnold'; 'Bob Bea'; 'Ford Brett'; 'Hans Juvkam-Wold'; 'Martin Chenevert'; 'Per Holand'; 'Skip Ward'
Cc: Black, Steve; Hanley, Kallie; Kemkar, Neal
Subject: RE: Meeting Monday

I would be surprised if he has a 15 minute attention span. It would be appropriate to clearly state the case by slide 2 that he could say yes or no to. I suspect that our only sellable point is that it is safer to continue drilling than restarting later. All the rest demonstrates that due diligence has been done.

Benton

From: Tom Williams [mailto:tom.williams@nautilus-int.com]
Sent: Saturday, June 19, 2010 4:38 PM
To: Ken Arnold; Benton Baugh; Bob Bea; Ford Brett; Hans Juvkam-Wold; Martin Chenevert; Per Holand; Skip Ward
Cc: Steve Black; Kallie Hanley; 'Kemkar, Neal'
Subject: Re: Meeting Monday

Thanks Ken and all the comments are appreciated. Good power points to leave behind. I spoke to a long time friend that works for a mostly democrat and well respected law firm in DC; strong colorado connections; he has known Salazar for a long time:
15 min attention span; well over his head; overwhelmed with the job he has; his staffers are obama worshipers; a relative weak manager and is dictated by the white house (browner); has little understanding of energy business, hates big oil - good news is he is a nice guy and likes smart guys so all of you will be well received. Suggestion was make an offer up front he can't refuse. Details are left for follow ons.

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Date: Sat, 19 Jun 2010 15:48:09 -0500
To: Benton Baugh<bbaugh@radoil.com>; Bob Bea<bea@ce.berkeley.edu>; Ford Brett<fbrett@petroskills.com>; Hans Juvkam-Wold<juvkam-wold@pe.tamu.edu>; Ken Arnold<karnold@karnoldconsulting.com>; Martin Chenevert<mechenevert@austin.utexas.edu>; Per Holand<Per.holand@exprosoft.com>; Skip Ward<egward@tamu.edu>; Tom Williams<Tom.Williams@Nautilus-Int.com>
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Nguyen, Ngoc B

From: Kemkar, Neal
Sent: Saturday, June 19, 2010 8:08 PM
To: 'tom.williams@nautilus-int.com'; 'karnold@karnoldconsulting.com'; 'bbaugh@radoil.com'; 'bea@ce.berkeley.edu'; 'fbrett@petroskills.com'; 'juvkam-wold@pe.tamu.edu'; 'mechenevert@austin.utexas.edu'; 'Per.holand@exprosoft.com'; 'egward@tamu.edu'
Cc: Black, Steve; Hanley, Kallie
Subject: Re: Meeting Monday

Thanks for the compliments to us and our boss, Tom. Please take your preparation offline. See many of you Monday.

Best,
Neal

From: Tom Williams <tom.williams@nautilus-int.com>
To: Ken Arnold <karnold@karnoldconsulting.com>; Benton Baugh <bbaugh@radoil.com>; Bob Bea <bea@ce.berkeley.edu>; Ford Brett <fbrett@petroskills.com>; Hans Juvkam-Wold <juvkam-wold@pe.tamu.edu>; Martin Chenevert <mechenevert@austin.utexas.edu>; Per Holand <Per.holand@exprosoft.com>; Skip Ward <egward@tamu.edu>
Cc: Black, Steve; Hanley, Kallie; Kemkar, Neal
Sent: Sat Jun 19 17:37:49 2010
Subject: Re: Meeting Monday

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Nguyen, Ngoc B

From: Mail Delivery System [MAILER-DAEMON@os-mail-4.tamu.edu]
To: egward@otrc.tamu.edu
Sent: Saturday, June 19, 2010 8:10 PM
Subject: Undeliverable: Meeting Monday

The following message to <egward@otrc.tamu.edu> was undeliverable.

The reason for the problem:

Re Meeting Monday

5.1.0 - Unknown address error 530-'5.7.1 Client was not authenticated'

Nguyen, Ngoc B

From: Ken Arnold [karnold@karnoldconsulting.com]
Sent: Saturday, June 19, 2010 9:38 PM
To: Kemkar, Neal
Subject: RE: Meeting Monday

For the record...I am a proud Obama worshiper even though I work and live in communities where such a stance is unpopular. My wife still has her Hillary and Obama stickers on her car and only gets nasty notes left behind occasionally.

Kenneth E. (Ken) Arnold
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Nguyen, Ngoc B

From: Juvkam-Wold, Hans [juvkam-wold@pe.tamu.edu]
Sent: Sunday, June 20, 2010 9:11 AM
To: Dubin, Lindsay
Cc: Black, Steve; Kemkar, Neal; Hanley, Kallie
Subject: RE: Meeting with Secretary Salazar Monday 6.21.10

Lindsay,

Thanks for sending the call-in information. The meeting starts at 10 a.m. Washington time, is that correct?

Hans

~~~
~~~

know by 3:00pm EASTERN tomorrow if you will be able to participate. Please be sure to indicate whether you will be attending in person or via phone. We will reach out to you with arrival instructions or a conference call number following our receipt of your participation.

Thank you,

Lindsay Dubin
Special Assistant
Office of Scheduling and Advance
The U.S. Department of the Interior
p: (202) 208-7551 | f: (202) 208-4694
lindsay_dubin@ios.doi.gov<mailto:brian_screnar@ios.doi.gov>

Nguyen, Ngoc B

From: Morlandt, Christopher
Sent: Monday, June 21, 2010 8:32 AM
To: Ken Arnold
Subject: RE: Meeting with Secretary Salazar Monday 6.21.10

Good morning Mr. Arnold,

We have everything covered, and will have a projector, screen and laptop set-up in the Secretary's office for the 10:00 am meeting. What time are you currently looking at arriving? I will talk to you soon.

Chris Morlandt
202-257-2645

From: Ken Arnold [mailto:karnold@karnoldconsulting.com]
Sent: Saturday, June 19, 2010 9:32 PM
To: Morlandt, Christopher
Subject: RE: Meeting with Secretary Salazar Monday 6.21.10

Chris

We will have a power point presentation to show the Secretary. I will have a flash drive and also my computer if we need it. Can you arrange for everything else.

Ken

Kenneth E. (Ken) Arnold
K Arnold Consulting, Inc.
3031 Shadowdale
Houston, TX 77043
Cell: 832-212-0160
Home: 713-939-1034
www.karnoldconsulting.com

From: Morlandt, Christopher [mailto:Christopher_Morlandt@ios.doi.gov]
Sent: Friday, June 18, 2010 10:10 AM
To: Ken Arnold
Cc: Hanley, Kallie; Dubin, Lindsay
Subject: RE: Meeting with Secretary Salazar Monday 6.21.10

Good morning Mr. Arnold,

My name is Chris Morlandt and I will be assisting you with the entry into our building on Monday 6-21-2010. We are located at 1849 C st. NW directly across from DAR Constitution hall. I have notified our security team of your arrival and so there will be no need to sign in / go through metal detectors. I will personally meet you downstairs in our C st. lobby entrance and escort you up to the meeting. If you have any questions whatsoever -- please do not hesitate to give me a call. I look forward to meeting you on Monday and I hope you have a wonderful weekend.

Respectfully,

Chris Morlandt
(202)-257-2645

From: Dubin, Lindsay
Sent: Friday, June 18, 2010 10:27 AM
To: Ken Arnold
Cc: Black, Steve; Kemkar, Neal; Hanley, Kallie; Morlandt, Christopher
Subject: RE: Meeting with Secretary Salazar Monday 6.21.10

Hi Ken,

Glad to hear that you will be attending. Christopher Morlandt from the Secretary's office, who is cc'd, will be reaching out to you today with arrival instructions.

Look forward to seeing you Monday,

Lindsay

From: Ken Arnold [mailto:karnold@karnoldconsulting.com]
Sent: Thursday, June 17, 2010 6:45 PM
To: Dubin, Lindsay
Cc: Black, Steve; Kemkar, Neal; Hanley, Kallie
Subject: RE: Meeting with Secretary Salazar Monday 6.21.10

I will attend in person. Please let me know who else was invited.

Kenneth E. (Ken) Arnold
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Houston, TX 77043
Cell: 832-212-0160
Home: 713-939-1034
www.karnoldconsulting.com

From: Dubin, Lindsay [mailto:Lindsay_Dubin@ios.doi.gov]
Sent: Thursday, June 17, 2010 5:23 PM
To: Dubin, Lindsay
Cc: Black, Steve; Kemkar, Neal; Hanley, Kallie
Subject: Meeting with Secretary Salazar Monday 6.21.10

Good evening,

Interior Secretary Ken Salazar hopes that you can participate in a meeting at 10:00am EASTERN Monday, June 21, 2010 as a follow-up to Tuesday's conference call regarding the 30-day report on Increased Safety Measures for Energy Development on the Outer Continental Shelf. For those of you who are unable to join this meeting in person, there will be a call-in option for you to participate remotely. This meeting/conference call is limited to the people who have received this email. Please let Kallie Hanley (cc'd) and me know by 3:00pm EASTERN tomorrow if you will be able to participate. Please be sure to indicate whether you will be attending in person or via phone. We will reach out to you with arrival instructions or a conference call number following our receipt of your participation.

Thank you,

Lindsay Dubin
Special Assistant
Office of Scheduling and Advance
The U.S. Department of the Interior
p: (202) 208-7551 | f: (202) 208-4694
lindsay_dubin@ios.doi.gov

Nguyen, Ngoc B

From: Ken Arnold [karnold@karnoldconsulting.com]
Sent: Tuesday, June 22, 2010 8:44 AM
To: Black, Steve; Kemkar, Neal; Hanley, Kallie
Cc: Benton Baugh; Bob Bea; Ford Brett; Hans Juvkam-Wold; Ken Arnold; Martin Chenevert; Per Holand; Skip Ward; Tom Williams
Subject: FW: DOI report

In the email below you can see I have been asked to forward a copy of the power point. I suggested the staff person contact DOI direct. In the meantime, I have also been contacted by several reporters for copies. I am reluctant to do so as our group wants to work with the Secretary to help redefine the moratorium and not be as negative as we are being portrayed in the media. We do not want to take an action which will be thought of as hostile.

On the other hand, today's NYT story (http://nyti.ms/c2NiZv) seems to indicate the administration's mind is made up and the moratorium will extend with no changes into next year. If this is the case we are inclined to release the power point.

Please **reply to all** with your thoughts.

Ken

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www.karnoldconsulting.com

From: Moore, Kristina [mailto:Kristina.Moore@mail.house.gov]
Sent: Monday, June 21, 2010 1:07 PM
To: karnold@karnoldconsulting.com
Subject: DOI report

Mr. Arnold,

Thank you for your time this afternoon. As I mentioned on the phone, I am a senior investigator for Ranking Member Darrell Issa of the House Oversight and Government Reform Committee. The Wall Street Journal article, "Crude Politics," which discusses your concern for an increased safety risk associated with the six month moratorium, caught his eye. Accordingly, I have been instructed to learn more about possible alternatives to the moratorium that would not increase the risk to future drilling operations. In particular, he has expressed interest in proposals such as the "drill but not tap" strategy, which could have the benefit of keeping rigs operating, thereby reducing their incentive to leave the Gulf.

As such, I am very interested in obtaining a copy of the power point presentation you provided to the Department of Interior with these recommendations, as well as any other information that can help inform this discussion. Our standard operating procedure is to notify the source before any public dissemination of documents provided to the Committee and otherwise accommodate specific requests for confidential treatment.

Additionally, I am happy to make the identical request of the Department of Interior. However, you should know that the Department has been less than responsive to pretty much any Congressional investigation, relying heavily on the explanation that "all hands are on deck" responding to the crisis. If you could provide me with identifying characteristics of

the report (date, time, location, of the presentation, and the title of the presentation) that could help facilitate the processing of our request.

I am happy to respond to any questions that you may have and hope that we can start an open dialogue as we work to respond to the disaster in the Gulf.

Many Thanks,

Kristina Moore

Kristina M. Moore

Senior Counsel

Rep. Darrell Issa

Ranking Member of House Oversight and Government Reform

(202) 226-6080

Kristina.Moore@mail.house.gov

Nguyen, Ngoc B

From: Kemkar, Neal
Sent: Tuesday, June 22, 2010 9:06 AM
To: 'karnold@karnoldconsulting.com'
Cc: Black, Steve; Hanley, Kallie
Subject: Re: DOI report

Thanks Ken. Your decisions are your own. You know that.

The Secretary did invite you back in two weeks to continue the discussion on the moratorium and asked that you stay engaged with his top deputies in the meantime. The NYT, to the best of my knowledge, was not in the room for our discussion. You were.

From: Ken Arnold <karnold@karnoldconsulting.com>
To: Black, Steve; Kemkar, Neal; Hanley, Kallie
Cc: Benton Baugh <bbaugh@radoil.com>; Bob Bea <bea@ce.berkeley.edu>; Ford Brett <fbrett@petroskills.com>; Hans Juvkam-Wold <juvkam-wold@pe.tamu.edu>; Ken Arnold <karnold@karnoldconsulting.com>; Martin Chenevert <mechenevert@austin.utexas.edu>; Per Holand <Per.holand@exprosoft.com>; Skip Ward <egward@tamu.edu>; Tom Williams <Tom.Williams@Nautilus-Int.com>
Sent: Tue Jun 22 08:43:48 2010
Subject: FW: DOI report

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Please **reply to all** with your thoughts.

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Subject: DOI report

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Kristina Moore

Kristina M. Moore

Senior Counsel

Rep. Darrell Issa

Ranking Member of House Oversight and Government Reform

(202) 226-6080

Kristina.Moore@mail.house.gov

Nguyen, Ngoc B

From: Ken Arnold [karnold@karnoldconsulting.com]
Sent: Wednesday, June 23, 2010 7:47 PM
To: Benton Baugh; Bob Bea; Ford Brett; Hans Juvkam-Wold; Ken Arnold; Martin Chenevert; Per Holand; Skip Ward; Tom Williams
Cc: Black, Steve; Kemkar, Neal; Hanley, Kallie
Subject: Power Point Presented to Secretary Salazar on 6/21/2010
Attachments: Presentation to Secretary of Interior - Rev 4.pptx

You are receiving this because you expressed an interest in having a copy of the subject report. DOI has been asked if they have a problem with us distributing this to whomever asks and have not expressed an objection. Those present at the meeting or by phone were the original signers of the Group of 8, plus Per Holland and Arnold Stancell. Bob Bea and Skip Ward were unable to participate. From DOI attendees beside the Secretary included David Hayes, Tom Strickland, The new Director of the MMS Mike B (please excuse my inability to spell his last name as I am traveling and don't really have time to look it up).

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The Secretary has expressed an interest in meeting with us in two weeks with a wider audience.

Please be advised I am in SE Asia and will return to Houston Tuesday the 30th in the afternoon. Do not call my cell phone unless it is important as it is an expensive call for me. Also I have been unable to pick up my phone messages since leaving the US. I may be able to pick them up when I leave Viet Nom for Singapore Sunday but am not sure.

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Presentation to Secretary of Interior

June 21, 2010

Outline of the Discussion

1. Why We Are Here
2. Putting the Risks in Context
3. Putting the Moratorium in Context
4. Measures that should be taken now to improve safety in the GOM
5. Conclusions
6. Appendices

Why Are We Here

We are not here to provide an economic justification – jobs, revenue lost, etc. That is the job for economists.

We feel safety will be compromised if the 6 month ban is extended to all wells in the GoM over 500 feet in water depth.

This is the time we all need to work together and we understand the job at hand.

This is not the time to punish the innocent nor further harm the public's interest .

Why Are We Here

The moratorium as currently defined INCREASES risk when drilling is eventually resumed.

- 1. Stopping operations in the middle
- 2. Exporting best rigs
- 3. Loss of experienced drilling staff
- 4. Increased tanker traffic

We believe a moratorium is needed, but we believe it can be re-defined to reduce risk

- 1. Remove requirement for stopping operations
- 2. Require the implementation of many of the recommendations of the interim report including some not already included in NTL 05.
- 3. Allow drilling of “low risk” wells to maintain GOM drilling equipment and expertise.

Putting The Risks in Context

BP Oil Spill Disaster

We were not asked to provide analysis of the Horizon incident, but as information has been discovered it is clear best practices were not followed.

- The well design was marginal
- Human errors in judgment were made at very key operational decision points
- Warning signs were overlooked on the rig
- There may have been some failure of equipment

This was all preventable by following currently in place standard practices.

Safety Record of Drilling on the OCS

Over 50,000 wells drilled. 4000 in over 1000 feet of water.

Last major incident resulting in oil coming ashore in 1969. 41 years ago.

From 1970 until April 2010 a total of 1800 barrels of oil spilled due to blowouts.

All measurements of safety indices have shown a steady level of improvement since modern MMS regulations came into effect in 1970.

Record is better than or equal to that or any other region of the world.

Crude Oil Spills from Platform and Rigs from Federal OCS Activities

ears	**Production** (Thousand BBls)	**Number of Spills**	**Barrels Spilled** (Thousand BBls)
960-1969	1,460,000	13	99
970-1979	3,455,000	32	106
980-1989	3,387,000	38	7
990-1999	4,051,000	15	2
000-2009	5,450,000	72	18

lowout Events Exceeding 1,000 Barrels on OCS

Two blowouts associated with a hurricane event that destroyed four platforms. Total of 10,280 barrels crude oil spilled.

One blowout associated with drilling. 1,688 barrels condensate spilled.

One blowout that occurred when a supply vessel collided with a drilling rig during a storm and sheared the wellhead.

2,500 barrels crude oil spilled.

One blowout (Santa Barbara) was associated with drilling.

80,000 barrels spilled.

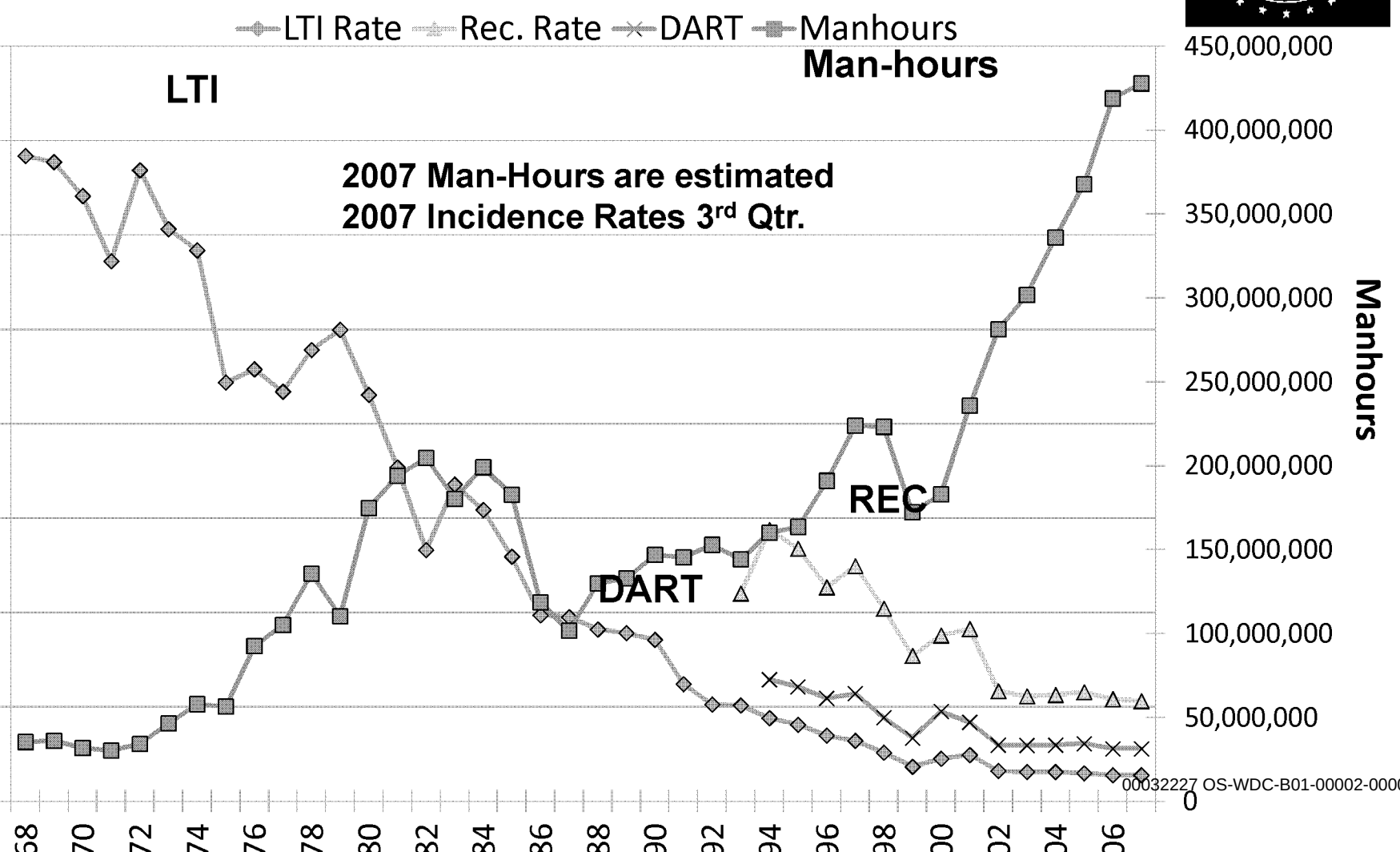
One blowout was caused by a fire in the production area that resulted in the loss of control of 12 wells on the platform.

30,000 barrels crude oil spilled.

One blowout associated with wireline work during workover operations. 53,000 barrels spilled.

om 1971 through 2009, a total of 1,784 barrels was spilled as a

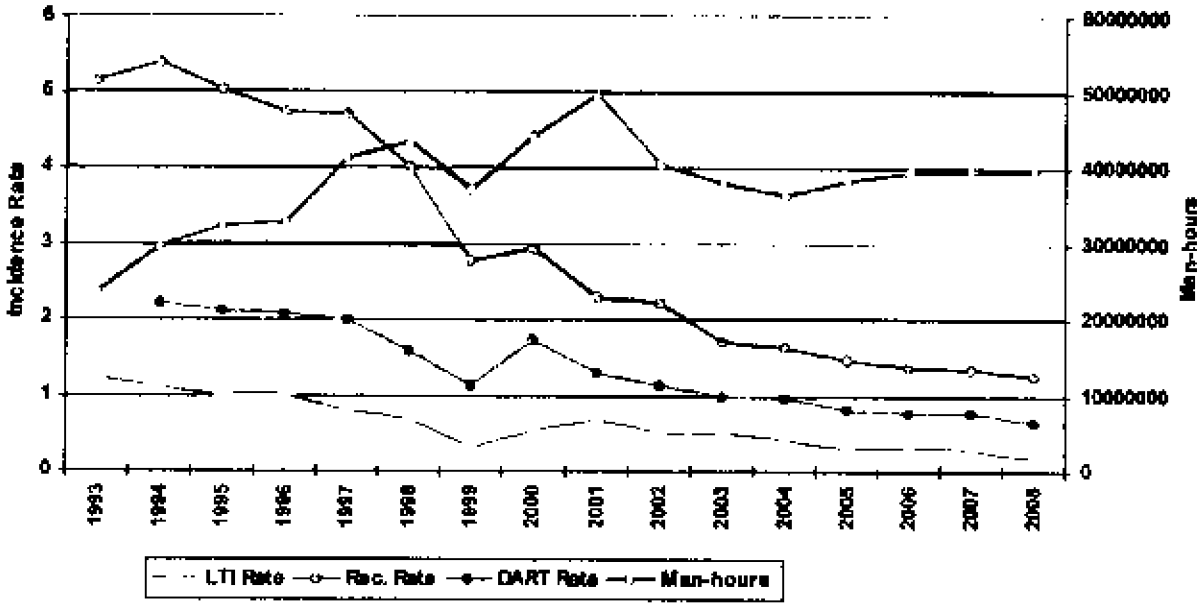
TOTAL INDUSTRY INCIDENCE RATES



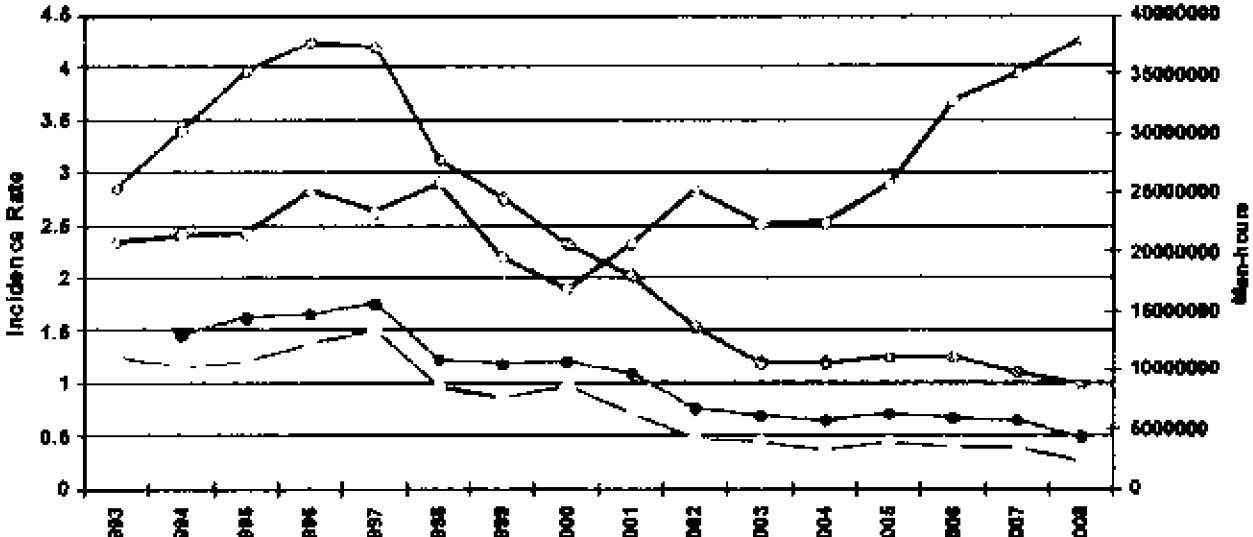
C 2008 US Water Totals		IADC 2008 European Water Totals	
l Man-hours	**39,665,580**	Total Man-hours	**38,049,523**
l Medical Treatment Incidents	**118**	Total Medical Treatment Incidents	**95**
l Restricted Work Incidents	**100**	Total Restricted Work Incidents	**43**
l Lost Time Incidents	**26**	Total Lost Time Incidents	**51**
l Fatalities	**3**	Total Fatalities	**0**
l Recordables	**247**	Total Recordables	**189**
ncidence Rate	**0.15**	LTI Incidence Rate	**0.27**
Frequency Rate	**0.73**	LTI Frequency Rate	**1.34**

st Time Incidence Rate = LTIs + FTLs X 200,000

US Water Total LTI & Recordable Incidence Rates vs Man-hours (Figure 1)

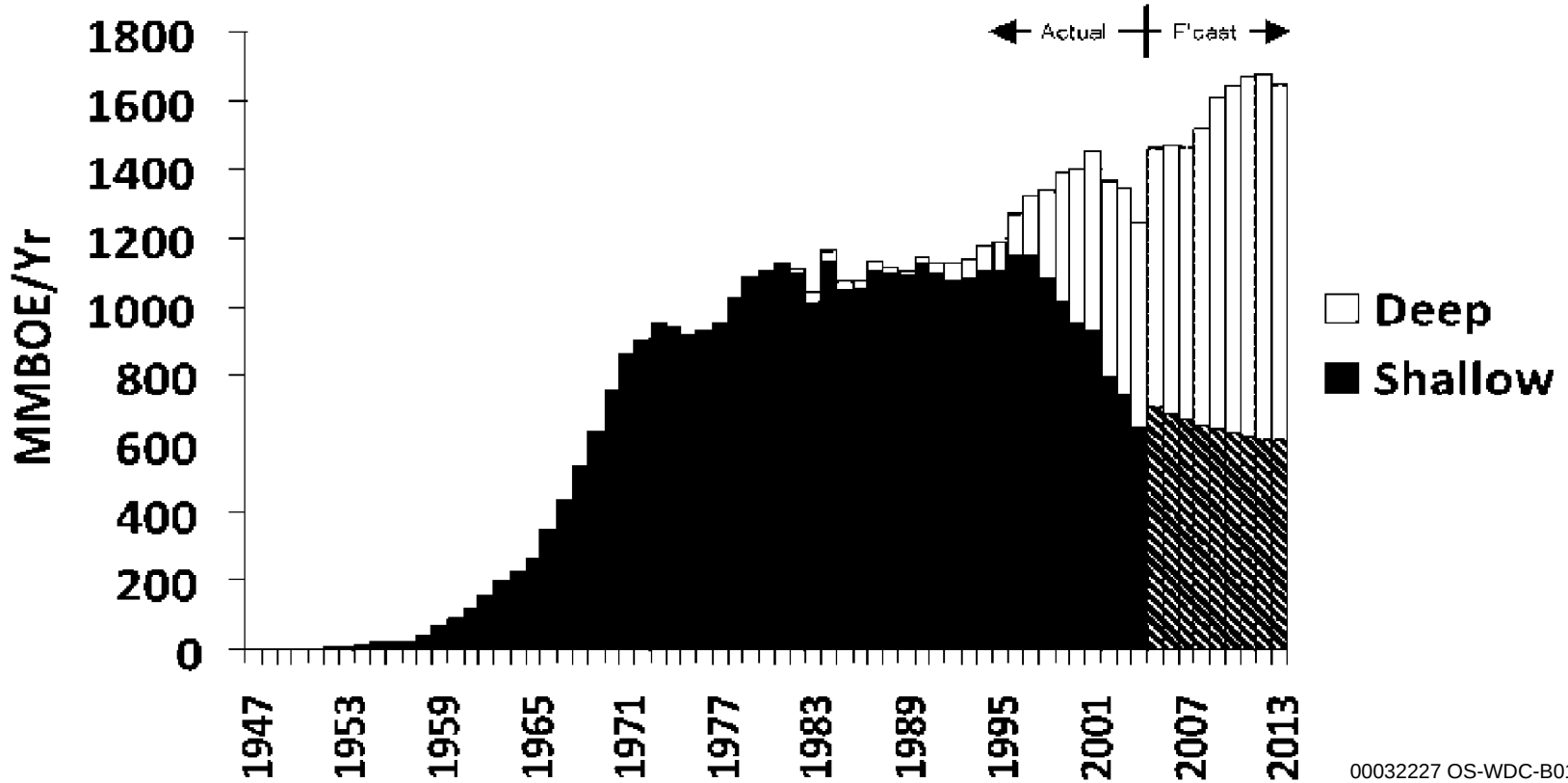


European Water Total Incidence Rates vs Man-hours (Figure 1)



GOM Offshore Production Increasingly from Deepwater

US GOM Offshore



Source: OCS Report MMS 2006-022

Understanding the Risks Summary

Even under existing conditions the record is good and improving at the same time that we are moving more and more into deep water

The Interim Report recommendations which can be implemented immediately (within 30 Days) should reduce the risk further but as the risks are low this is a marginal step

The Interim Report recommendations which take more time (up to 6 Months) should reduce the risks even further but in an even more marginal amount.

Putting the Moratorium in Context

Rationale for a Moratorium

We experts agreed to a list of recommendations which are needed to make drilling safer. Some of these recommendations take time to study and make into regulations to assure compliance. In some cases we agreed with time frames of as long as 6 months and even in one or two cases longer. How can we face the American people and say drilling is safe before all of our own recommendations can be carried out?

By not allowing drilling until all the recommendations we told the DOI are necessary for safety are in place the DOI is honoring our technical analysis.

The “Four Negatives” of the Moratorium

The Moratorium itself increases risk by:

- 1. Stopping operations in the middle
- 2. Exporting best rigs
- 3. Loss of experienced drilling staff
- 4. Increased tanker traffic

To reduce overall risk, the risk reductions which occur as a result of the Moratorium need to outweigh the added risks of the “four negatives”

As currently defined the Moratorium does not accomplish this objective

The Moratorium can be redefined to reduce risk

Effects of Stopping Operations

In any project risks are introduced when an appropriately planned operation is temporarily abandoned and then re-started at some future undetermined date.

- Macondo Well was being temporarily abandoned
- Montara Well was being re=entered after having been temporarily abandoned for four months

The Effect of the Moratorium on Rigs

- Best rigs will leave the Gulf first and come back last. This has a marginal negative impact on the overall safety of the fleet.
- Rigs will leave on long term contracts (2-5 years) and it will take a long time after the moratorium ends to get them back.
- The time to remobilize will take several additional months/years after the Moratorium is lifted and new rules in place.

Effects of Moratorium on Experienced Personnel

- Best people will leave the Gulf
- Workforce significantly impacted, including the thousands of support workers and service providers who support the drilling operations and must adhere to the safety standards – best of them will get work internationally or other industries/jobs.
- Recruitment of new people will stop – the best and brightest do not apply for uncertain jobs
- While some additional training and certification can and will take place during this time – as with the baseball offseason, players need a spring training to get back in shape – "From a safety standpoint we can't afford to have a spring training."
- The industry feels the safest and most effective rig operations and personnel are being punished.

Effects of Moratorium on Tanker Spills

- Source: NRC, “Oil in the Seas”, 2003
- Data for the period 1990-1999 (no one time disaster like Exxon Valdez or BP Macondo)
- Average Best Estimate of Oil Spilled in US waters from offshore platforms and pipelines: 7,000 barrels per year
- Average Best Estimate of Oil Spilled <u>in US waters</u> from tankers: 26,000 barrels per year
  - Does not include spills from US bound tankers in foreign or international waters
  - Does not include spills from marine terminals, refineries and storage tanks
  - Does not include spills at international loading terminals or in producing the oil transported

Measures that should be taken now to improve safety in the GOM

Manage Risk

The level of risk varies significantly between well types based on knowledge of formations being drilled and category of well

The highest risk wells warrant additional time to assure the risk can be managed and drilling these wells are warranted:

- Deepwater exploration wells
  - We have seen it is not just the drilling but the completion of these wells that pose risk
- Unknown pore pressure
- Extremely high pressure and/or high temperature wells

The Key to Increasing Safety

Require adoption of some Interim Report recommendations immediately

Provide a mechanism to allow rigs to remain working in the Gulf of Mexico

- Define a class of wells (other than workover, waterflood, gas injection or water disposal wells) which can be drilled safely. That is, wells where any increased risk by not waiting for all the recommendations to be implemented is lower than the risk of the "Four Negatives"

Maintain Moratorium on "Risky Wells"

Steps to Re-Define the Moratorium to INCREASE Safety

- Allow rigs to complete the work they are currently doing
- Require implementation of the key recommendations of the interim report which can be done within 30 days before ANY new wells can be drilled on the OCS (independent of water depth)
  - 8 Recommendations Already in NTL 05
  - 5 Additional Recommendations which could be added
- Maintain the moratorium on the more risky wells
  - Remaining Recommendations requiring additional study.

Risky Wells

Exploration wells to previously undrilled strata

Deepening existing wells to previously undrilled strata

HP/HT Wells

Less Risky Wells which Can be Drilled

Listed in increasing degree of risk:

- Wells which are abandoned before reaching producing zones (surface casings and top sections only)
- Water Disposal to Non-Producing Reservoirs
- Re-entries and Sidetracks
- Water Disposal to Producing Reservoirs, Waterflood and Gas Injection
- Development Wells to Known Reservoirs
- Workovers
- Drilling to the base of the salt section in deep exploration wells
- Delineation Wells to Non-producing Reservoirs

Wells in red above are already exempted from the moratorium by NTL 04

Conclusions

A moratorium is needed

It needs be defined taking into account ALL elements of risk, including the risks derived from the moratorium itself

Drilling can be made safer quickly by implementing many of the recommendations of the Interim Report

We should not ignore the “Four Negatives” of the moratorium

Allow drilling of “Less Risky Wells” to avoid the Four Negatives

It is justifiable to put a moratorium on “Risky Wells” to allow further thought and study

Appendices

30-Day Recommendations Already in NTL

Recommendations Which Could be Implemented But Are Not Currently in NTL

Recommendations to be Implemented After 30 Days

30-Day Recommendations Already in NTL

Section III Recommendation 1 – Compliance erification for Existing Regulations and April 30, 2010, National Safety Alert

Implement through NTL within 30 days

hin 30 days of the date of this report, the Department, in conjunction with the Department of Homeland urity, will ensure that operators are required to verify compliance with existing regulations and National ety Alert (issued April 30, 2010), which issued the following safety recommendations to operators and ing contractors:

- Examine all well-control equipment (both surface and subsea) currently being used to ensure that it has been properly maintained and is capable of shutting in the well during emergency operations. Ensure that the ROV hot-stabs are function-tested and are capable of actuating the BOP.
- Review all rig drilling/casing/completion practices to ensure that well-control contingencies are not compromised at <u>any</u> point while the BOP is installed on the wellhead.
- Review all emergency shutdown and dynamic positioning procedures that interface with emergency well control operations.
- Inspect lifesaving and firefighting equipment for compliance with federal requirements.
- Ensure that all crew members are familiar with emergency/firefighting equipment, as well as participate in an abandon ship drill. Operators are reminded that the review of emergency equipment and drills should be conducted after each crew change out.
- Exercise emergency power equipment to ensure proper operation.
- Ensure that all personnel involved in well operations are properly trained and capable of performing their tasks under both normal drilling and emergency well control operations.

Section I Recommendation 1 – Order One-Time Only Re-rtification of All BOP Equipment Used in New Floating Drilling Operations

Implement through NTL within 30 days

fore spudding any new well from a floating vessel, the operator will be quired to obtain and deliver to the Department of the Interior a written and ned certification from an independent third-party attesting that, on or er the date of this report, a detailed physical inspection and design review the BOP has been conducted by the equipment manufacturer and owner in cordance with the Original Equipment Manufacturer (OEM) specifications d that (i) the BOP will operate as originally designed; and (ii) any odifications or upgrades to the BOP stack conducted after delivery have not mpromised the design or operation of the BOP.

or to deploying the BOP, the operator must also verify that any odifications or upgrades to the BOP are approved by the Department of the erior and that documentation showing that the BOP has been maintained d inspected according to the requirements in API RP 53 and 30 CFR 0.446(a) is on file with the Department of the Interior or available for pection.

ection I Recommendation 2 – Order BOP Equipment ompatibility Verification for Each Floating Vessel and for Each New Well

Implement through NTL within 30 days

s part of a structured risk management process, the perator will be required to obtain an independent ird-party verification that the BOP will operate ith the drilling rig equipment and that the BOP is ompatible with the specific well location and well asis of design and well execution plan, i.e., in the vent of a well control event the BOP will provide a eal and contain wellbore pressure under all onditions expected in the wellbore.

Section I Recommendation 5– Develop Secondary Control System Requirements and Guidelines

Implement through rulemaking within 120 days

- Minimum ROV intervention capabilities for secondary control of all subsea BOP stacks, including the ability to close all shear and pipe rams, close the choke and kill valves and unlatch the lower marine riser package (LMRP).
- Minimum requirements for an emergency back-up BOP control system that is powered by a separate and independent accumulator bank with sufficient capacity to open and close one annular-type preventer and all ram-type preventers, including the blind shear ram. Such safety systems must include ***at least two*** of the following: autoshear, deadman, emergency disconnect system, and/or an acoustic activation system.
- Guidelines for arming and disarming the secondary BOP control system.
- Guidelines for documentation of BOP maintenance and repair (including any modifications to the BOP stack and control systems).

Section I Recommendation 7 – Develop New Testing Guidelines

Implement through NTL within 30 days

ird-party verification or documentation necessary to show at blind-shear rams will function and are capable of earing the drill pipe that is in use on the rig.

Implement partially through NTL within 30 days, then rulemaking within 120 days

inimum ROV performance testing standards, including rface and subsea function testing of ROV intervention ports d ROV pumps, to ensure compatibility with the BOP stack d that the ROV can close all shear and pipe rams, close the oke and kill valves, and unlatch the lower marine riser ckage.

Section I Recommendation 7 – Develop New Testing Guidelines

Implement through NTL within 30 days

andatory inspection and testing of BOP stack if any omponents are used in an emergency, *e.g.,* use of pipe casing shear rams or circulating out a well kick. This sting should involve a full pressure test of the BOP ter the situation is fully controlled, with the BOP on e wellhead.

Section I Recommendation 8 – Develop New Inspection Procedures and Reporting Requirements

Implement through NTL within 30 days

eginning no later than 60 days after the date of this port, all operators of floating drilling equipment will port to the Department of the Interior the following: (i) OP and well control system configuration, (ii) BOP and ell control system test results, including any anomalies testing or operation of critical BOP components, (iii) OP and well control incidents, and (iv) BOP and well ontrol system downtime for the last three years of illing operations.

Section II Recommendation 3 – New Casing And Cement Design Requirements: Two Independent Tested Barriers

Implement through NTL within 30 days

efore spudding any new floating drilling operation, all ell casing and cement designs must be signed by a rofessional Engineer, verifying that there will be at ast two independent tested barriers, including one echanical barrier, across each flow path during well ompletion and abandonment activities and that casing esign is appropriate for the purpose for which it is tended under reasonably expected wellbore onditions.

Section II Recommendation 5 – New Casing Installation Procedures

Implement through NTL within 30 days

he Department will ensure the requirement of the llowing BAST practices:

- Casing hanger latching mechanisms or lock down mechanisms must be engaged at the time the casing is installed in the subsea wellhead.
- For the final casing string, the operator must verify the installation of dual mechanical barriers (*e.g.,* dual floats or one float and a mechanical plug) in addition to cement, to prevent flow in the event of a failure in the cement.

Recommendations Which Could be Implemented But Are Not Currently in NTL

Section I Recommendation 7 – Develop New Testing Guidelines

Implement through NTL within 30 days

linimum surface and subsea function and ressure testing requirements to simulate (i) nintended disconnect of the lower marine riser ackage (LMRP), and (ii) loss of surface control e.g., electric and hydraulic power) of the subsea OP stack.

Section I Recommendation 8 – Develop New Inspection Procedures and Reporting Requirements

nplement in accordance with internal Departmental Guidance issued within 30 days

- The Department will evaluate and revise the manner in which it conducts its drilling inspections.
- Revised drilling inspections should include the witnessing of actual tests of BOP equipment, including the new requirements and guidance that address the surface and subsea testing of ROV and BOP stack capabilities.
- The Department will also develop methods to increase transparency and public availability of the results of inspections as well as routine reporting.
- The Department will work with Congress to obtain the necessary resources to implement these recommendations.

ection II Recommendation 2 – New Fluid Displacement Procedures

Implement through NTL within 30 days

or to displacement of kill-weight drilling fluid from the wellbore, the operator must ependently verify that:

- The BOPs are closed during displacement to underbalanced fluid columns to prevent gas entry into the riser should a seal failure occur during displacement.
- Two independent barriers, including one mechanical barrier, are in place for each flow path (i.e., casing and annulus).
- If the shoe track (the cement plug and check valves that remain inside the bottom of casing after cementing) is to be used as one of these barriers, it is negatively tested prior to the setting of the subsequent casing barrier. A negative test should also be performed prior to setting the surface plug.
- Negative tests are made to a differential pressure equal to or greater than the anticipated pressure after displacement. Each casing barrier is positively tested to a pressure that exceeds the highest estimated integrity of the casing shoes below the barrier.
- Displacement of the riser and casing to fluid columns that are underbalanced to the formation pressure in the wellbore is conducted in separate operations. In both cases, BOPs should be closed on the drill string and circulation established through the choke line to isolate the riser, which is not a rated barrier. During displacement, volumes in and out must be accurately monitored.
- Drill string components positioned in the shear rams during displacement must be capable

Section II Recommendation 7 – Enforce Tighter Primary Cementing Practices

Implement through a rulemaking within 120 days

he Department will institute a rulemaking to onsider the adoption of API RP 65 Part 2:

- Isolating potential flow zones during well construction (addressing previously identified gaps in primary cementing practices).

Section III Recommendation 3 –Adopt Final Safety and Environmental Management Systems Rule

Implement through publication of final rule within 30 days

OCS Safety Oversight Board will ensure the promulgation of a final SEMS Rule with full implementation of lements, along with provisions for public availability of information developed and collected under the rule ncrease transparency and accountability.

IS is a structured and comprehensive method for applying operational, safety and environmental protection ciples to offshore activities by focusing on personnel and ensuring accountability for operations throughout organization in the following specific areas:

1. Safety & Environmental Information
2. Hazards Analysis
3. Management of Change
4. Operating Procedures
5. Safe Work Practices
6. Training
7. Mechanical Integrity
8. Pre-Startup Review
9. Emergency Response & Control
10. Investigation of Accidents
11. Auditing the Program
12. Records & Documentation

Recommendations to be Implemented After 30 Days

Section I Recommendation 3 – Study Formal Equipment Certification Requirements

Implement recommendations through the Department workgroup within one year

e Department will immediately establish an independent technical orkgroup to review current, and investigate new, certification requirements BOP equipment and other components of the BOP stack such as control nels, communication pods, accumulator systems, and choke and kill lines. addition, this workgroup will recommend ways to make BOP certifications blicly available in order to increase transparency and accountability.

e establishment of a technical workgroup to examine the need for rtification of BOP systems and components is important; even when a BOP ck has all the above mentioned systems and components, it is of little use t does not function properly to prevent a well blowout.

Section I Recommendation 4 – New Blind Shear Ram Redundancy Requirement

Implement through rulemaking within 120 days

Within one year from the date of this report, all floating drilling operations will be required to have two sets of blind shear rams spaced at least 4 feet apart (to prevent system failure if drill pipe joint or drill tool is across one set of rams during an emergency).

Section I Recommendation 6 – Develop New ROV Operating Capabilities

Implement recommendations through the Department workgroup within one year

e Department will immediately establish an independent technical
rkgroup to develop further improvements to ROV operating capabilities
luding the following:

- Standardized hydraulic and electrical interfaces for all subsea BOP stacks so that they are accessible by any available ROV.
- Visual mechanical indicator or redundant telemetry channel to confirm ram closure (*e.g.,* a position indicator).
- Methods of subsea testing that would avoid detrimental effects of seawater in BOP system (*e.g.,* ROV with external hydraulic supply).
- An ROV interface with a valve below the lowest ram on the BOP stack to allow well-killing operations.

Section I Recommendation 7 – Develop New Testing Guidelines

No later than 180 days after the date of this report

- Department will develop clear requirements and guidelines
t address the surface and subsea testing of ROV and BOP stack
abilities.

Implement through rulemaking within 120 days

- Protocols for function testing, autoshear, deadman, emergency
disconnect systems and acoustic activation systems.

Section I Recommendation 8 – Develop New Inspection Procedures and Reporting Requirements

Implement through rulemaking within 120 days

here feasible, the electronic log from the BOP control system ould be transmitted online to a secure location onshore and ade available for inspection by the Department of the Interior.

Section II Recommendation 1 – Establish Deepwater Well-Control Procedure Guidelines

Implement through rulemaking within 120 days

ithin 120 days of the date of this report, the Department will sure that requirements and guidelines for deepwater well-ntrol procedures are established.

Section II Recommendation 4 – Study Formal Personnel Training Requirements for Casing and Cementing Operations

Implement recommendations through the Department workgroup within one year

The Department will immediately establish an independent technical workgroup, with appropriate academic, agency, industry and other stakeholder participation, to study whether to establish new training and certification requirements for rig personnel specifically related to casing and cementing operations.

Section II Recommendation 6 – Develop Additional Requirements or Guidelines for Casing Installation

Implement recommendations through a the Department workgroup within one year

he Department will provide for the immediate stablishment of a workgroup, to establish specific equirements or guidelines for the following rocedures and practices:

- Positive and negative test procedures and use of test results for evaluation of casing integrity.
- Use of float valves and other mechanical plugs in the final casing string or liner.

Section II Recommendation 7 – Enforce Tighter Primary Cementing Practices

Implement recommendations through a Department workgroup within one year

- The Department will study whether to determine specific cementing requirements.

Section II Recommendation 8 – Develop Additional Requirements or Guidelines for Evaluation of Cement Integrity

Implement recommendations through Department workgroup within one year

- The Department will immediately establish an independent technical workgroup to evaluate whether and under what circumstances the use of cement bond logs is feasible and practical and will increase safety.

Section II Recommendation 9 –Increase Federal Government Wild-Well Intervention Capabilities

own out, or “wild” wells, involve the uncontrolled release of ude oil or natural gas from an oil well where pressure ntrol systems have failed.

e Federal government should assess its current capability to eal with such emergency situations, particularly in deep ater, and develop a plan to increase its capabilities for direct ld-well intervention, should such be required, in future mergency situations.

ements to be considered include an inventory of existing ethods to stop a blowout and handle escaping wellbore uids, including but not limited to coffer dams, highly-capable OVs, portable hydraulic line hook-ups, and pressure-reading ols.

Section II Recommendation 10 – Study Innovative Wild-Well Intervention, Response Techniques and Response Planning

ddition, the Department will immediately establish a DOI workgroup to study methods to p a blowout and handle escaping wellbore fluids. The technical workgroup will take a fresh k at how to deal with a deepwater blowout. The conventional last resort method to control a wout is to drill a relief well. In deep water this can take several months. But the reality of ng several months to stop a high flowing well at deep water depths was difficult to imagine il the BP oil spill. The offshore oil and gas industry, learning from the BP Oil Spill response erience, should work toward being able to stop a spill resulting from a deepwater blowout. erators should work to be in a position to submit, with their Exploration or Development ns, an emergency response plan that addresses resources (including common resources) that uld be deployed in the event of a serious emergency, even if assessed as low probability.

e technical workgroup should also address operators' ability, on a regional or industry-wide is, to develop and procure a response package for deep water incidents, to include diagnostic l measurement equipment, pre-fabricated systems for deep water oil capture, logistical and nmunications support, and plans and concepts of operations that can quickly be deployed in event of an unanticipated blowout. Assess and certify potential options, e.g., deep water persant injection.

ection III Recommendation 2 – The Department Will Adopt Safety Case Requirements for Floating Drilling Operations on the OCS

Implement through rulemaking within 120 days

- Within 120 days of the date of this report, the Department will assure the adoption of appropriate safety case requirements based on IADC Health, Safety and Environmental Case Guidelines for Mobile Offshore Drilling Units (2009), which will include well construction safety assessment prior to approval of APD.
- This “safety case” should establish risk assessment and mitigation processes to manage a drilling contractor’s controls related to the health, safety and environmental aspects of their operations.
- In addition to the safety case, a separate bridging document should be required to connect the safety case to existing well design and construction documents.
- Such a proposed Well Construction Interfacing Document will include all of the elements in a conventional bridging document plus alignment of the drilling contractor’s management of change (MOC) and risk assessment to the lease operator’s MOC and well execution risk assessments.

Section III Recommendation 4 – Study Additional Safety Training and Certification Requirements

mplement recommendations through a Department workgroup within one year

- The Department will immediately establish a workgroup to investigate safety training requirements for floating drilling rig personnel and possible requirements for independent or more frequent certification and testing of personnel and safety systems.
- Establish an oil production safety program or institute (similar to NRC reactor safety program).
- Consider establishing a formalized analytical methodology to assess performance of safety systems in the event of multiple component failure or excursions outside normal environmental ranges.
- Strengthen technical support to the Department of the Interior and other regulatory authorities, including the resources necessary to obtain independent technical review of regulations and standards.
- Consider chartering a longer-term technical review of BOP reliability.
- Consider importing best practices from other agencies with similar responsibility for safety regulation of technically complex systems, e.g. FAA and NRC.

Nguyen, Ngoc B

From: Ken Arnold [karnold@karnoldconsulting.com]
Sent: Wednesday, June 23, 2010 7:47 PM
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Cc: Black, Steve; Kemkar, Neal; Hanley, Kallie
Subject: Power Point Presented to Secretary Salazar on 6/21/2010
Attachments: Presentation to Secretary of Interior - Rev 4.pptx

You are receiving this because you expressed an interest in having a copy of the subject report. DOI has been asked if they have a problem with us distributing this to whomever asks and have not expressed an objection. Those present at the meeting or by phone were the original signers of the Group of 8, plus Per Holland and Arnold Stancell. Bob Bea and Skip Ward were unable to participate. From DOI attendees beside the Secretary included David Hayes, Tom Strickland, The new Director of the MMS Mike B (please excuse my inability to spell his last name as I am traveling and don't really have time to look it up).

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The Secretary has expressed an interest in meeting with us in two weeks with a wider audience.

Please be advised I am in SE Asia and will return to Houston Tuesday the 30th in the afternoon. Do not call my cell phone unless it is important as it is an expensive call for me. Also I have been unable to pick up my phone messages since leaving the US. I may be able to pick them up when I leave Viet Nom for Singapore Sunday but am not sure.

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Presentation to Secretary of Interior

June 21, 2010

Outline of the Discussion

1. Why We Are Here
2. Putting the Risks in Context
3. Putting the Moratorium in Context
4. Measures that should be taken now to improve safety in the GOM
5. Conclusions
6. Appendices

Why Are We Here

We are not here to provide an economic justification – jobs, revenue lost, etc. That is the job for economists.

We feel safety will be compromised if the 6 month ban is extended to all wells in the GoM over 500 feet in water depth.

This is the time we all need to work together and we understand the job at hand.

This is not the time to punish the innocent nor further harm the public's interest .

Why Are We Here

The moratorium as currently defined INCREASES risk when drilling is eventually resumed.

- 1. Stopping operations in the middle
- 2. Exporting best rigs
- 3. Loss of experienced drilling staff
- 4. Increased tanker traffic

We believe a moratorium is needed, but we believe it can be re-defined to reduce risk

- 1. Remove requirement for stopping operations
- 2. Require the implementation of many of the recommendations of the interim report including some not already included in NTL 05.
- 3. Allow drilling of “low risk” wells to maintain GOM drilling equipment and expertise.

Putting The Risks in Context

BP Oil Spill Disaster

We were not asked to provide analysis of the Horizon incident, but as information has been discovered it is clear best practices were not followed.

- The well design was marginal
- Human errors in judgment were made at very key operational decision points
- Warning signs were overlooked on the rig
- There may have been some failure of equipment

This was all preventable by following currently in place standard practices.

Safety Record of Drilling on the OCS

Over 50,000 wells drilled. 4000 in over 1000 feet of water.

Last major incident resulting in oil coming ashore in 1969. 41 years ago.

From 1970 until April 2010 a total of 1800 barrels of oil spilled due to blowouts.

All measurements of safety indices have shown a steady level of improvement since modern MMS regulations came into effect in 1970.

Record is better than or equal to that or any other region of the world.

Crude Oil Spills from Platform and Rigs from Federal OCS Activities

ears	**Production** (Thousand BBls)	**Number of Spills**	**Barrels Spilled** (Thousand BBls)
960-1969	1,460,000	13	99
970-1979	3,455,000	32	106
980-1989	3,387,000	38	7
990-1999	4,051,000	15	2
000-2009	5,450,000	72	18

lowout Events Exceeding 1,000 Barrels on OCS

Two blowouts associated with a hurricane event that destroyed four platforms. Total of 10,280 barrels crude oil spilled.

One blowout associated with drilling. 1,688 barrels condensate spilled.

One blowout that occurred when a supply vessel collided with a drilling rig during a storm and sheared the wellhead.

2,500 barrels crude oil spilled.

One blowout (Santa Barbara) was associated with drilling.

80,000 barrels spilled.

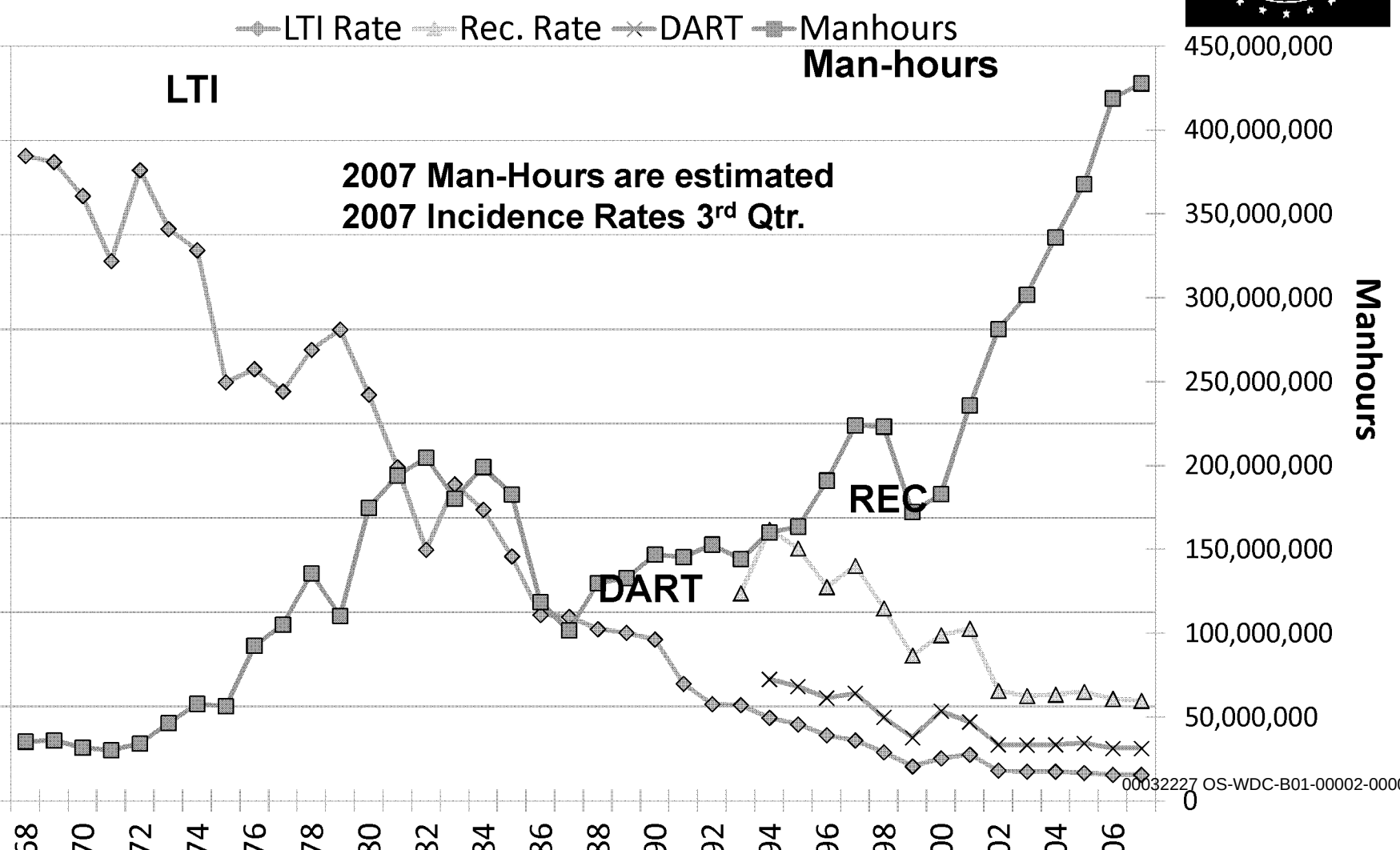
One blowout was caused by a fire in the production area that resulted in the loss of control of 12 wells on the platform.

30,000 barrels crude oil spilled.

One blowout associated with wireline work during workover operations. 53,000 barrels spilled.

om 1971 through 2009, a total of 1,784 barrels was spilled as a

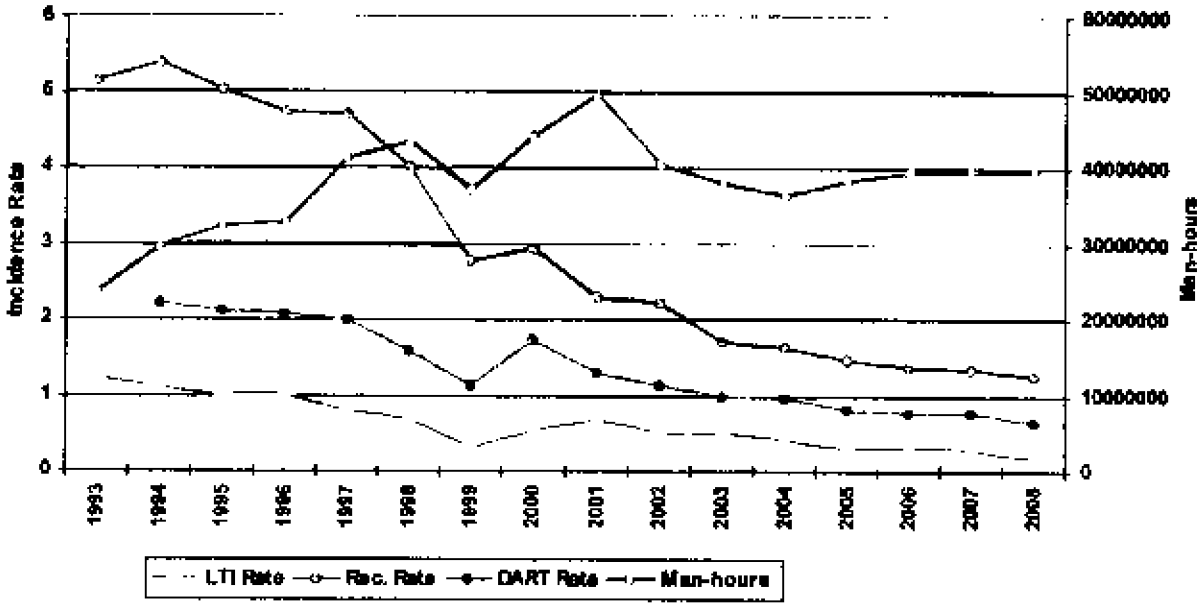
TOTAL INDUSTRY INCIDENCE RATES



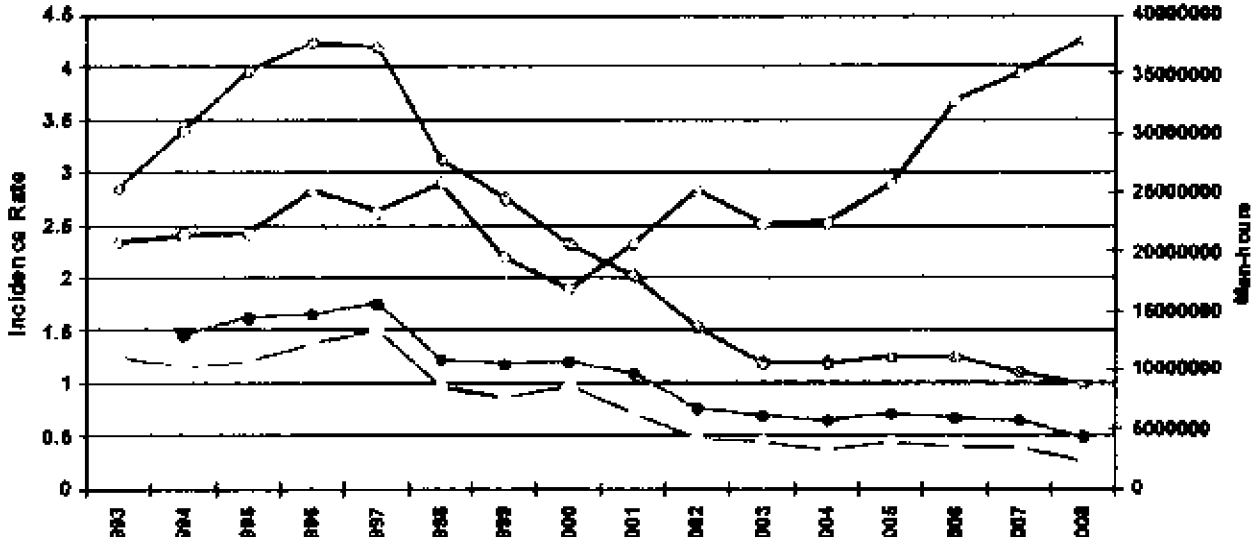
C 2008 US Water Totals		IADC 2008 European Water Totals	
l Man-hours	**39,665,580**	Total Man-hours	**38,049,523**
l Medical Treatment Incidents	**118**	Total Medical Treatment Incidents	**95**
l Restricted Work Incidents	**100**	Total Restricted Work Incidents	**43**
l Lost Time Incidents	**26**	Total Lost Time Incidents	**51**
l Fatalities	**3**	Total Fatalities	**0**
l Recordables	**247**	Total Recordables	**189**
ncidence Rate	**0.15**	LTI Incidence Rate	**0.27**
Frequency Rate	**0.73**	LTI Frequency Rate	**1.34**

st Time Incidence Rate = LTIs + FTLs X 200,000

US Water Total LTI & Recordable Incidence Rates vs Man-hours (Figure 1)

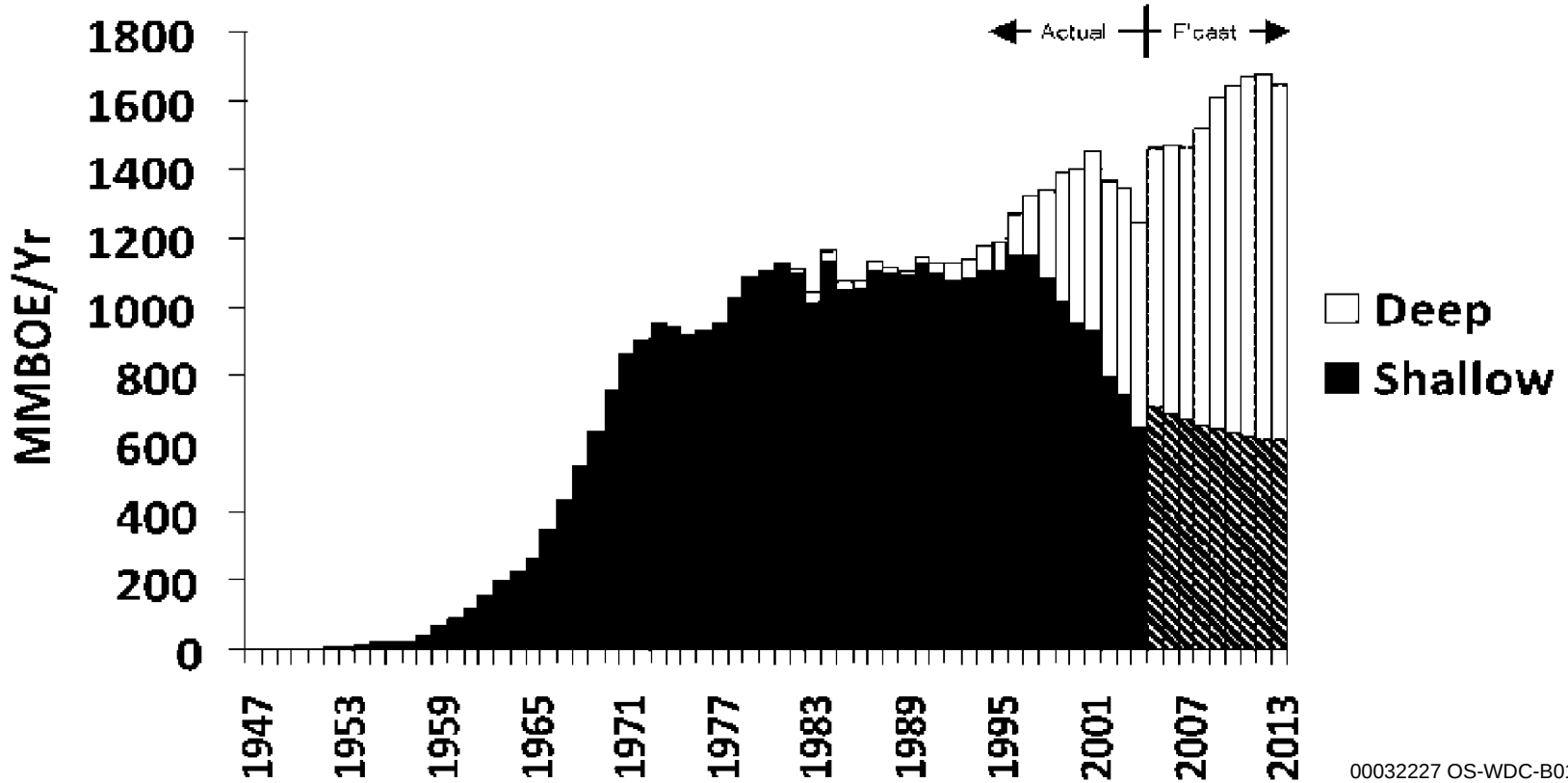


European Water Total Incidence Rates vs Man-hours (Figure 1)



GOM Offshore Production Increasingly from Deepwater

US GOM Offshore



Source: OCS Report MMS 2006-022

Understanding the Risks Summary

Even under existing conditions the record is good and improving at the same time that we are moving more and more into deep water

The Interim Report recommendations which can be implemented immediately (within 30 Days) should reduce the risk further but as the risks are low this is a marginal step

The Interim Report recommendations which take more time (up to 6 Months) should reduce the risks even further but in an even more marginal amount.

Putting the Moratorium in Context

Rationale for a Moratorium

We experts agreed to a list of recommendations which are needed to make drilling safer. Some of these recommendations take time to study and make into regulations to assure compliance. In some cases we agreed with time frames of as long as 6 months and even in one or two cases longer. How can we face the American people and say drilling is safe before all of our own recommendations can be carried out?

By not allowing drilling until all the recommendations we told the DOI are necessary for safety are in place the DOI is honoring our technical analysis.

The “Four Negatives” of the Moratorium

The Moratorium itself increases risk by:

- 1. Stopping operations in the middle
- 2. Exporting best rigs
- 3. Loss of experienced drilling staff
- 4. Increased tanker traffic

To reduce overall risk, the risk reductions which occur as a result of the Moratorium need to outweigh the added risks of the “four negatives”

As currently defined the Moratorium does not accomplish this objective

The Moratorium can be redefined to reduce risk

Effects of Stopping Operations

In any project risks are introduced when an appropriately planned operation is temporarily abandoned and then re-started at some future undetermined date.

- Macondo Well was being temporarily abandoned
- Montara Well was being re=entered after having been temporarily abandoned for four months

The Effect of the Moratorium on Rigs

- Best rigs will leave the Gulf first and come back last. This has a marginal negative impact on the overall safety of the fleet.
- Rigs will leave on long term contracts (2-5 years) and it will take a long time after the moratorium ends to get them back.
- The time to remobilize will take several additional months/years after the Moratorium is lifted and new rules in place.

Effects of Moratorium on Experienced Personnel

- Best people will leave the Gulf
- Workforce significantly impacted, including the thousands of support workers and service providers who support the drilling operations and must adhere to the safety standards – best of them will get work internationally or other industries/jobs.
- Recruitment of new people will stop – the best and brightest do not apply for uncertain jobs
- While some additional training and certification can and will take place during this time – as with the baseball offseason, players need a spring training to get back in shape – "From a safety standpoint we can't afford to have a spring training."
- The industry feels the safest and most effective rig operations and personnel are being punished.

Effects of Moratorium on Tanker Spills

- Source: NRC, “Oil in the Seas”, 2003
- Data for the period 1990-1999 (no one time disaster like Exxon Valdez or BP Macondo)
- Average Best Estimate of Oil Spilled in US waters from offshore platforms and pipelines: 7,000 barrels per year
- Average Best Estimate of Oil Spilled <u>in US waters</u> from tankers: 26,000 barrels per year
  - Does not include spills from US bound tankers in foreign or international waters
  - Does not include spills from marine terminals, refineries and storage tanks
  - Does not include spills at international loading terminals or in producing the oil transported

Measures that should be taken now to improve safety in the GOM

Manage Risk

The level of risk varies significantly between well types based on knowledge of formations being drilled and category of well

The highest risk wells warrant additional time to assure the risk can be managed and drilling these wells are warranted:

- Deepwater exploration wells
  - We have seen it is not just the drilling but the completion of these wells that pose risk
- Unknown pore pressure
- Extremely high pressure and/or high temperature wells

The Key to Increasing Safety

Require adoption of some Interim Report recommendations immediately

Provide a mechanism to allow rigs to remain working in the Gulf of Mexico

- Define a class of wells (other than workover, waterflood, gas injection or water disposal wells) which can be drilled safely. That is, wells where any increased risk by not waiting for all the recommendations to be implemented is lower than the risk of the "Four Negatives"

Maintain Moratorium on "Risky Wells"

Steps to Re-Define the Moratorium to INCREASE Safety

- Allow rigs to complete the work they are currently doing
- Require implementation of the key recommendations of the interim report which can be done within 30 days before ANY new wells can be drilled on the OCS (independent of water depth)
  - 8 Recommendations Already in NTL 05
  - 5 Additional Recommendations which could be added
- Maintain the moratorium on the more risky wells
  - Remaining Recommendations requiring additional study.

Risky Wells

Exploration wells to previously undrilled strata

Deepening existing wells to previously undrilled strata

HP/HT Wells

Less Risky Wells which Can be Drilled

Listed in increasing degree of risk:

- Wells which are abandoned before reaching producing zones (surface casings and top sections only)
- Water Disposal to Non-Producing Reservoirs
- Re-entries and Sidetracks
- Water Disposal to Producing Reservoirs, Waterflood and Gas Injection
- Development Wells to Known Reservoirs
- Workovers
- Drilling to the base of the salt section in deep exploration wells
- Delineation Wells to Non-producing Reservoirs

Wells in red above are already exempted from the moratorium by NTL 04

Conclusions

A moratorium is needed

It needs be defined taking into account ALL elements of risk, including the risks derived from the moratorium itself

Drilling can be made safer quickly by implementing many of the recommendations of the Interim Report

We should not ignore the “Four Negatives” of the moratorium

Allow drilling of “Less Risky Wells” to avoid the Four Negatives

It is justifiable to put a moratorium on “Risky Wells” to allow further thought and study

Appendices

30-Day Recommendations Already in NTL

Recommendations Which Could be Implemented But Are Not Currently in NTL

Recommendations to be Implemented After 30 Days

30-Day Recommendations Already in NTL

Section III Recommendation 1 – Compliance erification for Existing Regulations and April 30, 2010, National Safety Alert

Implement through NTL within 30 days

hin 30 days of the date of this report, the Department, in conjunction with the Department of Homeland urity, will ensure that operators are required to verify compliance with existing regulations and National ety Alert (issued April 30, 2010), which issued the following safety recommendations to operators and ing contractors:

- Examine all well-control equipment (both surface and subsea) currently being used to ensure that it has been properly maintained and is capable of shutting in the well during emergency operations. Ensure that the ROV hot-stabs are function-tested and are capable of actuating the BOP.
- Review all rig drilling/casing/completion practices to ensure that well-control contingencies are not compromised at <u>any</u> point while the BOP is installed on the wellhead.
- Review all emergency shutdown and dynamic positioning procedures that interface with emergency well control operations.
- Inspect lifesaving and firefighting equipment for compliance with federal requirements.
- Ensure that all crew members are familiar with emergency/firefighting equipment, as well as participate in an abandon ship drill. Operators are reminded that the review of emergency equipment and drills should be conducted after each crew change out.
- Exercise emergency power equipment to ensure proper operation.
- Ensure that all personnel involved in well operations are properly trained and capable of performing their tasks under both normal drilling and emergency well control operations.

Section I Recommendation 1 – Order One-Time Only Re-rtification of All BOP Equipment Used in New Floating Drilling Operations

Implement through NTL within 30 days

fore spudding any new well from a floating vessel, the operator will be quired to obtain and deliver to the Department of the Interior a written and ned certification from an independent third-party attesting that, on or er the date of this report, a detailed physical inspection and design review the BOP has been conducted by the equipment manufacturer and owner in cordance with the Original Equipment Manufacturer (OEM) specifications d that (i) the BOP will operate as originally designed; and (ii) any odifications or upgrades to the BOP stack conducted after delivery have not mpromised the design or operation of the BOP.

or to deploying the BOP, the operator must also verify that any odifications or upgrades to the BOP are approved by the Department of the erior and that documentation showing that the BOP has been maintained d inspected according to the requirements in API RP 53 and 30 CFR 0.446(a) is on file with the Department of the Interior or available for pection.

ection I Recommendation 2 – Order BOP Equipment ompatibility Verification for Each Floating Vessel and for Each New Well

Implement through NTL within 30 days

s part of a structured risk management process, the perator will be required to obtain an independent ird-party verification that the BOP will operate ith the drilling rig equipment and that the BOP is ompatible with the specific well location and well asis of design and well execution plan, i.e., in the vent of a well control event the BOP will provide a eal and contain wellbore pressure under all onditions expected in the wellbore.

Section I Recommendation 5– Develop Secondary Control System Requirements and Guidelines

Implement through rulemaking within 120 days

- Minimum ROV intervention capabilities for secondary control of all subsea BOP stacks, including the ability to close all shear and pipe rams, close the choke and kill valves and unlatch the lower marine riser package (LMRP).
- Minimum requirements for an emergency back-up BOP control system that is powered by a separate and independent accumulator bank with sufficient capacity to open and close one annular-type preventer and all ram-type preventers, including the blind shear ram. Such safety systems must include ***at least two*** of the following: autoshear, deadman, emergency disconnect system, and/or an acoustic activation system.
- Guidelines for arming and disarming the secondary BOP control system.
- Guidelines for documentation of BOP maintenance and repair (including any modifications to the BOP stack and control systems).

Section I Recommendation 7 – Develop New Testing Guidelines

Implement through NTL within 30 days

ird-party verification or documentation necessary to show at blind-shear rams will function and are capable of earing the drill pipe that is in use on the rig.

Implement partially through NTL within 30 days, then rulemaking within 120 days

inimum ROV performance testing standards, including rface and subsea function testing of ROV intervention ports d ROV pumps, to ensure compatibility with the BOP stack d that the ROV can close all shear and pipe rams, close the oke and kill valves, and unlatch the lower marine riser ckage.

Section I Recommendation 7 – Develop New Testing Guidelines

Implement through NTL within 30 days

andatory inspection and testing of BOP stack if any omponents are used in an emergency, *e.g.,* use of pipe casing shear rams or circulating out a well kick. This sting should involve a full pressure test of the BOP ter the situation is fully controlled, with the BOP on e wellhead.

Section I Recommendation 8 – Develop New Inspection Procedures and Reporting Requirements

Implement through NTL within 30 days

eginning no later than 60 days after the date of this port, all operators of floating drilling equipment will port to the Department of the Interior the following: (i) OP and well control system configuration, (ii) BOP and ell control system test results, including any anomalies testing or operation of critical BOP components, (iii) OP and well control incidents, and (iv) BOP and well ontrol system downtime for the last three years of illing operations.

Section II Recommendation 3 – New Casing And Cement Design Requirements: Two Independent Tested Barriers

Implement through NTL within 30 days

efore spudding any new floating drilling operation, all ell casing and cement designs must be signed by a rofessional Engineer, verifying that there will be at ast two independent tested barriers, including one echanical barrier, across each flow path during well ompletion and abandonment activities and that casing esign is appropriate for the purpose for which it is tended under reasonably expected wellbore onditions.

Section II Recommendation 5 – New Casing Installation Procedures

Implement through NTL within 30 days

he Department will ensure the requirement of the llowing BAST practices:

- Casing hanger latching mechanisms or lock down mechanisms must be engaged at the time the casing is installed in the subsea wellhead.
- For the final casing string, the operator must verify the installation of dual mechanical barriers (*e.g.,* dual floats or one float and a mechanical plug) in addition to cement, to prevent flow in the event of a failure in the cement.

Recommendations Which Could be Implemented But Are Not Currently in NTL

Section I Recommendation 7 – Develop New Testing Guidelines

Implement through NTL within 30 days

linimum surface and subsea function and ressure testing requirements to simulate (i) nintended disconnect of the lower marine riser ackage (LMRP), and (ii) loss of surface control e.g., electric and hydraulic power) of the subsea OP stack.

Section I Recommendation 8 – Develop New Inspection Procedures and Reporting Requirements

nplement in accordance with internal Departmental Guidance issued within 30 days

- The Department will evaluate and revise the manner in which it conducts its drilling inspections.
- Revised drilling inspections should include the witnessing of actual tests of BOP equipment, including the new requirements and guidance that address the surface and subsea testing of ROV and BOP stack capabilities.
- The Department will also develop methods to increase transparency and public availability of the results of inspections as well as routine reporting.
- The Department will work with Congress to obtain the necessary resources to implement these recommendations.

ection II Recommendation 2 – New Fluid Displacement Procedures

Implement through NTL within 30 days

or to displacement of kill-weight drilling fluid from the wellbore, the operator must ependently verify that:

- The BOPs are closed during displacement to underbalanced fluid columns to prevent gas entry into the riser should a seal failure occur during displacement.
- Two independent barriers, including one mechanical barrier, are in place for each flow path (i.e., casing and annulus).
- If the shoe track (the cement plug and check valves that remain inside the bottom of casing after cementing) is to be used as one of these barriers, it is negatively tested prior to the setting of the subsequent casing barrier. A negative test should also be performed prior to setting the surface plug.
- Negative tests are made to a differential pressure equal to or greater than the anticipated pressure after displacement. Each casing barrier is positively tested to a pressure that exceeds the highest estimated integrity of the casing shoes below the barrier.
- Displacement of the riser and casing to fluid columns that are underbalanced to the formation pressure in the wellbore is conducted in separate operations. In both cases, BOPs should be closed on the drill string and circulation established through the choke line to isolate the riser, which is not a rated barrier. During displacement, volumes in and out must be accurately monitored.
- Drill string components positioned in the shear rams during displacement must be capable

Section II Recommendation 7 – Enforce Tighter Primary Cementing Practices

Implement through a rulemaking within 120 days

he Department will institute a rulemaking to onsider the adoption of API RP 65 Part 2:

- Isolating potential flow zones during well construction (addressing previously identified gaps in primary cementing practices).

Section III Recommendation 3 –Adopt Final Safety and Environmental Management Systems Rule

Implement through publication of final rule within 30 days

OCS Safety Oversight Board will ensure the promulgation of a final SEMS Rule with full implementation of lements, along with provisions for public availability of information developed and collected under the rule ncrease transparency and accountability.

IS is a structured and comprehensive method for applying operational, safety and environmental protection ciples to offshore activities by focusing on personnel and ensuring accountability for operations throughout organization in the following specific areas:

1. Safety & Environmental Information
2. Hazards Analysis
3. Management of Change
4. Operating Procedures
5. Safe Work Practices
6. Training
7. Mechanical Integrity
8. Pre-Startup Review
9. Emergency Response & Control
10. Investigation of Accidents
11. Auditing the Program
12. Records & Documentation

Recommendations to be Implemented After 30 Days

Section I Recommendation 3 – Study Formal Equipment Certification Requirements

Implement recommendations through the Department workgroup within one year

e Department will immediately establish an independent technical orkgroup to review current, and investigate new, certification requirements BOP equipment and other components of the BOP stack such as control nels, communication pods, accumulator systems, and choke and kill lines. addition, this workgroup will recommend ways to make BOP certifications blicly available in order to increase transparency and accountability.

e establishment of a technical workgroup to examine the need for rtification of BOP systems and components is important; even when a BOP ck has all the above mentioned systems and components, it is of little use t does not function properly to prevent a well blowout.

Section I Recommendation 4 – New Blind Shear Ram Redundancy Requirement

Implement through rulemaking within 120 days

Within one year from the date of this report, all oating drilling operations will be required to ave two sets of blind shear rams spaced at ast 4 feet apart (to prevent system failure if rill pipe joint or drill tool is across one set of ams during an emergency).

Section I Recommendation 6 – Develop New ROV Operating Capabilities

Implement recommendations through the Department workgroup within one year

e Department will immediately establish an independent technical rkgroup to develop further improvements to ROV operating capabilities luding the following:

- Standardized hydraulic and electrical interfaces for all subsea BOP stacks so that they are accessible by any available ROV.
- Visual mechanical indicator or redundant telemetry channel to confirm ram closure (*e.g.,* a position indicator).
- Methods of subsea testing that would avoid detrimental effects of seawater in BOP system (*e.g.,* ROV with external hydraulic supply).
- An ROV interface with a valve below the lowest ram on the BOP stack to allow well-killing operations.

Section I Recommendation 7 – Develop New Testing Guidelines

No later than 180 days after the date of this report

- Department will develop clear requirements and guidelines
t address the surface and subsea testing of ROV and BOP stack
abilities.

Implement through rulemaking within 120 days

- Protocols for function testing, autoshear, deadman, emergency
disconnect systems and acoustic activation systems.

Section I Recommendation 8 – Develop New Inspection Procedures and Reporting Requirements

Implement through rulemaking within 120 days

here feasible, the electronic log from the BOP control system ould be transmitted online to a secure location onshore and ade available for inspection by the Department of the Interior.

Section II Recommendation 1 – Establish Deepwater Well-Control Procedure Guidelines

Implement through rulemaking within 120 days

ithin 120 days of the date of this report, the Department will sure that requirements and guidelines for deepwater well-ntrol procedures are established.

Section II Recommendation 4 – Study Formal Personnel Training Requirements for Casing and Cementing Operations

Implement recommendations through the Department workgroup within one year

The Department will immediately establish an independent technical workgroup, with appropriate academic, agency, industry and other stakeholder participation, to study whether to establish new training and certification requirements for rig personnel specifically related to casing and cementing operations.

Section II Recommendation 6 – Develop Additional Requirements or Guidelines for Casing Installation

Implement recommendations through a the Department workgroup within one year

he Department will provide for the immediate stablishment of a workgroup, to establish specific equirements or guidelines for the following rocedures and practices:

- Positive and negative test procedures and use of test results for evaluation of casing integrity.
- Use of float valves and other mechanical plugs in the final casing string or liner.

Section II Recommendation 7 – Enforce Tighter Primary Cementing Practices

Implement recommendations through a Department workgroup within one year

- The Department will study whether to determine specific cementing requirements.

Section II Recommendation 8 – Develop Additional Requirements or Guidelines for Evaluation of Cement Integrity

Implement recommendations through Department workgroup within one year

- The Department will immediately establish an independent technical workgroup to evaluate whether and under what circumstances the use of cement bond logs is feasible and practical and will increase safety.

Section II Recommendation 9 –Increase Federal Government Wild-Well Intervention Capabilities

own out, or “wild” wells, involve the uncontrolled release of ude oil or natural gas from an oil well where pressure ntrol systems have failed.

e Federal government should assess its current capability to eal with such emergency situations, particularly in deep ater, and develop a plan to increase its capabilities for direct ld-well intervention, should such be required, in future mergency situations.

ements to be considered include an inventory of existing ethods to stop a blowout and handle escaping wellbore uids, including but not limited to coffer dams, highly-capable OVs, portable hydraulic line hook-ups, and pressure-reading ols.

Section II Recommendation 10 – Study Innovative Wild-Well Intervention, Response Techniques and Response Planning

ddition, the Department will immediately establish a DOI workgroup to study methods to p a blowout and handle escaping wellbore fluids. The technical workgroup will take a fresh k at how to deal with a deepwater blowout. The conventional last resort method to control a wout is to drill a relief well. In deep water this can take several months. But the reality of ng several months to stop a high flowing well at deep water depths was difficult to imagine il the BP oil spill. The offshore oil and gas industry, learning from the BP Oil Spill response erience, should work toward being able to stop a spill resulting from a deepwater blowout. erators should work to be in a position to submit, with their Exploration or Development ns, an emergency response plan that addresses resources (including common resources) that uld be deployed in the event of a serious emergency, even if assessed as low probability.

e technical workgroup should also address operators' ability, on a regional or industry-wide is, to develop and procure a response package for deep water incidents, to include diagnostic l measurement equipment, pre-fabricated systems for deep water oil capture, logistical and nmunications support, and plans and concepts of operations that can quickly be deployed in event of an unanticipated blowout. Assess and certify potential options, e.g., deep water persant injection.

ection III Recommendation 2 – The Department Will Adopt Safety Case Requirements for Floating Drilling Operations on the OCS

Implement through rulemaking within 120 days

- Within 120 days of the date of this report, the Department will assure the adoption of appropriate safety case requirements based on IADC Health, Safety and Environmental Case Guidelines for Mobile Offshore Drilling Units (2009), which will include well construction safety assessment prior to approval of APD.
- This “safety case” should establish risk assessment and mitigation processes to manage a drilling contractor’s controls related to the health, safety and environmental aspects of their operations.
- In addition to the safety case, a separate bridging document should be required to connect the safety case to existing well design and construction documents.
- Such a proposed Well Construction Interfacing Document will include all of the elements in a conventional bridging document plus alignment of the drilling contractor’s management of change (MOC) and risk assessment to the lease operator’s MOC and well execution risk assessments.

Section III Recommendation 4 – Study Additional Safety Training and Certification Requirements

mplement recommendations through a Department workgroup within one year

- The Department will immediately establish a workgroup to investigate safety training requirements for floating drilling rig personnel and possible requirements for independent or more frequent certification and testing of personnel and safety systems.
- Establish an oil production safety program or institute (similar to NRC reactor safety program).
- Consider establishing a formalized analytical methodology to assess performance of safety systems in the event of multiple component failure or excursions outside normal environmental ranges.
- Strengthen technical support to the Department of the Interior and other regulatory authorities, including the resources necessary to obtain independent technical review of regulations and standards.
- Consider chartering a longer-term technical review of BOP reliability.
- Consider importing best practices from other agencies with similar responsibility for safety regulation of technically complex systems, e.g. FAA and NRC.

Nguyen, Ngoc B

From: Ken Arnold [karnold@karnoldconsulting.com]
Sent: Wednesday, June 23, 2010 7:47 PM
To: Benton Baugh; Bob Bea; Ford Brett; Hans Juvkam-Wold; Ken Arnold; Martin Chenevert; Per Holand; Skip Ward; Tom Williams
Cc: Black, Steve; Kemkar, Neal; Hanley, Kallie
Subject: Power Point Presented to Secretary Salazar on 6/21/2010
Attachments: Presentation to Secretary of Interior - Rev 4.pptx

You are receiving this because you expressed an interest in having a copy of the subject report. DOI has been asked if they have a problem with us distributing this to whomever asks and have not expressed an objection. Those present at the meeting or by phone were the original signers of the Group of 8, plus Per Holland and Arnold Stancell. Bob Bea and Skip Ward were unable to participate. From DOI attendees beside the Secretary included David Hayes, Tom Strickland, The new Director of the MMS Mike B (please excuse my inability to spell his last name as I am traveling and don't really have time to look it up).

The people contributing to this power point besides myself are:

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The Secretary has expressed an interest in meeting with us in two weeks with a wider audience.

Please be advised I am in SE Asia and will return to Houston Tuesday the 30th in the afternoon. Do not call my cell phone unless it is important as it is an expensive call for me. Also I have been unable to pick up my phone messages since leaving the US. I may be able to pick them up when I leave Viet Nom for Singapore Sunday but am not sure.

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Presentation to Secretary of Interior

June 21, 2010

Outline of the Discussion

1. Why We Are Here
2. Putting the Risks in Context
3. Putting the Moratorium in Context
4. Measures that should be taken now to improve safety in the GOM
5. Conclusions
6. Appendices

Why Are We Here

We are not here to provide an economic justification – jobs, revenue lost, etc. That is the job for economists.

We feel safety will be compromised if the 6 month ban is extended to all wells in the GoM over 500 feet in water depth.

This is the time we all need to work together and we understand the job at hand.

This is not the time to punish the innocent nor further harm the public's interest .

Why Are We Here

The moratorium as currently defined INCREASES risk when drilling is eventually resumed.

- 1. Stopping operations in the middle
- 2. Exporting best rigs
- 3. Loss of experienced drilling staff
- 4. Increased tanker traffic

We believe a moratorium is needed, but we believe it can be re-defined to reduce risk

- 1. Remove requirement for stopping operations
- 2. Require the implementation of many of the recommendations of the interim report including some not already included in NTL 05.
- 3. Allow drilling of “low risk” wells to maintain GOM drilling equipment and expertise.

Putting The Risks in Context

BP Oil Spill Disaster

We were not asked to provide analysis of the Horizon incident, but as information has been discovered it is clear best practices were not followed.

- The well design was marginal
- Human errors in judgment were made at very key operational decision points
- Warning signs were overlooked on the rig
- There may have been some failure of equipment

This was all preventable by following currently in place standard practices.

Safety Record of Drilling on the OCS

Over 50,000 wells drilled. 4000 in over 1000 feet of water.

Last major incident resulting in oil coming ashore in 1969. 41 years ago.

From 1970 until April 2010 a total of 1800 barrels of oil spilled due to blowouts.

All measurements of safety indices have shown a steady level of improvement since modern MMS regulations came into effect in 1970.

Record is better than or equal to that or any other region of the world.

Crude Oil Spills from Platform and Rigs from Federal OCS Activities

ears	**Production** (Thousand BBls)	**Number of Spills**	**Barrels Spilled** (Thousand BBls)
960-1969	1,460,000	13	99
970-1979	3,455,000	32	106
980-1989	3,387,000	38	7
990-1999	4,051,000	15	2
000-2009	5,450,000	72	18

lowout Events Exceeding 1,000 Barrels on OCS

Two blowouts associated with a hurricane event that destroyed four platforms. Total of 10,280 barrels crude oil spilled.

One blowout associated with drilling. 1,688 barrels condensate spilled.

One blowout that occurred when a supply vessel collided with a drilling rig during a storm and sheared the wellhead.

2,500 barrels crude oil spilled.

One blowout (Santa Barbara) was associated with drilling.

80,000 barrels spilled.

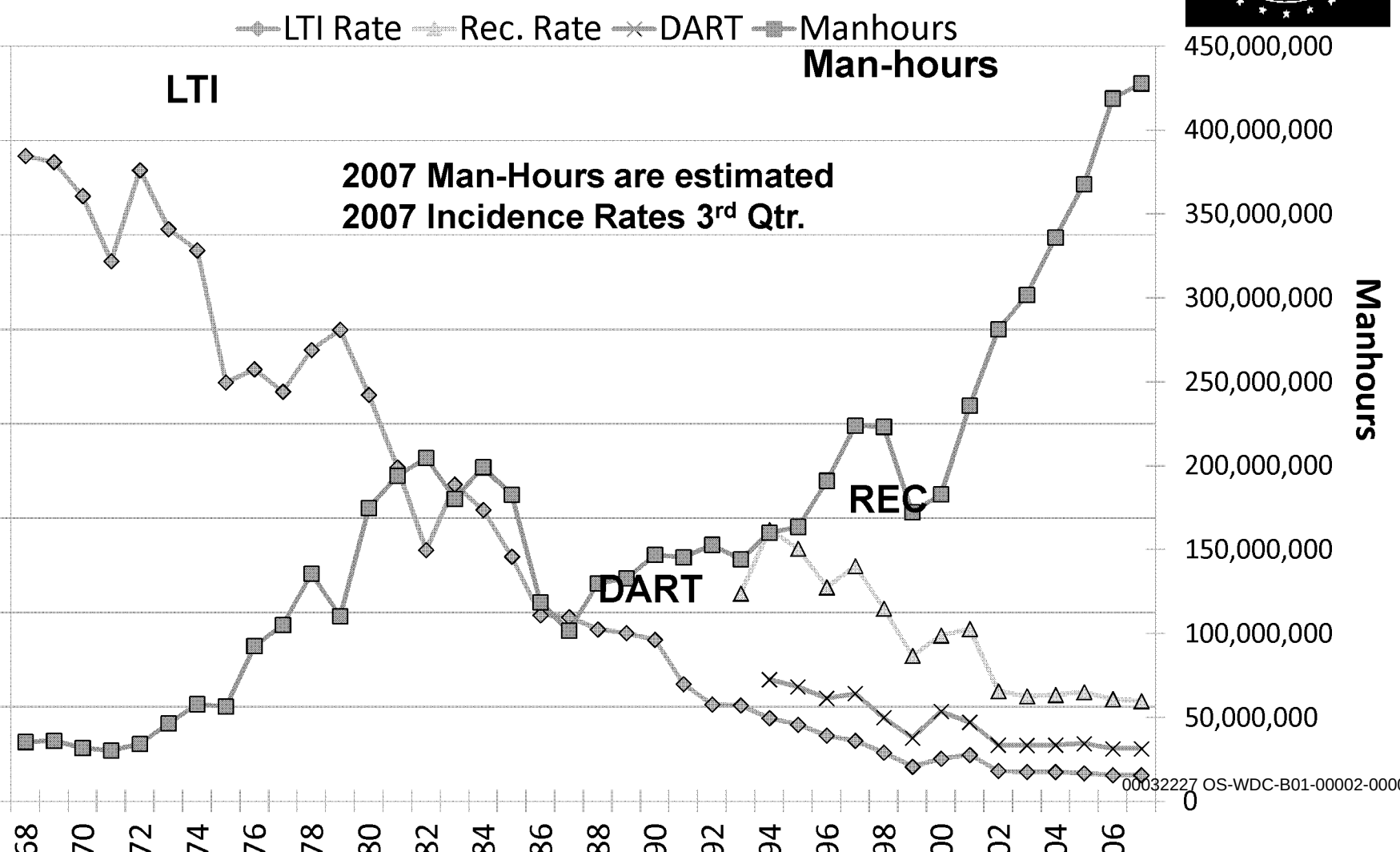
One blowout was caused by a fire in the production area that resulted in the loss of control of 12 wells on the platform.

30,000 barrels crude oil spilled.

One blowout associated with wireline work during workover operations. 53,000 barrels spilled.

om 1971 through 2009, a total of 1,784 barrels was spilled as a

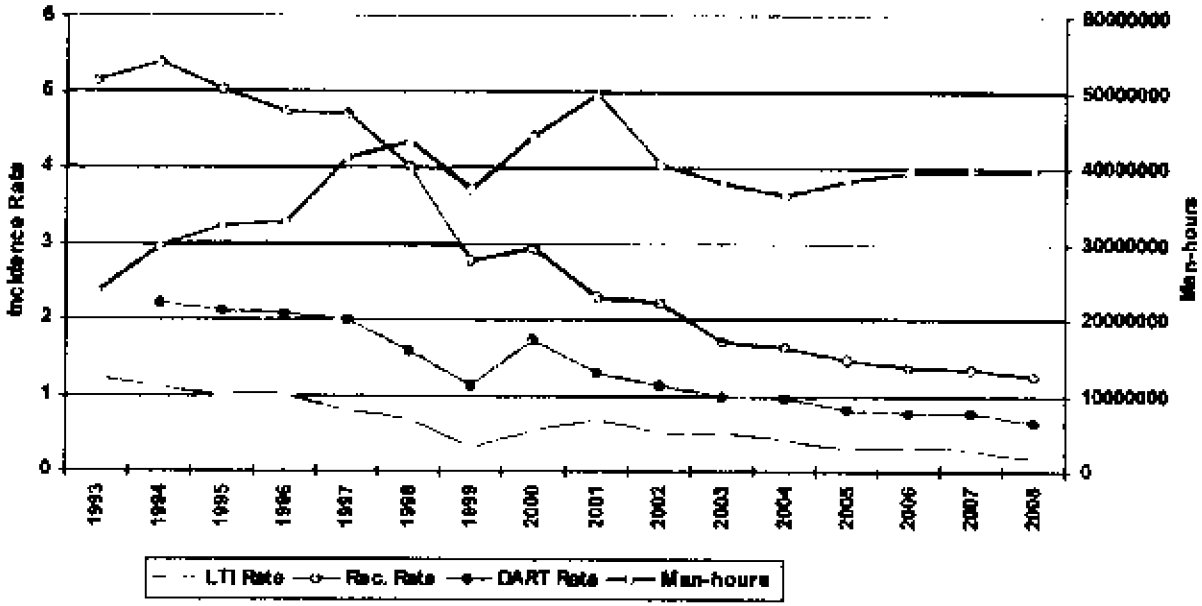
TOTAL INDUSTRY INCIDENCE RATES



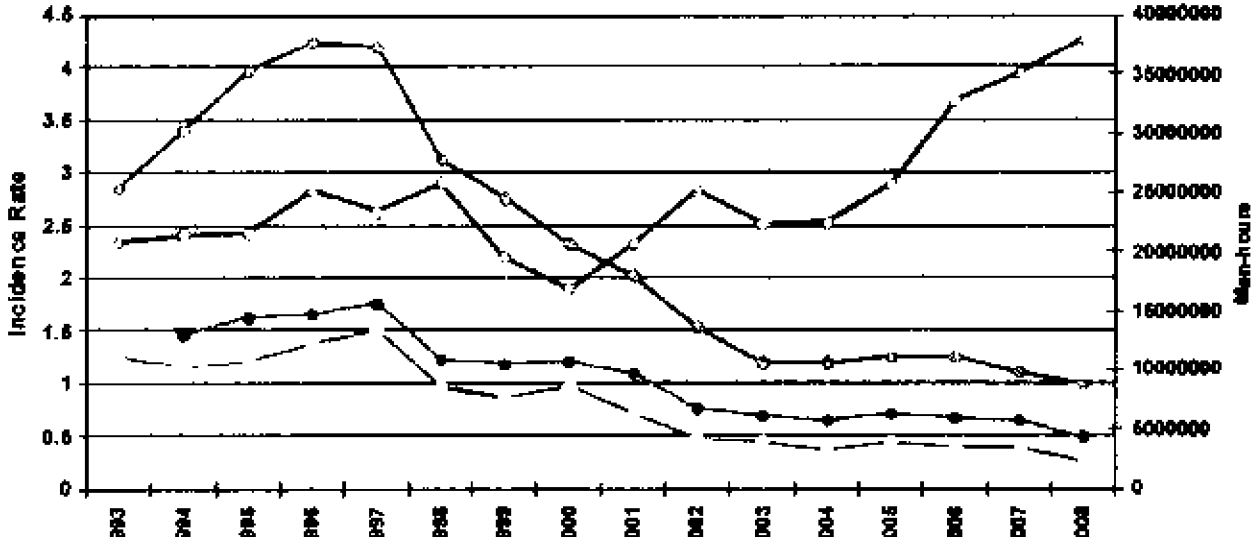
C 2008 US Water Totals		IADC 2008 European Water Totals	
l Man-hours	**39,665,580**	Total Man-hours	**38,049,523**
l Medical Treatment Incidents	**118**	Total Medical Treatment Incidents	**95**
l Restricted Work Incidents	**100**	Total Restricted Work Incidents	**43**
l Lost Time Incidents	**26**	Total Lost Time Incidents	**51**
l Fatalities	**3**	Total Fatalities	**0**
l Recordables	**247**	Total Recordables	**189**
ncidence Rate	**0.15**	LTI Incidence Rate	**0.27**
Frequency Rate	**0.73**	LTI Frequency Rate	**1.34**

st Time Incidence Rate = LTIs + FTLs X 200,000

US Water Total LTI & Recordable Incidence Rates vs Man-hours (Figure 1)

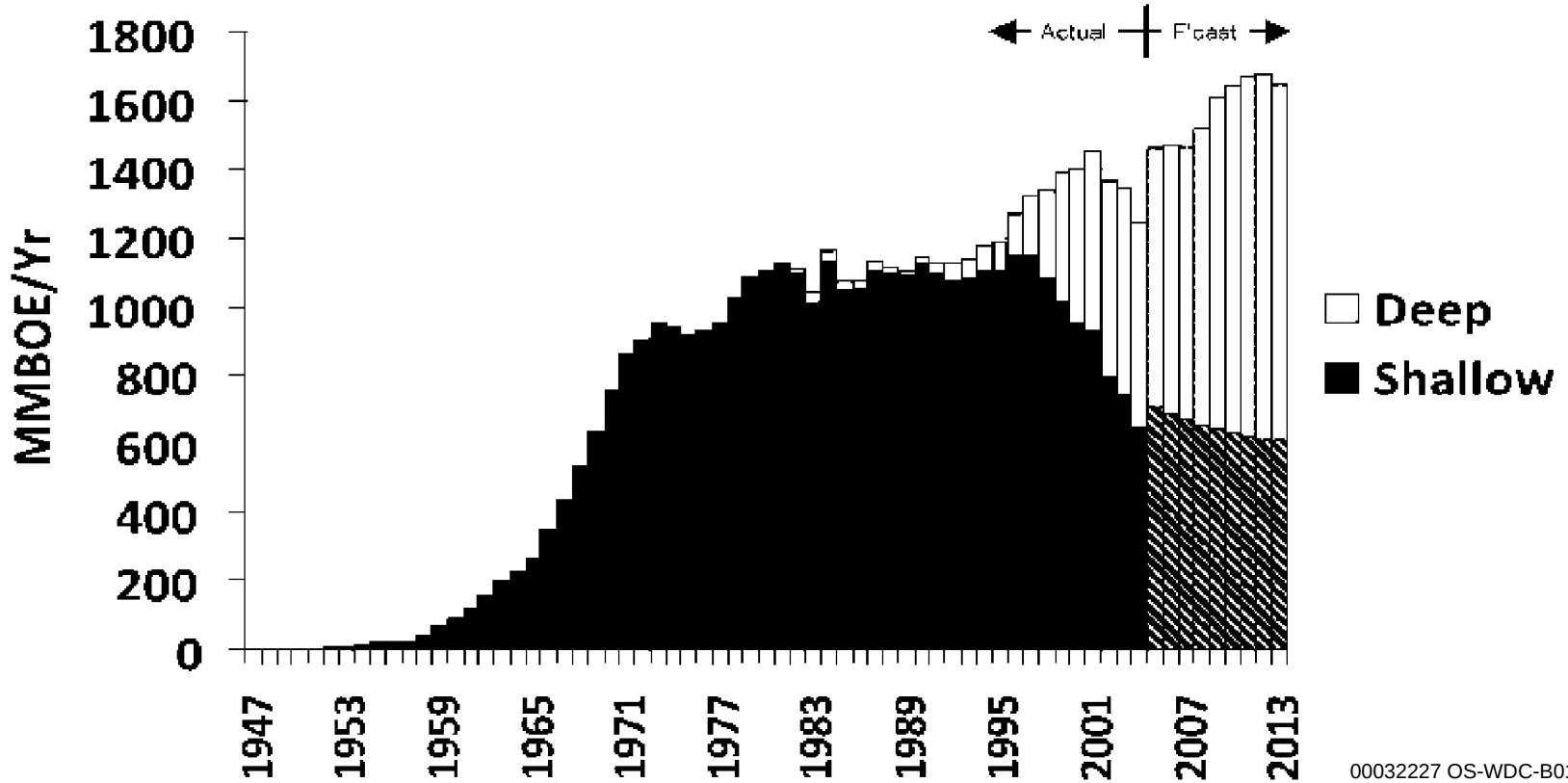


European Water Total Incidence Rates vs Man-hours (Figure 1)



GOM Offshore Production Increasingly from Deepwater

US GOM Offshore



Source: OCS Report MMS 2006-022

Understanding the Risks Summary

Even under existing conditions the record is good and improving at the same time that we are moving more and more into deep water

The Interim Report recommendations which can be implemented immediately (within 30 Days) should reduce the risk further but as the risks are low this is a marginal step

The Interim Report recommendations which take more time (up to 6 Months) should reduce the risks even further but in an even more marginal amount.

Putting the Moratorium in Context

Rationale for a Moratorium

We experts agreed to a list of recommendations which are needed to make drilling safer. Some of these recommendations take time to study and make into regulations to assure compliance. In some cases we agreed with time frames of as long as 6 months and even in one or two cases longer. How can we face the American people and say drilling is safe before all of our own recommendations can be carried out?

By not allowing drilling until all the recommendations we told the DOI are necessary for safety are in place the DOI is honoring our technical analysis.

The “Four Negatives” of the Moratorium

The Moratorium itself increases risk by:

- 1. Stopping operations in the middle
- 2. Exporting best rigs
- 3. Loss of experienced drilling staff
- 4. Increased tanker traffic

To reduce overall risk, the risk reductions which occur as a result of the Moratorium need to outweigh the added risks of the “four negatives”

As currently defined the Moratorium does not accomplish this objective

The Moratorium can be redefined to reduce risk

Effects of Stopping Operations

In any project risks are introduced when an appropriately planned operation is temporarily abandoned and then re-started at some future undetermined date.

- Macondo Well was being temporarily abandoned
- Montara Well was being re=entered after having been temporarily abandoned for four months

The Effect of the Moratorium on Rigs

- Best rigs will leave the Gulf first and come back last. This has a marginal negative impact on the overall safety of the fleet.
- Rigs will leave on long term contracts (2-5 years) and it will take a long time after the moratorium ends to get them back.
- The time to remobilize will take several additional months/years after the Moratorium is lifted and new rules in place.

Effects of Moratorium on Experienced Personnel

- Best people will leave the Gulf
- Workforce significantly impacted, including the thousands of support workers and service providers who support the drilling operations and must adhere to the safety standards – best of them will get work internationally or other industries/jobs.
- Recruitment of new people will stop – the best and brightest do not apply for uncertain jobs
- While some additional training and certification can and will take place during this time – as with the baseball offseason, players need a spring training to get back in shape – "From a safety standpoint we can't afford to have a spring training."
- The industry feels the safest and most effective rig operations and personnel are being punished.

Effects of Moratorium on Tanker Spills

- Source: NRC, “Oil in the Seas”, 2003
- Data for the period 1990-1999 (no one time disaster like Exxon Valdez or BP Macondo)
- Average Best Estimate of Oil Spilled in US waters from offshore platforms and pipelines: 7,000 barrels per year
- Average Best Estimate of Oil Spilled <u>in US waters</u> from tankers: 26,000 barrels per year
  - Does not include spills from US bound tankers in foreign or international waters
  - Does not include spills from marine terminals, refineries and storage tanks
  - Does not include spills at international loading terminals or in producing the oil transported

Measures that should be taken now to improve safety in the GOM

Manage Risk

The level of risk varies significantly between well types based on knowledge of formations being drilled and category of well

The highest risk wells warrant additional time to assure the risk can be managed and drilling these wells are warranted:

- Deepwater exploration wells
  - We have seen it is not just the drilling but the completion of these wells that pose risk
- Unknown pore pressure
- Extremely high pressure and/or high temperature wells

The Key to Increasing Safety

Require adoption of some Interim Report recommendations immediately

Provide a mechanism to allow rigs to remain working in the Gulf of Mexico

- Define a class of wells (other than workover, waterflood, gas injection or water disposal wells) which can be drilled safely. That is, wells where any increased risk by not waiting for all the recommendations to be implemented is lower than the risk of the "Four Negatives"

Maintain Moratorium on "Risky Wells"

Steps to Re-Define the Moratorium to INCREASE Safety

- Allow rigs to complete the work they are currently doing
- Require implementation of the key recommendations of the interim report which can be done within 30 days before ANY new wells can be drilled on the OCS (independent of water depth)
  - 8 Recommendations Already in NTL 05
  - 5 Additional Recommendations which could be added
- Maintain the moratorium on the more risky wells
  - Remaining Recommendations requiring additional study.

Risky Wells

Exploration wells to previously undrilled strata

Deepening existing wells to previously undrilled strata

HP/HT Wells

Less Risky Wells which Can be Drilled

Listed in increasing degree of risk:

- Wells which are abandoned before reaching producing zones (surface casings and top sections only)
- Water Disposal to Non-Producing Reservoirs
- Re-entries and Sidetracks
- Water Disposal to Producing Reservoirs, Waterflood and Gas Injection
- Development Wells to Known Reservoirs
- Workovers
- Drilling to the base of the salt section in deep exploration wells
- Delineation Wells to Non-producing Reservoirs

Wells in red above are already exempted from the moratorium by NTL 04

Conclusions

A moratorium is needed

It needs be defined taking into account ALL elements of risk, including the risks derived from the moratorium itself

Drilling can be made safer quickly by implementing many of the recommendations of the Interim Report

We should not ignore the “Four Negatives” of the moratorium

Allow drilling of “Less Risky Wells” to avoid the Four Negatives

It is justifiable to put a moratorium on “Risky Wells” to allow further thought and study

Appendices

30-Day Recommendations Already in NTL

Recommendations Which Could be Implemented But Are Not Currently in NTL

Recommendations to be Implemented After 30 Days

30-Day Recommendations Already in NTL

Section III Recommendation 1 – Compliance erification for Existing Regulations and April 30, 2010, National Safety Alert

Implement through NTL within 30 days

hin 30 days of the date of this report, the Department, in conjunction with the Department of Homeland urity, will ensure that operators are required to verify compliance with existing regulations and National ety Alert (issued April 30, 2010), which issued the following safety recommendations to operators and ing contractors:

- Examine all well-control equipment (both surface and subsea) currently being used to ensure that it has been properly maintained and is capable of shutting in the well during emergency operations. Ensure that the ROV hot-stabs are function-tested and are capable of actuating the BOP.
- Review all rig drilling/casing/completion practices to ensure that well-control contingencies are not compromised at <u>any</u> point while the BOP is installed on the wellhead.
- Review all emergency shutdown and dynamic positioning procedures that interface with emergency well control operations.
- Inspect lifesaving and firefighting equipment for compliance with federal requirements.
- Ensure that all crew members are familiar with emergency/firefighting equipment, as well as participate in an abandon ship drill. Operators are reminded that the review of emergency equipment and drills should be conducted after each crew change out.
- Exercise emergency power equipment to ensure proper operation.
- Ensure that all personnel involved in well operations are properly trained and capable of performing their tasks under both normal drilling and emergency well control operations.

Section I Recommendation 1 – Order One-Time Only Re-rtification of All BOP Equipment Used in New Floating Drilling Operations

Implement through NTL within 30 days

fore spudding any new well from a floating vessel, the operator will be quired to obtain and deliver to the Department of the Interior a written and ned certification from an independent third-party attesting that, on or er the date of this report, a detailed physical inspection and design review the BOP has been conducted by the equipment manufacturer and owner in cordance with the Original Equipment Manufacturer (OEM) specifications d that (i) the BOP will operate as originally designed; and (ii) any odifications or upgrades to the BOP stack conducted after delivery have not mpromised the design or operation of the BOP.

or to deploying the BOP, the operator must also verify that any odifications or upgrades to the BOP are approved by the Department of the erior and that documentation showing that the BOP has been maintained d inspected according to the requirements in API RP 53 and 30 CFR 0.446(a) is on file with the Department of the Interior or available for pection.

ection I Recommendation 2 – Order BOP Equipment ompatibility Verification for Each Floating Vessel and for Each New Well

Implement through NTL within 30 days

s part of a structured risk management process, the perator will be required to obtain an independent ird-party verification that the BOP will operate ith the drilling rig equipment and that the BOP is ompatible with the specific well location and well asis of design and well execution plan, i.e., in the vent of a well control event the BOP will provide a eal and contain wellbore pressure under all onditions expected in the wellbore.

Section I Recommendation 5– Develop Secondary Control System Requirements and Guidelines

Implement through rulemaking within 120 days

- Minimum ROV intervention capabilities for secondary control of all subsea BOP stacks, including the ability to close all shear and pipe rams, close the choke and kill valves and unlatch the lower marine riser package (LMRP).
- Minimum requirements for an emergency back-up BOP control system that is powered by a separate and independent accumulator bank with sufficient capacity to open and close one annular-type preventer and all ram-type preventers, including the blind shear ram. Such safety systems must include ***at least two*** of the following: autoshear, deadman, emergency disconnect system, and/or an acoustic activation system.
- Guidelines for arming and disarming the secondary BOP control system.
- Guidelines for documentation of BOP maintenance and repair (including any modifications to the BOP stack and control systems).

Section I Recommendation 7 – Develop New Testing Guidelines

Implement through NTL within 30 days

ird-party verification or documentation necessary to show at blind-shear rams will function and are capable of earing the drill pipe that is in use on the rig.

Implement partially through NTL within 30 days, then rulemaking within 120 days

inimum ROV performance testing standards, including rface and subsea function testing of ROV intervention ports d ROV pumps, to ensure compatibility with the BOP stack d that the ROV can close all shear and pipe rams, close the oke and kill valves, and unlatch the lower marine riser ckage.

Section I Recommendation 7 – Develop New Testing Guidelines

Implement through NTL within 30 days

andatory inspection and testing of BOP stack if any omponents are used in an emergency, *e.g.,* use of pipe casing shear rams or circulating out a well kick. This sting should involve a full pressure test of the BOP ter the situation is fully controlled, with the BOP on e wellhead.

Section I Recommendation 8 – Develop New Inspection Procedures and Reporting Requirements

Implement through NTL within 30 days

eginning no later than 60 days after the date of this port, all operators of floating drilling equipment will port to the Department of the Interior the following: (i) OP and well control system configuration, (ii) BOP and ell control system test results, including any anomalies testing or operation of critical BOP components, (iii) OP and well control incidents, and (iv) BOP and well ontrol system downtime for the last three years of illing operations.

Section II Recommendation 3 – New Casing And Cement Design Requirements: Two Independent Tested Barriers

Implement through NTL within 30 days

efore spudding any new floating drilling operation, all ell casing and cement designs must be signed by a rofessional Engineer, verifying that there will be at ast two independent tested barriers, including one echanical barrier, across each flow path during well ompletion and abandonment activities and that casing esign is appropriate for the purpose for which it is tended under reasonably expected wellbore onditions.

Section II Recommendation 5 – New Casing Installation Procedures

Implement through NTL within 30 days

he Department will ensure the requirement of the llowing BAST practices:

- Casing hanger latching mechanisms or lock down mechanisms must be engaged at the time the casing is installed in the subsea wellhead.
- For the final casing string, the operator must verify the installation of dual mechanical barriers (*e.g.,* dual floats or one float and a mechanical plug) in addition to cement, to prevent flow in the event of a failure in the cement.

Recommendations Which Could be Implemented But Are Not Currently in NTL

Section I Recommendation 7 – Develop New Testing Guidelines

Implement through NTL within 30 days

linimum surface and subsea function and ressure testing requirements to simulate (i) nintended disconnect of the lower marine riser ackage (LMRP), and (ii) loss of surface control e.g., electric and hydraulic power) of the subsea OP stack.

Section I Recommendation 8 – Develop New Inspection Procedures and Reporting Requirements

nplement in accordance with internal Departmental Guidance issued within 30 days

- The Department will evaluate and revise the manner in which it conducts its drilling inspections.
- Revised drilling inspections should include the witnessing of actual tests of BOP equipment, including the new requirements and guidance that address the surface and subsea testing of ROV and BOP stack capabilities.
- The Department will also develop methods to increase transparency and public availability of the results of inspections as well as routine reporting.
- The Department will work with Congress to obtain the necessary resources to implement these recommendations.

ection II Recommendation 2 – New Fluid Displacement Procedures

Implement through NTL within 30 days

or to displacement of kill-weight drilling fluid from the wellbore, the operator must ependently verify that:

- The BOPs are closed during displacement to underbalanced fluid columns to prevent gas entry into the riser should a seal failure occur during displacement.
- Two independent barriers, including one mechanical barrier, are in place for each flow path (i.e., casing and annulus).
- If the shoe track (the cement plug and check valves that remain inside the bottom of casing after cementing) is to be used as one of these barriers, it is negatively tested prior to the setting of the subsequent casing barrier. A negative test should also be performed prior to setting the surface plug.
- Negative tests are made to a differential pressure equal to or greater than the anticipated pressure after displacement. Each casing barrier is positively tested to a pressure that exceeds the highest estimated integrity of the casing shoes below the barrier.
- Displacement of the riser and casing to fluid columns that are underbalanced to the formation pressure in the wellbore is conducted in separate operations. In both cases, BOPs should be closed on the drill string and circulation established through the choke line to isolate the riser, which is not a rated barrier. During displacement, volumes in and out must be accurately monitored.
- Drill string components positioned in the shear rams during displacement must be capable

Section II Recommendation 7 – Enforce Tighter Primary Cementing Practices

Implement through a rulemaking within 120 days

he Department will institute a rulemaking to onsider the adoption of API RP 65 Part 2:

- Isolating potential flow zones during well construction (addressing previously identified gaps in primary cementing practices).

Section III Recommendation 3 –Adopt Final Safety and Environmental Management Systems Rule

Implement through publication of final rule within 30 days

OCS Safety Oversight Board will ensure the promulgation of a final SEMS Rule with full implementation of lements, along with provisions for public availability of information developed and collected under the rule ncrease transparency and accountability.

IS is a structured and comprehensive method for applying operational, safety and environmental protection ciples to offshore activities by focusing on personnel and ensuring accountability for operations throughout organization in the following specific areas:

1. Safety & Environmental Information
2. Hazards Analysis
3. Management of Change
4. Operating Procedures
5. Safe Work Practices
6. Training
7. Mechanical Integrity
8. Pre-Startup Review
9. Emergency Response & Control
10. Investigation of Accidents
11. Auditing the Program
12. Records & Documentation

Recommendations to be Implemented After 30 Days

Section I Recommendation 3 – Study Formal Equipment Certification Requirements

Implement recommendations through the Department workgroup within one year

e Department will immediately establish an independent technical orkgroup to review current, and investigate new, certification requirements BOP equipment and other components of the BOP stack such as control nels, communication pods, accumulator systems, and choke and kill lines. addition, this workgroup will recommend ways to make BOP certifications blicly available in order to increase transparency and accountability.

e establishment of a technical workgroup to examine the need for rtification of BOP systems and components is important; even when a BOP ck has all the above mentioned systems and components, it is of little use t does not function properly to prevent a well blowout.

Section I Recommendation 4 – New Blind Shear Ram Redundancy Requirement

Implement through rulemaking within 120 days

Within one year from the date of this report, all floating drilling operations will be required to have two sets of blind shear rams spaced at least 4 feet apart (to prevent system failure if drill pipe joint or drill tool is across one set of rams during an emergency).

Section I Recommendation 6 – Develop New ROV Operating Capabilities

Implement recommendations through the Department workgroup within one year

e Department will immediately establish an independent technical rkgroup to develop further improvements to ROV operating capabilities luding the following:

- Standardized hydraulic and electrical interfaces for all subsea BOP stacks so that they are accessible by any available ROV.
- Visual mechanical indicator or redundant telemetry channel to confirm ram closure (*e.g.,* a position indicator).
- Methods of subsea testing that would avoid detrimental effects of seawater in BOP system (*e.g.,* ROV with external hydraulic supply).
- An ROV interface with a valve below the lowest ram on the BOP stack to allow well-killing operations.

Section I Recommendation 7 – Develop New Testing Guidelines

No later than 180 days after the date of this report

- Department will develop clear requirements and guidelines
t address the surface and subsea testing of ROV and BOP stack
abilities.

Implement through rulemaking within 120 days

- Protocols for function testing, autoshear, deadman, emergency
disconnect systems and acoustic activation systems.

Section I Recommendation 8 – Develop New Inspection Procedures and Reporting Requirements

Implement through rulemaking within 120 days

here feasible, the electronic log from the BOP control system ould be transmitted online to a secure location onshore and ade available for inspection by the Department of the Interior.

Section II Recommendation 1 – Establish Deepwater Well-Control Procedure Guidelines

Implement through rulemaking within 120 days

ithin 120 days of the date of this report, the Department will sure that requirements and guidelines for deepwater well-ntrol procedures are established.

Section II Recommendation 4 – Study Formal Personnel Training Requirements for Casing and Cementing Operations

Implement recommendations through the Department workgroup within one year

The Department will immediately establish an independent technical workgroup, with appropriate academic, agency, industry and other stakeholder participation, to study whether to establish new training and certification requirements for rig personnel specifically related to casing and cementing operations.

Section II Recommendation 6 – Develop Additional Requirements or Guidelines for Casing Installation

Implement recommendations through a the Department workgroup within one year

he Department will provide for the immediate stablishment of a workgroup, to establish specific equirements or guidelines for the following rocedures and practices:

- Positive and negative test procedures and use of test results for evaluation of casing integrity.
- Use of float valves and other mechanical plugs in the final casing string or liner.

Section II Recommendation 7 – Enforce Tighter Primary Cementing Practices

Implement recommendations through a Department workgroup within one year

- The Department will study whether to determine specific cementing requirements.

Section II Recommendation 8 – Develop Additional Requirements or Guidelines for Evaluation of Cement Integrity

Implement recommendations through Department workgroup within one year

- The Department will immediately establish an independent technical workgroup to evaluate whether and under what circumstances the use of cement bond logs is feasible and practical and will increase safety.

Section II Recommendation 9 –Increase Federal Government Wild-Well Intervention Capabilities

own out, or “wild” wells, involve the uncontrolled release of ude oil or natural gas from an oil well where pressure ntrol systems have failed.

e Federal government should assess its current capability to eal with such emergency situations, particularly in deep ater, and develop a plan to increase its capabilities for direct ld-well intervention, should such be required, in future mergency situations.

ements to be considered include an inventory of existing ethods to stop a blowout and handle escaping wellbore uids, including but not limited to coffer dams, highly-capable OVs, portable hydraulic line hook-ups, and pressure-reading ols.

Section II Recommendation 10 – Study Innovative Wild-Well Intervention, Response Techniques and Response Planning

ddition, the Department will immediately establish a DOI workgroup to study methods to p a blowout and handle escaping wellbore fluids. The technical workgroup will take a fresh k at how to deal with a deepwater blowout. The conventional last resort method to control a wout is to drill a relief well. In deep water this can take several months. But the reality of ng several months to stop a high flowing well at deep water depths was difficult to imagine il the BP oil spill. The offshore oil and gas industry, learning from the BP Oil Spill response erience, should work toward being able to stop a spill resulting from a deepwater blowout. erators should work to be in a position to submit, with their Exploration or Development ns, an emergency response plan that addresses resources (including common resources) that uld be deployed in the event of a serious emergency, even if assessed as low probability.

e technical workgroup should also address operators' ability, on a regional or industry-wide is, to develop and procure a response package for deep water incidents, to include diagnostic l measurement equipment, pre-fabricated systems for deep water oil capture, logistical and nmunications support, and plans and concepts of operations that can quickly be deployed in event of an unanticipated blowout. Assess and certify potential options, e.g., deep water persant injection.

ection III Recommendation 2 – The Department Will Adopt Safety Case Requirements for Floating Drilling Operations on the OCS

Implement through rulemaking within 120 days

- Within 120 days of the date of this report, the Department will assure the adoption of appropriate safety case requirements based on IADC Health, Safety and Environmental Case Guidelines for Mobile Offshore Drilling Units (2009), which will include well construction safety assessment prior to approval of APD.
- This “safety case” should establish risk assessment and mitigation processes to manage a drilling contractor’s controls related to the health, safety and environmental aspects of their operations.
- In addition to the safety case, a separate bridging document should be required to connect the safety case to existing well design and construction documents.
- Such a proposed Well Construction Interfacing Document will include all of the elements in a conventional bridging document plus alignment of the drilling contractor’s management of change (MOC) and risk assessment to the lease operator’s MOC and well execution risk assessments.

Section III Recommendation 4 – Study Additional Safety Training and Certification Requirements

mplement recommendations through a Department workgroup within one year

- The Department will immediately establish a workgroup to investigate safety training requirements for floating drilling rig personnel and possible requirements for independent or more frequent certification and testing of personnel and safety systems.
- Establish an oil production safety program or institute (similar to NRC reactor safety program).
- Consider establishing a formalized analytical methodology to assess performance of safety systems in the event of multiple component failure or excursions outside normal environmental ranges.
- Strengthen technical support to the Department of the Interior and other regulatory authorities, including the resources necessary to obtain independent technical review of regulations and standards.
- Consider chartering a longer-term technical review of BOP reliability.
- Consider importing best practices from other agencies with similar responsibility for safety regulation of technically complex systems, e.g. FAA and NRC.

Nguyen, Ngoc B

From: Ford Brett [FBrett@PetroSkills.com]
Sent: Wednesday, June 23, 2010 8:05 PM
To: Ken Arnold
Cc: Benton Baugh; Bob Bea; Hans Juvkam-Wold; Ken Arnold; Martin Chenevert; Per Holand; Skip Ward; Tom Williams; Black, Steve; Kemkar, Neal; Hanley, Kallie
Subject: Re: Power Point Presented to Secretary Salazar on 6/21/2010

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Both the deep-water drilling ban and the overhaul of the agency, the Minerals Management Service, were prompted by the April 20 blowout of a BP well in the Gulf of Mexico.

The administration is appealing a federal judge's ruling Tuesday that blocks the May 27 ban on oil and gas drilling in more than 500 feet of water.
Salazar said he is also responding to the ruling by rewriting the moratorium with more nuance and justification.

Wednesday night, the administration asked a court to delay the Tuesday ruling as it appeals. The Justice Department said a delay would serve the public by eliminating risk of another drilling accident while new safety rules are considered.

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