

Deepwater Oil and Gas Operations and Regulations

Michael Saucier
Bureau of Safety and Environmental Enforcement
Gulf of Mexico OCS Region

April 21, 2010

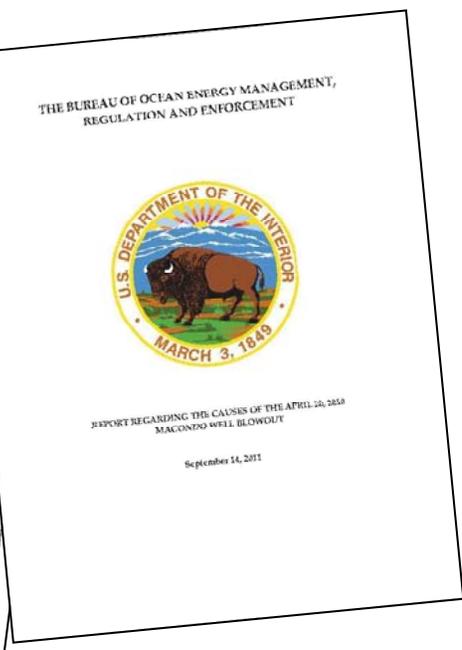
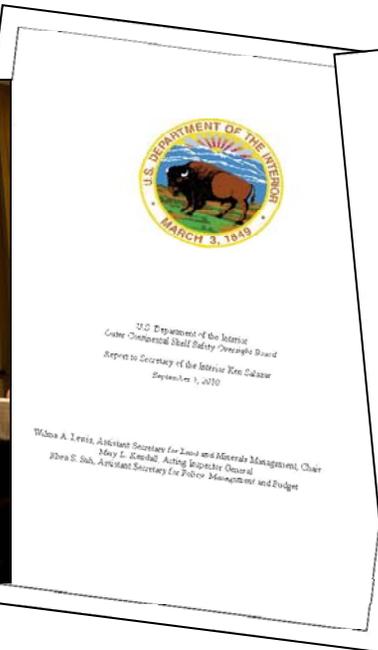
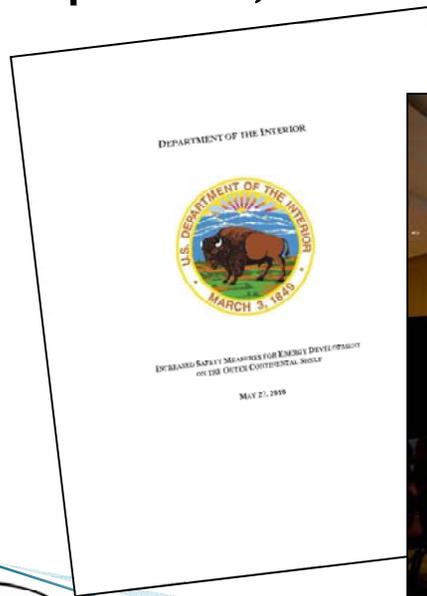
Mississippi Canyon Block 252

- ▶ The events of April 20, 2010 which took place in deepwater Gulf of Mexico have forever impacted the regulatory framework of deepwater oil and gas operations.



Regulatory Reviews

- ▶ May 27, 2010: 30-Day Safety Report
- ▶ BOEMRE Director's Forums on Offshore Drilling
- ▶ Sept. 1, 2010: OCS Safety Oversight Board Report
- ▶ Sept. 14, 2011: Joint Investigation Team Final Report



Regulatory Enhancements & Reforms

- ▶ **June 18, 2010: Notice to Lessees 2010–N06**
 - involves worst case discharge
 - “Information Requirements for Exploration Plans, Development and Production Plans, and Development Operations Coordination Documents on the OCS.”
- ▶ **Oct. 14, 2010: Interim Final Rule, *Drilling Safety Rule***
 - new standards for well–design, casing and cementing programs
- ▶ **Nov. 8, 2010: Notice to Lessees 2010–N10**
 - involves subsea blowout containment resources for deepwater drilling
 - “Statement of Compliance with Applicable Regulations and Evaluation of Information Demonstrating Adequate Spill Response and Well Containment Resources.”



Forward Progress – *development of technology*

- ▶ Nov. 8, 2010: Notice to Lessees 2010–N10
 - Development of containment resources by industry
 - Development of well containment screening tool



BOEMRE Well Containment Screening Tool Example Well Wellbore Schematic

18.34" HP housing @ 517' RKB (12' AML)
36" LP housing @ 517' RKB (9' AML)
Mudline @ 517' RKB (est)

| Top | (angle) | Bottom | Burst | CASING | Collaps | PP | MUD | FG | CEMENT |
|-----------------------|-----------|-----------------------|--|--|--|--------|---|------|------------------------------------|
| 517' TVD 517' MD | | 547' TVD 547' MD | Casing Stack Rating = 15,000 psi Annular (betw LMRP) = 10,000 psi BCP = 10,000 psi | | | | Seawater-Gel | | Jet |
| 517' TVD 517' MD | 0 degrees | 788' TVD 788' MD | Jetted | 30" 1.50" WT X80 552.69# | | | Seawater-Gel 8.8-13 spg mudline returns | | TOC - Mudline 100% excess |
| 517' TVD 517' MD | 0 degrees | 733' TVD 733' MD | 20" hole | TOL 16" 733' MD | | | | | |
| 517' TVD 517' MD | 0 degrees | 1440' TVD 1440' MD | 22" 1.25" WT X80 273.27# 7950 psi | 22" 1.25" WT X80 273.27# 7950 psi | 6670 psi | 8.6 | 8.6 | 12.5 | |
| 733' TVD 733' MD | 0 degrees | 1440' TVD 1440' MD | 18.5" x 20" hole | | | | Synthetic | | TOC - 13417' MD HD - 13609' TVD |
| 733' TVD 733' MD | 0 degrees | 1743' TVD 1743' MD | 16" 0.71" WT HC N-80 11# 5205 psi | 16" 0.71" WT HC N-80 11# 5205 psi | 5750 psi | 11.2 | 11.6 | 13.7 | |
| 517' TVD 517' MD | 0 degrees | 1743' TVD 1743' MD | 14.25" x 17" hole 13.50" 0.50" WT Q125 89.20# cross over at 11500' TVD 13.38" 0.514" WT Q125 72.20# | 14.25" x 17" hole 13.50" 0.50" WT Q125 89.20# cross over at 11500' TVD 13.38" 0.514" WT Q125 72.20# | 10330 psi 13.50" 4500 psi 8410 psi | 13.38" | 12.4 | 12.7 | 14.65 |
| 1743' TVD 1743' MD | 0 degrees | 2370' TVD 2370' MD | Weak Zone @ 2069' TVD/MD | Reservoir 1 - 2324' TVD Pore Pressure = 11.1 ppg Flowing = 0.230 pph Static = 0.371 pph | | | Synthetic | | |
| 1743' TVD 1743' MD | 0 degrees | 2370' TVD 2370' MD | | | | | | | |



Forward Progress

– following up on recommendations

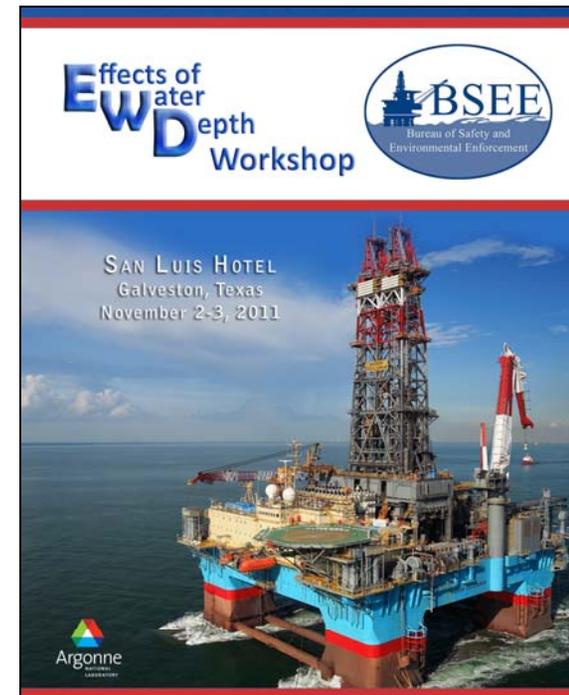
- ▶ Sept 1, 2010: OCS Safety Oversight Board Report

VII. Environmental Stewardship

A. Regulatory Framework

Recommendation 2.

Consulting with technical experts, conduct further analysis of the effects of water depth on equipment and operations, and determine the adequacy of current regulations.



Purpose of Workshop

- ▶ Provide for consultation among offshore deepwater oil and gas industry and regulatory experts to:
 - Identify the effects of water depth and related issues on equipment and operations; and
 - Identify approaches to address the water depth issue through regulations, standards, and practices designed to safeguard personnel, operations and the environment.



Topic #1: Surface BOP Equipment and Operations

▶ What we know...

- Have been used successfully for many years
- On floating facilities you are exposed if your riser were to part or leak
- Subsea isolation devices are available



Topic #1: Surface BOP Equipment and Operations

- ▶ What we should consider...
 - Accumulator volumes vs. required shearing pressure, are they sufficient as presently sized?
 - When drilling from a floating facility, should we always have a subsea Isolation Device installed on the seafloor?



Topic #2: Well Control – Subsea

▶ What we know...

- Subsea BOPs have been used successfully for many years
- It requires different procedures than surface well control
- Once a hydrocarbon influx gets above the BOP, the situation degrades quickly



Topic #2: Well Control – Subsea

- ▶ What we should consider...
 - Enhanced subsea well control training
 - Review procedures for hydrocarbon influxes which get above a subsea BOP
 - Pipe centralization prior to closing blind/shear rams
 - Research the effects of closing a subsea BOP while a well is flowing hydrocarbons across the BOP



Topic #3: Well Drilling & Completion Design and Barriers

▶ What we know...

- Industry has safely drilled and completed hundreds of wells in the GOM
- Industry has used cement and mechanical barriers in the wells
- Industry has performs numerous negative pressure test
- Industry conducts formation integrity test (FIT) at casing shoes



Topic #3: Well Drilling & Completion Design and Barriers

- ▶ What we should consider...
 - Are there any other barriers that could be used in a well?
 - Standardization of negative pressure test
 - Should we re-look at equivalent circulating densities vs. formation integrity test?
 - FIT being performed every time industry encounters a loss circulation zone



Topic #4: Pre-incident Planning, Preparedness, and Response

- ▶ What we know...
 - Industry now has containment strategies
 - Industry plans for the drilling of relief wells
 - Industry plans for a response to situations



Topic #4: Pre-Incident Planning, Preparedness, and Response

- ▶ What we should consider...
 - Do you have the capacity and competency to respond?
 - Do you have a rig under contract or some other agreement for a relief well before you spud your well?
 - Do your employees have Incident Command Training?
 - Consider large scale deployment drills



Topic #5: Post-incident Containment and Well Control

▶ What we know...

- Large amount of resources are required
- We now have more containment equipment and procedures than we did before Macondo
- Use of subsea dispersants is needed to be able to bring vessels over the site
- We now know we can lots of equipment in a small space with proper SIM OPS and work effectively



Topic #5: Post-incident Containment and Well Control

- ▶ What we should consider...
 - Decision making process with respect to containment
 - Who makes the ultimate call on what is done next
 - Standardization of nodule analysis of containment systems
 - Coordination, coordination, coordination



Topic #6: Need/Process for Risk Assessment of Critical Operations and Activities

- ▶ What we know...
 - Everyone performs risk assessments
 - Risk assessments are performed for critical operations



Topic #6: Need/Process for Risk Assessment of Critical Operations and Activities

- ▶ What we should consider...
 - Do we perform risk assessments correctly?
 - Do we perform them for the correct critical operations?
 - Should we design cap only wells?



Our Challenge as Technology Advances...



Looking forward to a successful workshop – Thank you

Michael Saucier
Bureau of Safety and Environmental Enforcement
Gulf of Mexico OCS Region