OCEAN ENERGY SAFETY ADVISORY COMMITTEE

October 15, 2012

Mr. James A. Watson
Director
Bureau of Safety and Environmental Enforcement
1849 C Street, N.W.
Washington, D.C. 20240

Dear Director Watson:

On behalf of the Ocean Energy Safety Advisory Committee (OESC), I would like to submit 25 recommendations to the Department of the Interior (DOI) and the Bureau of Safety and Environmental Enforcement (BSEE) for consideration and action. Over the course of the past year and a half, the four OESC subcommittees have been working hard to formulate and evaluate recommendations addressing each subcommittee topic for full Committee consideration. At our recent August 29-30, 2012, meeting in Anchorage, Alaska, the OESC determined the 25 recommendations listed below ready for submission to DOI and BSEE.

Additional information on these recommendations is provided in supplementary enclosures to this letter. Each enclosure has a label on the top left corner of the document highlighting the corresponding sections below.

Please accept these submissions as the OESC's formal recommendations to DOI/BSEE:

With respect to spill containment (reference material found in Enclosures 1-2):

- ***Workshop on Organizational and Systems Readiness for Containment Response:*** *DOI/BSEE, in consultation with other federal agencies, should immediately commission the development of a workshop to debrief government, industry, and academic resources involved in the Deepwater Horizon source control efforts to discuss lessons learned and chart a path forward in responding to future oil spills.*

    - This recommendation was originally presented to DOI/BSEE in a letter dated May 17, 2012. The enclosed white paper is intended to amplify and clarify this recommendation by providing additional details on motivation and background, issues to be addressed at the workshop, integration with other activities, and bibliography of relevant reports.

With respect to spill prevention (reference material found in Enclosures 3-4):

- *DOI should recommend that Department of Energy (DOE) collaborate with private industry to develop improved early kick detection systems which would increase the probability of responding to a well kick with minimal volume influx.*

- *BSEE should facilitate a joint industry project (JIP) to develop technologies to enable continuous monitoring of well-bore integrity throughout the full depth extent of a well using real-time telemetry of temperature, pressure, acoustic, and other signals.*

- *DOI/BSEE should facilitate a JIP with industry participants and academia to develop enhanced shearing technologies to completely cut drill pipe, tool joints, and casing strings, and to assure that the blind shear rams installed in the blowout preventer (BOP) stack are capable of shearing the pipe and/or sealing the wellbore under maximum anticipated pressures. The JIP should also consider unconventional severance and/or shut-in technologies.*

- *BSEE should initiate a discussion with BOP manufacturers, operators, and drilling contractors to define the current state and future needs for technology in BOP instrumentation, monitoring, and data recording. BSEE should facilitate a JIP to fill any identified gaps.*

- *DOI should recommend that DOE sponsor research on the viability of acoustic activation of BOPs and other submerged well-control equipment in the deepwater (DW) Gulf of Mexico (GOM). Further, the research should include the feasibility and viability of integrating the use of acoustics with independent/secondary BOP stacks (short stacks) similar to the capping stack. This could serve as a totally redundant and robust backup/emergency BOP stack.*

- *Work is being carried out through the American Petroleum Institute Standards process to standardize remotely operated vehicles (ROV) connection ports for all subsea BOP stacks in the U.S. Outer Continental Shelf (OCS) and develop ROV pump capabilities to achieve closing time and volume requirements for all critical functions that meet or exceed current standards. BSEE should monitor these activities, and incorporate these standards into regulations as appropriate.*

With respect to spill response (reference material found in Enclosures 5-9):

- *That DOI support continued and dedicated research and development (R&D) funding from the Oil Spill Liability Trust Fund as a Department priority to support oil spill response research, including the National Oil Spill Response Research and Renewable Energy Test Facility (Ohmsett). DOI should maintain the Ohmsett facility under direction of BSEE's Oil Spill Response Division. Additionally, BSEE should work with the Department to secure long-term research funding, develop a R&D strategic plan to address various OCS operating conditions including those encountered in deepwater and in the Arctic, and upgrade the Ohmsett facility to support testing of new and improved oil spill response technologies.*

- *That DOI support the Interagency Coordinating Committee on Oil Pollution Research (ICCOPR) as the Federal coordinating body for oil spill research. BSEE should keep ICCOPR apprised of oil spill response R&D as intended under Oil Pollution Act of 1990 (OPA 90) as the primary means to leverage the efforts of other Federal agencies engaged in similar research affecting offshore oil spill response.*

BSEE should also coordinate with ICCOPR to facilitate and better incorporate the knowledge from state and local agencies, academia, and industry into oil spill response R&D projects.

- *The United States Geological Survey (USGS) is not a member of ICCOPR, but has research programs and interests relevant to the activities of this committee. It is recommended that USGS attend ICCOPR meetings and if supported by DOI apply to the committee for ad hoc or permanent membership.*

- *BSEE should continue to work with its interagency partners to develop a process to evaluate selected oil spill response equipment and tactics under realistic conditions and utilize this information to inform planning tools and requirements, and regulatory changes. Complementing this effort would include completing the BSEE/U.S. Coast Guard (USCG) co-funded study on improving the planning standards for mechanical recovery equipment (i.e., the effective daily recovery capacity, or EDRC), and publishing new regulations that implement improved standards by BSEE and USCG. These improved standards would: 1) provide a more realistic measure of a skimming system's potential to recover oil, and 2) improve the effectiveness of removal equipment by providing credit for innovations that result in greater oil recovery in planned offshore spill conditions.*

- *DOI should explore the use of periodically reviewed performance-based standards to spur innovation in oil spill response technology and ensure utilization of best available technology. BSEE should consult with industry and interagency stakeholders during development of such standards.*

- *BSEE, within its responsibility, should continue to play a strong role in conducting and/or supporting oil spill response research and technology development, both nationally and internationally. This pertains to all aspects of oil spill planning, preparedness and response related to offshore exploration, production, and development, and includes technology R&D related to mechanical recovery equipment and systems, in-situ burning, dispersants, cold weather and ice response, remote sensing technologies, etc.*

- *In compliance with statutory and permitting requirements, BSEE should work with federal partners and relevant authorities to encourage and facilitate controlled experimental releases of oil that benefit offshore spill response R&D and equipment testing. This would include coordination with regional response teams (RRTs) in the proposed areas of release. BSEE should also consider the possibility of international cooperation in this area, as the U.S. has participated and been invited to participate in controlled experimental releases in other countries such as Norway.*

- *BSEE should evaluate the need for Arctic oil spill equipment deployment exercise(s) prior to beginning drilling operations.*

- *That DOI continue its participation with groups listed in Enclosure 8. For groups in which BSEE is currently the lead for DOI, BSEE's Oil Spill Program should be the focal point for this participation.*

- *Because of their trustee role the U.S. Fish and Wildlife Service (USFWS) usually represents DOI at the RRT. USFWS should ensure that the views and mandates of BSEE and the other DOI Bureaus are represented adequately during all RRT discussions. This is especially important in areas such as cascading of response equipment, offshore logistics, use of subsurface dispersants, containment and protection strategies, as other DOI Bureaus such as BSEE, Bureau of Ocean Energy Management, National Park Service, USGS and Bureau of Indian Affairs manage federal land, determine lease sites, approve oil spill response plans and bring significant experience and expertise to spill response.*

- *That DOI and its Bureaus continue to monitor activities of the international organizations in which they are currently engaged (Enclosure 8), especially in the Arctic to ensure that BSEE's regulations and policy related to planning, preparedness and response can adapt to new information that will be obtained as Arctic oil exploration increases around the world. BSEE Oil Spill Response Division should be the focal point for this participation.*

- *That DOI determine the best way to pass information between Bureaus on spill response planning and preparedness. The DOI Emergency Operations Center and Emergency Management Council fill critical roles in preparing for and responding to spills at a high level, but do not provide the detailed, ongoing information exchange between Bureaus that is necessary to take maximum advantage of DOI expertise and activities in spill response planning and preparedness. Two possible means for implementing this increased communication are:*

    - *DOI identify an "oil spill group" consisting of one person per Bureau or Office who would serve as the single point of contact to represent that agency. These representatives would be responsible for receiving and passing information related to spill response expertise and activities either through an identified DOI representative (e.g., from BSEE's Oil Spill Response Program) or as part of regular meetings (e.g., a subcommittee to the Emergency Management Council, using face-to-face or electronic meetings). This person would not have to be the subject matter expert for all activities related to oil spills, but would be responsible for bringing the appropriate assets of their Bureau to oil spill planning, preparedness, response and restoration.*

    - *Develop a virtual "oil spill forum" that would include individuals throughout DOI with an interest and responsibility in spill response. Through such an interactive on-line forum, members could post information and exchange ideas related to spill-related expertise and activities.*

With respect to safety management systems (reference material found in Enclosures 10-12):

- *DOI/BSEE should put greater emphasis on measuring the health of the safety culture by requiring the reporting of safety performance indicators.*

    - *BSEE should work with other regulators, industry, academia, and non-governmental organizations to define appropriate safety performance indicators.*

    - *Center for Offshore Safety (COS) has an ongoing effort to identify safety performance indicators, initially for the DW GOM. BSEE should look into this work.*

    - *BSEE should also review similar international initiatives (e.g. from International Association of Oil and Gas Producers, International Regulators Forum, Petroleum Safety Authority, etc.)*

    - *BSEE should consider using the COS to analyze and maintain the data.*

    - *If BSEE elects to receive the safety performance indicator information, it could be used to direct BSEE-initiated inspections and audits, but should neither be made public in its raw form, nor used to punish individuals or organizations.*

    - *BSEE should develop a system to make this information public in a neutral format (i.e. non company specific)*

- *BSEE should develop and implement a submittal and approval process for leaseholder Safety and Environmental Management Systems (SEMS) programs. In addressing this recommendation BSEE should (a) implement this requirement over a period of time to obtain the necessary resources, and (b) consider the dynamic nature of a leaseholder SEMS program, and recognizing that this program changes, develop an adequate approval process for program amendments.*

- *BSEE should review inspection/audit practices carried out by other countries and other industries, as well as the team based approach in BSEE's Focus Facility Reviews and the California State Lands Commission facility evaluations and revise their approach to audit and inspection. In developing this revised approach, BSEE should consider the recommendations of the National Research Council report "Evaluating the Effectiveness of Offshore Safety and Environmental Management Systems."*

- *The proposed SEMS II rule requires the use of independent third party SEMS auditors. BSEE should revise this requirement and allow leaseholders to (a) perform qualified, independent internal auditing and/or (b) use a third party auditor.*

- *BSEE should utilize the OESC and any successor federal advisory committee as a resource for input and early stakeholder feedback on important BSEE issues and initiatives. This includes regulatory development, use of industry standards, policies and procedures, and research-related decisions. BSEE should ask OESC to provide recommendations on specific issues of concern to the Bureau.*

With respect to the Arctic:

- *BSEE regulations as written do not address all the unique Arctic operating conditions. To ensure common standards for Arctic OCS exploration and production, the Committee recommends that DOI develop Arctic specific regulations and/or incorporate standards for prevention, safety, containment and response preparedness in the Arctic OCS.*

In addition to the submission of these 25 recommendations, the Committee recommended the creation of additional subcommittees to focus on two critical areas. In response, BSEE Designated Federal Officer Joe Levine approved the creation of subcommittees in the following areas:

- Evaluation of the Arctic
  This subcommittee will formulate all information from the subcommittees for a formal set of recommendations on the Arctic.

- Evaluation of the Ocean Energy Safety Institute (OESI)
  This subcommittee will evaluate the efforts of the original four subcommittees and develop a consolidated recommendation on establishing the OESI to be considered by the Committee at out next meeting.

The Committee will summarize all its activities and recommendations in its summary report together with indications of priorities and supporting documentation. This report will be compiled and reviewed at the Committee's January 2013 meeting.

We look forward to your response on these formal recommendations and any other input you may have for the Committee at your earliest convenience.

Sincerely,

Dr. Thomas O. Hunter
Chairman
Ocean Energy safety Advisory Committee

Enclosures

Enclosure 1

Ocean Energy Safety Advisory Committee, August 29, 2012

Recommendation:
Workshop on Organizational and Systems Readiness for Containment Response – Supplemental Information

The source control response to the Deepwater Horizon (DWH) blowout involved an unprecedented level of interaction and coordination among scientists, engineers and emergency response officials from the public and private sectors. This required bringing together the appropriate expertise from government, industry and academia and establishing protocols for information sharing, industry/government interactions and decision making.

The opportunity exists now to capture the organizational and system readiness lessons learned from source control efforts during the DWH blowout, to be prepared to respond more efficiently to future spills. This opportunity must be exercised soon, as memories of issues, events and interactions during this response are rapidly fading. This process should also include review of the numerous reports that have been prepared documenting the DWH source control efforts.

DOI/BSEE, in consultation with other federal agencies, should immediately commission the development of a workshop to debrief government, industry and academic personnel involved in the DWH source control efforts to discuss lessons learned and chart a path forward in responding to future oil spills.

Background Information:

Following the Deepwater Horizon spill, there has been a significant effort by industry and government to improve the Nation's subsea containment capacity. Lease holders are now required to address how they will conduct effective and early intervention in the event of a blowout as part of the permitting process. This requirement has spurred the establishment of industry cooperatives that provide the hardware and expertise needed to cap a subsea well.

In addition to the hardware, it is equally important that the industry and government maintain and exercise the capability and capacity necessary to effect containment operations. During the Deepwater Horizon spill response, it was apparent that a high degree of skill was needed to plan and execute source control operations. To sustain these complex operations that run 24/7, potentially for weeks on end, a significant pool of these skilled personnel is needed. Additionally, the complexity of the Deepwater Horizon source control operations underscored the need to bring together expertise from across government and industry to provide timely and effective command, control and oversight of source control operations. The skills and experience necessary to respond to a major incident offshore necessarily come from many companies, including the operator, other upstream operating companies, service companies, and consultants, as well as several government agencies. The number of organizations involved, and their relative contributions will depend to a great extent on the internal capabilities of the lease operator. As part of a preparedness regime, these capabilities and capacities need to be identified upfront and tested periodically to ensure they are effective when needed. A great deal of work was done

assessing organizational and system readiness in the aftermath of the Deepwater Horizon incident and several reports were issued by industry, government and academia; a list of these reports is appended to this note for reference.

To review lessons learned from the Deepwater Horizon blowout and be better prepared in the event of a major offshore spill, it is recommended that a workshop be held to debrief government, industry and academic people involved in Macondo source control efforts, discuss lessons learned and chart a path forward. The focus of the workshop would be on source control only, since organizations responsible for response (e.g., USCG) are already well organized. Argonne National Lab would be effective facilitator for such a workshop, as they were for the 2011 Deepwater Galveston workshop. The main needs and issues to address at this workshop are:

- Managing infrastructure and capacity to ensure timely and effective command, control and oversight of source control operations,
- Identifying expertise needed and relevant people ahead of time
- Deployment of critical technical experts where decisions are being made with others engaged remotely to run models, provide advice, etc.
- Assigning leadership and responsibilities
- Facilitating information flow for timely and open exchange of data and ideas, allowing time for in-depth analysis and discussion of alternatives with minimum disruption to ongoing operations
- Facilitating and managing on-site interactions between scientists and engineers, both informally and through meetings
- Selection and management of external scientific and technical advisors

This debrief of source control efforts from Deepwater Horizon is not intended as a stand-alone exercise. Recognizing that time has passed and additional work has been initiated, this workshop, which is intended to capture past learnings, will be undertaken in concert with recent exercises as well as ongoing and future activities within BSEE to identify best practices in source control that can be applied in any future incidents.

Ideally, this workshop would be held in 2013, with a report by the end of year. The cost of the workshop is estimated to be on the order of $100 K.

Organizational and systems readiness for containment response - Preliminary List of References in support of the Recommendation for a Workshop on for lessons learned from Deepwater Horizon, Revised April 2012

The Incident Specific Preparedness Review, January 2011, (http://www.uscg.mil/foia/docs/DWH/BPDWH.pdf)

The National Incident Commander's Report: MC252 Deepwater Horizon, October 2010, (http://www.nrt.org/production/NRT/NRTWeb.nsf/AllAttachmentsByTitle/SA-1065NICReport/$File/Binder1.pdf?OpenElement)

On Scene Coordinator Report: Deepwater Horizon Oil Spill, September 2011, (http://www.uscg.mil/foia/docs/DWH/FOSC_DWH_Report.pdf)

"Deepwater: The Gulf Oil Disaster and the Future of Offshore Drilling", Report to the President, National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, January 2011 (http://www.oilspillcommission.gov/sites/default/files/documents/DEEPWATER_ReporttothePresident_FINAL.pdf)

"Decision-Making within the Unified Command", Staff Working Paper No. 2, National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, January 2011 (http://www.oilspillcommission.gov/sites/default/files/documents/Updated%20Unified%20Command%20Working%20Paper.pdf)

"Stopping the Spill: The Five-Month Effort to Kill the Macondo Well", Staff Working Paper No. 6, National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, January 2011 (http://www.oilspillcommission.gov/sites/default/files/documents/Updated%20Containment%20Working%20Paper.pdf)

"Macondo: The Gulf Oil Disaster", Chief Counsel's Report, National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, February 2011 (http://www.oilspillcommission.gov/sites/default/files/documents/C21462-407_CCR_for_print_0.pdf)

"Deepwater Horizon Containment and Response: Harnessing Capabilities and Lessons Learned", BP, September 2010 (http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/incident_response/STAGING/local_assets/downloads_pdfs/Deepwater_Horizon_Containment_Response.pdf)

Organizational and systems readiness for containment response - Preliminary List of References in support of the Recommendation for a Workshop on for lessons learned from Deepwater Horizon, Revised April 2012 (continued)

The National Oil and Hazardous Substances Pollution Contingency Plan, 40 Code of Federal Regulations, Part 300
(http://www.gpo.gov/nara/cfr/waisidx_00/40cfr300_00.html)

Homeland Security Presidential Directive 5: Management of Domestic Incidents, February 2003
(http://www.dhs.gov/xabout/laws/gc_1214592333605.shtm#1)

The National Incident Management System, December 2008
(http://www.fema.gov/pdf/emergency/nims/NIMS_core.pdf)

The National Response Framework, January 2008
(http://www.fema.gov/pdf/emergency/nrf/nrf-core.pdf)

"Lessons Learned from the Perspective of the DOE Tri-Labs Team Deepwater Horizon Response Effort", September 16, 2010
(Document approved for public release, copy provided by Sandia National Labs.)

Enclosure 2

Lessons Learned from the Perspective of the DOE Tri-Labs Team

Deepwater Horizon Response Effort

Executive Summary

The nation's ability to respond effectively to energy emergencies was tested during the Deepwater Horizon collapse and resulting release of hydrocarbons into the Gulf of Mexico. As viewed by the DOE tri-labs team, successes during the response included the following: rapid, innovative hardware deployment; good government and industry cooperation; and good access to real time information about the response efforts. Two suggestions for improving future response efforts are: 1) establish earlier coordination among government resources deployed to the crises center, and, 2) improve access to industry expertise, especially related to operational constraints. In regard to this subsea oil emergency, the limited knowledge about the physical configuration and state of health of the system following the incident was an impediment to the response effort.

Background

At the request of the Secretary of Energy, representatives from Lawrence Livermore National Laboratory (LLNL), Los Alamos National Laboratory (LANL), and Sandia National Laboratories (SNL) reported to BP's Crises center on May 1, 2010 to support the incident management team (IMT) based in Houston, Texas. The focus the laboratories' effort was to support BP's IMT in stopping the flow of oil from the Macondo Well following the tragic accident on April 20 and subsequent collapse of the Deepwater Horizon rig on April 22. This document lists the lessons learned from 137 days (01 May through 14 Sept) of full-time engagement by the DOE national laboratories team, referred to in this document as the tri-labs team. Lessons include successful, positive elements as well as areas for improvement, should such an endeavor be required in the future. Three categories of lessons learned are included: 1) those pertaining to energy emergency response by the country, particularly related to the oil infrastructure; 2) aspects associated with interactions between governmental agencies and interactions between the DOE and BP during the response; and, 3) issues internal to DOE and the tri-labs team during the response effort.

Energy Emergency Response

Successes

- The ability of the industry (BP and their industry partners/suppliers) to innovate by designing, testing and installing hardware quickly in a very challenging physical environment contributed positively to the response effort. Examples where this was evident include the following: hydrocarbon collection devices (riser insertion tool and top hats); structural reinforcements (kink clamp, stack bracing jacks); well closure devices (caps, flange connector spool assembly); and drilling tools (active ranging while drilling tool).
- The ability to mobilize DOE's technical capabilities to support the analytical needs of the IMT was beneficial to the response effort. Examples include: estimating maximum well shut in pressures; examining annular or central flow indicators; reviewing the mechanical design/integrity of "first of a kind" hardware (e.g. the capping stack); and calculating the structural integrity of the riser kink. Providing access to an independent group of analysts to examine flow scenarios in a "rapid turn-around" mode was useful in informing decisions related to the first Top Kill attempt.

Areas for Improvement

- The lack of understanding of the subsea oil business by the laboratories was detrimental to the response effort. Throughout the early days of the response, significant time was spent examining ideas that likely would have been successful if the constraint of deep ocean operations was relaxed, or if several months of bench data could be collected, or if dozens of ROVs could be devoted singularly to the proposed task for weeks, etc. Given the extensive operations experience of oil industry and associated service providers, the establishment of an industry-based technical advisory group could have provided the government access to the most relevant *operational* experience. The ability of the tri-labs team to call upon industry experts was limited. Requests for industry involvement were on short notice and at times precluded proper context setting or preparatory material distribution. An example of how an industry advisory group could add value in future situations is as a review board to help prioritize ideas suggested by interested parties based on operational applicability.
- The slow development of integration of the tri-lab effort with other government organizations was detrimental to the response effort. Direct and purposeful interactions with the USGS, USCG and BOEM did not begin until around the time of the Static Kill Operation. The initial interactions were largely ad hoc in nature and were built through relationships established at the crisis center. Earlier interaction between the government agencies, both at the "headquarters" level and in the field (in Houston) might have improved the effectiveness of the government team.
- The lack of understanding of how all elements of the subsea oil enterprise (physical, regulatory, human, information/communications) operate in "off-normal" situations may have slowed the response effort. Examining these systems from an integrated perspective might illuminate gaps in the nation's ability to meet a combination of safety, security and reliability requirements. A consortium might use this approach to first look at BOPs since physical, regulatory, software/communications and human factors all impact the performance of BOPs.

- The ability of the community (industry and government) to know the physical configuration and state of health of subsea systems severely limited the effectiveness of response efforts. Several examples include the following: the position and integrity of the BOP components and locking devices; the pressure and flowing volume of oil from the well; the position of the hanger seal assembly; and the content of the riser above the stack. Uncertainties about the system slowed decision making and required several response paths (and hardware options) to be pursued in parallel.

Government and BP Interactions

Successes

- The provision of dedicated on-site support in the crisis center was critical to the functioning of the tri-labs team. Assignment of technical personnel to liaise with the team was invaluable. In addition, information technology support, administrative liaisons, office supplies, copying, printing, medical support, meals, and office/meeting space were provided and aided the activities of the team. Professional respect and concerns for the safety, health, and productivity of tri-labs personnel were consistently expressed throughout the response effort.
- Full and real-time access to information and personnel by the tri-labs team was essential and extremely helpful for the response effort. Engineering liaisons assigned to support the tri-labs team were knowledgeable, proactive, and available.
- Inclusion of tri-labs representative in engineering meetings, operations meetings, and daily updates to cabinet-level officials assisted with information flow and responsiveness.
- The position of an executive leader from the laboratories who served as a liaison between the government and BP leadership was helpful to the response effort. In particular, this person clearly identified decisions, provided a venue for various perspectives to be heard, then articulated decisions and/or outstanding disagreements. This person also identified actions required for resolving disagreements.
- As noted above, the slow development of integration of the tri-lab effort with other government organizations was detrimental to the response effort. This was largely corrected in the August timeframe when the USCG leadership began coordinating efforts among the government entities located in Houston, thus providing a more effective "whole of government" approach consistent with the National Incident Command model.

Areas for Improvement

- The vast knowledge of the science team was helpful in proposing scientific hypotheses and experiments, yet it was difficult to separate ideas that were interesting and potentially implementable from those that were not. Investigation of all ideas required tremendous resources (of both the government and BP) to respond, and resulted in unnecessarily strained

relations between lab personnel & BP. The development of the aforementioned industry advisory group could have helped inform the science team such that they could serve as an even more effective advisor to the DOE.

- The informal assembly of industry experts to help inform decisions by the government generated concerns about the independence of such a group due to the competitive nature of the industry. See above for suggestions regarding the establishment of an industry advisory group earlier in the response effort.
- Understanding that government discussions were often needed to occur without BP present, the absence of BP representatives in the decision making process often left questions unanswered and, at times, caused delays and confusion in the transmittal of accurate information to the interested government stakeholders. It is not clear how to improve in this area.

Internal to DOE and Labs

Successes

- The common goal of stopping the flow of oil served as a strong motivator for the three laboratories working together as a unified team.
- The mobilization of an executive leader from the laboratories was helpful to the response effort. This individual integrated the efforts of the three Labs and served as the DOE point of contact for the Science advisors and the tri-lab team with the Secretary of Energy.
- The ability of Houston-based labs representatives to reach back to labs for technical support was helpful to the response effort; however, delivery of results at times was slower than desired.
- The addition of an on-site project/administrative support person from the labs for the tri-labs team in early June improved the effectiveness of the team.
- Establishment of an External Collaborative Network based SharePoint site for the tri-labs team and science advisors was useful given the large volume of information being shared.

Areas for Improvement

- Staffing the tri-labs team was challenging. Finding people with the right expertise and the ability to dedicate themselves full time (plus nights and weekends) for 5 months was one challenge. The desire to add new team members (partly to relieve people and cover the diverse technical areas) was advocated by some, but given the urgency of the team's deliverables, it was frustrating to take the time necessary to bring new people up to speed. Establishment of a core team assigned for the duration of the event is suggested as an advantage over rotating in new people throughout the response effort.
- Clarity of charter (including purpose, roles, responsibilities, authorities, resource requirements, exit strategy) of the tri-labs team and the DOE science advisors would have been helpful for all parties. The establishment of clear DOE-BP or government-BP information sharing protocols or

agreements consistent with the charter would have eliminated confusion as to what information could be shared. Improved clarity of purpose may have increased the effectiveness of the science calls and the effectiveness of communications between Houston and DOE headquarters.

- Implementation of a prioritization system for the tri-labs team to ensure most relevant and important issues received the necessary attention and tangential efforts did not overwhelm the resources would have been helpful. Establishing a quantitative ranking system for requests dependent on the most pressing issue at hand and the potential impact might have been useful.
- Clarity of legal guidance to the labs and the need for retention of all relevant documentation could have been improved.
- Clarity of the authorization and funding process with the appropriate contracting officer direction in place for the DOE M&O contractors to respond to a National Emergency Event.
- Having a better understanding by tri-labs team members of the USG National Incident Command process and DOE's role in the NIC structure would have been useful. It would also have been helpful for the tri-labs team members to better understand the charter of the Energy Department's science team along with a description of the roles, responsibilities and authorities of same.
- Engagement of DOE's energy emergency response personnel and infrastructure might have been helpful. Previously established decision authorities, communications channels and information sharing agreement protocols during energy emergencies might have been leveraged in this situation.

Enclosure 3

20 August 2012

MEMORANDUM

TO: THOMAS HUNTER
CHAIRMAN
OCEAN ENERGY SAFETY COMMITTEE (OESC)

FROM: SPILL PREVENTION SUBCOMMITTEE (SPS)

SUBJECT: Interim R&D recommendations from the SPS

The SPS is presenting the attached set of recommended interim findings and recommendations to the OESC for consideration and deliberation. The SPC recommends that these findings and recommendations, if accepted by the OESC, be submitted by the OESC to Secretary Salazar and Director Watson.

Attached Please find:

- A proposed letter from the OESC to Secretary Salazar and Director Watson, summarizing the spill prevention R&D findings and recommendations of the OESC.
- Draft Spill prevention subcommittee report of findings and recommendations, providing greater detail and support. This is a draft of the R&D vector chapter of the report which the SPS will present to the OESC in December.

During the OESC meeting in Anchorage on 29-38 August 2012 the SPS will lead a discussion on this topic in which the OESC will be invited to deliberate the findings and recommendations and vote on their adoption.

Attachments:

Draft letter from OESC to Secretary Salazar and Director Watson on spill prevention R&D findings and recommendations.

Draft Spill Prevention Subcommittee Report of Findings and Recommendations

Enclosure 4

To: Hon Ken Salazar
Secretary of the Interior

James Watson
Director, Bureau of Safety and Environmental Enforcement
Department of the Interior

From: Ocean Energy Safety Advisory Committee (OESC)

Subject: Spill Prevention Research and Development (R&D) Recommendations for DOI consideration and action

Date: August 30, 2012

Background:

The prudent, safe development of our Nation's offshore oil and gas resources will continue to be a key element in promoting economic development and energy security. Preventing catastrophic accidents offshore is the most important factor in maximizing the value of this resource. This will require a coordinated, cooperative partnership between government, industry, and academia.

Offshore exploration and production is a technology-driven enterprise that is dependent upon high quality information and data. Technical advances are allowing producers to find and develop oil and natural gas in increasingly challenging environments. Regulators need to ensure that research is conducted to appropriately identify and quantify the risks of these increasingly sophisticated operations, as well as develop new technical solutions to mitigate those risks. A successful approach will build on the core competencies of the Federal agencies and leverage the technical capabilities of the private sector.

The private sector has responded to the Macondo accident in many ways - creating joint industry task forces to address technical issues identified in the various Macondo investigations, committing capital and expertise to spill containment organizations like the Helix Well Containment Group and the Marine Well Containment Company, and establishing the Center for Offshore Safety, an industry sponsored organization focused initially on offshore deepwater safety. While still in its early stages, the Center will serve the U.S. offshore oil and gas industry by ensuring continuous improvements in safe and environmentally responsible offshore drilling, completions, and operations through leadership, communication, teamwork, utilization of disciplined management systems, and independent third-party auditing and certification.

There has also been a shift in R&D topics within Federal agencies, with recent activities focusing on assessing and reducing the risks and potential safety and environmental impacts of exploration and production operations. The Department of the Interior (DOI) has appropriated

funding for applied research related to operational safety and pollution prevention. The Department of Energy (DOE) has refocused its offshore R&D program towards greater emphasis on safety and environmental sustainability.

Findings:

As deepwater[1] drilling challenges grow increasingly complex, government, industry, and academia must provide new technological solutions to address these complexities and enhance spill prevention measures. These solutions can be either new tools or new operating models/concepts that, when properly implemented, mitigate the risks of a significant oil spill incident. Also important are technological challenges associated with shallow-water offshore drilling and production in environmentally sensitive frontier areas, such as the Arctic.[2]

The OESC rank-ordered the technology needed to prevent spills. The Committee reviewed the numerous reports that were completed in the wake of the Macondo accident.[3] The Committee also reviewed the results and conclusions of a risk analysis project commissioned by the DOE and conducted by the Los Alamos National Laboratory, and reviewed recommendations from the Secretary of Energy's Ultra-Deepwater Advisory Committee related to the DOE's ultra-deepwater research program.

The Committee concluded that the following six research areas are of the highest priority for achieving the goals of preventing oil spills in deepwater, listed in priority order (highest to lowest). Further details can be found in the draft Vector 1 Chapter of the Spill Prevention Subcommittee Report of Findings and Recommendations, which is included as an addendum to this memorandum.

1. ***Early kick detection***: Improved Instrumentation for Early Kick Detection to increase the probability of responding to a well kick with minimal volume influx. The earlier the kick is detected, the more options are available for addressing the problem before it becomes an emergency situation. Along with improvements to surface kick detection and smart alarm systems, further use of look-ahead seismic profiling to update pore pressure models and real-time downhole kick indicator data such as pressure at the bit, hydrocarbon inflow detection, and dynamic fluid densities enabled by high-rate transmission technologies will significantly improve the industry's ability to detect and rapidly respond to well kicks. In addition, there are existing technologies like managed pressure drilling (MPD) that can help minimize the size of any influx. There is room to improve upon MPD equipment design to make it more applicable to floating drilling operations.
2. ***Wellbore Monitoring***: Continuous monitoring of wellbore integrity to avoid hydrocarbon releases during normal operations, and, especially, during upset conditions when, for

[1] Defined as drilling in water depths of 1,000 feet or greater

[2] Arctic operations are complicated by harsh environmental challenges, to include seasonal ice flows, severe temperatures and remote locations.

[3] The Subcommittee reviewed the National Oil Spill Commission Report to the President, the National Oil Spill Commission Chief Council Report, the coast Guard Response Report and National Preparedness Report, the API Joint Industry Task Force report, the BOEMRE/Coast Guard Joint Investigation, the National Academy of Engineers report, and the DNV report on the blowout preventer

example, the blowout preventer is activated. Wellbore system integrity requires that there is no flow from the seafloor mechanical system, such as the BOP stack, wellhead housing, casing hangers or seals and lock-downs; between nested casing strings or directly through casing into surrounding formations; or along the cement sheath. The most critical data in assessing wellbore integrity are the pressures between the various casing strings landed and sealed in the wellhead housing, although distributed temperature, pressure and acoustic sensing (e.g., using fiber optic arrays) is also important.

3. ***Shearing***: Enhanced shearing capacity and nonconventional shearing to assure that the blind shear rams installed in the blowout preventer stack are capable of shearing the drill pipe under any pipe loading condition and at maximum anticipated pressures and sealing the wellbore. Also needed are secondary severance technologies such as lasers or explosive systems, which can cut the drill pipe and in some cases seal the borehole in case the BOP fails.
4. ***Blowout Preventer (BOP) Monitoring***: Real-time BOP monitoring to make informed decisions about maintenance or mitigation strategies during routine (non-emergency) operations; regarding secondary interventions during upset or emergency conditions; and decisions regarding spill response and containment strategies. This monitoring system would include information about whether or not the BOP has sealed against flow, position of the various rams, and rate of flow through the BOP in the event of a blowout. This information should be available whether or not the rig is still connected to the well.
5. ***Acoustic Activation***: Development of acoustic sources/sensors and actuators to remotely activate the BOP and other submerged well-control equipment during emergency situations when the rig is disconnected from the well or other modes of activation have failed.
6. ***BOP/ROV interface***: Development of standards for BOP/Remotely Operated Vehicle (ROV) interfaces and increased pump capabilities in order to provide an alternate method for BOP activation should a blowout occur and the BOP fail to close and contain it. This alternative depends upon a standard interface between the BOP and ROV for all equipment being used in the U.S. Outer Continental Shelf (OCS).

Recommendations:

The OESC has identified a number of steps that should be taken to address the gaps revealed in the findings, above. Some of these actions can be addressed directly by DOI by instructing the Bureau of Safety and Environmental Enforcement (BSEE) to act. Others will require DOI to collaborate with other Federal agencies, industry participants, or other entities:

1. *DOE should collaborate with private industry to develop an improved early kick detection system which would increase the probability of responding to a well kick with minimal volume influx.*

   As a first step, the National Energy Technology Laboratory should provide DOI with an update on current and future technology development plans for real-time kick detection and pore-pressure prediction using improved sensors in concert with high-rate data

transmission equipment. This review should provide a detailed gap assessment, as well as recommendations on how best to accelerate technology development underway in private industry to overcome these gaps. The OESC then recommends combining the development of an improved kick detection sensor system and a smart alarm system in a joint industry technology development project utilizing appropriate expertise from the National Laboratories, which would fast-track the effort by bringing in additional technical resources and integrating results from test programs on multiple rigs with different equipment trials. Joint public and private funding of recommended R&D is expected.

2. *BSEE should convene a joint industry project (JIP) to develop technologies to enable continuous monitoring of well-bore integrity throughout the full depth extent of a well using real-time telemetry of temperature, pressure, acoustics, and other signals.*

   The monitoring capability should be available both while connected to the well, and from retrievable data recording through a "black box" when disconnected from the well. The JIP team should be comprised of experts from downhole measurement service companies, wellhead and BOP manufacturers, operators, drilling contractors, DOE National Laboratories, academia, and BSEE/DOI. Joint public and private funding is expected with in-kind support from service companies and equipment manufacturers.

3. *Private industry participants should convene* a *JIP to develop enhanced shearing technologies to completely cut drill pipe, tool joints, and casing strings, and to assure that the blind shear rams installed in the BOP stack are capable of shearing the pipe and sealing the wellbore under maximum anticipated pressures.*

   The shearing capacity needs to cut the pipe in both compressed and uncompressed state. This should include better methods to test rams at higher pressures to ensure equipment performance readiness. This work should be funded through participant memberships – independent operators and some state-sponsored oil companies – and through contributor memberships – vendors, engineering firms, and others – who contribute through membership fees and in-kind work. In-kind work would be assigned to the appropriate vendors and suppliers, while the overall project scope would be managed by the JIP.

4. *BSEE should initiate a discussion with BOP manufacturers, operators, and drilling contractors to define the current state and future needs for technology in BOP instrumentation, monitoring, and data recording.*

   Instrumentation is required that will provide continuous data on the position of the rams, status of mechanical components like "locks" and sealing elements, hydraulic control system pressures and volumes, and wellhead temperature and pressure. This data should be available continuously during normal operations, as well as stored in a "blackbox" attached to the BOP and available for download when the rig is not on location. A JIP should then be initiated to fill any gaps identified during this discussion (i.e., that are not the focus of active industry R&D). This research should be funded by oil and gas companies, BSEE/DOI and DOE, with in-kind support from BOP manufacturers.

5. *DOE should sponsor research on the viability of acoustic activation of BOPs and other submerged well-control equipment in the deepwater Gulf of Mexico. Further, the research should include the feasibility and viability of integrating the use of acoustics with independent/secondary BOP stacks (short stacks) similar to the capping stack. This could serve as a totally redundant and robust backup/emergency BOP stack.*

   While this acoustic technology is widely used in the North Sea and the Campos Basin, renewed testing in the Gulf of Mexico would support application of the technology throughout the U.S. Outer Continental Shelf, and may lead to improved system and operational reliability. To enable the industry to commercialize a solution, these government researchers should work closely with oil and gas equipment manufacturers for incorporation into subsea field designs.

6. *Additional work should be carried out through the API Standards process to standardize ROV connection ports for all subsea BOP stacks in the U.S. OCS and develop ROV pump capabilities to achieve closing time and volume requirements for all critical functions that meet or exceed current standards.*

   Since the Macondo incident, the industry has been actively developing and deploying solutions to identified ROV-BOP interfacing challenges. Concurrent with the work of the API 17H, 16D, and S53 committees, the industry has moved forward to respond to the need for interface standardization, increased function testing, and achieving greater flow capacity. Industry, through the support of API and equipment manufacturers, should be responsible for funding of this effort.

Many of the research topics considered above will necessitate a coordinated research effort between industry, government, and academia due to the complexity of the topics and the specialized capabilities that are needed to conduct the research. The general roles and responsibilities of these cooperating entities are outlined below.

- *Department of the Interior*: The BSEE should sponsor near-term R&D that advances current state of the art technologies and the immediate requirements of the regulatory process. The proposed BSEE Ocean Energy Safety Institute could serve as a technical interface between the research community within other Federal agencies, industry and academia and BSEE's regulatory activities. As evidenced in the Macondo response, the United States Geological Survey (USGS) is a valuable scientific resource that will have a role supporting BSEE's research efforts.
- *Department of Energy*: DOE, with the support of DOE National Laboratories, should support longer-term transformational areas of R&D and quantification of risks. In addition, DOE should continue to manage public-private research partnerships that enable the Federal government to leverage expertise in the private sector.
- *Industry*: The private sector will continue to drive continuous improvement both in commercializing increasingly difficult resources and in innovating technological solutions to reducing the risks of these operations. Entities such as the Center for Offshore

Safety, the Marine Well Containment Company, and the Helix Well Containment Group are examples of industry collaborations that will continue to drive technological change. The Federal government should not endeavor to replicate these efforts. It is important, however, that the Federal government builds and maintains sufficient technical expertise to monitor and evaluate a continuously changing playing field in order to ensure that regulations effectively mitigate risks.

- *Academia*: Universities currently play a key role in executing much of the research sponsored by the various Federal agencies. The academic community should continue to serve as a primary resource for ongoing research activities. Additionally, both government and the private sector will rely on the academic community to provide the next generation of scientists and engineers.

Addendum: DRAFT Spill Prevention Subcommittee Report of Findings and Recommendations – Vector 1

Introduction/ Background OESC

The Ocean Energy Safety Advisory Committee (OESC) chartered on February 8, 2011 will advise the Secretary of the Interior, through the Director of the Bureau of Safety and Environmental Enforcement (BSEE), on a variety of issues related to offshore energy safety.

Spill Prevention Subcommittee Members

Chris Smith – DOE
Walter Cruickshank – BOEM
Steve Hickman – USGS
Paul Siegele – Chevron
Charlie Williams – Shell
Don Jacobsen – Noble Corp.
Richard Sears – Stanford
Lois Epstein – The Wilderness Society

Subcommittee Goal and Approach

The Chairman of the Ocean Energy Advisory Safety Committee asked the Spill Prevention Subcommittee to investigate a range of issues pertaining to spill prevention in offshore oil and gas development. The Spill Prevention Subcommittee reviewed the risks of offshore oil and natural gas exploration and production (E&P) activities to evaluate how those risks could be mitigated through development of effective technology and regulatory policy.

To achieve this goal, the Spill Prevention Subcommittee considered the following topics:

- State of existing operations and technology used to prevent blowouts and spills.
- State of the current R&D undertaken by government, industry and academia.
- What needs to be done or should be done to advance this topic area.
- Recommendations on future research

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Detailed Findings and Recommendations

Vector 1: Recommendations to identify research for government, industry, and academia that would bolster research and development for spill prevention

Background

As the challenges grow increasingly more complex for deepwater drilling (1,000 feet and greater), government, industry, and academia should provide new technological solutions to address these complexities and enhance spill prevention measures. These solutions can be either new tools or new operating models that, when properly implemented, mitigate the risks of an oil spill incident.

The Spill Prevention Subcommittee rank-ordered the technology development needs described below using a qualitative assessment of impact to prevent another catastrophic event from happening in U.S. Outer Continental Shelf (OCS) waters. The Committee reviewed the numerous reports that were completed in the wake of the Macondo accident. The Committee also reviewed the results and conclusions of a risk analysis project commissioned by the DOE and conducted by the Los Alamos National Laboratory, and reviewed recommendations from the Secretary of Energy's Ultra-Deepwater Advisory Committee related to the DOE's ultra-deepwater research program.

The findings and recommendations included below are listed in rank order with 1.1 being highest ranked and 1.6 being lowest ranked.

Finding 1.1: Improved Instrumentation for Kick Detection

In addition to currently available mud-pulse telemetry equipment to detect and transmit downhole kick indicators, there is active development of higher data-rate transmitting systems (e.g., wired drillpipe) to significantly improve the speed of detection (see below for discussion). However, surface kick detection equipment and practices have largely gone unchanged over the last two decades.

The traditional approach to kick detection at the surface has been measurement of delta flow at the rig floor (outflow minus inflow.) A key element for successful detection of any kick is adequate rig instrumentation. The delta flow accuracy required to successfully detect a small formation fluid influx, or drilling fluid loss, during the drilling process is well beyond the capability of typical rig equipment. Flow meters with the desired reliability and accuracy exist, but the problem lies with practical application of these sensor technologies and acceptance by the industry. The challenge then is to provide a useful system for measuring delta flow that will be widely accepted and eventually found on every offshore drilling rig. This will require a system with the following characteristics: low impact on the drill rig hardware and instrumentation, low cost, easy installation, and maintenance by personnel that are normally present at the drill site, as well as minimum interference with the return flow.

In current practice, inflow measurements are almost always made on drill rigs by counting mud pump strokes over a period of time and calculating flow rate using volume per stroke and assumed pump efficiency. This method does not have the accuracy or response time desired for a good delta flow

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measurement. The most common means of measuring outflow is the paddle-meter, which measures the height of the flowing mud stream after it exits the wellhead. It is the instrument of choice not because of its ability to measure flow rate, but because it meets the requirements for practical application. In fact, it is often calibrated in percent of full scale deflection and is used more as a relative flow indicator than as an accurate measurement of flow. Some rigs also include a radar FloSho meter to measure return mud flow, which, like the paddle-meter, measures the height of the mud flow in the rig's return flowline. Measurements at very low flow rates using paddle or radar flow meters are often unreliable due to the build-up of solids deposited in the flowline.

An improved method for measuring delta flow for the purpose of detecting kicks is to use an ultrasonic or magnetic flow meter and coupling it to inflow measurements to determine actual delta flow. A third possibility for measuring delta flow is to use a Coriolis flow meter in both the inflow and outflow lines (this meter can also provide mud density and mud temperature measurements). However, ultrasonic, magnetic and Coriolis flow meters require the line they are installed in to be fluid filled, which is not normally the case for the gently sloping return flowline on most drilling rigs.

Another common method of detecting delta flow is by monitoring changes in mud tank volume as measured by pit level meters. While this system provides a measure of the total pit volume gained or lost over a period of time, it does not permit rapid detection or accurate quantification of wellbore production or loss rates, which are essential data for rapid response to kicks or lost circulation.

Along with improvements to surface kick detection, further use of look-ahead seismic profiling to update pore pressure models and real-time downhole kick indicator data such as pressure at the bit, hydrocarbon inflow detection, and dynamic fluid densities enabled by high-rate transmission technologies will significantly improve the industry's ability to detect and rapidly respond to well kicks.

Recommendation 1.1

DOE should collaborate with private industry to develop an improved early kick detection system which would increase the probability of responding to a well kick with minimal volume influx. Technology development projects in this area are currently in progress between operating companies, drilling contractors and service providers; however these are separately managed projects.

As a first step, the National Energy Technology Laboratory should provide DOI with an update on current and future technology development plans for real-time kick detection and pore-pressure prediction using improved sensors in concert with high-rate data transmission equipment. This review should provide a detailed gap assessment, as well as recommendations on how best to accelerate technology development underway in private industry to overcome these gaps. The OESC then recommends combining the development of an improved kick detection sensor and smart alarm system in a joint industry technology development project utilizing appropriate expertise from the National Laboratories, which would fast-track the effort by bringing in additional technical resources and integrating results from test programs on multiple rigs with different equipment trials. Joint public and private funding of recommended R&D is expected.

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The combination of enhanced surface kick detection through improved sensors and smart alarms along with significantly improved acquisition, transmittal and processing of downhole kick indicators and look-ahead seismic imaging for pore pressure prediction will significantly increase the likelihood that a kick will be detected and adequately dealt with in the US OCS.

Finding 1.2: Assessing Integrity of Wellhead Housing, Seals, Casing, and Cement

To prevent the accidental release of oil or gas from a sub-sea well – either during normal operations or when a Blowout Preventer (BOP) or other secondary sealing system is activated and the well is shut in -- the entire engineered well system must have integrity. This requires that there is no flow: 1) from the surface mechanical system, such as the BOP stack, wellhead housing, casing hangers or seals and lock-downs, 2) between nested casing strings or directly through casing into surrounding formations, for example due to hanger seal failure, a casing connection leak, or a hole in the casing, or 3) along the cement sheath, either at the cement/pipe or cement/formation interface. Current technologies in wellhead housings and seals provide little data on integrity, and there is usually no method of measuring pressure in the casing strings that are hung and sealed in the wellhead housing.

Determination of integrity throughout the full depth extent of the well is also critical to devise effective well-containment strategies if well control is lost and a blowout occurs. If the well has maintained its integrity, then a capping stack can be installed to shut-in the well and stop all flow. Alternatively, if well integrity is poor or unknown, then two other well capping approaches can be employed: 1) "cap and flow", which allows the well to be capped but continue to flow to a surface capture system at a controlled rate; or 2) "cap with subsurface pressure relief", where the capping stack is used to fully shut in the well at seafloor but the well is flowing into the formation far below the mud line. In this case, there is sufficient geologic containment to prevent a sea-floor broach (this issue is being addressed by the OESC Spill Containment Subcommittee).

Downhole monitoring of various parameters indicative of sub-sea-floor fluid flow, pressure communication or mechanical failure can be used to assess wellbore integrity, using either discrete transducers or distributed fiber optic sensors installed outside or between casing strings. For example, fiber optic acoustic, temperature, strain and pressure sensors are currently being used to track fluid inflow/outflow zones during open-hole hydraulic stimulations, repeat seismic surveys (e.g., zero offset and walk-away Vertical Seismic Profiles), and monitoring reservoir and casing/cement response to long-term production. Although some off-shore installations have been completed, these "smart-well" technologies have been developed primarily for on-land applications and would need to be adapted for routine installation, remote operation, and data collection on the sea floor.

Recommendation 1.2

BSEE should convene a joint industry project (JIP) to develop technologies to enable continuous monitoring of well-bore integrity throughout the full depth extent of a well using real-time telemetry of temperature, pressure, acoustics, and other signals.

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The most important data in assessing wellbore integrity is pressure between the various casing strings landed and sealed in the wellhead housing. It is particularly important to know the B annulus pressure, which is pressure in the annulus between the last two casing strings that were landed and installed in the wellhead, as an indicator of seal, casing or cement failure. Temperature in this annulus would also be useful to diagnose flow around the upper casing hanger seal. Methods exist or can be readily developed that allow for direct measurement of the B annulus pressure or measurement via embedded sensors in the annulus that communicate acoustically. It would also be useful to monitor this data in real-time via the active BOP system and in a retrievable "black box" mode rather than requiring the presence of an ROV.

Single- or multi-mode optical fibers installed outside or between selected casing strings offer significant advantages over traditional (discrete) sensors by allowing the precise location of a temperature, acoustic or pressure anomaly indicative of a casing/seal leak or fluid flow behind casing. Although installation of such a system is very challenging, this type of distributed sensing technology could also help determine whether or not the cement is acting as a seal between the formation and casing, especially in proximity to the reservoir. In the event that wellbore integrity is lost, direct measurement of fluid loss rates into surrounding geologic formations will probably also require repeat sea-surface seismic profiling and other remote geophysical surveys, as discussed in the OESC Spill Containment Subcommittee report.

The Spill Prevention Subcommittee recommends that technologies be developed to enable continuous monitoring of well-bore integrity throughout the full depth extent of a well, using real-time telemetry of temperature, pressure, acoustics, and perhaps other signals (such as annular flow or fluid chemistry) while connected to the well and retrievable data ("black box") recording when disconnected from the well. The joint industry project should combine expertise from downhole measurement service companies (plus sensor R&D companies from other industries), wellhead and BOP manufacturers, operators, drilling contractors, National Laboratories, academia, and BSEE/DOI. Funding would come from oil and gas companies as well as BSEE/DOI and DOE, with in-kind support from service companies and equipment manufacturers.

Finding 1.3: Enhanced Shearing Capacity and Nonconventional Shearing

With the increased use of stronger and thicker walled tubulars in today's well construction, it is important to develop enhanced shearing technologies to assure that the shear rams installed in the BOP stack are capable of shearing the drill pipe under maximum anticipated pressures. Valve-design and low-force shearing remain the primary method of intervention, and equipment manufacturers are actively working on enhancing the capability of their proprietary designs. The challenge is to develop blind shear rams capable of cutting tool joints, which comprise a significant amount of pipe in a well, and capable of cutting multiple pieces of drill pipe in the BOP.

Assurance is needed that the shear rams are capable of performing their function at full pressure, in any environment and pipe-loading condition. Shearing strength and pipe management during shearing are critical to this assurance. Also needed are alternatives to the shear rams as secondary severance technologies. Some operators are currently working on proprietary designs such as laser technology and

targeted explosive systems, which can cut the pipe and in some cases seal the wellbore in case the BOP fails. This is an opportunity for a joint industry technology development project.

Recommendation 1.3

Private industry participants should convene a JIP to develop enhanced shearing technologies to completely cut drill pipe, tool joints, and casing strings, and to assure that the blind shear rams installed in the BOP stack are capable of shearing the pipe and sealing the wellbore under maximum anticipated pressures. This technology R&D should be informed by risk assessments and mitigation strategies developed under a variety of compressive load situations. Also, better methods should be established to test rams at higher pressures to ensure equipment performance readiness. While there is a large focus on the ability to shear, equal focus and attention to sealing the wellbore – post shear – must be treated as part of all proposed solutions.

This work should be done as a joint industry technology development project focused on advancing the technologies for deepwater E&P and funded through participant memberships – independent operators and some state-sponsored oil companies – and through contributor memberships – vendors, engineering firms, and others – who contribute through membership fees and in-kind work. In-kind work would be assigned to the appropriate vendors and suppliers, while the overall project scope would be managed by the JIP.

Finding 1.4: Real-Time Blowout Preventer Monitoring

In responding to a well control incident it is important to have data on the mechanical status of the BOP (e.g., whether the rams are opened or closed), to inform decisions regarding secondary interventions such as activation of the BOP via remotely operated vehicles or acoustic actuators or application of nonconventional shearing/sealing technologies. Besides data to assess BOP integrity and function, data are also needed on rate of flow through the BOP in the event of a blowout in order to design effective oil containment and collection strategies.

Although BOP manufacturers are actively working on this problem, current BOPs offer little information on the status, position or functionality of key components, nor do they provide accurate information on wellbore pressure and temperature below the BOP stack. Current BOPs do collect data via the control pods that are part of the electro-hydraulic control system, but this data is primarily related to BOP operation. Also, the rig will likely be disconnected from the BOP in an emergency, and the pods will either be gone (in an emergency disconnect the LMRP containing the pods will have disconnected from the BOP stack) or will no longer be in communication with the rig. However, there are ROV access ports on some BOPs that allow gathering of limited temperature and pressure data from the BOP with the rig no longer on location.

Recommendation 1.4

BSEE should initiate a discussion with BOP manufacturers, operators, and drilling contractors to define the current state and future needs for technology in BOP instrumentation, monitoring, and data recording. A joint industry project should then be initiated to fill any gaps identified during this

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discussion (i.e., that are not the focus of active industry R&D), funded by oil and gas companies as well as BSEE/DOI and DOE, with in-kind support from BOP manufacturers.

Development of instrumentation to provide continuous data on position of the rams, status of mechanical components like "locks" and elastomeric sealing elements, hydraulic control system pressures and volumes pumped (including by ROVs), and wellhead temperature and pressure is required. Also needed is flow rate thru the BOP during a blowout. Ideally, these data should be stored in a "blackbox" attached to the BOP and available for download when the rig is not on location. With the exception of flow rate, all other data measurements and data storage and transmission needs should in principle be available via existing technology. However modifying existing BOPs for this is a challenging task. Flow rate might be estimated to an acceptable degree of accuracy from measurements of temperature and pressure at various positions within the BOP stack.

Finding 1.5: Acoustic Sensors/Actuators

In an emergency situation, it may become necessary to remotely activate BOPs and other submerged well-control equipment via acoustic sensors and actuators. Although U.S. regulations enacted in 2003 do not require acoustic triggers, Norway and Brazil require these devices in all offshore drilling operations. While they are not required with rigs operating offshore in the U.K. they are almost standard in U.K. North Sea operations.

The data that exists from research on acoustic triggers in the Gulf of Mexico is outdated. Early problems were generally related to background noise, and although existing devices can operate at ranges exceeding 3 miles (16,000 ft) operations in the Gulf of Mexico at the time this research was conducted were limited to around 2,000 feet. This area is congested with multiple engines, and has abundant sea life (dolphins and whales) - all creating sound waves, which interfere with the acoustic signals. In addition, frequency flux occurs when other devices operate at similar frequencies and cause either interference or accidental triggering.

Currently there are digital acoustic systems available that have a high degree of functionality and reliability over the earlier, non-digital systems.

Recommendation 1.5

DOE should sponsor research on the viability of acoustic activation of BOPs and other submerged well-control equipment in the deepwater Gulf of Mexico. Further, the research should address the feasibility and viability of integrating the use of acoustics with independent/secondary BOP stacks (short stacks) similar to the capping stack. This could serve as a totally redundant and robust backup/emergency BOP stack. While this technology is widely used in the North Sea and the Campos Basin, renewed testing in the Gulf of Mexico would support application of the technology throughout the U.S. OCS and may lead to improved system and operational reliability.

The DOE National Laboratories should lead this research, as they have expertise in sonic controls, sensors, triggers and sonic sensing and some National Labs are already working on other drilling and

well-control solutions. This government research should be funded by DOE. To enable the industry to commercialize a solution, these government researchers should work closely with oil and gas equipment manufacturers for incorporation into subsea field designs.

Finding 1.6: ROV – BOP Interface Standardization and Increased Capacity

When a blow-out occurs and the BOP fails to close and contain it, it may be possible for the BOP to be activated from a remotely-operated vehicle (ROV) by pumping fluid into the ROV access ports. This secondary activation depends on proper sizing of the ROV ports, availability of the seal stab to go into the port, and the pressure and volume pumping capability of the ROV. There is already activity in the industry to address this issue (discussed below). However, because of the difficulty of pumping at high rates and pressures in deep water, the topic of ROV/BOP interface standardization and increased capacity should be further pursued.

Currently there are three primary BOP stack suppliers. Based upon the configuration of the stack, several ROV suppliers can customize the panel interface on the BOP for each installation. Therefore, each installation may be different and often incompatible.

The standardization of connection and intervention ports for all subsea BOP stacks would ensure compatibility with ROV equipment being used in the U.S. OCS. With this standardization in place, any vessel with an ROV that is responding to a well control situation could quickly adapt its ROV to be compatible with the BOP on that well. In addition, improving the flow-rate capacity performance standards would ensure that the ROVs are capable of pumping fluid fast enough to generate the pressure needed to operate rams and unlatch the lower marine riser package (LMRP).

The challenge is to standardize the ROV/BOP interface so that all or most ROVs can service BOP stacks operating in the deepwater US OCS. There is also a need to increase volume capacity of ROV functionality. Current regulations require that: 1) all subsea BOPs have ROV intervention capability, 2) an ROV and a trained ROV crew must be maintained on each floating drilling rig when a BOP is installed and in operation on the wellhead, and 3) all ROV intervention functions on subsea BOPs must be tested to ensure they are capable of actuating, at a minimum, one set of pipe rams and one set of blind-shear rams and unlatching the LMRP.

Recommendation 1.6

Additional work should be carried out through the API Standards process to standardize ROV connection ports for all subsea BOP stacks in the U.S. OCS and develop ROV pump capabilities to achieve closing time and volume requirements for all critical functions that meet or exceed current standards. Industry, through the support of API and equipment manufacturers, should be responsible for funding.

Since the Macondo incident, the industry has been actively developing and deploying solutions to identified ROV-BOP interfacing challenges. Concurrent with the work of the API 17H, 16D, and S53 committees, the industry has moved forward to respond to the need for interface standardization, increased function testing, and achieving greater flow capacity. API Standard 53 has included the following requirements or guidelines, as they relate to these three specific points:

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- Frequency of testing and acceptance criteria for all secondary and emergency systems are provided in the tables included in the document.
- A consistent means of measurement is required across all systems to determine their success or failure.
- The BOP stack must be capable of activating the following critical functions: each shear ram, one pipe ram, ram locks and unlatching of the LMRP connector.
- The BOP stack shall be equipped with ROV intervention equipment, which at a minimum allows execution of the critical functions.
- Hydraulic inputs for all critical functions shall be fitted with API 17H ROV hot-stab receptacles.
- Hydraulic fluid can be supplied by the ROV, stack-mounted accumulators or other external hydraulic power sources. The source of hydraulic fluid shall have the necessary pressure and flow rate to operate these functions at all times. This requirement means that whatever system is used to perform the testing must be available at the rig site at all times during drilling operations.
- If multiple receptacle types are used, a means of positive identification of the receptacle type and function shall be required.

Function Testing: BOP Intervention Skids were developed in response to the need for increased BOP function testing. These skids mount directly underneath any ROV and provide a dedicated fluid supply for BOP function testing. In emergency situations, these skids are able to pump seawater for unlimited volume. These skids are in use around the world.

Flow Capacity: In addition, the industry has developed and deployed multiple variants of sub-sea accumulator modules, dedicated for ROV Intervention. Sub-sea accumulation allows any ROV of opportunity to provide the necessary flow and pressure to close the rams quickly by way of connection to the ROV Intervention Panel on the BOP. Together, high-flow panels, intervention skids, and subsea accumulator modules comprise a complete system for BOP Intervention. Industry continues to develop and deploy these solutions to increase commonality and availability of ROV-accessible, high-flow fluid sources for BOP operation. Deployments will only increase as the work of the API committees draws to a close and industry-wide standards are finalized.

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Enclosure 5

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Report of the Response Subcommittee to the Ocean Energy Safety Advisory Committee
29 August 2012

In April 2012 the Response Subcommittee presented an interim report to the Ocean Energy Safety Advisory Committee (OESC). This report covers the period between that report and August 2012. The subcommittee members who helped prepare this report are listed below:

CAPT John Caplis (USCG)
Don Davis (LSU)
Lois Epstein (The Wilderness Society)
Marilyn Heiman (Pew Trusts)
Steve Hickman (USGS)
*CAPT Patrick Little (USCG)
David Moore (BSEE)
Mathy Stanislaus (EPA)
Peter Velez (Shell Oil)
David Westerholm (NOAA)

*note: CAPT Little was instrumental in the work of this Subcommittee and contributed until recently, when he retired from the Coast Guard

After receiving input on the interim report from the OESC in April 2012, the Response Subcommittee (Subcommittee) convened in June 2012 to finalize the organizing vectors and develop general recommendations. These recommendations were drafted and agreed upon for forwarding from the Subcommittee as recommendations to the OESC. The Subcommittee's three organizing vectors are:

- Facilitate Research and Development of Oil Spill Response Technology
- Oil Spill Risk Assessment, Preparedness, and Response in the Arctic OCS
- Interagency Coordination on Oil Spill Response Issues

Each vector is described below with associated recommendations. These recommendations are being brought forth to the Committee for approval and if approved will be forwarded to the Department of Interior. Additionally each vector has background information that can be found in the Appendices, which amplify the topics, problems and issues associated with the vector, gaps to be addressed and actions and recommendations. These recommendations (below) are worded in the form of a memorandum to Secretary Salazar, to facilitate discussion and voting by the Committee at our August 2012 meeting.

To: Hon Ken Salazar

Secretary of the Interior

From: Ocean Energy Safety Advisory Committee (OESC)

Through: James Watson, Director, Bureau of Safety and Environmental Enforcement

Subject: Oil Spill Response Recommendations for DOI consideration and action

Date: August 30, 2012

Cleaning up offshore spills from oil and gas drilling and production activities will require continuing advances in oil spill response regulations, planning, and technology. To help improve the Nation's ability to effectively respond to these offshore spills, the OESC has developed recommendations organized around three general themes, or vectors. These three organizing vectors are:

- Facilitate Research and Development of Oil Spill Response Technology
- Oil Spill Risk Assessment, Preparedness, and Response in the Arctic OCS
- Interagency Coordination on Oil Spill Response Issues

Each vector is briefly described below with associated recommendations for consideration by the Department of Interior. Additionally each vector has background information that can be found in the indicated Appendices, which amplify the topics, problems and issues associated with the vector, gaps to be addressed and actions and recommendations.

Vector 1: Facilitate Research and Development of Oil Spill Response Technology

The OESC performed an extensive review of existing research and development (R&D) activities related to technologies for oil spill response/cleanup in both government and industry to develop the following set of recommendations (see Appendix 1 for additional details).

Vector 1 - Specific Recommendations

1. That DOI support continued and dedicated R&D funding from the Oil Spill Liability Trust Fund (OSLTF) as a Department priority to support oil spill response research, including the National Oil Spill Response Research and Renewable Energy Test Facility (Ohmsett). DOI should maintain the Ohmsett facility under direction of BSEE's Oil Spill Response Division. Additionally, BSEE should work with the Department to secure long-term research funding, develop a R&D strategic plan to address various OCS operating conditions including those encountered in deepwater and in the Arctic, and upgrade the Ohmsett facility to support testing of new and improved oil spill response technologies.

2. That DOI support the Interagency Coordinating Committee on Oil Pollution Research (ICCOPR) as the Federal coordinating body for oil spill research. BSEE should keep ICCOPR apprised of oil spill response R&D as intended under OPA 90 (rather than as part of the Ocean Energy Safety Institute or other entity) as the primary means to leverage the efforts of other Federal agencies engaged in similar research affecting offshore oil spill response. BSEE should also coordinate with ICCOPR to facilitate and better incorporate the knowledge from state and local agencies, academia, and industry into oil spill response R&D projects.

3. The United States Geological Survey (USGS) is not a member of ICCOPR but has research programs and interests relevant to the activities of this committee. It is recommended that USGS attend ICCOPR meetings and if supported by DOI apply to the committee for ad hoc or permanent membership.

4. BSEE should continue to work with its interagency partners to develop a process to evaluate selected oil spill response equipment and tactics under realistic conditions and utilize this information to inform planning tools and requirements, and regulatory changes. Complementing this effort would include completing the BSEE/USCG co-funded study on improving the planning standards for mechanical recovery equipment (i.e., the effective daily recovery capacity, or ERDC), and publishing new regulations that implement improved standards by BSEE and USCG. These improved standards would: 1) provide a more realistic measure of a skimming system's potential to recover oil, and 2) create incentives to improve the effectiveness of removal equipment by providing credit for innovations that result in greater oil recovery in planned offshore spill conditions.

5. DOI should explore the use of periodically reviewed performance-based standards to spur innovation in oil spill response technology and ensure utilization of best available technology. BSEE should consult with interagency stakeholders during development to ensure consistency of such standards.

6. BSEE should continue to play a strong role in leading and supporting oil spill response research and technology development, both nationally and internationally. This pertains to all aspects of oil spill planning, preparedness and response related to offshore exploration, production, and development, and includes technology R&D related to mechanical recovery equipment and systems, *in-situ* burning, dispersants, cold weather and ice response, remote sensing technologies, etc.

7. In compliance with statutory and permitting requirements, BSEE should work with federal partners and relevant authorities to encourage and facilitate controlled experimental releases of oil that benefit offshore spill response R&D and equipment testing. This would include coordination with RRTs in the proposed areas of release. BSEE should also consider the possibility of international cooperation in this area, as the U.S. has participated and been invited to participate in controlled experimental releases in other countries such as Norway.

Vector 1 - General Recommendation

The Subcommittee will continue to evaluate whether this vector should continue if the OESC is continued by DOI and BSEE. If continued it is recommended that if approved by the OESC and accepted by BSEE, that future meetings occur between the Response Subcommittee and the designated implementation staff of DOI/BSEE, plus the USCG, EPA, NOAA, USFWS and other agencies as needed. These meetings would help focus future recommendations by allowing all groups to discuss methods and opportunities for improved, innovative oil spill response research, testing and training at Ohmsett and elsewhere. The Subcommittee feels strongly that while OESC can bring a diverse set of backgrounds (academia, non-profit, industry and government) that work should not duplicate other entities such as the Spill Advisory Group (SAG) or ICCOPR.

Vector 2 - Oil Spill Risk Assessment, Preparedness, and Response in the Arctic OCS

The OESC did an extensive review of existing studies and reports related to oil spill response in the Arctic and developed the following set of recommendations (see Appendix 2 for additional details).

This Subcommittee originally intended to assess the state-of-the-art in Arctic oil spill risk assessment, preparedness, and response. However, after further review and considering the rapidly evolving nature of oil spill response research and techniques relevant to Arctic waters, the Subcommittee agreed to narrow the scope and focus its recommendations on the regulatory aspects of exploration and production, as described below.

Vector 2 - Specific Recommendations

1. BSEE should evaluate the need for Arctic oil spill equipment deployment exercise(s) prior to beginning operations

2. BSEE should establish a formalized process with a fixed timeline for interagency review of Arctic Oil Spill Response Plans (OSRPs).

3. BSEE and BOEM should work with other agencies and stakeholders to increase their engagement in developing the Arctic Subarea Contingency Plans. BSEE should ensure that Arctic OSRPs are consistent with this Subarea Plan.

4. Once an OSRP is approved, BSEE should make the plan (or parts of the plan) publicly available.

5. BSEE should work with the U.S. Coast Guard, Environmental Protection Agency, Pipeline and Hazardous Materials Safety Administration, and other stakeholders to review the adequacy of the current OSRO (Oil Spill Removal Organization) construct for use in the Arctic environment.

6. BSEE and BOEM should review existing OSRP and permitting regulations, determine their adequacy for U.S. offshore Arctic environments, for exploration and production and revise as appropriate to respond effectively to a worst-case discharge. In particular, the OSRP and permitting regulations and associated approvals should address at least the following elements:

    a. Seasonal drilling limitations that consider the timing and adequacy of oil spill response operations, given available technologies and the type of drilling operation
    b. Prompt deployment of response equipment and adequately trained personnel.
    c. Ice capable equipment appropriate for expected conditions
    d. Adequate strategies and equipment to protect important ecological and subsistence areas

Other Issue

The subcommittee could not come to consensus on the issue of whether BSEE should provide a public review process for Arctic OSRPs prior to approval.

Vector 2 - General Recommendation

This vector should continue if the OESC is continued by DOI and BSEE. As Arctic challenges have implications for all OESC work, we recommend that the Arctic vector should be continued as a new stand-alone Subcommittee.

Vector 3 - Interagency Coordination on Oil Spill Response Issues

The OESC developed a list of regional, national and international organizations that were involved with oil spill response and analyzed the mandates, membership and functions of these groups. The OESC then determined the scope of DOI participation in these organizations and looked at the Bureaus and Offices within DOI and the manner in which they share information internally. Based on this analysis, the OESC developed the following set of recommendations. These recommendations take into account how DOI should improve internal communication and engage with these external groups to best prepare for and respond to offshore releases (see Appendices 3 and 4 for additional details).

Vector 3 - Specific Recommendations

1. That DOI continue its participation with groups listed in Appendix 4. For groups in which BSEE is currently the lead for DOI, BSEE's Oil Spill Program should be the focal point for this participation.

2. That BSEE attend National Response Team (NRT) meetings and request to participate in NRT subcommittee work related to offshore response. BSEE should also work with the mandated DOI representative to the NRT (Office of the Secretary) to ensure that the NRT as a body adequately addresses the challenges related to offshore response.

3. That BSEE and BOEM regularly attend Regional Response Team (RRT) meetings in areas where they have interest (i.e., regions with offshore exploration and production) to ensure that regional and area contingency planning, preparedness and response are addressed appropriately. In these regions, BSEE and BOEM should meet with the current DOI representative to the RRT to ensure that all DOI equities are represented at the meetings. This is critical as the RRT has certain responsibilities under regulation, including using dispersants as an alternative response measure.

4. Because of their trustee role the USFWS usually represents DOI at the RRT. USFWS should ensure that the views and mandates of BSEE and the other DOI Bureaus are represented adequately during all RRT discussions. This is especially important in areas such as cascading of response equipment, offshore logistics, use of subsurface dispersants, containment and protection strategies, as other DOI Bureaus such as BSEE, BOEM, NPS, USGS and IA manage federal land, determine lease sites, approve oil spill response plans and bring significant experience and expertise to spill response.

5. That DOI continue to coordinate and engage with the Interagency Coordinating Committee on Oil Pollution Research (ICCOPR) to maximize investment of oil spill research dollars. We further recommend that the USGS attend ICCOPR meetings and determine if they want to petition to become a permanent member. Currently, the only DOI Bureaus represented on ICCOPR are BSEE, BOEM and USFWS. (See also discussion in Appendices 1 & 4)

6. That DOI and its Bureaus continue to monitor activities of the international organizations in which they are currently engaged (Appendix 4), especially in the Arctic to ensure that BSEE's regulations and policy related to planning, preparedness and response can adapt to new information that will be obtained as Arctic oil exploration increases around the world. BSEE Oil Spill Response Division should be the focal point for this participation.

7. That DOI determine the best way to pass information between Bureaus on spill response planning and preparedness. The DOI Emergency Operations Center and Emergency Management Council fill critical roles in preparing for and responding to

spills at a high level, but do not provide the detailed, ongoing information exchange between Bureaus that is necessary to take maximum advantage of DOI expertise and activities in spill response planning and preparedness. Two possible means for implementing this increased communication are:

a. DOI identify an "oil spill group" consisting of one person per Bureau or Office who would serve as the single point of contact to represent that agency. These representatives would be responsible for receiving and passing information related to spill response expertise and activities either through an identified DOI representative (e.g., from BSEE's Oil Spill Response Program) or as part of regular meetings (e.g., a subcommittee to the Emergency Management Council, using face-to-face or electronic meetings). This person would not have to be the subject matter expert for all activities related to oil spills but would be responsible for bringing the appropriate assets of their Bureau to oil spill planning, preparedness, response and restoration.

b. Develop a virtual "oil spill forum" that would include individuals throughout DOI with an interest and responsibility in spill response. Through such an interactive on-line forum, members could post information and exchange ideas related to spill-related expertise and activities.

Vector 3 - General Recommendation

The OESC recommends that this vector not continue, even if the OESC is continued by DOI and BSEE. With the current recommendations and information provided in Appendix 4, DOI should be able to continually evaluate and grow their participation in spill response organizations (existing and new) and continue to improve their ability to transmit information between DOI Bureaus and Offices.

Final Comments and Future Response Vectors for the OESC

Although the OESC had originally considered an organizing vector pertaining to cascading of oil response equipment, this vector has now been deleted. This decision was based on a number of factors, including the low notional priority assigned by the OESC, the recognition that this is much more than a DOI issue (e.g. Environmental Protection Agency (EPA), U.S. Coast Guard (USCG) and that States have significant equities regarding equipment requirements and potential cascading decisions), and the realization that this issue has already been addressed in a number of reports (e.g. Incident Specific Preparedness Review, Presidential Commission, and Admiral Allen's report to the Department of Homeland Security) and needs to be resolved across the appropriate Federal response agencies, states, and industry.

In the long term, it is important that a body such as the OESC keep track of issues that impact oil spill response, such as Estimated Daily Recovery Capacity, worst case discharge calculations, dispersants, response in extreme conditions, and response exercise

and planning protocols. If the OESC continues, then it would be appropriate to continue the Response Subcommittee to focus on the evolution of these issues and develop new vectors. It would also be appropriate for this subcommittee to follow up and assess the impact and effectiveness of the currently proposed recommendations.

Enclosure 6

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APPENDIX 1
Response Subcommittee Vector 1:
Facilitate Research and Development of Oil Spill Response Technology

While research and development (R&D) efforts into the enhancement of oil spill response occurs on an ongoing basis through a variety of mechanisms, it is important to have a robust process for supporting the creation of new ideas and the further development of those ideas and technology that look the most promising. Areas that could benefit from additional research should be identified, prioritized, and funded; traditional and non-traditional approaches should be pursued to encourage invention, innovation and implementation of new oil spill response methods. Approaches to oil spill response that are proven to work should be documented, shared widely through a consistent, stable clearinghouse of information, and their use encouraged. Lessons learned after actual spills should be communicated to the oil spill response community in as timely a fashion as possible. Continued support of innovation in oil spill response is in the best interest of all stakeholders, but there must be a transparent process that allows new approaches to be critically evaluated and the resulting information rapidly disseminated to the oil spill response community.

Research on oil spills leads to a better understanding of the environmental conditions and oil discharge characteristics that determine the effectiveness of oil spill response methods (e.g., mechanical devices, chemical dispersants, *in-situ* burning, herders, and other alternative techniques). This research relies upon a full spectrum of testing and validation ranging from bench- and meso-scale research in laboratories or purposely constructed wave tanks (e.g., Ohmsett, Environmental Protection Agency (EPA)/Canada DFO) to larger-scale, open-water controlled field testing. Considerable research has already been done at the bench scale and wave tank levels. For example, Ohmsett (the National Oil Spill Response Research and Renewable Energy Test Facility) plays an important role in testing and improving technology and innovation, such as through the Wendy Schmidt Oil Cleanup X Challenge. To determine whether conclusions drawn from smaller-scale research will hold true for larger-size oil discharges, testing in real-world conditions will provide important data on response equipment capacity and effectiveness, and may help drive innovation. To evaluate oil spill response equipment and tactics under realistic conditions, BSEE should work with its interagency partners to explore whether field testing is needed and how to facilitate the necessary permitting by all applicable agencies, as has been useful in some nations (e.g. Norway and Canada). If so, tests should be performed with careful planning and approved plans and permits, and involve research institutions, academia, regulators, industry, public stakeholders and others.

BSEE Oil Spill Research

For more than 25 years, BSEE has maintained and funded a comprehensive, long-term research program to improve oil spill response technologies through the Oil Spill Response Research (OSRR) Program. The major focus of the program, which is now a responsibility of the BSEE Oil Spill Response Division, is to improve the knowledge and technologies used for the prevention, detection, control, assessment, containment, treatment, and cleanup of oil spills that may occur on the U. S. Outer Continental Shelf. The OSRR program is responsive to the information and technological needs of the Bureau's offices and to specific requirements and limitations in the BSEE authority. Information derived from the OSRR

program is directly integrated into BSEE's offshore operations and is used to make regulatory decisions pertaining to environmental impact studies, permitting, reviewing and approving plans, safety and pollution inspections, enforcement actions, and training requirements.

Continuing an effective OSRR program means that BSEE and its Federal partners each have roles in identifying and developing the best available response technologies. Response technologies identified by the OSRR program focus on preventing offshore operational spills from reaching sensitive coastal environments and habitats and reducing overall environmental impacts. BSEE has always played a critical role in driving R&D studies, and reports from these studies can be found at the following link: http://www.bsee.gov/Research-and-Training/Master-List-of-Oil-Spill-Response-Research.aspx

On 31 January 2012 BSEE issued their annual request for white papers suggesting oil spill response research focused on dispersant use impact on worker safety, the application of dispersant at a point source subsea location, increasing encounter rate for *in-situ* burn operations, mechanical technologies in Arctic conditions, remote sensing technologies, recovery of sunken *in-situ* burn residue, subsea oil spill containment and removal, surface oil containment and removal, and feasibility studies for conducting subsea dispersant research at Ohmsett. Research priorities for the current fiscal year have largely been driven by lessons learned from the Macondo well blowout response and recommendations found in the Presidential Commission report, the Incident Specific Preparedness Review, and similar internal studies that assessed the multifaceted response that took place following the blowout. After selecting promising research and receiving full proposals, BSEE is now in the process of funding many projects that will serve to advance offshore spill response. In both the selection of research topics and in the determination of project funding, BSEE considered priorities discussed during meetings of the Interagency Coordinating Committee on Oil Pollution Research (ICCOPR) and considered the merits of specific proposals while seeking joint project opportunities involving multiple agencies. This practice of interagency discussion and collaboration should be encouraged to continue.

Interagency Coordinating Committee on Oil Pollution Research (ICCOPR)

The Oil Pollution Act of 1990 (Section 7001) established the ICCOPR. The purpose of ICCOPR is to coordinate a comprehensive program of oil pollution research and technology development among the Federal agencies, in cooperation and coordination with industry, universities, academia, research institutions, state governments, and other nations, as appropriate, and to foster cost-effective research mechanisms, including the joint agency funding of this research. The Chairperson of ICCOPR is the US Coast Guard representative, who is required to submit a biennial report to Congress on activities carried out under Section 7001 in the preceding two fiscal years, and on activities proposed to be carried out in the current two fiscal year period. The 14 members of ICCOPR are:

- U.S. Coast Guard (USCG)
- Bureau of Safety and Environmental Enforcement (BSEE)
- Bureau of Ocean Energy Management (BOEM)
- National Oceanic and Atmospheric Administration (NOAA)
- Environmental Protection Agency (EPA)
- National Institute of Standards and Technology (NIST)
- Department of Energy (DOE)
- U.S. Fish and Wildlife Service (USFWS)
- Maritime Administration (MARAD)
- Pipeline and Hazardous Materials Safety Administration (PHMSA)
- U.S. Corps of Engineers (COE)

- US Navy (USN)
- National Aeronautics and Space Administration (NASA)
- Federal Emergency Management Agency (FEMA) – US Fire Administration (USFA)

The Subcommittee believes that ICCOPR is the right group to establish national oil spill R&D priorities for the Federal Government that are consistent with each agency's mission and regulatory authority. The ICCOPR has recently updated their charter to reaffirm membership and commitment to national coordination of research initiatives. In this charter revision, BSEE will now serve as Vice Chair on a rotating basis with NOAA and EPA. The ICCOPR is also updating its existing Oil Pollution Research and Technology Plan and expects it to be finished in fiscal year 2013. The ICCOPR website and additional information can be found at:
http://www.iccopr.uscg.gov/apex/f?p=118:20:1030918118532892

Ohmsett Facility

The Ohmsett facility is a unique oil spill response research and renewable energy test facility located on the U.S. Naval Weapons Station Earle, in Leonardo, New Jersey. It is the only facility in the world that allows for the full-scale testing, training, and research with oil, in a controlled, simulated at-sea environment. The facility is critical to oil spill response technology development in the U.S.. Ohmsett is a government owned, contractor operated facility, and is available for use by State, Federal, and foreign government agencies, industry and academia. As part of its mandate to ensure that the best and safest technologies are used in offshore oil and gas operations, BSEE operates the 2.6-million gallon test tank for two essential functions related to oil spill response planning: 1) responder training and 2) full-scale equipment and chemical testing. Without Ohmsett, the testing and evaluation of equipment, systems and methodologies, as well as responder training would have to be conducted during actual oil spills, where conditions cannot be repeated and where such training would interfere with response operations.

Ohmsett provides a controlled environment for both warm- and cold-water testing and training, including the ability to simulate realistic broken ice conditions in the tank. This capability allows Ohmsett to remain operational year round, offering testing and training during the winter months. Over the past ten years, Ohmsett has become a world leader in realistic dispersant effectiveness testing. Large-tank dispersant experiments conducted at Ohmsett provide a critical link between small-scale laboratory and open-water experiments because they can simulate real-world conditions without the permitting problems or the cost of a field release. Recent testing and research activities include submerged oil detection and recovery experiments, testing of chemical herders to improve response countermeasures, *in-situ* burning, and verification of oil spill remote sensing and measurement systems.

Ohmsett is an ideal venue for training oil spill first responders in the deployment and operation of oil spill equipment and systems. Training emphasizes classroom exercises and practical hands-on use of oil spill equipment under realistic conditions. Hands-on exercises are conducted with real oil in a simulated at-sea environment. Ohmsett's training expertise allows participants to increase their recovery proficiency while receiving state-of-the-art training. Because of this, the USCG National Strike Force holds 3 to 4 training classes per year at Ohmsett. Training programs can be tailored to meet client's specific needs. In addition to the annual USCG oil spill response training and industry sponsored classes, BSEE has taught a Spanish language responder training class and a hands-on operational chemical dispersant training class.

Funding for the BSEE OSRR program, and operation and maintenance of Ohmsett are appropriated from the Oil Spill Liability Trust Fund (OSLTF). The OSLTF receives funds from a tax on each barrel of oil produced or imported into or out of the U.S.. As intended by the Oil Pollution Act of 1990, companies that produce and transport oil are directly supporting research to improve oil spill response capabilities. However, additional funding for operations, maintenance, and upgrades are required to ensure that Ohmsett continues to be the country's premier oil-spill response testing facility and that it can accommodate emerging technologies under a wider range of operating conditions.

Specific Recommendations

To increase the effectiveness of the research, testing, training and coordination activities discussed above, the Response Subcommittee makes the following specific recommendations:

1. That DOI support continued and dedicated R&D funding from the OSLTF as a Department priority to support oil spill response research, including Ohmsett. DOI should maintain the Ohmsett facility under direction of BSEE's Oil Spill Response Division. Additionally, BSEE should work with the Department to secure long-term research funding, develop a strategic plan to address various OCS operating conditions including those encountered in deepwater and in the Arctic, and upgrade the Ohmsett facility to support testing of new and improved oil spill response technologies.

2. That DOI support ICCOPR as the Federal coordinating body for oil spill research. BSEE should keep ICCOPR appraised of oil spill response R&D as intended under OPA 90 (rather than as part of the Ocean Energy Safety Institute or other entity) as the primary means to leverage the efforts of other Federal agencies engaged in similar research affecting offshore oil spill response. BSEE should also coordinate with ICCOPR to facilitate and better incorporate the knowledge from state and local agencies, academia, and industry into oil spill response R&D projects.

3. The United States Geological Survey (USGS) is not a member of ICCOPR but has research programs and interests relevant to the activities of this committee. It is recommended that USGS attend ICCOPR meetings and if supported by DOI apply to the committee for ad hoc or permanent membership.

4. BSEE should continue to work with its interagency partners to develop a process to evaluate selected oil spill response equipment and tactics under realistic conditions and utilize this information to inform planning tools and requirements, and regulatory changes. Complementing this effort would include completing the BSEE/USCG co-funded study on improving the planning standards for mechanical recovery equipment, or effective daily recovery capacity (EDRC), and publishing new regulations that implement improved response planning standards. These improved standards would: 1) provide a more realistic measure of a skimming system's potential to recover oil, and 2) create incentives to improve the effectiveness of removal equipment by providing credit for innovations that result in greater oil recovery in planned offshore spill conditions.

5. DOI should explore the use of periodically reviewed performance-based standards to spur innovation in oil spill response technology and ensure utilization of best available technology. BSEE should consult with interagency stakeholders during development to ensure consistency of such standards.

6. BSEE should continue to play a strong role in leading and supporting oil spill response research and technology development, both nationally and internationally. This pertains to all aspects of oil spill planning, preparedness and response related to offshore exploration, production, and development, and includes technology R&D related to mechanical recovery equipment and systems, *in-situ* burning, dispersants, cold weather and ice response, remote sensing technologies, etc.

7. In compliance with statutory and permitting requirements, BSEE should work with federal partners and relevant authorities to encourage and facilitate controlled experimental releases of oil that benefit offshore spill response R&D and equipment testing. This would include coordination with the Regional Response Teams (RRTs) in the proposed areas of release. BSEE should also consider the possibility of international cooperation in this area, as the U.S. has participated and been invited to participate in controlled experimental releases in other countries such as Norway.

General Recommendation

The Subcommittee will continue to evaluate whether this vector should continue if the OESC is continued by DOI and BSEE. If continued it is recommended that if approved by the OESC and accepted by BSEE, that future meetings occur between the Response Subcommittee and the designated implementation staff of DOI/BSEE, plus the USCG, EPA, NOAA, USFWS and other agencies as needed. These meetings would help focus future recommendations by allowing all groups to discuss methods and opportunities for improved, innovative oil spill response research, testing and training at Ohmsett and elsewhere. The Subcommittee feels strongly that while OESC can bring a diverse set of backgrounds (academia, non-profit, industry and government) that work should not duplicate other entities such as the Spill Advisory Group (SAG) or ICCOPR.

Enclosure 7

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APPENDIX 2

Response Subcommittee Vector 2

Oil Spill Planning, Preparedness, and Response in the Arctic OCS

Oil and gas potential is significant in Arctic Alaska, with renewed interest in oil and gas exploration and production in the Beaufort and Chukchi seas of the Alaska Outer Continental Shelf (OCS). Beyond petroleum potential, this region also supports significant fish and wildlife resources and ecosystems, with indigenous people who rely on these resources for subsistence, and who follow cultural traditions dating back thousands of years.

A key concern about development of oil and gas resources in the Arctic OCS is the need to ensure that scientific understanding and technological capability are sufficient for reliable oil-spill risk assessment, preparedness, and response under difficult environmental conditions with limited local infrastructure. Although there have been recent advances in oil-spill risk assessments in the Arctic OCS, scientific and technological challenges remain in a number of areas.

Challenging conditions in the Arctic Ocean require fit-for-purpose technological response and regulatory approaches. These include technologies for detecting, monitoring, and tracking oil around and under ice, and the efficacy of oil spill countermeasures such as mechanical recovery (e.g., skimmers), in-situ burning, bioremediation, and the use of chemical dispersants in Arctic waters. There is potential for severe weather year round including high winds, dense fog, sea ice and freezing temperatures, which have the potential to cause operational difficulties during response activities. The near shore environment is shallow and Native communities rely in large part on these coastal waters for their way of life. In addition, the Arctic coastline is remote and lacks basic infrastructure. Equipment cannot easily be brought in to most areas, which requires operators to properly design their oil spill response programs to account for accessibility and prompt delivery of equipment and personnel.

BSEE regulations as written do not specifically address Arctic operating conditions. Instead, BSEE has put in place a new national Notice to Lessees (NTL) as an interim measure designed in part to improve spill response strategies. However, to codify these actions and ensure full system readiness for Arctic OCS exploration and production, the Response Subcommittee recommends that DOI develop and adopt spill response standards specifically for the Arctic OCS.

In addition to drawing on the knowledge of subcommittee members, there were a number of sources that were reviewed and analyzed in coming up with recommendations. These include:

U.S. Coast Guard's (USCG) Incident Specific Preparedness Review;
National Oil Spill Commission's report;
National Energy Board review for offshore drilling in the Canadian Arctic;
USGS Circular 1370, Report on Science Support in the Arctic.

This Subcommittee originally intended to assess the state-of-the-art in Arctic oil spill risk assessment, preparedness, and response. However, after further review and considering the rapidly evolving nature of oil spill response research and techniques relevant to Arctic waters, the Subcommittee agreed to

narrow the scope and focus its recommendations on the regulatory aspects of exploration and production, as described below.

Specific Recommendations

1. BSEE should evaluate the need for Arctic oil spill equipment deployment exercise(s) prior to beginning operations.

2. BSEE should establish a formalized process with a fixed timeline for interagency review of Arctic Oil Spill Response Plans (OSRPs).

3. BSEE and BOEM should work with other agencies and stakeholders to increase their engagement in developing the Arctic Subarea Contingency Plans. BSEE should ensure that Arctic OSRPs are consistent with this Subarea Plan.

4. Once an OSRP is approved, BSEE should make the plan (or parts of the plan) publicly available.

5. BSEE should work with the U.S. Coast Guard, Environmental Protection Agency, Pipeline and Hazardous Materials Safety Administration, and other stakeholders to review the adequacy of the current OSRO (Oil Spill Removal Organization) construct for use in the Arctic environment.

6. BSEE and BOEM should review existing OSRP and permitting regulations, determine their adequacy for U.S. offshore Arctic environments, for exploration and production and revise as appropriate to respond effectively to a worst-case discharge. In particular, the OSRP and permitting regulations and associated approvals should address at least the following elements:

    a. Seasonal drilling limitations that consider the timing and adequacy of oil spill response operations, given available technologies and the type of drilling operation.
    b. Prompt deployment of response equipment and adequately trained personnel.
    c. Ice capable equipment appropriate for expected conditions.
    d. Adequate strategies and equipment to protect important ecological and subsistence areas.

Other Issue

The subcommittee could not come to consensus on the issue of whether BSEE should provide a public review process for Arctic OSRPs prior to approval.

General Recommendation

This vector should continue if the OESC is continued by DOI and BSEE. As Arctic challenges have implications in all other subcommittee work, this topic should be discussed with the entire Committee and whether arctic should be vectors under the Response and other existing Subcommittees or should be separate as a new stand-alone Subcommittee.

Enclosure 8

DRAFT
APPENDIX 3
Response Subcommittee Vector 3:
Interagency coordination on Oil Spill Response Issues

The National Contingency Plan outlines a framework for federal and state agencies to work with other organizations (e.g., industry committees) that are involved with oil spill planning, preparedness (including training and exercises), and response through the National Response Team (NRT), Regional Response Teams (RRT), and Area Committees. Other government and industry committees (e.g., Interagency Coordinating Committee for Oil Pollution Research - ICCOPR, American Petroleum Institute Spills Advisory Group, Interagency Arctic Research Policy Committee) provide additional avenues for public/private interactions. Although the Bureau of Safety and Environmental Enforcement (BSEE) has primary responsibility for establishing and verifying compliance with offshore oil spill planning and preparedness requirements, they are not represented on some of the interagency and agency/industry committees. Additionally, there are other bureaus of the U.S. Department of the Interior (DOI), such as the U.S. Geological Survey (USGS), that demonstrated expertise during the Macondo spill that could be of value for future oil spill planning, preparedness, and response. Although DOI has multiple functions with respect to the interagency process, including trustee responsibilities, regulatory enforcement, licensing, scientific/applied research, and planning and preparedness for offshore response, these functions have not been fully represented in interagency deliberations.

From this background, the Response Subcommittee developed a list of organizations that were involved with oil spill response and analyzed the mandates, membership and function of these groups. The Subcommittee then determined if DOI and/or BSEE participated in these organizations in any way. Finally the Subcommittee looked at the Bureaus and Offices within the DOI and the interface they have with spill response. To best visualize this effort the Subcommittee developed a spreadsheet (Appendix 4) dividing the groups into categories (International, National, Regional, Industry and DOI Bureaus and Offices) describing the mandate or mission, lead agency and participation. This spreadsheet only documents existing activity and does not include recommendations. The recommendations based on this matrix are found below. These recommendations take into account how DOI should engage with these groups in the future to best meet their needs in preparing for and responding to offshore releases, taking steps to ensure that the viewpoints of agencies such as BSEE, Bureau of Ocean Energy Management (BOEM), USGS, and U.S. Fish and Wildlife Service (USFWS) are adequately represented.

Additionally, the Subcommittee looked at how DOI Bureaus and Offices shared information on spill response. This is key not only during a spill response but also in advance of an event, when planning and preparedness activities may be known to only a small subset of interested parties within DOI. These preparatory activities include such things as ongoing research on the efficacy of specific oil-spill response/cleanup tactics, a pending decision (for example preauthorization of dispersants), a joint industry project, an international agreement or an upcoming exercise. The Spill Response Subcommittee is not aware of a single entity within DOI that exists solely to coordinate oil spill response planning and preparedness functions across all DOI bureaus and agreed that a better job could be done of sharing this type of information. However, there are multiple groups within DOI that serve coordinating roles in planning for or responding to spills and other emergencies once they occur, some of which might be expanded to facilitate such pre-event coordination. For example, DOI has an Emergency Operations

Center (EOC) that is the hub for orchestrating a coordinated Department response to an emergency such as a major oil spill. During DWH, the center held daily conference calls with all DOI Bureaus working on the response and got daily reports from each Point of Contact on key activities. It also served as a location for Bureau staff working directly on the response. However, the EOC does not routinely exchange information between the various DOI Bureaus and Offices related to spill planning and preparedness, as outlined in Appendix 4. There was also some confusion within certain Bureaus on what and how they relayed information to the EOC during a spill; BSEE's Oil Spill Program understands the role of the EOC in oil spills but other Bureaus do not seem to be in the same position. There is also the DOI Emergency Management Council, which meets monthly and on which all Bureaus have leads and alternates. This may be the appropriate group to bring emergency coordination questions to, even if they relate to offshore oil spills, but these meetings may not be the best forum for a single DOI representative to routinely give and receive information on behalf of their Bureau. DOI recently formed the Strategic Sciences Group, which is less a coordination mechanism and more a rapid-response advisory group/think tank. There are also existing coordination mechanisms within DOI that are focused on the Natural Resources Damage Assessment (NRDA) process, for example through the DOI Office of Environmental Policy and Compliance, but this is different from response. While the Subcommittee does not necessarily favor establishment of another internal DOI group, the need to receive and transmit information to the appropriate DOI Bureaus, Offices and individuals is critical.

Specific Recommendations

To improve interagency coordination in oil spill response, the Response Subcommittee makes the following specific recommendations:

1. That DOI continue its participation with groups listed in Appendix 4. For groups in which BSEE is currently the lead for DOI, BSEE's Oil Spill Program should be the focal point for this participation.

2. That BSEE attend National Response Team (NRT) meetings and request to participate in NRT subcommittee work related to offshore response. BSEE should also work with the mandated DOI representative to the NRT (Office of the Secretary) to ensure that the NRT as a body adequately addresses the challenges related to offshore response.

3. That BSEE and BOEM regularly attend Regional Response Team (RRT) meetings in areas where they have interest (i.e., regions with offshore exploration and production) to ensure that regional and area contingency planning, preparedness and response are addressed appropriately. In these regions, BSEE and BOEM should meet with the current DOI representative to the RRT to ensure that all DOI equities are represented at the meetings. This is critical as the RRT has certain responsibilities under existing regulations, including using dispersants as an alternative response measure.

4. Because of their trustee role the USFWS usually represents DOI at the RRT. USFWS should ensure that the views and mandates of BSEE and other DOI Bureaus are represented adequately during all RRT discussions. This is especially important in areas such as cascading of response equipment, offshore logistics, use of subsurface dispersants, containment and protection strategies, as other DOI Bureaus such as BSEE, BOEM, NPS, USGS and IA manage federal land, determine lease sites, approve oil spill response plans and bring significant experience and expertise to spill response.

5. That DOI continue to coordinate and engage with the Interagency Coordinating Committee on Oil Pollution Research (ICCOPR) to maximize investment of oil spill research dollars. We further recommend that the USGS attend ICCOPR meetings and determine if they want to petition to become a permanent member. Currently, the only DOI Bureaus represented on ICCOPR are BSEE, BOEM and USFWS. (See discussion in Appendix 4.)

6. That DOI and its Bureaus continue to monitor activities of the international organizations in which they are currently engaged (Appendix 4), especially in the Arctic to ensure that BSEE's regulations and policy related to planning, preparedness and response can adapt to new information that will be obtained as Arctic oil exploration increases around the world. BSEE Oil Spill Response Division should be the focal point for this participation.

7. That DOI determine the best way to pass information between Bureaus on spill response planning and preparedness. The DOI Emergency Operations Center and Emergency Management Council fill critical roles in preparing for and responding to spills at a high level, but do not provide the detailed, ongoing information exchange between Bureaus that is necessary to take maximum advantage of DOI expertise and activities in spill response planning and preparedness. Two possible means for implementing this increased communication are:

    a. DOI identify an "oil spill group" consisting of one person per Bureau or Office who would serve as the single point of contact to represent that agency. These representatives would be responsible for receiving and passing information related to spill response expertise and activities either through an identified DOI representative (e.g., from BSEE's Oil Spill Response Program) or as part of regular meetings (e.g., a subcommittee to the Emergency Management Council, using face-to-face or electronic meetings). This person would not have to be the subject matter expert for all activities related to oil spills but would be responsible for bringing the appropriate assets of their Bureau to oil spill planning, preparedness, response and restoration.

    b. Develop a virtual "oil spill forum" that would include individuals throughout DOI with an interest and responsibility in spill response. Through such an interactive on-line forum, members could post information and exchange ideas related to spill-related expertise and activities.

General Recommendation

The Subcommittee recommends that this vector not continue if the OESC is continued by DOI and BSEE. With the current recommendations and information provided in Appendix 4, DOI should be able to continually evaluate and grow their participation in spill response organizations (existing and new) and continue to improve their ability to transmit information between Bureaus.

Enclosure 9

Appendix 4 (Vector 3 Cont.) - Interagency Coordination Matrix

REGIONAL

	NAME	WEBSITE	MANDATE or MISSION	LEAD	MANDATED COMPOSITION (US AGENCIES ONLY)	OTHER AGENCY PARTICIPATION	DOI's CURRENT ROLE AND ENGAGEMENT
AC	Arctic Council - Emergency Prevention Preparedness and Response Working Group	eppr.arctic-council.org	The EPPR Working Group was established under the Arctic Environmental Protection Strategy (AEPS) in 1991. One of five working groups of the Arctic Council, which was established in 1996 to foster international co-operation on environmental protection and sustainable development in the Arctic. EPPR reports to the Arctic Council and Ministers through Senior Arctic Officials (SAOs). The EPPR Working Group receives its direction from Ministerial meetings held every two years.	DOS	USCG, BSEE, EPA, NOAA	As needed for special topics	BSEE as advisor to U.S representative to Council
AC	Arctic Council - Protection of Arctic Marine Environment Working Group	www.pame.is	The Protection of the Arctic Marine Environment Working Group (PAME) is one of six Arctic Council working groups. PAME is the focal point of the Arctic Council's activities related to the protection and sustainable use of the arctic marine environment.	DOS	USCG, BSEE, EPA, NOAA	As needed for special topics	BSEE as advisor to U.S representative to Council
AC	Arctic Council - Marine Oil Pollution Preparedness and Response Taskforce	eppr.arctic-council.org	The Emergency Prevention, Preparedness and Response Working Group (EPPR) addresses various aspects of prevention, preparedness and response to environmental emergencies in the Arctic. Members of the Working Group exchange information on best practices and conduct projects to include development of guidance and risk assessment methodologies, response exercises, and training. The goal of the EPPR Working Group is to contribute to the protection of the Arctic environment from the threat or impact that may result from an accidental release of pollutants or radionuclides. In addition, the Working Group considers questions related to the consequences of natural disasters.	DOS	USCG, BSEE, EPA, NOAA	As needed for special topics	BSEE/OSRD serve as member of U.S. delegation representing DOI bureaus
	Cook Inlet Regional Citizens' Advisory Council (CIRCAC) - Oil Spill Prevention and Response (OSPR) Committee	www.circac.org	Cook Inlet RCAC is an independent non-profit corporation guided by its mission: OPA 90 directs the Council in its efforts to improved marine transportation and oil facility operations and mandates action to that end. COOK INLET RCAC must provide advice and recommendations on policies, permits and site-specific regulations for terminal and tanker operations and maintenance; monitor environmental impacts of the operation of terminals and tankers; monitor terminals and tanker operations and maintenance that may affect the environment near terminals; review the adequacy of oil-spill prevention and contingency plans for terminals and tankers; provide advice and recommendations on port operations, policies and practices; and review standards for tankers bound for, loading at, or exiting from oil terminals among other duties. Congress envisioned this council and the PWSRCAC as a mechanism to foster long-term partnerships between industry, government, and the coastal communities of Alaska.	USCG assesses RCAC for compliance with OPA 90	The Oil Pollution Act of 1990 includes a provision calling for an annual review of Cook Inlet RCAC's activities by the United States Coast Guard (USCG). The recertification process is designed to insure that Cook Inlet RCAC is meeting the mandates spelled out in OPA 90 and is representing the interests of the communities within the vicinity of the terminal operations.	Ex Officio members include: USCG, USFS, EPA, NOAA, BLM, BSEE	DOI and BSEE through RCAC comments on planning and regulation related to their mandates
	Exxon Valdez Oil Spill Trustee Council	www.evostc.state.ak.us/	Oversees restoration of the injured ecosystem through the use of the $900 million civil settlement. The Council consists of three state and three federal trustees (or their designees). The Council is advised by members of the public and by members of the scientific community.			NOAA, DOI, USDA/USFS	DOI
	Interagency Arctic Research Policy Committee (IARPC)	www.nsf.gov/od/opp/arctic/iarpc/start.jsp	To survey Arctic research conducted by Federal State, and local agencies, universities, and other public and private institutions to help determine priorities for future Arctic research, including natural resources and materials, physical and biological sciences, and social and behavioral sciences. (Established by the Arctic Research Policy Act of 1984)	NSF	DOC, DOD, DOE, DOI, DOS, DOT, DHHS, NASA, EPA		DOI
	Interagency Working Group on Coordination of Domestic Energy Development and Permitting in Alaska	http://www.doi.gov/alaskaen	The Interagency Working Group on Coordination of Domestic Energy Development and Permitting in Alaska was established by Executive Order 13580, to coordinate the efforts of Federal agencies responsible for overseeing the safe and responsible development of onshore and offshore energy in Alaska	DOI	DOD (Army Civil Works), DOC (NOAA), USDA, DOE, DHS (USCG), EPA, Federal Coordinator for Alaska Natural Gas Transportation Projects. EOP is represented through the Domestic Policy Council, CEQ, OSTP, OMB and NSS.		
	National Research Council Study on Responding to Oil Spills in Arctic Environments	http://dels.nas.edu/osb	The Ocean Studies Board of the U.S. National Research Council is soliciting nominations for individuals to serve on its new study committee on Responding to Oil Spills in Arctic Environments, co-led by the Polar Research Board and Transportation Research Board. This study is sponsored by API, the Arctic Research Commission, BOEM, BSEE, Marine Mammal Commission, NOAA, OSRI, the State of Alaska and U.S. Coast Guard. This study will assess the current state of the science regarding oil spill response and environmental assessment in the Arctic region (with a specific focus on the regions north of the Bering Strait), with emphasis on potential impacts in U.S. waters.	National Academies	None	NOAA and USCG are sponsors	BOEM and BSEE are sponsors
	North Pacific Research Board	www.nprb.org/about/board.html	A government, industry and academic board to recommend marine research initiatives to the U.S. Secretary of Commerce, who makes final funding decisions. Designated by Congress.	North Pacific Fishery Management Council (Chair)	NOAA (Executive Committee)	USARC, USGS, USCG (Member)	USGS
	North Slope Science Initiative (NSSI)	www.northslope.org	Developed by federal, state and local governments with trustee responsibilities for land and ocean management, to facilitate and improve collection and dissemination of ecosystem information pertaining to the Alaska North Slope region, including coastal and offshore regions.	BLM	Oversight Group (voting privileges): BLM, FWS, NPS, NOAA, BOEM.	Scientific Advisors to Oversight Group (non-voting): USGS, DOE, NOAA National Weather Service	BLM, NPS, BOEM, USGS
	Oil Spill Recovery Institute (OSRI)	www.pws-osri.org	The Oil Spill Recovery Institute (OSRI) was established by Congress in response to the 1989 Exxon Valdez. They were task with developing oil spill best available techniques, equipment and materials for dealing with oil spills in the Arctic and sub-Arctic marine environment. They also complement federal and state damage assessment efforts and determine, document, assess and understand the long-range effects of Arctic and sub-Arctic oil spills on the natural resources of Prince William Sound, and the environment, the economy and the lifestyle and well-being of the people who are dependent on those resources. OSRI is administered through and housed at the Prince William Sound Science Center, a non-profit research and education organization located in Cordova. The PWS Science Center facilitates and encourages ecosystem studies in the Greater Prince William Sound region.	DOI, NOAA, USCG	DOC (NOAA) chairs the advisory board. DOI and USCG are advisory board members	None	DOI is on advisory board

	Pacific States/British Columbia Oil Spill Task Force	www.oilspilltaskforce.org	To provide a forum where Task Force Members can work with stakeholders from the Western US and Canada to implement regional initiatives that protect 56,660 miles of coastline from Alaska to California and the Hawaiian archipelago		Exec. Director selected by states on Task Force	USCG, NOAA, BSEE attend meetings	BSEE (Pacific Region)
	Prince William Sound Regional Citizens' Advisory Council (PWSRCAC) - Oil Spill Prevention and Response (OSPR) Committee	http://www.pwsrcac.org/	PWSRCAC is an independent non-profit corporation guided by its mission: citizens promoting environmentally safe operation of the Alyeska Pipeline marine terminal in Valdez and the oil tankers that use it. The Oil Spill Prevention and Response (OSPR) Committee works to minimize the risks and impacts associated with oil transportation through strong spill prevention and response measures, adequate contingency planning, and effective regulations. The council comments on and participates in monitoring and assessment of environmental, social, and economic consequences of oil-transportation activities, including comments on the design of measures to mitigate the impacts of oil spills and other environmental effects of terminal and tanker operations.	USCG assesses RCAC for compliance with OPA 90	Each year, the U.S. Coast Guard assesses whether the council fosters the general goals and purposes of the Oil Pollution Act and is broadly representative of the communities and interests as envisioned in the Act		DOI and BSEE through RCAC comments on planning and regulation related to their mandates
	U.S. Arctic Research Commission (USARC)	www.arctic.gov	To develop and recommend an integrated national Arctic research policy. (continued in legislation)	USARC	NSF as a nonvoting member		None

Appendix 4 (Vector 3 Cont.) - Interagency Coordination Matrix

NATIONAL AND INDUSTRY						
NAME	WEBSITE	MANDATE or MISSION	LEAD	MANDATED COMPOSITION (US AGENCIES ONLY)	OTHER AGENCY PARTICIPATION	DOI's CURRENT ROLE AND ENGAGEMENT
US National Response Team (NRT)	www.nrt.org	Under law and regulation, the NRT provides technical assistance, resources and coordination on preparedness, planning, response and recovery activities for emergencies involving hazardous substances, pollutants and contaminants, hazmat, oil, and weapons of mass destruction in natural and technological disasters and other environmental incidents of national significance.	EPA Chair, USCG Vice Chair	Dept of Agriculture, NOAA, DOD (Navy Supsalv) , DOE, DHHS, DOI, DOJ, DOL, DOT, GSA, FEMA, DOS, Nuclear Regulatory Commission	Other agencies as ad hoc	DOI (Office of the Secretary) sits on the NRT
Regional Response Team (RRTs)	www.rrt.nrt.org	To protect public health and safety and the environment by ensuring coordinated, efficient, and effective support of the federal, state, tribal, local, and international responses to significant oil and hazardous substance incidents within the Region as mandated by law and regulation in the National Contingency Plan (NCP)	EPA & USCG Co-Chairs	Varies slightly, but usually: USDA, DOD (Navy, ACoE, Army), DOE, FEMA, GSA, DHHS, DOI, DOL (OSHA), DOC (NOAA), NRC, DOS, DOT, PHS, DOJ	Other agencies and states as ad hoc	DOI (USFWS, NPS, BLM, IA) and NOAA are the Federal trustees, with scientific input by the USGS. In areas with offshore activity BOEM/BSEE have contributed and is recognized as non-voting member
International Oil Spill Conference (IOSC) - Executive Committee	iosc.org/charter.aspx	To promote an international exchange of information and ideas dealing with spill prevention, planning, response and restoration processes, protocols and technology. To promote international sharing of best practice as it relates to management of the varied impacts of oil spills and their aftermath.	API, BSEE, EPA, IMO, IPIECA, NOAA, USCG	Not mandated but by charter -EPA, USCG, NOAA, BSEE	API, IMO, IPIECA	BSEE represents DOI on the Executive Committee
National Research Council - Marine Board	www.trb.org/MarineBoard/AboutMarineBoard.aspx	Serves the national interest by providing evaluations and advice concerning the ability of the nation's marine and maritime industries to operate safely and efficiently and in an environmentally responsible manner.	Sponsors: USCG, NOAA, BOEM, MARAD	None		BOEM (Sponsor)
Ocean Energy Safety Advisory Committee (OESC)	www.boemre.gov/mmab/EnergySafety.htm	To advise the Secretary of the Interior, through the Director of the Bureau of Ocean Energy Management, Regulation and Enforcement, on a variety of issues related to offshore energy safety.	BSEE	BOEM**, BSEE**, USGS, DOE, NOAA, USCG, EPA **When the FACA was established the Committee member came from BOEMRE. Currently that member is in BOEM but BSEE representatives support the subcommittees and provide all admin and logistical support to the FACA*		BOEM and USGS are respresented on the FACA BSEE is represented on subcommittees.
American Petroleum Institute (API)'s Spill Advisory Group (SAG)	www.api.org for info on API The SAG does not have a website	The SAG is a discussion forum with industry, government and some state and private entities on spill response.	API*	None	USCG, EPA, NOAA, BSEE	BSEE
Petroleum Environmental Research Forum (PERF)	www.perf.org	Joint industry forum to collect, exchange, and analyze information relating to practical and theoretical science and technology concerning the petroleum industry, and a mechanism to establish joint research and development projects in that field. Goal is to stimulate cooperative research and development of technology for environmental pollution control and waste treatment for the petroleum industry.	INDUSTRY	None	DOE, other agencies have attended meetings	
Interagency Coordinating Committee for Oil Pollution Research (ICCOPR)	www.iccopr.uscg.gov/apex/f?p=118:20:1573393391937347	To coordinate a comprehensive program of oil pollution research, technology development, and demonstration among the federal agencies, in cooperation and coordination with industry, universities, research institutions, state governments, and other nations, as appropriate, and shall foster cost-effective research mechanisms, including the joint funding of the research.	USCG	DOC (NOAA, NIST), DOE, DOI (USFWS, BOEM/BSEE), DOT (MARAD, PHMSA), DOD (CoE, Navy), EPA, NASA, DHS (USCG, FEMA, USFA)	Other agencies attend meetings	USFWS, BSEE/BOEM
INDUSTRY GROUPS						
Helix Well Containment Group	www.hwcg.org	The Helix Well Containment Group (HWCG) is a consortium of 24 deepwater operators in the Gulf of Mexico who have come together with the common goal of expanding capabilities to quickly and comprehensively respond to a subsea spill to protect employees, communities and the environment.	INDUSTRY	None	None	BSEE as interface to response community. BSEE has also been requested to sit on the HELIX advisory board.
American Petroleum Industry CO-OP Managers (APICOM)	apicom.org	The Association of Petroleum Industry Cooperative Managers (APICOM) was founded in 1972 and is an association of unaffiliated petroleum industry oil spill cooperative managers. APICOM exists for the purpose of exchanging information related to the management of an oil spill response cooperative. It also serves as a forum for the exchange of ideas related to oil spill response technologies, operations, regulations and other issues of common interest to its members.	INDUSTRY	None	None	BSEE as interface to response community
International Assocation of Oil and Gas Producers (*See International Section*)	www.ogp.org.uk		INDUSTRY	None	None	BSEE as interface to response community
Marine Well Containment Company (MWCC)	www.marinewellcontainment.com	Marine Well Containment Company (MWCC) is a not-for-profit company that provides well containment equipment and technology in the U.S. Gulf of Mexico and is committed to being continuously ready to respond to a well control incident in the Gulf.	INDUSTRY	None	None	BSEE as interface to response community
Oil Spill Removal Organizations (OSROs)	Each OSRO has their own website	OSROs are organizations (companies and cooperatives) that have been established to meet industry regulations for spill response. There are a number of national and regional OSROs that provide response capability to the offshore industry such as (MSRC-Marine Spill Response Corporation, NRDC-National Response Corporation, Clean Gulf Associates, Alaska Clean Seas, Cook Inlet Spill Prevention and Response Incorporated (CISPRI), and others. Most of these OSROs are represented in SCAA or APICOM.	INDUSTRY	None	None	BSEE as interface to response community
Spill Control Association of America (SCAA)	www.scaa-spill.org	Founded in 1973 to actively promote the interests of all groups within the spill response community, SCAA represents spill response contractors, manufacturers, distributors, consultants, instructors, government & training institutions and corporations working in the industry.	INDUSTRY	None	None	BSEE as interface to response community

** indicates non-government participant listed because of their lead or key role*

Appendix 4 (Vector 3 Cont.) - Interagency Coordination Matrix

INTERNATIONAL

	NAME	WEBSITE	MANDATE or MISSION	LEAD	MANDATED COMPOSITION (US AGENCIES ONLY)	OTHER AGENCY PARTICIPATION	DOI's CURRENT ROLE AND ENGAGEMENT
	Arctic Research Council of the United States (ARCUS), Canada - United States Northern Oil and Gas Research Forum	www.arcus.org/meetings/2010/northern-oil-and-gas-research-forum	ARCUS, a nonprofit consortium of educational and scientific institutions that have a substantial commitment to arctic research, facilitates discussion of important arctic research initiatives, produces reports with research community recommendations for arctic science priorities, and distributes information resources to the arctic research community. Among its activities, ARCUS hosts the Canada-United States Northern Oil and Gas Research Forum.	University of Alaska Fairbanks*	None	Navy on advisory board, USACE and USGS Associate members, ARCUS receives some grants from Federal agencies	USGS
	Canada-U.S. Joint Marine Pollution Contingency Plan	www.nrt.org/production/NRT/NRTWeb.nsf/PagesByLevelCat/Level2Canada?Opendocument	Provides a coordinated system for planning, preparedness and responding to harmful substance incidents in the contiguous waters.	USCG	This is an agreement between the USCG and Canadian CG. A similar agreement exists between EPA and Canada's Ministry of Environment.	NRT agencies would support the USCG FOSC	DOI as part of NRT; DOI RRT reps (mostly F&W) covering AK, Great Lakes, Pacific and Atlantic where U.S. borders Canada
	International Assocation of Oil and Gas Producers (*also in Industry Group Section*)	www.ogp.org.uk	The International Association of Oil & Gas producers (OGP) is a unique global forum in which members identify and share best practices to achieve improvements in every aspect of health, safety, the environment, security, social responsibility, engineering and operations.	IOGP*	None	None	DOI (BSEE) as interface to response community
IMO	International Maritime Organization (IMO)	www.imo.org/About/Pages/Structure.aspx#3	To improve the safety and security of international shipping and to prevent marine pollution from ships. It is also involved in legal matters, including liability and compensation issues and the facilitation of international maritime traffic	USCG	Selected U.S. agencies will be part of delegation. Other agency input is solicited on international issues that will be brought up in IMO forums.	NOAA, DOS, DOD, DHS, EPA, DOJ, NTSB, MARAD, DOI, DOT	IMO definition of ship includes offshore facilities - fixed and floating. DOI (BSEE) provides the U.S. delegation technical support on offshore facilities.
IMO	*IMO - Marine Environment Protection Committee (MEPC)*	www.imo.org/About/Pages/Structure.aspx#3	To consider any matter within the scope of the IMO concerned with prevention and control of pollution from ships. In particular it is concerned with the adoption and amendment of conventions and other regulations and measures to ensure their enforcement	USCG	Selected U.S. agencies will be part of delegation. Other agency input is solicited on international issues that will be brought up in IMO forums.	NOAA, DOS	DOI (BSEE) provides the U.S. delegation technical support on MEPC issues related to offshore facilities.
IMO	*IMO - Maritime Safety Committee*	www.imo.org/About/Pages/Structure.aspx#3	To consider any matter within the scope of the IMO concerned with aids to navigation, construction and equipment of vessels, manning from a safety standpoint, rules for the prevention of collisions, handling of dangerous cargoes, maritime safety procedures and requirements, hydrographic information, log-books and navigational records, marine casualty investigations, salvage and rescue and any other matters directly affecting maritime safety.	USCG	Selected U.S. agencies will be part of delegation. Other agency input is solicited on international issues that will be brought up in IMO forums.	NOAA, DOS	DOI (BSEE) provides the U.S. delegation technical support on MEPC issues related to offshore facility safety.
IMO	*IMO - Facilitation Committee*	www.imo.org/About/Pages/Structure.aspx#3	To ensure that the right balance is struck between maritime security and the facilitation of international maritime trade.	USCG	Selected U.S. agencies will be part of delegation. Other agency input is solicited on international issues that will be brought up in IMO forums.	DOS	None
IMO	*IMO - Technical Cooperation Committee*	www.imo.org/About/Pages/Structure.aspx#3	To consider any matter within the scope of the IMO concerned with the implementation of technical co-operation projects for which the Organization acts as the executing or co-operating agency and any other matters related to the IMO's activities in the technical co-operation field.	USCG	Selected U.S. agencies will be part of delegation. Other agency input is solicited on international issues that will be brought up in IMO forums.	DOS, NOAA	None
IMO	*IMO - Legal Committee*	www.imo.org/About/Pages/Structure.aspx#3	To deal with any legal matters within the scope of the IMO.	USCG	Selected U.S. agencies will be part of delegation. Other agency input is solicited on international issues that will be brought up in IMO forums.	NOAA, DOS	None
	International Tanker Owners Pollution Federation (ITOPF)	www.itopf.com/about	ITOPF offers a broad range of technical services to its Members and Associates, their pollution insurers and other groups around the world concerned with marine spills. These services include: Response to spills, Damage assessment, Contingency planning & advisory work, Training & education, Information	ITOPF*	None	NOAA has a MOU with International Group of P&I Clubs for NRDA	
	Interspill Steering Committee	www.interspill.org	Committee is concerned with marine pollution prevention, preparedness, response and restoration in Europe	European Oil Spill Industry, IPIECA, European Maritime Safety Agency*	No U.S. Agencies, however USCG, NOAA, BSEE and EPA meet with interspill as part of tri-conference agreement.	None	DOI (BSEE) is on the Executive Committee of the IOSC and respresents this group as part of the Triconference agreement with Interspill and Spillcon
	International Petroleum Industry Environmental Conservation Association (IPIECA)	www.ipieca.org/vision-mission-and-membership-commitment	IPIECA's mission is developing, sharing and promoting sound practices and solutions; Enhancing and communicating knowledge and understanding; Engaging members and others in the industry; Working in partnership with key stakeholders	IPIECA*	None		DOI (BSEE) interfaces with this group on offshore related issues.
	Joint Industry Program - SINTEF	www.sintef.no/Projectweb/JIP-Oil-In-Ice/Program-overview	To develop knowledge, tools and technologies for environmentally beneficial oil spill response strategies for ice-covered waters.	SINTEF*	None	BSEE	DOI (BSEE) interfaces with this group on offshore related issues.

	NAME	WEBSITE	MANDATE or MISSION	LEAD	MANDATED COMPOSITION (US AGENCIES ONLY)	OTHER AGENCY PARTICIPATION	DOI's CURRENT ROLE AND ENGAGEMENT
JIPs	Joint Industry Task Force on Oil Spill Response (JITF)		JITF evaluates procedures and lessons learned during the Deepwater Horizon (DWH) oil spill response with the focus being to identify potential opportunities for improvement to the oil spill response system in the areas of planning and coordination, optimization of each response tool, research and development (R&D), technology advancement and training/education of all parties preparing for or responding to an oil spill.	API*	None	BSEE, USCG, NOAA, EPA	DOI (BSEE) interfaces with this group on offshore related issues abd has been briefed on the four task forces (Operating procedures, subsea well control and containment, offshore equipment and oil spill preparedness and response.
	Joint Industry Program - International Oil and Gas Producers (OGP)	www.ogp.org.uk/news/industry-programme-to-strengthen-arctic	To further enhance industry knowledge and capabilities in the area of Arctic oil spill response to advance dispersant effectiveness and environmental effects, in-situ burning, mechanical recovery and remote sensing	IOGP*	None	BSEE, USCG, NOAA	DOI (BSEE) interfaces with this group on offshore related issues abd has been briefed on the four task forces (Operating procedures, subsea well control and containment, offshore equipment and oil spill preparedness and response.
	Panama Canal International Coordination with the NRT	www.nrt.org/production/NRT/NRTWeb.nsf/PagesByLevelCat/Level2Panama?Opendocument	MOA between PCA (Panama Canal Authority) and NRT to facilitate international support to significant spills	USCG/EPA	Through an agreement between the NRT and Panama Canal Authority (PCA) the NRT will provide spill support The NRT has provided modeling, training and participated in exercises.	NRT agencies would support thePCA per agreement.	DOI (PMB, Office of Environmental Policy and Compliance) as part of NRT
	U.S. Mexico Joint Contingency Plan	www.nrt.org/production/NRT/NRTWeb.nsf/PagesByLevelCat/Level2Mexico?Opendocument	Provides a mechanism for cooperation between the U.S. and Mexico in response to a polluting incident that may pose a significant threat to both parties.	USCG	This is an agreement between the USCG and Mexico with annexes for both the Gulf of Mexico and Pacific Ocean	NRT agencies would support the USCG FOSC.	DOI as part of NRT; DOI RRT reps covering Pacific and Atlantic where U.S. borders Mexico
	World Petroleum Council	www.world-petroleum.org/index.php?/Constitution/constitution.html	The principal purpose of the WPC is to promote the management, sustainable supply and use of the world's oil and gas resources for the benefit of mankind It aims to encourage the application of scientific and technological advances and the study of economic, financial, management, environmental and social issues relating to the petroleum industry for the benefit of all, through taking into account the needs of both present and future generations.	API*	None	USGS	USGS

** indicates non-government participant listed because of their lead or key role*

Appendix 4 (Vector 3 Cont.) - Interagency Coordination Matrix

DOI BUREAUS AND INTERNAL SPILL RESPONSE GROUPS

NAME	WEBSITE	MANDATE or MISSION
Bureau of Land Management (BLM)	www.blm.gov/wo/st/en.html	The Hazard Management and Resource Restoration (HMRR) Program commonly known as Hazardous Materials Management (HAZMAT) supports the DOI's goals by protecting lives, resources and property, and improving the health of landscapes and watersheds. This group has responsibility for hazardous material response and Natural Resource Damage Assessment on BLM lands.
Bureau of Ocean Energy Management (BOEM)	www.boem.gov	BOEM assess the potential environmental impacts from exploring and extracting resources. For oil and gas development, these efforts begin with the preparation of a Programmatic Environmental Impact Statement in support of the 5-year OCS Leasing Program. After the Secretary has decided on the size, timing, and location of lease sales for the 5-year period, lease sale specific EISs are prepared. The bureau assesses oil-spill risks associated with offshore energy activities off the U.S. continental coast and Alaska by calculating spill trajectories and contact probabilities.
Bureau of Safety and Environmental Enforcement (BSEE)	www.bsee.gov	BSEE works to promote safety, protect the environment, and conserve resources offshore through vigorous regulatory oversight and enforcement. The Oil Spill Response division is responsible for developing standards and guidelines for offshore operators' Oil Spill Response Plans through internal and external reviews of industry OSRPs to ensure compliance with regulatory requirements and coordination of oil spill drill activities. The Oil Spill Response division also plays a critical role in the review and creation of policy, guidance, direction and oversight of activities related to BSEE's oil spill response. The division oversees the Unannounced Oil Spill Drill program and works closely with sister agencies such as USCG and EPA to continually enhance response technologies and capabilities.
DOI Office of Emergency Management	www.doi.gov/emergency/index.cfm	The Office of Emergency Management establishes and disseminates policy and coordinates the development of bureau and office programs for an integrated and comprehensive program which spans the continuum of prevention, planning, response, and recovery. The program encompasses all types of hazards and emergencies that impact Federal lands, facilities, infrastructure, and resources; Tribal lands and Insular Areas; the ability of the Department to execute essential functions; and for which assistance is provided to other units of government under Federal laws, Executive Orders, interagency emergency response plans such as the National Response Framework, and other agreements.
DOI Strategic Sciences Group (SSG)	www.doi.gov/news/pressreleases/loader.cfm?csModule=security/getfile&pageid=274267	SSG is intended to ensure that preparedness, response and recovery efforts by the department and its bureaus will utilize the best available science and lessons learned from past events, including the Deepwater Horizon oil spill and Hurricane Katrina. Leads are NPS and USGS.
Indian Affairs (IA)	www.bia.gov	IA provides services (directly or through contracts, grants, or compacts) to approximately 1.9 million American Indians and Alaska Natives. American Indians and Alaska Natives are trustees for their lands.
National Park Service (NPS)	www.nps.gov	The Associate Director for Natural Resources, Stewardship and Science has responsibility for Natural Resource Damage Assessment. Damage assessment and restoration within NPS involves providing guidance for the appropriate and consistent application of Federal damage assessment and restoration statutes (including the Park System Resource Protection Act), and coordinating and managing NPS damage assessment and restoration activities. National parks can and will assist with response within the parks themselves. During the Deepwater Horizon spill biologists, ecologists, and archeologists from those parks helped identify the most sensitive areas of coastline so the USCG could put protective measures in place such as absorbent boom and protection for nesting sea turtles and colonial seabirds.
Office of Insular Affairs	http://www.doi.gov/oia/index.cfm	The Secretary of the Interior has administrative responsibility for coordinating federal policy in the territories of American Samoa, Guam, the U.S. Virgin Islands, and the Commonwealth of the Northern Mariana Islands, and the responsibility to administer and oversee U.S. federal assistance provided to the Freely Associated States of the Federated States of Micronesia, the Republic of the Marshall Islands, and the Republic of Palau under the Compacts of Free Association.
U.S. Fish and Wildlife Service (FWS)	www.fws.gov	FWS personnel respond to spills of hazardous materials to provide scientific and technical advice relative to impacts on fish and wildlife and the environment. FWS maintains expertise in mitigating the effects of oil spills and hazardous materials. FWS is the primary trustee for DOI in Natural Resource Damage Assessments. FWS is also the DOI representative on most of the Regional Response Teams.
U.S. Geological Survey (USGS)	www.usgs.gov	USGS is a scientific research agency within the Department of the Interior, providing impartial information on environmental health, ecosystem function, natural hazards, energy, mineral and water resources, and climate and land-use change. USGS supports the science needs of all DOI bureaus, as well as other federal, state and local agencies. USGS personnel assisted with the DWH response by providing real-time geographic information systems, leading flow-rate estimation efforts, conducting studies of the transport, fate and environmental impact of residual oil and dispersants, and providing scientific data and analyses in support of the NRDA and Gulf Coast Ecosystems Restoration Task Force.

Enclosure 10

Ocean Energy Safety Advisory Committee
Safety Management Subcommittee
Safety Culture Recommendation

Recommendation 3 – Data Management

August 15th, 2012

Introduction

At the full OESC meeting in April 2012, the SMS Subcommittee proposed three recommendations to the OESC relating to Offshore Safety Culture [1]. The OESC supported two of the three recommendations, which were subsequently submitted to DOI/BSEE by Chairman Hunter in a letter dated May 17, 2012, and requested that the third recommendation be reworded and re-submitted to the committee for approval.

In the following section the re-worded recommendation is presented to the Committee for approval

3- Data Management

Data is one of the essential management tools needed to ensure that safety performance indicator trends can be analyzed and proper management decisions made to reduce or eliminate certain unwanted consequences. The challenges so far in relation to use of data in offshore safety management are many, hence the flurry of initiatives that are ongoing on this subject.

This subcommittee's work in this area was mainly focused on emphasizing key recommendations as related to data management; these recommendations should not be considered comprehensive as they are not covering such areas as prevention. The focus in this section is on data as related to checking that the safety culture which is being developed and followed is leading to the desired safety outcomes. The subcommittee recommends the following:

a. That DOI/BSEE put greater emphasis on performance indicators of the health of the safety management systems rather than on lagging personal safety indicators. The focus should be on leading indicators measured weeks if not months prior to the potential hazard occurring and measuring people's behavior and decisions early in the process that may lead to a hazard. This would be more effective than simply relying on indicators that occur immediately prior to an incident where intervention is limited, more reactive and usually less effective. The key is in finding measures of how completely the elements of SEMS are being actually implemented in the operations. The recommendations of the National Academy report on "Evaluating the Effectiveness of Offshore Safety and Environmental Systems" might form a basis for defining these indicators.

b. That both near miss reporting and hydrocarbon release data could be included as indicators to be reported. BSEE should work with other regulators and industry to better define the specifics of such indicators before they can be implemented.

c. That once indicators are defined, contractors and operators should be allowed to present their safety performance leading indicators in a neutral format and in a safe environment that would allow the development of a stronger and more mature safety culture, one that would not punish individuals or organizations for sharing their data. The Center for Offshore Safety (COS) is a good example where such data can be analyzed and shared in a neutral environment. A process should be developed to allow the data to be made available to the public in a neutral format.

d. We recommend that BSEE and the industry work through international initiatives and the COS on consolidating the format of reporting these indicators. The data collection process is the foundation of all future analysis and recommendations that are made, and as such should be well structured and organized according to an international guideline or standard. This would allow the largest data set for the analysis of trends. Such a data collection process would provide important feedback to the previously recommended Offshore Safety Leadership Council to assist them in better understanding how behaviors and values are changing and to help drive to a stronger safety culture.

References

[1] - SMS Subcommittee Vector #1 recommendation document dated April 10, 2012

Enclosure 11

Ocean Energy Safety Advisory Committee
Safety Management Subcommittee
Safety Management System Enhancement Recommendation

August 29, 2012

Introduction

At the full OESC meeting in April 2012, the Safety Management Systems (SMS) Subcommittee recommended that DOI/BSEE redirect its work on the proposed Safety and Environment Management Systems (SEMS) II rule in order to address four critical issues with the current SEMS regulations:

- Jurisdiction
- Responsible party
- Performance-based approach
- Process safety management

The OESC supported this recommendation and the Chairman submitted the recommendation to the Department of Interior (DOI) and the Bureau of Safety Environmental Enforcement (BSEE) in a letter dated May 17, 2012.

During and after the April 2012 meeting, the Subcommittee identified several additional improvement topics that required further analysis and debate before bringing them forward as firm recommendations. These focused on whole system safety management, hazard identification & mitigation, and performance based approach to safety. In June 2012 the SMS Subcommittee met and discussed SEMS, Safety Culture and other related topics. Based on this meeting and the subcommittee's continued work on safety management systems, five new recommendations for DOI/BSEE have been generated and are now submitted to OESC for consideration.

New Recommendations

1) Management and Facility Level Approach: The SMS Subcommittee believes that the current SEMS regime could be more effective if amended to provide focus on two different levels. This amended approach would provide the necessary balance between management, engineering, and operational activities and thus would significantly enhance barriers to major incidents and worker/environmental safety on the OCS. A graphical depiction of this dual level approach is shown below in Figure #1.

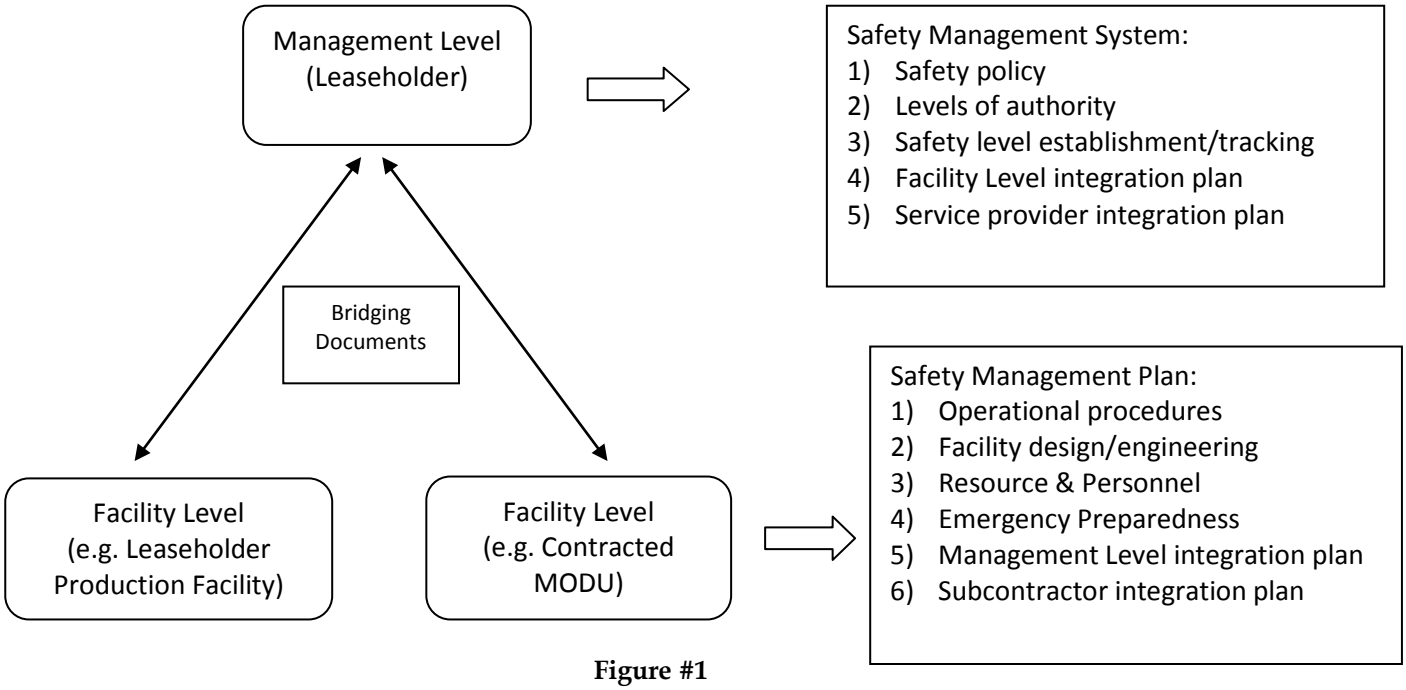

Figure #1

The SMS Subcommittee believes that leaseholders should be considered as the "Management level" for this new approach. Leaseholders should be tasked with setting general safety policies; defining achievable safety levels, developing bridging documents with facility and service providers, and managing the overall safe operation of their leased area(s). These and other elements are key components of an effective safety management system. Furthermore, it should be the responsibility of a leaseholder to bridge all of the "Facility Level" Safety Managements Plans (SMP).

Owners and/or operators of facilities[1] must be given the responsibility to develop and implement their own Safety Management Plans that are facility specific. In particular, these parties need to be responsible for all equipment on the facility and all activities performed on the facility. Job safety analyses, facility level hazard analysis, operating procedures and mechanical integrity program need to be developed, implemented, and owned by the people at the Facility level. This would include integrating subcontractors that provide equipment plus personnel on that facility. It should be noted that these SMPs must be appropriately bridged with a "Management Level" SMS prior to the start of any activities.

Portions of this new approach follow what is currently being implemented in the United Kingdom. Under UK Health and Safety law, the primary responsibility for ensuring safety on a facility is placed on a "duty holder." This "duty holder" is typically considered to be the operator for production installations (fixed and floating facilities) and owners of non-production installations (contracted MODUs). "Duty holders" are responsible for the overall safety of their individual facility and must coordinate the health and safety of all the companies and personnel present.

[1] As defined by 33 CFR 250.105

Recommendation: Proper safety management on the U.S. OCS needs focus on delegating of appropriate SMS responsibilities to both the leaseholder and the owner/operator of each facility. This requires the implementation of a dual level concept consisting of a "Management Level SMS" that covers safety policy, delegation of authorities, integration of safety plans, etc. and a "Facility Level SMP" that includes operational procedures, facility design/engineering, resource and personnel, emergency preparedness, integration planning, etc.

BSEE should continue regulating the leaseholders and should develop/implement the "Management Level" portion of this approach, however the "Facility Level SMP" portion of this approach may fall outside of BSEE's current authority/jurisdiction. The subcommittee recognizes that BSEE has jurisdiction over specific systems that may be on a "facility," however; the "Facility Level SMP" should be regulated and developed by the appropriate regulatory agency that has jurisdiction over the safety of the entire facility.

2) SEMS Program submittal and approval: The SMS subcommittee members feel strongly that improvements can be made to the current SEMS regime by developing a submittal and approval process of a leaseholder's SEMS Program. These changes would improve the dialogue and learning and thus effectiveness of SEMS and reinforce the performance-based approach.

   In the United Kingdom and Australia, safety management plans are submitted to the Health and Safety Executive (HSE) and National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA), respectively, as part of their "Safety Case" requirements. These plans are then assessed on an individual basis to ensure that all aspects involving safety are being properly managed, and to confirm whether or not the regulator is satisfied that there is sufficient robustness in the safety management system. For certain vessels[2]operating on the U.S. OCS, the Coast Guard requires that their Safety Management Systems be certificated. This certification process involves a systematic review of the management system, including emergency preparedness, incident investigation and risk management procedures.

   The current SEMS regulations do not require leaseholders to submit their SEMS Program to BSEE for approve or comment. BSEE does, however, have the right to request a leaseholder to make their program available for evaluation, when requested. The SMS subcommittee feels that this is a missed opportunity to understand the risks and controls of an operation and/or facility and therefore provide better oversight. The Subcommittee also feels that this best practice would also help the Bureau more quickly develop its knowledge and capabilities regarding safety management systems. It will be necessary for BSEE to implement this recommendation over a period of time to allow BSEE to obtain the necessary resources to perform this approval.

   Recommendation: BSEE should develop and implement a submittal and approval process for leaseholder SEMS plans.

3) Audits, inspections and feedback: In other offshore oil and gas regulatory systems, as well as in other industries such a nuclear, facility inspections/audits are carried out by 2-3 person teams over multiple days, often proceeded by discussions with leadership and support staff in the office. These include an in-depth audit of the safety management system. Following the inspection/audit, the regulators meet with the facility operator to review findings, discuss gaps and develop an improvement plan of actions to close those gaps. This collaborative and interactive approach helps both the regulator and operator to identify and address any key gaps in the safety management system being used on the facility and helps

[2] See 33 CFR 96.210 for applicability.

foster a cooperative safety culture where the regulator and operator are working together towards a safer industry. Right now, SEMS audits by BSEE inspectors are not performed this way. The SMS Subcommittee believes that there should be a close-out review meeting between BSEE and the leaseholder to allow for an open discussion on any written/official citations and the development of an improvement plan.

Recommendation: BSEE should review inspection/audit practices carried out by other countries and other industries, as well as the team based approach in BSEE's Focus Facility Reviews and the California State Land facility evaluations and revise their approach. This review should include an evaluation of the following factors: frequency and approach, regulatory agency resource needs and funding requirements including transportation needs. A critical part of this review would be to identify best practices around proactive feedback, and improvement planning to move away from the current PINC list approach. This recommendation is not meant to take away from BSEE's traditional inspections and ability to issue immediate citations for any egregious safety violations.

4) Independent third party audits:
The SMS subcommittee also recommends that BSEE revise the requirement for independent third party audits as included in the proposed SEMS II rule and stay with the current practice of using internal auditors. Use of a competent and well-documented internal team would help to ensure a quality audit that also encourages an appropriate culture of safety. BSEE, in consultation with the industry through the Center for Offshore Safety (COS), should develop an approach to certify auditors (including internal auditors), develop audit standards, and establish the process by which audits are conducted. Along with improved facility inspections and interactive feedback sessions as proposed above, the subcommittee believes that internal audits by qualified auditors would significantly improve audit and SEMS effectiveness.

Recommendation: BSEE should revise the requirement in the SEMS II proposed rules for independent third party SEMS auditors to allow qualified internal SEMS auditors.

The SMS Subcommittee recognizes that the first recommendation would require a large regulatory change and organizational shift; nevertheless the Subcommittee advocates that DOI/BSEE not delay action on the remaining recommendations while working on the first one. The Department of Interior should request additional resources and funding to implement these recommendations if needed.

Enclosure 12

Ocean Energy Safety Advisory Committee
Safety Management Subcommittee
Stakeholder Engagement Recommendation

August 15th, 2012

Stakeholder Engagement

The Safety Management Systems Subcommittee proposes the following recommendation for consideration by the OESC:

The Ocean Energy Safety Advisory Committee (OESC) recommends that BSEE utilize the OESC and any successor federal advisory committee as a resource for input and early stakeholder feedback on major BSEE issues and initiatives. BSEE could ask OESC to provide recommendations on specific issues of concern to the Bureau. Major initiatives on which BSEE might solicit input from the OESC include regulatory proposals (prior to the start of the formal regulatory process and during open comment periods), use of industry standards, policies and procedures (e.g., Notices to Lessees, enforcement approaches), and research-related decisions.