**DECISION MEMORANDUM FOR THE SECRETARY**

October 1, 2010

**TO:** Secretary

**FROM:** Michael R. Bromwich
Director, Bureau of Ocean Energy Management, Regulation and Enforcement

**cc:** David J. Hayes
Thomas Strickland
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**SUBJECT:** Report regarding the current suspension of certain offshore permitting and drilling activities on the Outer Continental Shelf

## I. INTRODUCTION AND BACKGROUND

In the July 12 Decision Memorandum imposing a second suspension of certain deepwater drilling activities on the Outer Continental Shelf (OCS), the Secretary requested that BOEMRE, by no later than October 31, 2010, report its findings and recommendations regarding whether modification to the scope or duration of the deepwater drilling suspension would be appropriate. This Report summarizes the results of BOEMRE's fact collection and analysis and our recommendations based on the information gathered and developments since the July 12 suspension decision.

### A. Suspensions of Deepwater Drilling Activity

On April 20, 2010, the *Deepwater Horizon*, an offshore rig drilling an exploratory well located 52 miles from shore in the Gulf of Mexico in nearly 5,000 feet of water, lost control of the Macondo well. This loss of well control resulted in the release of hydrocarbons through the wellbore that led to explosions on the rig, which killed 11 workers, injured 17 others, caused the *Deepwater Horizon* to sink, and resulted in a major oil spill with significant effects on the marine and coastal environments.

In light of the *Deepwater Horizon* event, the President directed the Secretary to report, within 30 days, on "what, if any, additional precautions and technologies should be required to improve the safety of oil and gas exploration and production operations on the outer continental shelf." In response to this directive, on May 27, 2010, the Department of the Interior produced a report entitled "Increased Safety Measures for Energy Development on the Outer Continental Shelf" (the "Safety Report").

Following the issuance of the Safety Report, on May 28, 2010, the Secretary directed the Minerals Management Service, now the Bureau of Ocean Energy Management, Regulation and Enforcement ("BOEMRE" or "Bureau"), to exercise its authority under the Outer Continental Shelf Lands Act ("OCSLA") to suspend certain drilling activities in water depths of 500 feet or greater for a period of six months. The May 28 suspension was intended, among other things, to minimize the possibility of another catastrophic event; to ensure that operators similarly situated to *Deepwater Horizon* operate in a safe manner once drilling resumes; to take into account the expected timeline for killing the Macondo well; and to provide adequate time to obtain input from on-going investigations of the disaster and to develop regulations addressing the safety-related issues described in the Safety Report. After imposition of the May 28 suspension, the Secretary and BOEMRE continued to closely monitor, evaluate, and respond to the continuing flow of information concerning the evolving situation related to BP Oil Spill.

On June 22, a federal District Court in Louisiana ruled that claims filed by certain providers of support services to offshore oil and gas operations, alleging that the May 28 suspension was arbitrary and capricious, were likely to succeed on the merits. The Court preliminarily enjoined enforcement of the May 28 suspension, and the Department complied with the injunction. The government also appealed the Court's decision to the United States Court of Appeals for the Fifth Circuit.

Immediately following the injunction of the May 28 suspension, the Secretary directed BOEMRE to review data and information concerning the safety of drilling on the OCS, the status of efforts to contain the Macondo well, and the status of the response to the BP Oil Spill. Based on this analysis, Director Bromwich prepared an Options Memorandum, dated July 10, to the Secretary that addressed in detail the facts and risks associated with each of these areas, as they existed at that point in time.[1] The Options Memorandum also presented various alternatives available to the Secretary with respect to the potential suspension of deepwater drilling in light of the Secretary's responsibility under OCSLA to manage resource development on the OCS in a safe and environmentally sound manner and to assure the American public that OCS deepwater drilling will be conducted in a manner – and under conditions – that are safe for workers, coastal communities, and the environment. *See* 43 U.S.C. §§ 1332(6) and 1348(a); 30 C.F.R. 250.106.

On July 12, the Secretary of the Interior issued a decision memorandum imposing a second suspension of certain drilling operations in deepwater, which currently remains in effect. Unlike the May 28 suspension decision, the July 12 suspension decision defines the drilling operations subject to the suspension based on the equipment configuration used in conducting the operation. Specifically, the July 12 suspension

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[1] Decision Memorandum for the Secretary from Michael R. Bromwich, regarding "Options regarding the suspension of certain offshore permitting and drilling activities on the Outer Continental Shelf" (July 10, 2010) (the "Options Memorandum").

applies, with certain exceptions, to the drilling of wells using subsea blowout preventers (BOPs) or surface BOPs on a floating facility.[2]

As detailed in the Secretary's July 12 Decision Memorandum, three primary grounds supported a temporary pause in certain deepwater drilling operations. First, the suspension allowed time for the implementation of appropriate workplace and drilling safety measures. Second, the suspension was intended to provide BOEMRE, industry, and others time to develop strategies and methods for the containment of wild wells in deepwater. Finally, the suspension in drilling was necessary to ensure that appropriate and sufficient response resources are available in the event of another major oil spill.

The current suspension of certain deepwater drilling activities is effective until November 30, 2010. However, the July 12 Decision Memorandum makes clear that the suspension could be lifted earlier than November 30 if "the safety, containment and response issues that have created the need for a suspension have been resolved, or if those three issues are addressed to a degree that can be determined upon further study to ensure an acceptable margin of safety." The Secretary directed BOEMRE to continue collecting and analyzing information – including information obtained through public forums and outreach involving members of industry, academia, non-governmental organizations, elected officials, and the general public – regarding each of the three critical issues underlying the temporary suspension of deepwater drilling.

### B. Review Since the July 12 Suspension Order

In response to the Secretary's directive, BOEMRE has conducted extensive information collection, review, and analysis relating to the three key issues supporting the temporary suspension of deepwater drilling – drilling and workplace safety, well containment, and spill response. Between August 4 and September 13, 2010, Director Bromwich led public forums in eight cities across the country – New Orleans, Mobile, Pensacola, Santa Barbara, Anchorage, Houston, Biloxi, and Lafayette. A total of 61 representatives from the academic community, the oil and gas industries, conservation groups, and local businesses provided thoughtful and valuable information about drilling safety, well containment, and oil spill response, as well as other issues related to offshore drilling. Director Bromwich also heard from 37 elected officials regarding these issues as well as the economic effects of the oil spill and the deepwater drilling suspension on their constituents.[3] BOEMRE received and reviewed 138 comment cards submitted by

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[2] Similar to the May 28 suspension, the July 12 suspension does not apply to deepwater production activities; drilling operations that are necessary to conduct emergency activities, such as the relief well drilling operations related to the Macondo well; drilling operations necessary for completions or workovers (where surface BOP stacks are installed, they must be utilized during these operations); abandonment or intervention operations; or waterflood, gas injection, or disposal wells. BOEMRE ordered that any current drilling operations covered by the suspension proceed to the next safe opportunity to secure the well and take all necessary steps to cease operations and temporarily abandon or close the well.

[3] A list of all of the participants in the eight public forums is attached at Appendix 1.

members of the public at the forums and 456 comments submitted to BOEMRE through an internet facility established for the purpose of obtaining public comment.

In addition to the eight public meetings described above, BOEMRE has collected information relevant to the potential modification of the scope or duration of the deepwater drilling suspension from the following sources:

- A September 22 summit, sponsored by the Department of the Interior and the Department of Energy, in which senior government scientists and officials and representatives from industry and stakeholder groups discussed critical issues related to blowout containment and lessons based on the experience with the Macondo well containment effort.

- Briefings from and meetings with approximately 17 groups, including the Joint Industry Task Forces established by the oil and gas industry, BP, the major oil companies that initiated the Marine Well Containment System development project, a number of environmental groups, and members of the academic and research communities.[4]

- Extensive written materials, including a report prepared by BP in response to a request from Director Bromwich, entitled "Deepwater Horizon Containment and Response: Harnessing Capabilities and Lessons Learned;" an interim report of the Subsea Well Control and Containment Joint Industry Task Force; an interim report of the Oil Spill Response Joint Industry Task Force; BP's Accident Investigation Report regarding the causes of the Macondo blowout and *Deepwater Horizon* event; the Council of Economic Advisors' Report, "Estimating the Economic Effects of the Drilling Moratorium on the Gulf Coast Economy;" and the Bipartisan Policy Center's report regarding the drilling suspension.

- Materials related to Congressional hearings held since the July 12 suspension decision.

- Daily situation reports on the Macondo well containment and response efforts, including reports from the Unified Command and the Department of the Interior Watch Office, and BOEMRE Spot Reports and Offshore Incident Reports.

## II. DISCUSSION

OCSLA authorizes the Secretary to prescribe regulations for the "suspension or temporary prohibition of any operation or activity, including production, pursuant to any lease or permit . . . if there is a threat of serious, irreparable, or immediate harm or damage to life (including fish and other aquatic life), to property, to any mineral deposits

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[4] A list of participants in these stakeholder meetings is attached at Appendix 2.

. . . or to the marine, coastal, or human environment . . .." 43 U.S.C. § 1334(a)(1). BOEMRE regulations provide that the Bureau may order suspensions of operations when activities "pose a threat of serious, irreparable, or immediate harm or damage" to human or animal life, property, any mineral deposit or the marine, coastal, or human environment as described in Section 1334(a)(1) above or "[w]hen necessary for the installation of safety or environmental protection equipment." 30 C.F.R. §§ 250.172(b)-(c).

The Macondo well blowout and its aftermath have provided new information about drilling on the OCS – in particular about (1) systemic safety issues that need to be addressed, (2) deficiencies of blowout containment technology and strategies, and (3) the shortcomings of oil spill response strategies and resources relative to spills in deepwater. BOEMRE has examined and analyzed the developing data and information in order to provide the Secretary with the best and most complete information on which to make judgments about whether continuation of the drilling suspension is appropriate to reduce threats to life and the environment and about necessary improvements in safety and environmental protection equipment.

### A. The Status of Drilling and Workplace Safety on the OCS

In the July 12 Decision Memorandum, the Secretary stated, "[w]ith regard to the first basis for my decision – the need to ensure that adequate safety measures are in place to address the risks of deepwater drilling – it is imperative that we have additional information about the causes of the BP Oil Spill and implement safety measures to address the risks associated with those causes."[5]

As discussed below, although several investigations into the causes of the Macondo blowout and *Deepwater Horizon* explosion are ongoing and have not yet issued their findings, substantially more information is now available regarding the potential causes of the accident and safety measures necessary to address the risks underlying those causes than was previously the case. Moreover, BOEMRE now has announced a new Safety Interim Final Rule and, for the first time, a Workplace Safety Rule requiring operators to develop safety and environmental management systems (SEMS). These rules address many of the most significant drilling and workplace safety concerns following from the Macondo and *Deepwater Horizon* events and substantially close the gaps in safety regulation identified in the Safety Report. Finally, BOEMRE has made progress in reconfiguring its inspections and drilling monitoring regime to support more vigorous regulatory oversight and safe offshore drilling.

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[5] Decision Memorandum from the Secretary to Michael R. Bromwich, entitled "Decision memorandum regarding the suspension of certain offshore permitting and drilling activities on the Outer Continental Shelf" (July 12, 2010) (the "July 12 Decision Memorandum") at 3.

## 1. The Safety Risks Associated with Deepwater Drilling

As discussed in the July 12 Decision Memorandum, all offshore drilling for oil and natural gas involves a broad range of risks, including risks related to equipment or systems failure, human error, and other occurrences that could threaten the safety of workers and endanger the environment. The risks associated with drilling conditions in deepwater are even greater.[6] The heightened risks posed by deepwater drilling relate to the following factors:

- The type of equipment that must be used in deepwater. Specifically, in deepwater, drilling is conducted from floating facilities – rather than rigs resting on the seafloor – that use either subsea BOPs or surface BOPs on the floating facility.

- Deepwater wells can be extremely productive and have flow rates 5 to 10 times greater than shallow water wells. These characteristics were fully demonstrated by the Macondo well. Accordingly, operators' worst-case discharge estimates typically anticipate larger potential releases from deepwater wells.

- Over-pressure formations – *i.e.*, formations with pressures that exceed normal pressures at a given depth – present special challenges in the deepwater drilling environment. Addressing over-pressure formations in deepwater drilling operations is more complex than in shallow water operations. For example, in general, deepwater wells have more casing/liner strings, leaving less annular space between the casing and the hole diameter. This makes cementing the hole more difficult.

- As demonstrated by the Macondo blowout, water depth, pressure, and temperature are major factors affecting the ability of well control crews to bring deepwater blowouts under control. Complications associated with responding to a deepwater blowout include inaccessibility of the well, methane hydrate formation at lower seafloor temperatures, longer times needed to move remotely operated vehicles (ROVs) and equipment from the surface to the workzone, and the need to work with larger support equipment due to the greater water pressure.[7]

Some drilling activities pose a higher likelihood of encountering a blowout than others. As a general matter, the risks associated with types of drilling are determined by the drilling operators' familiarity with wellbore parameters, including pore pressures, fracture gradients, lost circulation, and abnormal pressure zones. Because exploration

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[6] *See, e.g.*, Presentation of Dr. John Rogers Smith of Louisiana State University, regarding "Perspectives on Deepwater Drilling Safety and Blowout/Spill Containment" (September 13, 2010) at 6.

[7] *See* Interagency Memorandum from Dr. Marcia McNutt to Michael R. Bromwich, regarding "USGS Support for Macondo Well Control and Containment; Observations Regarding Technical Problems with Deepwater Efforts" (June 27, 2010).

wells involve drilling to find new productive formations (or to confirm a previous discovery) under circumstances where there is limited knowledge of these wellbore parameters, these are the highest risk wells.[8] Therefore, casing and cementing programs must be designed to reach certain target zones while crews collect relevant wellbore and formation data. The Macondo well fell within this category. Other types of drilling operations, including the drilling of development wells, involve less risk because they are typically drilled into known reservoirs and the relevant geological information is available to the operator.[9]

Several reviews and investigations seeking to identify the root causes of the *Deepwater Horizon* accident are ongoing and have not yet issued findings, including the joint BOEMRE / United States Coast Guard (USCG) joint investigation, the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling review, a review by the National Academy of Engineering (NAE), and on-going Congressional inquiries. Substantial investigative work remains to be done and, therefore, significant factual information and insights relating to the Macondo blowout and *Deepwater Horizon* explosion will be available in the future.

Nevertheless, our knowledge base with respect to the potential causes of the *Deepwater Horizon* accident – as well as the safety measures necessary to address those causes – has significantly improved in recent months. BP has completed its internal investigation and issued its *Deepwater Horizon* Accident Investigation Report on September 8, 2010 (the "BP Report").[10] Based on the information that BOEMRE has collected since the *Deepwater Horizon* event, many safety-related observations and lessons can be learned based on the accident, including but not limited to the following[11]:

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[8] *See* Presentation of Bob Bemis of Noble Energy regarding "Deepwater Drilling Risk Mitigation and Safety," delivered at the BOEMRE Forum on Offshore Drilling in Pensacola, Florida (August 11, 2010) ("Bemis Presentation") at 7.

[9] Options Memorandum at 9-11.

[10] BP provided the Department of the Interior and BOEMRE with briefings regarding the BP Report soon after its release. Although the BP Report and those briefings provide significant useful information about the potential causes of the Macondo blowout and the *Deepwater Horizon* explosion, we do not endorse BP's findings and continue to look forward to the findings and conclusions of the several other investigations and reviews developing information about these events.

[11] During BOEMRE's fact collection campaign following the July 12 Decision memorandum, BOEMRE collected a great deal of information and ideas regarding approaches to improving the safety of offshore drilling, including suggestions regarding the balance between prescriptive and performance-based regulation, risk trend analysis, technological improvements in information systems and software specific technical issues relating to well design and construction. Although a full discussion of all of the information and suggestions that BOEMRE received through its fact-gathering and outreach efforts cannot be included in this report, we are considering all of this information in connection with the broad re-evaluation of our regulatory structure and inspections regime.

- Cementing. There were significant weaknesses in the cementing design and process applied to the Macondo well.[12]

- Testing of well integrity. The negative-pressure test procedure conducted on the Macondo well failed to establish well integrity, and BOEMRE regulations should prescribe negative-pressure testing to ensure proper casing installation, including requiring that casing strings be "locked down" prior to the negative-pressure test.[13]

- Use of drilling fluids. BOEMRE regulations should prescribe procedures for handling the displacement of kill-weight drilling fluids (mud).[14]

- BOPs. The Macondo well BOP failed to seal, and application of the enhanced testing requirements to the relief well BOPs revealed significant issues with the deadman mechanism of one of the relief well BOPs.[15]

- Workplace safety and management systems. Standardized and comprehensive workplace safety and management programs – known as safety and environmental management systems (SEMS) – for identifying, addressing and managing operational safety hazards and impacts, with the goal of promoting both human safety and environmental protection should be mandatory.[16]

- Inspections and monitoring. There is a need for rigorous rig inspections. The higher-risk phases of drilling operations should be closely monitored through

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[12] Memorandum from David Dykes to Tommy Beaudreau, entitled "Recommended Additional Safety Measures" (September 29, 2010) ("Dykes Memorandum") at 1; BP Report entitled "*Deepwater Horizon*: Accident Investigation Report" (September 8, 2010) (the "BP Report") at 33; Presentation of Darryl A. Bourgoyne of Louisiana State University, delivered at the BOEMRE Public Forum on Offshore Drilling in Pensacola, Florida (August 11, 2010) ("Bourgoyne Presentation") at 5.

[13] Dykes Memorandum at 1; BP Report at 38-41; Bourgoyne Presentation at 5.

[14] Dykes Memorandum at 2.

[15] E-mail from David Trocquet regarding "Relief Well BOP Testing Summary" (July 1, 2010). *See also* Presentation of Frank Gallander, Chevron Corp., regarding "Update to BOEM on JIP Study on Reliability of Subsea Blowout Preventers," delivered at the BOEMRE Forum on Offshore Drilling in Lafayette, Louisiana (September 13, 2010) at 7.

[16] Presentation of J. Ford Brett, President of Petro Skills, delivered at the BOEMRE Forum on Offshore Drilling in Pensacola, Florida (August 11, 2010) at 14; Presentation of Yarko "J.J." Sos of Check-6, Inc., entitled "Safety Management Systems in the Oil Field," delivered at the BOEMRE Forum on Offshore Drilling in Santa Barbara, California (August 24, 2010); Presentation of Rob Hurley of Hurley Environmental, Safety, Management Company, entitled "Personnel Safety Issues," delivered at the BOEMRE Forum on Offshore Drilling in Santa Barbara, California (August 24, 2010) at 8.

real-time review of electronic drilling data and on-site observation of operations.[17]

For the reasons discussed in detail below, substantial progress has been made since the Macondo well blowout that addresses the threats to life and the environment posed by each of these root causes of the *Deepwater Horizon* event and fundamental safety issues. A table summarizing each of the specific new safety measures that have been developed to address these issues, as well as measures addressing the threats posed in the areas of blowout containment and spill response, is included at Appendix 3.

### 2. New Safety Measures That Were Not In Place at the Time of the *Deepwater Horizon* Event

The Safety Report, prepared in the immediate aftermath of the *Deepwater Horizon* event, "recommends a number of specific measures designed to ensure sufficient redundancy in the blowout preventers (BOP), to promote the integrity of the well and enhance well-control, and to facilitate a culture of safety through operational and personnel management."[18] Building upon the Safety Report, BOEMRE has prepared three sets of major safety-related standards: (1) Notice to Lessees No. 2010-05: Increased Safety Measures for Energy Development on the OCS (the Safety NTL), which was issued on June 8, 2010; (2) the Safety Interim Final Rule, which has been completed and will be published in the next several days; and (3) the Workplace Safety Rule, which requires operators to develop SEMS programs, which has been completed and is scheduled to be published in the next several days, with additional enhancements to be added in a supplemental rulemaking. With certain exceptions discussed below, these measures implement the enhanced safety standards recommended by the Safety Report. These new safety standards also address the central safety concerns raised by the *Deepwater Horizon* event, including new requirements relating to wellbore integrity, secondary safety features and well control equipment.

#### a. The Safety NTL

Under existing regulations, BOEMRE may issue "Notices to Lessees and Operators" that "clarify, supplement, or provide more detail about certain requirements." 30 C.F.R. § 250.103. On June 8, 2010, BOEMRE issued the Safety NTL, which provides direction to operators and lessees about certain safety measures outlined in the Safety Report relating to well casing design, cementing programs and procedures, and BOP control systems and testing. These safety measures apply to all activities on the OCS and in general cover operations in both deep and shallow waters. As discussed below, these

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[17] Bemis Presentation at 8; Presentation of Mark Steinhilber of the California State Lands Commission, regarding "DOI BOEM Forum," delivered at the BOEMRE Public Forum on Offshore Drilling in Santa Barbara, California (August 24, 2010) at 20; Report of the Bipartisan Policy Center to the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling (August 24, 2010) at 10.

[18] Safety Report, Executive Summary at 1.

provisions have been further codified by the Safety Interim Final Rule. The Safety NTL also includes two provisions with which operators must comply, but which have not been incorporated into the Safety Interim Final Rule: (1) certifications by operator Chief Executive Officers of compliance with all BOEMRE drilling and safety regulations, and (2) certification of compliance with the BOEMRE-related provisions of the joint BOEMRE/USCG safety alert issued on April 30, 2010 following the *Deepwater Horizon* event.

### b. The Safety Interim Final Rule

The Safety Interim Final Rule is an emergency rulemaking under the Administrative Procedures Act, the requirements of which will be effective immediately upon the rule's publication. The Safety Interim Final Rule imposes standards and requirements that are critical to the safety of offshore oil and gas operations on the OCS. Broadly speaking, the requirements of the Safety Interim Final Rule fall into two categories: (1) wellbore integrity, including cementing and casing programs, negative-pressure testing, and the proper displacement of drilling fluids; and (2) well control equipment, including BOP components and testing of the capabilities of such equipment.

- Wellbore integrity provides the first line of defense against a blowout by preventing a loss of well control. Well bore integrity includes appropriate use of drilling fluids and the casing and cementing program. These are used to balance pressure in the borehole against the fluid pressure of the formation, preventing an uncontrolled influx of fluid into the wellbore. The specific provisions in this rule that address wellbore integrity are:

    - Incorporating standards relating to the isolation of potential flow zones during well construction;

    - Certification by a professional engineer that the casing and cementing program is appropriate for the purposes for which it is intended under expected wellbore pressures;

    - Ensuring proper installation of the casing or liner in the subsea wellhead or liner hanger, including ensuring that latching mechanisms or lock-down mechanisms are engaged upon installation of each casing string liner;

    - Testing requirements to ensure proper casing installation: (1) pressure testing on casing seal assemblies to ensure proper casing installation, and (2) negative-pressure testing;

    - Review and approval by BOEMRE District Managers prior to the displacement of kill-weight drilling fluid; and

    - Deepwater well control training for rig personnel.

- Well control equipment is used to bring a well back under control in the event of a loss of well control. Well control equipment includes the BOP and control systems that activate the BOP, either through a control panel on the drilling rig or through ROVs that directly interface with the BOP to activate appropriate rams. The provisions in the Safety Interim Final Rule that address well control equipment include:

    - Submission of documentation and schematics for all control systems;

    - Requirements for independent third-party verification that BOP blind-shear rams are capable of cutting any drill pipe in the hole under maximum anticipated surface pressure;

    - Requirement for a subsea BOP stack equipped with ROV intervention capability, including minimum requirements that the ROV be capable of closing one set of pipe rams, closing one set of blind-shear rams, and unlatching the LMRP;

    - Requirement for maintaining an ROV on each floating drilling rig on a continuous basis and having a trained ROV crew on each floating drilling rig;

    - Requirement for autoshear and deadman systems for dynamically positioned rigs;

    - Minimum requirements for personnel authorized to operate critical BOP equipment;

    - Requirements for documentation of subsea BOP inspections and maintenance;

    - Requirements for the testing of all ROV intervention functions on the subsea BOP stack during the stump test and testing at least one set of rams during the initial test on the seafloor;

    - Function-testing autoshear and deadman systems on the subsea BOP stack during the stump test and testing the deadman system during the initial test on the seafloor; and

    - Pressure testing of any shear rams used in an emergency.

In connection with anticipated future rulemaking related to drilling safety standards, BOEMRE is considering two additional measures recommended by the Safety Report: (1) requirements relating to the installation of redundant blind-shear rams on BOP stacks, and (2) adoption of a new "safety case" performance-based model for floating drilling operations. The decision not to include these requirements in the Safety

Interim Final Rule was based on a number of considerations. First, compliance with a redundant blind-shear ram requirement would necessitate the onshore retrofitting of most BOPs currently in service, which may take industry up to two years to complete.[19] Therefore, BOEMRE is evaluating the appropriate means by which to phase in these BOP enhancements and the incremental increase in safety that they may offer. BOEMRE also is exploring further rulemaking relating to additional instrumentation and sensors on BOPs and enhancements to the activation features of BOPs, such as remote actuation systems. Second, as discussed further below, the Workplace Safety Rule that will be issued in final form in the next few days will require companies to develop and document the type of SEMS programs that are essential components of the safety case model. BOEMRE's experience with the implementation of the SEMS rule will help inform its thinking on what additional aspects of the safety case model to adopt. BOEMRE will evaluate enhancements to BOP functionality, the safety case model, and other information – including the findings of the ongoing investigations of the *Deepwater Horizon* event – in connection with consideration of future rulemakings.

### c. The Workplace Safety Rule

The Workplace Safety Rule requires operators to develop and implement a comprehensive management program for identifying, addressing and managing operational safety hazards and impacts, with the goal of promoting both human safety and environmental protection. The Workplace Safety Rule will cover all offshore oil and gas operations within BOEMRE's jurisdiction and will apply to the design, construction, start-up, operation, inspection, maintenance and decommissioning of offshore rigs and platforms. The Workplace Safety Rule contains the following 13 elements:

- General provisions regarding the implementation, planning, and management review and approval of the SEMS program;

- Safety and environmental information requirements establishing the minimum safety and environmental information needed for any facility relating to design data; facility processes and flow diagrams; and mechanical components, such as piping and instrument diagrams;

- Hazards analysis that includes a facility-level risk assessment;

- Management of change program for addressing any facility or operational changes, including management changes, shift changes, and contractor changes;

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[19] BOPs are complex pieces of safety equipment. Modifications to BOP configurations, including the addition of new redundancies, must be carefully evaluated to ensure that there is not an incremental decline in the overall safety functionality of the BOP and ability of crews to operate the system. *See* Presentation of Chris Nelson of Newfield Exploration, delivered at the BOEMRE Forum on Offshore Drilling in Pensacola, Florida (August 11, 2010) at 10.

- Operating procedures, including requirements for the evaluation of operations and development of written procedures;

- Safe work practices, including the development of appropriate manuals, standards, and rules of conduct;

- Training relating to safe work practices and technical issues, including the training of contractors;

- Mechanical integrity, including requirements relating to preventive maintenance programs and quality control;

- Pre-startup review of all systems;

- Emergency response and control systems that must be implemented and validated by drills, including emergency evacuation plans, and oil spill contingency plans;

- Procedures for investigating incidents and taking appropriate corrective action;

- Regular audits that must be conducted initially within two years, and then at three-year intervals; and

- Maintenance of records and documentation that describe all elements of the SEMS program.

Operators are required to develop a SEMS program that complies with the Workplace Safety Rule within one year of the rule's publication. We anticipate additional rulemaking supplementing the Workplace Rule to require, among other things, that an independent third party conduct an audit of the operator's SEMS program within two years of the rule's publication.

### d. BOEMRE's Inspection and Monitoring Program

Under OCSLA and its implementing regulations, BOEMRE is authorized to conduct inspections to verify that operations are being conducted in accordance with all applicable laws and regulations and use authorizations, including leases. 43 U.S.C. § 1348(c); 30 C.F.R. § 250.130. Central to the reforms underway at BOEMRE are improvements in the Bureau's inspection and monitoring program. BOEMRE currently is engaged in a reorganization that will address, among other things, the structure of the inspection and monitoring program, as well as the guidance and training provided to inspectors. Over the coming year and more, BOEMRE anticipates adding scores of inspectors and engineers to enhance its oversight of offshore drilling operations.

In the near term, BOEMRE currently is developing plans and schedules for conducting safety inspections of all deepwater drilling facilities upon the expiration or lifting of the suspension of deepwater drilling. These inspections are anticipated to

include reviews of compliance certification and packages required under the Safety NTL and the Interim Final Rule; baseline reviews of all deepwater drilling facilities for compliance with BOEMRE's prescriptive regulations, including as appropriate, the new requirements of the Safety Interim Final Rule; and schedules and procedures for monitoring by qualified BOEMRE personnel of critical phases in deepwater drilling operations, such as casing and cementing processes.

### B. The Status of Well Containment Capabilities

In the July 12 Decision Memorandum, the Secretary determined that a temporary pause in deepwater drilling was necessary, in part, to "give industry time to take concerted action toward the development of more effective blowout containment strategies and capabilities for deepwater operations."[20] It is clear that, due to the experience of gaining control over the Macondo well and a new commitment by industry focused on developing new equipment and systems for well containment, industry and government are better equipped and prepared today to contain an oil well blowout in deepwater than they were at the time of the *Deepwater Horizon* event or the July 12 suspension decision. These key developments with respect to well containment include:

- Containment and subsequent killing of the Macondo well after the successful installation of an LMRP capping stack, followed by the intersection by relief well operations and cementing of the wellbore.

- Substantial technological innovation and development with respect to deepwater well containment equipment in response to the Macondo well blowout, which remains available in the event of another deepwater well control incident.

- Major advances in industry's and the government's knowledge base with respect to the challenges associated with deepwater well containment and the techniques and strategies that were successful, and that failed, in gaining control of the Macondo well.

- A substantial commitment by industry, in cooperation with the government, to invest in the development of new, effective and versatile well control equipment and deepwater well containment response infrastructure.

#### 1. The Condition of Deepwater Well Containment Capability Prior to the Macondo Blowout

The Macondo well blowout, which led to the uncontrolled release of oil into the Gulf of Mexico over a period of nearly 90 days, revealed the inadequacy of available equipment and techniques to contain a subsea blowout. At the time of the Macondo blowout, there existed no purpose-built subsea containment equipment that was available

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20 July 12 Decision Memorandum at 4.

for deployment – the development of the equipment and measures necessary to respond to the blowout had to be improvised over a period of nearly three months while the well remained uncontrolled. Moreover, none of the containment strategies brought to bear in response to the Macondo blowout had ever been attempted in similar water depths and conditions. In Congressional hearings following the *Deepwater Horizon* accident, executives from major oil companies admitted that that industry was not well equipped to stop an uncontrolled deepwater blowout.[21]

As a result of the lack of necessary equipment and preparation for a deepwater blowout, there were numerous improvised and failed attempts to stop the flow of oil from the Macondo well. Below is a brief summary of the evolving attempts to gain control of the Macondo well.

- Immediately after the blowout, ROVs made multiple unsuccessful attempts to seal off the well by closing the BOP's rams via "hot stabbing."

- In early May, a 100-ton containment dome was lowered over the leaking riser. However, the unanticipated formation of hydrates, among other factors, made the dome ineffective.

- On May 16, a "Riser Insertion Tube Tool" (RITT) was installed at the end of the riser, which provided limited containment of around 6,000 barrels of oil per day.[22] In the meantime, a "kink" in the riser near the wellhead emerged as a significant additional source of oil flow.

- A multiple-week construction effort was undertaken to prepare a long-distance hook-up for a "top kill" operation using heavy drilling mud. By May 26, the top kill operation had failed.

- After the top kill effort was unsuccessful, the focus shifted back to containment, with efforts made to execute a "clean" cut of the riser near the top of the BOP stack and install a fitted cap over the riser. That effort was not successful. In early June, a "top hat" was installed on top of the Lower Marine Riser Package (LMRP), allowing for the collection of hydrocarbons to Discoverer Enterprise to begin at a rate of 17,000 barrels of oil per day.

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21 *See, e.g.*, Testimony of Rex Tillerson, Hearing on "Drilling Down on America's Energy Future: Safety, Security and Clean Energy," Subcommittee on Energy and Environment (June 15, 2010). *See also* Written Testimony of Lamar McKay, Chairman and President of BP America, Hearing on "Economic and Environmental Impacts of the Recent Oil Spill in the Gulf of Mexico," Senate Environment and Public Works Committee, (May 11, 2010).

22 Report by BP, "Deepwater Horizon Containment and Response: Harnessing Capabilities and Lessons Learned (September 1, 2010) ("BP Lessons Learned Report") at 10.

- On July 15, 2010, the flow of oil from the Macondo Well was stopped, after a LMRP capping stack was installed and tested successfully.

- In early August, a "static kill" procedure, which involved pumping mud and cement through the top of the well, was successfully completed. The damaged BOP was removed and replaced on September 3.

- The well was ultimately "killed" on September 19, after the relief well successfully intersected and cemented the Macondo well nearly 18,000 feet below the surface.

The Macondo well control efforts were greatly complicated by a number of unexpected difficulties, some of which were attributable to the deepwater environment and others related to the unique circumstances of the Macondo blowout. For example, the combination of hydrocarbons, deep-ocean pressures and cold seawater contributed to the formation of methane hydrates, which rendered the containment dome buoyant and ineffective.[23] In addition, the actual volume of the flow from the well was orders of magnitude greater than the anticipated volume or BP's and National Oceanic and Atmospheric Administration's (NOAA) initial estimates. Some commentators have suggested that the ability to generate an accurate estimate of the flow rate more quickly potentially could have influenced the containment strategy and might have accelerated well control efforts.[24] Another problem was that there were leaks from multiple sources, which changed over time.[25] Even the ultimately successful installation of the LMRP capping stack was initially delayed for five days because of the existence of irregular debris from the well, including two segments of drill pipe.[26] Finally, the interruption of containment efforts as a result of inclement weather highlighted the need for improved capability to disconnect and reconnect to the well quickly in response to weather patterns.[27]

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23 *See id.* at 9; Transcript from BOEMRE Forum on Offshore Drilling in Mobile, Alabama ("Mobile Forum Transcript") at 55 (Richard Lynch, BP).

24 *See* Mobile Forum Transcript at 55 (Richard Lynch, BP); Transcript from BOEMRE Forum on Offshore Drilling in New Orleans, Louisiana ("New Orleans Forum Transcript") at 61-63 (Stephen Sears, LSU); *see also* Presentation by Stephen Sears, entitled "LSU Concept on a Deepwater Containment System," delivered by Stephen O. Sears at the BOEMRE Forum on Offshore Drilling in New Orleans, Louisiana (August 4, 2010) ("Sears Presentation") at 1; E-mail from Marcia McNutt to Raya Bakalov dated September 7, 2010 ("For example, the coffer dam failed because the flow rate was off by an order of magnitude.").

25 *See* New Orleans Forum Transcript at 61-63 (Stephen Sears, LSU); *see also* Sears Presentation at 1.

26 Letter from Dave C. Barrow to Michael Bromwich dated September 13, 2010, at 3.

27 *See* Mobile Forum Transcript at 55 (Richard Lynch, BP).

### 2. The Current Status of Well Containment Capabilities

The Macondo well experience has substantially improved industry's and the government's knowledge, available resources and equipment, and preparedness with respect to the containment of a deepwater blowout. The current ability to respond to a loss of well control in deepwater is substantially different than that which existed at the time of the Macondo blowout.[28] Several significant developments and improvements have been made in the areas of deepwater well containment technology and equipment; the use of ROVs and remote sensing technology, including for the development of flow rate estimates; the management and coordination of containment operations and logistics; and the drilling of relief wells.

#### a. Containment Technology and Equipment

The containment of the Macondo well led to the design and construction of a number of new pieces of equipment and the development of techniques that had not been previously deployed in the Gulf of Mexico and, in some cases, anywhere in the world.[29] These include:

- A hydrate-inhibition system featuring the engineering of a subsea methanol delivery system from a dedicated vessel.

- The construction of the first two containment-purpose free-standing risers in the Gulf of Mexico and a subsea manifold connected to the BOP for the purpose of implementing a top kill and diverting flow from the wellhead to a collection vessel.

- Deployment of a fleet of multipurpose vessels that supported a variety of containment-related tasks. Certain of these vessels were modified for these functions or fitted with equipment to accommodate hydrocarbon collection. As a result, a fleet of vessels capable of supporting deepwater containment efforts is currently available in the Gulf.

As discussed further below, ExxonMobil, Chevron, ConocoPhillips and Shell have formed the Marine Well Containment Company (MWCC) in connection with an industry-led initiative to develop enhanced subsea well control systems. The MWCC recently announced an agreement with BP to provide BP's underwater well containment

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[28] *See e.g.*, Letter from Erik Milito to Michael Bromwich dated September 20, 2010, at 3; Letter from Douglas J. Suttles to Michael R. Bromwich, dated August 31, 2010, attaching the BP Lessons Learned Report ("The nature of the Deepwater Horizon incident – including the scope, scale, and complexity of the response – drove significant capability improvements across a number of fronts."); Presentation by Dr. Tom Hunter, entitled "Deepwater Horizon: A Way Forward," delivered at the Joint Department of Interior – Department of Energy Meeting regarding "Strengthening Deepwater Blowout Containment Capabilities" (September 22, 2010) ("Joint DOI-DOE Meeting on Containment") at 6.

[29] BP Lessons Learned Report at 9-13.

equipment, developed in response to the Macondo blowout, to the MWCC as part of BP's intent to join this new organization.[30] The MWCC is also in the process of negotiating agreements with vessel owners to secure the available fleet for future use.[31] Moreover, under the Clean Water Act, the government would have the authority to direct the activity of, and monitor the deployment of, MWCC resources in the event of a spill. *See* 42 U.S.C. § 1321.

### b. Use of ROVs and Remote Sensing Technology

ROVs and remote sensing technology are essential to successful containment operations, particularly in a deepwater environment. Several advances were made on this front in the course of the Macondo well containment efforts, including:

- The use of digital radiography to evaluate the drill pipe within the damaged riser.

- The use of ROVs for a number of complex construction, intervention, and maintenance tasks, which involved making certain engineering tasks "ROV-friendly" by developing specially designed grips on components and using standardized "plug and play" ROV interfaces.

- Improvements in surface, seabed and water-column monitoring equipment. Seismic monitoring and other similar systems were developed to deliver data about subsurface changes faster than had been done before. Also, multiple active and passive acoustic-monitoring devices were used at the seabed and in the water column.

- Finally, the Macondo experience improved knowledge about the methods used to estimate the flow rate of an oil spill. The Flow Rate Technical Group was able to improve the precision of the methods used to measure the flow rate, and, as a result, "we now know exactly what techniques to use under what circumstances to estimate the flow rate."[32]

### c. Operation Command and Control and Logistics

The Deepwater Horizon containment and response efforts required the simultaneous operation (SIMOPS) of up to 19 principal vessels, some up to 250 meters in length, operating at times within 25 feet or less of each other. By contrast, the most

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30 ExxonMobil Announces Equipment for Industry Use Through Marine Well Containment Company, News Release dated September 20, 2010; *see also* Transcript from BOEMRE Forum on Offshore Drilling in Lafayette, Louisiana (Lafayette Forum Transcript) at 41-43 (Sara Ortwein, ExxonMobil).

31 Mobile Forum Transcript, at 65-66 (Richard Morrison, BP).

32 Statement of Dr. Marcia McNutt at the Joint DOI-DOE Meeting on Containment (September 21, 2010).

complex previous SIMOPS in the industry involved the deployment of three to four major ships. The Deepwater Horizon SIMOPS also required, for the first time, the management of flares of hydrocarbons from vessels. The successful coordination of these vessels was a major undertaking, which led to a number of improvements in precision planning and risk management, such as establishing a rotating on-site branch director and storyboarding. In addition, the SIMOPS team used a relatively new Automatic Identification Software, which provided real-time visualization, identification, tracking and positioning of vessels on graphic displays.

### d. Drilling of Relief Wells

The drilling of relief wells to intercept and permanently seal the Macondo well was planned as a long-term strategy from the outset of the response. Under the direction of Unified Command, BP teams proceeded with drilling two relief wells using two deepwater semi-submersible rigs, the Development Driller II (DDII) and the Development Driller III (DDIII). In the process of drilling these wells, several measures that had only been used on land or in shallow water were adapted to the deepwater environment and to drilling from floating platforms. For example, the drilling of these wells helped refine and advance techniques for "ranging" – *i.e.*, locating the existing well for intercept by the relief well.[33] This represents a significant technological advance in relief well interception capability.

### e. Commitment of Industry and Government to the Development of Containment Capabilities

Several industry initiatives are currently underway to improve the industry's long-term containment capability.

- BP has developed a blueprint, called its Containment Disposal Project (CDP), adapting now-existing technologies, developed in response to the Macondo blowout, to create a flexible rapid-deployment containment capability in the Gulf of Mexico. This system involves a number of features, including floating production, storage and offloading units (FPSO), free-standing risers, dynamically positioned off-take shuttle tankers, flexible pipelines and a methanol-deployment-purposed vehicle for hydrate mitigation.[34]

- ExxonMobil, Shell, Chevron and ConocoPhillips have committed to investing $1 billion in designing and developing a multi-scenario, multi-component containment system, the Marine Well Containment System (MWCS), which is intended to be a pre-engineered, designed, constructed, tested and maintained

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33 BP Lessons Learned Report at 23.

34 *Id.* at 24.

system ready for rapid response within 24 hours.[35] As currently envisioned, the MWCS will work in a wide range of scenarios, in depths of up to 10,000 feet, under varying weather conditions and for flow rates that exceed the size and scope of the BP Oil Spill. The current concept for the system consists of the following elements: (1) a subsea containment assembly; (2) equipment on the ocean floor, such as a production manifold; (3) freestanding risers, located a distance away from the well; and (4) vessels on the surface to capture, process and store oil. Although the MWCS is promising, significant developmental work on the system remains to be done. There also exist a number of issues related to operator access to the system, training, testing and inspection, and government oversight.

- A Joint Industry Task Force on Subsea Well Control and Containment is reviewing and evaluating current containment capacities and developing and implementing a strategy to address future requirements for containment equipment, practices and industry standards.[36] On September 3, 2010, the Task Force issued draft recommendations for improved well containment and intervention, including 15 immediate-action items for industry.[37]

### C. The Status of Spill Response Resources

In the July 12 Decision Memorandum, the Secretary concluded that "[t]he unprecedented deployment of spill response equipment and cleanup crews to the vicinity of the Macondo well and regional shorelines in response to the BP Oil Spill raises serious concerns about the industry's and the Government's current ability to respond in a meaningful way to another deepwater spill."[38] BOEMRE has compiled and analyzed information regarding the present state of oil spill response capabilities, and three of BOEMRE's eight public forums specifically focused on this issue.

Significantly fewer spill response and cleanup resources remain engaged in the BP Oil Spill response effort than was the case on July 12, and more resources are now available should another oil spill occur. In addition, response to the BP Oil Spill has led to substantial improvements in the use of spill response resources and oil detection systems. Nevertheless, the spill response efforts related to the BP Oil Spill highlighted a number of critical shortcomings, including the need for further improvements of skimming and shoreline protection equipment, the need for more realistic response

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35 According to a representative of the MWCC, this $1 billion figure does not include the cost of securing existing equipment and vessels that would be used in response to a containment emergency before the MWCS is available. New Orleans Forum Transcript at 22 (Melody Meyer, Chevron Energy Technology Company).

36 Joint Industry Subsea Well Control and Containment Task Force Draft Industry Recommendations (September 3, 2010) ("Containment JITF Draft Recommendations") at 2.

37 *Id.*

38 July 12 Decision Memorandum at 4.

equipment recovery calculations in OSRPs, and the need for more rapid mobilization of resources.

### 1. Availability of Oil Spill Response Resources

At the time of the July 12 suspension decision, the Macondo well was still releasing oil into the Gulf, and more than 45,000 personnel and 6,700 vessels were deployed in response to the BP Oil Spill.[39] At the height of the response, as many as 47,848 responders, 8,044 vessels, and 123 aircraft were deployed to the Gulf to spot, track and recover oil.[40] The BP Oil Spill taxed shared spill response resources to the limit. For example, NOAA stated that it was fully engaged in the spill response and, "[a]lthough unlikely, if another large spill was to occur simulataneously in another location across the United States, NOAA would have difficulty responding to its complete ability."[41]

The resources available for other response activity today, should another spill occur, have increased significantly from those critical levels in July. The Macondo well has now been permenently sealed, and oil has not flowed into the water since July 15.[42] Oily liquid has not been recovered from the surface of the Gulf of Mexico since July 21, and the last controlled burn took place on July 20.[43] The following charts show the steady decrease since mid-July in equipment and personnel being utilized for the Macondo response:[44]

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39 Deepwater Horizon Incident Joint Information Center Press Release, "The Ongoing Administration-Wide Response to the Deepwater BP Oil Spill," July 12, 2010.

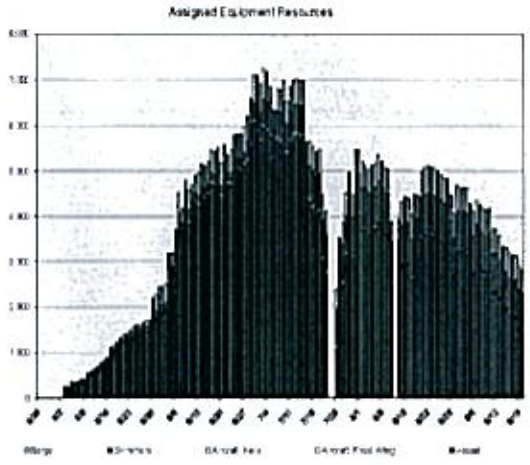
40 *Gulf Coast Incident Management Team Established in New Orleans, Deepwater Horizon Response Leadership Consolidated to Reflect Ongoing Operations* (September 20, 2010), available at http://app.restorethegulf.gov/go/doc/2931/901235/.

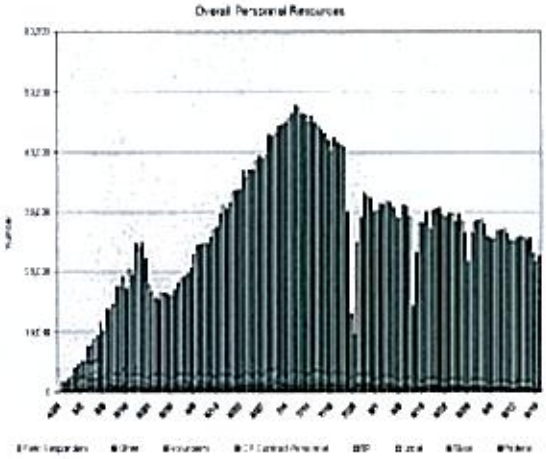
41 Written Statement of NOAA Administrator Lubchenco, Hearing before the Senate Committee on Commerce, Science and Transportation (May 18, 2010), *cited in* July 12 Decision Memorandum at 18.

42 U.S. Government BP Deepwater Horizon Oil Budget, available at http://www.deepwaterhorizonresponse.com/posted/2931/Oil_Budget_description_8_3_FINAL.844091.pdf; Statement from Admiral Allen on the Successful Completion of the Relief Well, 9/19/10, available at http://app.restorethegulf.gov/go/doc/2931/900707/.

43 *The Wicked Well is Dead, Complete Gulf Restoration Pledged*, Environment News Service (Sepbember 20, 2010), available at http://www.ens-newswire.com/ens/sep2010/2010-09-20-01.html.

44 Deepwater Horizon Response Metrics, Operating Period 153.





As of September 16, approximately 25,200 personnel and 2,600 vessels were still responding to the BP Oil Spill, a reduction by approximately one-half of the July figrues.[45] Approximately 670,000 feet of containment boom remained deployed in the Gulf, down from a high of about 3.8 million feet.[46] On the basis of these figures, there is no longer an urgent concern about the sufficiency of resources to respond to another potential oil spill.

### 2. Developments in Oil Spill Response Technology and Techniques

Similar to the innovations in well control capabilities, the BP Oil Spill also has led to better systems for oil detection and tracking. Skimming capacity increased and new techniques to improve recovery rates were developed. In-situ burning proved effective in open water and processes for its use were developed and tested. Dispersants were applied effectively at the subsea source, although the use of subsea dispersants remains controversial and merits further study. Shoreline response techniques have improved, although shoreline protection remains subject to concerns about its efficacy. Although several areas for improvement remain, the capacity to respond to another offshore oil spill is substantially greater today than it was at the time of the July 12 suspension decision.

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45 *The Ongoing Administration-Wide Response to the Deepwater BP Oil Spill* (September 17, 2010), available at http://app.restorethegulf.gov/go/doc/2931/900375/; Deepwater Horizon Response Metrics, Operating Period 153.

46 *The Ongoing Administration-Wide Response to the Deepwater BP Oil Spill* (September 17, 2010), available at http://app.restorethegulf.gov/go/doc/2931/900375/; Deepwater Horizon Response Metrics, Operating Period 153.

### a. Oil Detection and Tracking

Effective oil detection and tracking is essential to locating spilled oil and determining whether it is best skimmed, burned, or dispersed.[47] The experience responding to the BP Oil Spill led to a number of improvements in this area, including:

- The use of satellite imagery integrated and calibrated with multispectral photography, thermal imaging, aerial radar, and infrared to allow a determination of both location and type of oil.[48]

- The combined use of aerial surveillance and satellites allowing responders to track, spot, recognize, and report the presence and location of oil and provide real-time direction to water-based responders.[49]

- Improvement of communication systems between aerial and water-based responders, including the construction of twenty-six radio towers outfitted with aviation band and VHF marine band connections that would be available in the event of another deepwater spill.[50]

### b. Skimming Capacity and Recovery Rates

Skimming is the standard industry practice for recovering spilled oil. Several technical and process improvements for skimming operations were developed during the course of the BP Oil Spill response, including:

- Development of a command and control system that combined aerial surveillance with on-water coordination of vessels to better place skimmers on the oil.[51]

- Use of four modified barges known as "Big Gulp" skimmers that were able to handle emulsified oil and sea grass.[52]

- Use of commercial fishing vessels for boom and skim operations.[53] Through a Vessels of Opportunity (VOO) program, 5,800 local vessels were added to the

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47 Mobile Forum Transcript at. 38-39 (Richard Morrison, BP).

48 *Id.* at 40.

49 BP Lessons Learned Report at 46.

50 *Id.* at 43.

51 *Id.* at 50.

52 Mobile Forum Transcript at 42 (Richard Morrison, BP).

53 *Id.* at 49.

response effort and aided in transport and logistics, booming, skimming, and in-situ burning.[54] The VOO program resulted in processes and protocols for recruiting, vetting, training, and tasking a VOO fleet.[55] The vessels and equipment developed in response to the BP Oil Spill will be available for future spills through arrangements that are being made with oil spill response organizations.[56]

### c. In-Situ Burning

Prior to the BP Oil Spill, in-situ burning of spilled oil had been used only once in open U.S. waters, in Prince William Sound during the Exxon Valdez spill.[57] As a result of the experience gained in the BP Oil Spill response, in-situ burning became a more systematic and developed response measure.[58] A total of 411 burns were conducted ranging from 10 minutes to 12 hours.[59] It is estimated that as much oil was removed through controlled burning as through skimming, with as much as 5% of oil removed by burning versus 3% by skimming.[60] In-situ burning capability was enhanced through the improvements in the identification of oil condition, a newly designed "dynamic" burn process, significantly enhanced fireboom technology, and increases in the number of experts qualified to handle burning – from fewer than 10 experts to more than 50.[61] Finally, there are now documented protocols, processes, and procedures for in-situ burning.[62]

Despite the apparent success of in-situ burning in the BP Oil Spill response, the Joint Industry Task Force recognized that burning compromises air quality and that the

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54 BP Lessons Learned Report at 39.

55 *Id.* To increase the capacity of VOOs, the Joint Industry Task Force recommended developing a response system that could be used specifically by VOOs, staging those systems in strategic locations, and developing a training program for VOO crews. Recommendations of the Joint Industry Oil Spill Preparedness & Response Task Force, V-10.

56 Mobile Forum Transcript at 65-66 (Richard Morrison, BP).

57 BP Lessons Learned Report at 52-53.

58 Presentation of Richard Morrison and Richard Lynch of BP, entitled "Harnessing the Lessons of Deepwater Horizon: Contributing to a new era of deepwater response," delivered at the BOEMRE Forum on Offshore Drilling in Mobile, Alabama (August 10, 2010) ("BP Presentation") at 19; Transcript from BOEMRE Forum on Offshore Drilling in Anchorage, Alaska at 97 (Allan Allen, Spilltec.com).

59 Mobile Forum Transcript at 44 (Richard Morrison, BP).

60 *Id.*; U.S. Government BP Deepwater Horizon Oil Budget, available at http://www.deepwaterhorizonresponse.com/posted/2931/Oil_Budget_description_8_3_FINAL.844091.pdf.

61 BP Presentation at 19.

62 *Id.*

decision to burn "must be made in consideration of all of the risks and tradeoffs posed to human health and the environment by the spill and the available countermeasures."[63]

### d. Use of Dispersants

The purpose of deployment of dispersants is to speed up the natural degradation of oil by spreading it out and making it more readily available to bacteria.[64] The BP Oil Spill response used an unprecedented 1.84 million gallons of dispersants, approximately 1.07 million gallons on the surface and, for the first time, 771,000 gallons subsea.[65] The government estimates that 8% of the total oil released from the Macondo well was chemically dispersed and was or is in the process of being naturally degraded.[66]

There are open questions about the relative health and environmental effects of dispersants. The EPA found that dispersants are generally less harmful than the oil leaking from the source and biodegrade in a much shorter time span.[67] However, the government, academia, environmental groups, and industry all recognize the need for additional study into the effects and use of dispersants.[68]

### e. Shoreline Response

Shoreline protection involves the deployment of boom to prevent oil from affecting the shoreline. Shoreline cleanup requires labor intensive processes of wiping, scrubbing, hot and cold water washing, and manually and mechanically picking up oil

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63 Recommendations of the Joint Industry Oil Spill Preparedness & Response Task Force, IV-6; *see also* Det Norske Veritas, OLF/NOFO Summary of differences between offshore drilling regulations in Norway and U.S. Gulf of Mexico, Report no/DNV Reg No.: 2010-1220/ 12P3WF5-9 Rev 02, 2010-08-26, pg. 3-4.

64 Mobile Forum Transcript at 45 (Richard Morrison, BP); Mobile Forum Transcript at 75 (Dr. Edward Overton, LSU).

65 Deepwater Horizon Incident Joint Information Center Press Release, "The Ongoing Administration-Wide Response to the Deepwater BP Oil Spill," September 9, 2010; Mobile Forum Transcript at 70 (Dr. Edward Overton, Louisiana State University).

66 U.S. Government BP Deepwater Horizon Oil Budget, available at http://www.deepwaterhorizonresponse.com/posted/2931/Oil_Budget_description_8_3_FINAL.844091.pdf.

67 EPA Questions and Answers on Dispersants, available at http://www.epa.gov/bpspill/dispersants-qanda.html#role2.

68 Mobile Forum Transcript at 46 (Richard Morrison, BP); Written Statement of Douglas Helton, Incident Operations Coordinator, Office of Response and Restoration, National Oceanic and Atmospheric Administration, U.S. Department of Commerce Hearing on "Turning Ideas Into Action: Ensuring Effective Clean Up and Restoration In The Gulf," before the Subcommittee on Oceans, Atmosphere, Fisheries and Coast Guard, Committee on Commerce, Science, and Transportation, U.S. Senate, (July 21, 2010); Mobile Forum Transcript at 119 (Dr. George Crozier, Dauphin Island Sea Lab); Mobile Forum, Transcript at 103-104 (Manley K. Fuller III, Florida Wildlife Federation); Recommendations of the Joint Industry Oil Spill Preparedness & Response Task Force, III-10.

contaminated sand, soil, and debris.[69] According to the Joint Industry Task Force, "the basic concepts for shoreline protection and cleaning have changed very little over the last 20 years."[70] At its height, the BP response effort deployed about 3.8 million feet of containment boom and 9.7 million feet of boom to contain oil and protect shorelines.[71] Shoreline protection efforts have faced a number of challenges, although the response to the BP Oil Spill also led to some improvements in shoreline protection measures, including enhancements to Area Contingency Plans and systems for coordinating with local communities that have applicability to any future response efforts.[72]

### D. Economic Considerations

Neither OCSLA nor the implementing regulations require that the Secretary consider economic effects before issuing a drilling suspension. Nevertheless, in the July 12 Decision Memorandum, the Secretary considered available studies regarding the potential economic effects of a suspension of deepwater drilling, as well as the economic and environmental effects of the oil spill. The Secretary concluded that "a suspension of deepwater drilling will have a significant, negative economic impact on direct and indirect employment in the oil and gas industry, as well as other secondary economic consequences" but decided that this negative impact was outweighed by the substantial economic and environmental costs associated with the on-going BP Oil Spill and the potential economic damages of another deepwater spill.[73]

Since the July 12 decision, new information has become available, both with respect to the economic effects of the deepwater drilling suspension and the effects of the BP Oil Spill on the economy and environment of the Gulf Coast.

#### 1. Economic Effects of the Suspension of Deepwater Drilling

The suspension of deepwater drilling has had an undeniable and substantial negative economic effect on direct and indirect employment and spending in the oil and gas industry. During the public forums, BOEMRE received a large number of comments from the public and elected officials in the Gulf states that described the economic hardship of workers and contractors in the drilling industry as a result of the deepwater drilling suspensions.

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69 Recommendations of the Joint Industry Oil Spill Preparedness & Response Task Force, VI-1.

70 Recommendations of the Joint Industry Oil Spill Preparedness & Response Task Force, VI-2.

71 BP Lessons Learned Report at 5; The Ongoing Administration-Wide Response to the Deepwater BP Oil Spill (September 17, 2010), available at http://app.restorethegulf.gov/go/doc/2931/900375/; Deepwater Horizon Response Metrics, Operating Period 153.

72 Mobile Forum Transcript at 50 (Richard Morrison, BP).

73 July 12 Decision Memorandum at 16-17.

However, new and more precise information has been developed since the July 12 decision that suggests that the overall economic impact of the temporary suspension of deepwater drilling has been much less significant than originally estimated.[74] For example, at the time of the July 12 decision, it was estimated that the six-month suspensions would result in the loss of more than 23,000 jobs.[75] A recent study by the Council of Economic Advisors, dated September 16, estimates that the suspension has caused a much smaller loss in jobs than originally anticipated – between 9,000 and 13,000 total jobs.[76]

The main reason for the difference in these estimates is that, contrary to the predictions of industry commentators, operators have not moved their deepwater rigs out of the Gulf of Mexico. Only a few deepwater rigs have left the Gulf of Mexico, and 43 rigs remain.[77] In addition, many of the deepwater drilling operators and contractors have chosen to keep many of their employees on payroll, whereas earlier studies assumed that all employees would be laid off en masse for the duration of the suspension.[78] In fact, about 1,800 out of 9,700 rig workers (20%) have been laid off in the three months since the suspension.[79] Unemployment data from the four parishes believed to be most heavily dependent on the deepwater drilling industry support these estimates:

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74 "Estimating the Economic Effects of the Drilling Moratorium on the Gulf Coast Economy," Report of the Council of Economic Advisors dated September 16, 2010 ("CEA Report") at 2.

75 Options Memorandum at 21.

76 CEA Report at 2.

77 *Id.* at 9.

78 *Id.* at 2.

79 *Id.* at 9, 15. These figures are based on conversations with a number of rig operators and on a review of employment and unemployment data in four contiguous Louisiana parishes widely believed to be heavily dependent on the deepwater drilling industry: the Lafourche, St. Mary's, Terebonne, and Iberia parishes. The CEA Report concludes that "[b]ased on most recently available data, these four parishes have yet to experience significant changes in their overall labor markets." *Id.* at 15.

**Table 4: Employment Changes from April 2010 to July 2010 for Four Oil Industry Intensive Parishes in Louisiana**

*(Not Seasonally Adjusted)*

| | Employment Level | | | | Unemployment Rate | | |
|---|---|---|---|---|---|---|---|
| | April | July | Change | %Change | April | July | Change |
| **US** | 139,302 | 140,134 | 832 | 0.6% | 9.5 | 9.7 | 0.2 |
| **Louisiana** | 1,958,626 | 1,971,923 | 13,297 | 0.7% | 6.2 | 7.6 | 1.4 |
| **Total for 4 parishes** | 152,299 | 153,154 | 855 | 0.6% | 6.0 | 6.8 | 0.8 |
| **Iberia** | 31,445 | 31,900 | 455 | 1.4% | 6.8 | 7.7 | 0.9 |
| **Lafourche** | 46,844 | 46,958 | 114 | 0.2% | 4.4 | 5.0 | 0.6 |
| **St.Mary** | 21,366 | 21,524 | 158 | 0.7% | 8.0 | 9.3 | 1.3 |
| **Terrebonne** | 52,644 | 52,772 | 128 | 0.2% | 4.8 | 5.3 | 0.5 |

Source: CEA Report at 17.

This is not in any way to minimize the economic impact of the suspension of deepwater drilling, nor the hardship it has caused for many people. It is simply an effort to quantify and make more accurate an assessment of those consequences.

### 2. Economic and Environmental Effects of the BP Oil Spill

The BP Oil Spill has had severe consequences for the Gulf of Mexico economy and environment. Fishing, shrimping, tourism, commercial retail and other industries in the Gulf of Mexico region all have been adversely affected by the spill. At the time of the Secretary's July 12 decision, NOAA was reporting that approximately 32.3% of Gulf waters had been closed to fishing.[80] Hundreds of miles of wetlands were affected by oil from the Macondo well, and 35 National Wildlife Refuges located in the Gulf were considered at risk due to the oil spill.[81]

Today, there are signs that this grim picture is slowly beginning to change. As of September 21, 2010, NOAA reported that the area closed to all commercial and recreational fishing had fallen to 13% of Gulf of Mexico waters.[82] There is also evidence that the tourism industry in the Gulf is rebounding. In a recent poll of 415 travel franchise owners, 80% of those questioned said there was no impact on their autumn Florida bookings and 90% said the same about Louisiana.[83]

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80 Options Memorandum at 19.

81 Options Memorandum at 20.

82 NOAA Southeast Fishery Bulletin dated September 21, 2010; Deepwater Horizon Response Daily Report at 21.

83 Reuters, *Oil Spill Will Not Impact Florida Tourism: Poll* (September 3, 2010), available at http://www.reuters.com/article/idUSTRE6822DK20100903.

## III. Options and Recommendation

In light of the foregoing, BOEMRE has identified the following options available to the Secretary with respect to the current suspension of deepwater drilling as imposed pursuant to the July 12 Decision Memorandum.

**Option 1**: No modification to the scope or duration of the July 12 suspension, which applies to certain deepwater drilling operations, as defined by the July 12 Decision Memorandum.

Pros

- Allows time for compliance with the new safety requirements imposed by the Safety Interim Final Rule prior to lifting the suspension.

- Allows time for BOEMRE to hire additional inspectors in preparation for the more frequent and extensive inspection and monitoring of deepwater drilling operations.

- Allows additional time for all spill response resources currently devoted to the BP Oil Spill response and clean-up to become available in the event of a second spill.

Cons

- No potential mitigation of the economic effects of the full term of the deepwater drilling suspension.

- The new drilling and workplace safety standards and requirements under the Safety Interim Final Rule and other measures have substantially raised the bar on drilling safety and address what are currently believed to be the root causes and issues related to the *Deepwater Horizon* event, and, therefore, the marginal benefit to safety of continuing the suspension is unclear.

**Option 2**: Lifting of the deepwater drilling suspension in the wake of publication of the Safety Interim Final Rule and the SEMS rule.

Pros

- Provides industry with the potential to resume drilling sooner, thereby potentially lessening the economic effects of the suspension of deepwater drilling.

- Compliance with the new safety measures included in the Safety NTL and Safety Interim Final Rule are pre-requisites to the resumption of deepwater drilling, and therefore safety concerns are addressed.

Cons

- Potentially allows drilling to resume before it would under the November 30 deadline, which potentially would allow less time for additional spill response resources to become available.

- Potentially allows less time for improvements in BOEMRE's inspections and monitoring programs.

**Option 3**: Lifting the suspension as to all deepwater drilling operations except for the highest risk operations involving exploratory drilling into hydrocarbon-bearing formations whose geological characteristics are not well-known.

Pros

- Mitigates the economic effects of the drilling suspension by allowing the resumption of certain drilling operations, such as production drilling into known formations and drilling of exploratory wells short of hydrocarbon-bearing zones.

- Compliance with the new safety measures included in the Safety NTL and Safety Interim Final Rule are pre-requisites to the resumption of deepwater drilling, and therefore safety concerns are addressed.

Cons

- Potentially allows drilling to resume before it would under the November 30 deadline, which potentially would allow less time for additional spill response resources to become available.

- Potentially allows less time for improvements in BOEMRE's inspections and monitoring programs.

- The new drilling and workplace safety standards and requirements under the Safety Interim Final Rule and other measures have substantially raised the bar on drilling safety and address what are currently believed to be the root causes and issues related to the *Deepwater Horizon* event, and, therefore, the marginal benefit to safety of continuing the suspension is unclear.

**Option 4**: Continue the suspension of deepwater drilling until the completion of the investigations into the root causes of the *Deepwater Horizon* event.

Pros

- Allows time for the further analysis of the root causes of the *Deepwater Horizon* event and identification of potential measures to address any causes or issues that may not yet be known or understood.

- Minimizes the risk of another deepwater blowout and spill by continuing the suspension of deepwater drilling activity.

- Allows additional time for advances in well containment equipment and measures, such as the MWCS.

- Allows additional time for the availability of oil spill response resources and the development of updated oil spill response plans for the Gulf of Mexico.

Cons

- Potential marginal safety benefits of the continued suspension are uncertain.

- Could lead to a significant extension of the deepwater drilling suspension, with potentially very substantial economic effects.

- Could lead to substantial industry uncertainty and a more substantial exodus of drilling operations from the Gulf.

**Option 5**: Extend the suspension of deepwater drilling generally, or more narrowly to the drilling of deepwater exploratory wells into hydrocarbon-bearing zones, for a period defined by compliance with new safety requirements (such as the addition of redundant blind-shear rams onto BOP stacks and/or implementation of a safety case regime) or further advances in well containment equipment (such as the MWCS becoming operational).

Pros

- Minimizes the risk of another deepwater blowout and spill by continuing the suspension of the most risky deepwater drilling activity.

- Allows additional time for the development of further safety enhancements, including potentially in response to the findings of ongoing investigations into the *Deepwater Horizon* event.

- Allows additional time for advances in well containment equipment and measures, such as the MWCS.

- Allows additional time for the availability of oil spill response resources and the development of updated oil spill response plans for the Gulf of Mexico.

Cons

- Could lead to a significant extension of the deepwater drilling suspension, with potentially substantial economic effects.

- Could lead to substantial industry uncertainty and a more substantial exodus of drilling companies from the Gulf.

**Recommendation**

BOEMRE recommends that the Secretary proceed with Option 2, which would lift the suspension of deepwater drilling before the suspension currently is scheduled to expire on November 30 and, in our view, strikes the appropriate balance among the various safety-related and other considerations relevant to the suspension. BOEMRE believes that the threat to life and the environment posed by the *Deepwater Horizon* event and the BP Oil Spill has been substantially reduced because (1) the new safety standards and requirements imposed by the Safety Interim Final Rule, the Workplace Safety Rule, and other safety-related measures have substantially raised the bar on drilling and workplace safety; (2) the Macondo well has been successfully killed and new containment capabilities are currently available, and industry is committed to developing further containment capabilities in cooperation with government; and (3) more spill response resources are currently available in the event of another spill. Finally, lifting the suspension early has the potential to mitigate the economic effects of the drilling suspension.

## APPENDIX I

## BUREAU OF OCEAN ENERGY MANAGEMENT, REGULATION AND ENFORCEMENT

## PUBLIC FORUMS ON OFFSHORE DRILLING

In response to Secretary Salazar's request that Director Bromwich collect public and expert input concerning drilling safety, containment and oil spill response, Director Bromwich convened eight public forums on offshore drilling in different cities across the country. A total of 61 experts from academia, the oil industry and conservation groups offered their suggestions for improving drilling safety, well containment and oil spill response. Director Bromwich also heard from 37 local elected officials regarding the impact of the oil spill and the suspension on their constituents. In addition, the public submitted comment cards and online comments at Regulations.gov. BOEMRE received and reviewed 138 comment cards and 456 online comments.

Below is more detailed information about each of the forums.

- August 4, 2010: New Orleans, Louisiana. Forum on strategies for well control and containment in deepwater. Two expert panels delivered presentations, including a panel of representatives from ExxonMobil, Chevron, Shell and ConocoPhillips on the Marine Well Containment System and a panel of experts from industry, academia and the conservation community.

  The panelists were:
  - *Sara Ortwein*, President, ExxonMobil Upstream Research Company
  - *Melody Meyer*, President, Chevron Energy Technology Company
  - *Charlie Williams*, Chief Scientist, Well Engineering and Production Technology, Shell Oil Company
  - *Steve Bross,* Manager, Project Development, ConocoPhillips
  - *Stephen O. Sears,* Chair, Department of Petroleum Engineering, LSU
  - *Douglas Meffert,* Eugenie Schwartz Professor of River & Coastal Studies and Deputy Director for Policy, Tulane
  - *Melanie Driscoll*, Director of Bird Conservation, Louisiana Coastal Initiative, National Audubon Society
  - *Michael Voisin*, Chief Executive Officer, Motivatit Seafood

  In addition, the following elected officials delivered oral statements:
  - *Scott Angelle*, Lt. Governor of Louisiana
  - *Anh ("Joseph") Cao*, U.S. Congressman representing the Second Congressional District of Louisiana
  - *David Camardelle*, Grand Isle Mayor
  - *Michel Claudet*, Terrebonne Parish President
  - *Charlotte Randolph*, Lafourche Parish President

- *Mitch Landrieu*, Mayor of New Orleans

Comment cards from 18 members of the public were collected during the New Orleans forum.

- August 10, 2010: Mobile, Alabama. Forum on oil spill preparedness and response. Two expert panels delivered presentations, including a panel of representatives from BP and a panel of experts from industry, academia and the conservation community.

  The panelists were:
  - *Richard Morrison*, Vice President of Operations, Gulf of Mexico, BP
  - *Richard Lynch*, Vice President, Drilling and Completions, BP
  - *Edward Overton*, Department of Environmental Studies, LSU
  - *George F. Crozier*, Executive Director, Dauphin Island State Lab
  - *Manley K. Fuller, III*, President, Florida Wildlife Federation
  - *Steve Russell*, Director of Business Relations and Expansion, Mobile Chamber of Commerce

  No public officials delivered oral statements.

  Comment cards from 9 members of the public were collected during the Mobile forum.

- August 11, 2010: Pensacola, Florida. Forum on drilling safety and safety equipment. Two panels of experts from industry and academia delivered presentations.

  The panelists were:
  - *Bob Bemis,* VP of Environment, Health and Safety, Noble Energy
  - *J. Ford Brett*, Managing Director, Petro Skills
  - *Darryl Bourgoyne*, Instructor, Director Well Facility, Louisiana State University
  - *Chris Nelson*, Drilling Manager, Newfield Exploration
  - *Conley Perry*, West Engineering
  - *Mike Van Gemert*, West Engineering
  - *Ross Frazer*, Vice President of Engineering, ATP Oil &Gas

  In addition, the following elected officials delivered oral statements:
  - *P.C. Wu,* Pensacola City Councilman
  - *Kevin White*, Commissioner, Escambia County, Florida

  Comment cards from 2 members of the public were collected during the Pensacola forum.

- August 24, 2010: Santa Barbara, California. Forum on offshore drilling workplace safety. Two panels of experts from industry and the conservation community delivered presentations.

  The panelists were:
  - *Brenda Kelly,* Director, Accreditation & Certification, International Association of Drilling Contractors
  - *Dan Gremaud,* Safety & Training Specialist, Nabors Well Services
  - *Earl Piermattei*, Senior Engineer, Ben C. Gerwick Inc. Consulting Engineers
  - *Yarko "JJ" Sos,* President and Chief Operating Officer, Check-6, Inc.
  - *Linda Krop*, Chief Counsel, Environmental Defense Center
  - *Keith Wenal,* Health and Environmental Safety Manager, Venoco Inc.
  - *Rob Hurley,* Principal Consultant, Hurley Environmental, Safety, Management Company
  - *Mark Steinhilber,* Senior Process Safety Engineer, Supervisor, Mineral Resources Management Division, California State Lands Commission

  In addition, the following elected officials delivered oral statements:
  - *Abel Maldonado*, Lieutenant Governor of California
  - *Helene Schneider*, Mayor of Santa Barbara
  - *Lois Capps*, U.S. Congresswoman for the 23rd District of California
  - *Margaret Connell*, Mayor Pro Tempore for Goleta City
  - *Janet Wolf*, Chair of Santa Barbara Board of Supervisors

  Comment cards from 21 members of the public were collected during the Santa Barbara forum.

- August 26, 2010: Anchorage, Alaska. Forum on oil spill preparedness and response in the Arctic. Two panels of experts from industry and the conservation community delivered presentations.

  The panelists were:

  - *Leslie Pearson,* Pearson Consulting
  - *Ron Morris,* President and General Manager, Alaska Clean Seas
  - *Marilyn Heiman,* Director, U.S. Arctic and Offshore Energy Reform Programs, Pew Environment Group
  - *Michael Castellini,* Interim Dean, School of Fisheries and Ocean Sciences, University of Alaska Fairbanks
  - *Peter K. Velez,* Global Emergency Response Manager, Shell International E&P
  - *Johnny Aiken,* Alaska Eskimo Whaling Commission
  - *Alan A. Allen,* Oil Spill Consultant, Spiltec.com

  In addition, the following elected officials delivered oral statements:

- *Lisa Murkowski*, U.S. Senator from Alaska
- *Mark Begich*, U.S. Senator from Alaska
- *Edward S. Itta*, Mayor, North Slope Borough
- *Dan Sullivan*, Mayor, Anchorage
- *Larry Hartig*, Commissioner, Alaska State Department of Environmental Conservation
- *Caroline Cannon*, President of the Native Village of Point Hope

Comment cards from 29 members of the public were collected during the Anchorage forum.

- September 7, 2010: Houston, Texas. Forum on offshore drilling and workplace safety. Two expert panels delivered presentations, including a panel of representatives from the Joint Industry Task Forces and a panel of experts from industry and the conservation community.

  The panelists were:

  - *Gary Luquette*, Chevron, API Upstream Committee Chairman
  - *John Peters*, Chevron, Chairman, Offshore Operating Procedures Task Force
  - *Alan Summers*, Diamond Offshore Drilling, Chairman, Offshore Equipment Task Force
  - *Charlie Williams*, Shell, Chairman, Subsea Well Control and Containment Task Force
  - *Jay Collins*, Oceaneering, Co-Chairman, Oil Spill Response Task Force
  - *Keith Robson*, Marathon, Co-Chairman, Oil Spill Response Task Force
  - *Richard C. Haut,* Senior Research Scientist, Houston Advanced Research Center
  - *Lois N. Epstein*, Arctic Program Director, The Wilderness Society
  - *Nancy Leveson*, Professor of Aeronautics and Astronautics, Massachusetts Institute of Technology
  - *Alan Spackman*, Vice President of Offshore Technical and Regulatory Affairs, International Association of Drilling Contractors
  - *Robin M. Pitblado*, Director, SHE Risk Management Service Area, Det Norske Veritas

  In addition, the following elected officials delivered oral statements:

  - *Al Green*, U.S. Congressman representing the 9th District of Texas
  - *Sheila Jackson Lee*, U.S. Congresswoman representing the 18th District of Texas
  - *Gene Green*, U.S. Congressman representing the 29th District of Texas
  - *Victor G. Carrillo*, Chairman, Texas Railroad Commission
  - *Elizabeth Ames Jones*, Commissioner, Texas Railroad Commission

Comment cards from 46 members of the public were collected during the Anchorage forum.

- September 10, 2010: Biloxi, Mississippi. Forum on oil spill preparedness and response. A panel of experts from industry and academia delivered presentations.

  The panelists were:

  - *Gary Rook*, Technical Director, Edison Chouest Offshore
  - *John Dane III*, President and Chief Executive Officer, Trinity Yachts
  - *Jim Adams*, President, Offshore Marine Service Association
  - *Donald W. Davis*, Former Administrator, Louisiana Applied and Educational Oil Spill Research and Development Program
  - *Kevin Costner*, Co-founder, Ocean Therapy Solutions and Blue Planet Solutions

  In addition, the following elected officials delivered oral statements:

  - *Gene Taylor*, U.S. Congressman representing the 4th District of Mississippi
  - *A.J. Holloway*, Mayor of the City of Biloxi
  - *Connie Moran*, Mayor of the City of Ocean Springs
  - *Connie Rockco*, Harrison County Supervisor
  - *Michael Mangum*, Jackson County Supervisor

  Comment cards from 13 members of the public were collected during the Biloxi forum.

- September 13, 2010: Lafayette, Louisiana. Forum on well control and containment in deepwater. Two expert panels delivered presentations, including a panel of representatives ExxonMobil, Chevron, Shell and ConocoPhillips on the Marine Well Containment System and a panel of experts from industry, academia and the conservation community.

  The panelists were:

  - *Sara Ortwein*, President of ExxonMobil Upstream Research Company
  - *Melody Meyer*, President, Chevron Energy Technology Company
  - *Charlie Williams*, Chief Scientist, Well Engineering and Production Technology, Shell Oil Company
  - *Steve Bross*, Manager, Project Development, ConocoPhillips
  - *Dave Barrow*, Executive Sales Marine, Wild Well Control
  - *Bryce A Levett*, Director of Energy Solutions, Det Norske Veritas
  - *Bart Heijermans*, Executive Vice President and Chief Operating Officer, Helix Energy Solutions Group, Inc.

- *John Rogers Smith*, Associate Professor, Craft & Hawkins Department of Petroleum Engineering, LSU
- *Frank Gallander*, Consultant, Subsea Well Intervention Team, Chevron Global

In addition, the following elected officials delivered oral statements:

- *Scott Angelle*, Lt. Governor of Louisiana
- *Charles Boustany*, U.S. Congressman representing Louisiana's Seventh Congressional District
- *Charlie Melancon*, U.S. Congressman representing Louisiana's Third Congressional District
- *Joey Durel*, Lafayette City / Parish President
- *Charlotte Randolph*, Lafourche Parish President
- *Arlanda Williams*, Terrebonne Parish Councilwoman
- *John Young*, Jefferson Parish Councilman
- *Wayne Landry*, St. Bernard Parish Councilman

Comment cards from 10 members of the public were collected during the Lafayette forum.

## APPENDIX II

## ADDITIONAL STAKEHOLDER MEETINGS

In addition to the public forums, Director Bromwich received briefings on issues relating to the subject matter of the drilling suspensions from various stakeholders, including industry representatives, environmental and conservation groups, and members of the academic community. BOEMRE met with the following seventeen groups:

- Alaska Wilderness League
- American Petroleum Institute
- British Petroleum
- Center for Biological Diversity
- Chevron North America
- Deepwater Horizon Study Group
- Edison Chouest Offshore
- ExxonMobil
- Gulf Economic Survival Team
- International Association of Geophysical Contractors
- Joint Industry Task Force
- National Ocean Industries Association
- Offshore Operators Committee
- PEW Research Center
- Shell Company
- Sierra Club
- Southern Environmental Law Center

## APPENDIX III

### New Measures Addressing the Safety, Containment and Response Issues in Light of *Deepwater Horizon*

| **Safety, Containment and Response Issues in Light of *Deepwater Horizon*** | **New Measures Addressing These Issues** |
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| <u>Casing and Cementing Design and Procedures</u><br><br>There were significant weaknesses in the casing and cementing design and process applied to the Macondo well. In addition, the negative-pressure test procedure conducted on the Macondo well failed to establish well integrity. | • The Safety NTL requires operator CEOs to certify compliance with all BOEMRE drilling and safety regulations.<br><br>Provisions of the Safety Interim Final Rule addressing well integrity:<br><br>• § 250.198(a)(3): Incorporating new standards relating to the isolation of potential flow zones during well construction.<br><br>• § 250.198(h)(79): Requiring a written description of how the operator evaluated best practices, including identification of mechanical barriers and cementing practices to be used for each casing string.<br><br>• § 250.420(b)(3): Requiring installation of dual mechanical barriers in addition to cement for final casing string.<br><br>• § 250.420(a)(6): Requiring certification by a professional engineer that there are two independently tested barriers and the casing and cementing design are appropriate<br><br>• § 250.423(b): Operator must ensure that casing or liner is properly installed in the subsea wellhead or liner hanger and that the latching mechanisms or lock-down mechanisms are engaged upon installation of each casing string or liner. Operator must perform a pressure test on the casing seal assembly to ensure proper installation |

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| | of casing or liner.<br><br>• § 250.423(c): Operator must perform a negative pressure test to ensure proper casing installation for the intermediate and production casing strings. |
| Displacement of Drilling Fluids<br><br>Simultaneous displacement of kill-weight drilling fluids (mud) from the riser while pumping the fluids to a near-by boat did not allow for accurate monitoring of fluid volumes. | Provisions of the Safety Interim Final Rule addressing the proper displacement of drilling fluids:<br><br>• § 250.456(j): Operator must obtain approval from the BOEMRE District Manager before displacing kill-weight drilling fluid from the wellbore. The operator must submit the reasons for displacing the kill-weight drilling fluid and provide detailed step-by-step procedures describing how the operator will safely displace these fluids. |
| Well Control Equipment<br><br>The Macondo well BOP failed to seal, and application of the enhanced testing requirements to the relief well BOPs revealed significant issues with the deadman mechanism of one of the relief well BOPs. | Provisions of the Safety Interim Final Rule addressing well control equipment:<br><br>• § 250.416(d): Requiring submission of documentation and schematics for all control systems;<br><br>• § 250.416(e): Requiring independent third-party verification that BOP blind-shear rams are capable of cutting any drill pipe in the hole under maximum anticipated surface pressure;<br><br>• § 250.416(f): Requiring independent third-party verification that subsea BOP was designed for the specific equipment on the rig and specific design.<br><br>• § 250.442(c), § 250.515(e); § 250.615(e): Requiring that subsea BOP stacks be equipped with ROV intervention capability, including minimum requirements that the ROV be capable of |

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| | closing one set of pipe rams, closing one set of blind-shear rams, and unlatching the Lower Marine Riser Package;<br><br>• § 250.442(e); § 250.515(e); § 250.615(e): Requiring that an ROV be maintained on each floating drilling rig on a continuous basis and a trained ROV crew be on each floating drilling rig;<br><br>• § 250.442(f); § 250.515(e); § 250.615(e): Requirement for autoshear and deadman systems for dynamically positioned rigs;<br><br>• § 250.442(e); § 250.515(e); § 250.615(e): Minimum requirements for personnel authorized to operate critical BOP equipment;<br><br>• § 250.446(a); § 250.516(h); § 250.516(g); § 250.617: Requirements for documentation of subsea BOP inspections and maintenance;<br><br>• § 250.449(j); § 250.516(d)(8); § 250.616(h)(1): Requirements for the testing of all ROV intervention functions on the subsea BOP stack during the stump test and testing at least one set of rams during the initial test on the seafloor;<br><br>• § 250.449(k); § 250.516(d)(9); § 250.616(h)(2): Function-testing autoshear and deadman systems on the subsea BOP stack during the stump test and testing the deadman system during the initial test on the seafloor;<br><br>• § 250.451(i): Pressure testing of any shear rams used in an emergency; and<br><br>• § 250.1715; § 250.1721(h): Requiring certification by a professional engineer of the well abandonment design and procedures; that there will be at least two independent tested barriers, including one |

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| | mechanical barrier, across each flow path during abandonment activities; and that the plug meets the requirements in the table in § 250.1715 |
| Safety and Environmental Management Program<br><br>The *Deepwater Horizon* accident highlighted the lack of a standardized, comprehensive approach to safety and environmental protection. | • The Safety and Environmental Management Systems (SEMS) Rule establishes a standardized and comprehensive safety management program for identifying, addressing and managing operational safety hazards and impacts, with the goal of promoting both human safety and environmental protection.<br><br>The SEMS Rule requires:<br><br>• **Safety and environmental information**: Establishing minimum safety and environmental information needed for any facility, e.g. design data; facility process such as flow diagrams; mechanical components such as piping and instrument diagrams; etc;<br><br>• **Hazards analysis**: requiring a facility-level risk assessment;<br><br>• **Management of change**: addressing any facility or operational changes including management changes, shift changes, contractor changes, etc.;<br><br>• **Operating procedures**: requiring evaluation of operations and written procedures;<br><br>• **Safe work practices**: requiring the development of manuals, standards, rules of conduct, etc.;<br><br>• **Training**: calling for training on safe work practices and technical training of all employees and contractors. |

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| | • **Mechanical integrity**: providing for preventive maintenance programs, quality control;<br><br>• **Pre-startup review**: calling for a review of all systems;<br><br>• **Emergency response and control**: providing for emergency evacuation plans, oil spill contingency plans, etc., as well as for drills to validate such plans;<br><br>• **Investigation of Incidents**: establishing procedures for investigating incidents, corrective action and follow-up;<br><br>• **Audits**: required initially within 2 years; then in 3-year intervals;<br><br>• **Records and documentation**: requiring documentation that describes all elements of SEMS program. |
| <u>Offshore Facilities Inspections</u><br><br>The *Deepwater Horizon* accident highlighted the need for a more robust and aggressive offshore facilities inspection program. | BOEMRE inspections are anticipated to include:<br><br>• Reviews of compliance certification and packages required under the Safety NTL and the Safety Interim Final Rule;<br><br>• Baseline reviews of all deepwater drilling facilities for compliance with BOEMRE's proscriptive regulations, including as appropriate, the new requirements of the Safety Interim Final Rule; and<br><br>• Monitoring by qualified BOEMRE personnel of critical phases in deepwater drilling operations, such as casing and cementing processes. |
| <u>Well Containment Capabilities</u><br><br>The *Deepwater Horizon* accident | The key developments with respect to well containment include: |

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| highlighted the inadequacy of available equipment and techniques to contain a deepwater blowout. | • The Macondo well has been killed.<br><br>• Technological innovation and development with respect to deepwater well containment equipment in response to the Macondo well blowout, which remains available in the event of another deepwater well control incident.<br><br>• Advances in industry's and the government's knowledge base with respect to the challenges associated with deepwater well containment and the techniques and strategies that were successful, and that failed, in gaining control of the Macondo well.<br><br>• Commitment by industry, in cooperation with the government, to invest in the development of new, effective and versatile well control equipment and deepwater well containment response infrastructure. |
| <u>Oil Spill Response Resources</u><br><br>The unprecedented deployment of spill response equipment and cleanup crews to the vicinity of the Macondo well and regional shorelines in response to the BP Oil Spill raised concerns about the industry's and the Government's ability to respond in a meaningful way to another deepwater spill. | • Significantly fewer spill response and cleanup resources are tied up in the BP Oil Spill response effort than was the case on July 12, and more resources are now available should another oil spill occur.<br><br>Improvements in the use of spill response resources, including improvements to:<br><br>• Oil detection and tracking;<br><br>• Skimming capacity and recovery rates;<br><br>• In-situ burning methods;<br><br>• Use of dispersants; and<br><br>• Shoreline response. |