DEPARTMENT OF THE INTERIOR
OCEAN ENERGY SAFETY ADVISORY COMMITTEE
WASHINGTON, D.C.
NOVEMBER 7-8, 2011

MEETING MINUTES

The Ocean Energy Safety Advisory Committee (OESC) held its third meeting on November 7-8, 2011, at the Department of the Interior's (DOI) South Interior Building, 1951 Constitution Avenue, N.W., Washington, D.C. 20240.

The meeting agenda (Appendix I) focused on academia outreach; reports and interim recommendations from the four OESC subcommittees; the International Association of Drilling Contractors (IADC) Health Safety and Environmental (HSE) Case for Mobile Offshore Drilling Units (MODUs), the Bureau of Safety and Environmental Enforcement (BSEE) Incident Data Analysis; Safety and Environmental Management Systems (SEMS); summary of findings of the Deepwater Horizon (DWH) Joint Investigation Team (JIT); and American Petroleum Institute (API) standards.

All fifteen of the Committee members (Appendix II) were in attendance both days of the meeting.

In accordance with the provisions of the Federal Advisory Committee Act (FACA), Public Law 92-463, the meeting was open to the public from 1:00 p.m. to 5:30 p.m. on November 7 and 8:00 a.m. to 5:15 p.m. on November 8. Approximately 70 members of the public and press were in attendance (Appendix III).

The meeting was called to order by Designated Federal Officer (DFO) Joseph R. Levine after establishing quorum. He then introduced DOI Deputy Secretary David J. Hayes to offer remarks (Appendix IV) and OESC Chairman Thomas O. Hunter to lead meeting proceedings.

Monday, November 7, 2011

The first day of the meeting consisted of presentations on academia outreach; subcommittee reports on oil spill prevention, oil spill containment, oil spill response, and safety management systems; and IADC HSE case for MODUs.

Academic Outreach: State of Universities and Petroleum Engineering

OESC Member Taduesz W. Patzek (Academia) outlined the state of universities' programs associated with petroleum engineering (Appendix V). He said there was a huge need for qualified personnel. As of his report, there were 193 petroleum engineering tenure-tracked faculty-nationwide which was woefully inadequate. He mentioned that he was in the process of trying to collect research and teaching capabilities in various universities around the United States (US). There's a general shortage of engineering in the entire country.

OESC Member Paul K. Siegele (Offshore Energy Industry) expressed concern over the way industry was characterized in the presentation – the perception that industry was full of unprepared or untrained people.

OESC Member Lois N. Epstein (Non-Governmental Organization-NGO) stated that the conversation was interesting, but she would have liked to see what types of research was necessary or where the gaps were.

Subcommittee Reports and Interim Recommendations
Oil Spill Prevention Subcommittee

OESC Member Christopher A. Smith (Department of Energy – DOE) presented the Oil Spill Prevention Subcommittee's activities to date in Appendix VI. He began the presentation with a discussion on well design incorporating multiple barriers essential to safety. He mentioned that the Subcommittee viewed "cementing" as part of the drilling operation that it was considering. He emphasized that the Subcommittee would be making specific recommendations for changes in regulatory reporting requirements.

OESC Chairman Thomas O. Hunter suggested that the Subcommittee might need something about flow, since there were some people that thought not knowing the flow at DWH hurt the containment effort. Response was this would be addressed in the Containment Subcommittee report.

OESC Member Christopher A. Smith (DOE) outlined the three primary vectors from Spill Prevention Subcommittee: 1) Regulations – make recommendations about what changes need to be made, and the bounds between prescriptive and performance-based regulations; 2) Research and Development (R&D) – look at the state of it in academia and government, and make recommendations on what research gaps existed and if any changes need to be made in how it would be funded; 3) Automation – to what degree could specific steps be taken to improve this; and 4) Human Factors - issue that overlapped with SEMS.

OESC Chairman Thomas O. Hunter requested that the Subcommittee be as specific as possible so the OESC would know where the recommendations were going to fall.

Oil Spill Containment Subcommittee

OESC Member Richard A. Sears (NGO) addressed the Oil Spill Containment Subcommittee's activities to date in Appendix VII. He stated that operators must address internal containment capability to generate a responsible party checklist.

OESC Chairman Thomas O. Hunter referred to Vector 1 – Readiness for Containment as a meaty, crucial topic. He asked if there was any way to work financial issues in to the Vector and wondered if anyone else in the government was looking at the issue.

OESC Member Richard A. Sears (NGO) said he was not aware of anyone else in the government working on it. The National Response Team had been looking, but in the context that there was no regulatory requirement for it.

OESC Chairman Thomas O. Hunter asked whether the Subcommittee discussed relief wells or debris removal.

OESC Member Richard A. Sears (NGO) said the Subcommittee did not really talk about debris removal. Relief wells were discussed in the context of containment scenarios. There might be situations where a relief well would be the best option, as much as people do not like the idea. If the rig was sitting on top of everything, that might be the answer. He stated that the Subcommittee added containment scenario planning to the list so that people would not assume that the containment scenario was always for a subsea capping stack.

Oil Spill Response Subcommittee

OESC Member Patrick E. Little (U.S. Coast Guard-USCG) addressed the Oil Spill Response Subcommittee's activities to date in Appendix VIII. He acknowledged a series of contributors that helped with the initial work, including David N. Moore and Peter K. Velez. The scope of their work looked for gaps and inadequacies in BSEE's response construct; looked at the interface between BSEE and other agencies; focused on the critical areas where input was most needed; and identified areas of commonality with other groups.

He highlighted the Subcommittee's four Vectors: 1) Oil Spill Risk Assessment, Preparedness and Response in the Arctic Outer Continental Shelf (OCS); 2) Cascading of oil response equipment; 3) Full-scale testing of response equipment; and 4) Interagency coordination on oil spill response issues.

Committee members asked if it would be possible to prioritize the vectors over time, maybe with Arctic first, or second since there was a need to get back to work in the Gulf of Mexico (GOM).

OESC Member Patrick E. Little (USCG) replied Arctic was very important, but it posed some challenges for short term efforts, so maybe vectors 2 and 3 could move faster.

OESC Chairman Thomas O. Hunter asked that the arctic question be tabled and addressed during the Committee discussion time slot on the following day.

Safety Management Systems (SMS) Subcommittee

OESC Member Joseph M. Gebara (Offshore Energy Industry) addressed the SMS's activities to date in Appendix IX. He stated that the scope was mainly on "soft" elements of safety - people, procedures, and processes. He highlighted the Subcommittee's three vectors: 1) Develop a safety culture; 2) Continuously improve System Safety Performance through an Optimum SMS; and 3) Develop a learning environment that fosters continuous improvement.

OESC Chairman Thomas O. Hunter stated that being able to cross the boundary between industry and regulators was gong to be critical.

The Subcommittee recognized that SEMS and SEMS II were being implemented and planned to look into whether there was a facility specific document that could link all of this (goal was to stay away from the word "safety case", which normally referred to a performance-based system as in the United Kingdom (UK), the HSE safety case).

Subcommittee recognized that safety cases "did not prevent incidents", but it wanted to research "safety case" in the non-UK sense.

A Committee member recommended that clear precise definitions of all the terms be prepared.

OESC Member Joseph M. Gebara (Offshore Energy Industry) stated that the Subcommittee would look at the SMS created by SEMS and decide what additional components might be required.

He said implementation of the proposed “safety culture” would require more involvement between DOI, BSEE, and Bureau of Ocean Energy Management (BOEM) executives with industry leaders and executives. The Subcommittee did not see the need for any new organization to take responsibility for disseminating recommendations from leading and lagging indicators.

OESC Chairman Thomas O. Hunter asked if human factors could be merged into the SMS vectors.

OESC Member Joseph M. Gebara (Offshore Energy Industry) replied, yes.

OESC Member Christopher A. Smith (DOE) stated that the other vectors were very specific. The Subcommittee was also looking at prescriptive versus performance based regulations, so that might be another issue of overlap that needed to be addressed.

IADC HSE Case for MODUs

Alan E. Spackman (IADC) noted that IADC completed a gap analysis on its guidelines and API’s Recommended Practice (RP) 75 and BSEE’s SEMS Final Rule in Appendix X. IADC discovered that the major difference between IADC guidelines and RP 75 and regulations was that there was no government review of hazards analysis. If BSEE decided on any additional requirements, such as requiring a job-safety analysis to be signed off by an installation manager wearing pink shoes, IADC would put that detail in the appendix of its guidelines, as it would for any regulation requirement that was not in its safety case guidelines.

He stated there were profound differences between countries, such as Norway, UK, Australia and Cuba. The approaches reflected political, cultural and practical differences. Norway did not require the submission of hazard analysis data, but it required that information be provided at any given point upon request.

Australia started by modeling their approach after the UK, and they knew they did not want quantitative risk analysis, just qualitative. But they had a lack of regulatory authority, particularly over environmental aspects. He noted that IADC would be revisiting guidance provided to them.

He noted that IADC came into contact with Cuba at an International Regulators Forum (IRF) conference many years ago. Cuba adopted IADC HSE case guidelines as their model for their regulatory system.

Australia required fourteen copies of an HSE case for review. One remained unopened, and the other thirteen were distributed as appropriate. UK approved codes of practice that must be used, and that went down to industry standards that you could justify not using. In Norway, you might be told you needed more distance under your freezer so you could get a mop under it, as part of your safety case.

IADC identified prerequisites for having an HSE case 1) a robust and effective management system; 2) ongoing process feedback loop in order to be functional; 3) three to five years at worker level buy-in; and 4) management on a rig needed to be responsible for delivery of an HSE case for a drilling rig.

OESC Chairman Thomas O. Hunter asked if the hazard assessment was dominated by major or minor things.

Alan E. Spackman (IADC) responded that IADC addressed both. IADC left it up to the regulatory system to determine how one was weight versus the other. He said that the UK looked at loss of three lives in a single event as a major hazard and would require a full-blown hazard analysis, but thresholds could be set however you wanted.

OESC Member Christopher A. Smith (DOE) asked if a relatively high bar was needed to do a "bow tie" for every event in order for it to be manageable.

OESC Member Nancy G. Leveson (Academia) stated she disliked the bow ties because it oversimplified things, and assumed that all the events and barriers were independent. In DWH, there was poor maintenance, time pressures, and other things that had all kinds of dependence on each other. So this seemed unrealistic.

Alan E. Spackman (IADC) responded that software was available that allowed you to interlink the barriers for bow ties so you could manage the maintenance program across the entire rig.

OESC Member Nancy G. Leveson (Academia) stated that she investigated a number of accidents where the risk assessment or analysis showed that the incident could not have happened, so she was skeptical of some of the models because when you looked at real accidents, and discovered that was not what happened.

Alan E. Spackman (IADC) responded that was why they needed to be audited appropriately during their implementation and the quality of the assumptions made questioned.

OESC Member Nancy G. Leveson (Academia) stated that the qualitative assessments were just as bad as the quantitative ones.

Alan E. Spackman (IADC) responded the US needed to balance goal setting versus prescription. The existing regulation considered compliance with BSEE (formerly Minerals Management Service) regulations to be best available and safest technology (BAST) was wrong, and you also could not be "free" of all hazards.

A Committee member asked who had the ultimate responsibility when there was a bridging document with an operator and a contractor.

Alan E. Spackman (IADC) responded that there were legislative and regulatory constraints that would have to be adhered to. BSEE would probably ultimately have to make that call. He abstained from identifying who was responsible because it was the subject of ongoing litigation.

OESC Chairman Thomas O. Hunter asked the OESC industry members how far this was from where the US was today.

A Committee member responded that they thought industry would have significant challenges taking the UK safety case into the US. But many people used the bow tie methodology/analysis. It could work well if you focused on the major risks versus tackling all the risks out there.

OESC Chairman Thomas O. Hunter quoted Eisenhower, "plans are not important, but planning is, since that means everyone has talked to each other" to emphasize the importance of ensuring there was a good relationship between industry and the regulator.

DFO Joseph R. Levine (BSEE) thanked Mr. Spackman for his presentation and observed that quite a bit of the presentation was under the purview of the SMS Subcommittee, i.e., what kind of SMS to recommend to BSEE.

OESC Chairman Thomas O. Hunter also thanked Mr. Spackman and stressed the importance of presentation and Committee discussion and the potential tie-in to the three vectors the SMS Subcommittee proposed. He said there were a lot of soft factors within safety culture that really mattered such as a partnership or some desirable relationship between regulator and industry. Without that, no matter how complicated the system in place was it would not work.

Committee Discussion on Subcommittee Interim Recommendations

OESC Chairman Thomas O. Hunter noted time was set aside on the agenda for the OESC to determine next steps for the areas of focus (vectors) identified by each of the subcommittees.

A Committee member stated he would like to end the meeting on the 8th with a clearer idea of what each subcommittee and ultimately the Committee was attempting to accomplish in terms of product/recommendation(s) to the Secretary of the Interior.

OESC Chairman Thomas O. Hunter agreed and recessed the meeting.

Tuesday, November 8, 2011

Committee Action on Subcommittee Interim Recommendations
Spill Prevention

OESC Member Donald E. Jacobsen (Offshore Energy Industry) led Committee discussion on spill prevention recommendations/vectors: 1) Recommendations to BSEE on regulations and enforcement; 2) R&D for spill prevention; and 3) Automated systems to improve prevention of loss of well control (including instrumentation systems).

Subcommittee members stated that number 2 and 3 were broad in definition, however doable by the next full Committee meeting. Number 2 might require a workshop run by the Subcommittee. Number 1 would be an area to evaluate as more regulations were developed in the future.

Spill Containment

OESC Member Richard A. Sears (NGO) led Committee discussion on spill containment recommendations/vectors: 1) Organizational and systems readiness for containment response; 2) Instrumentation and data to diagnose mechanical condition of well loss control; 3) Assessing and mitigating risks posed by underground blowouts; 4) Secondary capabilities and systems for back-up BOP operations; and 5) Containment scenario planning.

Subcommittee members viewed number 1 and 2 as the easiest and most specific to accomplish first and number 3 would be the toughest due to large amount of theoretical data required to be reviewed. Number 4 needs to be framed better to address the actual problem. Number 5 might resolve itself since the work is occurring already within the Marine Well Containment Company (MWCC) and the Helix Group.

Spill Response

OESC Member Patrick E. Little (USCG) led Committee discussion on spill response recommendations/vectors: 1) Arctic risk assessment, preparedness, and response; 2) Cascading of equipment; 3) Full-scale testing; and 4) Interagency coordination.

Subcommittee members viewed number 1 as the most significant and determined it would require most time to accomplish; although they viewed the Arctic as having the highest priority. The Arctic also contained the largest number of issues and would require prioritization. Numbers 2-4 each could be completed within one year's time.

Safety Management Systems (SMS)

OESC Member Joseph M. Gebara (Offshore Energy Industry) led Committee discussion on SMS recommendations/vectors: 1) Implementation safety culture; 2) Implement an optimum

SMS to continuously improve safety performance; and 3) Develop a learning environment to foster continuous improvement.

Subcommittee members planned to be able to define what they looking were for in "implementation of a safety culture" by the next meeting. They felt that number 2 would entail working on understanding how far SEMS went and then put together a facility-specific safety management document. They noted the overlap with other subcommittees, especially on the prescriptive versus performance regulations. Number 3 related to leading indicators and lagging indicators. There was some suggestion that although this recommendation was for the government, it was not just about the government, but also how government could encourage industry to do better.

Arctic Discussion

OESC Chairman Thomas O. Hunter posed the question to all the subcommittees regarding how much work it would take for each one of them to apply activities in each of their vectors to address the arctic.

In regards to Prevention, Committee members viewed spill prevention concerns as not necessarily unique to the Arctic. The basic techniques and equipment were the same for the Arctic as in other regions.

In regards to Response, Committee members viewed spill response issues notably different in the Arctic. There were various responsibilities and experience from different Committee members that could provide expertise on these issues. R&D would be very important for the Arctic as more development occurred. It makes sense for the Subcommittee to review issues concerning the Arctic. The same basic technologies for the response efforts already existed.

In regards to Safety Management Systems, Committee members believed arctic issues should be viewed as incidental in terms of workload.

In regards to Containment, Committee members agreed that spill containment presented challenges. Specifically, a situation like drilling and completing relief wells while encountering difficult weather conditions was a major concern. There needed to be a considerable amount of work on containment scenario planning in the shallow waters of the arctic. Much of the containment and capping stack equipment only worked in deep water, not shallow. The current MWCC and Helix Group were not designed to work or were deployable in the Arctic easily.

OESC Chairman Thomas O. Hunter added two new vectors for Committee consideration, one on American universities, and one on cooperative development regarding an Institute. There were a total of seventeen vectors for full Committee consideration (Appendix XI).

Department of the Interior Remarks

Secretary Kenneth L. Salazar (DOI) spoke about the importance of arctic lease sales and the international dialogue focusing on the arctic (Appendix XII). The role of the Committee should

be to provide insight into what areas DOI should focus on as development occurred. He expressed interest in hearing the Committee's opinion on the idea of an ocean energy safety institute. He viewed the Committee as a vital forum to advise and collaborate on various issues.

Director Michael R. Bromwich (BSEE) viewed the Committee as an advisor to BSEE on stepping up aggressive enforcement efforts (Appendix XIII). In addition, he expected the Committee to provide important insight into largely unexplored areas throughout the arctic. He stressed, collaboration was key to the success. The ability to define rule and the ability of enforcement is very important, but both are works in progress. He anticipated both long and short-term insight into issues such as permitting and Arctic response.

Presentation on BSEE Incident Data Analysis (Losses of Well Control on US OCS)

David O. Izon (BSEE) informed the Committee that there was a change in the report rule in 2006 (Appendix XIV). There appeared to be an increase in loss of well control events; however, that was because there was more information collection occurring. Sixty-five Lost Well Control (LWC) events occurred since 2001; twenty-six during drilling operations, out of 7,701 wells drilled. Since 2006, that rate was one per 273 wells being drilled. He did not have total number of plugging and abandonment (P&A) work performed, so that rate was not available for presentation. There were thirty-two LWC events in total since 2006, seven of which were in water deeper than 1000 feet. Rate was one LWC per 192 wells.

He stated that LWC event causes were submitted by industry; the government did not determine them. Often they were classified as "other" when the reason given does not fit into the other categories. For Macondo, it was classified as cementing and some human error.

Committee members questioned when government inspected the event and what happened to the operator. They wanted to know what information was not being reported by industry.

David O. Izon (BSEE) replied BSEE district offices conducted investigations when an event occurred. It depended on the incident, which then caused BSEE to act on a way to investigate.

Proposed Rule: Revisions to SEMS (BSEE Proposed Rule on SEMS II)

David M. Nedorostek (BSEE) explained that SEMS required all employees to be trained in all thirteen elements, and SEMS II added four more elements (Appendix XV).

OESC Member Nancy G. Leveson (Academia) asked whether there was an ability to receive any anonymous feedback on whether these things were operationally effective.

David M. Nedorostek (BSEE) responded, BSEE had anonymous reporting of unsafe work conditions, and that would be a way for employees to report something like this. Reporting Unsafe Work Conditions, for example, applied to contractor employees as well.

OESC Member Joseph M. Gebara (Offshore Energy Industry) asked if in instances where stop work authority (SWA) must be a line item on an operator's Job Safety Analysis, whether it would be the lease operator or the rig operator.

David M. Nedorostek (BSEE) responded, BSEE intended it to be operator, but when it came to the bridging documents it was up to the operator to decide exactly how that would be carried out. Employees would be provided with a toll-free number for BSEE's Investigations & Review Unit.

SEMS Compliance – Stone Energy Corporation (Stone)

Gene P. Cella (Stone) explained Stone's strategy as it related to compliance with BSEE's SEMS requirement (Appendix XVI).

He reminded the OESC of SEMS information that was addressed in earlier presentations: 1) SEMS was a BSEE requirement; 2) Each operator was required or must have a SEMS program in place; and 3) Based on API RP 75, there was a line in the sand for compliance by November 15 and it applied to all those OCS oil and gas operations under BSEE jurisdiction.

He stated Stone had a SEMS in place prior to the SEMS requirement, so it did not start with a blank sheet of paper. Stone viewed this as an opportunity to update its documentation; and an opportunity to consolidate its programs and practices through electronic systems to provide its employees and contractors with quicker access to its program.

Stone worked the transition to SEMS as a project utilizing an operationally based work team and, again, utilized a web-based system. He mentioned that Stone was a member of the Offshore Operators Committee (OOC), the Center for Offshore Safety (COS), as well as National Ocean Industries Association (NOIA) to ensure alignment with industry.

He stressed Stone had very robust programs in place to run Management of Change, around safe work practices, energy response, incident investigation. It utilized and mapped out those programs to demonstrate compliance with SEMS. So, that was the process it went through from a SEMS perspective.

From a strategic perspective, Stone evaluated the SEMS requirement; conducted gap assessments to see where it needed to make some improvements; worked this as a project utilizing operationally based work team. He felt that was critically important. Stone identified all of the accountable parties to really work on its elements and to make sure that they made sense. Stone peer reviewed those elements to make sure that it was headed in the right direction.

He stated that the bridging documents and agreements were new, as per SEMS. It was a matter of identifying what practices Stone was going to follow as contractor-operator when conducting work in OCS waters.

Stone evaluated the OOC tool kit which provided example agreements, training matrices, audit protocols, those types of things that best met Stone's need. From a production operations and a rig operations perspective there were no major items or issues identified in the hazard analysis.

From a production operations perspective, Stone had an opportunity to update some of its platform drawings. From a rig operations perspective, it was an opportunity to improve document control a bit and also utilize SharePoint to better organize Stone's data from a document control perspective.

He mentioned that Stone recently received Notice-to-Lessee (NTL) 2011-N09. The document provided interpretation and clarity around SEMS that would have assisted Stone greatly if it was received a bit earlier, particularly with Stone's development implementation. He said Stone was evaluating the NTL right to determine if it would have an impact on Stone's implementation plan.

He said Stone also felt that operators should be given a grace period regarding SEMS compliance. The initial audits should provide warnings rather than incidents of noncompliance. There would be interpretation issues with the SEMS requirement and Stone's plea was that BSEE worked with them as they learned together. He emphasized that a key ingredient to success of SEMS is the HSE culture of an organization.

OESC Chairman Thomas O. Hunter thanked Mr. Cella for an excellent summary and opened the floor for questions. He asked in the absence of SEMS I and now SEMS II, if Mr. Cella had to characterize the extent of the effort required to build on an existing program as significant or modest.

Gene P. Cella (Stone) replied, even though Stone built on existing programs it was a massive effort. There was quite a bit of workforce involved in updating documentation. And, again, Stone's operationally based work team was about a 15- to 18-person team consisting of manager supervisors and folks from the field.

OESC Chairman Thomas O. Hunter reminded Mr. Cella of the question that OESC Member Leveson raised earlier in the meeting regarding SEMS deployment. Certainly operational accidents and workforce protection were addressed. He asked if major accidents like a Macondo or something like that allowed a mechanism to focus on those decisions as well.

Gene P. Cella (Stone) said Stone's SEMS addressed both personal safety and process safety. It was Stone's belief that it would take a robust SEMS as well as the right HSE culture in an organization to prevent incidents such as the Macondo incident.

OESC Chairman Thomas O. Hunter said the OESC's SMS had been working on this issue. He said a poor Operational Safety Program would likely have an opportunity for big incidents (reasonable causality). He inquired if a good program would be better protected against major accidents and major human error or things that the OESC heard about in earlier presentations. His concern was people could have a really good Operational Safety Program, but the big issues would not get addressed. He asked if Mr. Cella felt that was a reasonable fear.

Gene P. Cella (Stone) felt Stone's challenge was behaviors. He said you could have the best program, the best practice in place, but if you had the wrong behaviors, that was where it could go wrong.

SWA was something that Stone took very seriously. Stone had a SWA in place for a number of years. It was Stone's expectation that anybody on the site that was not comfortable with the way work was progressing, be it personal safety, be it process safety, they had the right to stop that job.

Prior to the SEMS requirement coming into play, Stone had a Safety Observation Program called Observe and on the Observe card there was a space to actually fill in whether work was stopped that day and a brief description of the work that was stopped. Stone evaluated that information on both a daily and a monthly basis.

OESC Member Donald E. Jacobsen (Offshore Energy Industry) thanked Mr. Cella for a great summary and asked if Stone's safety management, safety culture, was rated on a scale of one to ten a year ago would that rating change as it was now, post implementation of SEMS.

Gene P. Cella (Stone) responded, Stone would see improvement because it had a large population of its workforce involved in enhancing the documentation. It was rolled out and now Stone had heightened awareness in its organization, which was always a good thing. He felt you would see good results just based on that.

OESC Member Charles R. Williams II (Offshore Energy Industry) commented on SWA – it was like all these systems-based tools, it took the whole system to work. Another key part of the system was many people had a well-designed process, a well-defined, well designed process that went through well drills on paper and other exercises, and a key part of that exercise was all of the contractors involved in drilling that well were actually familiar with the well plan and what you were trying to accomplish there. It was really tied into bridging documents. He concluded, a key part of stopping work was preplanning and including everybody in understanding what you were trying to accomplish.

OESC Member Richard A. Sears (NGO) asked how much of what Stone had done so far felt like compliance as opposed to an opportunity for improvement and change.

Gene P. Cella (Stone) responded, the deadline of November 15th really focused them, although they had a lot of it in place beforehand.

OESC Member Taduesz W. Patzek (Academia) asked how Stone handled competing priorities.

Gene P. Cella (Stone) responded, that Stone put safety of personnel first, then environmental protection next, then compliance third, followed by production and cost. That was the priority order for all Stone operations.

OESC Member Joseph M. Gebara (Offshore Energy Industry) asked how Stone communicated with the personnel onboard of the facility. He also asked what format was used to communicate the SEMS requirements. Finally, he asked what the guidelines were that they had to follow in the operation on board the platforms.

Gene P. Cella (Stone) said that every one of Stone's offshore employees was brought in twice a year for all-day meetings to focus on safety. The entire offshore workforce was brought in in May and September and a large part of that meeting was sharing with them the SEMS program and their expectations as Stone moved forward.

OESC Chairman Thomas O. Hunter thanked Mr. Cella for his presentation. He said that it was a great amount of insight. He concluded from listening to it that it was a doable do and it was reasonably aligned with Stone Energy and its values, but there were a few areas where Mr. Cella would like to see some attention paid, like deadlines, and such. If SEMS II was implemented, it would be a little more complicated. He stated the OESC's meeting agenda would not allow them to delve deeper than that, but asked if his understanding was accurate – it aligned with Stone Energy well enough that deployment was of assistance to and was not so onerous that you could not accommodate and improve at the same time.

Gene P. Cella (Stone Energy) confirmed that was correct.

Presentation on Drilling Safety: Off-Rig BOP Monitoring – Ashford Technical Services (ATS)

Frank M. Chapman (ATS) discussed his beliefs that the industry had recognized that cycle-based maintenance was more appropriate than time-based maintenance (Appendix XVII). Time was fine if you had some device that had a predictable number of cycles, such as pumps. But that was not what had been seen with BOPs. Most operators already collected well data at an onshore site, so why not include BOP data in there as well?

OESC Chairman Thomas O. Hunter asked who made the decision about what instrumentation was needed on a BOP stack.

OESC Member Paul K. Siegele (Offshore Energy Industry) responded that a real-time monitoring thing was on the rig floor. But what was being proposed here was a maintenance system that was actually based on use. He stated that his company used time based approach versus cycle based maintenance. He asked whether that was why his company did not know what the cycle lifetime was. He asked how long it would take to develop the data on cycles.

Frank M. Chapman (ATS) responded, yes and Stone did not know what was wearing out. The data collection needed to start now and might take two to three years.

OESC Chairman Thomas O. Hunter stated that with DWH there was no measurement of ram position. He asked who would decide whether that should be on there, if it was possible to do.

OESC Member Richard A. Sears (NGO) remarked, he thought the market would decide. But it was not a huge marketplace with lots of manufacturing and lots of opportunities for development, so things moved slowly. He added that there was a lot of data gathering opportunity misses, such as the fact that no one checked the batteries when they pulled them to see if they were really worn out or if they were still good. He thought the industry was really focused on a prescriptive maintenance schedule.

OESC Member Charles R. Williams II (Offshore Energy Industry) said ultimately the rig owner decided what instrumentation they needed.

OESC Member Christopher A. Smith (DOE) asked if any of ATS's work looked into real-time decision making instead of just maintenance schedules.

Frank M. Chapman (ATS) responded, ATS was focusing on it more as a tool for managing the process on a continuing basis, but not so much for real-time decisions.

Summary of Findings of the DWH JIT

Michael D. Farber (BSEE), Kirk H. Malstrom (BSEE), Captain David S. Fish (USCG), and Steven Venckus (USCG) provided a brief summary of the DWH JIT findings (Appendix XVIII). USCG had fifty-something recommendations. The Commandant rejected nine of those for various reasons. It was mentioned that during the week of November 14, JIT would be meeting with USCG's offshore industry FACA. Volume 1 of the report addressed the vessel and Volume 2 addressed everything down below. From JIT's perspective, it was a failure of the safety management systems of the lease operator and rig operator.

For the most part, the systems and organizational defenses worked. One hundred fifteen people were saved because many of the safety recommendations from the past worked. Now it was time to figure out how to turn the DWH experience into new practices. In the Gulf, there was a 50/50 split between US flagged vessels and foreign flagged vessels. Better promotion was required for MODU standards through the International Maritime Organization.

A Committee member asked if there were any legislative recommendations.

Michael D. Farber (BSEE) responded, no. JIT focused on recommendations to the agency and industry.

OESC Member Christopher A. Smith (DOE) stated there was a discussion in the Presidential Oil Spill Commission about whether or not the effort to fight the fire contributed to the eventual sinking. He asked whether JIT came to a conclusion as to the root causes of the buckling of the drill pipe.

Michael D. Farber (BSEE) replied, in regards to the BOP, the JIT conclusions lined up with Det Norske Veritas (DNV) largely. But DNV found or believed that the forces from down in the well caused the buckling. The JIT found that it could have been from the bottom, or forces from the weight of drill pipe from above, caused the buckling. But JIT could not conclude which one was the true cause.

OESC Member Joseph M. Gebara (Offshore Energy Industry) asked if BSEE and USCG learned anything about how the memorandum of understanding (MOU) between the two agencies might need to be adjusted.

USCG responded that they were currently working on seven MOUs with BSEE.

Presentation on SEMS Development and Implementation - Shell

W.E. "Skip" Koshak (Shell Exploration and Production Company) stated that Stone's approach to SEMS was very similar to how Shell and the majors approached it as well. The view from Shell is that the industry community was in this together (Appendix XIX).

There was still some ambiguity, but that was okay, since there would always be some level of ambiguity when you moved to performance or goal oriented approaches. If you could not get to an understanding of what the goals were, you had to be a bit more prescriptive.

He highlighted the distinction between Shell's relationship with the drilling contractors and with the production contractors. By and large Shell and many of the other major companies had a bridging mechanism that essentially adopted the drilling company's processes and procedures, and essentially their SEMS programs because of their direct control over drilling operations.

He stressed, bridging documentation was a critical component, but, again, thinking in terms of those smaller contractors, the same type of bridging documentation would not be used for other companies. They had to be able to tailor and modify as appropriate.

Major companies were ensuring that they could integrate SEMS while at the same time contemplating what impact SEMS II would have. It was somewhat of a moving target.

He said industry was preparing for some new unknowns 1) new BSEE and BOEM worlds, since both of the agencies had inspectors; 2) inspection protocol; 3) effect of retiring work force (Federal knowledge base headed out the door); 4) overall response of the contracting community (roles and responsibilities); 5) competency, training and certification (major companies could be responsible for training the small contractors); and 6) role of the COS (contractor accreditor, third-party inspector accreditor, etc.).

OESC Chairman Thomas O. Hunter asked Mr. Koshak what his view was on independent third-party audits and the non-review or the lack of review of plans (use audit process for review) concepts.

W.E. "Skip" Koshak (Shell E&P Company) said SEMS II, as proposed, did not require that an operator submit a SEMS plan, that it be verified, certified, approved by BSEE and then industry would implement it.

DFO Joseph R. Levine (BSEE) added, neither did SEMS I. SEMS II was just an add-on to SEMS I. It did not require plans.

W.E. "Skip" Koshak (Shell E&P Company) continued, his response to that was it actually led to a collaborative performance/goal-based environment, to a degree, that Industry was hoping to continue to move toward. What he meant by that was there had to be a level of trust between the

regulator and the regulated, otherwise every single thing that industry did would require someone looking over its shoulder.

In regards to the independent third-party, he was not all that familiar with the USCG model, but had heard a couple of times that the USCG actually pre-certified third party auditors. He would be fine with the concept as long as there was a healthy degree of separation between the auditing entity and the audited entity. Either the COS would probably be the likely candidate to do that, but there ought to be an entity that could ensure that the degree of separation existed and could ensure that the auditor had the competency that was required to perform the audit.

OESC Member Charles R. Williams II (Offshore Energy Industry) spoke on behalf of COS. COS fully intended to have training and verification of third party auditors that audited SEMS systems. They were currently working on making that happen. He reminded the Chairman that SEMS was written in the early 1990s and many major companies had SEMS systems for all that. Major companies have been self-auditing those systems with their own auditors because they wanted to know that they were working as well. He felt good about industry's own internal auditors independently auditing in their own internal system. So using third party auditors, he felt could work as well because encouraged by the good results from the internal auditors.

DFO Joseph R. Levine (BSEE) thanked Mr. Koshak for his efforts and opened the floor for public comments.

Public Comment

The Committee received public comments from Ian S. Sutton, Amec Paragon (Appendix XX); and Michael Craig, Independent Citizen (Appendix XXI).

API Standards

Rick Graff (Chevron Gulf of Mexico Deepwater Exploration) provided an update on the Joint Industry Task Force(s) and API standards 96 and 97 (Appendix XXII). He stressed, any opinions he gave would be his opinions and should be considered that as a member of the general public since he was an API member, not an API employee.

Four Joint Industry Task Forces (JITFs) were created in 2010 that addressed prevention, intervention, and spill response. He focused on the Operating Procedures Task Force which fell under the prevention category and invited the Committee to ask questions as needed throughout his presentation.

He explained, the Well Construction Interface Document (WCID) – API Bulletin 97 addressed all the elements in the conventional bridging document, plus alignment of the drilling contractor's management of change and risk assessment to the lease operator's management change and well execution risk assessments. The WCID also talked about the safety case.

OESC Chairman Thomas O. Hunter asked if the Safety Case terminology used was the same as used in European model.

OESC Member Charles R. Williams II (Offshore Energy Industry) asked if "European" meant the "UK HSE Safety Case.

Rick Graff (Chevron Gulf of Mexico Deepwater Exploration) replied, the only place Safety Case has been mentioned in the document was in the original directive. Safety Case was removed from the WCID document because the preferred approach was SEMS with full responsibility on the operator. Contractors Safety and Environmental Management System (C-SEMS) would interface with WCID, which would interface with the Lease Operators SEMS (O-SEMS), which included the well base design, execution plan, and the risk assessment. As directed by vote of fifteen affirmative and four negative.

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OESC Member Joseph M. Gebara (Offshore Energy Industry) asked whether the ballot process was through API. If so, was the vote among API members represented?

Rick Graff (Chevron Gulf of Mexico Deepwater Exploration) replied, yes and comments were received from non-voters as well. For example, BSEE made comments.

OESC Member Joseph M. Gebara (Offshore Energy Industry) asked how many OESC members had seen the ballot.

Three of the four offshore energy industry OESC representatives confirmed viewing the ballot.

Rick Graff (Chevron Gulf of Mexico Deepwater Exploration) offered to put all OESC members on the electronic mailing list to receive documents that would be balloted.

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OESC Member Charles R. Williams II (Offshore Energy Industry) commented that the API standards process was American National Standards Institute (ANSI) certified. He explained ANSI was a separate group that certified that an open standards development process was in place to ensure all interested parties were allowed to participate in commenting on and creating standards.

DFO Joseph R. Levine (BSEE) stated that BSEE was very actively engaged in the review and comment process as a non-member member.

OESC Member Charles R. Williams II (Offshore Energy Industry) asked if it was important for the WCID that the drilling contractor used the IADC HSE Case.

Rick Graff (Chevron Gulf of Mexico Deepwater Exploration) replied, the IADC document was referenced, but the Safety Case part of the IADC document was not used.

OESC Member David G. Westerholm (National Oceanic and Atmospheric Administration – NOAA) asked whether there would be potential for comments received to actually change some aspect or some direction. For example, would there be a re-vote or would API just go ahead with affirmative vote.

Rick Graff (Chevron Gulf of Mexico Deepwater Exploration) replied, all comments were reviewed and if warranted they would be incorporated into the document for potential re-ballot.

OESC Chairman Thomas O. Hunter stated he was familiar with the ANSI structure, but not with the API structure. He asked whether an API member was representing and voting on behalf of their company.

Rick Graff (Chevron Gulf of Mexico Deepwater Exploration) replied, yes members were representatives of their company and each company had one vote.

He continued, RP 96 – deepwater well design and construction was originally well design considerations, but when API went through the considerations it wound up getting into the construction part of it.

It reviewed deepwater rig systems and BOPS. This shows how the rig type and what environment it's used in affects the well design. We have examples of current deepwater well architecture and the Barrier Philosophy.

OESC Chairman Thomas O. Hunter stated that OESC Member Siegele had a concern at one point about full reservoir fluid, column densities, and well casing design. He asked if it was resolved in the latest version of RP 96.

OESC Member Paul K. Siegele (Offshore Energy Industry) replied, he thought it was still an open set of debates among the industry task forces and BSEE, and one of the key things that were being resolved through this discussion was determining what the gradients to be used in the calculation were. In other words, if you had regional knowledge about what the fluid types were, what the likely API gravities were, that affected the gradients that you could justify to the regulator as to what should be used for the design criteria. If you did not have access to that, then you would use default data, some of which might lead you to overdesign.

DFO Joseph R. Levine (BSEE) added it was his understanding that it was not addressed in this document. It was the containment tool, correct?

OESC Member Charles R. Williams II (Offshore Energy Industry) clarified the document they were trying to refer to as a containment tool was that determined the cap-ability of the well was actually a cap-ability determination tool.

Rick Graff (Chevron Gulf of Mexico Deepwater Exploration) continued, RP 96 addressed quite a few things in great detail, so the balloting process was sent out for re-ballot after a thorough review of 1,100 comments received. Re-ballot comments were due back on November 18th. If all of the comments were not addressed, then another re-ballot period would be initiated. If all of the comment were addressed, a simple e-mail stating the problem(s) was addressed and document would be sent for publication.

OESC Member Christopher A. Smith (DOE) revisited discussion about the tool being a tool to determine the cap-ability of a well, not being a design tool. He asked whether design tool was used in implementing the steps driven by the tool itself, the design of the well.

Rick Graff (Chevron Gulf of Mexico Deepwater Exploration) replied, that was correct before Macondo --

OESC Member Charles R. Williams II (Offshore Energy Industry) pointed out another significant thing was that most design around wells was driven around burst and tension because that was the normal load on a well (industry terminology - Quadrant 1), which was burst and tension. When you get into the cap-ability tool, it would drive you to a completely different quadrant and so the cap-ability tool drives a design choice and drives being in a quadrant, you know, that wasn't part of the design process previously.

Rick Graff (Chevron Gulf of Mexico Deepwater Exploration) continued, all the testing done for his company was for burst and tension up until two years ago. Now all the testing done was for collapse and compression loads. Because the very high collapse loads you saw, like 8,000 pounds, was very significant and required a total redesign for it to meet these loads.

OESC Chairman Thomas O. Hunter asked for terminology clarification for the record on whether the screening tool Mr. Graff mentioned was the same well containment screening tool that BSEE showed the OESC at the New Orleans meeting in July 2011.

OESC Member Charles R. Williams II (Offshore Energy Industry) and Mr. Graff both replied, he was correct for the record.

OESC Member Walter D. Cruickshank (BOEM) inquired about the inability to drill to 36,000 feet. He asked whether it was a consequence of the choice to design the well for cap-ability. If there was a cap and flow scenario and a company was comfortable with, would it be able to drill to a deeper depth.

Rick Graff (Chevron Gulf of Mexico Deepwater Exploration) replied, that was an excellent point. A meeting was held with Argonne National Lab (ANL) to discuss this very issue. It was recommended several times to the operators there that they all re-examine the cap and flow case by BSEE versus the cap and contain mode.

OESC Member Stephen H. Hickman (U.S. Geological Survey – USGS) added the cap and flow presumably was dependent upon worst-case discharge calculations, pressure drops along the string and annuli and all that, it was going to have some impact.

Rick Graff (Chevron Gulf of Mexico Deepwater Exploration) replied, right. You had to keep your pressure below where you would fracture to the surface and once these strings started breaking, they would just domino up until you get basically to your 22-inch casing. At your shallowest casing shoe, you had to look at what the fracture gradient was there, stay below that, and then you had a flow case, which was pretty significant volumes, but, again, BSEE had been

looking at more cases than any one company has. They looked at them all and they were giving us encouragement.

OESC Member Charles R. Williams II (Offshore Energy Industry) added, these cap and flow systems could choke the well. So, you demonstrated that your choke flow stayed within the capacity of the cap and flow system and within the capacity of your casing.

OESC Member Paul K. Siegele (Offshore Energy Industry) assisted Mr. Graff in answering OESC Member Smith's question regarding deepwater Gulf of Mexico well designs pre-Macondo and post-Macondo. He said there was an unintended consequence regarding the regulations on how deep operators were able to get down and what operators would have to forego in terms of resources that ought to be traded off against the risk of another Macondo-like blowout. He said the OESC ought to be very conscious about the recommendations coming out of this Committee for things like Mr. Graff was highlighting in his presentation 1) additional requirements for tolerances around cement; or 2) other well intentioned regulation that would even further limit resources. That was the trade-off discussed thought this meeting.

Rick Graff (Chevron Gulf of Mexico Deepwater Exploration) continued, that was for cap and contain; cap and flow was a different story, and that again, was dependent on the reservoir. He concluded there were a lot of other things that went into that.

OESC Member Joseph M. Gebara (Offshore Energy Industry) asked for further clarification on OESC Member Siegele's explanation. Based on the figures and the extra barriers illustrated in the design, extra barriers in the new design would be considered a safer design.

Rick Graff (Chevron Gulf of Mexico Deepwater Exploration) responded, when drilling there were two barriers: 1) the operational barrier and 2) BOPs. The physical barrier of the mud was really an operational barrier because the mud weight had to be kept up. The two barriers did not change in pre- and post- Macondo.

OESC Member Charles R. Williams II (Offshore Energy Industry) added, it was like the load case. You had to run bigger, thicker, maybe different rated casings, so it really changed the size and rating of the casing, not the number of barriers.

OESC Member Richard A. Sears (NGO) added it was the same number of barriers, but it was a more robust well.

OESC Member Stephen H. Hickman (USGS) stated obviously Macondo was a very complicated well and asked in the light of the current regulations that were being discussed how much more complicated it would have been. He followed with second question regarding specific higher risks that were brought into play by going to thicker wall casing, separate from the depth limit issue. Because the depth issue just meant you could not access as much oil and gas, it was an economics, but if you were working at a depth you could access with both technologies, the old and new regulations, what were the new unintended risks that were brought into play.

Rick Graff (Chevron Gulf of Mexico Deepwater Exploration) replied, it was not just one single answer, it was a variety of answers.

OESC Member Stephen H. Hickman (USGS) stated he was just trying to get a sense of the specific problems, and cementing was one, inadvertent fracking and losing control was another.

OESC Member Paul K. Siegele (Offshore Energy Industry) added hook loads would be a third.

OESC Chairman Thomas O. Hunter stated this was a very interesting discussion. It lit everybody up, which was good. He mentioned that an important point was made in an earlier presentation regarding P&A accidents (30 percent) were not all from drilling. He asked if there were any wells out there with casing designs that would not meet the current requirements. He asked if there were operations that could be performed on those existing wells, either in P&A or somewhere, which would put them at risk compared to the new designs. He said the focus was on drilling, but wanted to know about risks associated with the old casing designs post-drilling, post-completion, which to his knowledge could not be changed.

Rick Graff (Chevron Gulf of Mexico Deepwater Exploration) replied, you were not taking a kick for P&A, it would just be regular and should not be any issue. There would be an issue for barrier verification – the tested barrier versus the confirmed barrier, what degrees of barrier, how you tested the barriers, that was where you get into much more than the actual casing strength for a P&A or Temporary P&A (T&A).

OESC Chairman Thomas O. Hunter asked if a current well, an old well, would be in the same position that Macondo was in when the temporary plug was being put in place during P&A.

Rick Graff (Chevron Gulf of Mexico Deepwater Exploration) replied, if you did not test the barriers and the well flowed, you could be in there, but if you properly executed the barrier testing, then you would not be in that position.

OESC Member Richard A. Sears (NGO) asked Chairman Hunter if he was thinking of an old well after life of field and now going back –

OESC Chairman Thomas O. Hunter said he was assuming there might be a case where the reservoirs were still robust and there would be fairly high pressures. He was wondered if there was a problem with old wells, with old casing designs because he was struck by the number of blowouts that were non-drilling related in the earlier presentation.

OESC Member Charles R. Williams II (Offshore Energy Industry) replied, obviously the wells that were producing out there now that would ultimately need to be P&A. They had the production casing installed, and since they were in fact producing by definition, they had integrity when they were put into production. That integrity, generally, still existed, because it had the integrity and that was why it was able to be put on production.

Rick Graff (Chevron Gulf of Mexico Deepwater Exploration) said that was a good point. Any production well had to be able to withstand production loads and that was the worst case discharges and so they would always, by definition, be able to withstand – the new drilling requirements did not matter.

OESC Chairman Thomas O. Hunter thanked Mr. Graff for his presentation and Q&A. It was very illuminating.

OESC Member Paul K. Siegele (Offshore Energy Industry) commented, Mr. Graff was working on two of these JITFs. There was also 53 and 75. And the point, he was trying to make earlier when the OESC was going through the vectors for the prevention group was that the OESC needed to factor in the work that was going on with these groups because it was highly technical, it was done with the best in industry, and all of these groups were coming up with very good gaps and research direction ideas, which should serve for all of the committees as a starting point. He urged his fellow OESC members to tap into this work as they figured out the future research direction for each of the subcommittees.

OESC Chairman Thomas O. Hunter remarked that was probably the most significant learning the OESC had from having this dialogue. With all this work going on the OESC needed to be aware, and needed to take the most advantage of it and maintain active engagement with the people doing the formulation.

OESC Member Charles R. Williams II (Offshore Energy Industry) pointed out API's Draft 96 was an incredible document. It had a lot of detail. It actually was not a bad textbook for deep well engineering. He recommended that his fellow Committee members review it and it probably would be a good idea to review 97 to see all of the work that was already conducted.

Voting Process

The Committee established voting process for identifying the lowest priority recommendations/ vectors. Each Committee member had five votes to use to determine lowest priorities. They had to decide which ones were doable in a one-year timeframe or would have the least impact on the Committee.

Vectors

OESC Chairman Thomas O. Hunter wanted the subcommittee leads to reformulate the vectors given the final votes. Their respective action items were to consult with the subcommittee members and report back to full Committee.

Some Committee members viewed the voting process as everyone moving towards a containment scenario planning vector. This issue had to do with scope creep in that in the wake of DWH, people wanted to promote a research-based atmosphere.

The Arctic was another area of focus for the Committee. However, a significant portion of the Committee did not think given the amount of work required, that many of the Arctic-based

vectors were achievable in a short period. The Arctic issues were also viewed by DOI as medium to long-term issues.

OESC Member Patrick E. Little (USCG) asked what the expectations and deliverables were. He felt the reformulation process would take longer than three weeks.

OESC Chairman Thomas O. Hunter replied, the exercise was intended to determine what the members felt was achievable in a reasonable timeframe.

Next Meeting

Committee members recommended meeting during March/April timeframe in Houston, Texas.

OESC Chairman Thomas O. Hunter requested that the Committee members solidify the vectors and their definitions by the next meeting. This would assist with determining form recommendations would take and the timeline/workload for the rest of calendar year 2012. He also asked each subcommittee to determine the need for additional resources (staff support, third-party support, etc.) and how much.

OESC Chairman Thomas O. Hunter thanked everyone for their time and efforts to date and adjourned the meeting.

Dr. Thomas O. Hunter
Chairman, Ocean Energy Safety Advisory Committee

APPENDICES

I. Meeting Agenda
II. Members in Attendance
III. Public and Press in Attendance
IV. Remarks by Mr. David J. Hayes, Deputy Secretary, Department of the Interior
V. Presentation by Dr. Taduesz W. Patzek, University of Texas at Austin (OESC Member – Academia)
VI. Report by Oil Spill Prevention Subcommittee
VII. Report by Oil Spill Containment Subcommittee
VIII. Report by Oil Spill Response Subcommittee
IX. Report by Safety Management Systems Subcommittee
X. Presentation by Mr. Alan E. Spackman, Vice President, Offshore Technical and Regulatory Affairs, International Association of Drilling Contractors
XI. Summary of Vectors for Committee's Consideration
XII. Remarks by Mr. Kenneth L. Salazar, Secretary, Department of the Interior
XIII. Remarks by Mr. Michael R. Bromwich, Director, Bureau of Safety and Environmental Enforcement
XIV. Presentation by David O. Izon, Petroleum Engineer, Operational Safety Branch, BSEE
XV. Presentation by David N. Nedorostek, National SEMS Coordinator, Operational Safety Branch, BSEE
XVI. Presentation by Frank M. Chapman, President, Ashford Technical Services
XVII. Presentation by Gene P. Cella, Corporate Health, Safety and Environmental Manager, Stone Energy Corporation
XVIII. Briefing by Michael D. Farber, Senior Advisor to the Director, Investigations and Review Unit, BSEE; Kirk H. Malstrom, Petroleum Engineer, Regulations Development Branch, BSEE; and Captain David S. Fish, USCG
XIX. Presentation by W.E. "Skip" Koshak, U.S. Environmental and Regulatory Manager, Shell Exploration and Production Company
XX. Public Comment by Ian S. Sutton, Petroleum Engineer, Process Risk Management, Amec Paragon
XXI. Public Comment by Michael Craig, Independent Citizen
XXII. Presentation by Rick Graff, Senior Drilling Engineer Consultant, Chevron Gulf of Mexico Deepwater Exploration

Additional Material Distributed at Meeting

- *Federal Register* Notice – Oil and Gas and Sulphur Operations in the Outer Continental Shelf—Revisions to the Safety and Environmental Management Systems (09/11/11)
- NTL No. 2011 – N09 National Notice to Lessees and Operators of Federal Oil, Gas, and Sulphur Leases, Outer Continental Shelf (10/21/11)
- International Containment Summit April 2011 Washington DC – Tom Hunter's Notes
- Letter from Gary Kenny Managing Principal (10/27/11)
- The Use of Safety Cases in Regulation by Professor Nancy Leveson, Aeronautics and Astronautics/Engineering Systems, Massachusetts Institute of Technology
- Written Comment received from Ted Tupper (E-mail 10/31/11)
- Safety: Integrated Disaster Prevention For the Offshore Driller: Rapid Engaging Blowout Emergency Capture and Control Apparatus (10/22/11)

MEETING OF THE
OCEAN ENERGY SAFETY ADVISORY COMMITTEE
WASHINGTON, D.C.
NOVEMBER 7, 2011

The Ocean Energy Safety Advisory Committee is a public federal advisory committee consisting of 15 members from federal agencies, the ocean energy industry, non government organizations and academia who will advise the Secretary of the Interior and the Director of the Bureau of Safety and Environmental Enforcement (BSEE) on improving all aspects of ocean energy safety.

1:00 p.m. **Welcome and Introductions**
Joseph R. Levine Designated Federal Officer, BSEE
Committee Members in Attendance

1:05 p.m. **Opening Remarks**
David J. Hayes Deputy Secretary of the Interior

1:15 p.m. **Committee Remarks**
Thomas O. Hunter Committee Chair

1:30 p.m. **Outreach Update – Academia**
Tadeusz W. Patzek Professor and Chair, Department of Petroleum and Geosystems Engineering, University of Texas at Austin

1:45 p.m. **Subcommittee Reports and Interim Recommendations**
Christopher A. Smith Member, Spill Prevention Subcommittee
Charles R. Williams II Member, Containment Subcommittee
Patrick E. Little Member, Spill Response Subcommittee
Joseph M. Gebara Member, Safety Management Systems Subcommittee

3:45 p.m. **Break**

4:00 p.m. **Committee Discussion on Subcommittee Interim Recommendations**

5:00 p.m. **International Association of Drilling Contractors (IADC) Health, Safety and Environmental Case for Mobile Offshore Drilling Units**
Alan E. Spackman Vice President, Offshore Technical and Regulatory Affairs, IADC

5:30 p.m. **Meeting Recess**

MEETING OF THE
OCEAN ENERGY SAFETY ADVISORY COMMITTEE
WASHINGTON, D.C.
NOVEMBER 8, 2011

8:00 a.m. Committee Announcements
Thomas O. Hunter Committee Chair

8:15 a.m. Committee Action on Subcommittee Interim Recommendations

10:00 a.m. Department of the Interior Remarks
Kenneth L. Salazar Secretary of the Interior
Michael R. Bromwich Director, BSEE

10:30 a.m. Break

10:45 a.m. BSEE Incident Data Analysis
David O. Izon Petroleum Engineer, Operational Safety Branch, BSEE

11:05 a.m. Proposed Rule: Revisions to Safety and Environmental Management Systems (SEMS II)
David M. Nedorostek National SEMS Coordinator, Operational Safety Branch, BSEE

11:25 a.m. Drilling Safety: Off-Rig Blowout Preventer Monitoring
Frank M. Chapman President, Ashford Technical Services

11:45 a.m. Lunch

1:15 p.m. Stone Energy Corporation – Safety and Environmental Management Systems Compliance
Gene P. Cella Corporate Health, Safety and Environmental Manager, Stone Energy

1:45 p.m. Safety and Environmental Management Systems Development and Implementation – Major Operator
W. E. "Skip" Koshak U.S. Environmental and Regulatory Manager – Offshore, Shell E&P Company

2:15 p.m. Summary of the Findings of the Deepwater Horizon Joint Investigation Team
Michael D. Farber Senior Advisor to the Director, Investigations and Review Unit, BSEE
Kirk H. Malstrom Petroleum Engineer, Regulations Development Branch, BSEE
David S. Fish Captain, U.S. Coast Guard
Michael J. Simbulan Lieutenant Commander, U.S. Coast Guard

2:45 p.m. American Petroleum Institute (API) Standards:
- **API Recommended Practice 96 - Deepwater Well Design and Construction (Draft)**
- **API Bulletin 97 - Well Construction Interface Document Guidelines (Draft)**

Rick Graff Senior Drilling Engineer Consultant, Chevron Gulf of Mexico Deepwater Exploration

3:15 p.m. Break

3:30 p.m. Public Comment
Ian S. Sutton Petroleum Engineer, Process Risk, Management, Amec Paragon
Michael Craig Independent Citizen

4:15 p.m. Open Committee Discussion
- **Next Meeting**
- **New Business**
- **Summarize Action Items**

5:15 p.m. Meeting Adjourns

Appendix II

REPRESENTATIVES IN ATTENDANCE AT THE OCEAN ENERGY SAFETY ADVISORY COMMITTEE MEETING Washington, D.C. November 7-8, 2011

MEMBERS

Thomas O. Hunter	Chair
Nancy G. Leveson	Academia
Tadeusz W. Patzek	Academia
Lois N. Epstein	Non Government Organization
Richard A. Sears	Non Government Organization
Joseph M. Gebara	Offshore Energy Industry
Donald E. Jacobsen	Offshore Energy Industry
Paul K. Siegele	Offshore Energy Industry
Charles R. Williams II	Offshore Energy Industry
Walter D. Cruickshank	Bureau of Ocean Energy Management
Christopher A. Smith	Department of Energy
Mathy V. Stanislaus	Environmental Protection Agency
David G. Westerholm	National Oceanic and Atmospheric Administration
Patrick E. Little	U.S. Coast Guard
Stephen H. Hickman	U.S. Geological Survey

INTERIOR DEPARTMENT REPRESENTATIVES

Kenneth L. Salazar	Secretary, Department of the Interior
David J. Hayes	Deputy Secretary, Department of the Interior
Michael R. Bromwich	Director, Bureau of Safety and Environmental Enforcement

PUBLIC AND PRESS ATTENDEES
OCEAN ENERGY SAFETY ADVISORY COMMITTEE MEETING
WASHINGTON, DC
NOVEMBER 7-8, 2011

PUBLIC

Skip Koshak	Shell Exploration - New Orleans, LA
Ian Sutton	AMEC
David Izon	DOI - Bureau of Safety and Environmental Enforcement
Bernard Hester	Tetra Technologies, Inc.
Kathy Gaither	Sandia National Labs
Marianne Walck	Sandia National Labs
Hank Lobe	Sonardyne International
Rick Graff	Chevron - Houston, TX
Alan Spackman	International Association of Drilling Contractors - Houston, TX
Susan Gregersen	Department of Energy
Greg DeMarco	ExxonMobil
Doug Slitor	DOI - Bureau of Safety and Environmental Enforcement
Cheri Hunter	DOI - Bureau of Safety and Environmental Enforcement
Frank Chapman	Ashford Tech
Randall Luthi	National Ocean Industries Association
Lars Herbst	DOI - Bureau of Safety and Environmental Enforcement
Eileen Angelico	DOI - Bureau of Safety and Environmental Enforcement
Steven Feldgus	DOI - Bureau of Safety and Environmental Enforcement
Melissa Schwartz	Department of the Interior
Staci King	DOI - Bureau of Safety and Environmental Enforcement
Melinda Mayes	DOI - Bureau of Safety and Environmental Enforcement
Margaret Laney	BP
Michael Craig	Oceana
Gregory Washington	Chevron - Washington, DC
David Miller	American Petroleum Institute
Christopher Freitas	Department of Energy
Freridun Albyrak	IBM
Elena Melchert	Department of Energy
Brendan Klaproth	Basyuk & Klaproth
Eleanor Huffries	PEW
Raya Bakalov	DOI - Bureau of Safety and Environmental Enforcement
Ben Coco	DOI - Bureau of Safety and Environmental Enforcement
David Nedorostek	DOI - Bureau of Safety and Environmental Enforcement
Rob McKeehan	WilmerHale
Richard Morrison	BP - Washington, DC
Kyle Moorman	DOI - Bureau of Safety and Environmental Enforcement
Jeryne Bryant	DOI - Bureau of Safety and Environmental Enforcement
John Gregory	DOI - Bureau of Safety and Environmental Enforcement
Jerry Wenzel	Stone Energy
Gene Cella	Stone Energy
Robert LaBelle	DOI - Bureau of Safety and Environmental Enforcement
Doug Morris	DOI - Bureau of Safety and Environmental Enforcement
Margaret Schneider	DOI - Bureau of Safety and Environmental Enforcement
Sharon Willingham	DOI - Bureau of Safety and Environmental Enforcement

Kristin Larson	Skadden Arps
Susan Carter	ExxonMobil
D'Anne Mica	National Ocean Industries Association
Marc Montemerlo	U.S. Coast Guard
Kirk Malstrom	DOI - Bureau of Safety and Environmental Enforcement
Michael Farber	DOI - Bureau of Safety and Environmental Enforcement
David Fish	U.S. Coast Guard
Steve Venckus	U.S. Coast Guard
Timothy Sampson	Consultant
David Smith	DOI - Bureau of Safety and Environmental Enforcement
Dara Fennell	DOI - Bureau of Safety and Environmental Enforcement
Monica Glenn	DOI - Bureau of Safety and Environmental Enforcement
Ned Farquhar	Department of the Interior
Greg Wilson	Environmental Protection Agency
Christine Allen	Anderson Court Reporting

PRESS

Gary Gentile	Platts
Phil Taylor	E&E Daily
Jen Dlouhy	Hearst
David Ivanovich	Argus Media
Alan Kovski	BNA
Ayesha Rascal	Reuters
Ben Geman	The Hill
Darren Goode	Politico

Appendix IV

DEPARTMENT OF THE INTERIOR (DOI)
OCEAN ENERGY SAFETY ADVISORY COMMITTEE MEETING
WASHINGTON, D.C.
NOVEMBER 7, 2011

DOI REMARKS

DAVID J. HAYES
Deputy Secretary of the Interior

Deputy Secretary David J. Hayes (DOI): Thank you, Joe. I wanted to say a few words of welcome to the Committee. It seems appropriate that we're meeting in this room. This is an historic room. This was the Department of War in World War II. This is where the Joint Chiefs met in this room with the Joint Command with the British Generals. This was the map room and there were large tables with maps of Europe and this is where the Allies made their decisions about movements in Europe. It's an historic room and an appropriate place for this Committee to make its landing and to address the challenges of deep-water drilling. The Secretary will be here tomorrow with Mike Bromwich and we'll be eager to hear the results of your discussions here over the next day or two.

I want to at the outset emphasize how much we appreciate the incredible and hard work that I know you all are putting into this. When we formed this Committee, Tom Hunter your Chair said we're going to drive this Committee pretty hard. Is that okay? Of course, we said, sure, it's okay with us. In fact, that's exactly what we need. I hope it's okay with you because I know it's been a burden. This is a volunteer effort and we really appreciate what you're doing. I think all of us have a sense of the importance of your work because of what happened in the Gulf last year. We now know in Technicolor how dangerous deep-water drilling can be and the importance of ensuring that the government is a full player in working with industry and the NGO community in developing the best gold standard for safety and environmental response possible. This has been an area of emphasis for the administration for the last many months. The President of course earlier this year submitted to the public a Blueprint for a Secure Energy Future talking about and recognizing the continued importance of offshore oil and gas as a part of our energy economy going forward, but with the critical importance of doing it safely and in an environmentally sound manner.

I want to give you a couple of related initiatives that we are involved in where your work has relevance. First of course we have continued to reorganize our regulatory effort in this area and since this committee last minute we separated on October 1 the former Bureau of Ocean Energy Management Regulation and Enforcement into two separate entities. One, the BOEM, the Bureau of Ocean Energy Management, is the unit that is primarily responsible for leasing activity and long-range planning activities, the resource management side of the house. The other, BSEE, the Bureau of Safety and Environmental Enforcement, is primarily responsible for

safety and enforcement and the watchdog if you will. We have two directors now and we are the right standards in place and we'll be able to move forward with them.

Let me mention a couple of other related initiatives. In July the President issued an Executive Order that established an Interagency Working Group on the Coordination of Domestic Energy Development and Permitting in Alaska, a mouthful, but the point of the Executive Order was to get across the government coordination in our permitting activities for energy development in Alaska both on the renewable side and on the conventional oil and gas side. He appointed me Chair of this interagency group and we have at the table all of the relevant department with equities in this area. As we have begun our work, I am reminded as Chair of how important it is to get your input both in terms of the agencies represented here, but also the expertise from the academic community, from industry and from the NGO community so that we make good decisions when it comes to permitting activities in the oil and gas areas in particular in the Arctic. Again, a recent inflection point to reinforce the relevance and importance of your work.

Also we have been continuing to work in the international arena. The Secretary and I went to Nuuk, Greenland in May with Secretary Clinton for the meeting of the Arctic Council, the eight Arctic nations. With Secretary Clinton leading the delegation, we reinforced the relationship with the other Arctic nations and are moving forward with them to develop potential international capabilities in the Arctic dealing with spill response issues and also ecosystem-based management principles. We are committed to bringing our learning and the learning that your Committee is helping with to the international community and we now have reinvigorated some outstanding ties with other nations to facilitate that. Also of course as Mike Bromwich will discuss tomorrow, we are continuing to talk with the other nations that are involved in deep-water drilling as a follow-up to the Secretary's meeting that he had here in Washington earlier this year. Again we want to participate in creating the gold standard for deep-water oil and gas exploration and development.

Finally, in that regard, as Mike will discuss tomorrow, we will be moving forward with a rulemaking to add to the rules that we have been developing to help facilitate responsible oil and gas development. As you know, we have moved forward with rules that we put in place a year ago now to put in place the higher safety standards that we adopted again a year ago, and we also put in place new management standards required for development industry to follow. We will be looking to put in place now the next generation requirements for deep-water oil and gas drilling through an Advanced Notice of Rulemaking for, for example, features for blowout preventers and other equipment expectations that would be appropriate for deep-water oil and gas drilling. Your work will be directly relevant to the development of those rules which will proceed in an open and transparent manner with input from all interested parties.

I say these things, I review these updates and relevant developments in other forums to reemphasize and reinforce the point that you work is so important to what we are doing every day here at the Department of the Interior in terms of overseeing oil and gas development in the offshore. Thank you for that. I will stick around a little while to get a flavor for what you're doing and I know Ken Salazar and Mike will be looking forward to meeting with you tomorrow. Thank you.

DFO Joseph R. Levine (BSEE): Thank you very much, David. I'd like to hand it over to Dr. Hunter, the chairman of the committee. Tom?

OESC Chairman Thomas O. Hunter: Good morning, everyone, and welcome to our third meeting of the Ocean Energy Safety Advisory Committee. I want to make a comment on David. He's right here so I might as well comment he's here. I could equally comment when he's not here. When the story of Deepwater Horizon is told, there of course is a lot, there have been books written and all those things, but the one thing I can attest to every morning, every single morning without exception -- there are a set of people who discussed and engaged in what was going to happen that day. I can assure that every single day I participated, David was there. There was always this voice on the telephone conference call that said he was there participating and anxious to engage. If I think you go back and ask the question about how things worked in those days the summer before this, you'll conclude that it was people worked closely together -- so it was my pleasure to work for David there and to continue the relationship. David, thank you for being with us.

Academic Outreach

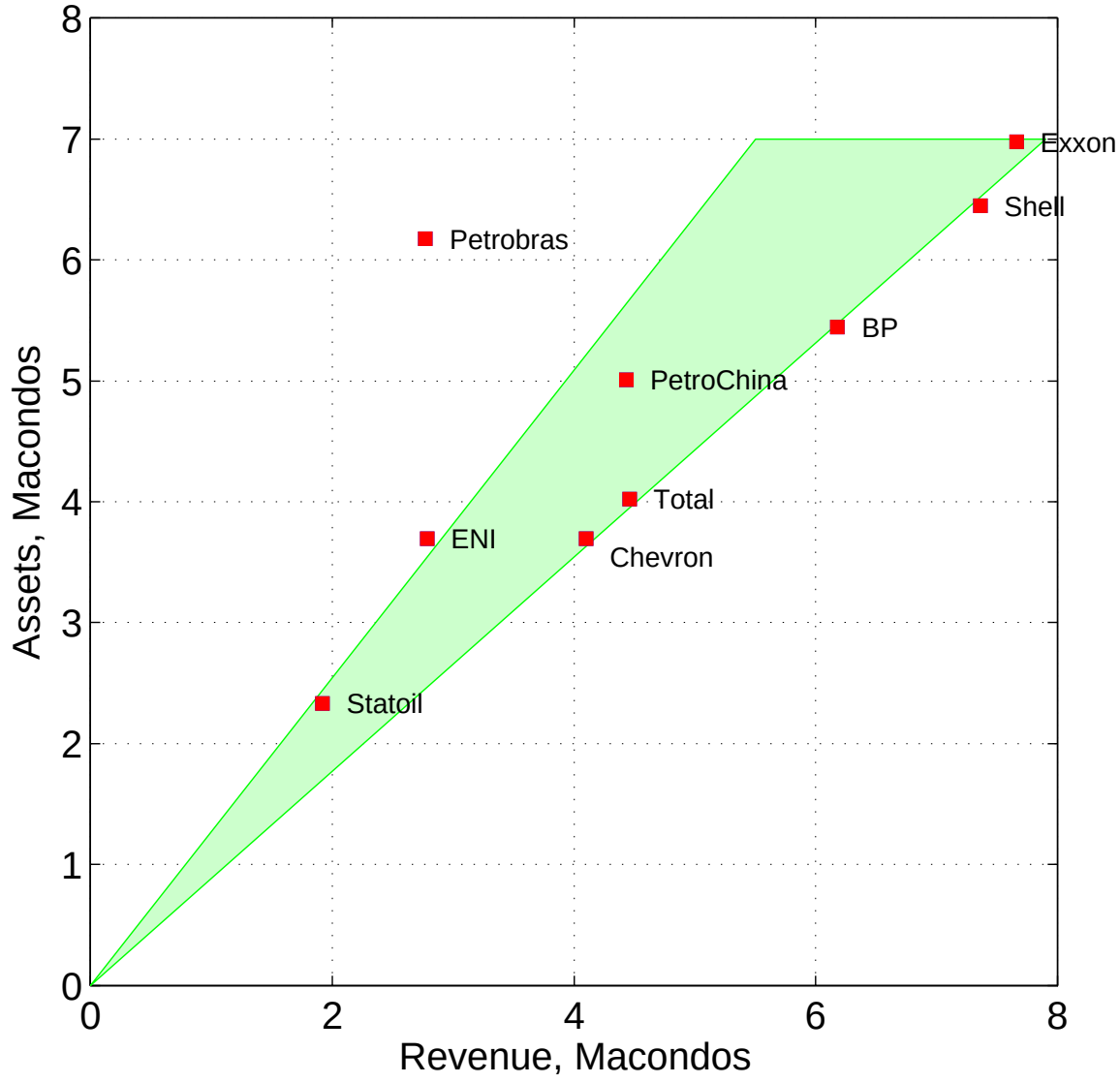
Tad Patzek, Petroleum & Geosystems Engineering, UT Austin

OESC Meeting, DOI, 1849 C Street, Washington D.C., Nov 7, 2011, 1:45 p.m.

Talk Outline

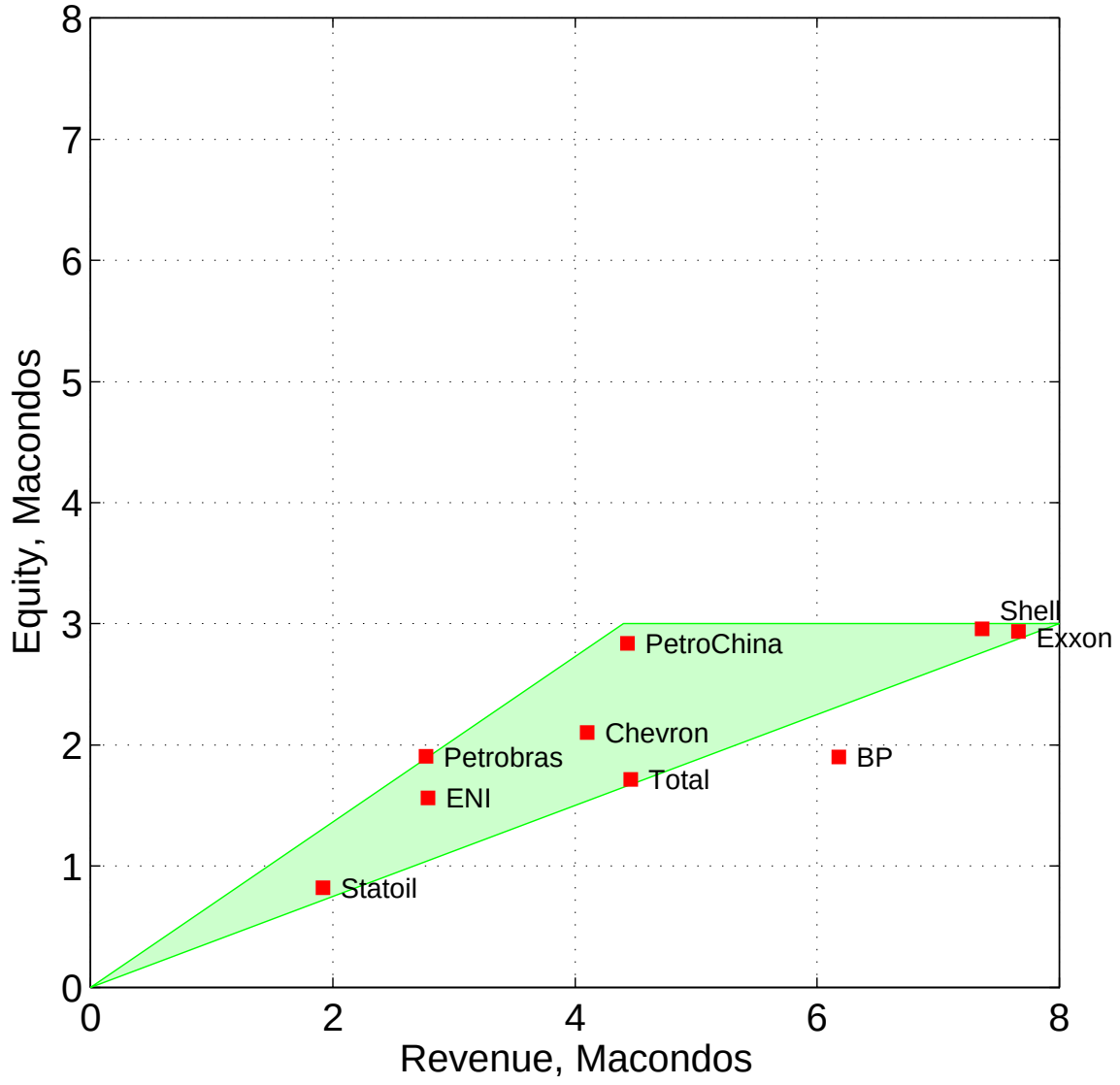
- Summary of facts and conclusions
- Possibilities of meaningful academic research in offshore safety
- State of science and engineering labor force U.S.
- State of engineering labor force, petroleum engineering in particular
- Principles of successful research
- Government and industry funding of research

Why Are We Here?



The measurement unit: 1 Macondo Accident = $50 billion

Why Are We Here?



Conclusion: It is difficult for anyone to survive a Macondo-like accident

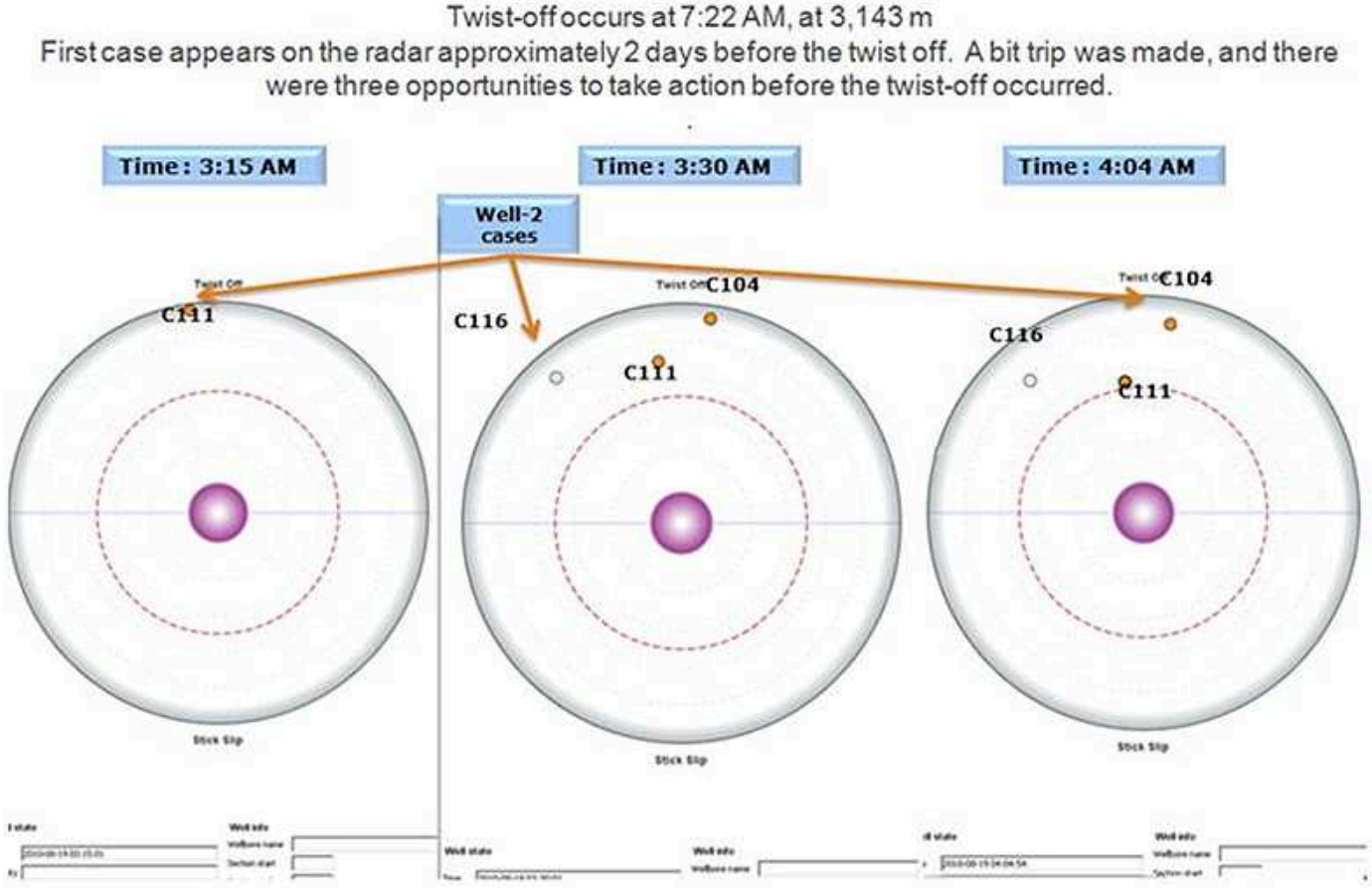
Summary of Relevant Facts

- The O&G industry and regulators in the U.S. have critical unfulfilled needs for qualified personnel
- Thus, inexperienced and nontechnical people are hired into drilling and other operations both on- and offshore
- The main danger to offshore safety is lack of experienced, coherent teams that work together for a long time
- The safety culture and procedures important, but high team turn over makes it fragile
- With increasing emphasis on remote control and supervision operations, there is even more dire need for experienced (10+ years) specialists in drilling, geosteering, mud logging, MWD, and LWD

Summary of Relevant Facts

- Given more resources, Academia in the U.S. could provide more educated and trained O&G workers
- Given more funding, Academia could develop new education technologies to provide hands-on learning-by-trying for students
- Given more research funding, Academia could develop more sophisticated physics-based models of major steps in offshore operations, and pattern recognition software to detect possible/ impending failures
- In summary, a healthy Academia could be a force vital to the industry and regulators

Pattern Recognition



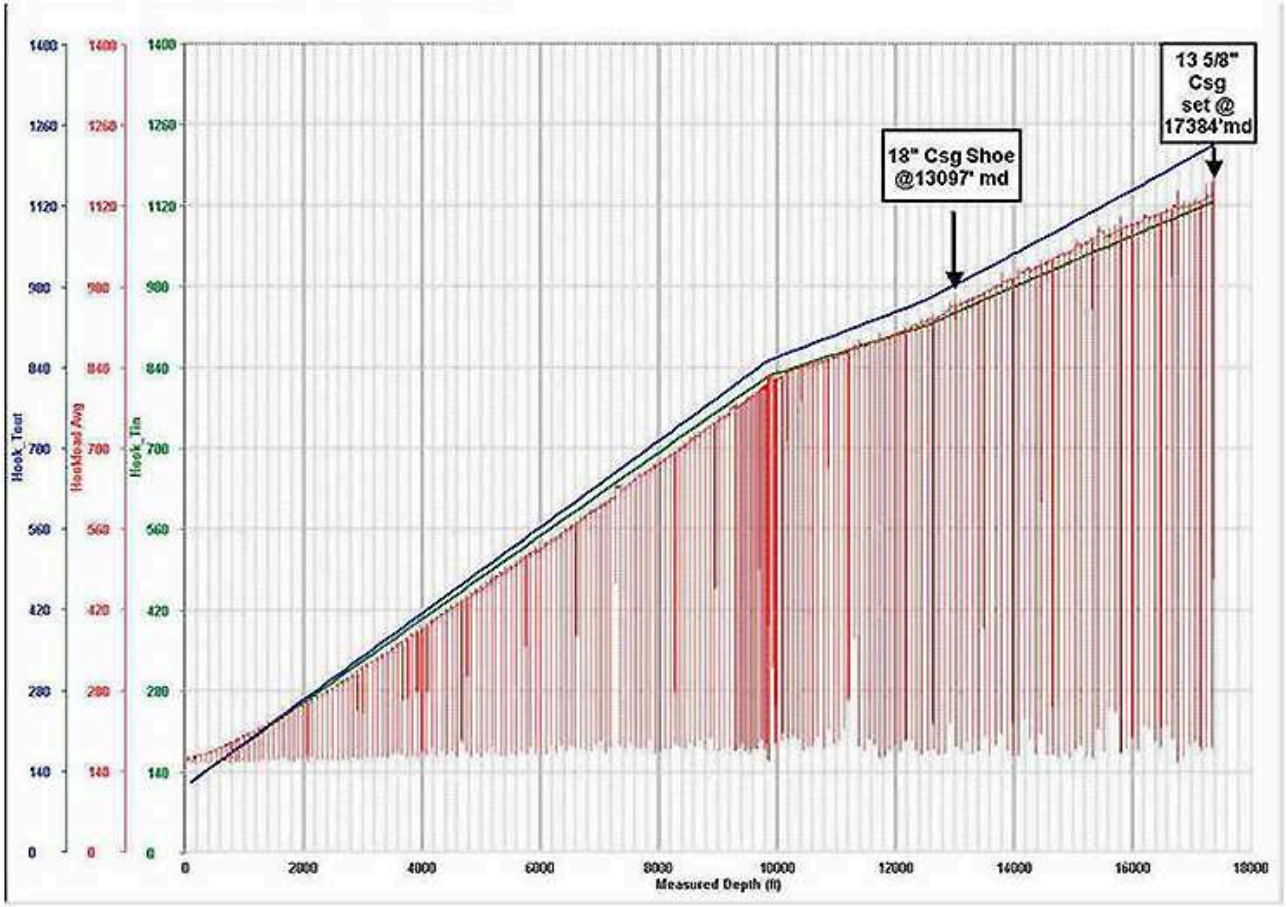
Physics of failures is the same across the world; surface sensor data have existed for 10 years

UG/grad PE courses can be designed to evaluate, analyze, and create a catalog of well failures

Sophisticated pattern recognition algorithms can be devised to catch impending failures

Image source: Prof. Eric van Oort, UT Austin

Process-based models



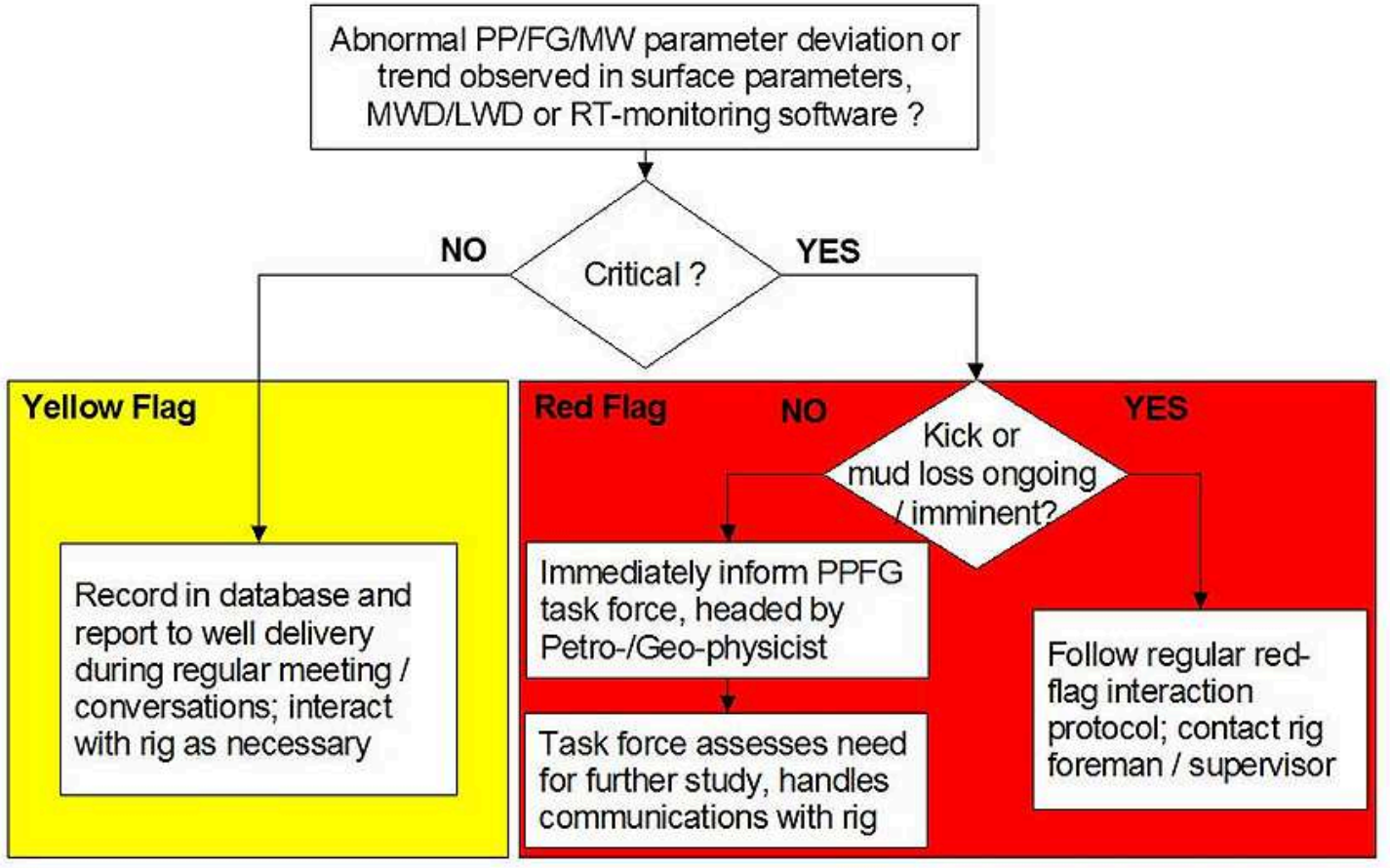
One can model all steps in well design and compare the model with actual performance

Large deviations from the model are flagged to operator and remote real-time operations center

Model behavior and statistics of deviations can be a subject of academic research

Image source: Prof. Eric van Oort, UT Austin

Decision making



PP = pore pressure, FG = fracture gradient, MW = mud weight

Sensor data and model comparisons can be fed into a decision-making platform

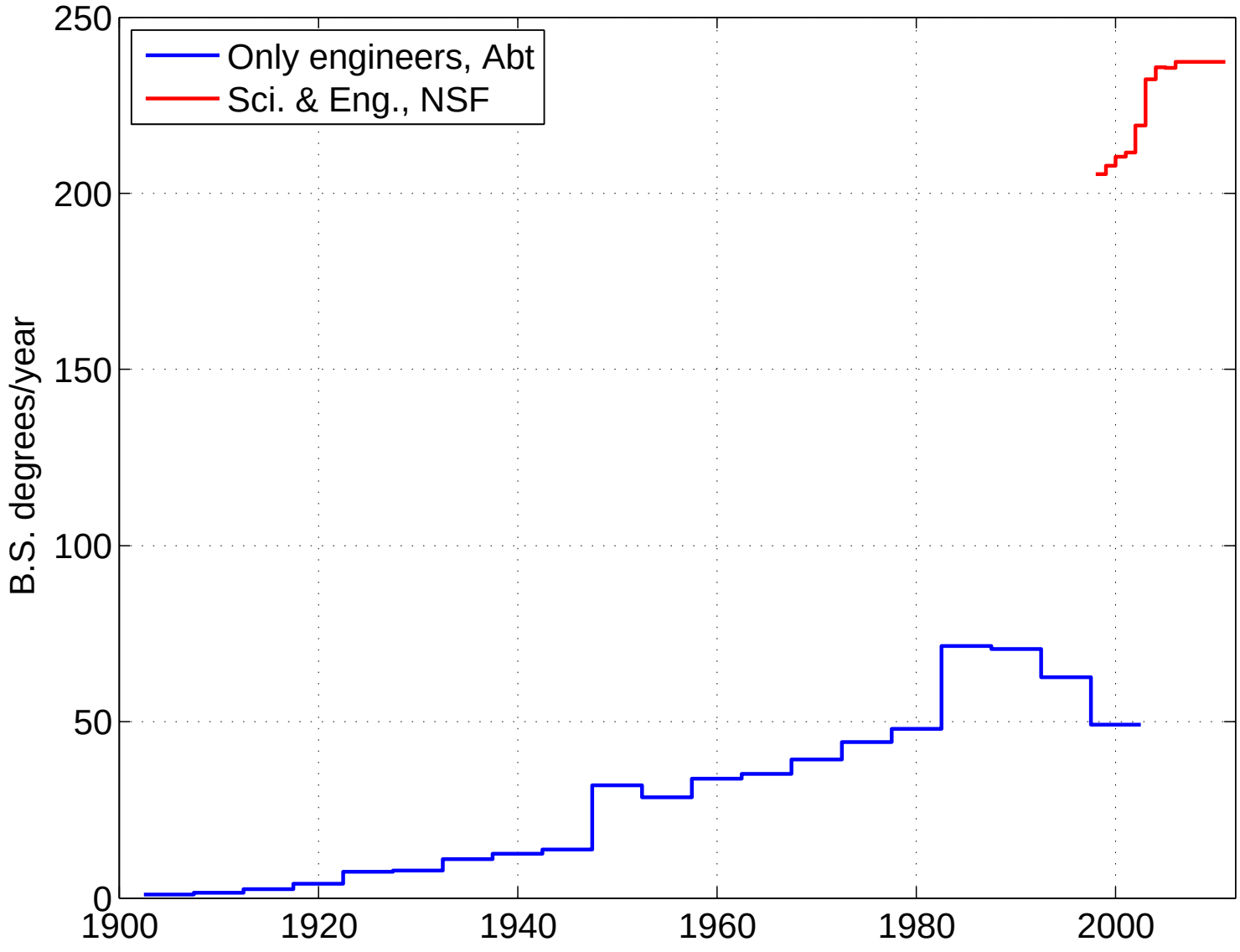
Features and performance of this platform can be a subject of academic research

Image source: Prof. Eric van Oort, UT Austin

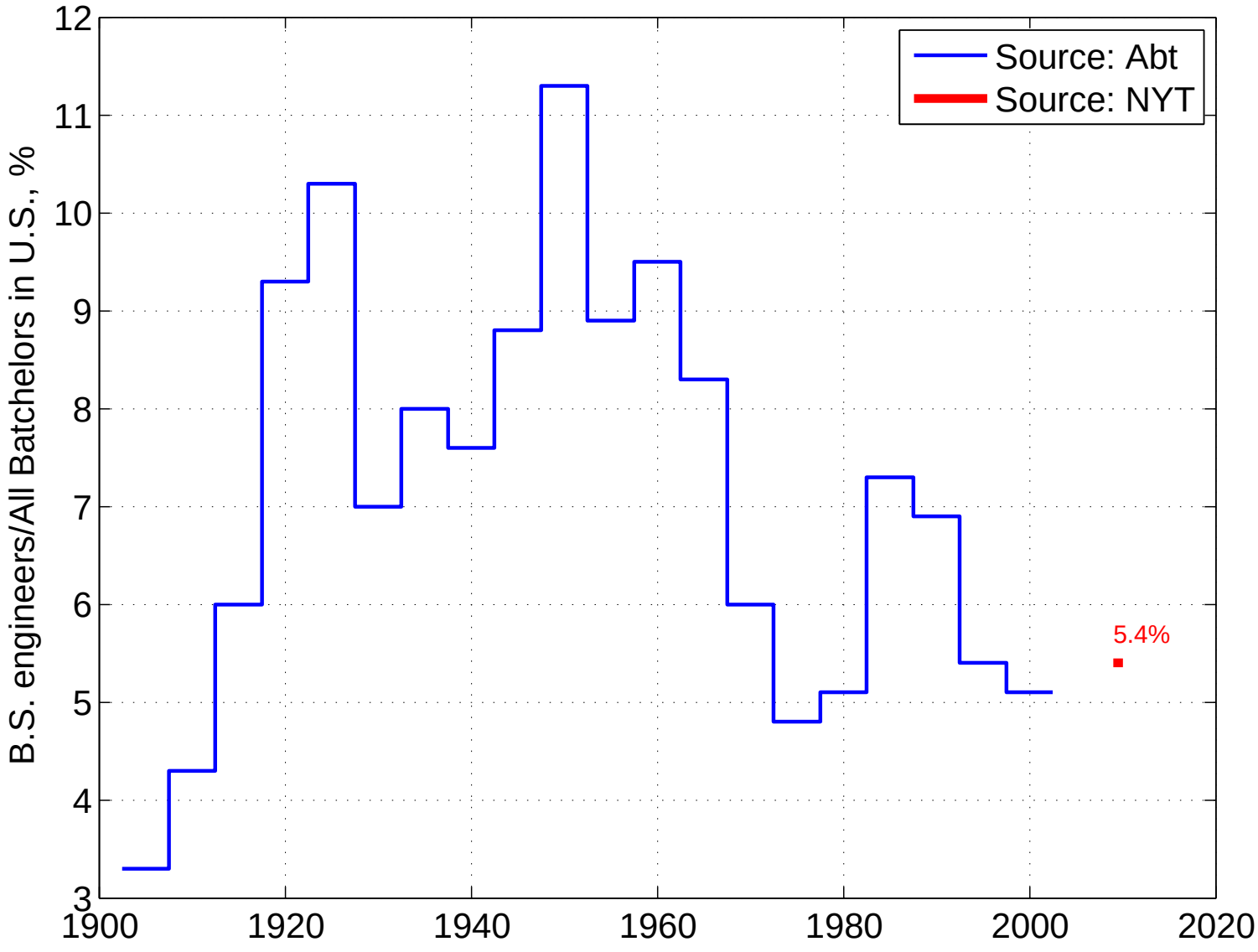
U.S. Eng. & Sci. Statistics

- There are 3.6 million native workers and 1.2 million foreign born
- The ratio of native/foreign-born workers declined from 6:1 to 3:1 over the last 15 years
- In 1999, there were 1.7 million practicing engineers; in 2008, this number decreased to 1.2 million
- Petroleum Engineering Departments enroll about 5,000 B.S., 1,000 M.S., and 500 Ph.D. engineers
- Current number of Petroleum Engineering (PE) Tenure-Track faculty, 193, is woefully inadequate
- U.S. PE Student/Faculty ratio is 34, UT's is 42

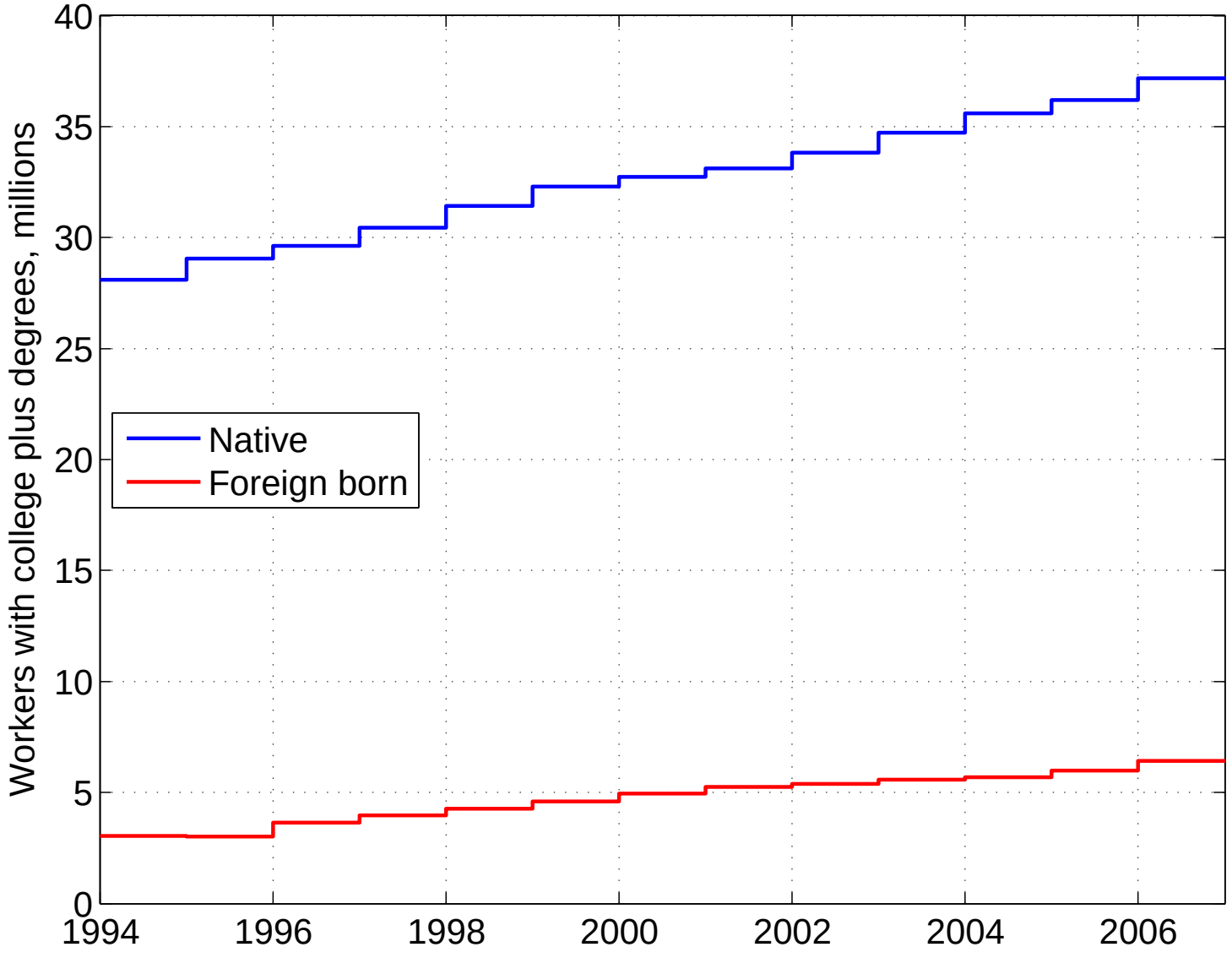
B. S. Degrees in Engineering in U.S.



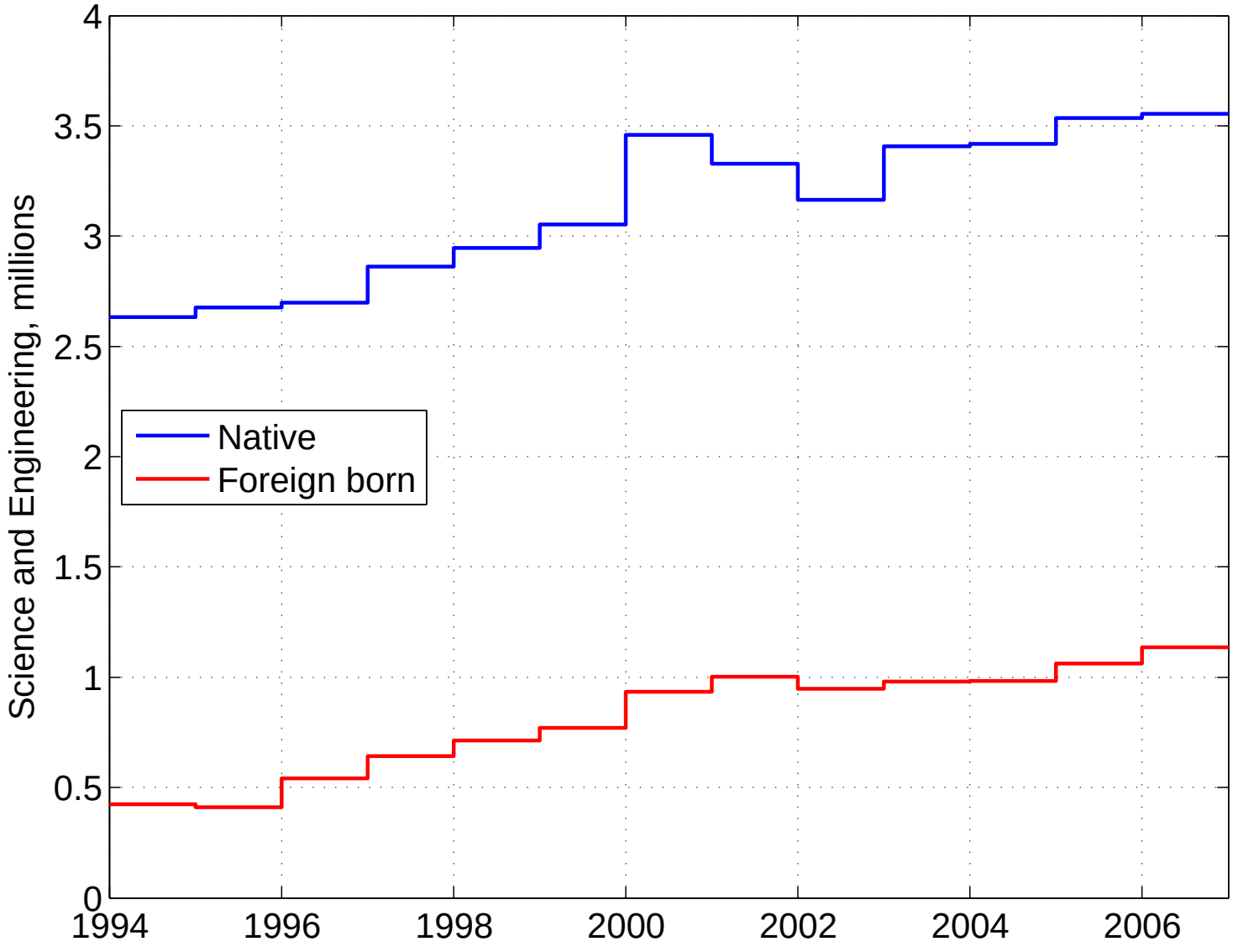
Fraction of B. S. Engineers in U.S.



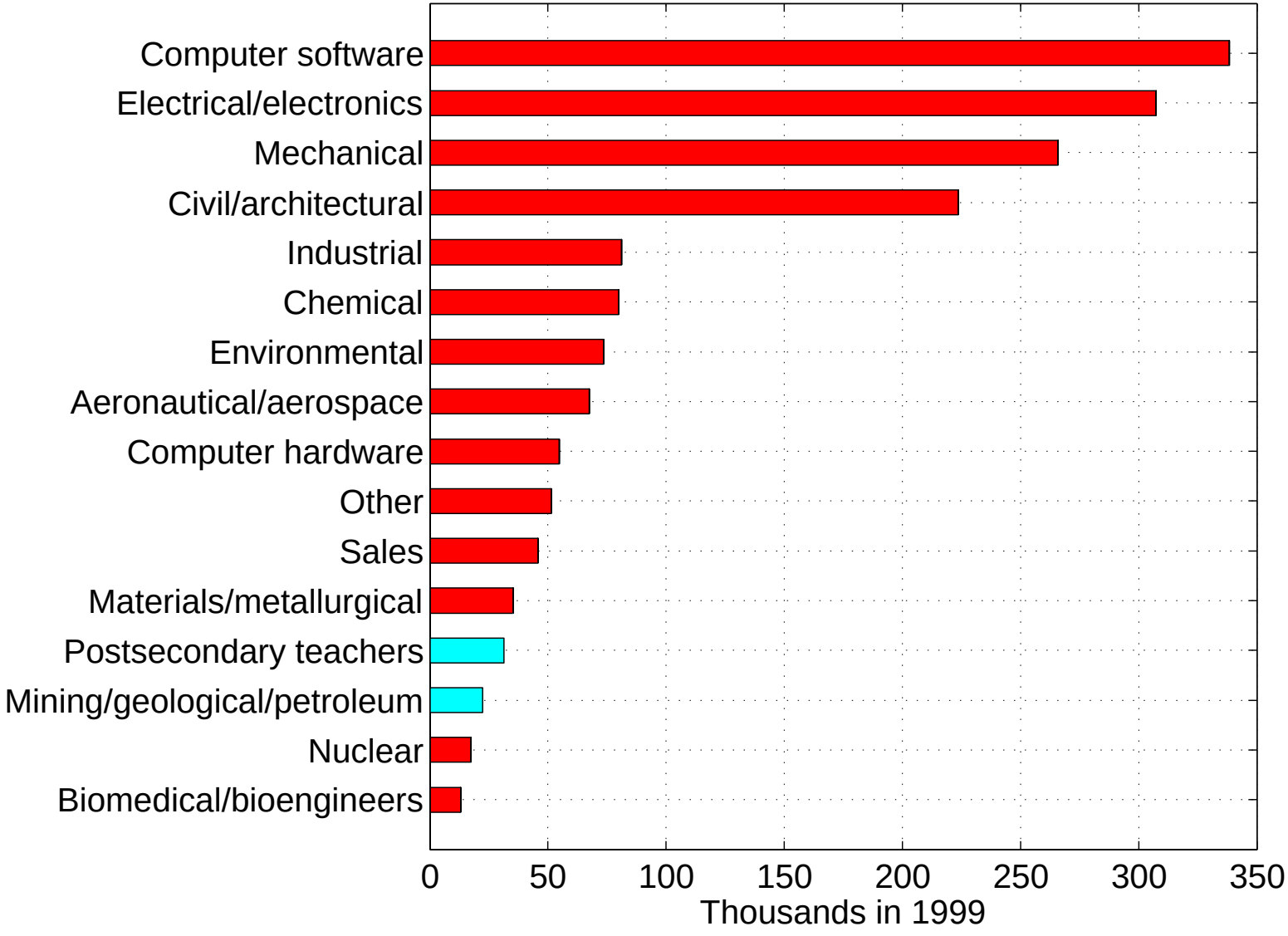
U.S. Postgraduate Labor Force



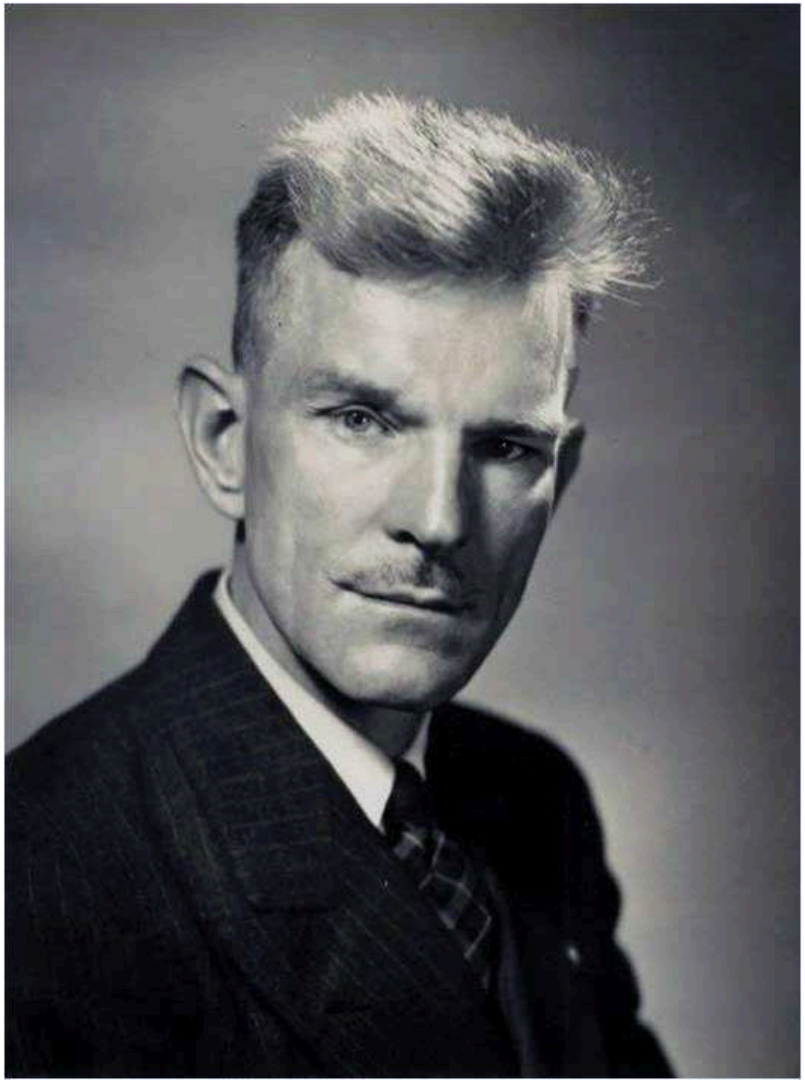
Science & Engineering Labor Force



Practicing Engineers in U.S.

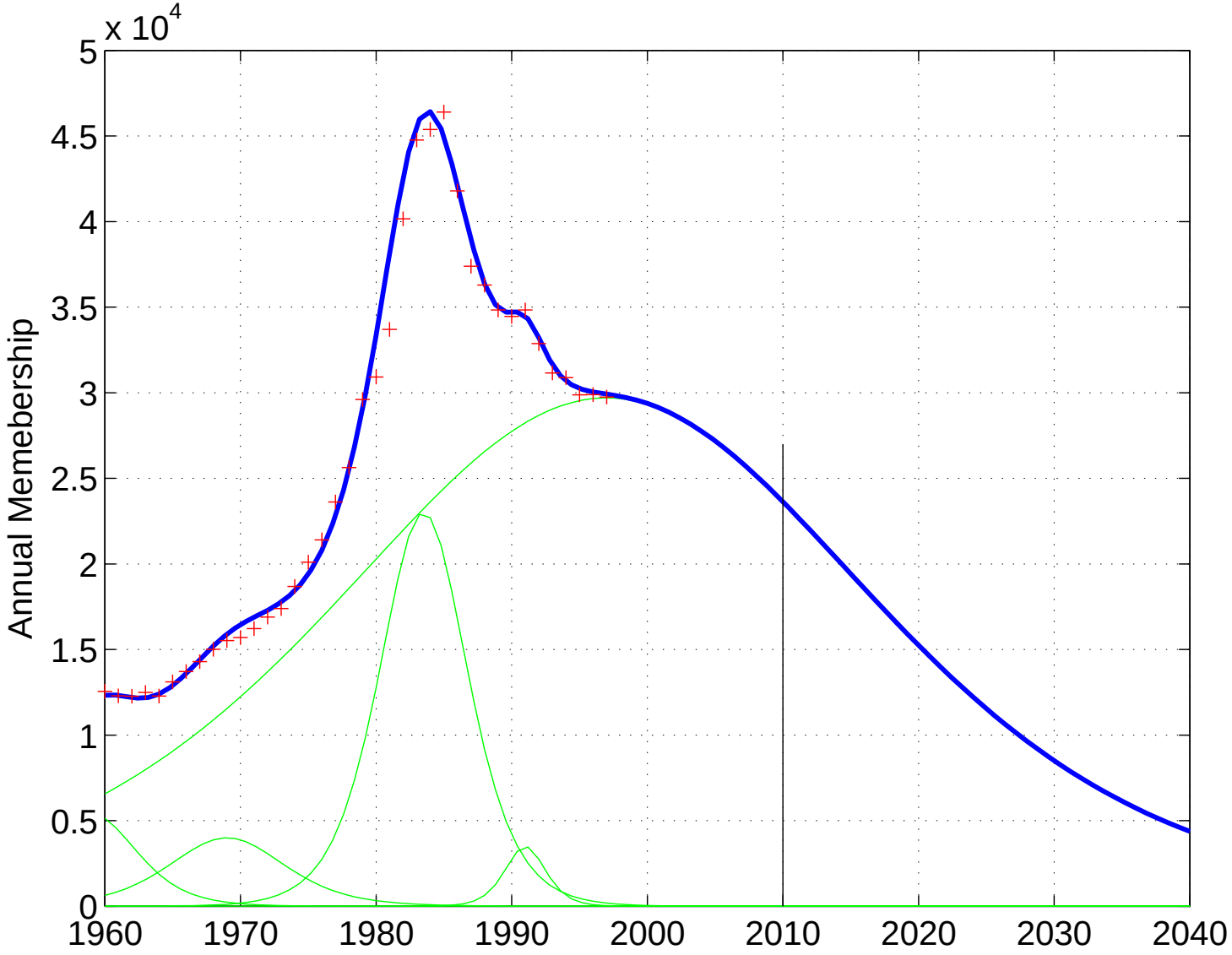


Marion King Hubbert

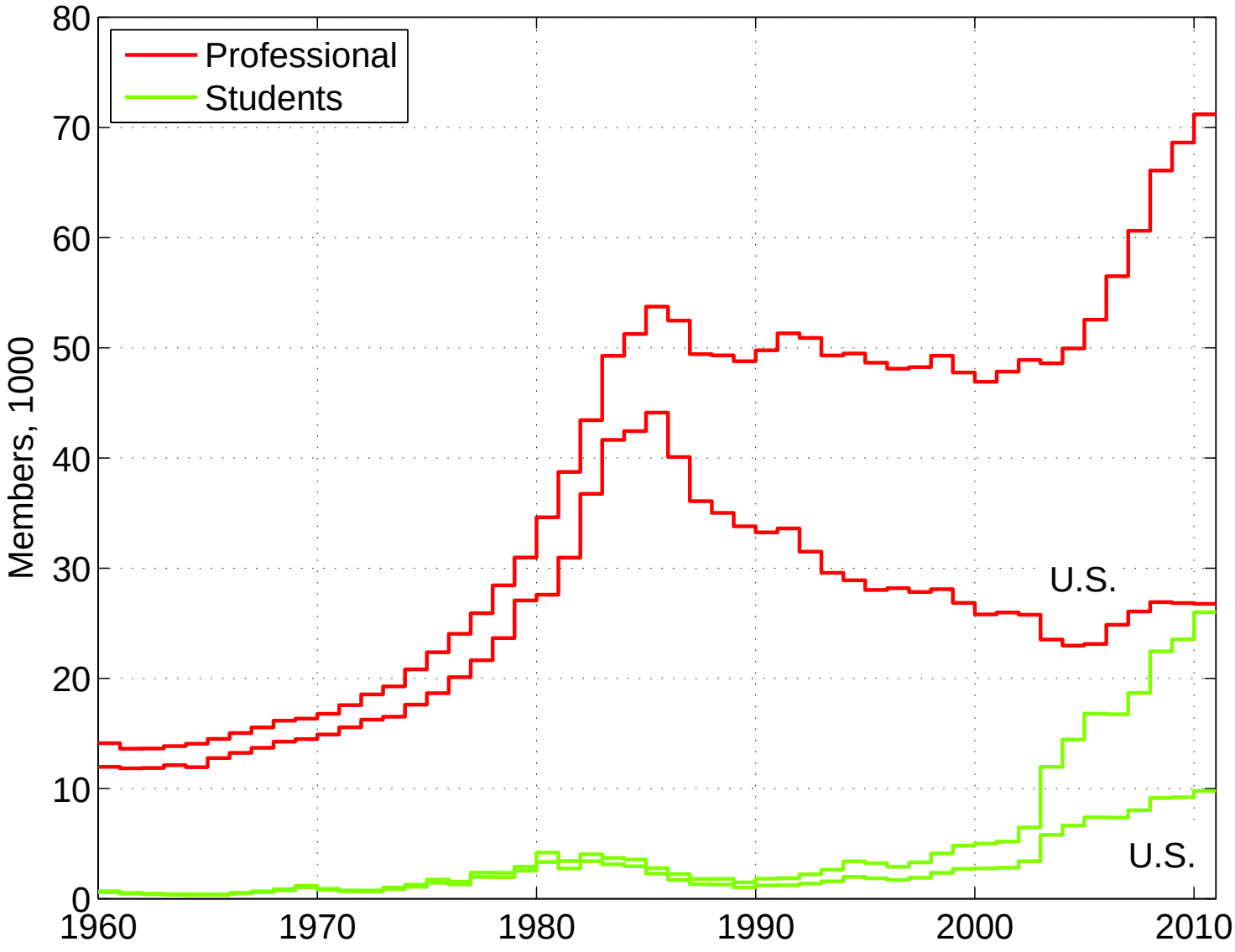


Born in San Saba, TX, 1903; died in 1989

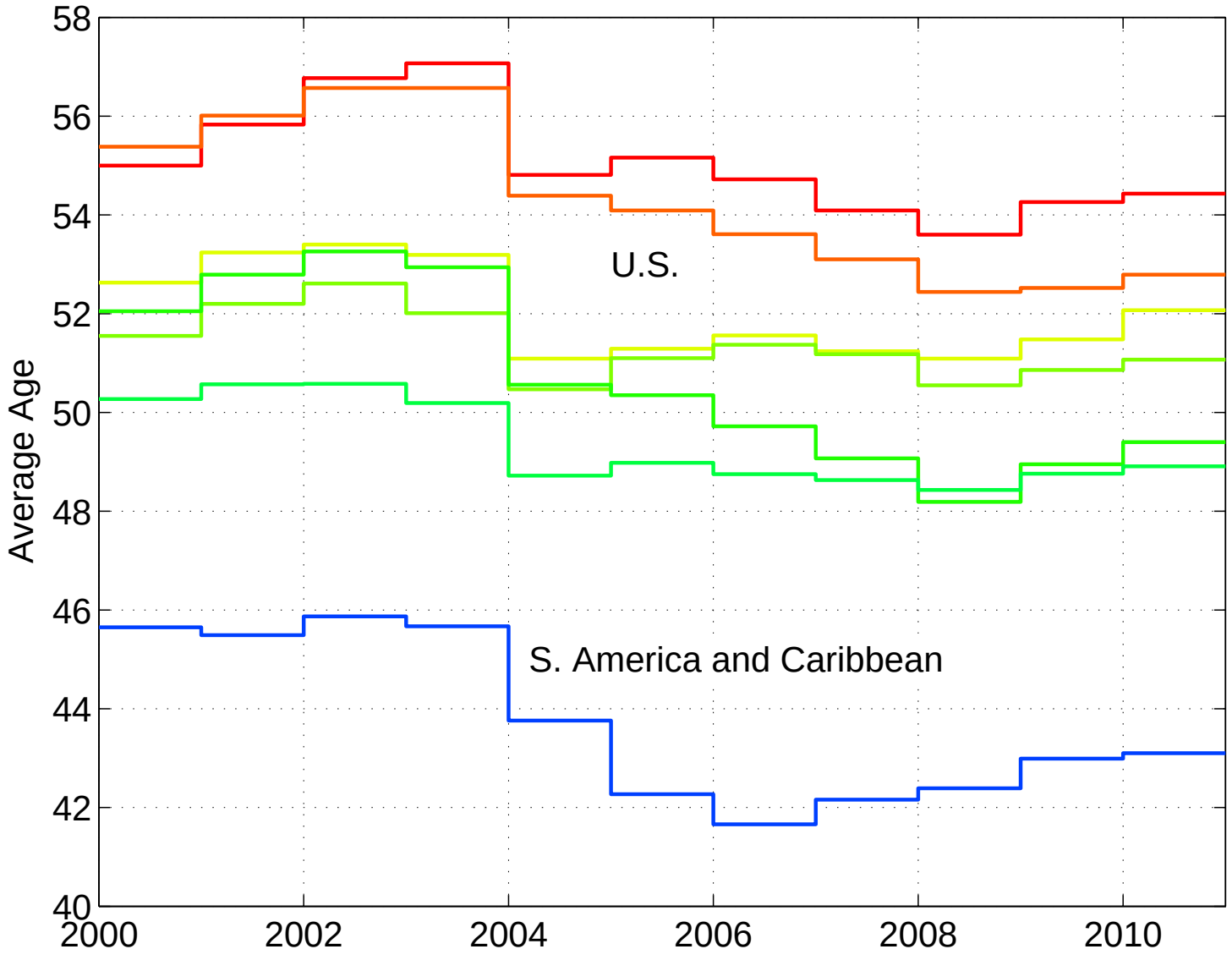
Professional Members of SPE in U.S.



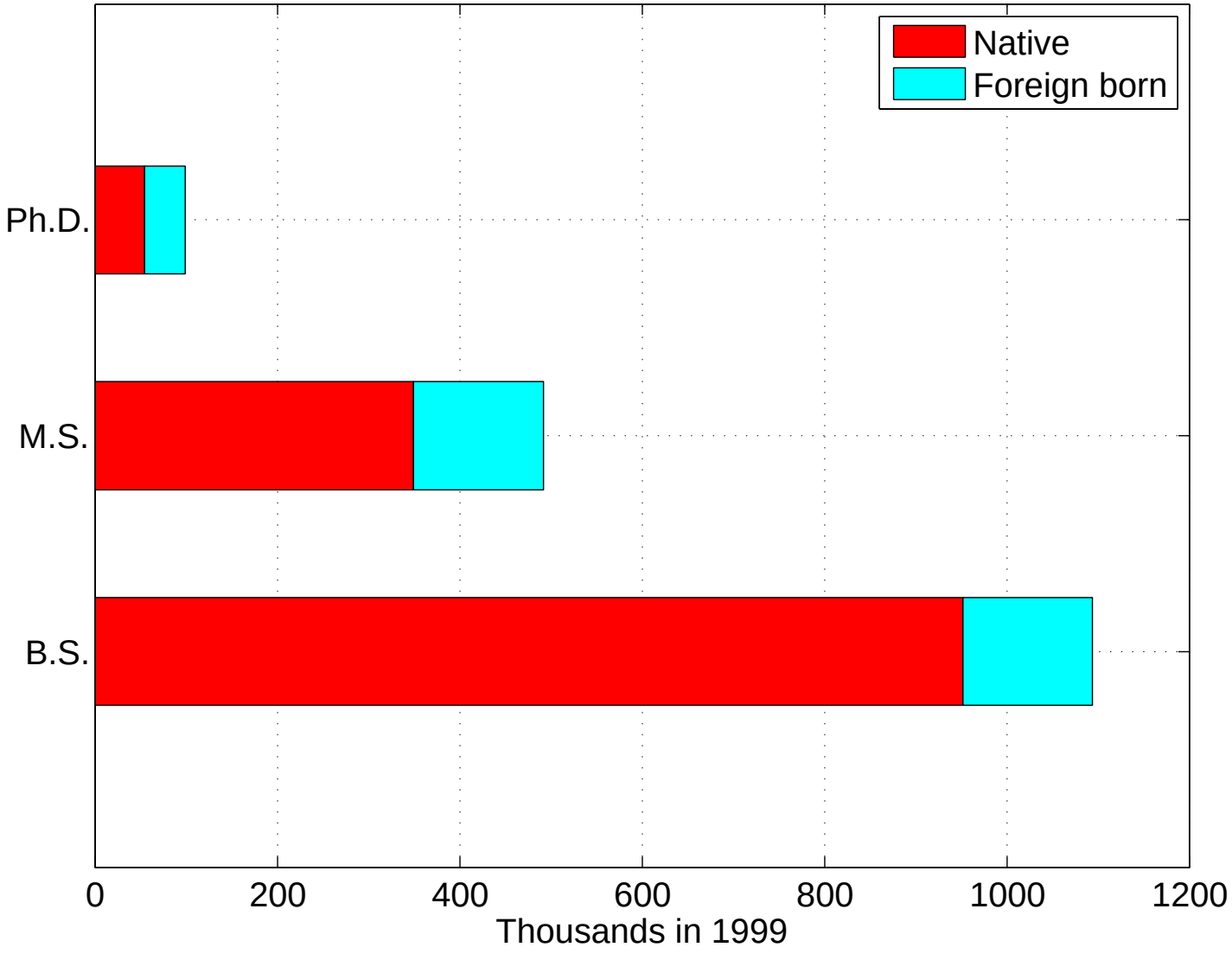
All SPE Members



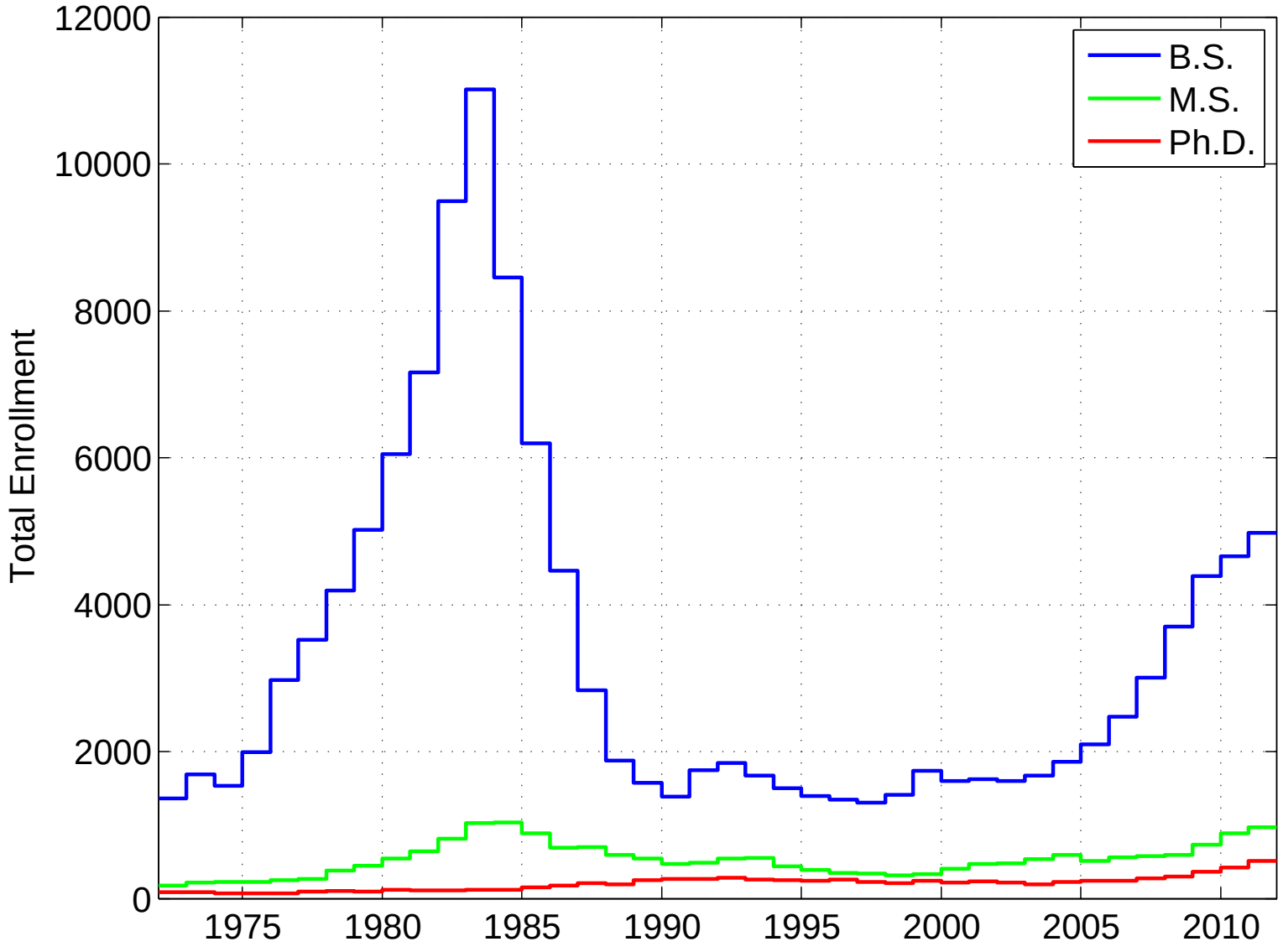
Ages of SPE Members



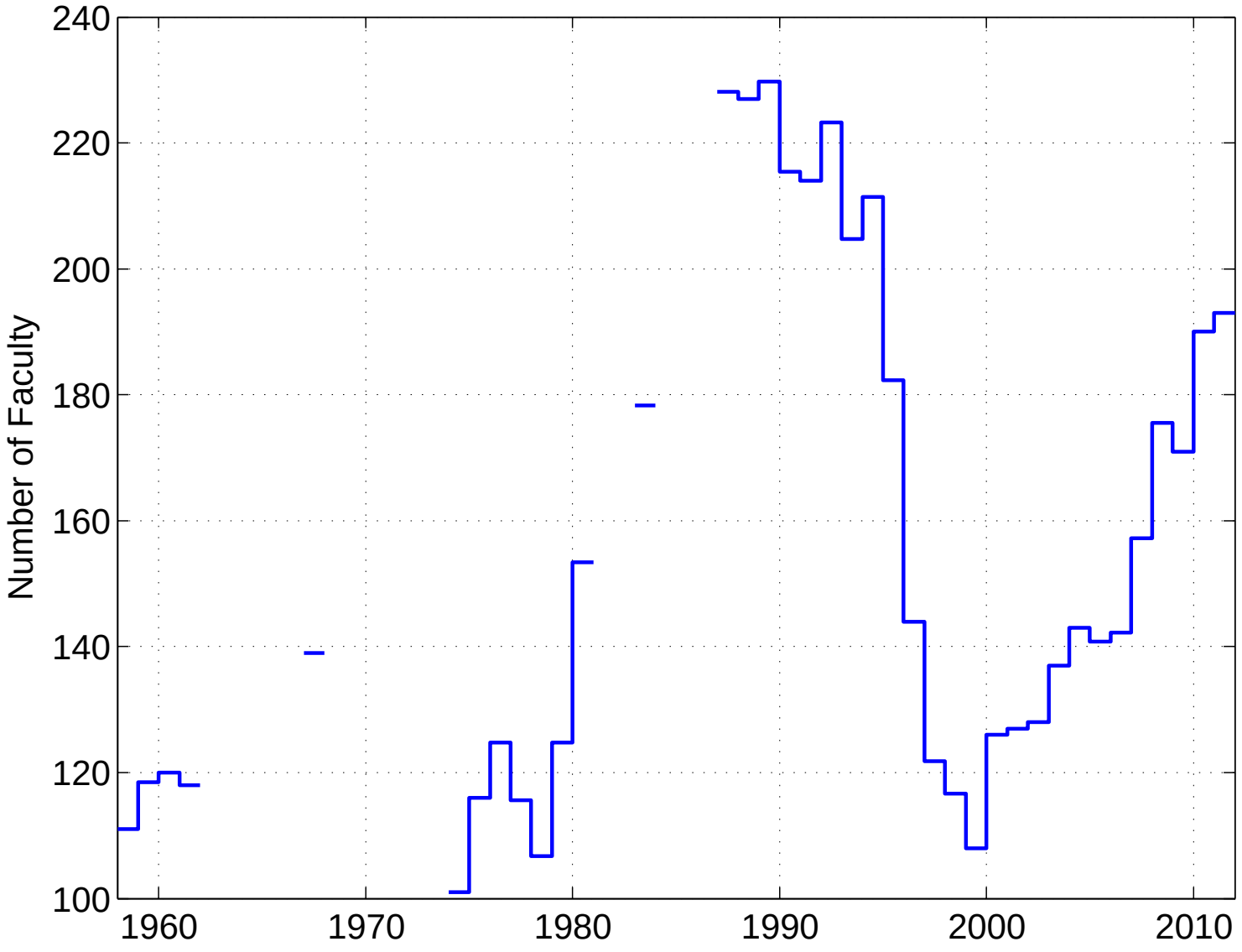
Engineers by Terminal Degree in U.S.



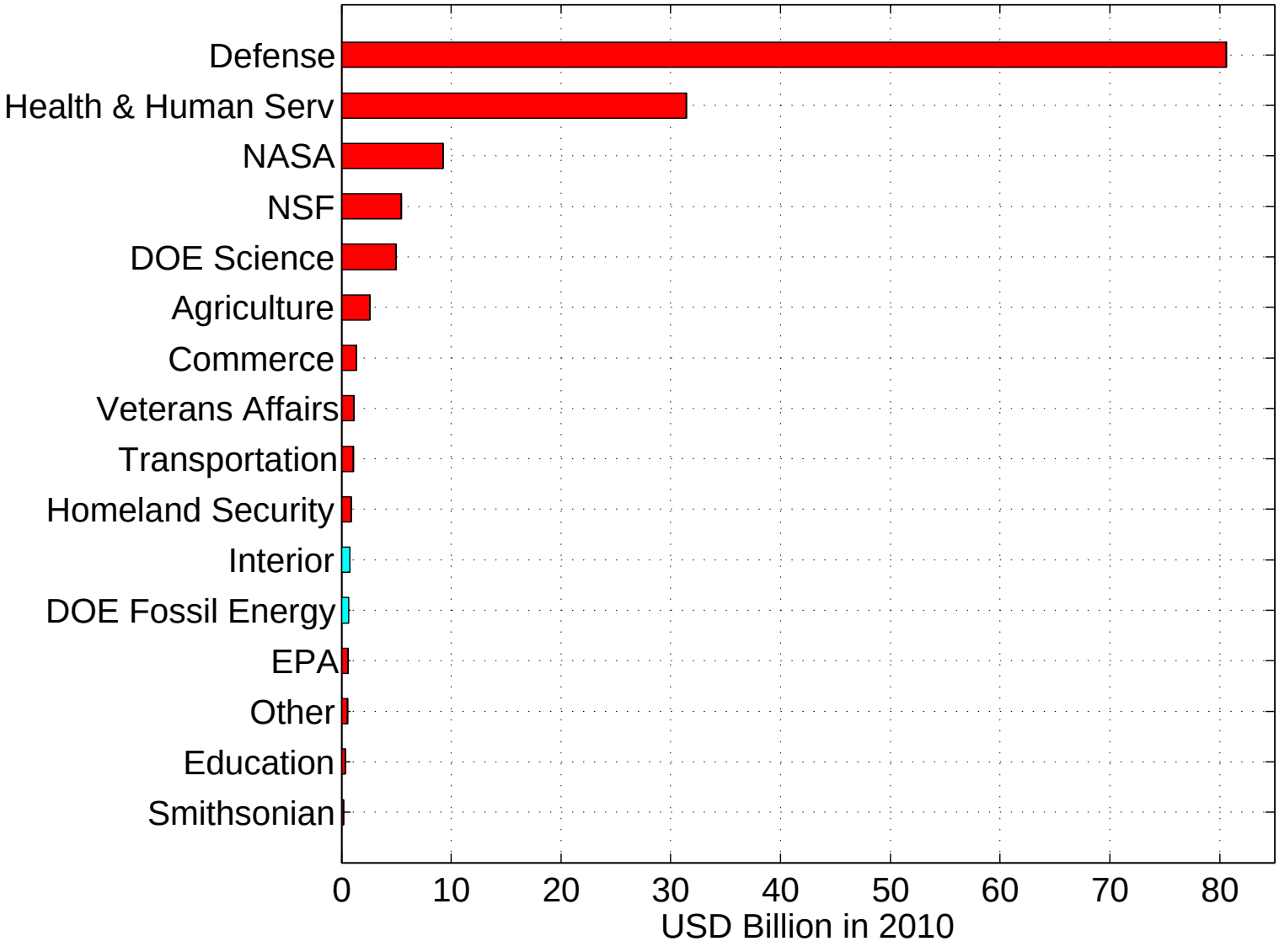
PE Enrollment in U.S.



Petroleum Faculty in U.S.

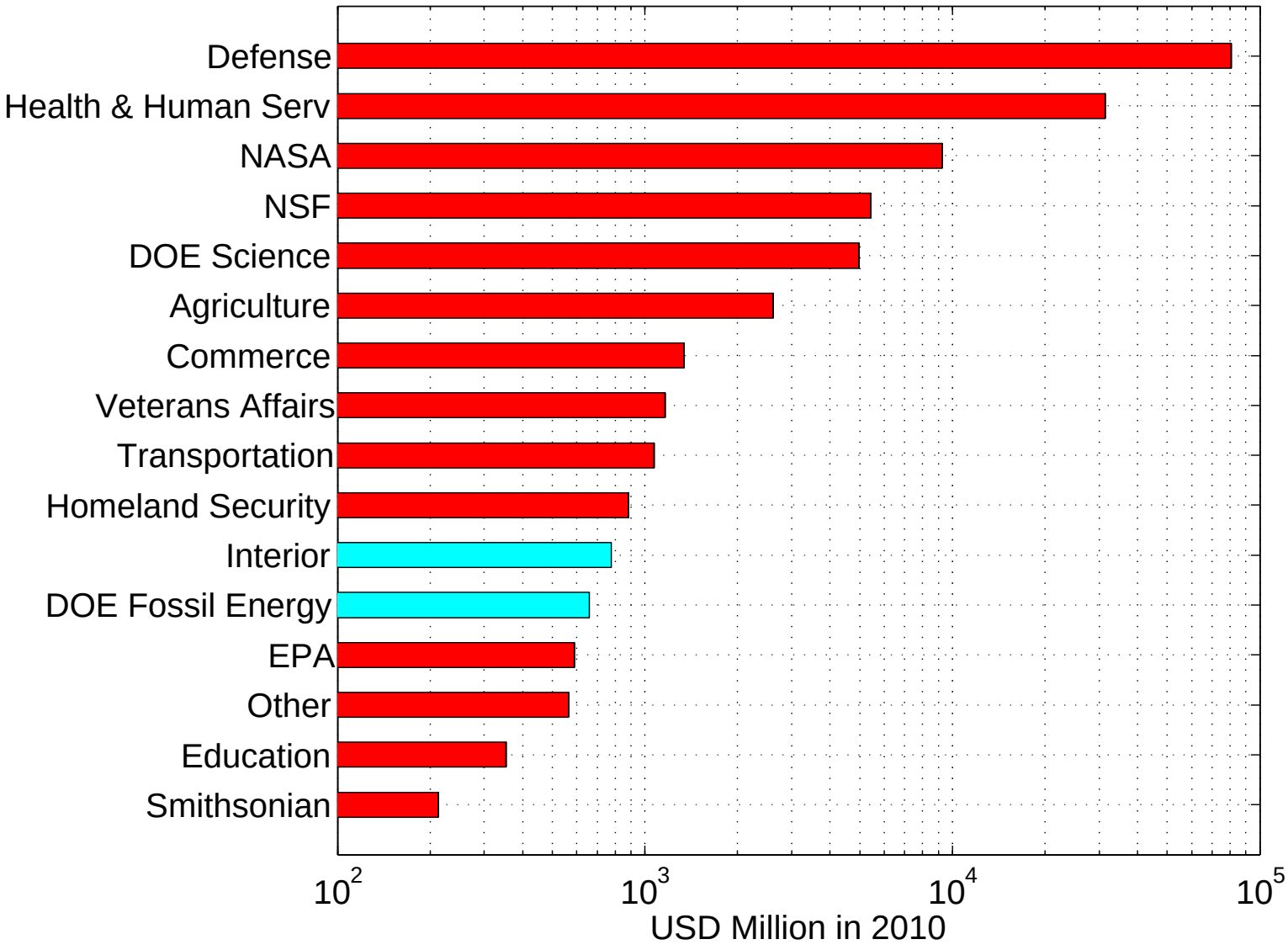


Federal R&D Spending in 2010



All government funding is spoken for

Federal R&D Spending in 2010



On the logarithmic scale, potential funding sources become visible

No Time Left. . .

Backup Slides

Industrial and Academic Research

- The holistic engineering by the industry must now be merged seamlessly with the integrative science by academia
- Because of complexity, the best science today is collaborative and fabulously expensive
- With few exceptions days of $50K/company JIPs are over

That the integrative science can be split into small tasks at the expense of rate is the only saving grace that prevents the limited industrial R&D from collapsing altogether when faced with new, much stricter demands

Science and Technology

- Without new types of data of ever higher resolution, acquired with devices of ever increasing power, modern science cannot function
- Technology provides the data gathering capability for science
- Science in return provides new theory and methods to design and construct the new sensors and machines
- At any given moment, progress of science can occur only within the barriers set by the available technology

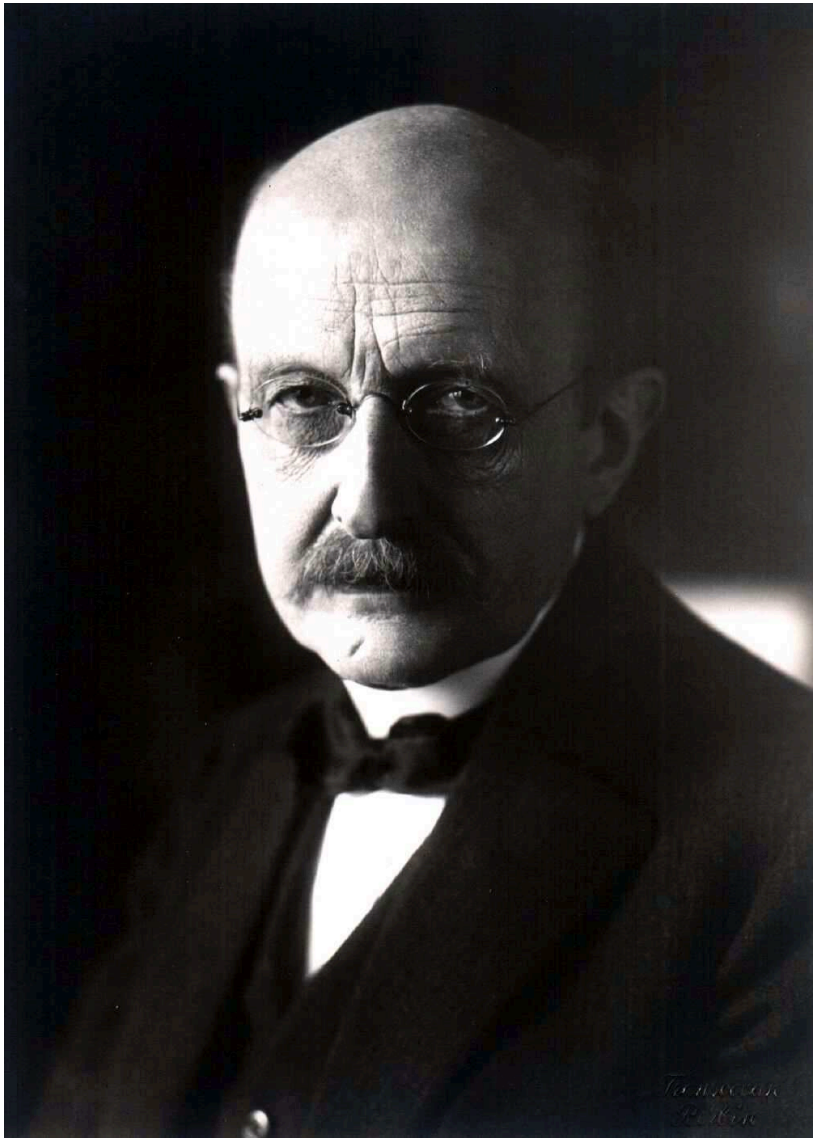
Progress in Science

Planck's Principle:

To be sure, with every advance in science the difficulty of the task is increased; ever larger demands are made on the achievements of researchers, and the need for a suitable division of labor becomes more pressing.

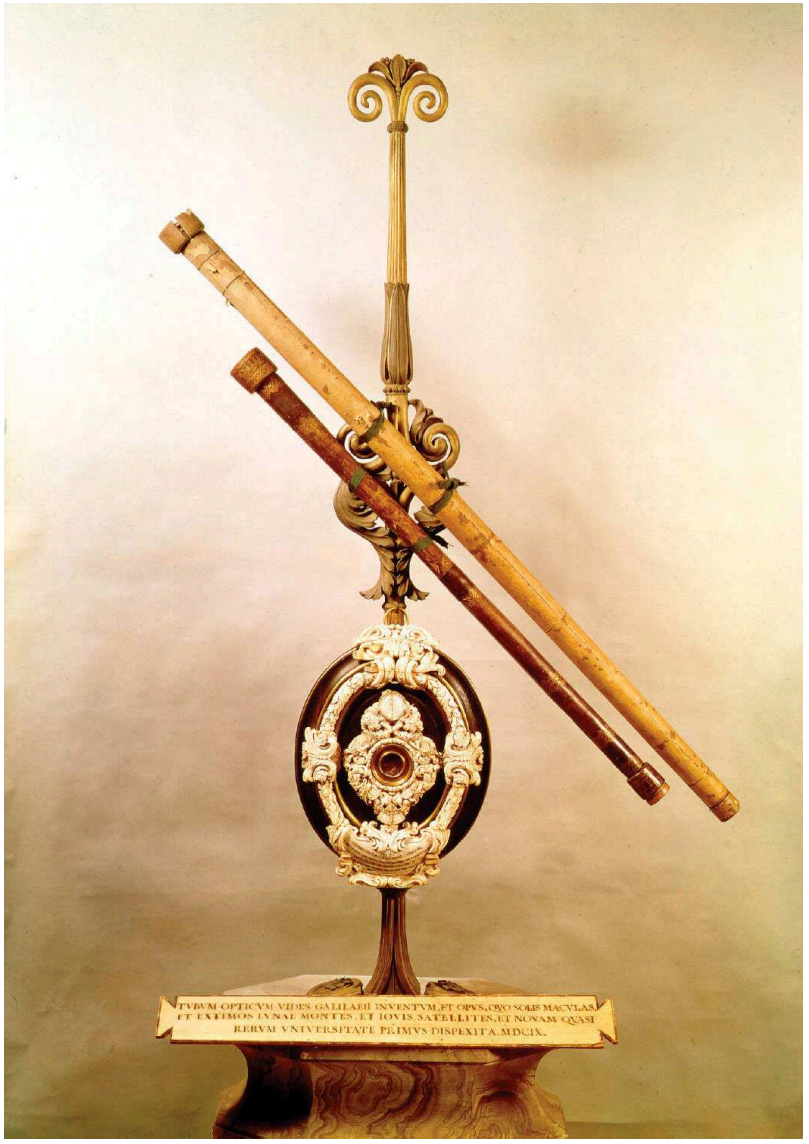
Vorträge und Erinnerungen (Lectures and Recollections),

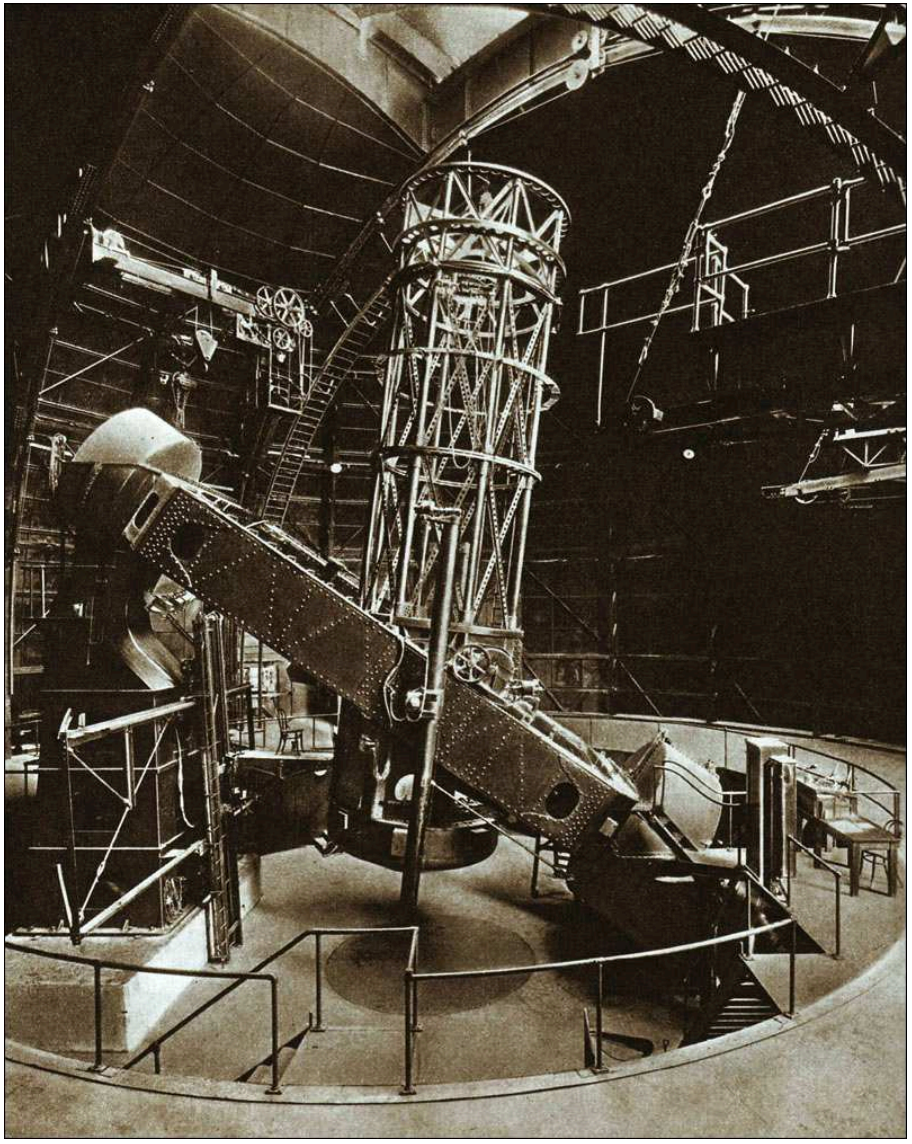
5th Ed. Stuttgart, 1949.



Max Karl Ernst Ludwig Planck, 1858 - 1947

Science and Technology



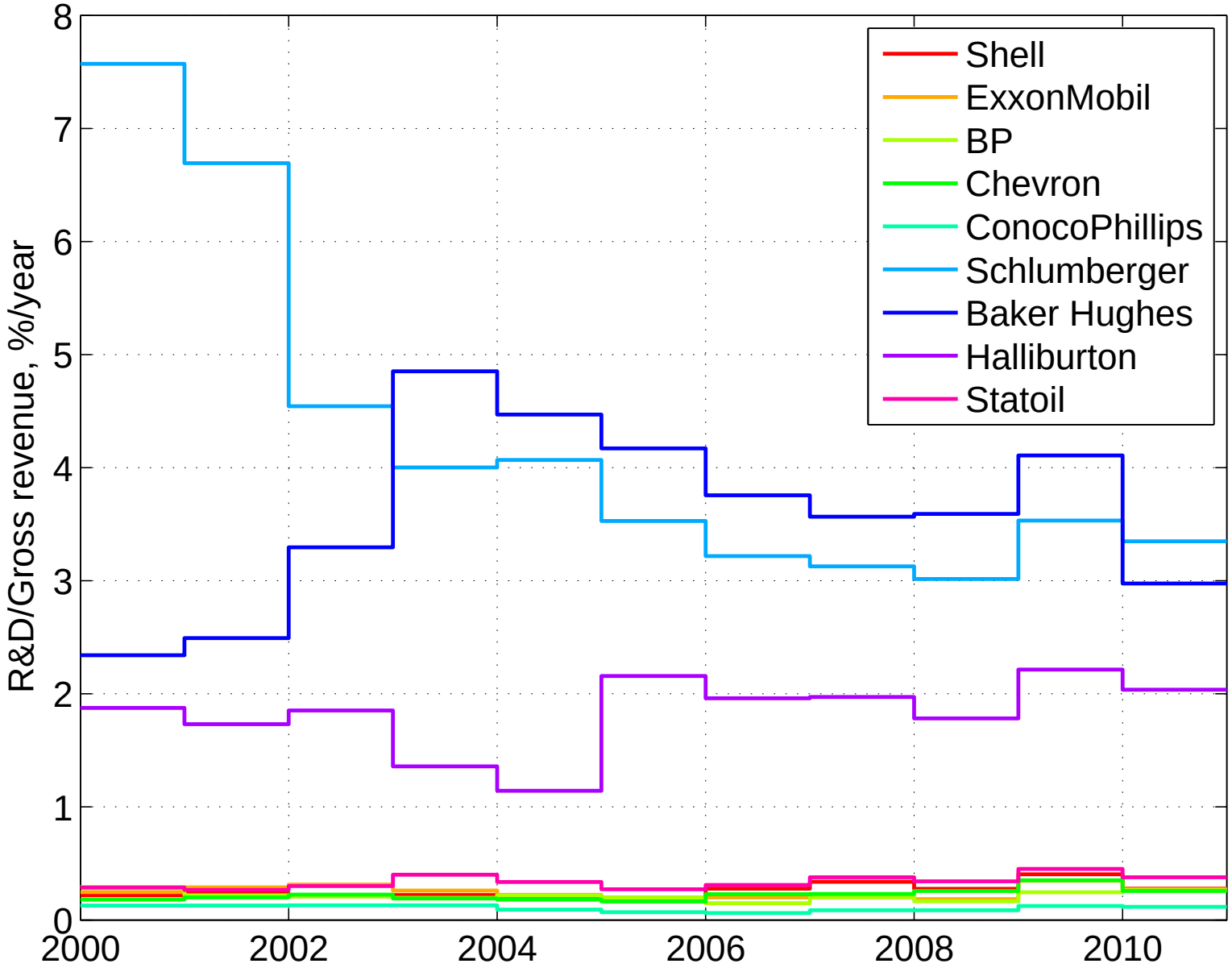


What if Galileo (1610) had the 100-inch Mount Wilson telescope (1918)?

Problem Statement

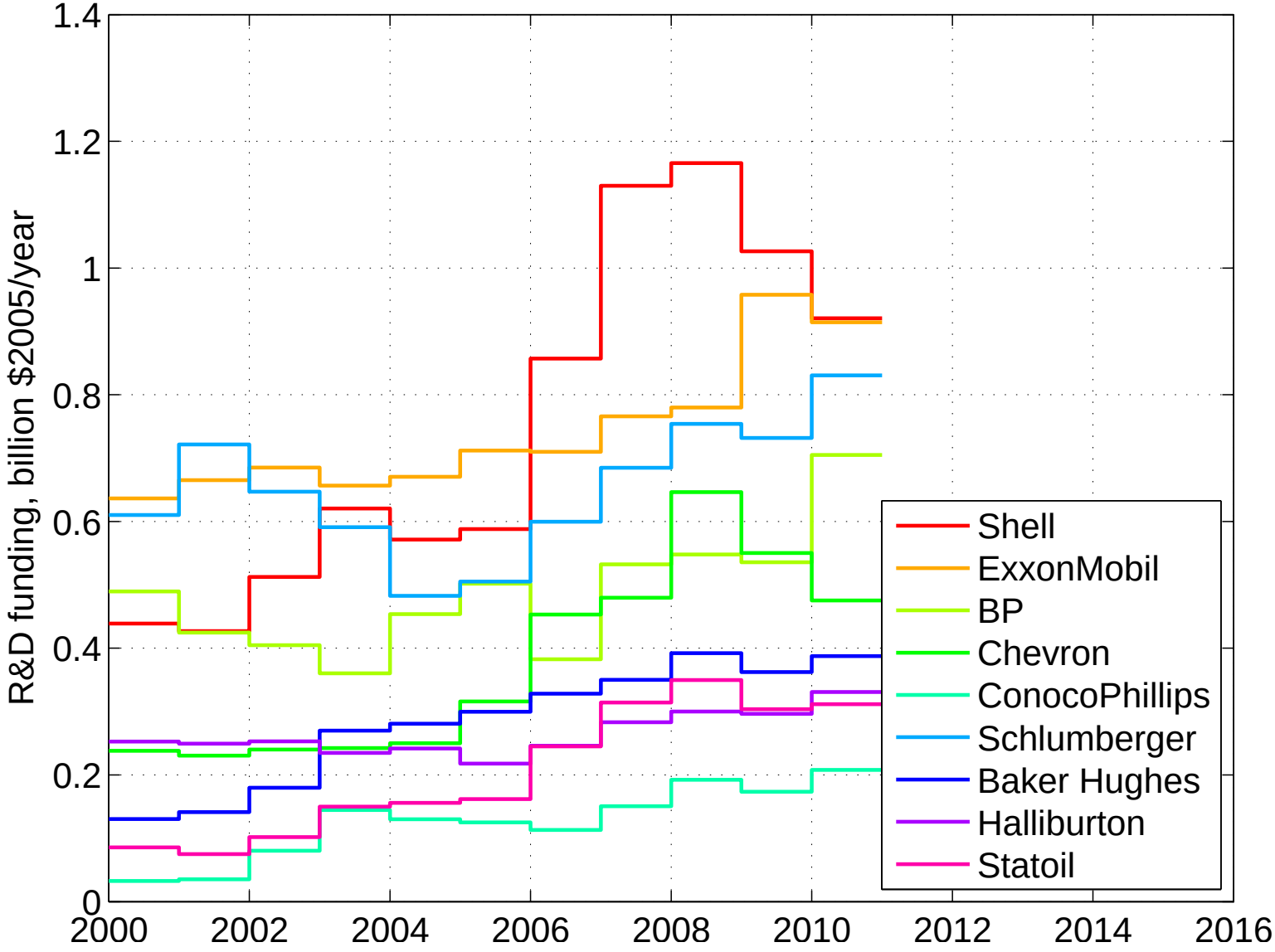
- Drilling and completions are the two highest costs of hydrocarbon recovery
- About 50 percent of drilling and completion costs can be avoided with better technology. . .
- . . . But serious research is needed worldwide
- While drilling budgets of the major O&G companies are serious (tens of billions of $ per year), their research efforts are incommensurate with needs

R&D Budget vs. Gross O&G Revenue



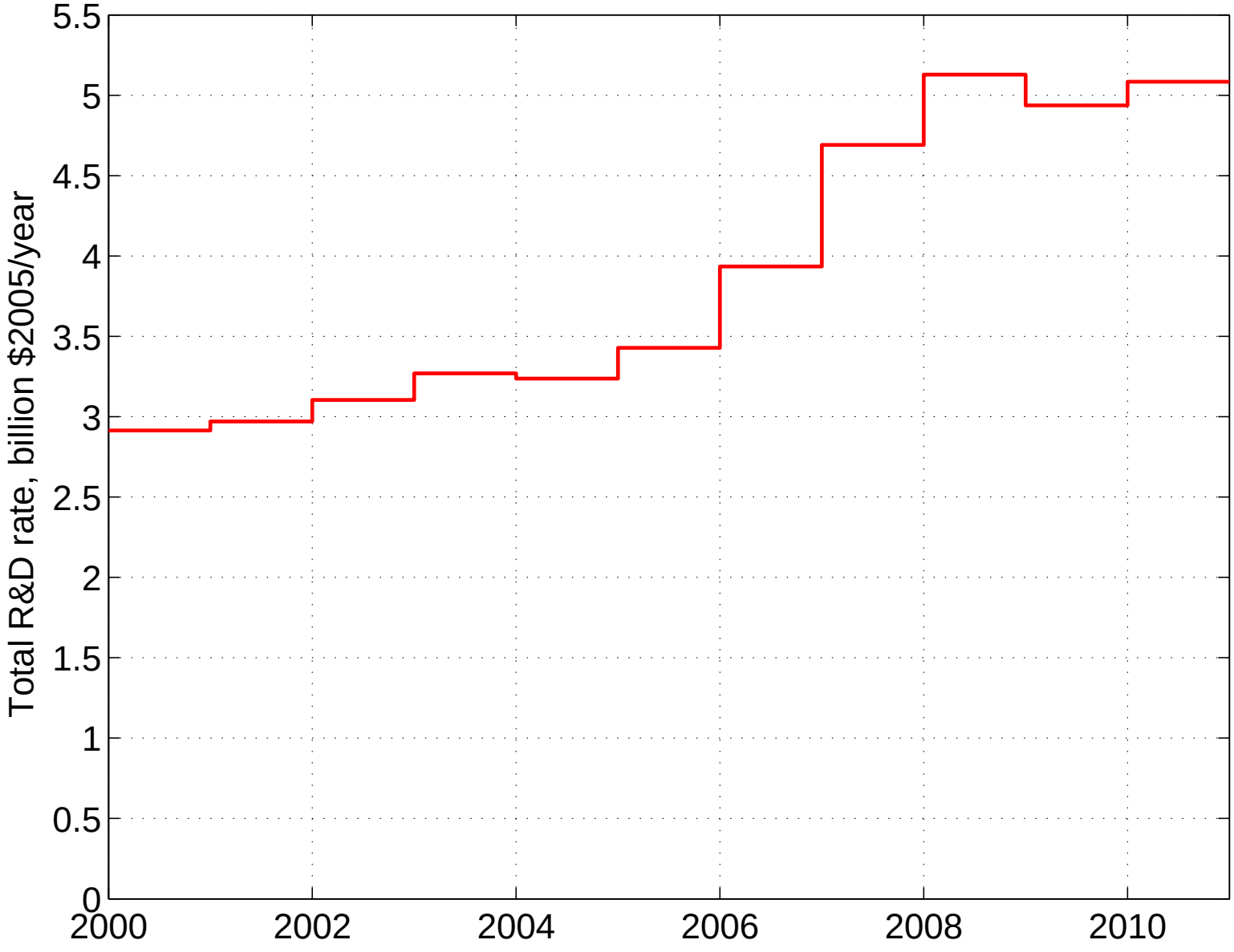
Annual Reports and Financial Statements

R&D Budgets by O&G Company



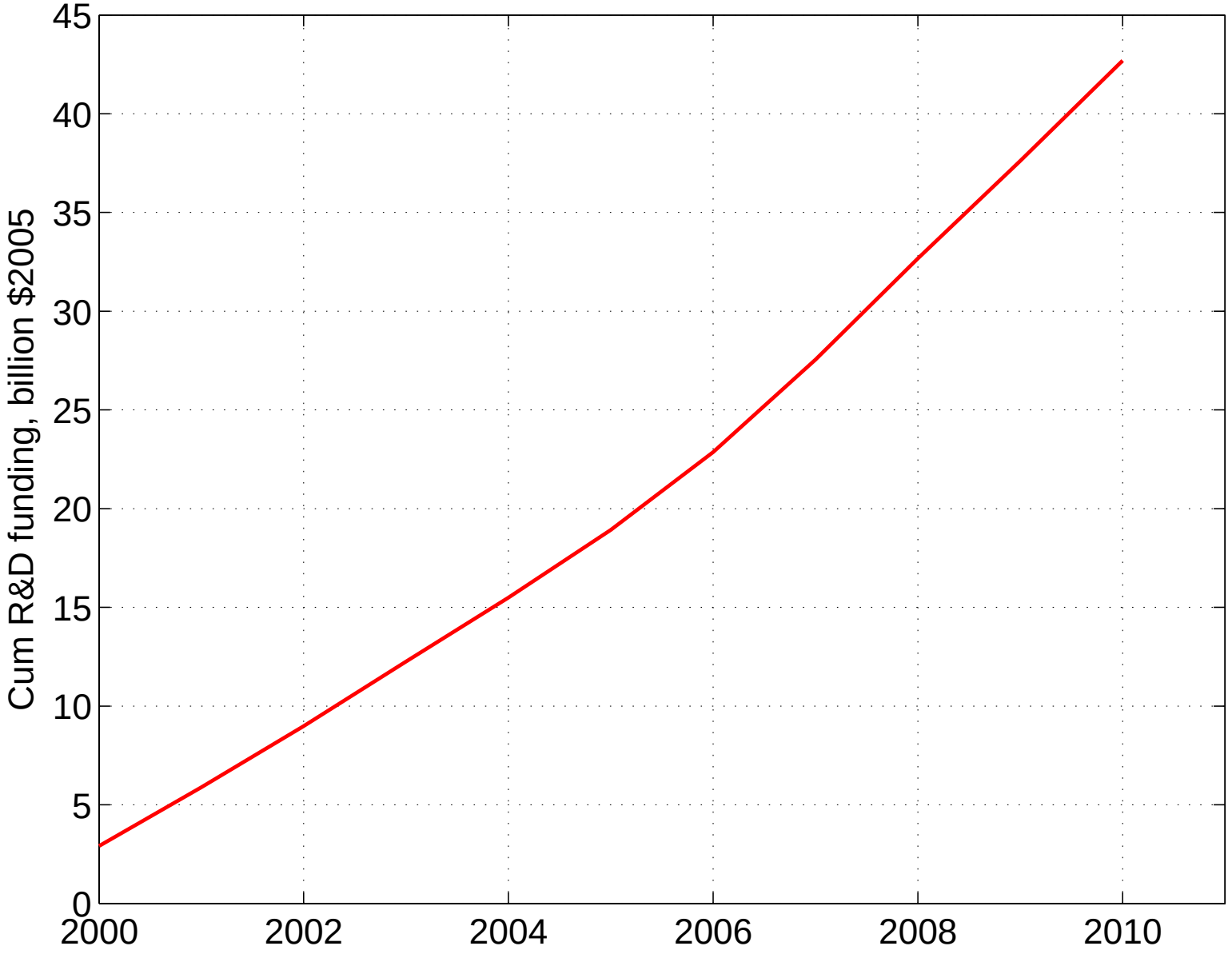
Annual Reports and Financial Statements

Annual R&D Budget in O&G Industry



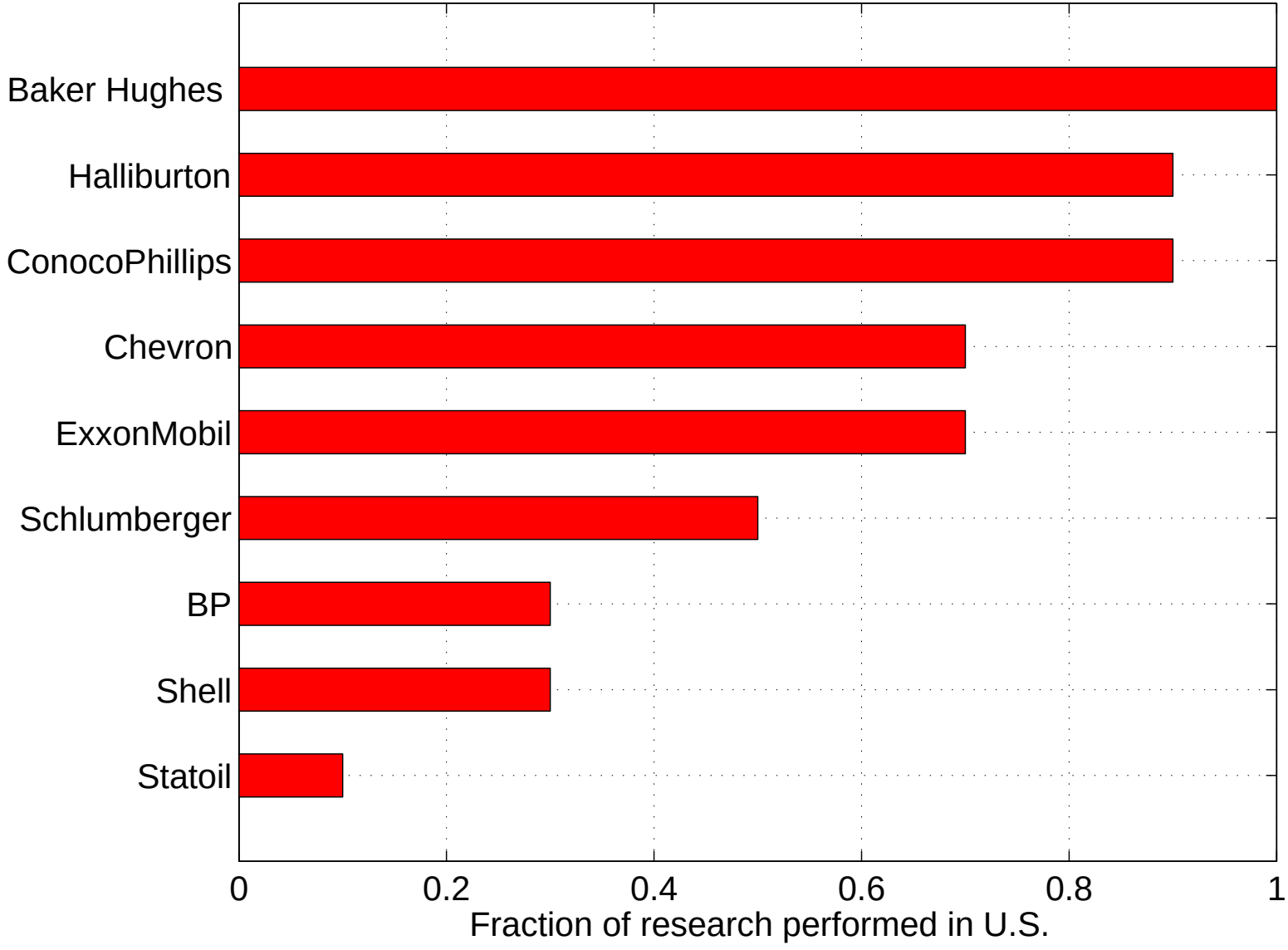
Annual Reports and Financial Statements

Cum R&D Spending in O&G Industry



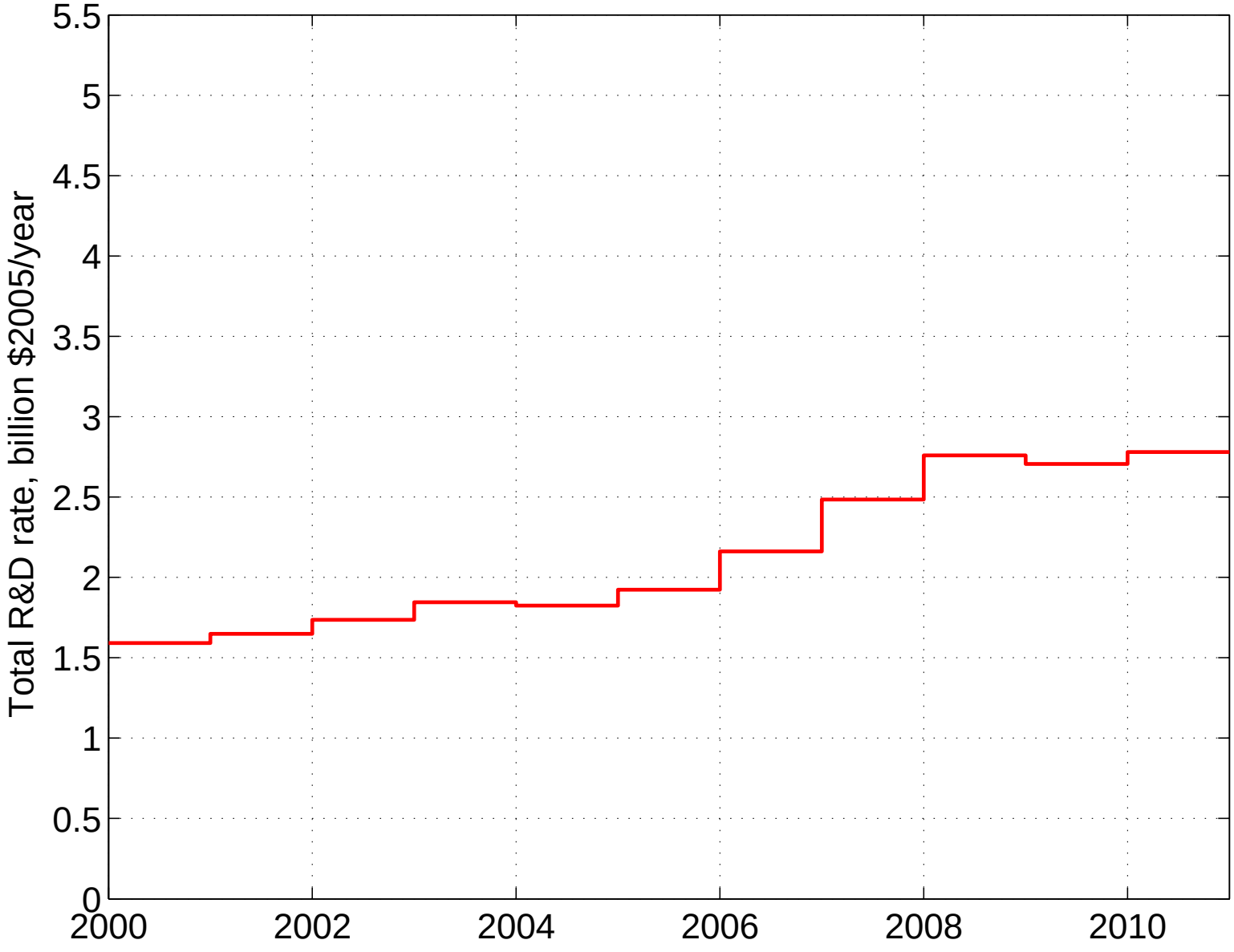
Annual Reports and Financial Statements

O&G R&D Budget Allocation to U.S.



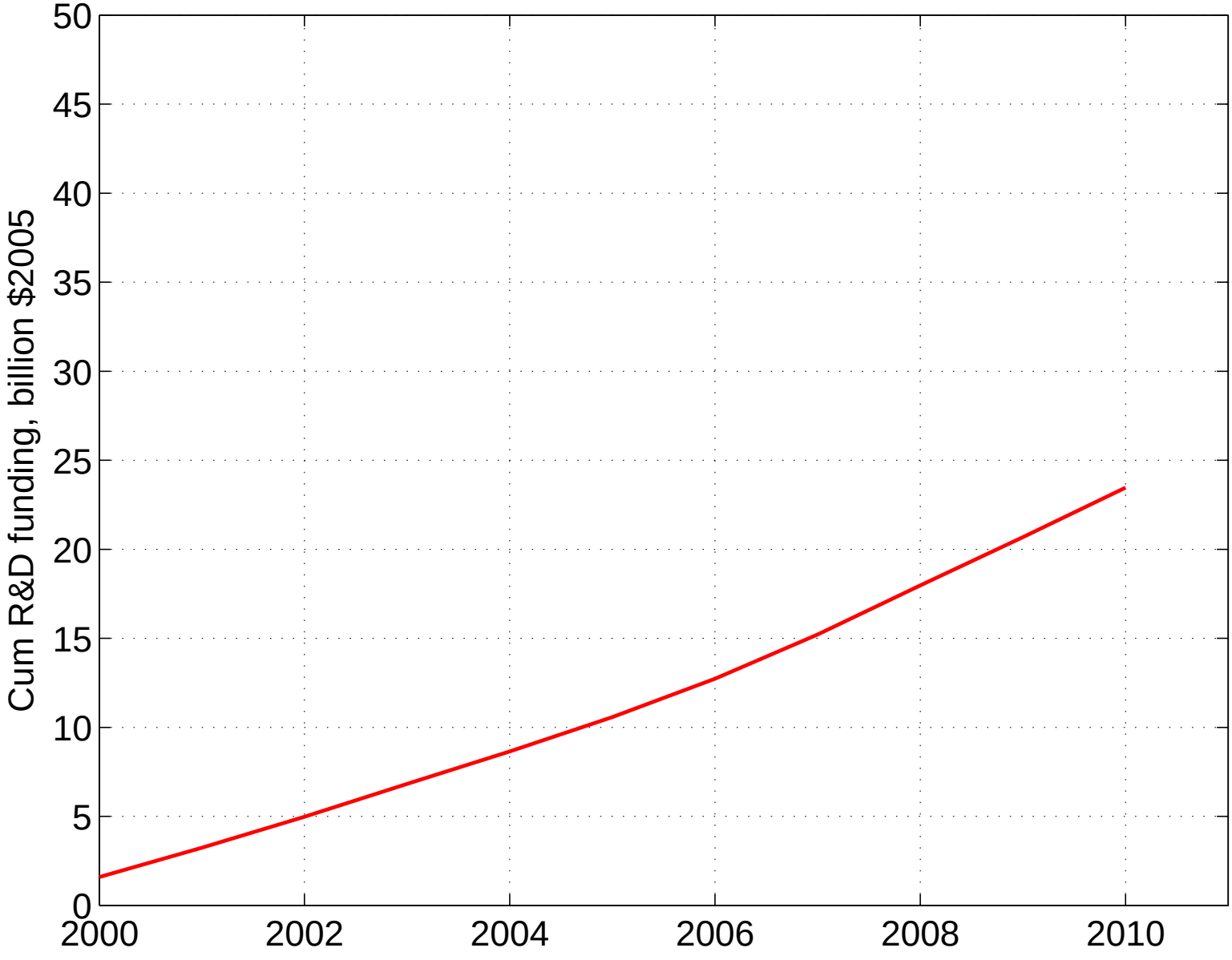
Various estimates

Annual R&D Budget in U.S. O&G



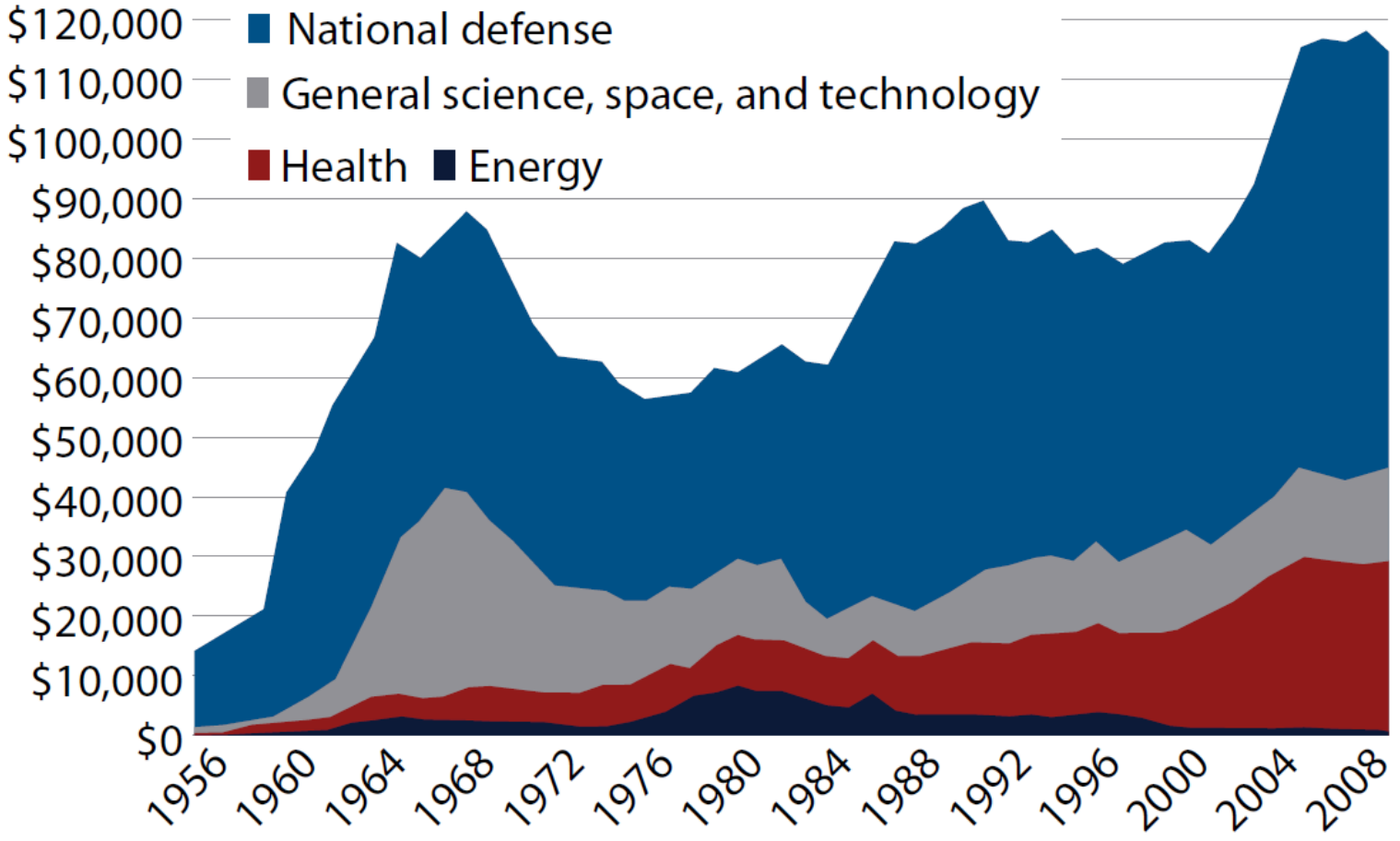
Annual Reports and estimated allocations

Cum R&D Spending in U.S. O&G



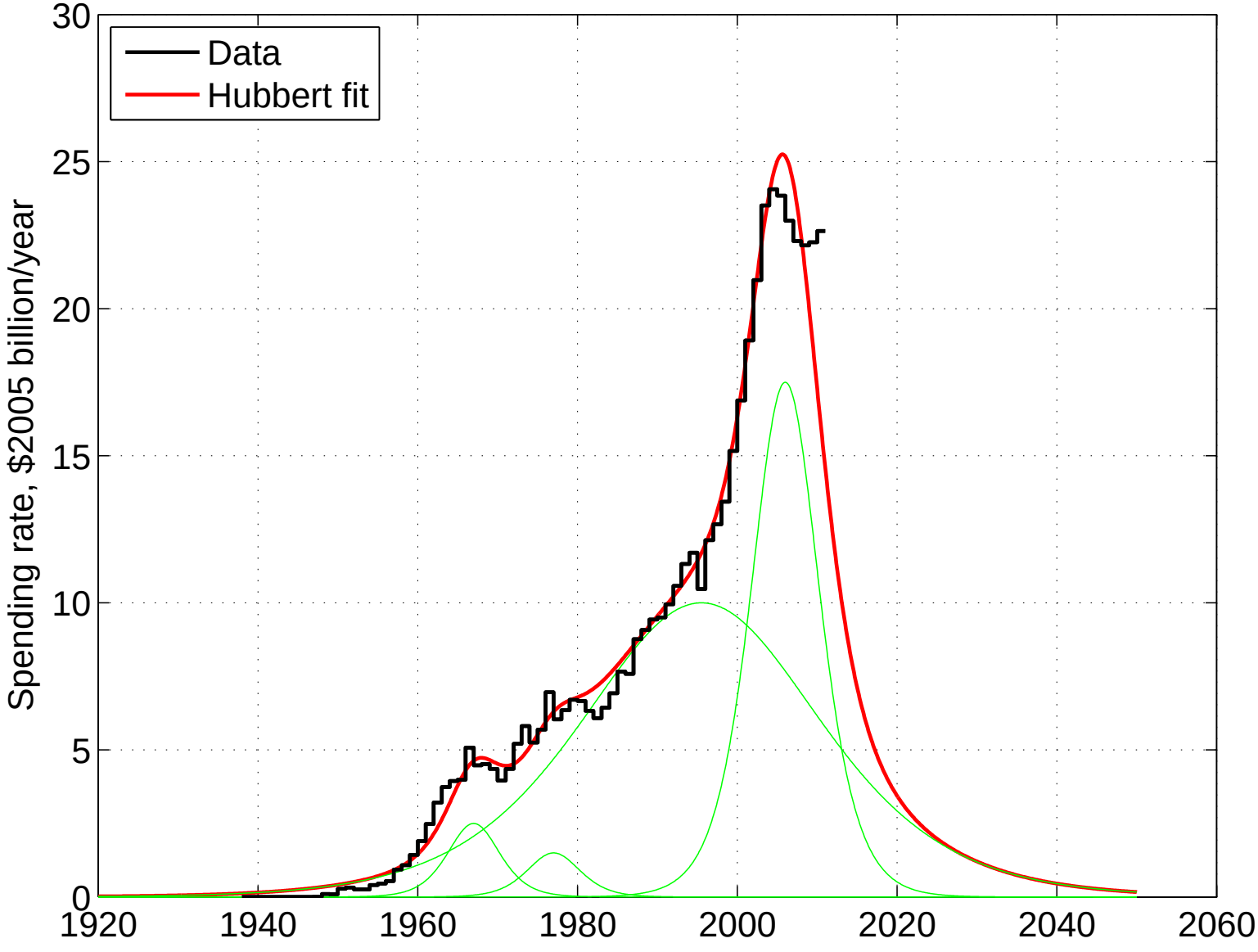
Annual Reports and estimated allocations

Federal R&D Spending



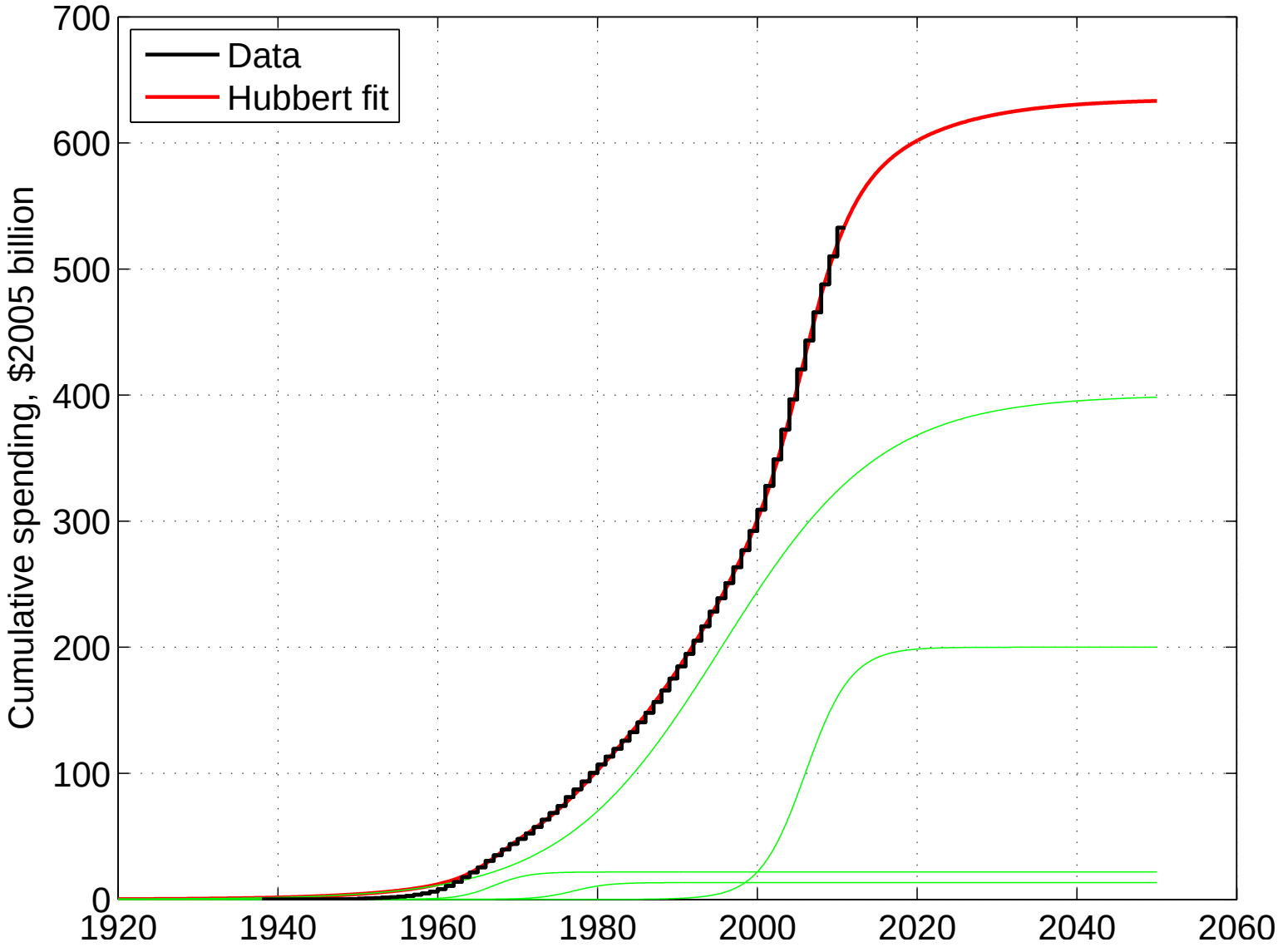
Office of Management and Budget, Fiscal Year 2008 Budget Historical Tables

Annual NIH Spending



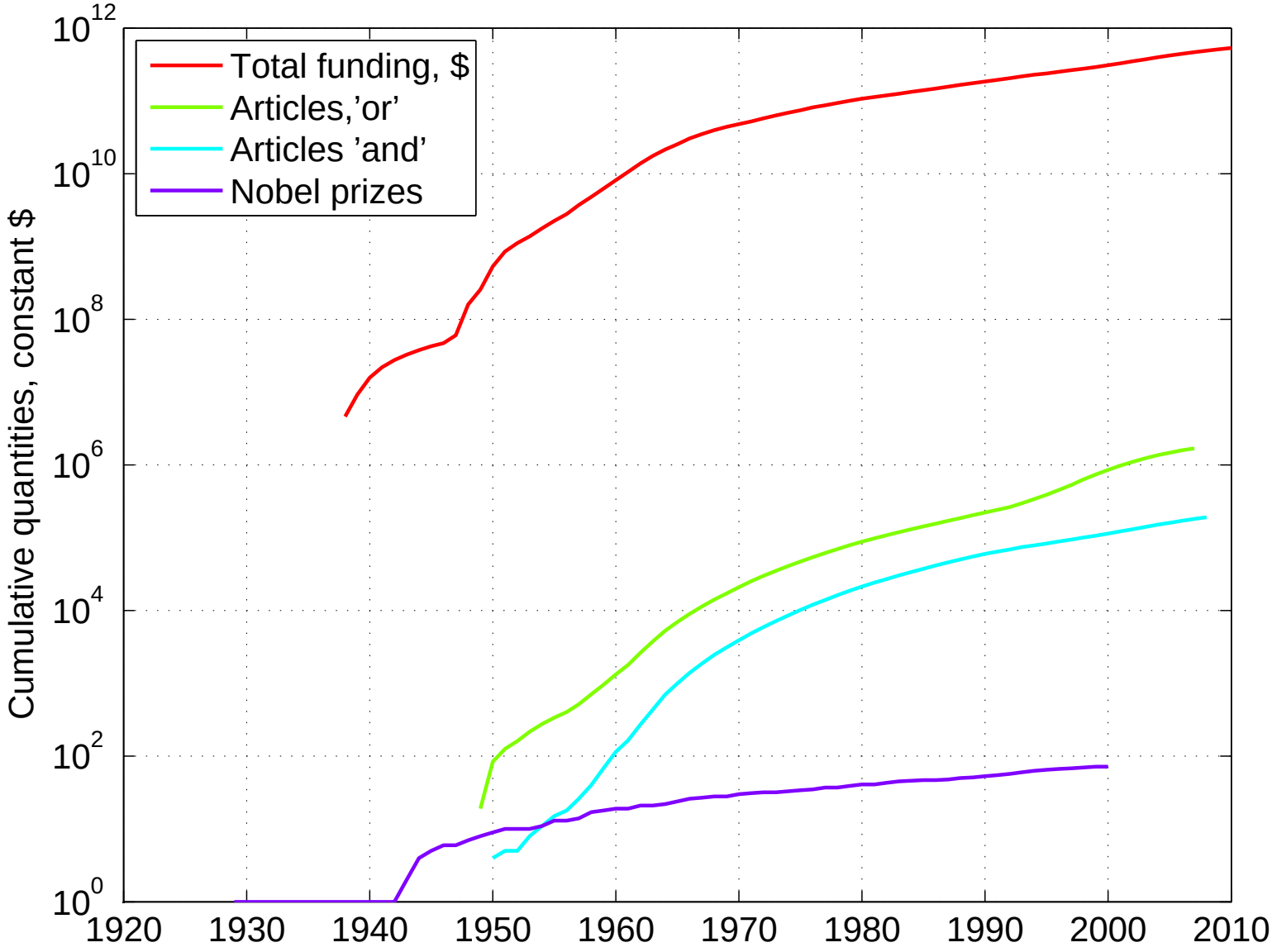
Source: NIH website

Cumulative NIH Spending



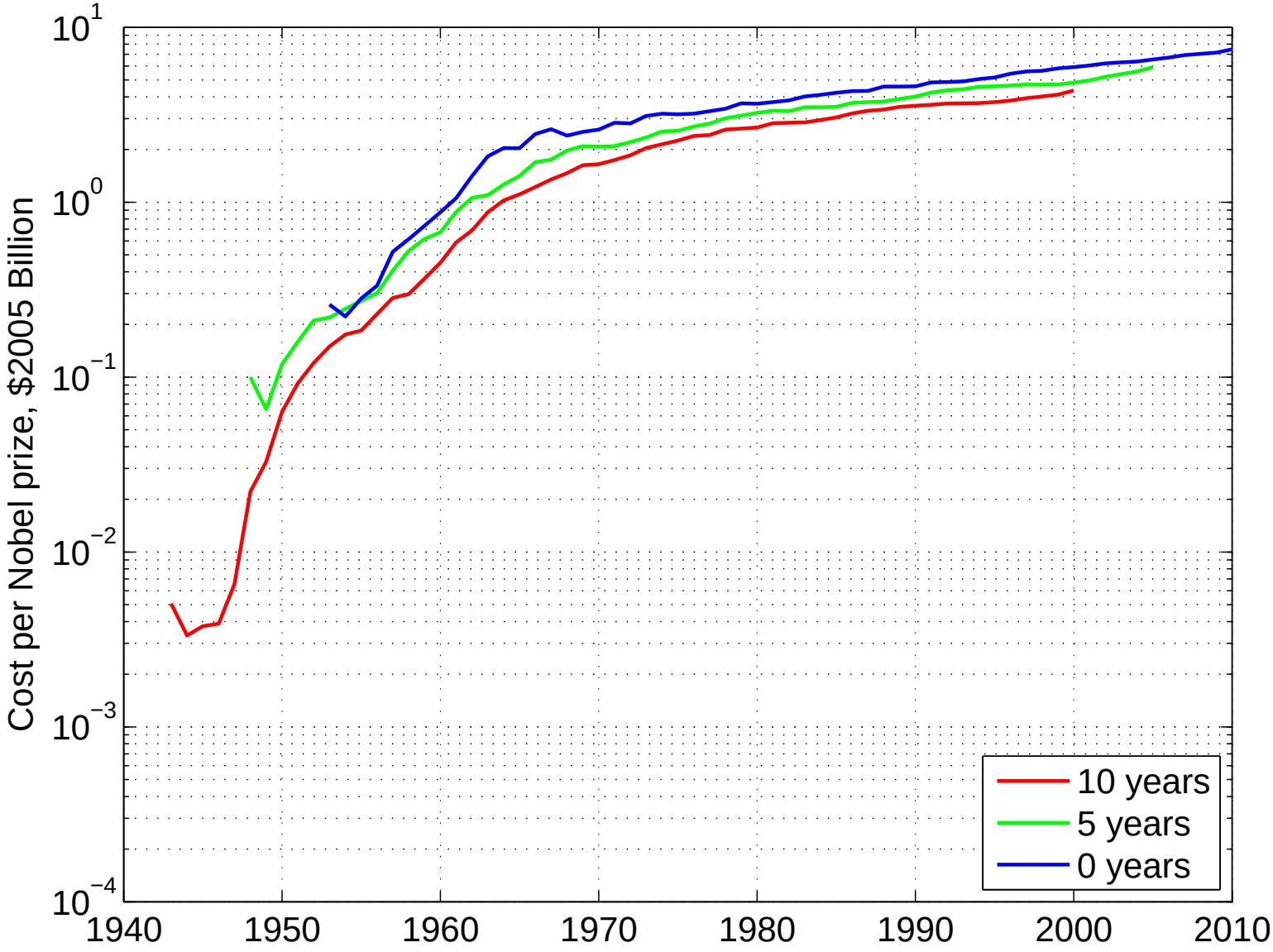
Source: NIH website

Characterization of NIH Spending



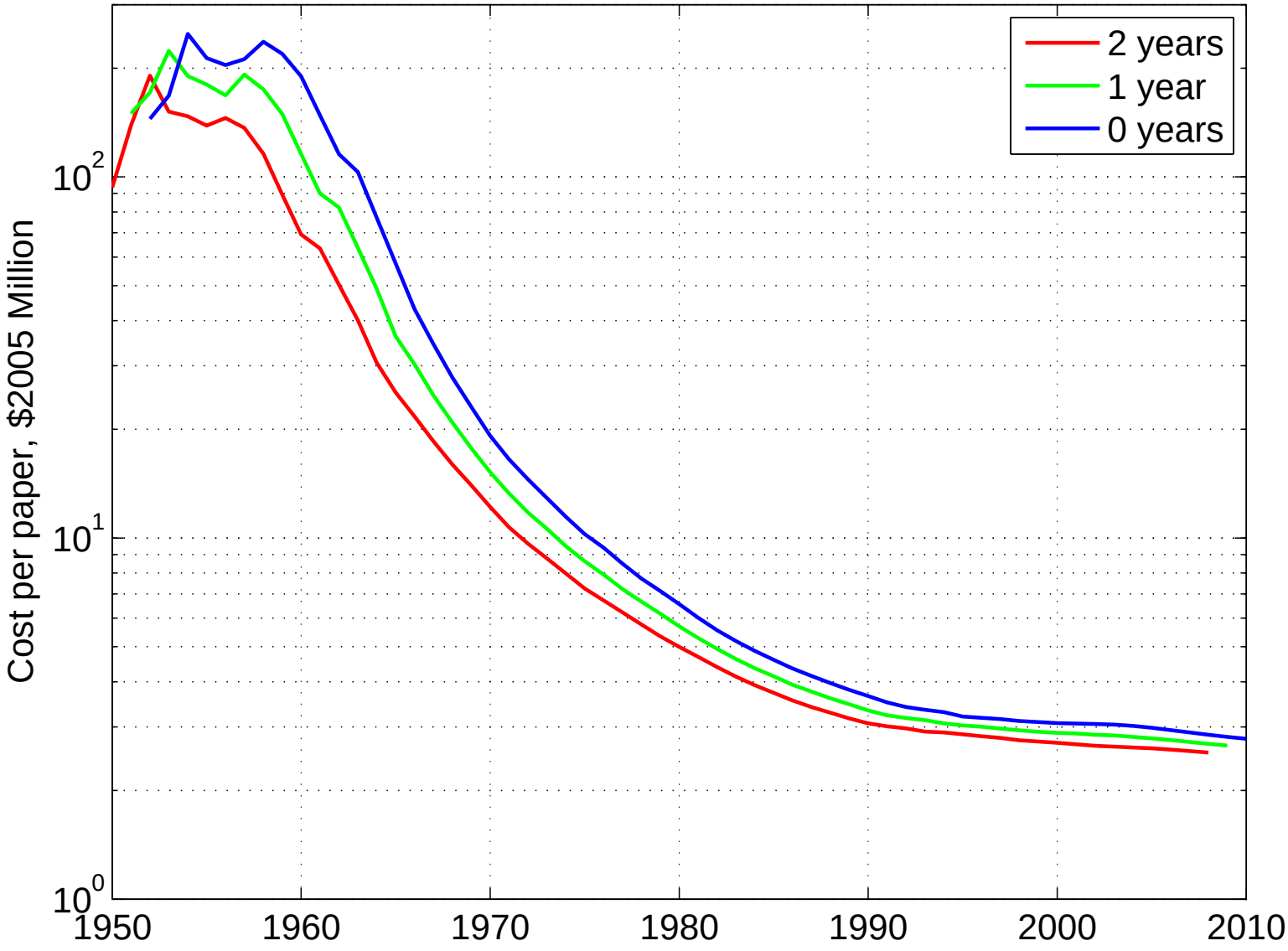
Sources: NIH website, Google Scholar, Nobel Prize website

NIH Spending per Nobel Prize



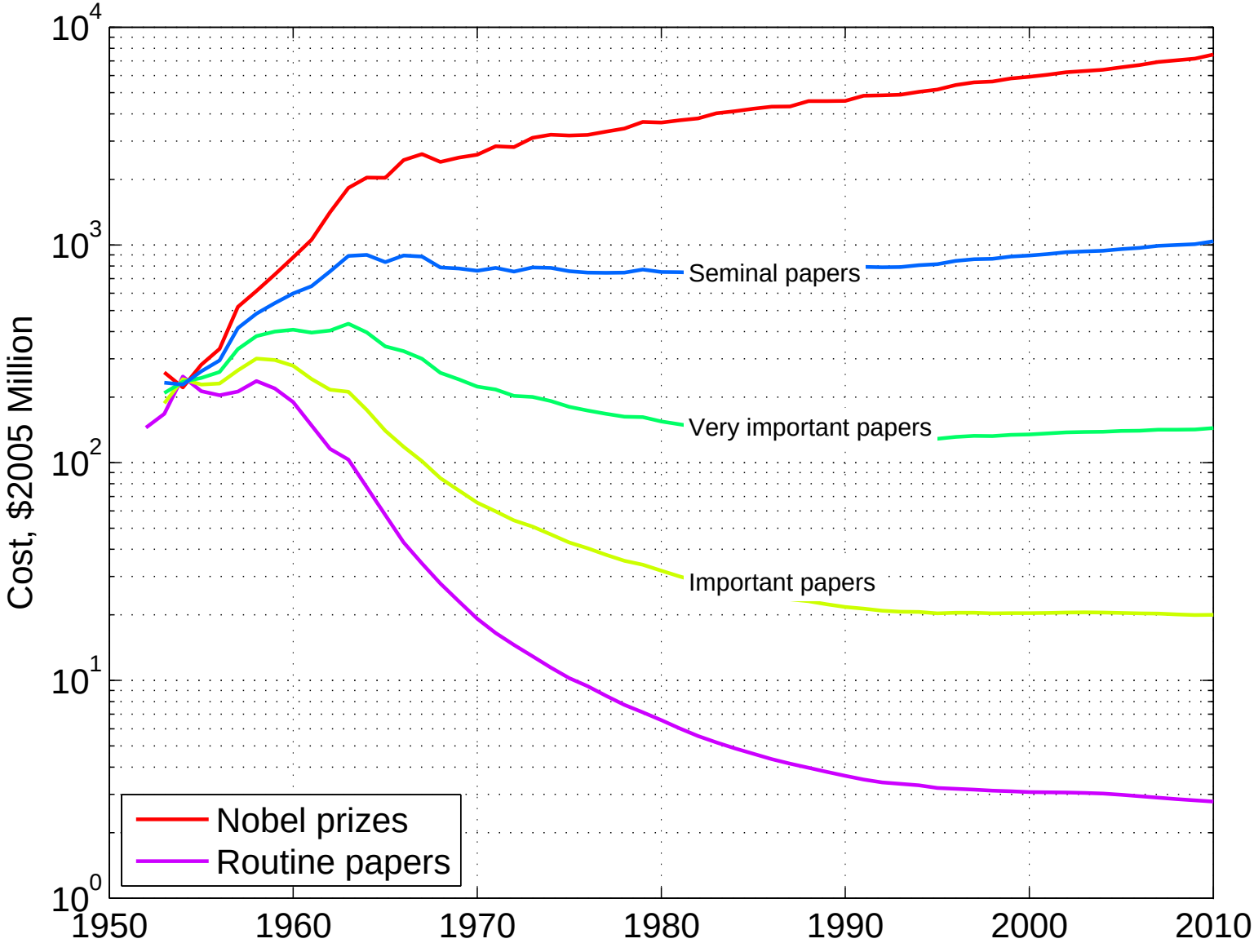
Sources: NIH website and Nobel Prize website

Cost per NIH Paper



Sources: NIH website and Goggle Scholar

Different NIH Papers



Sources: NIH website and Goggle Scholar

Spill Prevention Subcommittee

Presentation to the Ocean Energy Safety Advisory Committee

November 7, 2011

Spill Prevention Subcommittee Goals

- **The Chairman of the Ocean Energy Safety Advisory Committee has charged the Subcommittee on Spill Prevention with investigating a range of issues pertaining to spill prevention in offshore oil and gas development, as follows:**
  - What is the state of existing operations and technology?
  - What is the state of the current R&D undertaken by government, industry and academia?
  - What needs to be done or should be done to advance this topic area?
  - What work products can this subcommittee reasonably produce in the area of spill prevention and in what time frame?
  - Make recommendations on future research and oversight

Spill Prevention Subcommittee

- **Subcommittee Members:**
  - Lois Epstein – The Wilderness Society
  - Steve Hickman – USGS
  - Don Jacobsen – Noble Corp.
  - Nancy Leveson – MIT
  - Richard Sears – MIT
  - Paul Siegele – Chevron
  - Christopher A. Smith – DOE
  - Mathy Stanislaus – EPA
  - Walter Cruickshank – DOI

Spill Prevention White Paper

- **The White Paper addresses:**
  - Technical Challenges
  - Regulations and Enforcement
  - Industry R&D
  - Government R&D
  - Conclusions

The Subcommittee Prioritized Technical Challenges

- Operating offshore, particularly in deep water and in offshore frontier areas like the Arctic, creates production risks that are fundamentally distinct from onshore operations .
- Drilling is the phase of development in which the operator must manage the greatest number of risks and uncertainties.
- Concerns about fracturing the formation can have a big impact on well design, lost circulation, and loss of well control.
- Well design incorporating multiple barriers is essential to safety.
- Human factors relating to real–time data processing, interpretation, and decision making

Spill Prevention: Regulations

- Pre-Macondo Regulatory Environment – a largely prescriptive regulatory framework for OCS that primarily addressed the technical issues that might instigate active failures:
  - Fewer measures to address organizational risk factors, e.g., poor design, management of change, coordination and communication (latent conditions)
  - Regulations required use of best available and safest equipment and procedures on all E&P and production operations.
- In 1990, MMS introduced a voluntary systematic approach to detecting and managing human factors and addressing latent conditions – based on API's RP 75:
  - First step in moving from prescriptive to performance-based regulation; however, it did not create a sufficiently broad change in safety culture.
- In 2009, MMS published proposed rule to make mandatory parts of RP 75 -- titled Safety & Environmental Management System (SEMS)

Spill Prevention: Regulations (continued)

❖ Post-Macondo Regulatory Changes

- MMS was reorganized to better segregate duties: MMS became BOEMRE which has now been split into BOEM and BSEE
- BSEE will perform a comprehensive review and assessment of regulations
- DOI findings indicate that unsafe offshore drilling operations often result from human error
  - SEMS became a mandatory operating standard and was improved by requiring independent verification of compliance
- Other Rulemakings:
  - Measures designed to ensure sufficient redundancy in BOPs, promote well bore integrity and enhance well control equipment and procedures
  - Established new casing installation and cementing standards and require certification by registered professional engineer
  - New measure for training of rig personnel and closer oversight on deepwater operations

Regulations: Future Rule Making

- **Future BSEE Rule Making will Address Technical Challenges:**
  - Equipment certification
  - Blind Shear Ram redundancy requirement
  - Cement integrity
  - Safety training and industry certification requirements
  - Secondary control systems
  - Deepwater well-control procedure guidelines
  - Casing installations
  - Industry has developed and are revising recommended practices for OCS E&P activities thru API.
  - Fair, consistent inspection and enforcement are critical to ensuring regulatory compliance.

Ongoing Industry R&D

- Industry has dedicated significant research efforts to extend their ability to reliably and safely extract oil and gas from an increasingly challenging resource base.
- Oil and gas companies focus primarily on applied research.
- Service companies are also an important contributor to safety research, leading to more effective zonal isolation, new innovations in mechanical barriers, more effective monitoring equipment, and other innovations.
- A review of industry R&D efforts is currently underway in which the American Petroleum Institute, International Association of Drilling Contractors, Association of Drilling Engineers, and other global organizations are participating.
- Most industry R&D progress in spill prevention has been derived from improvements by manufacturers to their existing products, or through meeting specific operator needs.

Government Oil Spill Prevention R&D

❖ DOE research areas

DOE currently sponsors R&D activities in areas including well integrity, ultra-deepwater imaging, hydrate plug characterization, mechanical and structural stress analyses, integrated ultra-deepwater systems, and risk assessment through modeling and simulation.

❖ DOI Technology Assessment and Research

Through its Technology Assessment and Research (TA&R) Program, BOEMRE contracts studies to assist its managerial, technical and rules-writing staff in making decisions concerning safety of offshore oil, natural gas, and renewable energy operations.

	FY2008	FY2009	FY2010	FY2011
Department of Energy	$18.4	$18.4	$18.4	$23.4
Department of the Interior	$1.6	$1.6	$1.5	$5.4
Total	**$20.0**	**$20.0**	**$19.9**	**$28.8**

Federal Funding of Offshore Research and Development Activities ($ million)

❖ Other Federal research conducted by Coast Guard, USGS, DOT, and EPA

Conclusions

- Regulatory advances lag technical advances in the United States.
- Greater sharing of data will help companies learn and prevent accidents.
- There is an opportunity for government to work with academia and industry and take a broader role in research and development.
- There is a tremendous amount of data that requires processing in real time in deepwater operations. The industry would benefit from further automation R&D.
- Understanding and addressing human factors is a key element in preventing future accidents:
  - Collaborating on safety in a commercially competitive environment can benefit the oil and gas industry -- adopt best practices from other industries.
  - Offshore drilling operations are managed by a cluster of systems -- evaluating the way companies work together and jointly make decisions is important.
  - Change is a constant in any complex operation and risk increases any time change is introduced into an established procedure.

Recommendations that cross over to other Subcommittees

- The Prevention Subcommittee identified a number of recommendations for topics which are better addressed by the Safety Management Systems Subcommittee.
  - Human factors, e.g. the latent conditions that can impact spill prevention
  - Sharing of data (leading indicators, best practices, etc.) that will help companies learn and prevent incidents
- The following technology/equipment recommendations fit more appropriately with the Spill Containment Subcommittee
  - Instrumentation and data to diagnose condition of well after loss of control (BOP, casing, wellhead housing/seals, cement, etc.)
  - Secondary capabilities and systems for back-up BOP operation
  - Flow outside the well bore after loss of control

Next Steps

- Evaluate changes in spill prevention regulations and enforcement that BOEM/BSEE is proposing to address gaps exposed by the Macondo accident, and make recommendations for future improvements.
- Make specific recommendations for changes in regulatory reporting requirements and steps that industry and government can realistically take to utilize this data to improve safety. These data uses will include:
  1. Informing decisions of the OESAC regarding the types of technological, regulatory or enforcement advances needed to improve Ocean Energy Safety,
  2. Facilitating greater sharing of data and lessons learned between companies to improve equipment and procedures for offshore drilling,
  3. Informing future BSEE regulations pertaining to oil and gas drilling and production on the OCS, and
  4. Using shared data from past well control incidents, precursors, and near misses in advanced crew training and preparedness exercises.
- Consider specific R&D gaps that need to be addressed, and which development topics should be tackled by industry, government, and academia. Consider ongoing work by API sponsored Joint Industry Task Forces.
- Make more detailed recommendations on the development and implementation of automated systems to improve prevention of loss of primary well control.
- Collaborate with other subcommittee on areas of mutual interest.

Q&A

Potential Impacts

Impact to DOI/BSEE?

❖Technical resources in BSEE need to participate in technology identification and development efforts, so impact will depend on available staff and funding

❖New technology or regulatory requirements may have an impact on required staffing levels and/or expertise within BSEE

- Desired outcome of any required changes is to minimize this impact (i.e. use technology to work smarter and be efficient with staff)

Impact to Industry?

❖E&P Operators and Service companies dedicate significant resources and money to technology identification and develop, so minimal impact expected

❖Identified technology or regulatory requirements may have an initial capital requirement, but operating efficiencies and improved performance should offset some of this cost

- Need to be careful not to impact overall project economics and viability of deepwater oil and gas production

Opportunity for enhancing cooperative efforts?

❖Identified efforts require close cooperation between government, industry and academia.

Recommended Way Forward

- Coordinate with other subcommittees on identified cross-over areas.
- Bring together industry, government and academic experts to further explore required technology developments and develop specific recommendations for execution of the recommended technology development programs.
  - Build on existing efforts from RPSEA, API sponsored JITFs, etc.
  - May need dedicated resources to organize and drive results
  - Set up review/challenge sessions at regular intervals to monitor progress and provide steer to the team
  - Finalize recommendations with subcommittee and bring to full committee for endorsement
- Evaluate changes in spill prevention regulations to address gaps exposed by the Macondo accident, and make recommendations for future improvements.
- Timeline to complete the above activities depends on
  - Time required to pull together the right participants
  - Funding availability for dedicated resources

Containment Subcommittee

Presentation to the
Ocean Energy Safety Advisory Committee

November 7, 2011

- **Subcommittee Membership**
- **Subcommittee Scope**
- **Recommended Organizing Vectors**
- **Path Forward**

Subcommittee Membership

- Walter Cruikshank, Government
- Stephen Hickman, Government
- Patrick Little, Government
- Richard Sears, Non-governmental Organization
- Christopher Smith, Government
- Mathy Stanislaus, Government
- Charlie Williams, Industry

Subcommittee Scope

- **Characterize the state of existing capabilities and technologies for oil spill containment.**
- **Review research and technology development in this area currently undertaken by government, industry and academia.**
- **Identify critical knowledge gaps that impact containment capabilities in the event of an accident.**
- **Build recommendations for OESC of critical areas in which input is most urgently needed and develop recommendations for future research.**
- **Consider potential overlap with issues identified by other subcommittees in developing recommendations.**

Recommended Organizing Vectors

- **Topic 1: Organizational and System Readiness for Containment Response**
- **Topic 2: Instrumentation and Data to Diagnose Mechanical Condition of Well after Loss of Control**
- **Topic 3: Assessing and Mitigating Risks Posed by Underground Blowouts**
- **Topic 4: Secondary Capabilities and Systems for Back-Up BOP Operation**
- **Topic 5: Containment Scenario Planning**

Organizing Vectors - 1

Organizational and System Readiness for Containment Response

- **Industry cooperative initiatives for subsea containment**
  - Operators now must address internal containment capability, to generate a Responsible Party Checklist
  - Hardware and expertise issues are being addressed (e.g., Spill Containment Corporation), but sourcing skills and expertise still an issue
  - Industry and government capability for managing containment operations
- **Assess physical, organizational and system readiness in government (CG, BOEMRE) and industry**
- **Command and control structures, equipment readiness standards, personnel, testing and drills**
- **Assess existing constructs, organization and readiness**

Organizing Vectors - 2

Instrumentation and Data to Diagnose Mechanical Condition of Well after Loss of Control

- **Status and integrity of engineered well system**
  - Surface mechanical systems (BOP, wellhead housing and seals)
  - Casing and annuli
  - Cement integrity
  - Instrumentation and data gathering, “black box” systems
  - Diagnosing loss into formation (vector 3) needed to asses well integrity
- **Capping approaches**
  - Shut-in, cap and flow, subsurface relief stipulated during permitting, but need verification during loss of well control
  - **Flow rate estimation critical in designing capping and collection strategy**
  - Discharge rate and full understanding of flow path
  - **Current state of operator and service company R&D, roles for government and academic research**

Organizing Vectors - 3

Assessing and Mitigating Risks Posed by Underground Blowouts

- **Detection technologies to assess cross flow and seafloor broach**
  - 3D and 4D seismic surveys (baseline and post-incident)
  - Oceanographic imaging (e.g., sonar, ROV visual)
- **Vertical fracture development and propagation**
  - Physical processes in marine sediments
  - Vertical fracture propagation, pre-existing faults
  - Assessing subsurface flow path and rate, flow monitoring
  - Evolution of hydrocarbon pathways
  - Subsurface response during flow, kill and cementing operations
- **Assess state of industry knowledge and ongoing research**
- **Identification of experts in key technology areas**

Organizing Vectors - 4

Secondary Capabilities and Systems for Back-Up BOP Operation

- **ROV capabilities for activating BOP systems**
  - Sizing of ROV ports, pumping capabilities
- **Replacement or repair of control pods**
  - Secondary control systems and hydraulic power
- **Activation of secondary shearing system**
  - Multiple rams, pipe positioning, ram effectiveness, new technologies
- **Development of downhole devices for internally sealing wellbore**
  - New devices akin to downhole safety valves in production wells
- **Identify ongoing research, recommend joint partnership projects to fill gaps**

Organizing Vectors - 5

Containment Scenario Planning

- **Macondo has focused attention on capping stack approaches to subsea containment**
  - Identify scenarios where this is the proper approach
- **Limitations for capping stack systems**
  - Water depth
  - Pressure limits on well
  - Wellhead condition
  - Working in presence of a debris field
- **Containment with surface BOP systems and production facilities**
  - Potential for multiple, closely spaced wells
- **Broaching, hostile environments**
  - Multiple leak paths, storms, arctic conditions
- **Engage experts on well conditions and scenarios where existing and planned equipment or procedures are lacking or limited. Identify research needs**

Steps Forward

- **Coordinate with other subcommittees on common and overlapping themes**
- **Prioritize tasks, and identify resources necessary to accomplish goals.**
- **Coordinate with industry efforts such as JIT's**
- **Establish timelines and deliverables**

Spill Response Subcommittee

Presentation to the
Ocean Energy Safety Advisory Committee

November 7, 2011

Outline

- Introduction
- Subcommittee Membership
- Subcommittee Scope
- Recommended Organizing Vectors
- Other Recommendations
- Conclusions

Subcommittee Membership

OESC Members

- Walter Cruikshank, Government
- Lois Epstein, Non-Government
- Stephen Hickman, Government
- Patrick Little, Government
- Mathy Stanislaus, Government
- David Westerholm, Government
- Charlie Williams, Industry

Contributors

- Marilyn Heiman, Non-Government
- Craig Matthiessen, Government
- David Moore, Government
- Peter Velez, Industry
- Greg Wilson, Government

Scope

- Look for gaps & inadequacies in BSEE's offshore spill response construct, especially with respect to planning, preparedness & cleanup effectiveness
- Look at the interface between BSEE and other federal agencies, and suggest opportunities for BSEE engagement with these agencies to improve offshore oil spill response capability and capacity
- Focus on the few critical areas in which input is most urgently needed
- Identify areas of commonality with other groups or initiatives and build on that work as appropriate

Recommended Organizing Vectors

Vectors

- Oil Spill Risk Assessment, Preparedness and Response in the Arctic OCS
- Cascading of Oil Response Equipment
- Full-Scale Testing of Response Equipment
- Interagency Coordination on Oil Spill Response Issues

General Approach

- Review of applicable reports and publications from government organizations, industry, academia and other organizations
- Conduct interviews with external experts or advisory groups
- Select members of workgroup, augment with additional staff/resources as needed

Oil Spill Risk Assessment, Preparedness & Response in the Arctic Outer Continental Shelf

Problem Statement

- Need to ensure that scientific understanding and technological capability are sufficient for reliable oil-spill risk assessment, preparedness and response in the Arctic OCS, under difficult environmental conditions with limited local infrastructure.

Goal

- Prepare white paper that assesses the state-of-the-art in oil spill risk assessment, preparedness and response in the Arctic OCS and identifies key uncertainties and possible means to address these uncertainties.

Issues/Approach

- Perform gap analyses of critical scientific and technological issues, including:
  - Risk assessments and scenario planning in relation to likely reservoir discharge volumes, spill trajectories, weather conditions, rates of natural oil degradation, and ecological/human impacts.
  - Technologies for detecting, monitoring and tracking oil around and under ice.
  - The efficacy of oil spill countermeasures such as mechanical recovery (e.g., skimmers), in-situ burning, bioremediation and use of chemical dispersants in Arctic waters.
- Also consider legislative, regulatory or policy recommendations, as appropriate.

Cascading of Oil Spill Response Equipment

Problem Statement

- The Deepwater Horizon oil spill raised questions regarding the need for an emergency protocol for quickly moving response equipment from one location to another, which can be activated during oil spills that exceed local capabilities.

Goal

- Prepare a white paper that outlines current regulations on response equipment performance requirements, problems created by drawdown of equipment from donor geographic areas and options to facilitate rapid deployment of equipment in times of National emergencies

Issues/Approach:

- Review existing State and Federal regulations that establish oil spill response performance measures .
- Review contract agreements between plan holders and oil spill response organizations that limit movement of equipment
- Identify and assess legal and regulatory avenues that could be accessed to enable movement of equipment. Develop options for cascading equipment with benefits and limits of each.
- Appointment of legal staff to workgroup critical to project.

Full-Scale Testing of Response Equipment

Problem Statement

- Testing in real-world conditions may provide important data on response equipment capacity and effectiveness, and will help drive innovation and R&D.

Goal

- Prepare white paper that assess potential advances in oil spill response equipment that might be realized through testing under real-world conditions and propose procedures for carrying out such releases.

Issues/Approach:

- Evaluate published data on state-of-the-art in response research and preparedness testing using full-scale, open-water releases
- Summarize international best practices for such releases
- Assemble a database of the above information
- Recommend processes/procedures to allow intentional experimental spills of oil or other substances to:
  - Facilitate innovative technology research and development
  - Incentivize production and adoption of new technologies
  - Promote preparedness

Interagency coordination on oil spill response issues

Problem Statement

- BSEE is not directly represented on some key interagency and agency/industry committees dealing with oil spill planning, preparedness and response
- Other DOI Bureaus demonstrated expertise during the Macondo spill that could be of value for spill response

Goal

- Make recommendations on how DOI should engage with these committees in the future to best meet their needs in preparing for and responding to spills

Issues/Approach

- Look at these existing committees, their originating authority and purpose
- Assess DOI Bureaus are currently being engaged with these groups
- Make recommendations as appropriate

Other Recommendations

Government-industry-stakeholder cooperative development of ops/technology

- Long standing relationships and forums that help foster cooperation and exchange of ideas between industry and government, such as:
  - Interagency Coordinating Committee on Oil Pollution Research
  - American Petroleum Institute
  - International Oil Spill Conference
  - National Oil Spill Response Research & Renewable Energy Test Facility
  - Joint industry projects
- Opportunities are there, no need to invent new mechanisms
- Need more collaboration
- Coordination/outreach with stakeholder groups could use improvement

Go-forward Recommendations

Further develop actions needed to implement proposed vectors

- Potential two-day subcommittee workshop
- Need to prioritize activities - may need to consider phased approach

Identify and commission dedicated resource(s) to conduct work

- Full/part time dedicated resources are needed
  - Funding through and/or collaboration options
  - Utilize existing knowledge base in academia, industry and govt
- Dedicated resources can be supplemented by industry, academia, NGO, and government staff members as available
- Build on existing work already done by other groups
- Set up review/challenge sessions to monitor progress and guide workgroup(s)
- Once a short-list is generated, conduct a review/challenge session with a cross-section of experts from academia, government and industry
- Finalize recommendation and complete required justification and demonstration

Go-forward Recommendations

Timeline depends on:

- funding model
- time required to establish the workgroups
- number of members available and,
- most importantly, depth of investigation and analysis desired

Factors to consider in prioritizing:

- Impact of the issue
- Scope of the problem
- Cost/resources/time need to complete the work
- Interest by other parties, groups (e.g. is anyone else working on it?)

Conclusions

Potential Impact(s) to BSEE

- Only preliminary discussions to date - no firm recommendations
- May require:
  - Additional resources
  - Legislative change(s)
  - Regulatory change(s)
  - Policy change(s)

- Expect that many of the recommendations can be handled at the policy level

Safety Management Systems Subcommittee

Presentation to the Ocean Energy Safety Advisory Committee

November 7 2011

Table of Contents

- Current Subcommittee Members
- Scope and Focus
- Status
- Interim Recommendations/Vectors
- Go Forward Recommendations.
- Potential Impacts
- enhancing cooperative development of technology and operations – Subcommittee View
- Conclusions

Current Subcommittee Members

- Walter Cruickshank, Government
- Lois N. Epstein, Non-Government
- Joe Gebara, Industry, Sub-Committee Lead
- Don Jacobsen, Industry
- Nancy Leveson, Academia
- Patrick Little, Government
- Tad Patzek, Academia
- Charlie Williams, Industry

Scope and Focus

- Scope of Subcommittee.
  - Safety Management Systems
  - Emphasis on ‘soft’ elements (people, procedures and processes)
  - Pass any recommendations for hardware/software enhancements applicable to other subcommittees
  - Support other subcommittee input on SMS

- The focus of the subcommittee
  - provide recommendations to ensure that the exploration and production activities are performed
    - within a Safety Culture, that
    - supports continuous learning, and
    - utilizes a safety management system that lays the foundations for success.

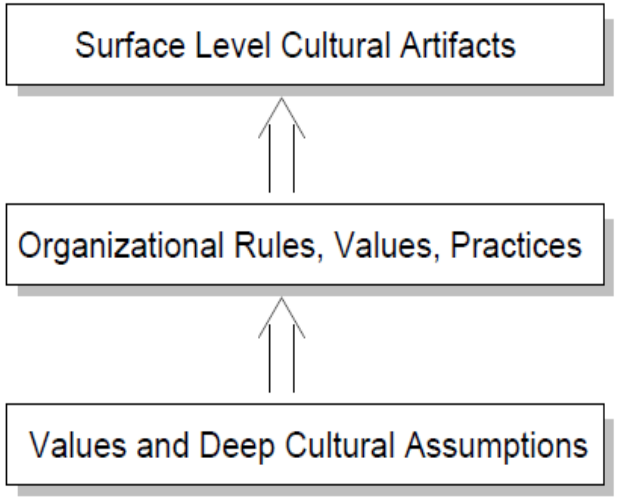
Status

- Interim Recommendations/Vectors
  - Develop Safety Culture
  - Implement an Optimum Safety Management System to continuously improve System Safety Performance
  - Develop a learning environment that fosters continuous improvement
- Overlap with other subcommittees

- Other areas SMS Subcommittee is exploring
  - Focus on the three recommended vectors

Vector 1 Summary: Safety Culture

- Organizational decision making always rests upon a set of industry or organizational values or assumptions.
- Trying to change safety outcomes by simply changing the organizational structures, including policies, and standard operating procedures,
  - may lower risk over the short term,
  - are very likely to be undone over time.



- Need to address the shared values and social norms – “The Safety Culture”

Vector 1 Summary: Develop a Safety Culture

- **Goals for regulators and industry :**
  - Commitment to safety by top leaders (regulators and industry executives) & stakeholders
  - Safety as an “organizational” and personal value
  - Communication of safety concerns throughout the “organization”, without fear
  - Thorough & timely investigation of incidents and accidents
  - Timely resolution of safety deficiencies
  - Integration of safety concerns into operational decision making
  - Use of early warning systems (leading indicators)
  - High levels of visibility of the state of safety

Vector 1 Summary: Develop a Safety Culture

- **Develop an informed recommendation on how to foster the development of a safety culture in the offshore industry.**

- **Areas to address:**
  - How to incentivize appropriate changes
  - How to receive input from stakeholders
  - Who best is to champion this effort, ensuring sustainable culture
  - What are the main pit-falls in implementing such a change.
  - The need for a safety leadership council.

Vector 2 Summary: Implementation of an Optimum SMS

- **Develop an informed recommendation on the optimum safety management system and whether a Safety Case should be used and made mandatory in the US OCS as part of a safety management system.**

- **Proposed methodology:**
  1. Review and analyze API Recommended Practices 75, SEMS and SEMS II requirements from BSEE, and other similar Safety Management Systems (SMS.)
  2. Review and analyze the construct of and various implementation methodologies for a Safety Case (SC.)
  3. Compare the methods analyzed for optimum effectiveness.
  4. Determine which method would be most effective in reducing the probability of a future incident
  5. Demonstrate/evaluate how the features of the recommended SC and/or SMS would have impacted the causal factors of the Macondo incident.

Vector 2 Summary: Implementation of an Optimum SMS

- **Special considerations if a Safety Case (SC) is recommended:**
  - Determine whether the SC method should be used
  - Determine if a prescriptive, goal based, or blended regulatory regime should be used
  - Determine how the SC should relate to the SMS that is supporting it
  - Evaluate the different approaches and criticisms to SC methods and recommend characteristics of proposed SC method. (ALARP?, Nimrod Example?, Montara?)
  - Clearly define the proper role of the regulators and agencies having jurisdiction in OCS in a SC regime
  - Assess consequential effects of the adoption of a SC on existing regulations outside of the SEMS regulations
- **Other considerations identified by the Subcommittee:**
  - Training and competency including contractors and regulators
  - Management of Change (MOC) (including organization, responsibilities, and procedures)
  - Regular up-dates and reviews Feedback loops and improvement loops tied to learnings and incidents
  - Design addresses total system safety performance

Vector 3 Summary: Development of a Learning Environment

- **Develop an informed recommendation on the steps to be undertaken to create an environment that fosters the sharing of leading indicators, near miss data and lessons learned between industry and government without fear of reprisal.**

- **Recommended methodology :**
  1. Identify the data that should be collected/used;
  2. Assess the need for a recommended practice for data collection;
  3. Identify who is best suited to be responsible for the process;
  4. Identify a feedback loop to ensure the information is useful.

Go-forward Recommendations

- **Develop actions from proposed vectors further by Subcommittee members before next committee meeting**
  - Preferably during a subcommittee two-day working meeting, with limited outside attendance, by invitation only.
  - Guideline for subcommittee working meeting have been requested.
- **Identify and commission dedicated resource(s) to research the cited documents and perform the appropriate gap analyses**
  - Full/part time dedicated resources are necessary.
  - Alternate funding to be considered
  - Dedicated resources can be supplemented by industry, NGO, and government staff members as available
  - Build on existing work already done by API, IADC, etc.
  - Set up review/challenge sessions at regular intervals to monitor progress and provide steer to the workgroup(s)
  - Once a short-list is generated, conduct a review/challenge session with a cross-section of experts from academia, government and industry
  - Finalize recommendation and complete required justification and demonstration

Go-forward Recommendations

- **Timeline to complete the above activities depends on**
  - funding model,
  - time required to establish the workgroups,
  - number of members available and,
  - most importantly, depth of investigation and analysis desired
  - With further literature review and support from API Center for Offshore Safety (COS), a more thorough description of the recommendation with timeline and resource requirements could be available by next OESAC meeting

Potential Impacts

Impact to DOI/BSEE?

- Change of current prescribed SEMS and proposed SEMS II to some other SMS will have an impact to BSEE that would have to be determined.
- Addition of a Safety Case requirement may require additional resources to review, approve and test effectiveness of the Safety Case in the field
- Implementation of the proposed Safety Culture would require more engagement of DOI, BSEE and BOEM executives with industry leaders and executives.
- Establishing a learning organization that gathers leading and lagging indicators analyzing and disseminating the data, may have an effect if BSEE takes on this responsibility.

Impact to industry?

- Change of current prescribed SEMS and proposed SEMS II to some other SMS should have some impact to industry participants. Most operators have a SMS, so impact would vary depending on recommended version/structure for the SMS
- Addition of a Safety Case and Learning Culture requirements would require additional resources to develop and implement. Specific Consideration should be given to:
  - Required time of implementation of the recommendations, taking into account required training, and resources.
  - Effect of changes in the regulation on permitting.

Subcommittee view on enhancing cooperative development of technology and operations

- **Based on the vectors that the SMS subcommittee is proposing, the following three cooperative opportunities are being presented to the committee.**
  - An organization or organizations are identified that would be best suited to take on the responsibility of gathering, analyzing and disseminating recommendations from leading and lagging indicators.
    - Possible organizations include: BSEE, Center for Offshore Safety (COS) or third party organizations.
  - The need for a safety leadership council that includes industry executives, regulatory representatives and public representatives such as safety experts is being discussed by the Subcommittee. Recommendations on potential role and responsibility of such council are expected to be presented at a later date.
  - Adoption of a new SMS and SC will require close cooperation between industry (IADC, API, etc.), US regulators, and other government agencies, and possibly International Regulators Forum.

Conclusions

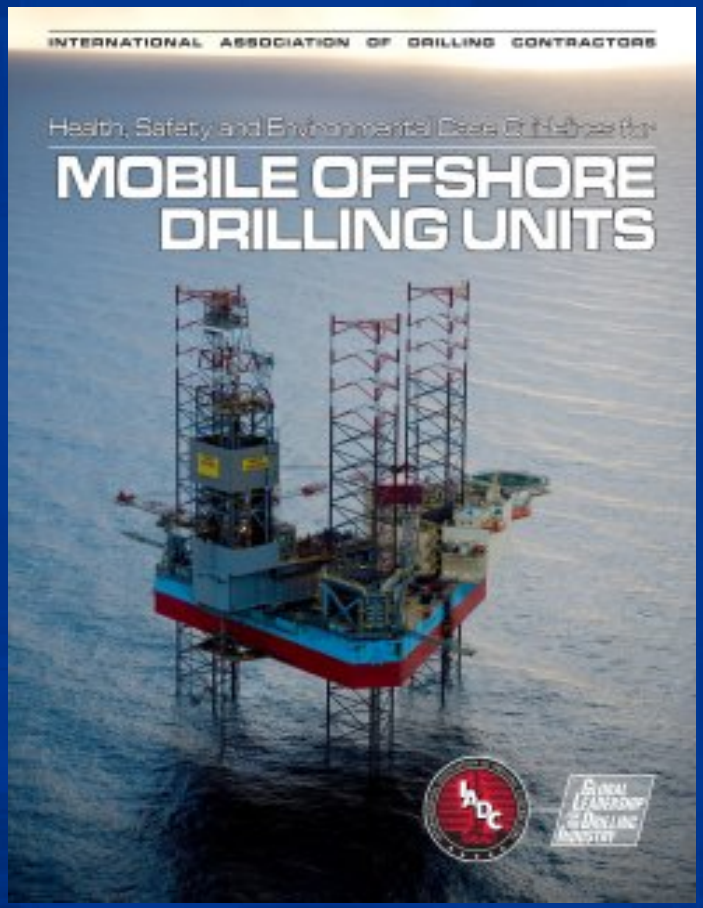
- **The Subcommittee considers that the three vectors that are being recommended are essential elements of a strong safety management framework and implementation after further definition would be highly encouraged.**
  - This subcommittee considers that it should limit its focus to these three vectors due to their high value.
- **For the Subcommittee to be able to progress its work in a more efficient manner, we would request early approval and discussion on**
  - Approval of a Subcommittee working meeting
  - Discussions on possibility of funding dedicated resources

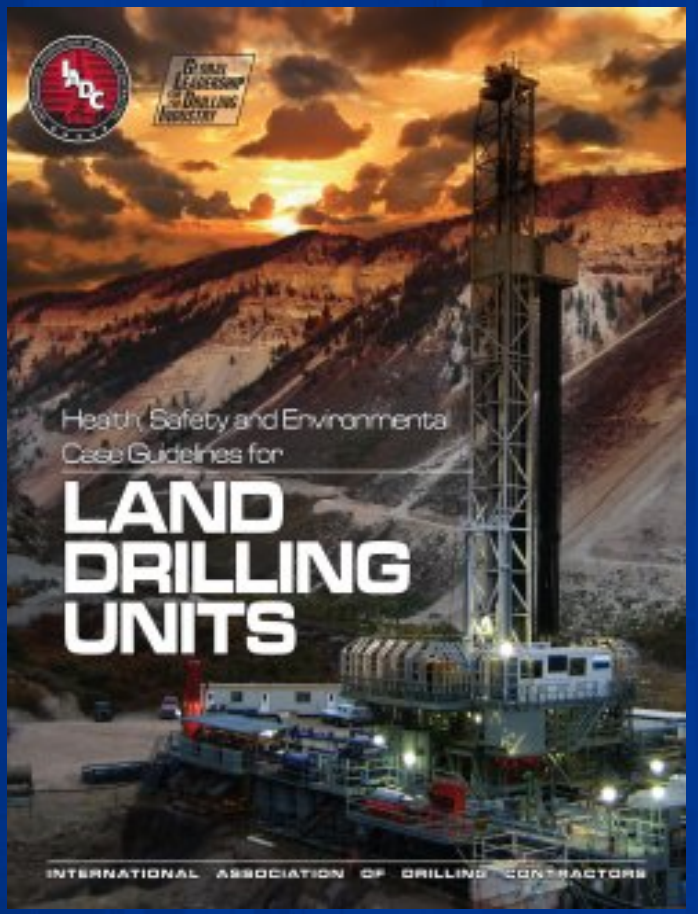
The IADC HSE Case for MODUs

Washington, DC – 7 November 2011

Alan Spackman
Vice President, Offshore Technical & Regulatory Affairs

IADC HSE Case Guidelines





http://www.iadc.org/hsecase/index.html

IADC HSE Case Guidelines for MODUs

- Completed Gap Analysis of IADC Guidelines against API RP 75
- Completed Gap Analysis of IADC Guidelines against BOEMRE's SEMS Final Rule
- Amendments to the IADC Guidelines for MODUs addressing identified gaps adopted at annual Users Group meeting (30 September – Amsterdam)

Why implement an HSE Case?

- Identification of hazards and establishment of risk-management controls to meet internal HSE objectives
- Documentation of process used to meet a client's HSE objectives
- Documentation of process used to meet HSE objectives that may be defined by a regulator

Regulatory approaches to the HSE Case

Differing approaches reflect political, cultural and practical differences:

- **United Kingdom**
- **Norway**
- **Australia**
- **Cuba**

Regulatory approach to the HSE Case

The approach can vary based on:

- Jurisdictional boundaries
- Regulator resource constraints
- Prescription
- Hazard threshold / risk tolerance

HSE Case prerequisites

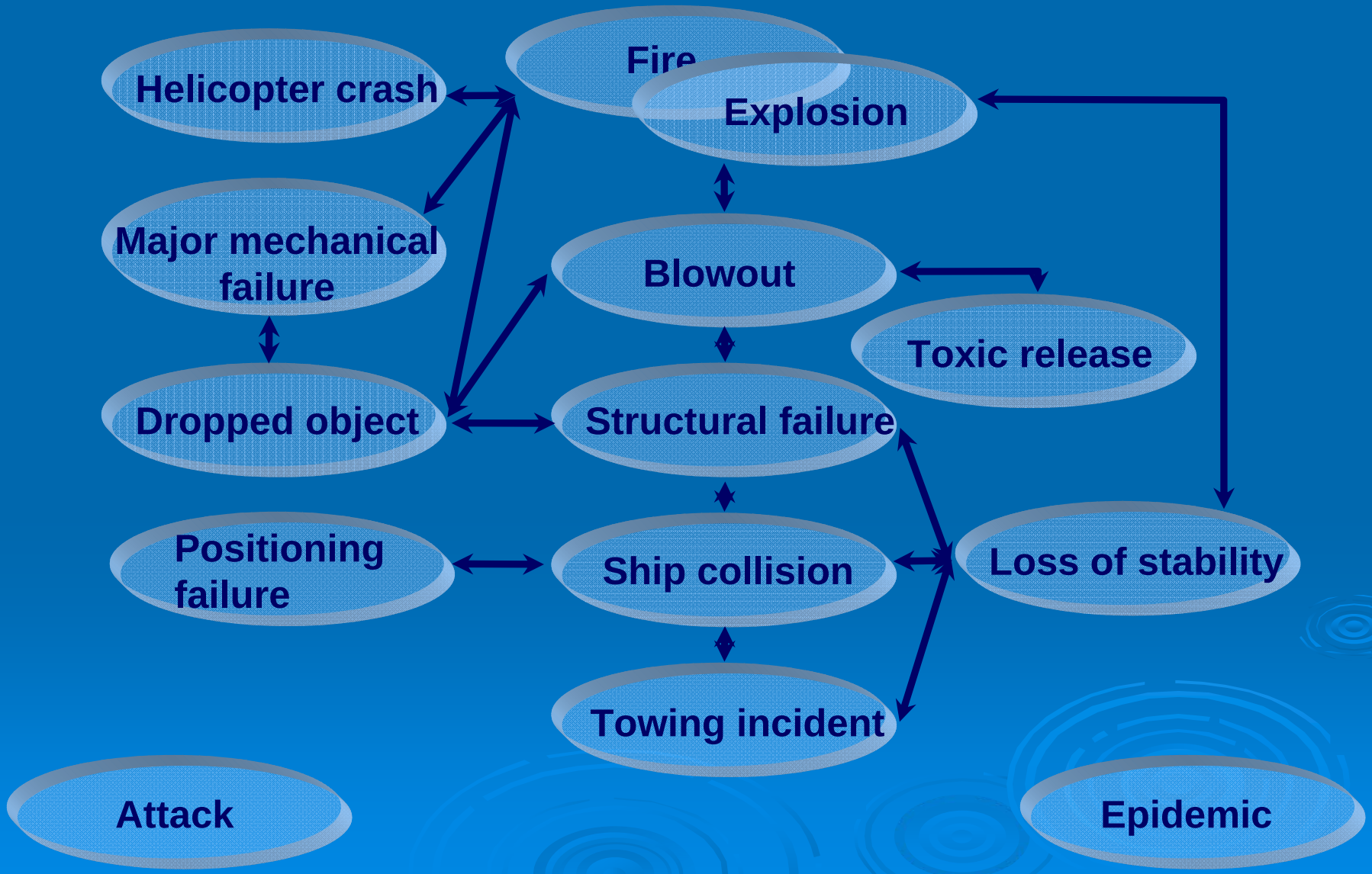
- Robust and effective management system
- Ongoing commitment to the process
- A clear understanding, established through dialog, of the internal, client and regulator expectations

HSE Case development

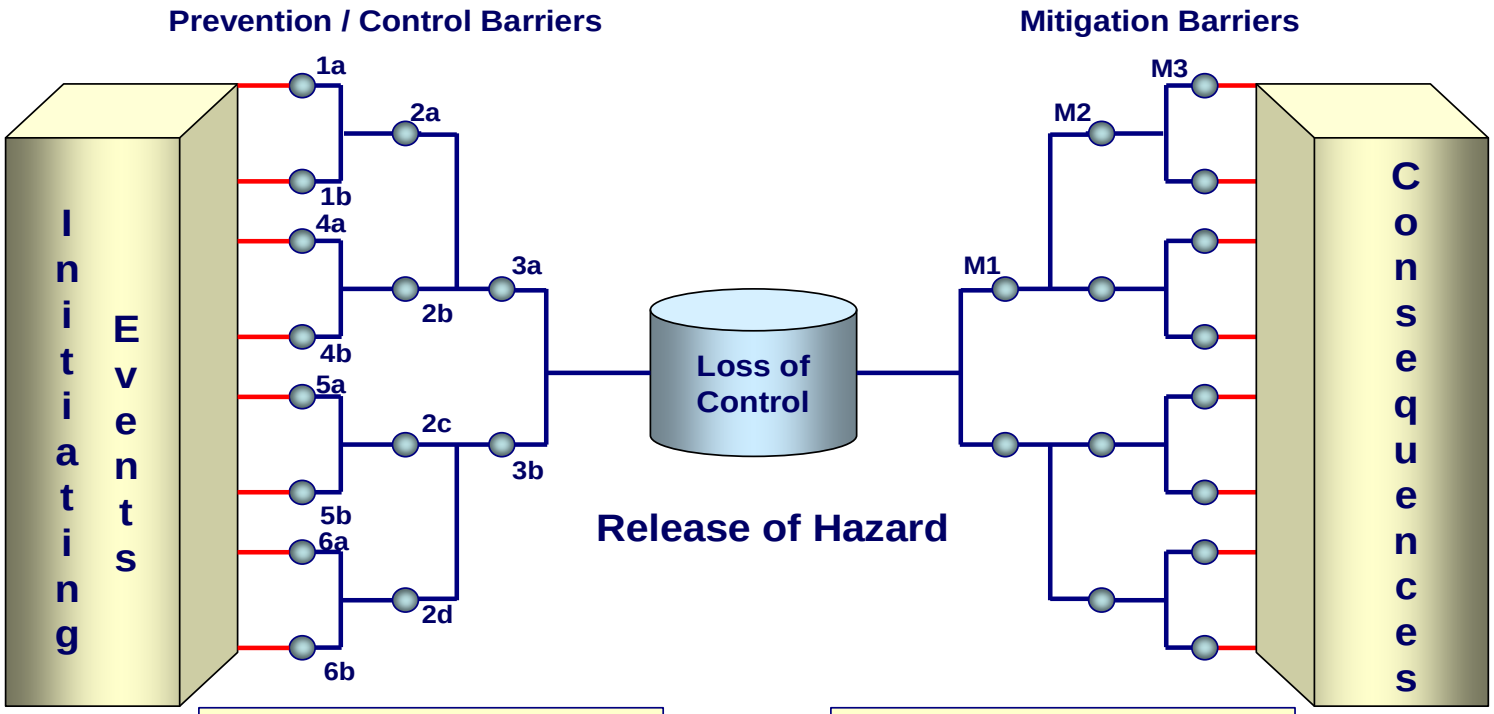
Three primary elements in the process

- Identification of the major hazards and events
- Identification and assessment of the risk-control measures (barriers) to prevent or mitigate those hazards
- Integration of barriers into design and operations

Major hazards and events



Assessment and integration



Regulatory challenges in the U.S.

- Defining and recognizing the “duty holder”
- Addressing (or not) jurisdictional issues with other regulators

  43 USC 1347(c) – The Secretary of the Department in which the Coast Guard is operating shall promulgate regulations or standards applying to unregulated hazardous working conditions related to activities on the Outer Continental Shelf when he determines such regulations or standards are necessary.
- Regulators’ resource constraints
- Dialog with regulator(s) to establish mutual understanding of goals

Regulatory dialogue

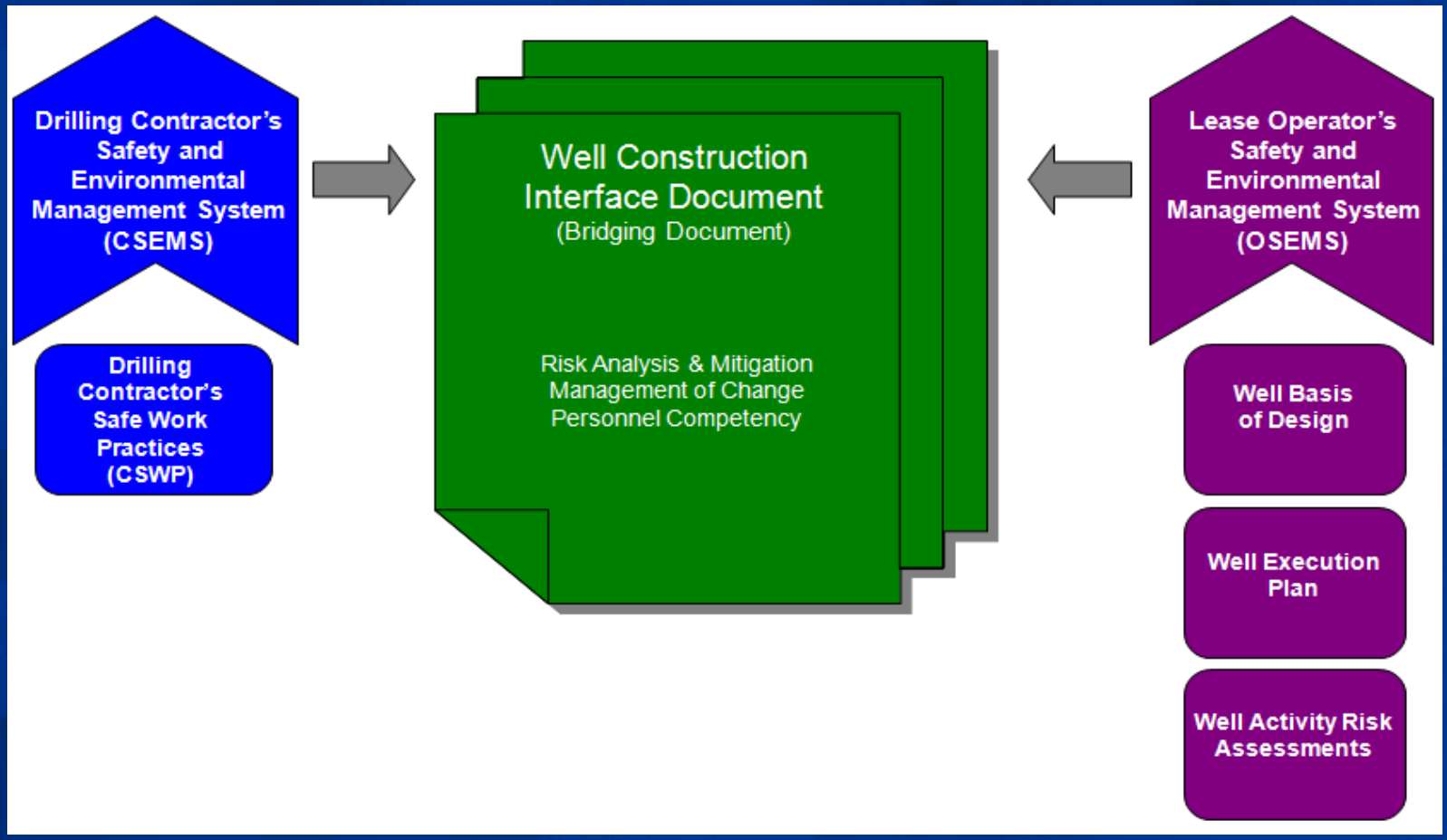
Regulatory challenges in the U.S.

- **Balancing goal-setting vs. prescription**
- **Removing impediments in existing regulations**

  30 CFR 250.107(c) . . . we consider your compliance with MMS regulations to be the use of BAST (Best Available and Safest Technology).
- **Auditing – Scope and location(s)**
- **Assuring effective bridging arrangements**

Bridging Arrangements

- **API / IADC Bulletin 97 – Well Construction Interface Document (under development)**



OESC Recommendation/Vector Matrix

	Subcommittee Recommendation/Vectors	Unique to Subcommittee	Shared with Another Subcommittee	Arctic Impact	Lesser Importance	Not Achievability in Short Time
	Spill Prevention					
1	Recommendation to BSEE on how regulations and enforcement systems can be used to improve BSEE's prorgam in regards to spill prevention: Include assessment of effectiveness			**Minor**	**7**	**5**
2	Recommendation to identify research for government, industry, and academia which would bolster reseacrh and development for spill prevention			**Incidental**	**1**	
3	Make more detailed recommendations on development and implementation of automated systems to improve prevention of loss of primary well control including instrumentation systems			**Incidental**	**3**	**3**
	Spill Containment					
1	Organizational and systems readiness for containment response			**Minor**		**1**
2	Instrumentation and data to diagnose mechanical condition of well loss control			**Incidental**	**1**	**1**
3	Assessing and mitigating risks posed by underground blowouts			**Incidental**	**4**	**11**
4	Secondary capabilities and systems for back-up BOP operations			**Incidental**	**4**	**3**
5	Containment scenario planning			**Minor**	**11**	**1**
	Spill Response					
1	Oil spill risk assessment, preparedness and response in the Arctic OCS			**Major**	**2**	**19**
2	Cascading of oil spill response equipment			**Incidental**	**5**	**1**
3	Full-scale testing of response equipment			**Incidental**	**2**	**5**
4	Interagency coordination on oil spill response issues			**Incidental**	**3**	
	Safety Management Systems					
1	Implement a safety culture			**Incidental**	**4**	**3**
2	Implement an optimum safety management systems to continuously improve system safety performance			**Incidental**	**1**	**2**
3	Develop a learning environment that fosters continuous improvement including data and assessment				**3**	**4**
	American Universities				**8**	**1**
	Cooperative Development (Institute)				**1**	

Appendix XII

DEPARTMENT OF THE INTERIOR (DOI)
OCEAN ENERGY SAFETY ADVISORY COMMITTEE MEETING
WASHINGTON, D.C.
NOVEMBER 8, 2011

DOI REMARKS

KENNETH L. SALAZAR
Secretary of the Interior

Secretary Kenneth L. Salazar (DOI): Thank you very much, Dr. Hunter. It's a pleasure for me to be here and an honor and also an opportunity for me to come and just let you know about the importance of your work today and into the future for a long time to come.

And so first let me say thank you to you, Dr. Hunter, for your work not only during the Deepwater Horizon Macondo well oil spill and the efforts of the President and so many other people and many of the people who are around this table who actually worked so hard to bring the Macondo oil spill to a place where at least it was arrested and we were able to move forward.

And secondly, thank you for your leadership on this Committee and all the time that you have spent on it along with all the great members who are members of this Committee. I look at somebody like Richard Sears and know how much time he spent working on the President's Commission on the Deepwater Horizon and having him here and offering his expertise to this Commission is a great testament to his own public service. And I look at Steve Hickman, who I know was there at the BP boiler room in Houston as we struggled with the issue for months at a time.

So, to all the members I could go around and signal something about each of you, but you're a very special group of people.

Let me also say thank you to Michael Bromwich because Mike has been with us doing Herculean work as we took the former regulatory regime, Ocean Energy for the United States, MMS, and transferred it into the Bureau of Ocean Energy Management and Regulation and now have completed the reorganization into the Bureau of Safety and Environmental Enforcement and to the Bureau of Offshore Energy Management. And so his work is one which I very much appreciate over the last year.

So, I wanted to share a few comments with you and then, I think, Michael is going to make some comments as well then maybe we'll have an opportunity to take a few questions.

But first, your organizational focus is exactly right. You know, I look back at the charge that we gave you and that we created you by Secretarial Order and at that time we said there were three

areas we wanted you to look at: drilling and workplace safety, intervention and containment, and oil spill response. And I remember thinking about those words at the time and thinking the best thing we could do is to prevent an incident like the Macondo from ever happening again. And so the prevention side of it made so much sense because we never want to get to the oil spill response.

But then if we do end up getting in a situation like we found ourselves in at Macondo, we want to make sure that we are ready to do is to move forward with containment as quickly as possible so that we mitigate whatever damage might be occurring from that kind of an incident. And then thirdly, moving forward if we have to deal with the oil spill response itself.

Those three categories are tremendously important and they continue to be very important to all of you.

I would submit that this Committee in coming up with its own organizational structure has even given, I think, more clarity to what we are doing because I looked last night at the organizational definitions that you have, Tom, and based on your meetings that you had in Washington and New Orleans, you have four subcommittees: the Oil Spill Prevention Subcommittee, the Containment Subcommittee, the Spill Response Subcommittee, and you've added the Safety Management Systems Subcommittee. So, I think those are all the most important areas that you ought to be working on and I appreciate your focus and the organizational clarity.

So, let me say, we have the right people to deal with ocean energy safety on this Committee and secondly you have the right organization. And as you move forward getting to the point where you have your conclusions and your recommendations in the spring of 2012, don't hesitate to let us know if there are additional resources that you need in order to be able to complete the job.

Now, why is your work so important? Why is it that it is so important that you're meeting here at South Interior today to grapple with these issues? At the end of the day it's important because this is all about the energy and environmental security of America and, really, the world, and I want to illustrate that to you in a couple of different issues that we currently are handling, which you will be learning about more and reading about more.

But first with respect to the Gulf of Mexico, you know, at the time that the Macondo well was in the middle of its blowout, I think there were a lot of people who thought that we were going to shut down the industry and we were going to shut down the Gulf of Mexico, but because of the good work of many people, including Director Bromwich, we are in a position where we can say that the activity in the Gulf of Mexico has returned. It's gotten back to a place where it was at the pre-Macondo well incident level.

And that's important for us as a nation because when you think about the fact that we are such an energy dependent nation on bringing oil from other countries, the fact that we have close to 30 percent of our oil and natural gas being produced in the Gulf of Mexico and being able to return there to a level of normalcy is something that's very important. And so your input and your guidance to the work that we have done at Interior and that Mike Bromwich has done is something that we very much appreciate.

But that effort is going to continue. So, today, later on, we will be announcing in a couple of hours with Director Beaudreau the next five-year plan for the United States of America in terms of ocean energy. That will put in place the five-year plan for the years 2012 to 2017 and it will have an emphasis in the Gulf of Mexico. We see robust oil and gas development in the Gulf of Mexico because there are a number of reasons to move forward in that area, including the fact that it has the most developed infrastructure for oil and gas development. It also has the support of the states in the Gulf of Mexico, and you have the capability that has been developed over the last year and a half, especially with respect to the oil spill response and the understanding of the Gulf.

So, under the legal regime under which I operate to make these decisions, in terms of ocean energy, it seems to me that the Gulf of Mexico is a place where we ought to be going.

In addition to the Gulf, let me also say that there are other areas in the OCS that are important and they're different and they're difficult and they require us to think about the kinds of issues that you're thinking about, they require us to develop addition science, additional geophysical information, additional oil spill response capability, and I'm speaking about the Arctic. We have in front of us, and have not yet made the final decision, on the expiration program that might move forward in 2012, but if that expiration program moves forward, it's currently conceived in both the Beaufort and the Chukchi Seas, the subcommittees that you're working on can make a significant contribution to making sure that we are doing the right thing there.

And I always have tried to let people know that there's a big difference between exploration and full development, so assuming there is exploration in either the Beaufort or the Chukchi or both of them this next summer, additional information will be developed, it will build on the information that has already been created from the several dozen wells that have already been drilled as exploratory wells in the Beaufort and the Chukchi. But there's a long way still to go and so you will see in the report later on today that the timing for lease sales in the Arctic is timing which will occur later on in that five-year period.

During that five-year period it will give us an opportunity to implement the recommendations that will come forward from this committee. So, in so many ways, you are helping us define the future of oil and gas production, not only in the Gulf of Mexico, but as well in frontier areas such as the Arctic and the same can be said about other areas which we might look forward to in the future.

So, it's really your work and our implementation of the 2012-2017 plan is something which is incredibly important.

Let me thirdly say your work is important on the international level. You know, I think people look to the United States from around the world and say you lived through the tragedy of the Deepwater Horizon, what did you learn from it? And how can you help inform the rest of the world on how we ought to move forward with safe oil and gas production in the oceans of our world? And so the International Containment Forum, which many of you participated in, which

Dr. Hunter was a key part of, is part of that effort, making sure that the lessons that we learned in the Gulf of Mexico over the last couple of years are lessons that we can share broadly.

In fact, following this meeting I am meeting with the minister of petroleum and environment for Norway where we will continue to talk about some of the international containment efforts that we have underway.

Now, let me speak about two areas that I think are really important on the international front. The first is within the Gulf of Mexico. Over the last couple years we've worked very hard with the country of Mexico, the president and the ministers that are involved in the energy issues in Mexico, to move forward with the development of a transboundary agreement between the United States and Mexico. Director Bromwich and the State Department, Ambassador Morningstar and others, have been very involved in getting us to move forward to the point where hopefully over the next several months there will be an international agreement between us and Mexico.

And when I went to visit with President Calderon in Mexico about -- sometime within the last year, one of the things that we spoke about is the fact that the Gulf of Mexico really is one pond. You know, there are other sovereigns that have an interest, but it is not the same level of ownership which the United States and Mexico have in the Gulf. Between the United States and Mexico we control probably over 90 percent, maybe even 98 percent of the entire Gulf itself.

Well, Mexico is wanting to move forward and developing its oil and gas resources in the Gulf of Mexico. But as we know from other incidents in the Gulf, that you can't just because of a political boundary line deal with oil spill prevention and preparedness and response on a political boundary line, and so what we want to do is to move forward with an agreement with Mexico so as they move forward with their own oil and gas development in the Gulf, the protocols which we have developed here in the United States will also be applicable to Mexico.

Both President Obama and President Calderon have reinforced that concept that we need to have one set of protocols that will be applicable in the Gulf of Mexico. So, the work that you are doing here, the recommendations that you will develop between now and the spring will be very important for us as we move forward with this regime working together in a bilateral fashion with the country of Mexico.

And secondly, on the international front, you know, over the last year we've had many opportunities to meet with the ministers of Russia and Angola and Brazil and a whole host of other countries where drilling of oil and gas in deeper and deeper waters is a reality and I think most of those countries are very interested in us moving forward with the development of a ministerial forum that will help us inform the safest way to produce oil and gas in the oceans of the world while at the same time making sure that the environment is being protected. And so we will continue to work on those international efforts.

It included, this last year, Secretary Clinton and myself in a historic meeting in Nuuk, Greenland, where the Arctic Council and its ministers all came together and signed a proclamation in Nuuk,

Greenland, that established an Arctic Council and Task Force that will look at safe oil and gas development in the oceans of the Arctic.

So, our international efforts are very important to us and the work that you do as experts is something that will inform what we do on the international level.

So, I give you some of those policy initiatives that we have underway at the Department of Interior within my office working closely with Director Bromwich and with Director Beaudreau to just let you know that your work has meaning. You are not just another advisory group that's coming together to give us a study that somehow is going to go on a shelf somewhere. Your work will help guide what we do in the United States of America and, really, across the world, with respect to the exploration and development of oil and gas in the oceans of the earth.

That's a monumental mission that you have and I'm grateful to Dr. Hunter and to each and every one of you for having given us of your time to work on this very important agenda.

And with that what I'd like to do is to turn it over, if I may, Tom --

OESC Chairman Thomas O. Hunter: Please.

Secretary Kenneth L. Salazar (DOI): -- to Mike Bromwich for his comments.

Appendix XIII

DEPARTMENT OF THE INTERIOR (DOI)
OCEAN ENERGY SAFETY ADVISORY COMMITTEE MEETING
WASHINGTON, D.C.
NOVEMBER 8, 2011

BUREAU OF SAFETY AND ENVIRONMENTAL ENFORCEMENT (BSEE)
REMARKS

MICHAEL R. BROMWICH
BSEE Director

Director Michael R. Bromwich (BSEE): Well, thank you very much, Mr. Secretary, and thank you, Tom, for inviting me here to the third meeting of the Ocean Energy Safety Advisory Committee. It's a great pleasure to be here with all of you and as I look around the room the selections that we made for this committee, I feel, have been validated.

And I've got individual stories to tell about most of you here, the various places that I first ran into you, Tad Patzek I ran into on my recruiting tour for petroleum engineers at the University of Texas, and he's one of the people who first brought home to me that R&D, particularly on safety issues, needed to be substantially improved.

I look at Charlie Williams who I wanted to congratulate for being named the chair of the Center for Offshore Safety, an industry group that I think will work closely with government to improve safety in the offshore ** Charlie was a recidivist in the various public forums that I held around the country at the direction of the Secretary to try to determine whether it was safe for deepwater drilling to resume. And based on information that Charlie and many other people here, including Nancy Leveson, provided, we made that decision that it was safe to start again a full month and a half before the original deepwater moratorium was set to expire.

Mathy Stanislaus, who I appeared with in my first of three appearances in front of Richard Sears' Deepwater Presidential commission.

So, I have individual stories to tell about almost everyone. Of course there's Walter, who has been a fabulous career deputy for me in BOEMRE.

So, it's a real pleasure to be here again for your third meeting. I've been at all three of them, I'm happy to say, and I really want to repeat what the Secretary said about thanking you for your service. This is not just another FACA. This is an incredibly important advisory committee that goes to the core of the mission of my agency, which has been renamed and shrunk, but the mission is critically important to ensuring the safety of exploration, development, and production in the offshore.

I know you've been very busy since the last meeting in July in New Orleans and we have too and I want to tell you just a little bit about what we've done and then talk to you a little bit about what my understanding is that you're doing.

The most important thing that we've done over the last few months is to complete the reorganization that was in the works for about a year. It was a heavy lift for the organization. It was done according to the plan laid out by the Secretary and some of his top people, even before I arrived at the agency, but it turned out to be right on the money in terms of separating functions that had coexisted in the same agency for 28 years where there was competing and conflict among the missions. And so it needed to be separated.

So, as you know, we separated the royalty and rental collections and then on October 1 we made the big and more difficult and more complicated split separating resource management, resource development management from safety and environmental enforcement. We think that's put the Department of the Interior and those three agencies in the position where they can pursue their missions without worrying about issues that are really collateral to their missions. We think they'll be able to better function in the months and years ahead.

As you know, we released the Joint Investigation Report in September, which is the culmination of more than a year of intensive investigation into the root causes of what happened at the Macondo well with the Deepwater Horizon. I understand you're going to have a presentation on that later this afternoon. I'm sure that most, if not all, of you have already paid close attention to that and are including that in your consideration and deliberations for what recommendations are appropriate going forward.

As you know, we have embarked on performance related standards as part of our regulatory regime. Going back a year ago we put into place for the first time the SEMS rule, the Safety and Environmental Management System rule. We're going to start enforcing that rule a week from today. We understood it was going to be a very significant lift for some operators, particularly smaller and independent operators, and so we wanted to be fair. And so we gave industry close to a year to prepare for that. But we're going to go in and we're going to start to make sure that companies are in fact complying with that.

We realized at about the time we put the original SEMS rule into place that there were some tweaks that needed to be done and so in order to accomplish those meaningful changes, including requiring third party audits, we have proposed what we call SEMS II, Son of SEMS, which will add certain requirements that companies and operators must have if they're going to have a fully compliant SEMS system. That's in the proposed rule stage so we're going to be obtaining comments on it, but we hope to go final on it in the not too distant future.

So, now is a good time to sort of look back at the last 16 months but also to look forward and look forward in conjunction with you. It's been a time of tremendous ferment and a lot of developments, obviously, in the wake of Deepwater Horizon, both for the industry and for the Department of the Interior and our agencies.

Clearly, we need to devise enduring ways, not short-term ways -- enduring ways to ensure that the regulations we have and the enforcement tools we use are relevant and current. We also need to make sure that we improve the enforcement of the rules, an area that we have not been particularly aggressive about in the past and that we need to improve on in the future.

In my judgment, and I know in the Secretary's judgment, this committee will play a central role in helping us move forward with a vibrant, relevant, flexible regulatory regime. We simply have to address the next generation of safety challenges that exist offshore. And that's especially important as the industry embarks on new frontiers in ultra deepwater and in geographic areas, including Alaska and the Arctic.

The Secretary has already referred to the Arctic and I just want to reinforce that point and I want to encourage the committee to focus on the special challenges that are presented by potential exploration and development in the Arctic and off Alaska.

I think it's important that the recommendations that you formulate should be relevant to the Arctic, not encouraging you to ignore other areas offshore, but the Arctic is special, it's different, and it's an area that, so far, has been largely unexplored. So, I think it's very much worthy of your extended time and attention to make sure that your recommendations are relevant to the special challenges of the Arctic.

I want to close by just thanking the committee and thanking the hard work of the subcommittees. A number of you saw me pop in and out of your subcommittee meetings. I was uncharacteristically silent because I was told I could sit in but I could not speak, which was an unfamiliar role for me. But I benefitted greatly from hearing about the hard work and the hard thinking that is going on in all of the subcommittees and like the Secretary, I very much look forward to the recommendations you are going to be providing us in short order, so I want to thank you all very much for your hard work.

OESC Chairman Thomas O. Hunter: Thank you, Michael. And it's a great pleasure to have you with us today and the Secretary. I can't say enough about how important it is to have your presence here with us and to help with some guidance to steer the committee into its next rounds.

I will echo one thing you both said, this is a very qualified group that is working very hard and it's a service they're all running, which I think is really terrific.

So, I'd like to personally thank you and we have time, I believe, for a question or two.

Secretary Kenneth L. Salazar (DOI): Sure.

OESC Chairman Thomas O. Hunter: We don't have -- I'm looking over and nodding, we don't --

Director Michael R. Bromwich (BSEE): I can stay for a couple of minutes.

OESC Chairman Thomas O. Hunter: Okay. So, Mr. Secretary, if you'd like to give us a last word?

Secretary Kenneth L. Salazar (DOI): Lois, go ahead.

OESC Member Lois N. Epstein (Non-Governmental Organization-NGO): Thank you for coming by and speaking today. That was very interesting and helpful. My question to you both actually is, and we've had some discussion about this at the committee level, the charter is for two years and some of the questions we're taking on are obviously longer-term challenges and are going to take longer. I've served on other federal advisory committees for much longer times and regulations and issues come up over time and there's value in having a long-term committee as well. Do you have a sense, do you have a vision for, you know, how long we would maintain ourselves as a committee or additional people, et cetera, and what might happen after two years?

Secretary Kenneth L. Salazar (DOI): Thank you.

OESC Member Lois N. Epstein (NGO): Because that's going to affect how we formulate our recommendations, obviously.

Secretary Kenneth L. Salazar (DOI): Absolutely, Lois.

OESC Member Lois N. Epstein (NGO): Thank you.

Secretary Kenneth L. Salazar (DOI): I mean, it's a great question. I think first our hope is that we get legislation that actually creates you in a permanent way through an Ocean Energy Safety Institute which we have proposed and which is under consideration now in the energy legislation, the different aspects of what is trying to move through the Senate and the House, so we would see you being a part of that effort if we can get it through Congress.

Now, if, you know, Congress is not being particularly productive these days, and so if the legislation does not get through, although we are examining a number of different vehicles in which we might be able to get it through, it would be my hope that we can continue this level of expertise in a continuing -- in the same form because your work is -- it's very important today. I mean, just outlining the issues that Michael and I just went through you know how important the work is, but it's going to be just as important in three or four years.

And let me also just take the occasion, Lois, to say this is not just a Department of Interior at the United States level. You think about the representation that we have here from the entire federal family, so obviously, you know, Chris Smith from the Department of Energy, they have tremendous expertise, you know, Commander Little, all the work that we have to do with the Coast Guard everywhere, including the Gulf and the Arctic, to you know, Mathy Stanislaus, you know, what you do with EPA and Administrator Jackson's interest in these issues, Admiral Papp's interest in these issues, those are all very, very important aspects of our work.

And Under Secretary Jane Lubchenco often talks to me about these issues and so I want to say thank you to David Westerholm. And then Steve Hickman, you and the United States

Geological Survey have so much to bring to this agenda because you are the best earth science agency in the world and already the work that you have done to help us in this effort, but also the work that you've done in terms of looking at the gaps in Arctic science through USGS has been tremendously helpful.

And, obviously, Walter, thank you again for bringing your historic knowledge and continuing to be a member of this committee.

Director Michael R. Bromwich (BSEE): Just very quickly, I agree with the Secretary. I think it's really very important that we have this group or a group very much like this continue to be engaged on these issues and to collaborate and provide recommendations to the agency. I think this was a great missing piece historically, having a forum where we could bring outsiders from industry, from the nonprofit world, from academia, and from other parts of the federal government to contribute ideas to the agency about how we could become more effective and more efficient in what we do.

I think it's vital that we keep this group together. I know the enormous demands that this makes on your time and you're busy people who have lots of other responsibilities, but it does provide a critical piece for us as we build up the capabilities of the agency and I know you're challenged for resources and we'll do what we can to try to provide more resources in the short and the medium term, but I think it's very important to keep this group together so we can continue to get the benefit of the deliberations on these issues that you're currently going through.

(Secretary exits.)

Director Michael R. Bromwich (BSEE): Anybody else for me? Yeah? Tad?

OESC Member Taduesz W. Patzek (Academia): I have a question because we spend a lot of time thinking about the Arctic and the importance of the Arctic to the work of our committee and it seems that both Secretary Salazar and you have emphasized that Arctic is important as Steve has predicted. So, is that true that Arctic is of great importance?

Director Michael R. Bromwich (BSEE): Yes, it is. I think that states the obvious. It's important for a variety of reasons. It's important because we have some important pending decisions, but it's important because we know far less about the Arctic than we do about, for example, the Gulf of Mexico. We know there are lots of challenges that we face there that we're struggling to figure out how to solve and address adequately.

So, yeah, it's very important, I think, to this agency, to the Department of the Interior, and to the public that as much high level, hard thought goes into sorting through some of the complex issues that we're facing in the Arctic. I think it's very important that that get done.

Anything else? I can take one or two more if there are other questions?

OESC Member Stephen H. Hickman (U.S. Geological Survey – USGS): Yeah, I was wondering if you had any particular feelings about issues that are especially critical in the Arctic

but perhaps maybe knowledge gaps -- technological, scientific knowledge gaps that need to be addressed both in terms of the exploration plans and in terms of five-year leasing -- of the leasing plans that are also being discussed?

Director Michael R. Bromwich (BSEE): Yeah. I can't -- I don't want to identify one or two issues because I think there are a lot of issues and I don't want to suggest that some are more important than others. And, you know, obviously the USGS did a very helpful analysis of the areas that had been explored and had not been explored in terms of scientific studies and so forth.

Historically the MMS and then BOEMRE had done a lot of scientific work and the USGS report was very helpful in suggesting that really what hadn't been done adequately was synthesizing all the knowledge and all the studies that had been done over time.

I think that work is ongoing and there's a tremendous amount of additional scientific work that's ongoing, both sponsored by BOEM as well as by various other entities.

So, I think there's really a web of issues that needs to be addressed and addressed fully and I think it could use the engagement of lots of agencies, including yours, including ours, including other members of the Federal family. It's just an area about which far less is known, it's a fragile area. I think we all acknowledge that in our ** we realize it's very important to do what we can to protect it.

OESC Chairman Thomas O. Hunter: Michael, just to comment, the committee just finished its deliberations on this topic and basically extending the areas of recommendation into the Arctic, in most areas, will not be as big a challenge as we first thought.

Director Michael R. Bromwich (BSEE): Good.

OESC Chairman Thomas O. Hunter: Secondly, there are some areas which will focus, at least in Spill Prevention, focus on the Arctic, which will require quite a bit of additional work, but the good news is, in general, they look extendable.

Director Michael R. Bromwich (BSEE): Well, that's great. That's actually great news. Any final question?

OESC Member Donald E. Jacobsen (Industry): Yes. Secretary Salazar mentioned the Gulf of Mexico's return to work and, you know, we're in a new norm. It is a return and then the agency has transformed and part of the challenge is that part of this new norm is a lot more regulation, a lot more inspection, enforcement. How are you feeling about the BSEE organization now and the capabilities to kind of carry out that work? Is it still work in progress?

Director Michael R. Bromwich (BSEE): Yes, and it will forever remain a work in progress. I don't think it will ever be settled. I think we're looking for more ferment, more change, more development in the agency than had historically been the case.

I think it's important to focus on the fact that we have returned to a place where permits, and particularly deepwater permits are being issued in significant numbers. The pace is not what it was pre-Macondo, but I think that's because of the new structure of regulations that exist. It takes industry longer to put their plans and their permit applications together, takes our people longer to review them because there are more things to make sure are submitted properly.

In the early stages, back beginning of this year, there were lots of back and forth applications to drill were submitted, they were incomplete, they were inadequate, they had lots of errors. So, we've worked very closely with industry to make sure that higher quality applications are submitted and what we've been seeing over the last several months is substantial improvement in the quality of the applications that we're getting on the BSEE side, so the applications for permits to drill, and that will allow us to be more efficient and more effective and I think industry is seeing a quicker pace as a result of that.

I don't think we'll go back to the pace that existed before simply because I think we were going very, very fast. The requirements were not as substantial as they are now, the review process was not as exhaustive as it is now. And I think because of the understandably great sensitivities of our people who now review these applications to drill, they're not going through anything quickly anymore, they want to make sure that everything that needs to be addressed, all the engineering issues that need to be addressed, are capably addressed.

Now, on the enforcement side, that's very much a work in progress. I think historically we have not been as aggressive on the enforcement side as we need to be. The rules need to be clear, but if the rules are clear we need to enforce them aggressively and that includes citing companies for violations and imposing significant fines to the limits of our abilities on companies that violate those regulations.

So, I think we do need to significantly step up our game in the enforcement area and that's one of the areas that we're going to focus on in the days and months ahead.

Any final questions?

OESC Member David G. Westerholm (National Oceanic and Atmospheric Administration – NOAA): I'll build on that one just a bit to have you sort of look into the future because obviously it's a concerted effort and there was some increase in the agency's budget to support that, but as we look to the future in a resource-constrained environment, and certainly all of our agencies are looking at that government-wide, do you see any impediments or anything that we can be thinking of as a committee to help, you know, to maybe suggest or structure something that would -- as we look forward, additional enforcement capability will be challenging or tight fiscal constraints that Congress is going to impose as will, you know, the review process. And everything that we want to do better we're going to find more challenging at least on the government side.

Director Michael R. Bromwich (BSEE): No, I think you're right. I think that we are going to face a resource-constrained environment for the indefinite future. I do think there has been a broad recognition and really a consensus that the former MMS, the former BOEMRE was an

agency that was resource-starved for almost the full three decades of its life and so the recovery from that and building up the capabilities that the agency lacked historically is a long-term project.

So far I've seen understanding in the Congress about that, realizing that this is an exercise in catching up rather than moving ahead aggressively to add lots of bells and whistles. There are basic aspects of the structure of the agency that need to be built up very significantly and I think as you deal with more of our people over time, I think you'll get honest answers from them about the areas that need to be built up and enforcement is the area that we've been focusing on recently that we didn't focus on as much going back many months ago.

So, I think it's simply the recognition that the agency needs the additional resources to do its work. One of the areas that I'm sure Tad is aware of, there's a sharp constrain on our ability to recruit engineers who are absolutely critical to reviewing drilling permits. Industry is facing some of that same problem. There is not a glut of talent out there and there's particularly not a glut of talent when you're trying to hire senior drilling engineers at the salaries that we're able to pay. And so I think that will become a bottleneck down the road and we've got to think constructively both in this group and outside this group about how we deal with that.

It's very important that we be able to push forward in a coherent way with energy development in the Gulf of Mexico and elsewhere, but if we don't have the resources, especially on the engineering side, there are going to be a lot of frustrated people in industry and elsewhere.

OESC Member Mathy V. Stanislaus (Environmental Protection Agency): So, if I could just flag, I guess the issue of the Arctic as generally the kind of post-lesson learned of the BP spill is that you have a number of different interagency processes. You have the interagency workforce pursuant to the President's Executive Order, it's deliberating on Arctic issues. You have the ongoing NRT work dealing with some of these issues.

So, in a sense, one of our challenges we've been discussing is there's lots of kind of parallel work that needs to be linked up at some point, so I think we could give some depth to some of these issues but it's also cognizant of the need to link up and line up with probably issues that are going to be given more depth and more discussion in other forums. You know, that's kind of our collective challenge.

Director Michael R. Bromwich (BSEE): I think that's right. I think that what's problematic is we're not dealing with a slide that we're putting under a microscope that's static. This is an ongoing process in which decisions are going to need to be made in the not too distant future and that's the function, really, of the interagency group and ultimately permitting decisions will be made by my agency in the Arctic.

So, what I think would be of enduring value that the committee can provide is a somewhat longer-range view of how do we address the special challenges of the Arctic, not tied to the immediate permitting decisions that federal agencies, including ours, are going to need to make in the next few months, but taking the longer view, how do we address some of these issues in the medium-term and in the longer-term?

So, I think you're right, it is challenging to figure out how to properly align what you're doing with what the federal agencies are doing and what they have the mandate to do, but I think that would be my suggestion is that you look a little bit more medium-term and long-term.

Anything else?

OESC Chairman Thomas O. Hunter: Thank you very much.

Director Michael R. Bromwich (BSEE): Thank you very much. Appreciate it.

Discussion of Losses of Well Control on the U.S. Outer Continental Shelf

Technical Presentation by David O. Izon

BSEE
Bureau of Safety and Environmental Enforcement

Offshore Energy Safety Advisory Committee
Washington, DC
November 8, 2011

Agenda

- Subpart A Incident Reporting Rule
- Summary of Loss of Well Control (LWC) Incidents
- Detailed Evaluation of LWC Incidents
- Summary
- Questions

OCS Operators must report to BSEE:

- All Fatalities
- All Injuries that Require Evacuation to Shore
- **All Losses of Well Control (LWC)**
- All Fires, Explosions, Collisions
- All Pollution Events ≥1 barrel
- Releases of H_2S, Structural Damages, Gas Releases, Crane and Material Handling Incidents

Definition of Loss of Well Control

As of 2006, BSEE defines LWC incidents as:

- Uncontrolled flow of formation or other fluid
  - Flow may be to an exposed formation (underground blowout) or at the surface
- Flow through a diverter
- Uncontrolled flow resulting from a failure of surface equipment or procedures

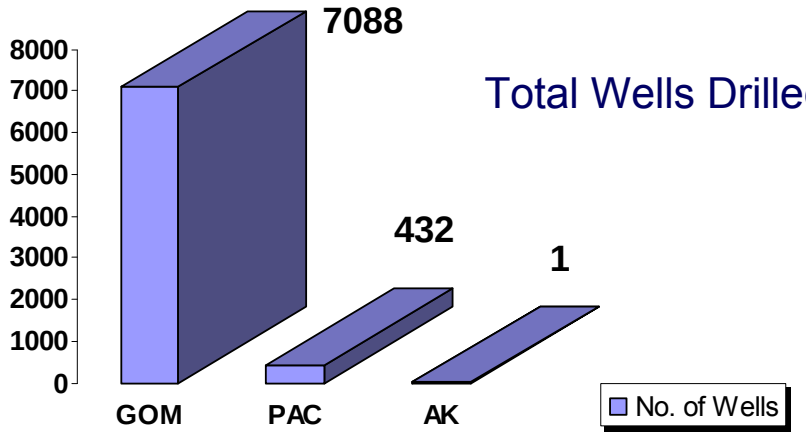
OCS Losses of Well Control
Incident Experience 2001- Present

Operations Associated with LWC Incidents 2001 – Present

65 Total LWC Incidents

- **26 Drilling**
- 17 Production
- 9 Workover
- 7 Plug & Abandonment
- 4 Completion
- 1 Coring
- 1 Hurricane

OCS Wells Drilled by Region
2001-Present



Total Wells Drilled = 7701

LWC Rates During Drilling Operations 2001 – Present

26 Drilling LWC
7701 Wells Drilled

- Rate = 1 LWC per 296 wells drilled

Other Impacts

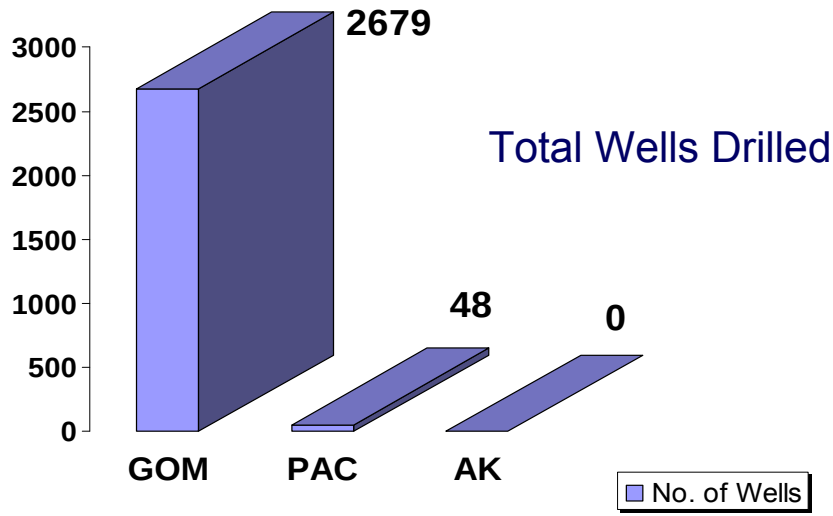
- Worker Safety: 13 fatalities and 51 injuries
- Environment: 14 pollution incidents with 3 spills >50 barrels

Operations Associated with LWC Incidents 2006 – Present

32 Total Loss of Well Control Incidents

- **10 Drilling**
- 10 Production
- 4 Workover
- 6 Plug & Abandonment
- 2 Completion

OCS Wells Drilled by Region Since 2006



Total Wells Drilled = 2727

LWC Rates During Drilling Operations Since 2006

10 Losses of Well Control

2727 Wells Drilled

- Rate = 1 LWC per **273** wells drilled

Other Impacts

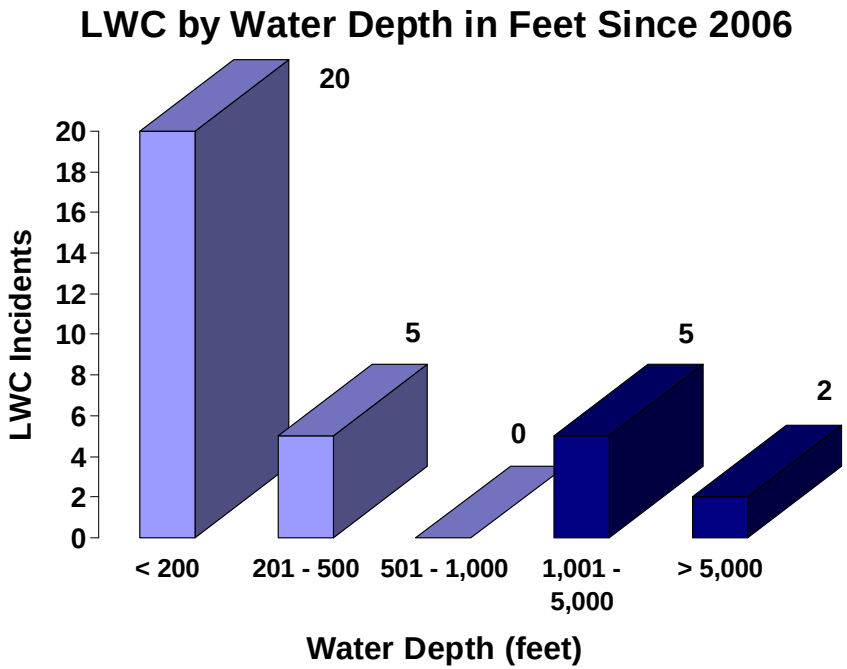
- Worker Safety: 12 fatalities and 47 injuries
- Environment: 2 pollution incidents both >50 barrels

OCS Losses of Well Control
Incident Experience Since 2006 in Water Depths >1,000 Feet

LWC Incidents in Water Depths > 1,000 Feet

7 Total LWC Incidents

- **4** Drilling
- 1 Production
- 1 Completion
- 1 Plug & Abandonment



Incident Experience Since 2006 in Water Depths >1000 Feet

LWC Rates During Deep Water Drilling Operations Since 2006

4 Losses of Well Control

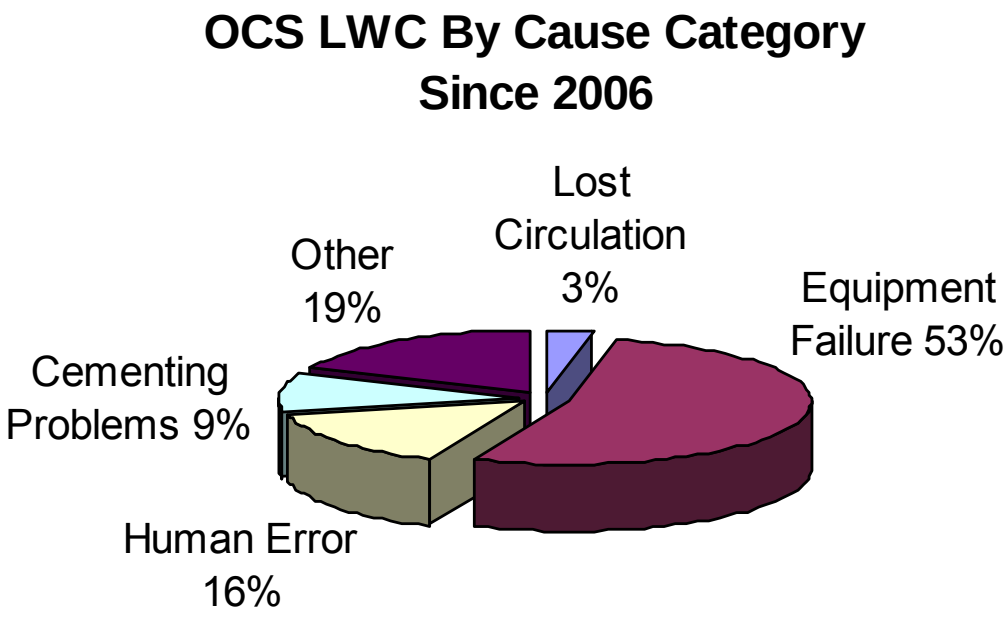
768 Wells Drilled

- Rate = 1 LWC per **192** wells drilled

Other Impacts

- Worker Safety: 11 fatalities and 47 injuries
- Environment: 2 pollution incidents both >50 barrels

OCS Losses of Well Control
Incident Experience Since 2006

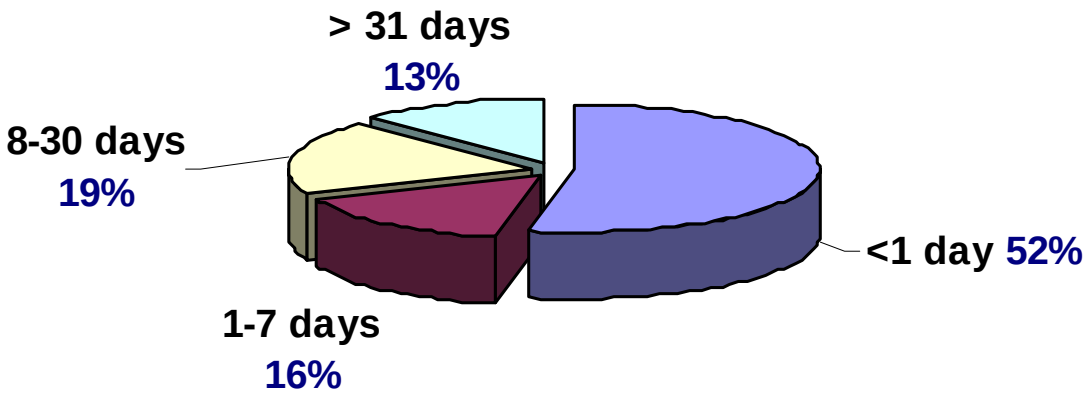


Examples:

Equipment Failure: Risers, Casing, BOP, etc.

Other: Boat Strike, Stuck Pipe, Unknown, etc.

LWC Incident Duration in Days



Key Point

Majority of Events Lasted <1 Day

- **17 incidents lasted <1 Day**
- **8 of 17 lasted < 1 HOUR**

Summary

Incident Experience

- Incident Reporting Rule limits direct comparison of LWC rates
- Since 2006
  - Drilling LWC Rate is 1 LWC per 273 wells drilled
  - 20 percent LWC occurred in Water Depths >1,000 feet
  - Majority of LWC Incidents lasted less than 1 day

Major Cause Categories

- Equipment Failure
- Human Error
- Cementing Problems

Contact Information

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Offshore Energy Safety Advisory Committee (OESC)

SEMS II Proposed Rule Update

Discussion Document
November 8, 2011
David Nedorostek

TODAY'S DISCUSSION

- SEMS Status
- Review SEMS Proposed Rule
- Seek OESC input
  - Keep in mind that comment period closes November 14, 2011

SEMS Status

- Operators must be implementing their SEMS program by 11/15/2011
- Applies to:
  - All operations - drilling, production, workover, completions, DOI regulated pipelines
  - All structures - fixed, floaters, MODUs
- Program approval ***not*** required
- 13 elements plus other provisions detailed in Subpart S
  - Job Safety Analysis
  - Independent 3rd Party audits (optional)
  - Submission of audit plans
  - Contractor interface

SEMS - IMPORTANT DATES

DATE	EVENT
05/1991	API RP 75 Published
06/2006	SEMS ANPR Published
07/2009	SEMS NPR Published
10/15/10	SEMS Final Rule Published
9/14/11	SEMS II NPR Published
11/14/11	**SEMS II NPR Comment Period Closes**
11/15/11	**Mandatory Implementation of SEMS**

SEMS II - POINTS OF INTEREST

- JSA (modifications)
- Only I3P conducts audits
- Stop Work Authority
- Ultimate Work Authority
- Employee Participation Program
- Reporting Unsafe Working Conditions

JSA MODIFICATIONS

- SEMS II NPR enhances JSA requirements
  - Use of single JSA for recurring activities
  - Training of personnel on how to identify hazards when conducting a JSA
  - Operator verification that contractors received training on identifying hazards

JSA MODIFCATIONS

- Requires immediate supervisor of the crew performing the work to**:**
  - prepare JSA,
  - sign JSA, and
  - ensure that all personnel participating in the job sign as well

TRAINING

- SEMS II NPR requires that personnel be trained in:
  - Stop Work Authority (SWA)
  - Ultimate Work Authority (UWA)
  - Employee Participation Program (EPP)
  - Reporting Unsafe Working Conditions
- Operator must verify that their internal personnel as well as contractors have been trained

AUDITING REQUIREMENTS

- SEMS II NPR requires audits to be conducted by **only** a Independent Third Party (I3P)
- Designated and Qualified Personnel (DQP) cannot conduct audits
- I3P must submit audit report to BSEE for approval

I3P QUALIFICATIONS

- Operator must submit the name of I3P to BSEE for approval
- The I3P nomination must include
  - SEMS education and experience
  - Experience in offshore HS&E
  - Technical capabilities
  - Previous experience with BSEE regulations
  - Avoiding conflicts of interest (I3P can **not** develop and audit your SEMS)
    - Statement signed by company management that the I3P auditor is not owned or controlled by the operator's company
- BSEE may or may not approve your I3P nomination

Stop Work Authority (SWA)

- Operator SWA must allow any employee (including contractor) to stop work
- Person in Charge (PIC) of the operation (task) is responsible for SWA implementation
- Work can resume when individual with UWA determines that the risk has been minimized
- SWA must be a line item on an operator's JSA
- Operator employees and contractors must be trained on SWA policies and procedures.

ULTIMATE WORK AUTHORITY (UWA)

- Applies to facilities under BSEE jurisdiction
- Operator's SEMS **must** identify the person with the UWA
- Person on facility to make final decisions on operations and activities on that facility
- Operator must take into account USCG regulations when designating a PIC
- Operator must ensure that all personnel clearly know who has UWA

EMPLOYEE PARTICIPATION PROGRAM (EPP)

- EPP provides mechanism for operator to engage all employees in the development & implementation of their SEMS

- Operator management must
  - provide each employee (operator and contractor) access to their SEMS program including the EPP
  - provide BSEE a copy of your EPP upon request during an audit

REPORTING UNSAFE WORK CONDITIONS

- Allows employees to report hazardous or unsafe working conditions to BSEE orally or in writing
- Applies to
  - operator employees
  - contractor employees
  - *contractors providing domestic service to the operator*
- Employee or contractor is not required to know whether a specific BSEE regulation has been violated in order to report an unsafe conditions

REPORTING UNSAFE WORK CONDITIONS

- Operators are required to
  - Provide employees a card that contains the BSEE telephone number which they can use to report unsafe activities
    - **# 1-877-440-0173**

RECORDKEEPING REQUIREMENTS

- Stop Work Authority (SWA)
  - 30 days onsite
  - Retain 2 years (offshore or onshore)
  - Make available to BSEE upon request.

- Employee Participation Program (EPP)
  - Retain 2 years (offshore or onshore)
  - Make available to BSEE upon request.

QUESTIONS?

THANK YOU

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(703) 787-1029

Ocean Energy Safety Advisory Committee

U. S. Department of the Interior

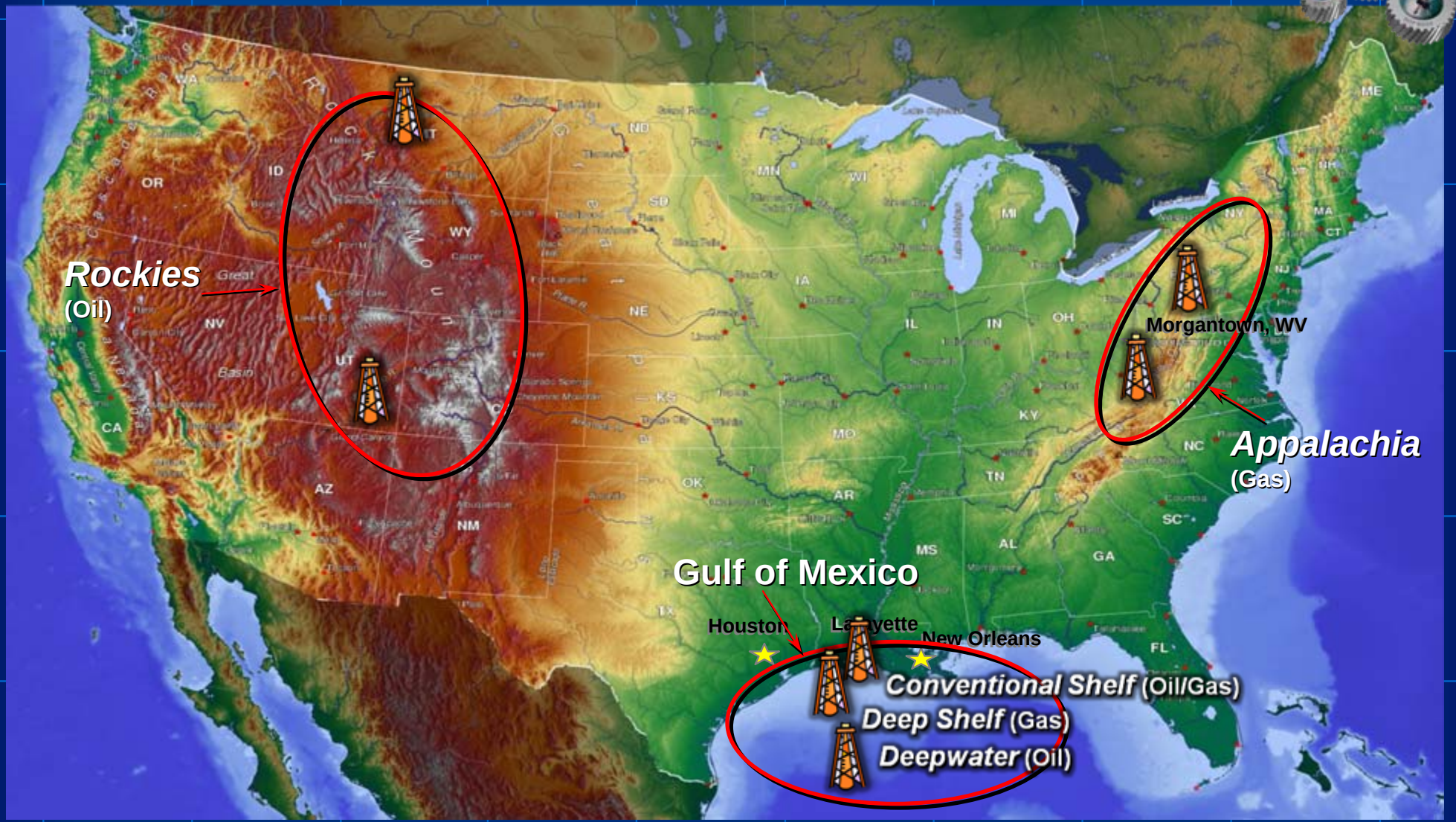
November 8, 2011

Stone Energy Corporation

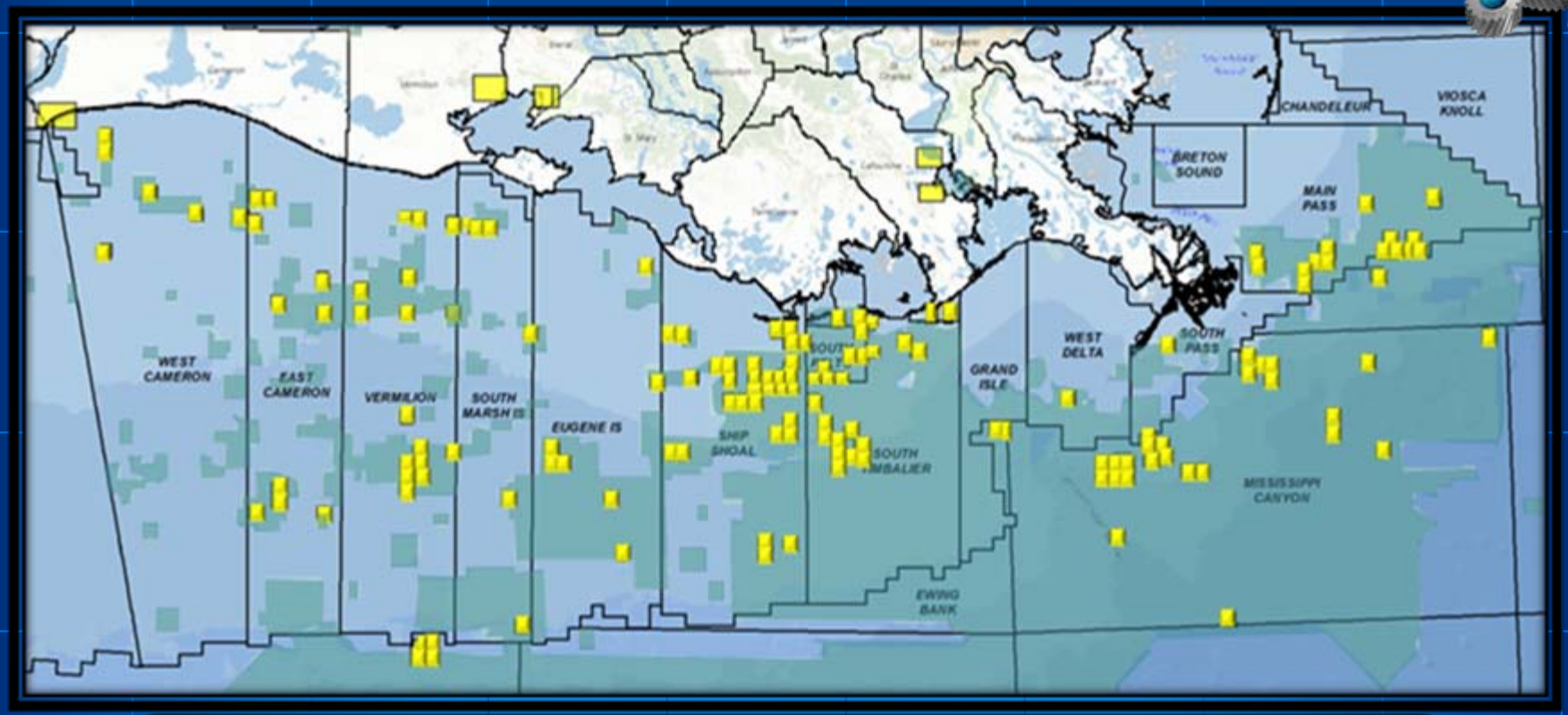
Safety Environmental Management System (SEMS) Compliance

Gene Cella
Corporate HSE Manager

Stone Energy Corporation



Outer Continental Shelf Waters



- 3rd Largest Lease Holder on Shelf
- 70 Deep Water Leases as Operator or Owner
- 200+ Facilities in OCS Waters (8 Pile – Single Pile Caisson / 15 ‘ – 1000’)
- Offshore Work Force:
  - Production: 120 Stone / 180 Contractors
  - Total including Drilling: 750 – 1000
- Production Gross: 30,000 BBL Oil / 200 MMCF Gas
- TRIR: .49 (2011)

Stone Energy Corporation

Safety Environmental Management System (SEMS) Requirement:

- **BOEMRE Requirement: As per 30 CFR 250.1900, Subpart S**
- **Each Operator in OCS waters must have a SEMS Program.**
- **Based on American Petroleum Institute (API) Recommended Practice (RP) 75.**
- **SEMS Program in place by November 15, 2011.**
- **SEMS Applies to all OCS Oil and Gas Operations under BOEMRE Jurisdiction.**

Stone Energy – SEMS Strategy

- **Stone had a Safety and Environmental Management System in place prior to the SEMS requirement.**

- **Opportunity to enhance our Safety and Environmental Management System**
  - **Updated Documentation Regarding our Management System to meet the Requirements of the SEMS Regulation.**
  - **Consolidated programs and practices through use of electronic systems.**

- **We have Worked the Transition to SEMS as a Project.**
  - **Utilized an operationally based work team to Develop, Implement and Maintain the Stone SEMS program.**
  - **Utilizing a web based system.**

- **Member of Offshore Operators Committee (OOC), Center for Offshore Safety (COS) and the National Ocean Industries Association (NOIA) to ensure alignment with industry.**
  - **Tool Kit**

Stone Energy - SEMS Elements

- General – Management Commitment, Setting Goals and Expectations
- Safety and Environmental Information – Safety Flow Diagrams
- Hazards Analysis – Facility Hazard Analysis and Procedure Hazard Analysis (JSEA)
- Management of Change – Change in Facilities and Personnel
- Operating Procedures – Instructions for Sound Operation of Facilities
- Safe Work Practices – Stone Safe Operating Practices and Contractor Selection Retention

- Training – Work Practices to perform Job, Operating Procedures
- Quality Assurance/Mechanical Integrity – Procurement, Fabrication, Installation, Maintenance and Testing
- Pre-Startup Review – Commissioning of New and Significantly Modified Facilities
- Emergency Response and Control – Initial response, Reporting and Drills
- Incident Investigation – Investigation of Serious or Potentially Serious Incidents and Follow-up
- Audit – Audit of SEMS Program
- Documentation and Recordkeeping – Procedures, Training, Incident Reports, JSEA's

Stone Energy – SEMS Strategy

- **Evaluated the SEMS Requirement**
- **Conducted Gap Assessment**
  - SEMS Requirement / Stone HSE Programs
- **Worked as a Project**
  - Operational Based Work Team
    - 80% of Work Force
  - Identified Accountable Parties for Element Development
  - Peer Reviews
  - Operations Developed and Endorsed the Final Product – “Ownership”
- **Developed Elements in line with API RP 75**
- **Engaged IT Department**
  - Developed Web Based SEMS Site
- **Reviewed Progress Regularly with Management**
- **Participated on Offshore Operators Committee**
  - Ensure Alignment with Industry

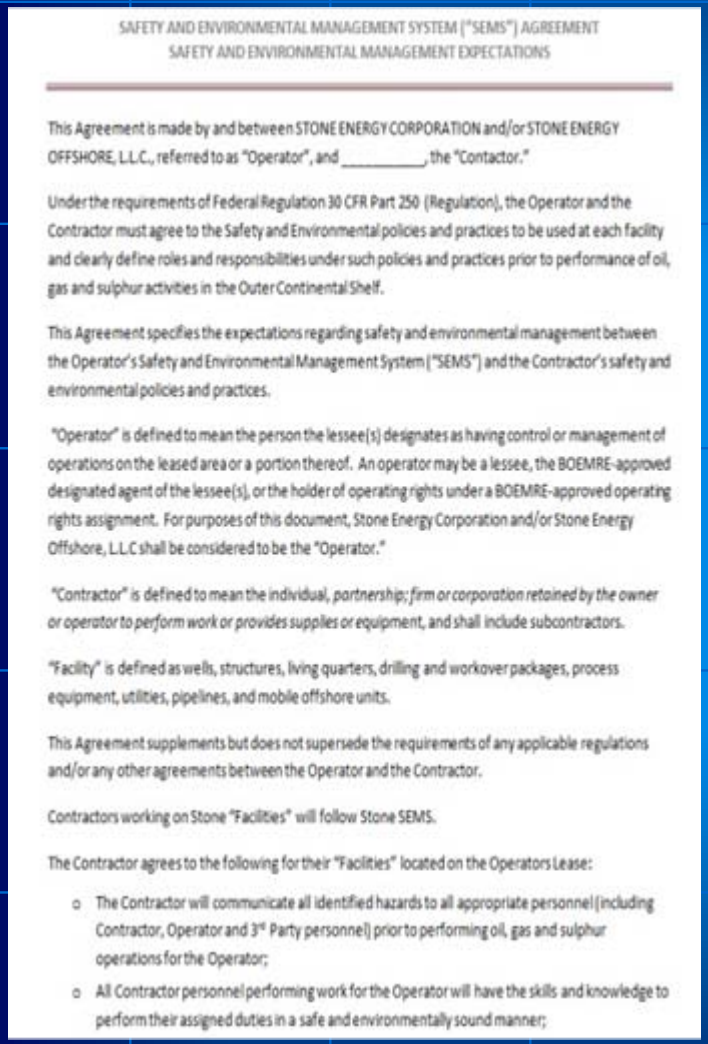
Stone Energy – SEMS Strategy

•2 Primary SEMS Focus Areas (i.e. Rig Operations / Production Operations).

- **Debated Topic:**
  - 1 SEMS
  - Multiple focus areas

- **Logical Breakdown of "How we Work at Stone".**
- **Many elements are corporate elements - Impact Both Areas (i.e. General / Safe Work Practices / Training / Emergency Response and Control / Investigation of Incidents / Audit).**
- **Enough differences between 2 areas - Makes Sense to Separate.**
  - Safety and Environmental Information / Hazard Analysis / MOC / Operating Procedures / Assurance of Quality and MI / Pre-Startup Review / Records and Documentation
  - Primary Difference - Rig Operations deals with Contractor Owned Equipment / Facilities such as Drilling Rigs. Elements are Written to Address This.
- **This Separation also assists Contractors to Focus on the Specific Area of our SEMS that applies to them.**

Stone Energy – SEMS Opportunities



SAFETY AND ENVIRONMENTAL MANAGEMENT SYSTEM ("SEMS") AGREEMENT
SAFETY AND ENVIRONMENTAL MANAGEMENT EXPECTATIONS

This Agreement is made by and between STONE ENERGY CORPORATION and/or STONE ENERGY OFFSHORE, L.L.C., referred to as "Operator", and _____, the "Contactor."

Under the requirements of Federal Regulation 30 CFR Part 250 (Regulation), the Operator and the Contractor must agree to the Safety and Environmental policies and practices to be used at each facility and clearly define roles and responsibilities under such policies and practices prior to performance of oil, gas and sulphur activities in the Outer Continental Shelf.

This Agreement specifies the expectations regarding safety and environmental management between the Operator's Safety and Environmental Management System ("SEMS") and the Contractor's safety and environmental policies and practices.

"Operator" is defined to mean the person the lessee(s) designates as having control or management of operations on the leased area or a portion thereof. An operator may be a lessee, the BOEMRE-approved designated agent of the lessee(s), or the holder of operating rights under a BOEMRE-approved operating rights assignment. For purposes of this document, Stone Energy Corporation and/or Stone Energy Offshore, L.L.C shall be considered to be the "Operator."

"Contractor" is defined to mean the individual, partnership; firm or corporation retained by the owner or operator to perform work or provides supplies or equipment, and shall include subcontractors.

"Facility" is defined as wells, structures, living quarters, drilling and workover packages, process equipment, utilities, pipelines, and mobile offshore units.

This Agreement supplements but does not supersede the requirements of any applicable regulations and/or any other agreements between the Operator and the Contractor.

Contractors working on Stone "Facilities" will follow Stone SEMS.

The Contractor agrees to the following for their "Facilities" located on the Operators Lease:

- The Contractor will communicate all identified hazards to all appropriate personnel (including Contractor, Operator and 3rd Party personnel) prior to performing oil, gas and sulphur operations for the Operator;
- All Contractor personnel performing work for the Operator will have the skills and knowledge to perform their assigned duties in a safe and environmentally sound manner;

- **Documentation of Hazard Analysis for all Facilities.**
  - Evaluated Current State.
  - Risk Ranked Facilities (i.e. Manned / Production / Storage Capacity / Process or Satellite Facility).
  - Walk Down Facilities and Documented Hazard Analysis.
- **Documentation of Operating Procedures for all Facilities.**
- **Implementation of Bridging Documents / Agreements with Contractors.**
  - Agreement utilized to document the relevant SEMS Requirements for Specific Operations that will be Utilized by the Operator and the Contractor (i.e. Operating Procedures).
  - Evaluated OOC Tool Kit Agreements.
  - Production and Rig Operations agreed to a Common Agreement.
  - Legal Review.
  - Presented to Contract Companies.

Stone Energy – Hazard Analysis Opportunities

Production Operations:

- No Major Issues Identified
- Opportunity to Fine Tune Program
  - Platform Drawing Revisions

Rig Operations:

- No Major Issues Identified
- Opportunity to Improve Document Control
  - Organized Data into one Location (i.e. Inspection of Drill String Components)

Stone Energy

Contractor Selection / Retention Program

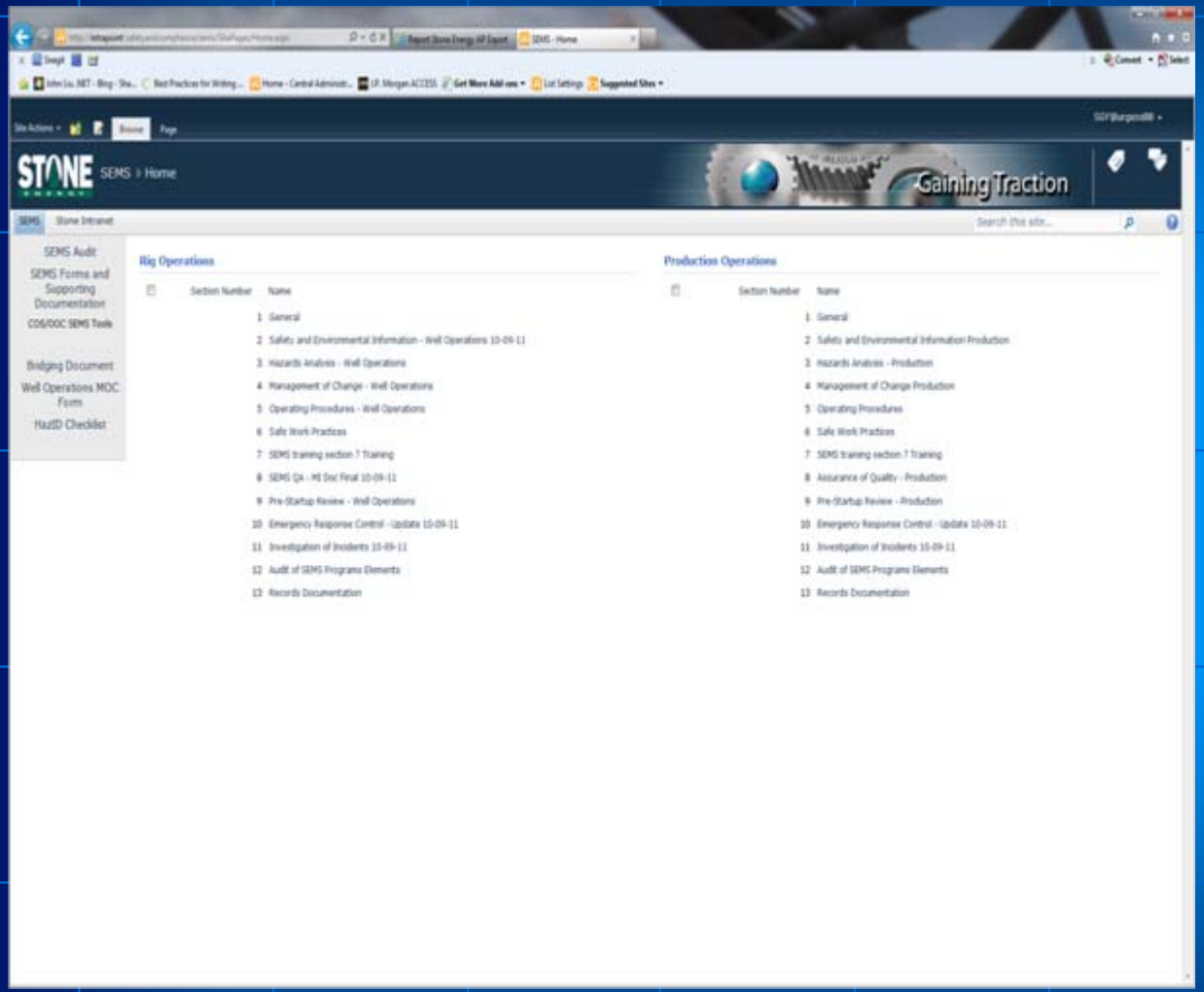




TRIR	Safety Program Evaluation	Master Service Agreement	Insurance	SEMS Bridging Agreement

- **Use of ISNetworld - Database:**
  - **TRIR / Safety Program Access & Evaluation / Insurance / Training Records**

Stone Energy – SEMS Strategy



- **Web Based**
- **2 Focus Areas**
  - **Rig Operations**
    - Well Construction Operations (i.e. Drilling / Completion)
  - **Production Operations**
    - Production
    - Construction
    - P&A
    - Well Work
- **Follows API RP 75**
- **Hot Links**
  - **OSRP**
  - **Operating Procedures**
  - **SSOP**
  - **Etc.**

Stone Energy – SEMS Strategy

Safety & Environmental Management Program
Section 6
SAFE WORK PRACTICES
OCS Well and Production Operations

Plan Execute Improve

SECTION 6 – Safe Work Practices
OCS Well and Production Operations

Prepared By	Corporate HSE Manager	Gene Cella	Stone Energy Corporation
Reviewed By	Manager GOM HSE and Regulatory	Cobb LeBoeuf	Stone Energy Corporation
Reviewed By	Operations Manager GOM	Kevin Hurst	Stone Energy Corporation
Reviewed By	Manager Engineering, Construction and Decommissioning	Greg Hernandez	Stone Energy Corporation
Reviewed By	Manager Shelf & Gulf Coastal Rig Projects	Craig Brazan	Stone Energy Corporation
Reviewed By	Operations Manager GOM Deepwater Projects	Craig Castille	Stone Energy Corporation
Approved By	VP Gulf of Mexico	John Pantaleo	Stone Energy Corporation
Approved By	EVP - Operations	Jerry Wenzel	Stone Energy Corporation

INDEX

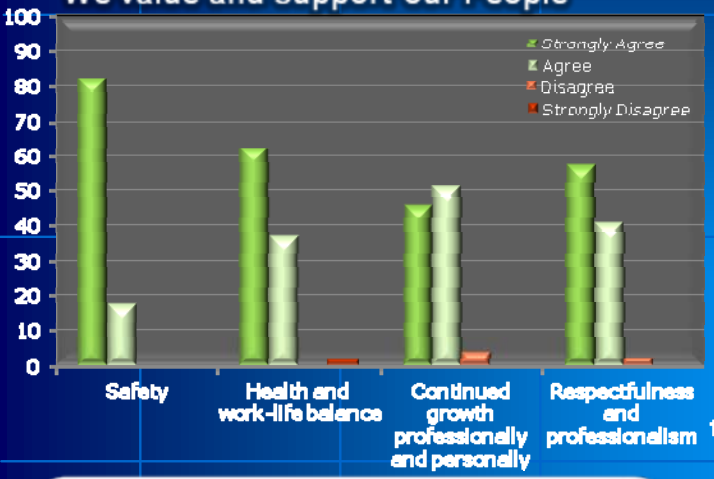
- **Follows API RP 75**

Stone Energy Hierarchy of Priorities

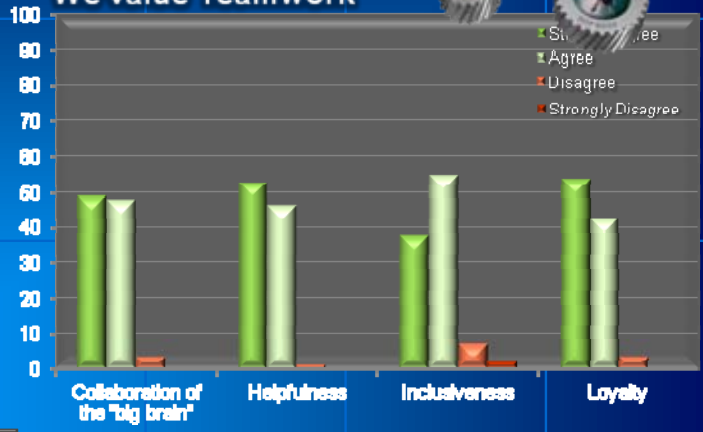
- **Stone Prioritizes our work as follows:**
  1. Safety of ALL personnel
  2. Protection of the Environment
  3. Compliance with laws and regulations
  4. Maximize Production
  5. Minimize Cost

Stone Values Survey Results

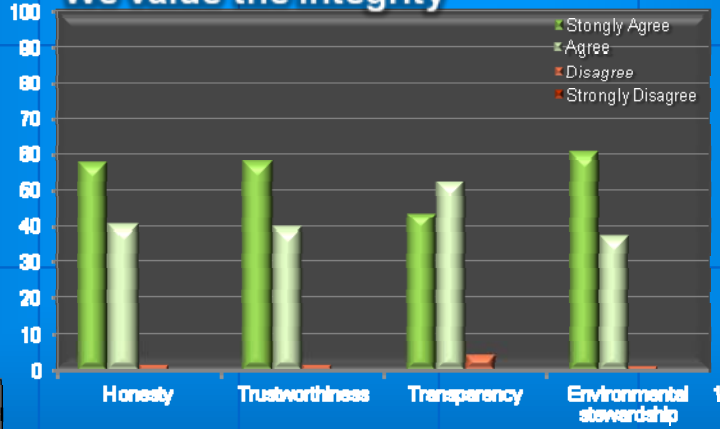
We value and support our People



We value Teamwork



We value the Integrity



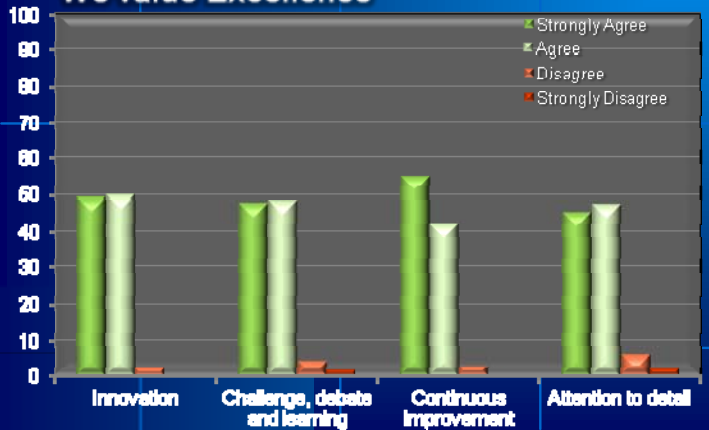
What did we learn?

- We live our Values
- Strongest on People, Integrity and Spirit
- Our culture embraces Safety
- Focus on Excellence and Teamwork
- Total participation 52%

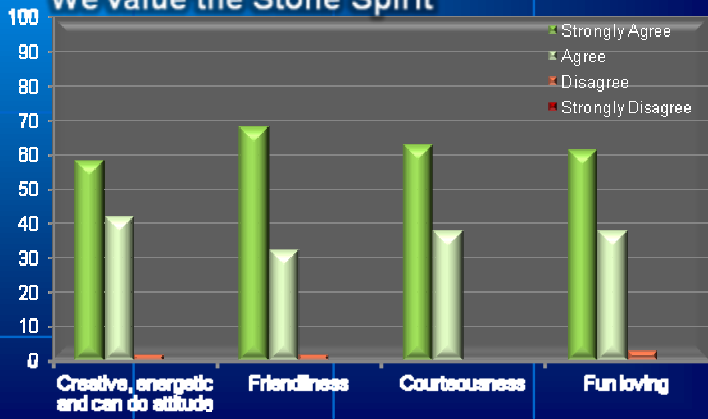
What will we do?

- Keep survey open
- Analyze comments from employees
- Continue to promote Values

We value Excellence



We value the Stone Spirit



Stone Energy SEMS

- Spent the last 9 months Updating Documentation Regarding our Management System to meet the Requirements of the SEMS Regulation.
- Rolled out Web Based System.
- Have a Full Time SEMS Coordinator to Manage and Maintain the Stone SEMS Program.
- Will Work with BSEE and Continue to Refine the System.

Stone Energy – Industry Organizations

Center for Offshore Safety (COS) / Offshore Operators Committee (OOC) / National Ocean Industries Association (NOIA):

- These are Important Venues for Industry to provide Input.
- David H. Welch, Stone CEO – Executive Director of NOIA
- Jerry Wenzel, Stone Executive Vice President of Operations - Currently on the Board of COS
- Kevin Hurst, Stone Operations Manager – OOC Vice Chair on the Executive Committee

SEMS Opportunities / Considerations

- **Received NTL 2011 – N09 "Guidance on the Development, Implementation and Maintenance of a SEMS Program for OCS Oil, Gas and Sulphur Operations on October 24, 2011. The Document Provides Interpretation and Clarity Regarding the SEMS Requirement. It Would have Assisted in our Development and Implementation Efforts if we Would have had this Document Sooner. Currently Evaluating the NTL to Determine the Impact to our Implementation Plan.**

- **Operators should be given a grace period regarding SEMS Compliance. The initial BSEE Audits should provide Warnings rather than INC's. There will be interpretation issues with the new SEMS Requirement. "Work with us as we Learn Together."**

- **A key Ingredient to the Success of SEMS is the HSE Culture of an Organization.**

Drilling Safety: Off-Rig BOP Monitoring

Frank M. Chapman
Ashford Technical Services
Houston, TX

Drilling Safety: Off-Rig BOP Monitoring

Using Today's Technology

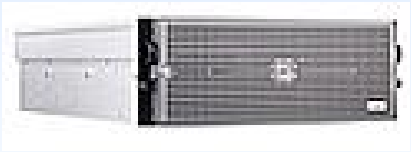
- Share with you some of the things Ashford Tech is doing using today's technology to monitor the BOP.
- Summarize how this can help improve drilling safety.
- Additional monitoring and data analysis that can be done in the near term.

Technology Overview

Remotely Monitor
the BOP
Anytime, Anywhere

Both Current and Historical
Status

Satellite
Link



Internet
Connection

Collect raw BOP **Data** from pressure switches, solenoids, pressure transducers and flow meters

Onshore
Web Server

Turn raw BOP data into useful **Information** made available via the Internet

Technology Overview

--- Satellite Link ---

--- Internet Connection ---

Jackup Rigs 350 ft Water Depth
Surface BOP

Raw Data

Semi-submersible Rigs
3K to 5K ft Water Depth
Hydraulic BOP Control System

Raw Data

Drill-ship 5K-10K ft Water Depth
MUX BOP Control System

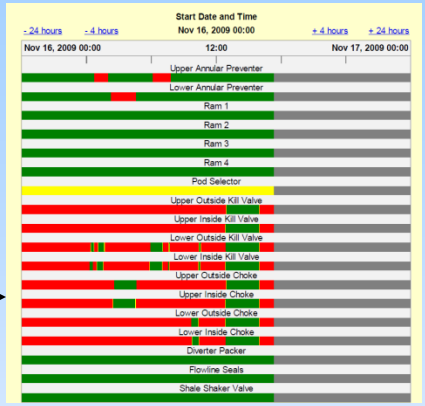
Raw Data

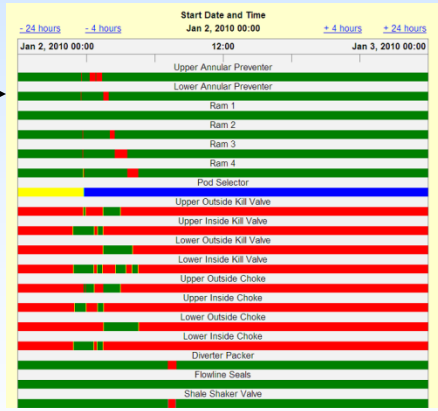
Translate
Rig Data to a
Common Information
Format for all Rigs

Database
All Rig
Information in a
Common Format

Convert
Rig Information to a
Common Visual
Presentation for
all Rigs

Partial Day
Real-time





Full Day
Historical Information

What is the technology?

- A Black Box
  - Yes. A tool for doing forensics after-the-fact.
- But more importantly it is a tool
  - To review and monitor drilling and safety equipment on a regular basis.
  - To review operational procedures on a regular basis.
- The goal is to improve operations and increase safety (and hopefully reduce the need for a Black Box).

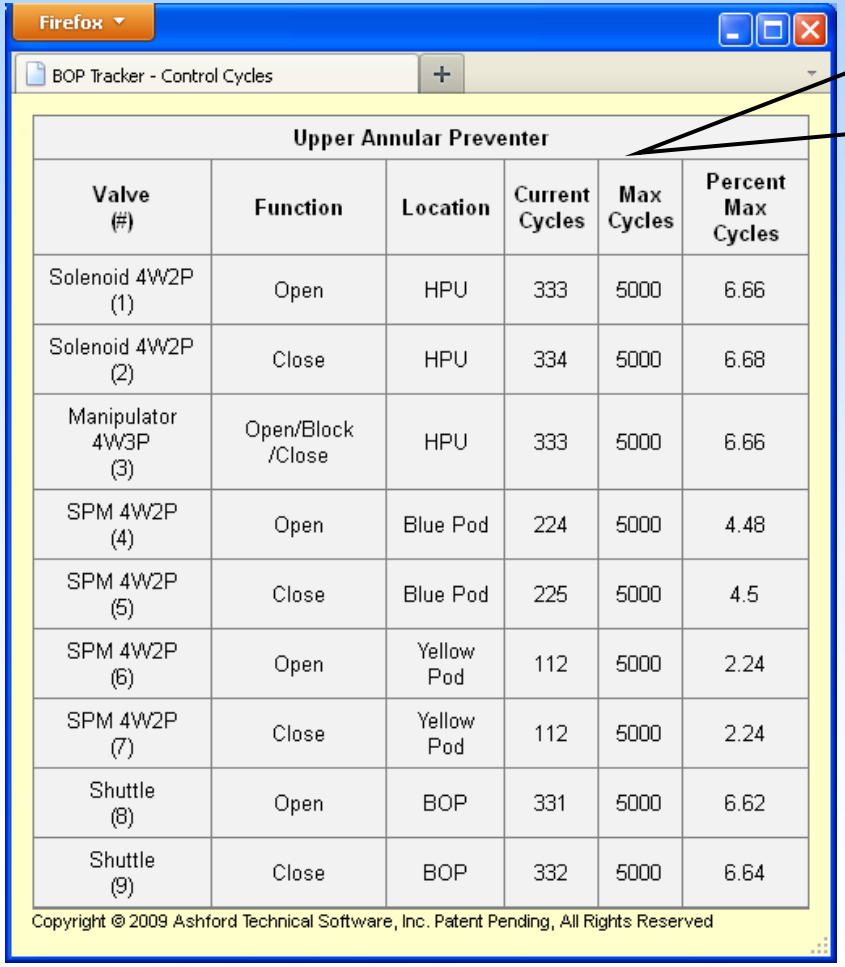
What does the technology do?

- Collects equipment data for input to preventive maintenance systems.
- Allows monitoring of operations for adherence to company and regulatory standards.
- Provides information to diagnose equipment failures.
- **Provides the information so expert onshore can provide guidance to personnel on the rig.**

Preventive Maintenance

Tracking Usage

Cycle report for all valves associated with Opening and Closing the Upper Annular



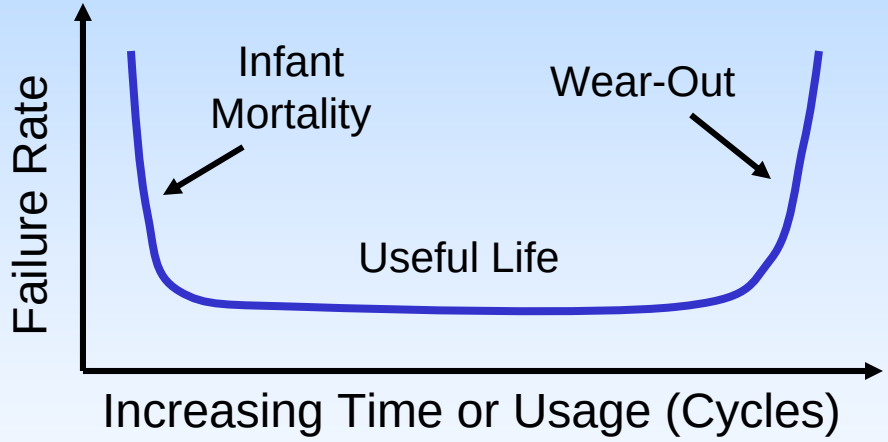
Upper Annular Preventer

Valve (#)	Function	Location	Current Cycles	Max Cycles	Percent Max Cycles
Solenoid 4W2P (1)	Open	HPU	333	5000	6.66
Solenoid 4W2P (2)	Close	HPU	334	5000	6.68
Manipulator 4W3P (3)	Open/Block /Close	HPU	333	5000	6.66
SPM 4W2P (4)	Open	Blue Pod	224	5000	4.48
SPM 4W2P (5)	Close	Blue Pod	225	5000	4.5
SPM 4W2P (6)	Open	Yellow Pod	112	5000	2.24
SPM 4W2P (7)	Close	Yellow Pod	112	5000	2.24
Shuttle (8)	Open	BOP	331	5000	6.62
Shuttle (9)	Close	BOP	332	5000	6.64

Max Cycles Currently no good data, using 5000 as a placeholder

Observations on BOP Usage

- Cycle-based is more appropriate than time-based maintenance.

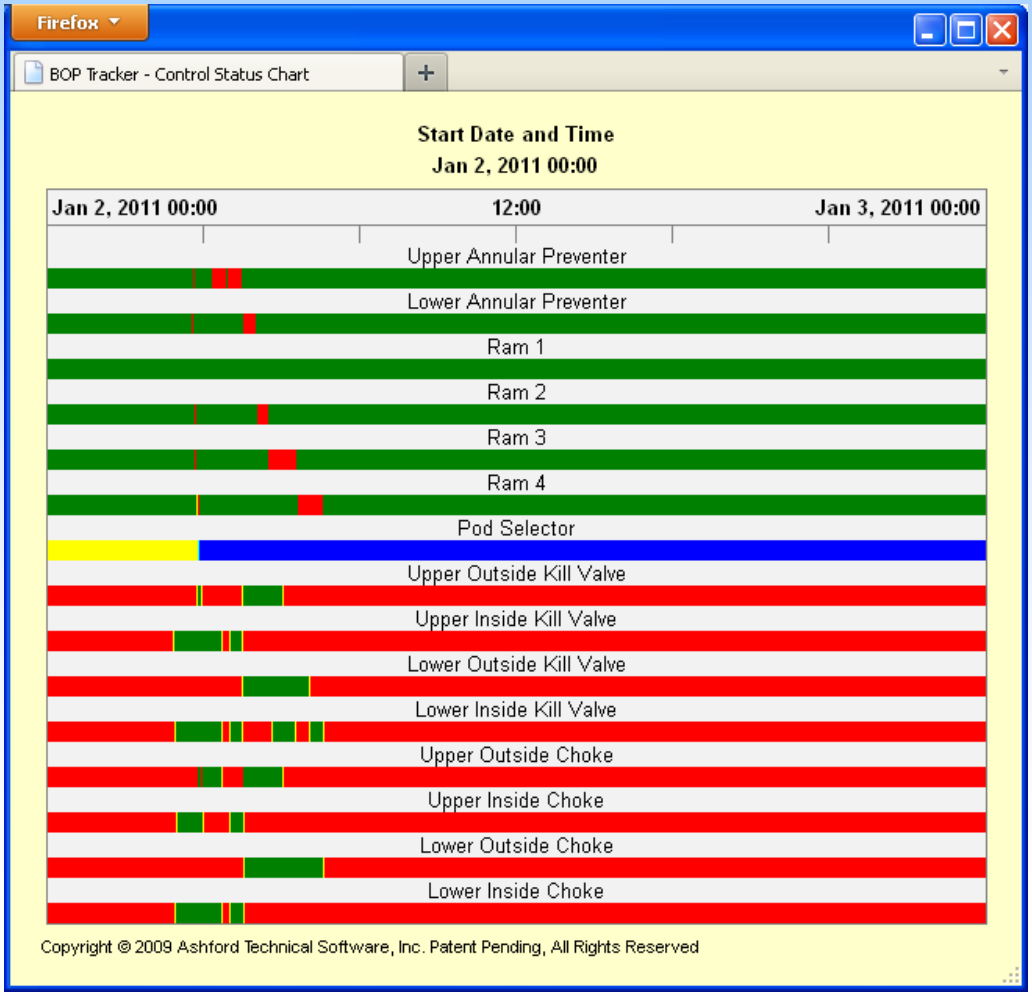


- BOP functions and valves are cycled more times than previously estimated.

Monitoring Operations

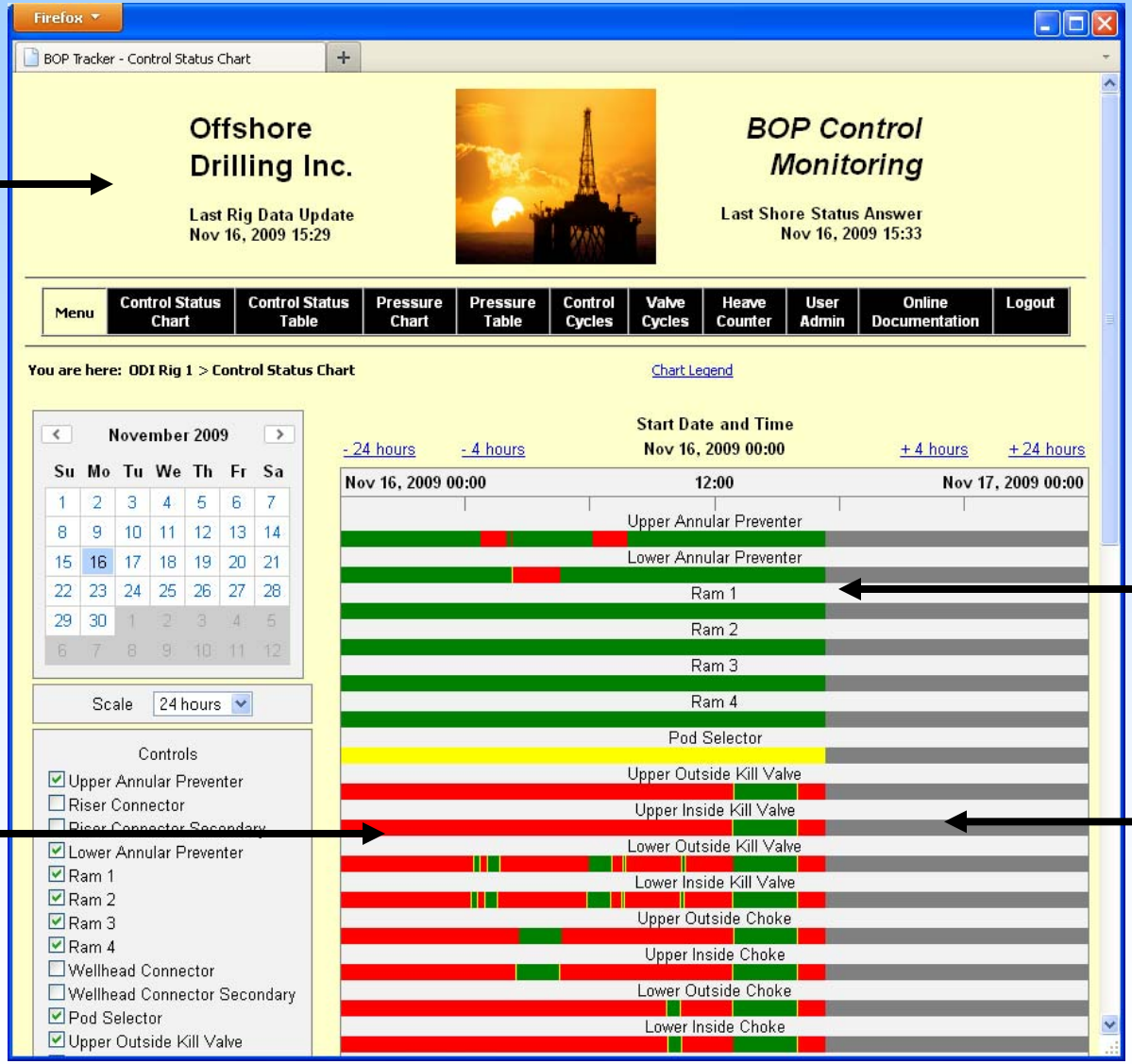
Tracking Operations, Providing Guidance

Detailed 24-hour summary of all major BOP functions



Anytime, Anywhere Access

Website Interface



Color Coded to Tool Pusher's Panel or a Common Format

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24-Hour Window

Something for everyone - regulator, driller, operator

- One person should be able to easily monitor multiple rigs on a regular basis.
  - *Regulators*: Efficient utilization of manpower to insure adherence to regulatory requirements.
  - *Drilling Contractors*: Preventive maintenance. Monitor and improve operations. Provide expert guidance to personnel on the rig.
  - *Operating Companies*: Oversee drilling and safety operations.

What else can be done today?

- Add monitoring of other drilling and safety equipment.
- Integrate equipment monitoring with well monitoring to build a more comprehensive picture of the drilling process.
- Provide the information required to develop performance-based maintenance.

Drilling Safety:
Off-Rig BOP Monitoring

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Appendix XVIII

DEPARTMENT OF THE INTERIOR
OCEAN ENERGY SAFETY ADVISORY COMMITTEE
WASHINGTON, D.C.
NOVEMBER 8, 2011

SUMMARY OF FINDINGS FROM DEEPWATER JOINT INVESTIGATION TEAM (JIT)

Michael D. Farber (BSEE): Thank you, Joe. Sorry we don't have any fancy slides today. I think the three of us and many others lived with these issues for so long I don't know that we could bear to put together slides for you all, and we also, more importantly, thought that the most productive thing might be for us to kick things off and then engage in a discussion, a give and take, if that's what you all want to do.

So, before we get to that, let me introduce who's up here with me. I'm Mike Farber. I'm the Chief of the Investigations and Review Unit now in BSEE and I worked alongside the BOEMRE-JIT Team, Joint Investigative Team, in working on the report and publishing the report.

On my immediate right is Kirk Malstrom. He and the rest of the Joint Investigative Team from our agency, they did the real work on the investigation, meaning, you know, they got on site on virtually day one, conducted all the hearings, collected all the documents, and did all the hard analysis. Kirk was a member of that team since the very beginning and part of what we'd like him to cover today with you all is some of the more important of the recommendations that are presented in the report.

To Kirk's right is Captain David Fish from the U.S. Coast Guard. Captain Fish is the Chief of the Investigations in Casualty Analysis Group for the Coast Guard. He's responsible for programs and policies in support of Coast Guard-Marine casualty investigations, environmental crimes, marine pollution investigations, and personnel action investigations. He also worked closely with the Coast Guard side of the Joint Investigative Team in putting forth their recommendations, and then with the commandant on the Commandant's Final Action Letter.

So, again, Captain Fish, I think, is going to focus a lot on sort of the path forward, you know, and not just on the findings and conclusions in the report, because we think that's kind of the most productive use of our time.

Captain Fish and I, along the way, we had many conversations during the process of producing volumes one and two in the report and it became clear to us, both through working through a lot of issues related to the Joint Investigation, that these were sort of the moments of planting the seeds for working together, the two agencies, not just Captain Fish and I, all of our colleagues working together to really build a lasting partnership to make sure we can do everything possible to ensure safe operations out there on the Outer Continental Shelf and really doing that required us to be hand-in-hand -- two agencies hand-in-hand.

And I think things like presenting to your committee is part of the next step and then working together to make sure regulatory reforms and other actions are done, hand-in-glove, together, so that we can get to where we all want to get to, which is enhancing safety out there.

I think that it's our hope that industry in particular will study closely the reports and the other various reports that have been issued. Obviously, industry remains on the front lines out there. They're well positioned, perhaps -- best positioned, to identify, mitigate and address risks associated with deepwater drilling. For all involved, we hope that the Joint Investigative Team's work and the set of conclusions, findings, and recommendations contained in the report, will help to prevent a blowout like the Macondo blowout from happening again.

The only way we can do that, I think, is to do the -- all of it's hard work, but the real hard work, in a lot of ways, comes in how do you convert a series of reports, a series of findings, conclusions, and recommendations, how do you convert all of that good work into a set of regulatory reforms, industry reforms, technological improvements, and you know, other best practice work? How do you do that to get to where we all want to go?

And, so, to that end, I thought I'd do just a high level summary of the findings and conclusions in the report, unless you think that this audience is already familiar with the report and I should jettison that. I want to use our 30 minutes sort of the best.

OESC Chairman Thomas O. Hunter: (inaudible) the present condition.

Michael D. Farber (BSEE): Yup, okay. I want to make sure I'm leaving enough time for both of my colleagues up here on the panel, and in particular to talk about sort of forward facing recommendations. But let me give you, sort of, as best I can, an overview of what the findings and conclusions -- core findings and conclusions were in the Joint Investigative Team. I'm going to say JIT Investigative Report.

The report, which I brought as my sole prop here, was issued in mid-September. It has 212 pages of findings and conclusions.

As we all know too well, the blowout did occur on April 20 when the Horizon crew was trying to finish work on the Macondo exploratory well resulting in the death of 11 individuals, the injury of many others, and the release of almost 5 million gallons of oil into the Gulf.

I think as we all also know, the central cause of the blowout, as found by the report, was a cement barrier failure, but many other factors contributed to that central failure and that's where a lot of the guts of the report focus on -- poor risk management, last minute changes to plans, failure to observe and react to critical indicators, inadequate well control response training, and inadequate well control response, insufficient emergency response training -- those are all really important findings coming out of the JIT's work in terms of what happened.

There's really no other way to say it other than, to me, at least, companies and individuals responsible for Macondo operations failed in a variety of ways and those failures, sort of, you can think about them in different categories. You can think about them in the adoption of incremental risk, sort of along the way, this decision led to this decision led to this decision, and sort of the aggregation of the level of risk, at some point, set the conditions for this all to happen.

It also likely happened in the failure to know exactly what was happening when it was happening, and then the failure to be trained to react properly once things started to go wrong.

The report broke down some of the failures into broad categories. You know, the first broad category that JIT looked at and made findings on were well design. As I said, the crew was engaged in temporary abandonment procedures, but leading up to that and including those procedures, BP made a series of decisions that complicated the cementing operations, that added the incremental risk, and ultimately may have contributed to the failure of the cement job.

The point at which they stopped drilling was a key decision, the decision to have one cement barrier in the well during the temporary abandonment procedures, the decision to set a lock-down sleeve at the time that they decided to set it, and the decision to use the spacer that they used in the well, that was another critical decision.

The next big category, cementing, the precise -- precisely how that cement, at least to the JIT -- precisely how it failed down there in the hole I don't know that we'll ever know, but it was some combination of swapping or fluid inversion of the cement in the drilling mud, contamination of the shoe track cement, or pumping the cement past the target location, also, as I learned, called over-displacement. Some combination of those things led to this catastrophic cement failure.

And so, I think, if you look at the findings and recommendations, because you can't pinpoint which one of those exactly went wrong on cementing, there are ideas on improving cementing operations that cut across these three theories because each of the possibilities have to be addressed.

We've all, I think, read and thought a lot about the negative tests that occurred on the rig. The JIT found that the crew did not fully consider or appreciate the pressure differential between the drill pipe and the kill line, and believed, or talked themselves into, that the differential was due to a bladder effect, a theory that later proved to be unfounded or virtually unheard of, and, you know, they thought they had a good test and what they had was the influx, sort of, looming below and ready to blow.

The Ignition Source and explosion, just quickly, the JIT found that after the cement barrier failed, the influx made its way to the rig and the crew sent the influx to a device called the Mud-Gas separator, a device that was not handled -- it's not designed to handle the level of flow that was coming up through the well. That was quickly overwhelmed and followed by ignition and two explosions.

The JIT also, and I think this is sort of an area that cuts across the Coast Guard's set of findings, recognized that the alarms were not set to automatically sound upon the detection of high, high levels of gas and bridge personnel didn't react quickly enough to the sounding of the alarms.

A better system and quicker reaction time may have saved lives, there's no question about that.

And I'm going to -- two or three other points before I can pass it to Kirk. The blowout preventer, I think, as we all know, as the last line of defense or as a tool that could have been used as a last line of defense, did not seal the well because either pressures from below or pressures from the weight of the drill pipe above, buckled the drill pipe inside the wall of the BOP setting that drill pipe outside the blind shear ram blades, so effectively leaving a gap through which flow could continue.

So, that's five, six categories of failures, each of which deserves and received very close attention in the JIT report.

Another thing -- category that we made sure to include in the report and that I think is an important part of the picture, there were problems with this well and with these operations prior to April 20. There were recurring well control events and delayed kick detection. The crew had a kick that they didn't detect promptly in March, March of that year, and that was really, in a lot of ways, at least to my own personal view, foreshadowed what happened on April 20, what failed to happen on March 8th.

This crew and this operation was under high pressure from scheduling conflicts and cost overruns. There were a number of personnel changes in conflicts that were happening at the time. Many -- most of these things have been detailed in -- certainly in our report and also in other reports. And it really did set the, sort of, set of conditions that --I don't want to say it was inevitable, but it kind of set this series of things in motion that led to the blowout.

So, at this point I'm going to pause and let Kirk sort of -- what he's going to do is sort of pull out some of the more -- I think, more important or -- they're all important, but some recommendations that are worth talking about in our 30 minutes together today.

OESC Chairman Thomas O. Hunter: Mike, just quickly. You had mentioned the Emergency Disconnect System that was also one of the things that was found -- was that a finding?

Michael D. Farber (BSEE): The EDS, I mean, to the JIT, I think -- and help me -- the JIT found that it was when the mux lines went out.

OESC Chairman Thomas O. Hunter: Yeah, right. Rich knows. But the point is, it didn't work. I mean, it didn't function.

Kirk H. Malstrom (BSEE): Well, they tried functioning it from the bridge, the sub sea engineer, but, you know, probably do to the loss of the mux lines they were unable to send that signal to the stack to operate.

OESC Chairman Thomas O. Hunter: (inaudible)

Kirk H. Malstrom (BSEE): The recommendations made by the Joint Investigation Team, they're -- from our side of the report, were basically made to the agency to consider some of these things, we didn't speak for the agency at the time, but kind of they weren't meant to be solely for our agency, we wanted them to -- they knew we needed input from industry to work on these together.

So, I'm just going to highlight some of these recommendations from the report and go from there just so we have time for questions afterwards.

Mike talked about one of the issues was with the negative test, we felt that was a strong indicator where they could have caught, you know, they could have seen a lot of things from that with the many anomalies that they had with it, so we recommended that we need to work with industry, we need to develop some sort of standardization with that negative test, how to interpret it, what that

means when there are anomalies and what to do with that, because, you know, leading up to that -- to the negative test, they submitted five different, you know, submittals within a week before the incident happened.

So, you know, there was many different ways to do it, and so, you know, there was a lot of confusion around that subject, so that's why we recommended -- threw that as one of the recommendations.

Another one that I know industry is already working on is a lot of the API committees, a lot of workgroups have been put together, and I know like with an API RP 65, they're, you know, looking at some of those. We really want to be involved with some of those to help, you know, make those even better.

And some of the things we wanted to look at with cementing, to be specific, is minimum hole diameter for a good cement job, we want to look at the rat hole mud density so there's not a fluid inversion, and also mud conditioning, circulating, you know, the well before to clean out any contaminants before you cement.

Mike also talked about their two-barrier issue with a mechanical barrier maybe. Why we felt this was important is when you do a pressure test after your cement job, you're mostly testing against your wiper plug which you run after, you know, your cement -- on top of your cement, so we want industry to look at the importance of setting that additional barrier.

Another one that was kind of -- we found quite interesting was the -- with all the simultaneous operations going on on the rig itself, the Mud Loggers were unable to verify what was going on on the rig, so it made it very hard for them, almost impossible, to accurately monitor fluid movement on the rig. And, you know, they need to have a better communication. I know they do a lot of the communications with the rig personnel, but there seem to be a disconnect where, you know, they had no idea exactly the operations that was going on, taking place.

Also another recommendation is industry and also the agency need to look at shearing capabilities of the BOP under flow conditions. That's not a test that are done at this time. I mean, there's no way to simulate those at this time. So, you know, we really need to think about how to approach that and to work with that.

And, once again, this just -- we need to recognize the anomalies that we have. A lot of simple anomalies, they may not seem like a lot but as they add up and they keep building on each other, you know, we need to look and see when is enough to look at those. So, you know, it takes a lot of training, personnel training. We want to look with industry just to help the guys on the rig make the best possible choices because they're always going to have a choice on the rig.

And also the final one that I want to talk about is the limited use of the Mud-Gas system that was also a problem that we found alarming how the Mud-Gas separator system, that vent line goes right up the leg of the derrick and goosenecks right back onto the rig floor, and that's maybe not the best design, I don't know, but definitely we want to look at some of that.

So, I mean, these are just some of the high level, just, highlights -- we had multiple recommendations for it, but these are just some that I felt, you know, good to talk about at this time.

Michael D. Farber (BSEE): Great. Captain Fish.

Captain David S. Fish (USCG): Hi. Thank you all for inviting me. As often is pointed out, everybody likes to see me in these meeting but not on the bridge of their vessel. So, thank you.

With me is Steve Venckus, not Michael Simbulan. Michael is deathly ill with some form of the crud. Steve is from our Judge Advocate General's shop.

We finished jointly with BSEE, just to remind everybody, Coast Guard Volume 1 is in two parts, and if you look at it, that's our process. We have a completely autonomous investigative board and they submit recommendations because by law not only are we supposed to find causal factors, but also present, then, lessons learned and recommendations to prevent it, which is pretty much today is the beginning of that process.

If you take a look at Volume 1, there's 50-some recommendations. The commandant did not accept all 50-some recommendations. There's nine that the commandant did not accept for a variety of reasons, generally it's a case of my investigators are on the deck plate (phonetic 0:22:34), the commandant's got a more strategic point of view, and a lot of times it's, yeah, that's a good point, but we're already doing it.

So, there is 40 recommendations going forward. This is the time of partnership, education, outreach. Coast Guard, we're very familiar with advisory committees, we have 13. Next week we're meeting with the offshore industry, so this is a good nice link.

Volume 1 is about the vessel, Coast Guard's authorities. Volume 2, Mike's volume, is everything down below. Overall, the failure, from our perspective, Coast Guard's world, our filter, is a failure of the safety management system between the owner-operator of the vessel, the owner of the well, and all the contractors.

They had it. It was excellent shelf ware. It wasn't operational. We focused on vessel Ops and safety systems, we focused on crew and bridge interaction and training, we focused on the alarms, we focused on abandonment, and we focused on fire fighting efforts.

At that point my job stops. If you're interested in spill response, read the FOSC Report in the ISPS. But that's where we stop.

Now, one thing I do want to say is for the most part, the systems, the organizational defenses, they worked. We lost 11 almost immediately, but of the 115 survivors, they all got off the vessel and we can't lose sight of that. Many, many, many safety systems worked. The redundancy of having double occupancy in the lifeboats on this type of a MODU, brilliant design, wasn't it? We burned up two, we still had two more.

Some safety recommendations to take a look at the design of them, that's a good safety recommendation. Having a stand-by vessel right there turned out to be absolutely fortuitous. Congress is having us take a look at how can we operationalize that in the future, and there's various ways to do that. We're going to have meetings with it. It doesn't necessarily mean a simple sailor (phonetic 0:24:53) solution that every rig has to have an OSV sitting next to

it. There's lots of ways to do this. We're going to be gathering that information to see what's the best way to do it.

Fast response vessel for rigs, right now they don't have to have one. Gee, maybe it's a good idea.

So, now's the time for partnerships. Now is the -- sort of the interesting point of view, the Coast Guard's moving out in three areas that are mutually enforceable and systemic. One are coastal state requirements, the United States Coast Guard requirements and authorities. We don't have to wait for anybody, we already have a lot of them. The other one is flag state. Pretty much we're 50-50 in the Gulf as far as foreign flag vessels and U.S. flag vessels, but they're still in our Gulf, on our Outer Continental Shelf, so we have to work with flag state making certain they meet their requirements.

And then finally, through the International Maritime Organization, we have to promote better MODU standards and so that we can approach it from an international perspective as well. So, we're going to be marching out three parallel tracks.

And input from this sort of committee is absolutely essential and we can't move out otherwise.

And there were some smaller recommendations, but if you look at it, it's on CG Mix, on the website. I think I also slung a copy on the Deepwater site. My site is down October 1st because I was too cheap to pay for it any longer, but please read the JIT -- the Coast Guard Volume 1, but along with the Commandant's Final Action.

And finally, we did the Final Action a little different than we've ever done before. We had a little delay because we published our Volume 1 first and the parties in interest, which is the way the Coast Guard conducts --

Michael D. Farber (BSEE): I had forgotten that. Thanks for reminding me.

Captain David S. Fish (USCG): I like to remind him daily.

In the Coast Guard we have what's called the parties of interest, and that's any licensed mariner that's generally owner-operated with a vessel, and pretty much anybody can come up to the Coast Guard investigator and say, hey, I can advance the government's investigation. We had 17?

Steven Venckus (USCG): Mm-hmm.

Captain David S. Fish (USCG): We had a small tribe of parties of interest. We did open up for comment, we allowed them in this period between April and September, for the parties of interest, to comment on the investigator's recommendations. We have included that in the Commandant's Final Action. We sort of did it like a regulatory project where we collected all 250-some comments and responded to each one.

It turned out that -- I will never do it again -- but it turned out to be a really good process with a lot of extremely valuable information. We don't normally allow PIIs input into a report, but we had the time to do it. They had requested it. It's a good thing.

Just so you know, we still have the BOP. It's still on the Coast Guard base along with some other pieces of evidence. We've given most back to the owners of the equipment. I think we still have the capping stacks. I think DOJ is still measuring that.

Judge Barbier is now the owner of the evidence. If anybody wants to take a look at it, if anybody wants to measure it, do a bucket list thing, contact the Judge and make arrangements to see it. It's no longer Coast Guard or BOEM controlled. The subpoenas are expired. But it does still exist. I figure that people will be wanting to take a look at Solenoid 103 one more time again.

And barring question, that's my report.

OESC Chairman Thomas O. Hunter: Questions from the committee? I think -- Tad?

OESC Member Taduesz W. Patzek (Academia): Captain Fish, could you please comment on the fire fighting action, you know, were there any recommendations from that action?

Captain David S. Fish (USCG): Yeah, there are some safety recommendations on that. One is, take a look at our training and coordination between the SAR Mission Controller, which is one function, and the fire fighting function. Because SAR Mission Controller, we didn't know if we still had people in the water. That person had paramount decision-making.

Fire fighting Outer Continental Shelf is an industry-led effort. The Coast Guard does not have fire-fighting capability on the Outer Continental Shelf. The responsibility comes through the Vessel Response Plan. Transocean identified who would take the lead on that effort.

We got all kinds of Congressional input on why didn't we use foam -- there's not that much foam. We also had an infinite source of fuel.

The vessel, you know, it survived for 48 hours, which is pretty remarkable. There was -- at the top of it there was probably five OSVs putting water on it. That's the best we can do. If we didn't have an infinite source, I suspect they would have put it out, but it was such a catastrophic fire with an infinite source of fuel, the vessel was doomed.

DFO Joseph R. Levine (BSEE): Lois?

OESC Member Lois N. Epstein (Non-Governmental Organization-NGO): Do you make any legislative recommendations or do you just focus on regulatory aspects?

Captain David S. Fish (USCG): Yes.

OESC Member Lois N. Epstein (NGO): Yes.

Captain David S. Fish (USCG): We will do legislative changes where that's necessary, if we need to expand our authorities through a Coast Guard Authorization Act. We do regulatory. We also do -- similar to BSEE we do, you know, industry partnerships and, you know, industry guidance, best practices, you know, what's the best way to move forward.

What we don't want to do is get stuck in a regulatory process that goes on, you know, easily for a decade, Subchapter N.

OESC Member Lois N. Epstein (NGO): How about BSEE?

Michael D. Farber (BSEE): In the investigative report there were no legislative recommendations but the agency -- in the report itself there were no legislative recommendations on the BSEE side in Volume 2, but the agency is certainly looking at all appropriate solutions to implement all the reforms that need to be implemented.

OESC Member Lois N. Epstein (NGO): Did you decide that you weren't going to do any? Or did you actually decide there was no need when you wrote the report? Is that clear?

Michael D. Farber (BSEE): Well, I didn't decide anything. It was the findings and the conclusions and recommendations were JIT's findings, but it's my understanding that they were focused on recommendations back to the agency and/or to industry. I'll let Kirk elaborate.

Kirk H. Malstrom (BSEE): Yes, most of the normal accident investigations are -- we do recommendations to the agency and then, you know, it's up to the agency to determine the appropriateness of how they can fulfill it.

OESC Member Christopher A. Smith (Department of Energy – DOE): I had a couple of questions. So, the Department of Energy oversaw the oil spill commission that managed by Reilly and Graham, so that's one that I'm familiar with and it sounds like there was a lot of consistency with your findings between that commission and ours.

I've got a couple of questions on areas that fell outside of the remit of the first oil spill commission and they might be questions that you have answers to or not, but the first is pointing back to the fire fighting that we talked about a moment ago.

I know that there was a discussion about whether or not the effort to actively fight the fire and put water on the platform contributed to the eventual sinking of the platform or not and if there was a decision around that or a way of making that decision that we might want to collectively think about differently if there was a finding there?

And the second question was around the BOP. I know that when the first commission finished its findings, the BOP investigation was still ongoing. Since then, your commission has made some statements about the BOP as has DNV, and my question was, did your group come to a conclusion about the root causes which led to that drill pipe elastically buckling within the BOP and falling outside of the cutting surface of the blind shear ram? And did you make any recommendations about the need to test BOPs under a failure condition such that you understand what type of response was required to re-center that pipe under an emergency condition where you actually have free flow of hydrocarbons through the well bore?

Michael D. Farber (BSEE): Should we take those in reverse order? On the BOP, at least from my perspective, and Kirk can either correct me or add to what I have to say, the difference -- by and large the JIT's conclusions lined up with DNV. DNV was the forensic examiner that did the forensic examination on behalf of the Joint Investigative Team.

By and large a lot of the findings lined up. One area where it was different, I think, went to your question, which is the DNV found or believed that the forces from down in the well that blew out caused the buckling, so you had to close the annular -- the pipe couldn't go anywhere, the pressure from below is what buckles the pipe and ends up outside the shearing surface of the blind shear rams.

The JIT found that either forces from the bottom or forces from the 5,000 pounds of drill pipe that may have come back down this way, you know, one source of pressure or another caused the buckling, not -- the JIT couldn't say with -- couldn't find, based upon the evidence, that it looked at in the expert analysis that it reviewed, that the pressure came from below. And that's, I mean -- the root cause of the buckling is sort of an either/or combination finding, and that's -- is that sort of accurate reflection or accurately captured?

OESC Member Christopher A. Smith (DOE) Did you have an opinion about the potential -- the actual movement or drift of the platform once the emergency started was one of the contributing factors, which is another thing I hear?

Kirk H. Malstrom (BSEE): It's pretty much dead calm out there on the day of the incident, so, I mean, I don't know what kind of vessel movement -- from environmental conditions you're going to have -- you weren't going to have the drift off, you know, on that riser. It was pretty calm that night.

Kirk H. Malstrom (BSEE): So, there was a second part of your question.

Captain David S. Fish (USCG): Second half of the question, there are recommendations to take a look in -- look for areas of improvement for fire fighting. On the second day it was better coordinated and the fire was directed onto the risers and not onto the deck. But what exacerbated the issue was the crew hadn't practiced good seamanship and some of their actions resulted in down flooding as well.

But we have damage -- there's a lot of damage from the fire and explosion itself. How much down flooding is the result of the water from the monitors we do know, because we -- I organized a dive, an ROV dive, using Navy soup salve (phonetic 0:00:54). We do know that there is damage to the risers where the shell of the risers is parted and water would have entered the vessel as well.

So, it's impossible to say other than a tremendously catastrophic casualty, the vessel was going down.

OESC Chairman Thomas O. Hunter: Paul, if you have a question (inaudible).

OESC Member Paul K. Siegele (Offshore Energy Industry): Could you talk about the findings on the alarms and what thoughts you have going forward in terms of alarm optimization, making sure that critical alarms are still set to go and not tripping so often that people tend to turn them off?

Captain David S. Fish (USCG): Yes, thank you. Yeah, that is one of the recommendations. What we want to take a look at is -- what was told to us through the JIT was that as best practice that they would be enabled and that then the bridge crew would monitor and make

an informed decision on what actions to take, because the owner-operator of the vessel was operating under the belief that we're cutting into hours of service, we're cutting into fatigue with alarms going off. This is a production vessel. So, let's have a human being take a look at the alarms and monitors and make the right decision.

I think for day-to-day operation that's probably a good idea. However, should all of the safety defenses -- been enabled? That's the issue. It was they had like one or the other. Probably going to go ahead working with the industry and come up with a best practice of saying, you know, maybe shutting down ventilation systems is good; general alarm, no, let's have a human being make that decision.

Also, Coast Guard, because these are licensed people, where you have to take a look at it from a manning standpoint, they -- the DP operators were probably fully employed before the decision was made that they would also be alarm monitors. Have we gone a bridge too far? Should we maybe add another -- is this a bridge management issue? A bridge resource management issue? Don't have an answer, but that's another thing that we're taking a look at.

I think basically we just need to take a look at it from what is an intelligent design, and not do a knee jerk reaction.

Kirk H. Malstrom (BSEE): One of the problems we saw as well is when the alarm -- the high, high gas alarms were going off, you know, they can respond when they have one, two compartments that show, you know, this high, high alarm, they can send somebody in to investigate what's going on. But when you have your whole system, your whole panel lit up, there is some confusion. I mean, how do you start resetting those alarms? So, we saw that was a problem they weren't really prepared for.

OESC Member Paul K. Siegele (Offshore Energy Industry): That was a lesson from Three Mile Island as well, you know, the whole panel goes up and what do you do? So, I think there's room for future research on this.

OESC Chairman Thomas O. Hunter: Joe.

OESC Member Joseph M. Gebara (Offshore Energy Industry): I appreciate you coming out this afternoon and sharing this with us. I have a question that's related to the fact that MODU operation is regulated by the two bodies that are sitting in front -- represented in front of us. Do you have any learnings from your investigation as to how the MOU that's signed between the two organizations may need to be adjusted in the future in terms of how you work together?

Captain David S. Fish (USCG): You bet. We have a joint statement -- we have a working group that's now -- gets together quarterly. We now have seven MOUs based upon vessel type, which makes for -- or platform, facility type, which makes a lot of sense. But the vision statement that we're operating under today is building a lasting federal partnership to improve safety and environmental protection in the offshore environment through collaboration and coordinated action.

We want to be more efficient, we want to be more effective. We don't want to have unnecessary overlap, but we don't want to have gaps as well, and that's what BSEE and the Coast Guard are

diligently working on at the staff level. But the quarterlies are conducted by senior leadership of both organizations, so there's been a lot of effort put to this, and it's how can we be better?

OESC Chairman Thomas O. Hunter: Just a quick question. I gather the report did not address anything after the rig sank or during the containment activities, is that correct?

Captain David S. Fish (USCG): (Nodding)

Kirk H. Malstrom (BSEE): (Nodding)

Michael D. Farber (BSEE): (Nodding)

OESC Chairman Thomas O. Hunter: So, is it fair to say that if all the alarms worked and all the systems were functional at the time of the incident as it was down hole, that lives could have been saved and the ship could have been, perhaps saved? In other words, was there anything that could be done after we got the first event in the judgment of the JIT that would have at least saved lives?

Kirk H. Malstrom (BSEE): The only thing I can think of is there were three individuals that were in the Mud Pump Room, they were fixing the number 2 pump, a pop-off valve on it, and in those compartments, you know, when they're notified of -- I mean, they should be notified if there's, you know, high gas alarms or combustibles, that sort of thing. I mean, other than that, I think most of them were taken out by the initial explosions. I mean, there wasn't much --

OESC Chairman Thomas O. Hunter: So, the die was cast largely when the first major flow came out -- gas flow came out of the well?

Kirk H. Malstrom (BSEE): Right. Most of the individuals that perished were on the rig floor. There was one crane operator that fell and then the other three were in that pump room.

Michael D. Farber (BSEE): But there was a 12-minute period between when the gas alarm started to sound and the general alarm was hit and the working theory is if that 12-minute period was shorter those 3 lives may have been saved.

OESC Chairman Thomas O. Hunter: Those three?

Michael D. Farber (BSEE): Yeah. Those three.

OESC Chairman Thomas O. Hunter: So, the answer is some lives could have been saved.

Michael D. Farber (BSEE): Some.

Captain David S. Fish (USCG): And an EDS might have worked in that first 12 minutes.

OESC Chairman Thomas O. Hunter: Well, that's why I asked about --

Captain David S. Fish (USCG): But we don't know. That's --

CHAIRMAN HUNTER: Yeah, if the EDS has worked --

Captain David S. Fish (USCG): Right. Right.

OESC Chairman Thomas O. Hunter: -- then both the ship and the lives might have been saved?

Captain David S. Fish (USCG): Right.

OESC Chairman Thomas O. Hunter: Is that a reasonable assumption?

Captain David S. Fish (USCG): Right. There is data. We don't know where the vessel black box is. I do, however, know where the bridge is. The bridge actually broke off the vessel and it's sitting on ocean floor. There is data there, it's a prohibitive cost to getting it out, and basically the government has felt that we've learned enough, there's no reason to spend millions of dollars to try to raise it.

Judge Barbier may have a different opinion, but, you know, we have that 12 minutes and so for that reason we have to say –

OESC Chairman Thomas O. Hunter: Good point.

Captain David S. Fish (USCG): -- there is a good possibility that lives could have been saved, but we don't know.

OESC Chairman Thomas O. Hunter: Joe, I think this has been terrific. Thank you very much.

DFO Joseph R. Levine (BSEE): Thank you very much. Appreciate your time.

Michael D. Farber (BSEE): Thanks for the opportunity.

OESC Member Lois N. Epstein (Non-Governmental Organization-NGO): Joe, can we get all the links to these reports and the President's commission?

OESC Member Mathy V. Stanislaus (Environmental Protection Agency) I mean, just to kind of put this in context with Lois, I think lots of other kinds of reviews and studies that have been done, I think for our work, I just want to kind of reference a few others that I think is really important.

So, the Coast Guard's Incident-Specific Preparedness Review, there's FOSC's report -- so, I just want to kind of orient that we need to kind of look at, given the four topical areas that we're focusing in on, we need to also focus in on those which focus in on the preparedness and response aspects and lessons learned.

OESC Chairman Thomas O. Hunter: That's consistent with our discussion. Very good.

Appendix XVIII

DEPARTMENT OF THE INTERIOR
OCEAN ENERGY SAFETY ADVISORY COMMITTEE
WASHINGTON, D.C.
NOVEMBER 8, 2011

SUMMARY OF FINDINGS FROM DEEPWATER JOINT INVESTIGATION TEAM (JIT)

Michael D. Farber (BSEE): Thank you, Joe. Sorry we don't have any fancy slides today. I think the three of us and many others lived with these issues for so long I don't know that we could bear to put together slides for you all, and we also, more importantly, thought that the most productive thing might be for us to kick things off and then engage in a discussion, a give and take, if that's what you all want to do.

So, before we get to that, let me introduce who's up here with me. I'm Mike Farber. I'm the Chief of the Investigations and Review Unit now in BSEE and I worked alongside the BOEMRE-JIT Team, Joint Investigative Team, in working on the report and publishing the report.

On my immediate right is Kirk Malstrom. He and the rest of the Joint Investigative Team from our agency, they did the real work on the investigation, meaning, you know, they got on site on virtually day one, conducted all the hearings, collected all the documents, and did all the hard analysis. Kirk was a member of that team since the very beginning and part of what we'd like him to cover today with you all is some of the more important of the recommendations that are presented in the report.

To Kirk's right is Captain David Fish from the U.S. Coast Guard. Captain Fish is the Chief of the Investigations in Casualty Analysis Group for the Coast Guard. He's responsible for programs and policies in support of Coast Guard-Marine casualty investigations, environmental crimes, marine pollution investigations, and personnel action investigations. He also worked closely with the Coast Guard side of the Joint Investigative Team in putting forth their recommendations, and then with the commandant on the Commandant's Final Action Letter.

So, again, Captain Fish, I think, is going to focus a lot on sort of the path forward, you know, and not just on the findings and conclusions in the report, because we think that's kind of the most productive use of our time.

Captain Fish and I, along the way, we had many conversations during the process of producing volumes one and two in the report and it became clear to us, both through working through a lot of issues related to the Joint Investigation, that these were sort of the moments of planting the seeds for working together, the two agencies, not just Captain Fish and I, all of our colleagues working together to really build a lasting partnership to make sure we can do everything possible to ensure safe operations out there on the Outer Continental Shelf and really doing that required us to be hand-in-hand -- two agencies hand-in-hand.

And I think things like presenting to your committee is part of the next step and then working together to make sure regulatory reforms and other actions are done, hand-in-glove, together, so that we can get to where we all want to get to, which is enhancing safety out there.

I think that it's our hope that industry in particular will study closely the reports and the other various reports that have been issued. Obviously, industry remains on the front lines out there. They're well positioned, perhaps -- best positioned, to identify, mitigate and address risks associated with deepwater drilling. For all involved, we hope that the Joint Investigative Team's work and the set of conclusions, findings, and recommendations contained in the report, will help to prevent a blowout like the Macondo blowout from happening again.

The only way we can do that, I think, is to do the -- all of it's hard work, but the real hard work, in a lot of ways, comes in how do you convert a series of reports, a series of findings, conclusions, and recommendations, how do you convert all of that good work into a set of regulatory reforms, industry reforms, technological improvements, and you know, other best practice work? How do you do that to get to where we all want to go?

And, so, to that end, I thought I'd do just a high level summary of the findings and conclusions in the report, unless you think that this audience is already familiar with the report and I should jettison that. I want to use our 30 minutes sort of the best.

OESC Chairman Thomas O. Hunter: (inaudible) the present condition.

Michael D. Farber (BSEE): Yup, okay. I want to make sure I'm leaving enough time for both of my colleagues up here on the panel, and in particular to talk about sort of forward facing recommendations. But let me give you, sort of, as best I can, an overview of what the findings and conclusions -- core findings and conclusions were in the Joint Investigative Team. I'm going to say JIT Investigative Report.

The report, which I brought as my sole prop here, was issued in mid-September. It has 212 pages of findings and conclusions.

As we all know too well, the blowout did occur on April 20 when the Horizon crew was trying to finish work on the Macondo exploratory well resulting in the death of 11 individuals, the injury of many others, and the release of almost 5 million gallons of oil into the Gulf.

I think as we all also know, the central cause of the blowout, as found by the report, was a cement barrier failure, but many other factors contributed to that central failure and that's where a lot of the guts of the report focus on -- poor risk management, last minute changes to plans, failure to observe and react to critical indicators, inadequate well control response training, and inadequate well control response, insufficient emergency response training -- those are all really important findings coming out of the JIT's work in terms of what happened.

There's really no other way to say it other than, to me, at least, companies and individuals responsible for Macondo operations failed in a variety of ways and those failures, sort of, you can think about them in different categories. You can think about them in the adoption of incremental risk, sort of along the way, this decision led to this decision led to this decision, and sort of the aggregation of the level of risk, at some point, set the conditions for this all to happen.

It also likely happened in the failure to know exactly what was happening when it was happening, and then the failure to be trained to react properly once things started to go wrong.

The report broke down some of the failures into broad categories. You know, the first broad category that JIT looked at and made findings on were well design. As I said, the crew was engaged in temporary abandonment procedures, but leading up to that and including those procedures, BP made a series of decisions that complicated the cementing operations, that added the incremental risk, and ultimately may have contributed to the failure of the cement job.

The point at which they stopped drilling was a key decision, the decision to have one cement barrier in the well during the temporary abandonment procedures, the decision to set a lock-down sleeve at the time that they decided to set it, and the decision to use the spacer that they used in the well, that was another critical decision.

The next big category, cementing, the precise -- precisely how that cement, at least to the JIT -- precisely how it failed down there in the hole I don't know that we'll ever know, but it was some combination of swapping or fluid inversion of the cement in the drilling mud, contamination of the shoe track cement, or pumping the cement past the target location, also, as I learned, called over-displacement. Some combination of those things led to this catastrophic cement failure.

And so, I think, if you look at the findings and recommendations, because you can't pinpoint which one of those exactly went wrong on cementing, there are ideas on improving cementing operations that cut across these three theories because each of the possibilities have to be addressed.

We've all, I think, read and thought a lot about the negative tests that occurred on the rig. The JIT found that the crew did not fully consider or appreciate the pressure differential between the drill pipe and the kill line, and believed, or talked themselves into, that the differential was due to a bladder effect, a theory that later proved to be unfounded or virtually unheard of, and, you know, they thought they had a good test and what they had was the influx, sort of, looming below and ready to blow.

The Ignition Source and explosion, just quickly, the JIT found that after the cement barrier failed, the influx made its way to the rig and the crew sent the influx to a device called the Mud-Gas separator, a device that was not handled -- it's not designed to handle the level of flow that was coming up through the well. That was quickly overwhelmed and followed by ignition and two explosions.

The JIT also, and I think this is sort of an area that cuts across the Coast Guard's set of findings, recognized that the alarms were not set to automatically sound upon the detection of high, high levels of gas and bridge personnel didn't react quickly enough to the sounding of the alarms.

A better system and quicker reaction time may have saved lives, there's no question about that.

And I'm going to -- two or three other points before I can pass it to Kirk. The blowout preventer, I think, as we all know, as the last line of defense or as a tool that could have been used as a last line of defense, did not seal the well because either pressures from below or pressures from the weight of the drill pipe above, buckled the drill pipe inside the wall of the BOP setting that drill pipe outside the blind shear ram blades, so effectively leaving a gap through which flow could continue.

So, that's five, six categories of failures, each of which deserves and received very close attention in the JIT report.

Another thing -- category that we made sure to include in the report and that I think is an important part of the picture, there were problems with this well and with these operations prior to April 20. There were recurring well control events and delayed kick detection. The crew had a kick that they didn't detect promptly in March, March of that year, and that was really, in a lot of ways, at least to my own personal view, foreshadowed what happened on April 20, what failed to happen on March 8th.

This crew and this operation was under high pressure from scheduling conflicts and cost overruns. There were a number of personnel changes in conflicts that were happening at the time. Many -- most of these things have been detailed in -- certainly in our report and also in other reports. And it really did set the, sort of, set of conditions that --I don't want to say it was inevitable, but it kind of set this series of things in motion that led to the blowout.

So, at this point I'm going to pause and let Kirk sort of -- what he's going to do is sort of pull out some of the more -- I think, more important or -- they're all important, but some recommendations that are worth talking about in our 30 minutes together today.

OESC Chairman Thomas O. Hunter: Mike, just quickly. You had mentioned the Emergency Disconnect System that was also one of the things that was found -- was that a finding?

Michael D. Farber (BSEE): The EDS, I mean, to the JIT, I think -- and help me -- the JIT found that it was when the mux lines went out.

OESC Chairman Thomas O. Hunter: Yeah, right. Rich knows. But the point is, it didn't work. I mean, it didn't function.

Kirk H. Malstrom (BSEE): Well, they tried functioning it from the bridge, the sub sea engineer, but, you know, probably do to the loss of the mux lines they were unable to send that signal to the stack to operate.

OESC Chairman Thomas O. Hunter: (inaudible)

Kirk H. Malstrom (BSEE): The recommendations made by the Joint Investigation Team, they're -- from our side of the report, were basically made to the agency to consider some of these things, we didn't speak for the agency at the time, but kind of they weren't meant to be solely for our agency, we wanted them to -- they knew we needed input from industry to work on these together.

So, I'm just going to highlight some of these recommendations from the report and go from there just so we have time for questions afterwards.

Mike talked about one of the issues was with the negative test, we felt that was a strong indicator where they could have caught, you know, they could have seen a lot of things from that with the many anomalies that they had with it, so we recommended that we need to work with industry, we need to develop some sort of standardization with that negative test, how to interpret it, what that

means when there are anomalies and what to do with that, because, you know, leading up to that -- to the negative test, they submitted five different, you know, submittals within a week before the incident happened.

So, you know, there was many different ways to do it, and so, you know, there was a lot of confusion around that subject, so that's why we recommended -- threw that as one of the recommendations.

Another one that I know industry is already working on is a lot of the API committees, a lot of workgroups have been put together, and I know like with an API RP 65, they're, you know, looking at some of those. We really want to be involved with some of those to help, you know, make those even better.

And some of the things we wanted to look at with cementing, to be specific, is minimum hole diameter for a good cement job, we want to look at the rat hole mud density so there's not a fluid inversion, and also mud conditioning, circulating, you know, the well before to clean out any contaminants before you cement.

Mike also talked about their two-barrier issue with a mechanical barrier maybe. Why we felt this was important is when you do a pressure test after your cement job, you're mostly testing against your wiper plug which you run after, you know, your cement -- on top of your cement, so we want industry to look at the importance of setting that additional barrier.

Another one that was kind of -- we found quite interesting was the -- with all the simultaneous operations going on on the rig itself, the Mud Loggers were unable to verify what was going on on the rig, so it made it very hard for them, almost impossible, to accurately monitor fluid movement on the rig. And, you know, they need to have a better communication. I know they do a lot of the communications with the rig personnel, but there seem to be a disconnect where, you know, they had no idea exactly the operations that was going on, taking place.

Also another recommendation is industry and also the agency need to look at shearing capabilities of the BOP under flow conditions. That's not a test that are done at this time. I mean, there's no way to simulate those at this time. So, you know, we really need to think about how to approach that and to work with that.

And, once again, this just -- we need to recognize the anomalies that we have. A lot of simple anomalies, they may not seem like a lot but as they add up and they keep building on each other, you know, we need to look and see when is enough to look at those. So, you know, it takes a lot of training, personnel training. We want to look with industry just to help the guys on the rig make the best possible choices because they're always going to have a choice on the rig.

And also the final one that I want to talk about is the limited use of the Mud-Gas system that was also a problem that we found alarming how the Mud-Gas separator system, that vent line goes right up the leg of the derrick and goosenecks right back onto the rig floor, and that's maybe not the best design, I don't know, but definitely we want to look at some of that.

So, I mean, these are just some of the high level, just, highlights -- we had multiple recommendations for it, but these are just some that I felt, you know, good to talk about at this time.

Michael D. Farber (BSEE): Great. Captain Fish.

Captain David S. Fish (USCG): Hi. Thank you all for inviting me. As often is pointed out, everybody likes to see me in these meeting but not on the bridge of their vessel. So, thank you.

With me is Steve Venckus, not Michael Simbulan. Michael is deathly ill with some form of the crud. Steve is from our Judge Advocate General's shop.

We finished jointly with BSEE, just to remind everybody, Coast Guard Volume 1 is in two parts, and if you look at it, that's our process. We have a completely autonomous investigative board and they submit recommendations because by law not only are we supposed to find causal factors, but also present, then, lessons learned and recommendations to prevent it, which is pretty much today is the beginning of that process.

If you take a look at Volume 1, there's 50-some recommendations. The commandant did not accept all 50-some recommendations. There's nine that the commandant did not accept for a variety of reasons, generally it's a case of my investigators are on the deck plate (phonetic 0:22:34), the commandant's got a more strategic point of view, and a lot of times it's, yeah, that's a good point, but we're already doing it.

So, there is 40 recommendations going forward. This is the time of partnership, education, outreach. Coast Guard, we're very familiar with advisory committees, we have 13. Next week we're meeting with the offshore industry, so this is a good nice link.

Volume 1 is about the vessel, Coast Guard's authorities. Volume 2, Mike's volume, is everything down below. Overall, the failure, from our perspective, Coast Guard's world, our filter, is a failure of the safety management system between the owner-operator of the vessel, the owner of the well, and all the contractors.

They had it. It was excellent shelf ware. It wasn't operational. We focused on vessel Ops and safety systems, we focused on crew and bridge interaction and training, we focused on the alarms, we focused on abandonment, and we focused on fire fighting efforts.

At that point my job stops. If you're interested in spill response, read the FOSC Report in the ISPS. But that's where we stop.

Now, one thing I do want to say is for the most part, the systems, the organizational defenses, they worked. We lost 11 almost immediately, but of the 115 survivors, they all got off the vessel and we can't lose sight of that. Many, many, many safety systems worked. The redundancy of having double occupancy in the lifeboats on this type of a MODU, brilliant design, wasn't it? We burned up two, we still had two more.

Some safety recommendations to take a look at the design of them, that's a good safety recommendation. Having a stand-by vessel right there turned out to be absolutely fortuitous. Congress is having us take a look at how can we operationalize that in the future, and there's various ways to do that. We're going to have meetings with it. It doesn't necessarily mean a simple sailor (phonetic 0:24:53) solution that every rig has to have an OSV sitting next to

it. There's lots of ways to do this. We're going to be gathering that information to see what's the best way to do it.

Fast response vessel for rigs, right now they don't have to have one. Gee, maybe it's a good idea.

So, now's the time for partnerships. Now is the -- sort of the interesting point of view, the Coast Guard's moving out in three areas that are mutually enforceable and systemic. One are coastal state requirements, the United States Coast Guard requirements and authorities. We don't have to wait for anybody, we already have a lot of them. The other one is flag state. Pretty much we're 50-50 in the Gulf as far as foreign flag vessels and U.S. flag vessels, but they're still in our Gulf, on our Outer Continental Shelf, so we have to work with flag state making certain they meet their requirements.

And then finally, through the International Maritime Organization, we have to promote better MODU standards and so that we can approach it from an international perspective as well. So, we're going to be marching out three parallel tracks.

And input from this sort of committee is absolutely essential and we can't move out otherwise.

And there were some smaller recommendations, but if you look at it, it's on CG Mix, on the website. I think I also slung a copy on the Deepwater site. My site is down October 1st because I was too cheap to pay for it any longer, but please read the JIT -- the Coast Guard Volume 1, but along with the Commandant's Final Action.

And finally, we did the Final Action a little different than we've ever done before. We had a little delay because we published our Volume 1 first and the parties in interest, which is the way the Coast Guard conducts --

Michael D. Farber (BSEE): I had forgotten that. Thanks for reminding me.

Captain David S. Fish (USCG): I like to remind him daily.

In the Coast Guard we have what's called the parties of interest, and that's any licensed mariner that's generally owner-operated with a vessel, and pretty much anybody can come up to the Coast Guard investigator and say, hey, I can advance the government's investigation. We had 17?

Steven Venckus (USCG): Mm-hmm.

Captain David S. Fish (USCG): We had a small tribe of parties of interest. We did open up for comment, we allowed them in this period between April and September, for the parties of interest, to comment on the investigator's recommendations. We have included that in the Commandant's Final Action. We sort of did it like a regulatory project where we collected all 250-some comments and responded to each one.

It turned out that -- I will never do it again -- but it turned out to be a really good process with a lot of extremely valuable information. We don't normally allow PIIs input into a report, but we had the time to do it. They had requested it. It's a good thing.

Just so you know, we still have the BOP. It's still on the Coast Guard base along with some other pieces of evidence. We've given most back to the owners of the equipment. I think we still have the capping stacks. I think DOJ is still measuring that.

Judge Barbier is now the owner of the evidence. If anybody wants to take a look at it, if anybody wants to measure it, do a bucket list thing, contact the Judge and make arrangements to see it. It's no longer Coast Guard or BOEM controlled. The subpoenas are expired. But it does still exist. I figure that people will be wanting to take a look at Solenoid 103 one more time again.

And barring question, that's my report.

OESC Chairman Thomas O. Hunter: Questions from the committee? I think -- Tad?

OESC Member Taduesz W. Patzek (Academia): Captain Fish, could you please comment on the fire fighting action, you know, were there any recommendations from that action?

Captain David S. Fish (USCG): Yeah, there are some safety recommendations on that. One is, take a look at our training and coordination between the SAR Mission Controller, which is one function, and the fire fighting function. Because SAR Mission Controller, we didn't know if we still had people in the water. That person had paramount decision-making.

Fire fighting Outer Continental Shelf is an industry-led effort. The Coast Guard does not have fire-fighting capability on the Outer Continental Shelf. The responsibility comes through the Vessel Response Plan. Transocean identified who would take the lead on that effort.

We got all kinds of Congressional input on why didn't we use foam -- there's not that much foam. We also had an infinite source of fuel.

The vessel, you know, it survived for 48 hours, which is pretty remarkable. There was -- at the top of it there was probably five OSVs putting water on it. That's the best we can do. If we didn't have an infinite source, I suspect they would have put it out, but it was such a catastrophic fire with an infinite source of fuel, the vessel was doomed.

DFO Joseph R. Levine (BSEE): Lois?

OESC Member Lois N. Epstein (Non-Governmental Organization-NGO): Do you make any legislative recommendations or do you just focus on regulatory aspects?

Captain David S. Fish (USCG): Yes.

OESC Member Lois N. Epstein (NGO): Yes.

Captain David S. Fish (USCG): We will do legislative changes where that's necessary, if we need to expand our authorities through a Coast Guard Authorization Act. We do regulatory. We also do -- similar to BSEE we do, you know, industry partnerships and, you know, industry guidance, best practices, you know, what's the best way to move forward.

What we don't want to do is get stuck in a regulatory process that goes on, you know, easily for a decade, Subchapter N.

OESC Member Lois N. Epstein (NGO): How about BSEE?

Michael D. Farber (BSEE): In the investigative report there were no legislative recommendations but the agency -- in the report itself there were no legislative recommendations on the BSEE side in Volume 2, but the agency is certainly looking at all appropriate solutions to implement all the reforms that need to be implemented.

OESC Member Lois N. Epstein (NGO): Did you decide that you weren't going to do any? Or did you actually decide there was no need when you wrote the report? Is that clear?

Michael D. Farber (BSEE): Well, I didn't decide anything. It was the findings and the conclusions and recommendations were JIT's findings, but it's my understanding that they were focused on recommendations back to the agency and/or to industry. I'll let Kirk elaborate.

Kirk H. Malstrom (BSEE): Yes, most of the normal accident investigations are -- we do recommendations to the agency and then, you know, it's up to the agency to determine the appropriateness of how they can fulfill it.

OESC Member Christopher A. Smith (Department of Energy – DOE): I had a couple of questions. So, the Department of Energy oversaw the oil spill commission that managed by Reilly and Graham, so that's one that I'm familiar with and it sounds like there was a lot of consistency with your findings between that commission and ours.

I've got a couple of questions on areas that fell outside of the remit of the first oil spill commission and they might be questions that you have answers to or not, but the first is pointing back to the fire fighting that we talked about a moment ago.

I know that there was a discussion about whether or not the effort to actively fight the fire and put water on the platform contributed to the eventual sinking of the platform or not and if there was a decision around that or a way of making that decision that we might want to collectively think about differently if there was a finding there?

And the second question was around the BOP. I know that when the first commission finished its findings, the BOP investigation was still ongoing. Since then, your commission has made some statements about the BOP as has DNV, and my question was, did your group come to a conclusion about the root causes which led to that drill pipe elastically buckling within the BOP and falling outside of the cutting surface of the blind shear ram? And did you make any recommendations about the need to test BOPs under a failure condition such that you understand what type of response was required to re-center that pipe under an emergency condition where you actually have free flow of hydrocarbons through the well bore?

Michael D. Farber (BSEE): Should we take those in reverse order? On the BOP, at least from my perspective, and Kirk can either correct me or add to what I have to say, the difference -- by and large the JIT's conclusions lined up with DNV. DNV was the forensic examiner that did the forensic examination on behalf of the Joint Investigative Team.

By and large a lot of the findings lined up. One area where it was different, I think, went to your question, which is the DNV found or believed that the forces from down in the well that blew out caused the buckling, so you had to close the annular -- the pipe couldn't go anywhere, the pressure from below is what buckles the pipe and ends up outside the shearing surface of the blind shear rams.

The JIT found that either forces from the bottom or forces from the 5,000 pounds of drill pipe that may have come back down this way, you know, one source of pressure or another caused the buckling, not -- the JIT couldn't say with -- couldn't find, based upon the evidence, that it looked at in the expert analysis that it reviewed, that the pressure came from below. And that's, I mean -- the root cause of the buckling is sort of an either/or combination finding, and that's -- is that sort of accurate reflection or accurately captured?

OESC Member Christopher A. Smith (DOE) Did you have an opinion about the potential -- the actual movement or drift of the platform once the emergency started was one of the contributing factors, which is another thing I hear?

Kirk H. Malstrom (BSEE): It's pretty much dead calm out there on the day of the incident, so, I mean, I don't know what kind of vessel movement -- from environmental conditions you're going to have -- you weren't going to have the drift off, you know, on that riser. It was pretty calm that night.

Kirk H. Malstrom (BSEE): So, there was a second part of your question.

Captain David S. Fish (USCG): Second half of the question, there are recommendations to take a look in -- look for areas of improvement for fire fighting. On the second day it was better coordinated and the fire was directed onto the risers and not onto the deck. But what exacerbated the issue was the crew hadn't practiced good seamanship and some of their actions resulted in down flooding as well.

But we have damage -- there's a lot of damage from the fire and explosion itself. How much down flooding is the result of the water from the monitors we do know, because we -- I organized a dive, an ROV dive, using Navy soup salve (phonetic 0:00:54). We do know that there is damage to the risers where the shell of the risers is parted and water would have entered the vessel as well.

So, it's impossible to say other than a tremendously catastrophic casualty, the vessel was going down.

OESC Chairman Thomas O. Hunter: Paul, if you have a question (inaudible).

OESC Member Paul K. Siegele (Offshore Energy Industry): Could you talk about the findings on the alarms and what thoughts you have going forward in terms of alarm optimization, making sure that critical alarms are still set to go and not tripping so often that people tend to turn them off?

Captain David S. Fish (USCG): Yes, thank you. Yeah, that is one of the recommendations. What we want to take a look at is -- what was told to us through the JIT was that as best practice that they would be enabled and that then the bridge crew would monitor and make

an informed decision on what actions to take, because the owner-operator of the vessel was operating under the belief that we're cutting into hours of service, we're cutting into fatigue with alarms going off. This is a production vessel. So, let's have a human being take a look at the alarms and monitors and make the right decision.

I think for day-to-day operation that's probably a good idea. However, should all of the safety defenses -- been enabled? That's the issue. It was they had like one or the other. Probably going to go ahead working with the industry and come up with a best practice of saying, you know, maybe shutting down ventilation systems is good; general alarm, no, let's have a human being make that decision.

Also, Coast Guard, because these are licensed people, where you have to take a look at it from a manning standpoint, they -- the DP operators were probably fully employed before the decision was made that they would also be alarm monitors. Have we gone a bridge too far? Should we maybe add another -- is this a bridge management issue? A bridge resource management issue? Don't have an answer, but that's another thing that we're taking a look at.

I think basically we just need to take a look at it from what is an intelligent design, and not do a knee jerk reaction.

Kirk H. Malstrom (BSEE): One of the problems we saw as well is when the alarm -- the high, high gas alarms were going off, you know, they can respond when they have one, two compartments that show, you know, this high, high alarm, they can send somebody in to investigate what's going on. But when you have your whole system, your whole panel lit up, there is some confusion. I mean, how do you start resetting those alarms? So, we saw that was a problem they weren't really prepared for.

OESC Member Paul K. Siegele (Offshore Energy Industry): That was a lesson from Three Mile Island as well, you know, the whole panel goes up and what do you do? So, I think there's room for future research on this.

OESC Chairman Thomas O. Hunter: Joe.

OESC Member Joseph M. Gebara (Offshore Energy Industry): I appreciate you coming out this afternoon and sharing this with us. I have a question that's related to the fact that MODU operation is regulated by the two bodies that are sitting in front -- represented in front of us. Do you have any learnings from your investigation as to how the MOU that's signed between the two organizations may need to be adjusted in the future in terms of how you work together?

Captain David S. Fish (USCG): You bet. We have a joint statement -- we have a working group that's now -- gets together quarterly. We now have seven MOUs based upon vessel type, which makes for -- or platform, facility type, which makes a lot of sense. But the vision statement that we're operating under today is building a lasting federal partnership to improve safety and environmental protection in the offshore environment through collaboration and coordinated action.

We want to be more efficient, we want to be more effective. We don't want to have unnecessary overlap, but we don't want to have gaps as well, and that's what BSEE and the Coast Guard are

diligently working on at the staff level. But the quarterlies are conducted by senior leadership of both organizations, so there's been a lot of effort put to this, and it's how can we be better?

OESC Chairman Thomas O. Hunter: Just a quick question. I gather the report did not address anything after the rig sank or during the containment activities, is that correct?

Captain David S. Fish (USCG): (Nodding)

Kirk H. Malstrom (BSEE): (Nodding)

Michael D. Farber (BSEE): (Nodding)

OESC Chairman Thomas O. Hunter: So, is it fair to say that if all the alarms worked and all the systems were functional at the time of the incident as it was down hole, that lives could have been saved and the ship could have been, perhaps saved? In other words, was there anything that could be done after we got the first event in the judgment of the JIT that would have at least saved lives?

Kirk H. Malstrom (BSEE): The only thing I can think of is there were three individuals that were in the Mud Pump Room, they were fixing the number 2 pump, a pop-off valve on it, and in those compartments, you know, when they're notified of -- I mean, they should be notified if there's, you know, high gas alarms or combustibles, that sort of thing. I mean, other than that, I think most of them were taken out by the initial explosions. I mean, there wasn't much --

OESC Chairman Thomas O. Hunter: So, the die was cast largely when the first major flow came out -- gas flow came out of the well?

Kirk H. Malstrom (BSEE): Right. Most of the individuals that perished were on the rig floor. There was one crane operator that fell and then the other three were in that pump room.

Michael D. Farber (BSEE): But there was a 12-minute period between when the gas alarm started to sound and the general alarm was hit and the working theory is if that 12-minute period was shorter those 3 lives may have been saved.

OESC Chairman Thomas O. Hunter: Those three?

Michael D. Farber (BSEE): Yeah. Those three.

OESC Chairman Thomas O. Hunter: So, the answer is some lives could have been saved.

Michael D. Farber (BSEE): Some.

Captain David S. Fish (USCG): And an EDS might have worked in that first 12 minutes.

OESC Chairman Thomas O. Hunter: Well, that's why I asked about --

Captain David S. Fish (USCG): But we don't know. That's --

CHAIRMAN HUNTER: Yeah, if the EDS has worked --

Captain David S. Fish (USCG): Right. Right.

OESC Chairman Thomas O. Hunter: -- then both the ship and the lives might have been saved?

Captain David S. Fish (USCG): Right.

OESC Chairman Thomas O. Hunter: Is that a reasonable assumption?

Captain David S. Fish (USCG): Right. There is data. We don't know where the vessel black box is. I do, however, know where the bridge is. The bridge actually broke off the vessel and it's sitting on ocean floor. There is data there, it's a prohibitive cost to getting it out, and basically the government has felt that we've learned enough, there's no reason to spend millions of dollars to try to raise it.

Judge Barbier may have a different opinion, but, you know, we have that 12 minutes and so for that reason we have to say –

OESC Chairman Thomas O. Hunter: Good point.

Captain David S. Fish (USCG): -- there is a good possibility that lives could have been saved, but we don't know.

OESC Chairman Thomas O. Hunter: Joe, I think this has been terrific. Thank you very much.

DFO Joseph R. Levine (BSEE): Thank you very much. Appreciate your time.

Michael D. Farber (BSEE): Thanks for the opportunity.

OESC Member Lois N. Epstein (Non-Governmental Organization-NGO): Joe, can we get all the links to these reports and the President's commission?

OESC Member Mathy V. Stanislaus (Environmental Protection Agency) I mean, just to kind of put this in context with Lois, I think lots of other kinds of reviews and studies that have been done, I think for our work, I just want to kind of reference a few others that I think is really important.

So, the Coast Guard's Incident-Specific Preparedness Review, there's FOSC's report -- so, I just want to kind of orient that we need to kind of look at, given the four topical areas that we're focusing in on, we need to also focus in on those which focus in on the preparedness and response aspects and lessons learned.

OESC Chairman Thomas O. Hunter: That's consistent with our discussion. Very good.


N714P

INCIDENT PREVENTION + RESPONSE

DEPARTMENT OF THE INTERIOR
OCEAN ENERGY SAFETY ADVISORY COMMITTEE MEETING
WASHINGTON, D.C.
NOVEMBER 8, 2011

PUBLIC COMMENTS BY
IAN S. SUTTON

Petroleum Engineer
Process Risk Management
Amec Paragon

Mr. Ian S. Sutton (Amec Paragon): Good afternoon. My name is Ian Sutton. I'm with AMEC, an engineering company in Houston. My concern or question concerns the independent third party (I3P) audit requirements.

This morning we saw the requirements for the I3P and they're onerous. They have to be an expert on process safety, on offshore operations, practical experience, and a good basis in engineering design.

There are not a lot of these people around and most of them are very gainfully employed as they are now. And our concern is -- or, at least my concern, is that the practical implementation of this requirement could be very difficult indeed. Thank you.

OESC Chairman Thomas O. Hunter: Thank you. Would you remind us again, just to put the comment in context, when the independent third party auditing requirement goes into place?

DFO Joseph R. Levine (BSEE): Right now SEMS I, which goes into effect, like we all know, November 15th, has the option of what we call a Designated Qualified Person, that's a company, person who can do the audit of the company, or an independent third party. That's in place November 15th.

The proposed rule, SEMS II comment period closes November 14th, removes the option for the designated and qualified person and leaves it as only an independent third party needs to conduct the company audit.

But it's a proposed rule, it's not in final format. I would say, though, when it moves forward, probably six months from now it would be final and then we'd have an effective date, 90 days or so.

OESC Member Charles R. Williams II (Offshore Energy Industry): I don't want to predict, you know, what the industry comments are going to be, but I suspect that a lot of people will comment on, you know, the period of time that it takes to get from where we are to where we want to be with all these verified auditors. So, I think there will be comments about that.

OESC Chairman Thomas O. Hunter: I think the commenters comment goes to that. They have to exist before we can hire them. I guess that's true.

DFO Joseph R. Levine (BSEE): Thank you for the comment, Ian.

DEPARTMENT OF THE INTERIOR
OCEAN ENERGY SAFETY ADVISORY COMMITTEE MEETING
WASHINGTON, D.C.
NOVEMBER 8, 2011

PUBLIC COMMENTS BY
MICHAEL CRAIG
Independent Citizen

Michael Craig (Independent Citizen): Sure, I'm Michael Craig and I guess I'm just here as an independent citizen even though I do work for an environmental nonprofit, just to put that out there.

Two notes about the R&D discussion. First of all, earlier it was mentioned about the Spill Response Subcommittee and there was mention of one of the recommendations addressing R&D into Spill Response technologies. And Lois had mentioned that that kind of seemed to be left out. And I know that we heard from Captain Little that it was left out because there were constructs that deal with that.

And I just want to highlight that there may be constructs that deal with that but they seem to not be doing their job. And just to underscore the issue, during the Macondo blowout the issue was raised of how much the skimmers recovered and, you now, they recovered 18,000 barrels a day, which is about 3 percent of what was flowing into the Gulf.

And so whether it's in the Arctic or in the Gulf of Mexico, clearly there are some problems that need to be worked out. So, in terms of formulating recommendations, maybe that is something to be considered.

On the other hand, we heard from Director Bromwich earlier that agency funding is not what it used to be and especially for BSEE they're facing tight budgets. So, another consideration that I just wanted to put out is when you delegate money to R&D, where that money is coming from, and if that's coming from BSEE's budget. Otherwise, that money could go toward BSEE what the best use of those funds actually would be, because another point that came about from the Deepwater Horizon was enforcement, you know, isn't where it needs to be at this point.

That's all I have. Thank you very much.

DFO Joseph R. Levine (BSEE): Thank you.

OESC Chairman Thomas O. Hunter: Great comments.

JITF and API 96/97

2010 Energy Industry Response

Created 4 Joint Industry Task Forces:

- Prevention
  - **Operating Procedures Task Force**
  - **Equipment Task Force**
- Intervention
  - **Subsea Well Control and Containment Task Force**
- Spill Response
  - **Oil Spill Preparedness and Response Task Force**

Restoring Confidence in Deepwater Drilling Operations

Operating Procedures Task Force

- Focus on Drilling & Completion safety, design, procedures and operations associated Deepwater Wells
- JITF met ~2 weeks in May 2010 to develop recommendations for DOI focused on (5) areas:
  1. Cementing
  2. **Loads and Resistance Deepwater Well Design Considerations**
  3. **Fluid Displacement and Negative Testing**
  4. **Abandonment and Barriers**
  5. **Adopt Safety Case & Well Construction Interface**

Objectives of JITF

- Make improvements
- Reduce risk
- Increase environmental protections
- Provide rationale for continued drilling in the Gulf of Mexico

API Bulletin 97

Well Construction Interface Document

DEPARTMENT OF THE INTERIOR

WCID Guidelines

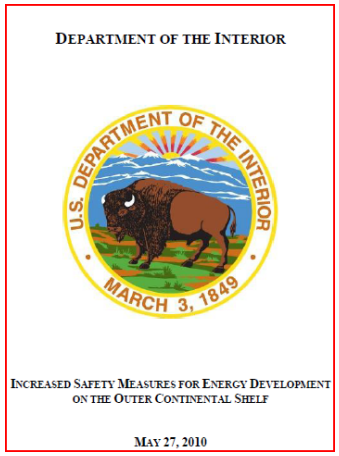
DOI May 27, 2010 Increased Safety Measure Report

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

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 must 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 will 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. The use of the IADC's Health, Safety, and Environmental Case Guidelines for Mobile Offshore Drilling Units will help operators and drilling contractors demonstrate their ability to operate safely and handle the risks associated with drilling on the OCS.

API Bulletin 97

- Initial Plan (mid 2010)


DEPARTMENT OF THE INTERIOR

INCREASED SAFETY MEASURES FOR ENERGY DEVELOPMENT ON THE OUTER CONTINENTAL SHELF

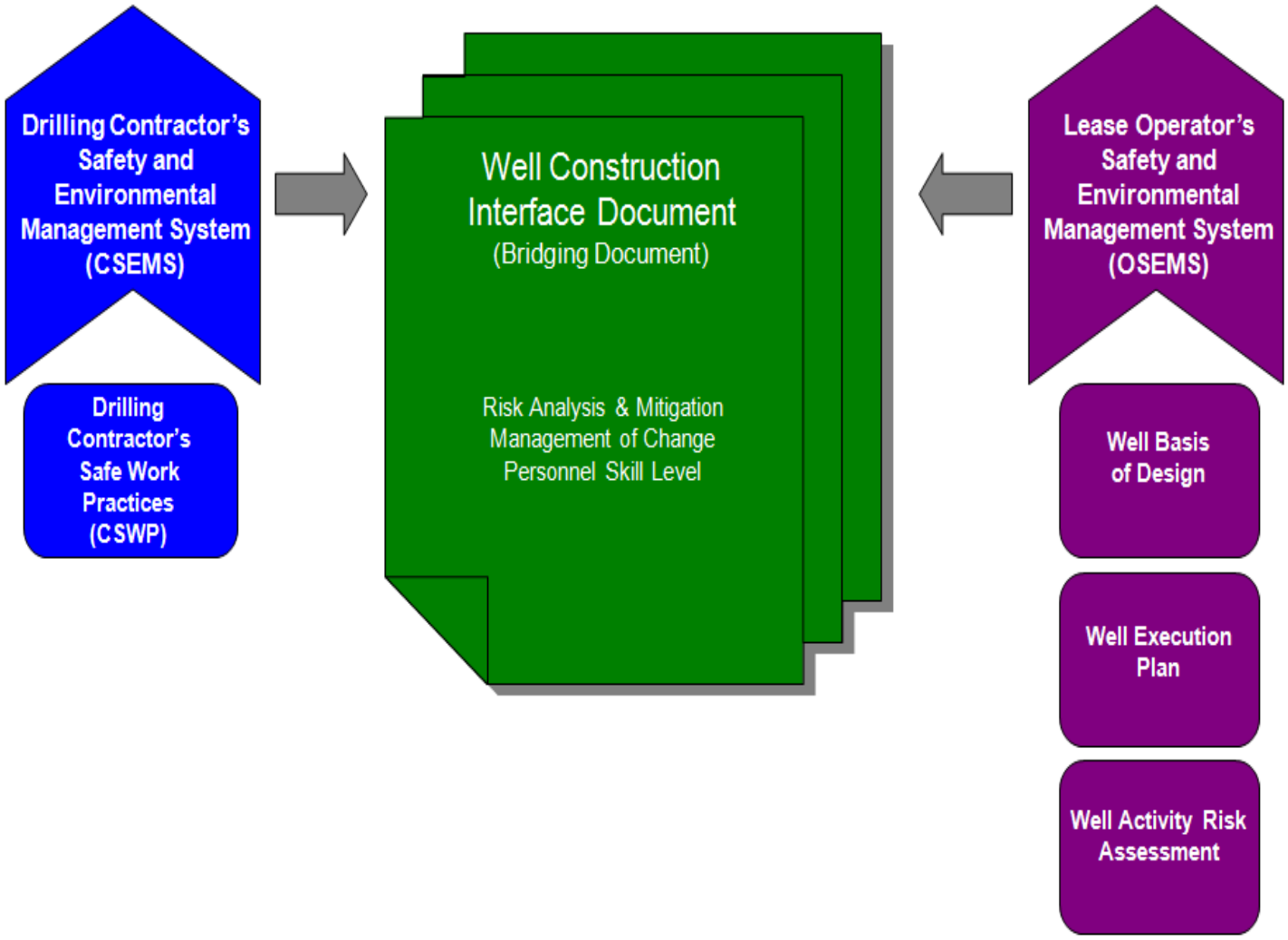
MAY 27, 2010

- Safety Case to link Contractors HSE case with Operators Safety Management System (SMS) (as alluded to in Buffalo report)
  - European Safety Case Regime for Gulf Of Mexico
  - WCID would be part of the APD process

Revisions

- Further meetings with BOEMRE 4th Qtr 2010 indicated different outcome
  - Safety Environment Management System (SEMS) by operator with full accountability on operator
  - WCID not integral to APD process
  - **Will be interface (bridging document) between operator and Rig Contractor and other Contractors. Focus on well design, execution plans, chain of command and Operator SEMS interface with Contractor**

Scope


Drilling Contractor's Safety and Environmental Management System (CSEMS)
Drilling Contractor's Safe Work Practices (CSWP)
Well Construction Interface Document
(Bridging Document)
Risk Analysis & Mitigation
Management of Change
Personnel Skill Level
Lease Operator's Safety and Environmental Management System (OSEMS)
Well Basis of Design
Well Execution Plan
Well Activity Risk Assessment

RP Bulletin 97 WCID Contents

- WCID Guidelines
  - Drilling Contractor/Operator SEMS Interface
  - Well Construction (geology, design, barriers, execution, risk analysis etc)
- WCID SEMS Interface Example
- WCID Well Construction Interface Example with Risk analysis example

2011 Results

- Refined Bulletin 97 and the WCID Example annexes to go to ballot
  - Removed references to permitting process and Registered Engineers
  - Removed references to equipment certifications
  - Removed safety case references.
- Ballot Bulletin 97 1st Edition—August
- Results received in October
  - 15 affirmative votes / 4 negative votes
  - reviewing several hundred comments

Proactive use of WCID will improve safety and compliance with SEMS

RP 96 Deepwater Well Design and Construction

- API (Gary Luquette and David Payne) committed to 2nd phase of JITF Operating Procedures for “new standards for DW well designs”. June 2010
- WG composed of operators, rig contractors, service companies, industry associations and government regulators

RP 96 Description

- Reviews Deepwater rig systems and BOPs (to show how rigs affect well design)
- Examples of current DW GOM well architecture, and Barrier Philosophy (7 pages)
- Defines load cases (internal and external pressures) and reviews survival design considerations
- Special considerations for drilling and completions

RP 96 description (Cont)

- Extensive review and examples for conducting displacement operations during drilling and completion operations
- Review of management of change, including Stop Work Authority
- 3 annexes provide examples for barriers employed during several operations, barrier definitions and examples for negative testing (53 pages total)

API RP 96 "Deepwater Well Design and Construction" Status

- Sent out for re-ballot late October 2010 after addressing over 1100 comments following original ballot
- Document intent (per original JITF)
  - Outline barrier and load case considerations
  - Supplement API RP 65-2 (and 90 for APB)
  - Discuss design features and risks for various scenarios to prevent loss of well control

RP 96 Conclusions

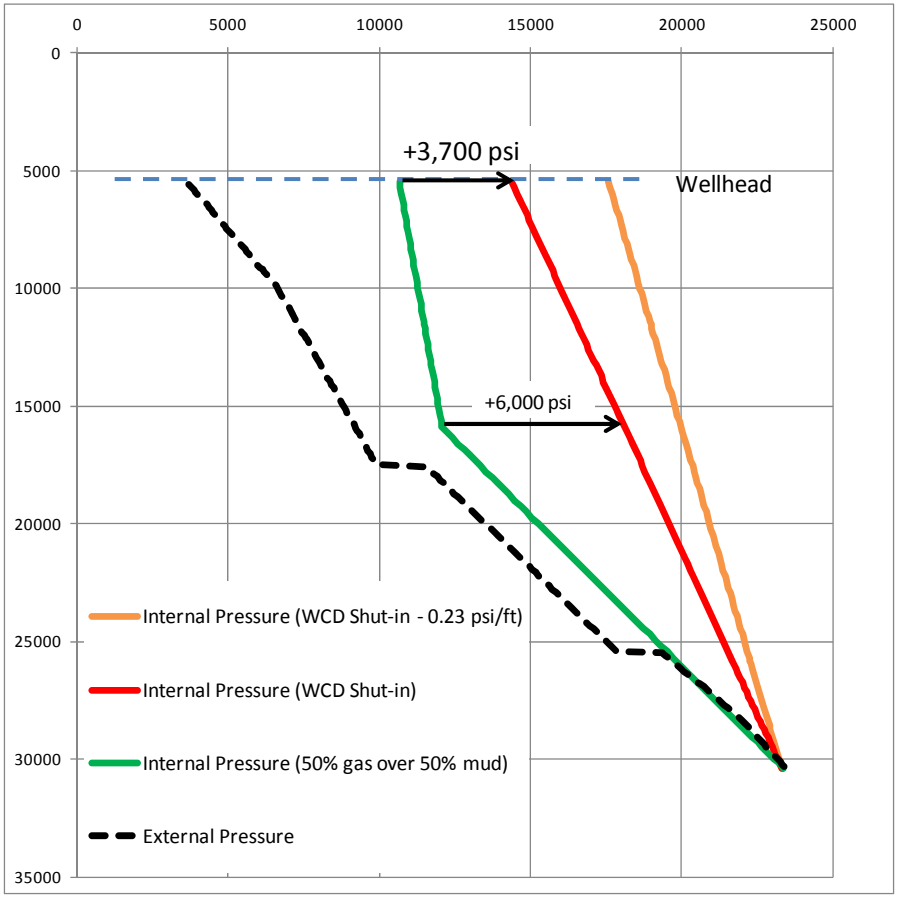
- RP 96 is not meant to be a text book for new engineers or drilling engineers new to Deep Water. It will not define what design factor to use for burst, for example.
- It is designed to demonstrate and give examples of casing loads, items to consider when designing wells, and examples of different well design considerations and design rationale.
- It gives multiple examples (but is not intended to cover all cases) for considerations when displacing wells and performing negative tests.
- It provides detailed definitions for barriers.
- It reviews operational considerations for drilling and completions, such as open water work, well testing and more.
- Special operational considerations such as landing strings, APB, Intelligent Wells

Well design to meet permitting requirements

Well Containment Screening Tool

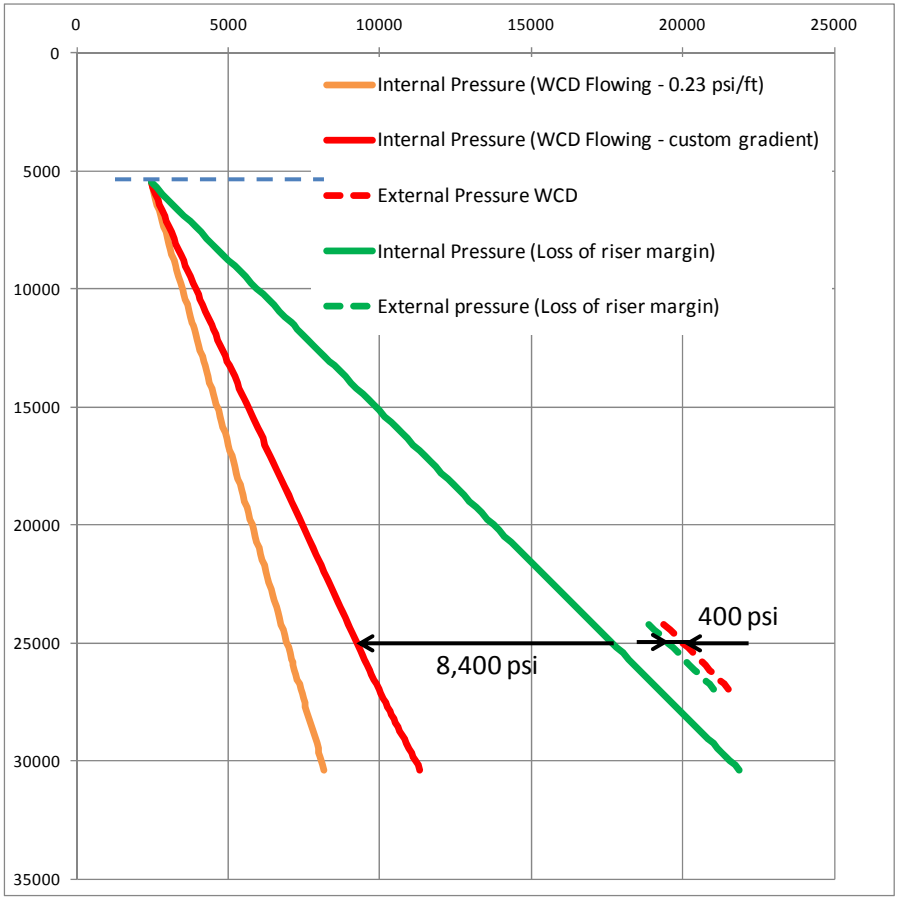
- Introduction – BOEMRE requirements (NTL-10)
- Design considerations to demonstrate containment capability
- Load cases for containment evaluation
- Examples of changes to well design
- Well Containment Screening tools – Level 1 & Level 2
- Version 19 is nearing completion, Cap and Flow

Drilling Burst design – Full shut-in



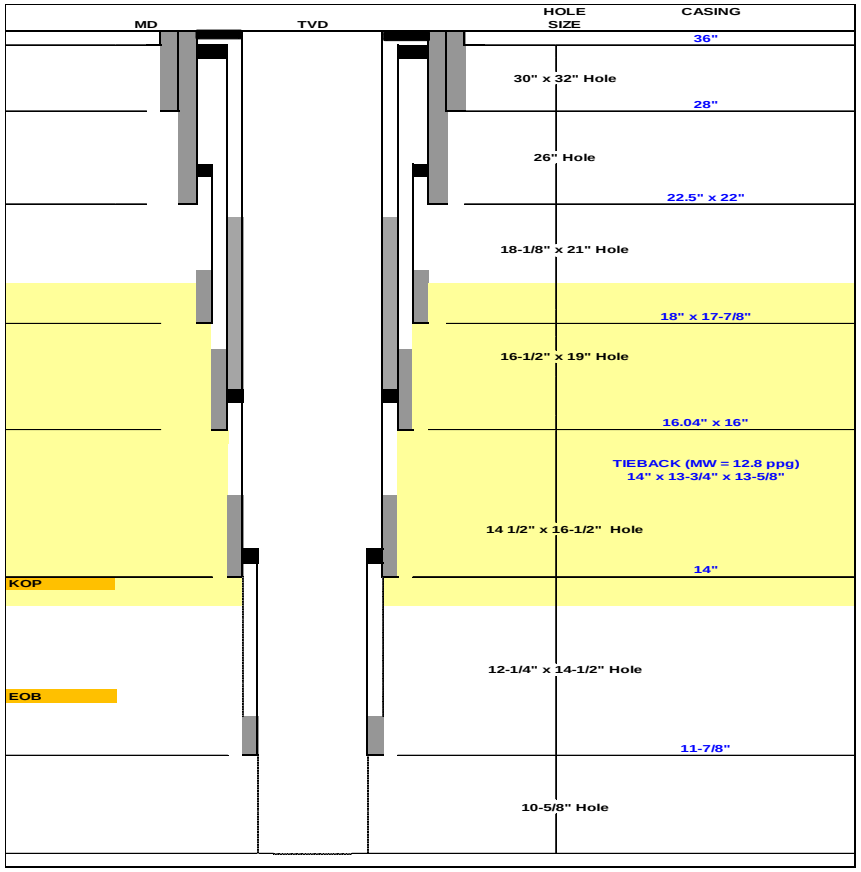
- Before NTL-10
  - Usually, worst case for drilling = Formation pressure at TD with top half (TVD) of well displaced to gas and lower half (TVD) filled with mud
- After NTL10
  - Internal pressure = reservoir pressure with full column of hydrocarbons above
  - Sensitive to fluid gradient
- Example: burst load increase
  - 3,700 psi at wellhead
  - 6,000 psi at ~16,000'
- Pressure on exposed formation increases (increased risk for fracture)
- Burst loads usually increase towards the mudline

Drilling Collapse design



- Before NTL-10
  - Usually, worst case for drilling = Loss of riser margin or mud drop due to downhole losses
- After NTL10
  - Internal pressure = seawater hydrostatic at mudline with flowing hydrocarbon gradient below
    - Sensitive to produced fluid gradient
  - Increased APB due to hydrocarbon flow
- Example: collapse load increase
  - 8,800 psi at 25,000'
    - 8,400 psi due to Internal Pressure decrease
    - 400 psi due to APB increase
- Collapse load increases with depth

Examples of changes to well design



- Burst (typically changes to upper half of well)
  - Tieback (14”, 13-3/4”, 13-5/8”)
  - Use 16.04”, 16.15” instead of 16”
  - Higher rating (submudline) hangers
  - Or resolve with Cap & Flow
- Collapse (typically changes to lower half of well)
  - Use heavier 16.04”, 16.15” instead of 16”
  - Use heavier 14” instead of 13-5/8”
  - Higher rating 14” hanger systems
  - Use long string to control APB (weight limited)
  - Lower liners collapse (11-7/8” and smaller)
- Formation strength (broaching)
  - Move mechanical failure point deeper
  - Change casing setting depths to take advantage of strong formation (e.g., salt) or weak/thief zones
  - Or resolve with Cap & Flow
- Using existing pre-NTL10 wells may be challenging
  - More complicated solutions, e.g., scab liners

Blowout Risk Assessment JIP (BORA)

- To develop a rapid risk assessment tool to evaluate the risk related to well design and operations in the Gulf of Mexico. The risk assessment tool will incorporate three key areas:
  - Design and Planning
  - Execution (in the field)
  - Containment (source control and collection)

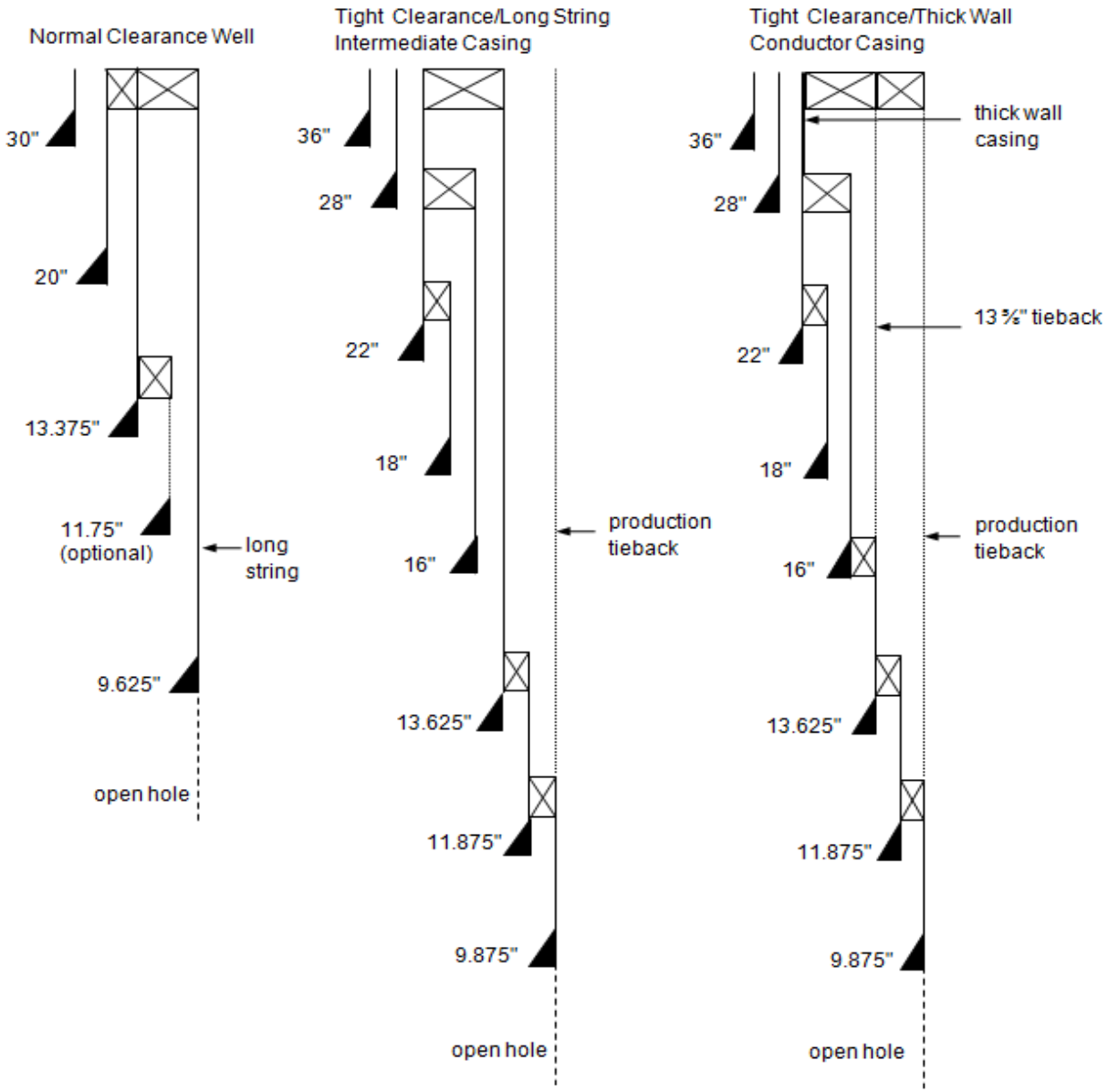
- A comparative risk assessment (CRA) will be developed to help provide a reference point to measure levels of risk.

Thirteen companies have committed to fund this JIP (Nov 1)

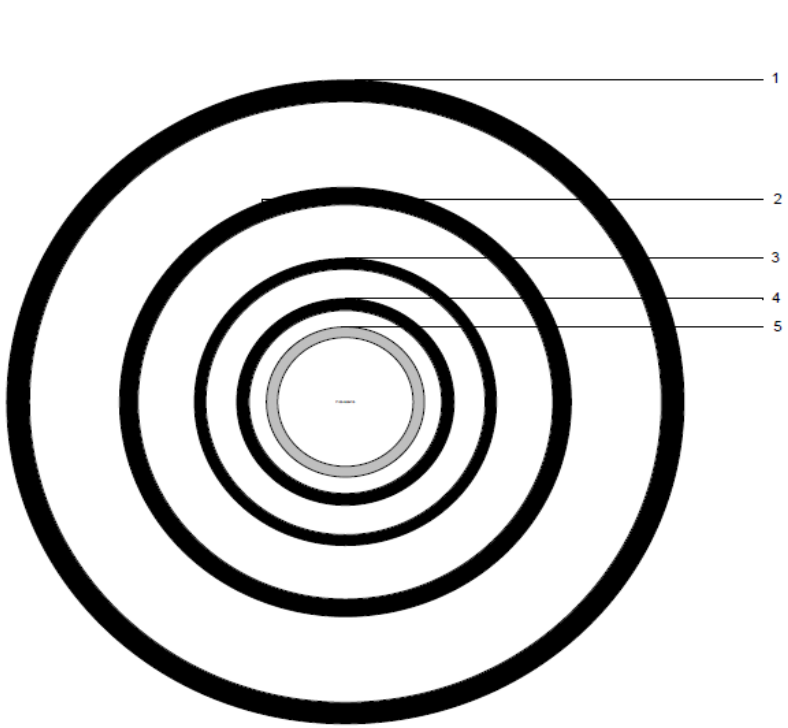
Similar approach to that used to access risk for anchored rigs

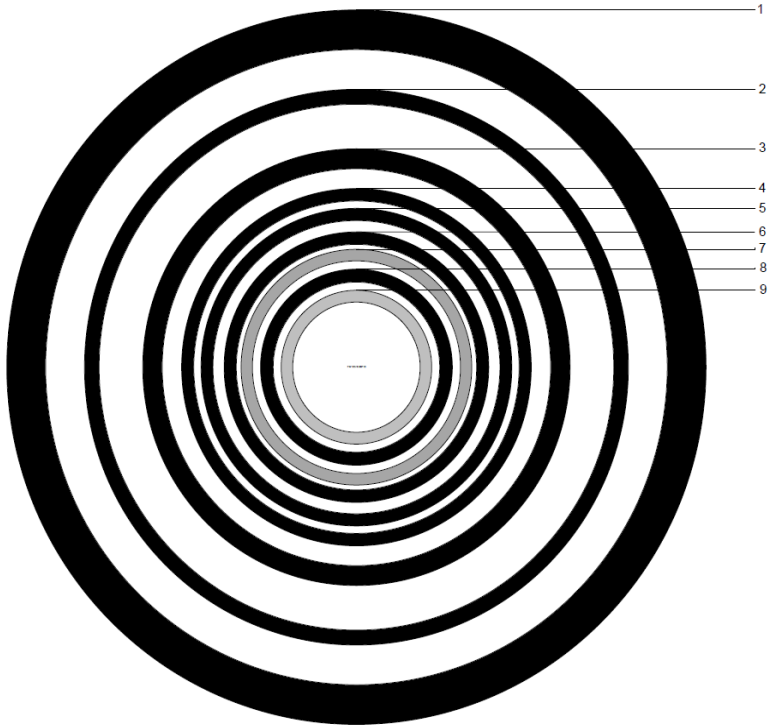
JITF Summary

- Provided input to DOI's 30-day Safety Report
- Included recommendation for Incorporation by Reference of API Recommended Practice on Cementing (RP 65-2)
- Proposal for a new API Recommended Practice on Deepwater Well Design Construction (RP 96)
- Proposal for developing a Well Construction Interface Document to align safety programs (Bulletin 97) – Joint with IADC
- Provide comments to DOI on Interim Final Drilling Rule


Normal Clearance Well
30"
20"
13.375"
11.75"
(optional)
long
string
9.625"
open hole
Tight Clearance/Long String
Intermediate Casing
36"
28"
22"
18"
16"
production
tieback
13.625"
11.875"
9.875"
open hole
Tight Clearance/Thick Wall
Conductor Casing
thick wall
casing
36"
28"
13⅜" tieback
22"
18"
production
tieback
16"
13.625"
11.875"
9.875"
open hole

Comparison of 1990s casing design to current deep well design





Barrier Verification