



U.S. CHEMICAL SAFETY AND HAZARD INVESTIGATION BOARD

INVESTIGATION REPORT

VOLUME 4

DRILLING RIG EXPLOSION AND FIRE AT THE MACONDO WELL

(11 Fatalities, 17 Injured, and Serious Environmental Damage)



DEEPWATER HORIZON RIG

MISSISSIPPI CANYON 252, GULF OF MEXICO

KEY ISSUES:

APRIL 20, 2010

- US OFFSHORE SAFETY REGULATION DURING AND AFTER MACONDO
- ATTRIBUTES OF AN EFFECTIVE REGULATOR AND REGULATORY SYSTEM

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Contents

ACRONYMS AND ABBREVIATIONS	7
REGULATORY OVERSIGHT OF U.S. OFFSHORE OIL AND GAS OPERATIONS: A CALL FOR MORE ROBUST AND PROACTIVE REQUIREMENTS	10
VOLUME 4 – INTRODUCTION	11
1.1 Approach to Analysis.....	12
1.2 Attributes of an Effective Regulatory Model.....	13
2.0 REVIEWING INTERNATIONAL REGULATORY MODELS	17
2.1 History of Safety and Environmental Management Systems Offshore in the US	17
2.1.1 The Outdated API Offshore Safety Management System Approach.....	19
2.2 Purpose of the Regulations and Role of the Regulator	21
2.3 An Alternative Regulatory Model: The Safety Case	22
2.4 Managing Major Accident Hazards in the US.....	25
3.0 INADEQUATE POST-MACONDO SAFETY MANAGEMENT REGULATIONS	27
3.1 SEMS: No Goal-Setting Risk-Reduction Standard	28
3.1.1 The Use of Standards and Guidance in ALARP-based Regulatory Regimes.....	32
3.1.2 Insufficient US Alternative Legal Mechanisms to Drive Continual Safety Improvements..	34
3.1.3 Ineffective Regulatory “Workarounds”	36
3.1.4 Recent BSEE-proposed Regulatory ALARP-type Language.....	37
3.2 SEMS Activity-Based Requirements: A Compliance-Based Mentality	38
3.3 Safety Responsibility Offshore	41
3.3.1 Offshore Regulatory Ambiguity and Industry/Stakeholder Response.....	43
3.3.1.1 Post-Macondo BSEE Efforts to Hold Contractors Responsible for Safety... 46	
3.3.1.2 Stakeholders Attempt to Fill Responsibility Gap with Voluntary Guidance 49	
3.3.2 Other Regimes’ Focus on Safety Responsibilities of Operator/Lessee and Drilling Contractor	49
3.3.3 Conclusion	52
3.4 Insufficient SEMS Worker Participation Provisions	53
3.4.1 Post-Macondo/SEMS Worker Participation Provisions	55
3.4.2 Insufficient and Limited SEMS Worker Participation Provisions.....	56
3.4.3 No SEMS Provisions for Worker-Elected Safety Representatives.....	57

3.4.4	No SEMS Requirement for Contractor Participation	60
3.4.5	SEMS Stop-Work Authority Impact on Worker Liability	62
3.4.6	Inadequate SEMS Requirements to Protect Workers from Retaliation	63
3.4.7	No SWA Worker-Requested Regulatory Provision in Regulation	65
3.4.8	No SEMS Safety Committees or Tripartite Safety Forums Provision.....	67
3.4.9	Conclusion	69
4.0	US OFFSHORE REGULATOR CHALLENGE IN EFFECTIVE OVERSIGHT	70
4.1	No Required Review of Major Accident Hazard Documentation Before Hazardous Work Begins	71
4.2	Regulatory Safety Oversight Audits and Initiatives	76
4.2.1	Challenges of Relying on Third-Party Audits in the GoM	78
4.3	Regulatory Use of Safety Performance Indicator Data	79
4.3.1	Roadblocks to Regulatory Improvements in Data Collection and Analysis	80
4.3.2	Inadequate Use of Safety Performance Indicators	84
4.4	Transparency of Offshore Safety	88
4.4.1	Regulatory Approaches to Transparency	89
5.0	INSUFFICIENT AND INADEQUATE STAFF FOR APPROPRIATE OVERSIGHT	94
5.1	Models for Building a Competent Regulator	94
5.1.1	UK Offshore Safety Directive Regulator	94
5.1.2	US Government Incentives to Build Competent Staff.....	96
5.2	Disproportionate Regulator Resources for Gulf of Mexico Offshore Activity.....	97
5.3	The Deficit in Regulator Technical Competency and Credibility	100
5.4	Post-Macondo Efforts to Improve Competency	101
5.5	Insufficient Regulatory Funding Mechanism for Securing Staff.....	102
5.5.1	Ineffectual Funding Appropriations for Offshore Activity.....	103
5.5.2	Industry Funding of International Offshore Regulators.....	106
5.6	The Importance of an Independent Regulator.....	108
5.6.1	The Minerals Management: The Safety Versus Revenue Conflict.....	108
5.6.2	BSEE Organizational Structure	110
5.6.3	Critical BSEE Drilling Permit Concerns	113
5.6.4	Historical Recognition for Separating Safety Oversight from Resource Development..	114
5.6.4.1	Creation of the Mine Safety and Health Administration.....	114

5.6.4.2 Creation of the Nuclear Regulatory Commission 114

5.6.4.3 Creation of the UK HSE Offshore Division..... 115

6.0 CONCLUSION..... 116

7.0 RECOMMENDATIONS 117

Appendix A: International Offshore Incidents and the US Response..... 121

Figures and Tables

Figures

Figure 3-1. Transocean’s Well Delivery Process..... 42

Figure 4-1. Department of Interior organization chart: at the time of the April 20, 2010, Macondo incident and currently. 112

Tables

Table 3-1. Current and BSEE proposed language for § 250.107, What must I do to protect health, safety, property, and the environment? 37

Table 4-1. Abridged list of reportable incidents to BSEE from § 250.188..... 81

Acronyms and Abbreviations

AB	Accreditation Body
ACOP	Approved Code of Practice
AEC	Atomic Energy Commission
ALARA	As Low As Reasonably Achievable
ALARP	As Low As Reasonably Practicable
ANSI	American National Standards Institute
AOC	Acknowledgement of Compliance
API	American Petroleum Institute
ASME	American Society of Mechanical Engineers
ASP	Audit Service Provider
ASTM	American Society for Testing and Materials
BAST	Best Available and Safest Technology
BOEM	Bureau of Ocean Energy Management
BOEMRE	Bureau of Ocean Energy Management, Regulation, and Enforcement
BOP	Blowout Preventer
BSEE	Bureau of Safety and Environmental Enforcement
CCPS	Center for Chemical Process Safety
C.F.R.	Code of Federal Regulations
COMAH	Control of Major Accident Hazards
COS	Center for Offshore Safety
CSB	U.S. Chemical Safety Board
CUPA	Certified Unified Program Agency
DAFW	Days Away From Work
DNFSB	Defense Nuclear Facilities Safety Board
DNV	Det Norske Veritas
DOI	Department of Interior
DWH	Deepwater Horizon
EPA	Environmental Protection Agency
EPP	Employee Participation Plan

FRC	Financial Reporting Council
GAO	US Government Accountability Office
GASCET	Guidance for the Topic Assessment of Major Accident Hazard aspects of Safety Cases
GoM	Gulf of Mexico
HSE	Health Safety Executive (of the United Kingdom)
IADC	International Association of Drilling Contractors
INC	Incident of Noncompliance
INPO	Institute of Nuclear Power Operations
IPD	Interim Policy Document
IRF	International Regulators' Forum
ITL	Information to Lessee
JSA	Job Safety Analysis
LCM	Loss Circulation Material
LTI	Lost Time Incident
MBI	Marine Board of Investigation
MDL	Multi-District litigation
MESA	Mining Enforcement and Safety Administration
MMS	Minerals Management Service
MOA	Memorandum of Agreements
MOC	Management of Change
MODU	Mobile Offshore Drilling Unit
MSHA	Mine Safety and Health Authority
NAE	National Academy of Engineering
NOPSA	National Offshore Petroleum Safety Authority; formally NOPSEMA (of Australia)
NOPSEMA	National Offshore Petroleum Safety and Environmental Management Authority
NRC	Nuclear Regulatory Commission
NTL	Notice to Lessee
OCS	Outer Continental Shelf
OCSLA	Outer Continental Shelf Lands Act
OECD	Organization for Economic Co-operation and Development
OESAC	Ocean Energy Safety Advisory Committee

OIAC	Offshore Industry Advisory Committee
OIM	Offshore Installation Manager
ONRR	Office of Natural Resources Revenue
OOC	Offshore Operators Committee
OSDR	Offshore Safety Directive Regulator
OSHA	Occupational Safety and Health Administration
OTC	Offshore Technology Conference
PHMSA	Pipeline and Hazardous Materials Safety Administration
PINC	Potential Incident of Noncompliance
PSA	Petroleum Safety Authority
PSM	Process Safety Management
RIF	Recordable Injury Frequency
ROP	Reactor Oversight Process
SEC	Securities and Exchange Commission
SEMP	Safety and Environmental Management Program
SEMS	Safety and Environmental Management System
SHE	Safety, Health and Environment
SMS	Safety Management System
SOP	Standard Operating Procedure
SWA	Stop Work Authority
TRB	Transportation Research Board
TPSR	Total Potential Severity Rate
TRIR	Total Recordable Injury Rate
UK	United Kingdom
US	United States
USCG	United States Coast Guard
UWA	Ultimate Work Authority
WCS	Well Construction Standards
WEST	Workforce Engagement Support Team
WOMP	Well Operations Management Plan

Volume 4

Regulatory Oversight of U.S.
Offshore Oil and Gas Operations: A
Call for More Robust and Proactive
Requirements

Volume 4 – Introduction

In the aftermath of the Macondo incident, the US offshore safety regulations for drilling and completions activities on the outer continental shelf have been reviewed, debated, and revised.¹ Amid several reorganizational efforts, the Department of Interior established the Bureau of Safety and Environmental Enforcement (BSEE) in October 2011 to oversee safety of the US offshore oil and gas operations.² BSEE's immediate predecessor, the Bureau of Ocean Energy Management, Regulation & Enforcement, (BOEMRE),³ promulgated the Safety and Environmental Management Systems (SEMS) rule in October 2010,⁴ requiring the previously voluntary practices in the American Petroleum Institute's (API) Recommended Practice 75 (API 75).⁵ After BSEE's creation, the agency amended SEMS in 2013 to further its initiative for performance-based⁶ regulations to “reduce the occurrence of accidents, injuries, and spills during oil and gas activities on the Outer Continental Shelf (OCS).”⁷ In April 2015, BSEE proposed well control regulations that it identified as the “most substantial rulemakings in the history” of offshore safety in the United States.⁸ Most recently, on December 7, 2015, BSEE announced the launch of a pilot Risk-Based Inspection Program to complement its existing inspections and audits with the goal of more efficiently and effectively managing the limited inspection and auditing resources of the agency.⁹ In support of these endeavors, BSEE has made efforts over the last five years to educate its staff and engage

¹ See Appendix A for a history of offshore US oil and gas safety regulation. Including pre-Macondo events.

² <http://www.bsee.gov/About-BSEE/BSEE-History/index/> (accessed January 19, 2016).

³ BOEMRE replaced the Minerals Management Service (MMS) shortly following the Macondo incident in 2010.

⁴ Oil and Gas and Sulphur Operations in the Outer Continental Shelf, 75 Fed. Reg. 63609 (Final Rule, October 15, 2010) (to be codified at 30 C.F.R. Part 250).

⁵ API Recommended Practice 75, 3rd ed., *Recommended Practice for Development of a Safety and Environmental Management Program for Offshore Operations and Facilities*, May 2004 (Reaffirmed May 2008).

⁶ The US Nuclear regulatory commission defines performance-based regulation as “a regulatory approach that focuses on desired, measurable outcomes, rather than prescriptive processes, techniques, or procedures. Performance-based regulation leads to defined results without specific direction regarding how those results are to be obtained;” <http://www.nrc.gov/reading-rm/basic-ref/glossary/performance-based-regulation.html> (accessed January 19, 2016).

⁷ Oil and Gas and Sulphur Operations in the Outer Continental Shelf—Revisions to Safety and Environmental Management Systems, 78 Fed. Reg. 20423 (Final Rule, April 5, 2013) (to be codified at 30 C.F.R. Part 250); While the original SEMS rule became effective on November 15, 2010, this subsequent enhancement effective June 4, 2013 is referred to as SEMS II. SEMS II incorporated additional safety requirements that addressed stop work authority, ultimate work authority, employee participation plan, guidelines for reporting unsafe work conditions, job safety analyses, and independence of accredited audit service providers. Unless otherwise stated, when the CSB refers to SEMS, it is addressing both the original SEMS rule and the subsequent SEMS II revisions; see also, BSEE. *Safety and Environmental Management Systems (SEMS) Fact Sheet*; <http://www.bsee.gov/BSEE-Newsroom/BSEE-Fact-Sheet/SEMS-II-Fact-Sheet/> (accessed March 21, 2016).

⁸ Oil and Gas and Sulphur Operations in the Outer Continental Shelf—Blowout Preventer Systems and Well Control, 80 Fed. Reg. 21504 (Proposed Rule, April 17, 2015) (to be codified at 30 C.F.R. Part 250).

⁹ *Bureau of Safety and Environmental Enforcement to Launch Pilot Risk-Based Inspection Program for Offshore Facilities*. December 7, 2015. <http://www.bsee.gov/BSEE-Newsroom/Press-Releases/2015/Bureau-of-Safety-and-Environmental-Enforcement-to-Launch-Pilot-Risk-Based-Inspection-Program-for-Offshore-Facilities/> (accessed December 21, 2015).

in dialogue with industry, regulatory bodies, and safety experts worldwide to improve its function as the regulator of offshore safety.

While acknowledging these positive efforts, the CSB concludes that the SEMS regulations do not provide BSEE with an adequate framework for major accident prevention, and an improved approach is needed to reduce the risk of another Macondo-like event. SEMS does not utilize goal-setting, meaning the reduction of risks to a goal such as “as low as reasonably practicable” (ALARP). In addition, notwithstanding the implementation of SEMS, BSEE audit findings suggest that a culture of minimal regulatory compliance continues to exist in the Gulf of Mexico and risk reduction continues to prove elusive.¹⁰ Ultimately, the offshore regulatory changes made thus far do not sufficiently place the onus on industry to reduce risk or empower the regulator to ensure proactive and effective industry management and control of major hazards.

1.1 Approach to Analysis

The CSB’s preventive mission as a federal agency is to reduce chemical hazards as broadly as possible (e.g., through recommendations that will effect national preventive changes). The CSB, therefore, focuses its recommendation efforts on changing national legislation, regulation, voluntary consensus standards, and industry recommended practices. As a result of an investigation or study, the CSB may issue “proposed rules or orders” to regulators such as the EPA Administrator and the Secretary of Labor “to prevent or minimize the consequences of any release of substances that may cause death, injury or other serious adverse effects on human health or substantial property damage as the result of an accidental release.”¹¹ The CSB’s investigative analytical approach, therefore, must look beyond technical and management system causes.

The CSB approach to regulatory analysis and recommendations starts with an examination of key investigative findings and an analysis of whether the applicable regulatory and enforcement regime manifests weaknesses or gaps that were causally related to the incident. The CSB formulates recommendations that, if effectively implemented, work to prevent or reduce the similar incidents or hazards to as great an extent as possible. For example, key findings in Volumes 3 and 4 of the Macondo Report show that the US offshore regulator lacks effective use of key process safety indicators and guidance addressing corporate boards of directors and human factors focused on major accident prevention. The CSB report analysis shows that addressing these significant gaps could help reduce the risk of similar incidents.

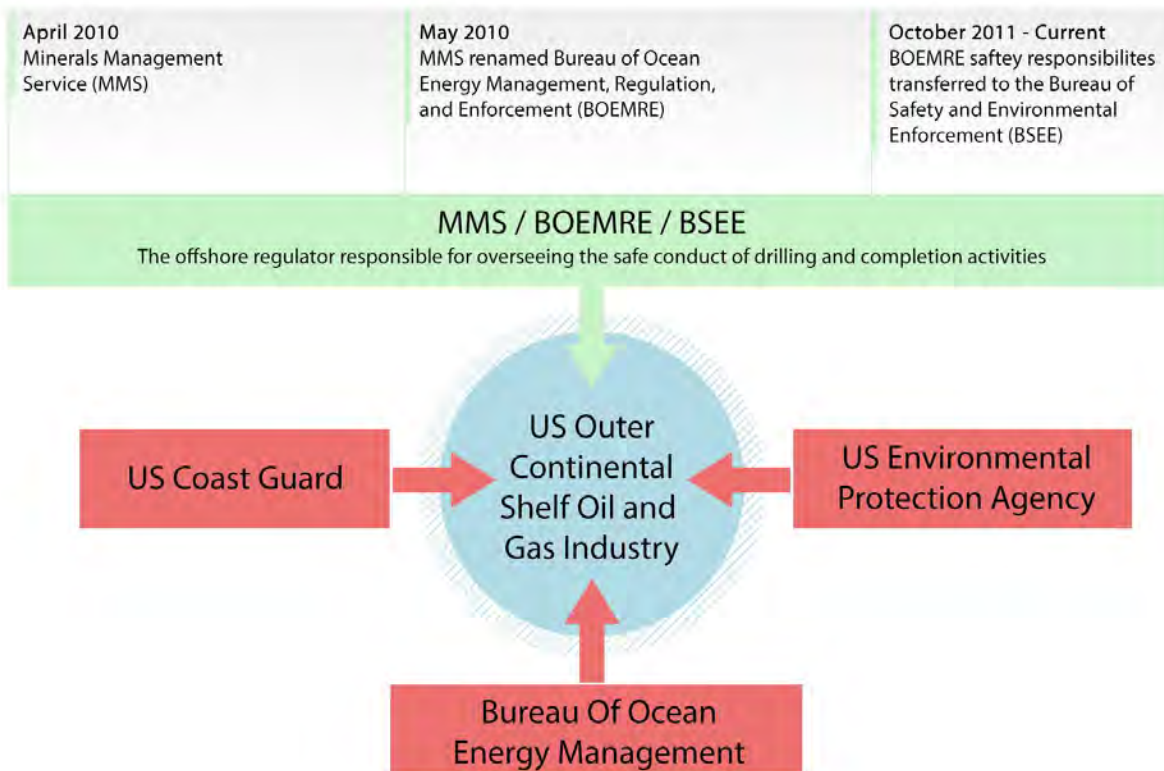
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Throughout Volume 4, the CSB refers to “the regulator” or “offshore regulations” to indicate either MMS or BSEE and their respective safety regulations for drilling and completions activities on the outer continental shelf. As indicated in the figure below, MMS evolved into BSEE after the Macondo incident occurred. In reality, several regulatory bodies oversee the offshore oil and gas industry, including the US

¹⁰ See Section 4.2 and Bureau of Safety and Environmental Enforcement. *BSEE Priorities Regarding SEMS*, Offshore Technology Conference, Houston, TX, 2015; http://www.bsee.gov/uploadedFiles/BSEE/BSEE_Newsroom/Speeches/2015/OTC%202015%20Mtg%20SEMS%20Presentation.pdf (accessed December 19, 2015).

¹¹ 42 USC sec. 7412(r)(6)(c)(ii).

Coast Guard (USCG), the Bureau of Ocean Energy Management (BOEM), and the Environmental Protection Agency (EPA), but the CSB generally limits its discussion to MMS and BSEE due to its specific authority over the safe conduct of offshore drilling and completion operations.



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1.2 Attributes of an Effective Regulatory Model

Various international models for offshore safety regulation can be used to compare and contrast what the US regulator has adopted since Macondo. No one approach is an undisputed panacea for all accidents, partly because prevention requires active and sustained participation in risk reduction from industry, the workforce, and the regulator. Ultimate responsibility for preventing incidents and protecting workers and the public always remains with the employers and parties who create or control major accident risk. Yet regulatory systems have an important role to play in establishing sufficient requirements, guidance, and oversight to establish a floor of practice that if covered employers implement effectively works to reduce major incidents.

As part of the agency's investigative approach, the CSB frequently compares international regulatory regimes from what existed at the worksite under investigation to examine the strengths and weaknesses of different models and methodologies.¹² It would be incorrect, however, to assume that an effective model

¹² In the investigation of a 1999 fire that killed four workers at the Tosco Avon refinery in Martinez, California, the CSB report identified features and attributes from the UK HSE's regulatory guidance related to safe piping and

found in some other international jurisdiction could necessarily be imported to the US with no allowance for important variances that may exist among cultures, existing legal and regulatory structures, political systems, as well as numerous and varied industry stakeholder interests and levels of involvement. To that end, the CSB reviews international regulatory models to identify various attributes that could strengthen the current US offshore regulatory environment. This helps clarify key attributes that could provide more effective safety regulation for addressing identified gaps and weaknesses. Recent CSB reports used this approach, such as those analyzing the 2010 Tesoro Anacortes and 2012 Chevron Richmond refinery incidents, and have identified attributes from other regulatory regimes to address causal regulatory gaps related to the incidents.¹³ Those attributes related to the Macondo incident causal factors include:

Continual Risk Reduction to Levels As Low As Reasonably Practicable (ALARP)

The intention of a goal-based, risk-reduction regulatory framework is to eliminate or sufficiently minimize the risks in an operation. Although risk can never be completely eliminated, any such framework must continually strive toward this goal. With major accident hazards, the key question becomes: Is there anything more that can be done to reduce the risk? ALARP is a standard familiar to industry in other global offshore regimes, and even in other high-hazard industries in the US. In such regimes, the government sets the goal, and the duty holder demonstrates how it will meet that goal through submitted documentation. The regulator then holds the duty holder accountable to execute that plan. The regulator will work with duty holders to obtain the necessary improvement if their work raises significant safety concerns at any point in the lifecycle of the hazardous operation.

The post-Macondo US offshore regulatory framework still does not provide goal-setting, risk-reduction requirements for oil and gas operations in the same manner as ALARP, though that may change, in part, if the well control rule BSEE recently proposed is adopted.¹⁴

equipment opening in process plants that supported the analysis and recommendations in the report. See USCSB, 2001, *Refinery Fire Incident, Martinez, CA, February 23, 1999*, Report No. 99-014-I-CA, Section 3, pp 31-44, March 2001, http://www.csb.gov/assets/1/19/Tosco_Final_Report.pdf (accessed March 25, 2016).

In the 2002 CSB Hazard Investigation Report, *Improving Reactive Hazard Management*, the CSB concluded that the UK HSE and European Union utilize a comprehensive “all hazards” approach to reactive hazard management with regulatory requirements based upon a facilities’ written analysis of specific hazards and needed controls rather than limited to an approach that only reviews listed chemicals based upon their inherent instability. Those regulatory attributes buttressed CSB’s recommendations that called upon EPA and OSHA to base reactive hazard coverage upon classifications beyond a list that would include combinations of chemicals and process specific conditions. See USCSB, 2002, *Improving Reactive Hazard Management*, Section 8.1.3, pp 83-84, October 2002, <http://www.csb.gov/file.aspx?DocumentId=355> (accessed March 25, 2016).

¹³ USCSB, 2013. *Regulatory Report: Chevron Richmond Refinery Pipe Rupture and Fire, Richmond, CA, August 6, 2012*, Report No. 2012-03-I-CA, April 2013, http://www.csb.gov/assets/1/19/Chevron_Regulatory_Report_11102014_FINAL_-_post.pdf (accessed January 25, 2016).

USCSB, 2014. *Catastrophic Rupture of Heat Exchanger, Anacortes, WA, April 2, 2010*, Report No. 2010-08-I-WA, May 2014, http://www.csb.gov/assets/1/7/Tesoro_Anacortes_2014-May-01.pdf (accessed October 7, 2015).

¹⁴ Oil and Gas and Sulphur Operations in the Outer Continental Shelf—Blowout Preventer Systems and Well Control, 80 Fed. Reg. 21504 (Proposed Rule, April 17, 2015) (to be codified at 30 C.F.R. Part 250).

Regulator Adaptability

The regulator has the tools to encourage industry to adopt new technologies and safer practices without additional rule-making. Such improvements may result from learnings from major accidents that occur within jurisdictional waters or internationally. The regulator must be capable of assessing the duty holders' chosen methods to assure that they remain adequate in terms of good practice and achieve a satisfactory level of safe operation.

Safety Responsibility is Maintained by those that Control or Create the Risk

Liability, and thus responsibility, for safety resides with the companies ("duty holders") that have the most direct control over the design, management, and execution of hazardous activities being undertaken. For example, an operator is responsible for the safe design of a well, while the drilling contractor supplies most of the workforce and infrastructure, resulting in control over the primary drilling operations and well response actions.

Active Worker Participation

Past CSB investigations have consistently identified the important role workers and their representatives play in major accident prevention. A fundamental element in effective safety management for major accident prevention is active and meaningful participation from the regulator, industry, and labor. Each of these entities provides unique and essential insights, so denying their effective participation removes critical voices in health and safety matters. Recognizing this operating principle, the United Kingdom (UK) and Norway established tripartite systems of industry, the regulator, and the workforce to deal with safety and health issues. Yet, the US offshore framework does not endow the workforce with a legally empowered voice on matters concerning safety. Similarly, US offshore regulations do not support a more traditional tripartite arrangement like those in other high-hazard industrial settings, domestically and internationally, where the regulator, industry, and workforce all play important roles.

Required Written Safety Documentation by Duty Holders

Duty holders submit or make available to the regulator documentation that analyzes all major hazards; the risks associated with those hazards; and the technical, operational, and organizational controls to reduce those risks to ALARP or a similar goal. Also included is a description of the safety management systems to continually monitor and respond to health and safety hazards. These documents become the basis for regulator audits to confirm that duty holders are following their own stated practices.

Regulatory Assessment and Verification

Regulators have a number of proactive tools at their disposal to evaluate and monitor safety performance. These include preventive assessments to verify that a company's technical and safety management practices are aligned with their written safety documentation, controlling regulations, industry standards, and good practice guidance before hazardous work begins, as well as audits and inspections to review the on-going effectiveness of a company throughout the lifecycle of the hazardous operation.

Regulator uses Process Safety Indicators that Drive Performance

The aim of collecting and using safety performance indicators is to publicly identify safety trends and to establish initiatives for industry to meet higher performance levels. An effective safety indicators program allows for regulatory focus on key indicators, target-setting to drive industry improvements, and issue-specific regulatory program initiatives.

Regulator Transparency

Through real-time publication of appropriate indicators, inspection results, and safety documentation, a regulator prompts companies to reduce risk. These safeguards illuminate for all stakeholders the companies that are experiencing superior safety results because of improved technologies or enhanced operational methodologies, and they can help companies with weaker safety performance to improve. Such transparency can also spur workforce and public pressure on companies to improve safety, protecting the lives of workers and the offshore environment.

Independent, Qualified, and Adequately Funded Regulator

An independent, technically qualified, and adequately resourced regulator is necessary to ensure that regulatory oversight does not devolve into an exercise in compliance-checking and paperwork. The regulator must be able to vigorously question and dialogue with industry regarding the offshore hazards, barriers, and safety management systems industry members have established to manage those hazards.

This final volume builds on Volume 3 analysis to support the conclusion that the offshore safety management regulations, specifically the SEMS Rule, do not adequately employ rigorous approaches to process safety management and major accident prevention. Despite the restructuring of the US offshore regulatory system and new safety management regulations for drilling and completion operations, critical gaps remain. Current safety management regulations fail to establish goal-oriented risk reduction measures for preventing major incidents; do not adequately support a tripartite system of industry, workforce, and regulator collaborating to improve safety; do not feature adequate proactive audits and inspections by the regulator; and do not sufficiently use leading and lagging safety performance indicators to avoid major accidents and influence ongoing safety improvements. The regulatory attributes identified in this final volume of the CSB's Macondo investigation series highlight the important roles of the regulator, industry, and workforce in a goal-setting, risk-reduction regime.

2.0 Reviewing International Regulatory Models

Volumes 2 and 3 of the CSB’s Macondo Investigation Report demonstrate that the incident would have been less likely to occur if BP and Transocean had implemented modern process safety good practices applicable to offshore (e.g., those concerning safety critical barrier identification and management, human factors, safety performance indicators of barrier health and safety system reliability, ALARP, and corporate governance of major accident hazards). While Transocean and BP had adopted some of these process safety concepts into their corporate policies, they did not apply them at Macondo. This disregard of their stated commitments reveals a culture of minimal compliance with regulations and demonstrates the need for regulatory action to prevent such an approach.

Before Macondo, offshore US regulations did not address safety management systems and risk management, relying instead on voluntary participation by operators to adopt safety and environmental management programs. Since Macondo, BSEE has promulgated SEMS, which incorporates by reference API’s *Recommend Practice for Development of a Safety and Environmental Management Program for Offshore Operations and Facilities*. Process safety management good practice has advanced considerably since API 75 was first published, but those advances are not reflected in the recommended practice, and consequently not in SEMS.

After reviewing the regulatory history of safety management systems offshore in the US, this chapter introduces a regulatory model referred to as the “safety case regime,” which has been widely recommended post-Macondo in numerous investigation reports. Volume 4 examines the safety case models used in the UK and Australia as well as the regulatory model adopted in Norway to review how the attributes identified in Section 1.2 might be implemented in the US to address regulatory gaps and weakness highlighted by the Macondo incident.

2.1 History of Safety and Environmental Management Systems Offshore in the US

In 1991, the then-US offshore regulator, MMS, proposed a regulatory model for offshore safety management, the Safety and Environmental Management Program (SEMP).¹⁵ SEMP was to address key points such as written management policies, procedures, training, accident prevention and investigation, and corrective action plans. Some industry commenters requested that MMS wait until the voluntary API 75 standard was published before making a decision, while some recommended MMS simply set safety goals for the industry rather than promulgating regulations.¹⁶ Ultimately, MMS did not promulgate SEMP regulations, but after helping to develop API 75, MMS requested that offshore operators¹⁷ voluntarily adopt the principles contained in it once published.¹⁸

¹⁵ Oil and Gas and Sulphur Operations in the Outer Continental Shelf, 56 Fed. Reg. 30400 (Notice, July 2, 1991).

¹⁶ Oil and Gas and Sulphur Operations in the Outer Continental Shelf, 59 Fed. Reg. 29277 (Notice, June 30, 1994).

¹⁷ ‘Operators’ as referenced in US offshore regulations refer explicitly to the leaseholders of the well; this term does not include drilling contractors or other well service providers.

¹⁸ Oil and Gas and Sulphur Operations in the Outer Continental Shelf, 59 Fed. Reg. 29277 (Notice, June 30, 1994).

API 75 recommended that OCS operators have a safety and environmental management program for their operations that included elements such as:¹⁹

- safety and environmental information;
- hazards analysis;
- management of change;
- safe work practices
- training;
- assurance of quality and mechanical integrity of critical equipment;
- and audit of safety and environmental management program elements.

Rather than ensuring continual safety improvement and evaluation of the effectiveness of safeguards through more rigorous requirements (e.g., using language such as “shall”), the standard relied upon permissive language such as “should” and “recommends.” For example, API 75 only permissively stated that owners and operators “should,” rather than “shall,” require that program elements be documented and reviewed to assure they continued to be suitable, adequate, and effective.²⁰

On June 30, 1994, MMS published a notice in the Federal Register stating that it would closely monitor the voluntary adoption of API 75 by OCS operators for two years.²¹ In another notice published in the Federal Register on July 18, 1996, MMS stated that it collaborated with API to conduct an annual series of surveys to gauge how well OCS operators were implementing SEMP through API 75.²² The MMS stated that surveys conducted in January 1995 and January 1996 showed OCS operators “well on their way to implementing SEMP plans,” and if progress similar to this were maintained, the MMS expected that many of these companies’ SEMP plans would be “fully implemented in the field within the next 1-2 years.”²³ As MMS continued to collect information, it deferred deciding for a mandatory or voluntary adoption of the SEMP by OCS lessees.

Throughout the 1990s and 2000s then, MMS monitored the voluntary adoption of SEMP, but it was not until 2006 that MMS again addressed making SEMP, and potentially elements addressed by API 75, a regulatory requirement.²⁴ At that time, MMS published a study of 310 incident that resulted in 13 fatalities and 97 injuries.²⁵ MMS’s analysis indicated that the contributing causes to the majority of these incidents were associated with four SEMP elements: hazards analysis, management of change, mechanical integrity, and operating procedures. MMS observed, “requiring operators to implement

¹⁹ API Recommended Practice, 75, 3rd ed., *Recommended Practice for Development of a Safety and Environmental Management Program for Offshore Operations and Facilities*, May 2004 (Reaffirmed May 2008).

²⁰ *Ibid.*, pp 2.

²¹ Oil and Gas and Sulphur Operations in the Outer Continental Shelf, 59 Fed. Reg. 29277 (Notice, June 30, 1994).

²² Safety and Environmental Management Program (SEMP) on the Outer Continental Shelf (OCS), 61 Fed. Reg. 37493 (Notice, July 18, 1996).

²³ *Ibid.*

²⁴ Oil and Gas and Sulphur in the Outer Continental Shelf (OCS)—Safety and Environmental Management Systems, 71 Fed. Reg. 29278 (Advanced Notice of Proposed Rulemaking, May 22, 2006).

²⁵ *Ibid.*

these critical elements of an integrated safety management system could address MMS's concerns with performance and ultimately improve safety and environmental compliance on the OCS."²⁶

This proposal was not without strong opposition. The Offshore Operators Committee (OOC),²⁷ a large industry group comprising major oil company representatives of which BP is a member, conducted a workshop in September 2009.²⁸ The OOC resisted making SEMP a required regulation. Instead, OOC compared MMS's proposal to adopt API 75 as regulation to the potential damage from a hurricane: "Both are disruptive to operations and are costly to recover from!"²⁹ OOC also asserted that MMS failed to understand that the existing voluntary programs for safety and environmental protections were effective, that the industry's safety record continued to improve without the need for prescriptive regulation. OOC asserted that the "recordkeeping" envisioned in SEMP/SEMS did nothing to keep people safe, thereby making the implementation of SEMS unnecessary.³⁰ OOC concluded that offshore safety could be most improved through the continued use of voluntary safety programs that allowed the "various operators the opportunity to style their programs to fit their corporate culture and operations" and the need to "modify worker behavior."³¹ Ultimately, it was only after the consequences of Macondo were fully realized did safety and environmental management systems become a regulatory requirement.

2.1.1 The Outdated API Offshore Safety Management System Approach

API 75 was, in part, based upon API 750, "Management of Process Hazards," whose safety focus is for the "prevention of catastrophic releases of toxic and explosive material." API 75, though, lacks the explicit purpose of preventing major hazard accidents and instead encompasses offshore safety and environmental protection in general.³² As generally discussed in Volume 2, the low probability of major accidents can lead to low perception of risk. As a result, offshore drillers may not assess major accident scenarios and identify controls to prevent or mitigate them.³³ Both BP and Transocean illustrated this lapse at Macondo. For example, BP's risk matrix for Macondo did not consider potential blowouts, but

²⁶ *Ibid.*

²⁷ According to the Offshore Operators Committee Mission Statement, available on its website: "The Offshore Operators Committee (OOC) is a non-profit organization comprised of any person, firm or corporation owning offshore leases and any person, firm or corporation engaged in offshore activity as a drilling contractor, service company, supplier or other capacity that desires to participate in the work of OOC or the Offshore Operators Committee... The Committee's activities are focused on providing its member operators with information and technical support that will assist them in conducting their offshore activities in a manner that will promote sound safety and environmental operational practice." See "About the OOC" at <http://www.offshoreoperators.com> (Accessed March, 26, 2016).

²⁸ OOC. Offshore Operators Committee SEMS Feedback, September 2, 2009; <http://big.assets.huffingtonpost.com/MMS-2008-OMM-0003-0030.3.pdf> (accessed March 26, 2016).

²⁹ Verret, A. *MMS Expectations*, Offshore Operators Committee SEMS Feedback, September 2, 2009; <http://big.assets.huffingtonpost.com/MMS-2008-OMM-0003-0030.3.pdf> (accessed March 26, 2016).

³⁰ Parker, W. *Closing Statement*, Offshore Operators Committee SEMS Feedback, September 2, 2009; <http://big.assets.huffingtonpost.com/MMS-2008-OMM-0003-0030.3.pdf> (accessed March 26, 2016).

³¹ Parker, W. *Closing Statement*, Offshore Operators Committee SEMS Feedback, September 2, 2009; <http://big.assets.huffingtonpost.com/MMS-2008-OMM-0003-0030.3.pdf> (accessed March 26, 2016).

³² API Recommended Practice, 750, 1st ed., *Management of Process Hazards*, January 1990.

³³ Volume 2, Section 4.1.

rather other more probable well control issues such as a stuck pipe or lost circulation.³⁴ In the case of Transocean, safety critical procedures identified and addressed personal safety hazards or relatively minor spills rather than potential loss of well control events.³⁵

API 75 states that operators should develop SEMP documentation addressing 11 management program elements such as hazard analysis, management of change, incident investigation, and audits.³⁶ While the 11 elements are important safety management systems, they fall short of the more rigorous approach taken by the Center for Chemical Process Safety (CCPS), which details additional elements that include process safety culture, management review and continual improvement, workforce involvement, and measurement and metrics.³⁷ These key topics and others are either missing or not effectively addressed in API 75. Moreover, language of the SEMP/SEMS guidelines weakens their impact. API 75 does not recommend a specific safety goal such as preventing accidents or controlling hazards, nor does it reference a risk goal such as ALARP.

The provisions listed in API 75 for each management program element are typically activity-based,³⁸ meaning that the mere completion of an activity does not necessarily focus on the effectiveness of accident prevention measures, or necessarily result in actual risk reduction. For example, the hazard analysis element in API 75 states the purpose of the analysis is “to identify, evaluate, and where unacceptable, reduce the likelihood and/or minimize the consequences of uncontrolled releases and other safety or environmental incidents.”³⁹ Without a risk-reduction requirement such as ALARP, this formulation leaves what is “unacceptable” entirely to the discretion of owners/operators, rendering the regulator powerless to proactively question or intervene, even if the owners/operators’ efforts seem minimal or insufficient.

Both API RP 750 and API 75 were first issued early in the development of process safety principles. API 750 is no longer published, and although API 75 was reaffirmed in 2008 and 2013, has not been updated since 2004. Neither reflects current process safety principles described throughout Volume 3, yet API 75 is a cornerstone of offshore US safety regulations requiring operators to “develop, implement, and maintain a safety and environmental management system (SEMS) program [that addresses] elements described in American Petroleum Institute’s Recommended Practice for Development of a Safety and Environmental Management Program for Offshore Operations and Facilities.”⁴⁰

³⁴ Volume 3, Section 4.4.2.

³⁵ Volume 3, Sections 1.8.2 - 1.8.4.

³⁶ API Recommended Practice, 75, 3rd ed., *Recommended Practice for Development of a Safety and Environmental Management Program for Offshore Operations and Facilities*, May 2004 (Reaffirmed May 2008).

³⁷ Center For Chemical Process Safety. *Guidelines for Risk Based Process Safety*; John Wiley & Sons: Hoboken, NJ, 2007.

³⁸ The CSB coined the term “activity-based” in its Chevron regulatory report; USCSB, 2013. *Regulatory Report: Chevron Richmond Refinery Pipe Rupture and Fire, Richmond, CA, August 6, 2012*, pp 9, Report No. 2012-03-I-CA, April 2013, http://www.csb.gov/assets/1/19/Chevron_Regulatory_Report_11102014_FINAL_-_post.pdf (accessed January 25, 2016).

³⁹ API Recommended Practice, 75, 3rd (2004, reaffirmed 2008) ed., *Recommended Practice for Development of a Safety and Environmental Management Program for Offshore Operations and Facilities*, pp. 7.

⁴⁰ 30 C.F.R. § 250.1900 (2016).

2.2 Purpose of the Regulations and Role of the Regulator

Offshore safety regulators exist, in part, to hold industry accountable for health, safety, and environmental protection standards in their offshore operations, and to address other issues not necessarily related to safety, such as licensing, revenue collection, and environmental protection and stewardship. Due to the dangers posed by high-hazard offshore oil and gas operations, the US government has an interest in establishing minimum safety standards and outside verification mechanisms to oversee that industry follows those standards to benefit of workers and the environment. The catastrophic potential for injuries, deaths, or damage that could result without an effective regulator cannot in good conscience be tolerated, and companies may not always choose to operate with appropriate protections unless the government requires it. At a minimum, offshore regulations explain to industry and the public the boundaries and expectations for those protections. These offshore resources are to some extent considered held in public trust, so another of the regulator's key tasks relates to effective stewardship of the deepwater assets themselves. Moreover, the regulator must act on environmental protection issues, driven by the growing need to safeguard the natural environment and the interest of all stakeholders as it grants operators and drillers a public license to extract offshore resources safely for the benefit of the corporation and the overall US economy.

Regulators can conduct oversight responsibilities through varied mechanisms, both proactively and reactively, to influence industry safety improvements. Regulators can challenge safety claims that industry makes and assure their implementation of safety management systems in general through inspections, audits, and incident investigation. Some regulatory attributes inherently provide a regulator with more tools or position the regulator to provide more effective—and even more proactive—oversight in high-hazard industries like offshore drilling.⁴¹

⁴¹ See Section 1.2 for a summary of these regulatory attributes, though they will be discussed more in depth throughout Volume 4.

2.3 An Alternative Regulatory Model: The Safety Case

Following the Macondo blowout, numerous widely circulated official investigative reports recommended broad improvements to the US offshore regulatory regime. Many specifically promoted adopting a fundamentally different regulatory model for deepwater drilling in the outer continental shelf region of the US, the “safety case.” They included:

- The National Commission on the BP Deepwater Horizon Oil Spill (National Commission) which stated, “The Department of the Interior should develop a proactive, risk-based performance approach specific to individual facilities, operations and environments, similar to the ‘safety case’ approach in the North Sea. . . . Require operators to develop a comprehensive ‘safety case’ as part of their exploration and production plans—initially for ultra-deepwater (more than 5,000 feet) areas, areas with complex geology, and any other frontier or high-risk areas—such as the Arctic.”⁴²
- The National Academy of Engineering (NAE), along with the National Research Council (NRC), examined the probable causes of the Macondo explosion, fire, and oil spill, recommending that the US “fully implement a hybrid regulatory system that incorporates a limited number of prescriptive elements into a proactive, goal oriented risk management system for health, safety, and the environment.”⁴³
- Det Norske Veritas (DNV), one of the leading classification and certification bodies operating worldwide, asserted, “The current safety regime for the US Gulf of Mexico is largely a prescriptive regulation with no requirement for safety cases to be performed. . . . an offshore safety regime based on a performance-based regulation requiring safety cases including risk assessments supplemented by required or recommended specific prescriptive regulation for selected areas is the most effective regime model.”⁴⁴
- The Department of Interior recommended several improvements concerning its offshore safety regime, including specific reference to the safety case model: “The Department Will Adopt Safety Case⁴⁵ Requirements for Floating Drilling Operations on the OCS . . . based on IADC [International Association of Drilling Contractors] Health, Safety and Environmental Case Guidelines for Mobile Offshore Drilling Units (2009).”⁴⁶ The DOI further recommended: “Finalize a rule that would require operators [on the OCS] to develop a robust safety and

⁴² National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling. *Deepwater: The Gulf Oil Disaster and the Future of Offshore Drilling - Report to the President*; January, 2011; pp 252-253.

⁴³ National Academy of Engineering and National Research Council. *Macondo Well Deepwater Horizon Blowout: Lessons for Improving Offshore Drilling Safety*; December 14, 2011; pp 90.

⁴⁴ Pitblado, R.; Bjerager, P.; Andreassen, E. *An Effective US Offshore Safety Regime*; Det Norske Veritas: 22 2010, July; pp 3. http://www.dnvusa.com/Binaries/1008-001%20Offshore%20Update_Key%20aspects_tcm153-430982.pdf (accessed March 16, 20106).

⁴⁵ DOI defines the safety case as follows: “A safety case is a comprehensive and structured set of safety documentation to ensure the safety of a specific vessel or equipment. This documentation is essentially a body of evidence that provides a basis for determining whether a system is adequately safe for a given application in a given environment;” Department of Interior. *Increased Safety Measures for Energy Development on the Outer Continental Shelf*; May 27, 2010; pp 27.

⁴⁶ Department of Interior. *Increased Safety Measures for Energy Development on the Outer Continental Shelf*; May 27, 2010; pp 27.

environmental management system for offshore drilling operations,” which DOI described as “a comprehensive, systems-based approach to safety and environmental management that incorporates best practices from around the globe.”⁴⁷

- The United States Coast Guard (USCG) recommended that it “work with BOEMRE to evaluate the benefits of shifting to a “Safety Case” approach similar to that used in the North Sea, a method in which there is a more holistic approach to safety.”⁴⁸

These recommendations reflect a logical progression of a regulatory approach seen throughout the history of offshore oil and gas regulation. It makes sense for society to protect its interests through appropriate regulation if an industry, such as offshore oil and gas exploration and production is capable of endangering the lives or safety of workers or creating significant health and safety or environmental risk to its citizens. Such a regulatory regime could be: (1) a state-run, nationalized industry centrally controlled by the government; (2) a prescriptive licensing and approval regime with audits and inspections and penalties for failure to comply with regulations; or (3) a safety case type of regime where the company proposes to conduct its activities and then explains its major accident hazards assessment and control plan to the regulator, typically (but not always) for acceptance before commencing drilling exploration or production operations.

Some prescriptive regulation is typically present in a safety case regime, such as technical requirements for equipment, but overall, the safety case approach refers to a goal-setting, risk-reduction approach intended to drive the risk of a major accident event to as low as reasonably practicable. Upon drilling a new well, this begins in the project development stage, when the leaseholder has a duty to demonstrate to the regulator that the risks of its design are ALARP, and how it will reassess any significant changes to maintain risk levels. The well design inherently defines what operational risks drilling contractors will manage and how they will implement, monitor, and maintain effective barriers (also referred to as controls) for each of those risks. Ultimately, the drilling contractor submits for the offshore regulator’s acceptance its “case” concerning the controls it has implemented to maintain operational safety.

A key advantage of this type of a goal-setting regulatory approach, in contrast to a regulatory scheme based on compliance with prescriptive requirements, is the freedom or flexibility it provides companies to control risks, and to be able to rely on good practice using their own preferred methods to achieve safe operation. This flexibility is particularly necessary for both the regulator and the company in situations affecting unique scenarios on the cutting edge of technology where good engineering practice continues to develop, such as Arctic operations. In fact, as explained by offshore expert Peter Wilkinson, “[o]ne of the main benefits [of the safety case model] is not the finished product, but the actual process of preparing

⁴⁷ *Ibid.*, pp 27- 28.

⁴⁸ As offshore safety regulators in the US, BOEMRE and USCG formed a Joint Investigation Team to investigate the Deepwater Horizon disaster. BOEMRE and the USCG published separate reports addressing their respective areas of safety responsibility; USCG, *Report of the Investigation into the Circumstances Surrounding the Explosion, Fire, Sinking and Loss of Eleven Crew Members Aboard the Mobil Offshore Drilling Unit Deepwater Horizon in the Gulf of Mexico, April 20-22, 2010*, Volume 1, MISLE Activity Number 3721503; pp 127. <http://www.uscg.mil/hq/cg5/cg545/dw/exhib/DWH%20ROI%20-%20USCG%20-%20April%2022,%202011.pdf> (Accessed March 26, 2016).

the safety case and having to identify hazards and review the installation design, construction and operation.”⁴⁹

A regulatory model like the safety case regime, however, demands that the regulator play a fundamental role in ensuring that industry continually strives to reduce risks to ALARP. This means the regulator is instrumental in using a variety of means to ensure good practices exist across the sector. Put simply, the regulator sets the goals (e.g., drive the risk as low as reasonably practicable), reviews a company’s proposed written case for safety in terms of its operations and management of hazards, and then ensures that a company performs as promised in meeting stated goals. If the regulator has concerns about a company’s safety case or operational performance, then it has the resources and other tools to understand the company’s position through direct engagement. The regulator can then either accept the company’s case, or alternatively initiate efforts to obtain necessary improvement. According to Wilkinson, the safety case regime even helps make regulators more effective. He noted: “safety cases make it possible for the regulator’s interventions to be more effective because the safety case should identify the critical safety issues and the regulator’s interventions can concentrate on these.”⁵⁰ These interventions reach far beyond complying with items on a checklist or maintaining completed documentation about required tasks that the operators and drillers performed.⁵¹ So a duty holder’s systematic analysis of major hazards documenting the risks, control measures and safety management systems meant to ensure their effectiveness is a necessary improvement in the US offshore environment. This would be the case whether the BSEE adopts an entire safety case system or imports to the US attributes from safety case regimes to fill regulatory gaps.

The safety case model is not a form of self-regulation. The regulator’s acceptance of a safety case does not constitute approval, in the traditional sense, that somehow the burden of maintaining safe operations shifts from the regulated to the regulator. Instead, acceptance is more akin to a comprehensive review of the operator’s or driller’s submitted safety case by the regulator. The regulator’s acceptance of the safety case implies that the submitter’s proposed documentation satisfactorily proposes good practice relating to identified hazards. Thereafter, the burden of operating safely continues to remain on the parties undertaking the risk, and the regulator will hold those parties to the submitted standards in the written cases for safety.

The regulator in a goal-setting, risk reduction regime must cultivate a sophisticated and nuanced approach, remaining nimble and playing different roles in different circumstances. The regulator’s role ranges from one of challenging industry to establish sound safety strategies, and enforcing the prescriptive aspects of the existing system—as well as each duty holder’s written case for safety—to partnering with operators and guiding industry toward continual improvements in offshore drilling safety.⁵² This volume explains why the regulator must be independent and have adequate resources,

⁴⁹ Shaw, S. *What’s the Case for a US Version of the Safety Case?*; April 2, 2014; <http://www.erm.com/en/news-events/platform/whats-the-case-for-a-us-version-of-the-safety-case/> (accessed March 26, 2016).

⁵⁰ Shaw, S. *What’s the Case for a US Version of the Safety Case?*; April 2, 2014; <http://www.erm.com/en/news-events/platform/whats-the-case-for-a-us-version-of-the-safety-case/> (accessed March 26, 2016).

⁵¹ *Ibid.*

⁵² Wilkinson, P. *Creating a New Offshore Petroleum Safety Regulator*, Presentation to IADC, Australian Petroleum Production & Exploration Association Conference, March 25, 2003; pp 5 <http://www.nopsema.gov.au/assets/document/IADC-Annual-General-Meeting.pdf> (accessed March 26, 2016).

including necessary funding and a strong workforce with sufficient technical expertise, interpersonal skills, credibility, and authority to work alongside industry for continual improvement.⁵³

While safety case type approaches were practiced by the UK and Australia before Macondo, recommendations for a safety case regime in response to the Macondo blowout also occurred internationally.⁵⁴ On September 23, 2013, based on its own independent studies, the European Commission implemented Safety of Offshore Oil and Gas Operations Directive that was “broadly based” on the preexisting UK offshore safety regime and related requirements, including preparation of a written case for safety.⁵⁵ This direct response to Macondo was in recognition of the more than 1,000 oil and gas production facilities offshore in the oceans surrounding EU member countries.

2.4 Managing Major Accident Hazards in the US

The CSB concludes that while adopting the SEMS regulation was an improvement for offshore US regulations, it remains inadequate for major accident prevention in offshore drilling, and BSEE is not fully empowered to accomplish its mission as the offshore regulator.

To illustrate by analogy, the current SEMS model in many ways parallels the Occupational Safety and Health Administration (OSHA) onshore Process Safety Management (PSM) regulation for fixed industrial facilities, which the CSB has studied extensively in its 17-year operating history.⁵⁶ The CSB has found that the onshore PSM approach used to regulate petroleum refineries in the US relies on a regulatory framework that duty holders can satisfy by “checking the box” when completing a variety of required safety-related activities, such as a process hazard analysis or management of change. Yet compliance with those requirements can still fail to improve safety. The activity may not adequately identify major hazards or control major accident events, in part, because the regulatory requirement lacks targeted risk-reduction, goal-setting requirements, and accommodations for a proactive regulator to engage with the facility. As such, the PSM approach has devolved into an activity-based, reactive regulatory climate. Activity-based approaches run contrary to longstanding onshore process safety good practice that advocates for the ultimate goal of continual risk reduction. In 1992, CCPS emphasized “after identifying hazards and analyzing effects of those hazards, a management system should be in place to assure that all practical steps have been taken to reduce the risks.”⁵⁷

⁵³ Wilkinson, P. *Creating a New Offshore Petroleum Safety Regulator*, Presentation to IADC, Australian Petroleum Production & Exploration Association Conference, March 25, 2003; pp 3
<http://www.nopsema.gov.au/assets/document/IADC-Annual-General-Meeting.pdf> (accessed March 26, 2016).

⁵⁴ Norway has a regulatory model that reflects many of the attributes in Section 1.2, but distinct differences exist between its regulatory model and that in the UK and Australia. Some of those differences are described throughout this volume.

⁵⁵ <http://www.hse.gov.uk/offshore/directive.htm> (accessed January 26, 2016).

⁵⁶ For example, the CSB investigated major industrial accidents such as the 2005 BP Texas City explosion and fire, which resulted in 15 fatalities and 180 injuries; the 2010 heat exchanger catastrophic rupture at Tesoro Anacortes Refinery, which led to seven fatalities, and the Chevron Richmond Refinery pipe rupture and fire, which caused worker injuries and over 15,000 local residents to seek medical attention. See, www.csb.gov.

⁵⁷ CCPS. *Plant Guidelines for Technical Management of Chemical Process Safety*; American Institute of Chemical Engineers: New York, NY, 1992; pp 67.

Despite the improvements to the US offshore regulatory scheme, as with onshore, there is no risk-reduction goal of ALARP or equivalent. In addition, the current US offshore regulatory framework emphasizes the regulator's role to a reactive one rather than encourage meaningful proactive engagement among the regulator, industry, and workforce. The outcome, therefore, may be similar to the PSM approach in which offshore operators may comply with SEMS requirements and communicate this compliance to the regulator, but they are not adequately or effectively identifying and controlling hazards or implementing good practice.

3.0 Inadequate Post-Macondo Safety Management Regulations

The offshore oil and gas industry is subject to legal requirements from a variety of regulators, including the US Environmental Protection Agency (EPA),⁵⁸ Bureau of Ocean Energy Management (BOEM),⁵⁹ US Coast Guard (USCG), and BSEE. Specific to safety, the Outer Continental Shelf Lands Act (OCSLA)⁶⁰ gives broad authority to the USCG and BSEE to regulate activities that affect the safety of life and property on facilities and vessels operating on the Outer Continental Shelf. The USCG and BSEE have signed Memoranda of Agreements (MOAs) to assign responsibilities between the two agencies for inspecting and overseeing systems and sub-systems on Mobile Offshore Drilling Units (MODUs)⁶¹ and other fixed OCS facilities.⁶² For example, on MODUs like the Deepwater Horizon, BSEE has lead regulatory oversight on systems related to drilling and completion activities, and the USCG has lead oversight of fire suppression systems. While the CSB acknowledges the dual regulatory role in maintaining safety on the OCS, the analysis contained in this report focuses on BSEE's regulatory responsibility because many of the systems for which the USCG has lead oversight (e.g., station keeping, fire protection, emergency evacuation plans, etc.) were not causal to the initial well release and explosion which were the focus of the CSB's investigation.

This chapter demonstrates that despite changes post-Macondo, US offshore safety regulations still do not provide an adequate safety management framework for major accident prevention. Without a continual risk-reduction goal like ALARP, the SEMS regulations are not as agile in driving ongoing industry improvement, especially because the US regulatory regime lacks mechanisms for rapidly adapting to

⁵⁸ For example, 40 C.F.R. Part 122. See also Memorandum of Understanding Between the Environmental Protection Agency and the Department of the Interior Concerning the Coordination of SPDES Permit Issuance with the Outer Continental Shelf Oil and Gas Lease Program. http://www.bsee.gov/uploadedFiles/BSEE/Newsroom/Publications_Library/001_1984-MOU.pdf (accessed February 26, 2016).

⁵⁹ "BOEM promotes energy independence, environmental protection and economic development through responsible, science-based management of offshore conventional and renewable energy and marine mineral resources," <http://www.boem.gov/About-BOEM/> (accessed February 26, 2016).

⁶⁰ 43 U.S.C. § 1331 et seq.

⁶¹ As defined by 46 U.S.C. § 2101 15(a), a MODU is "a vessel capable of engaging in drilling operations for the exploration or exploitation of subsea resources."

⁶² USCG and BSEE. Subject: Mobile Offshore Drilling Unites (MODUs). Memorandum of Agreement between the Bureau of Safety and Environmental Enforcement - U.S. Department of the Interior and the U.S. Coast Guard - U.S. Department of Homeland Security; BSEE/USCG MOA: OCS008; June, 4 2013; http://www.bsee.gov/uploadedFiles/BSEE/Newsroom/Publications_Library/MOA_OCS-08_MODUs_signed_06.04.2013.pdf (accessed February 26, 2016);

USCG and BSEE. Subject: Fixed Outer Continental Shelf (OCS) Facilities. Memorandum of Agreement between the Bureau of Safety and Environmental Enforcement - U.S. Department of the Interior and the U.S. Coast Guard - U.S. Department of Homeland Security; BSEE/USCG MOA: OCS008; September, 19, 2014; http://www.bsee.gov/uploadedFiles/BSEE/International_and_Interagency_Collaboration/Interagency/Agreements/MOA-2014-USCG-Fixed%20OCS%20Facilities.pdf (accessed February 26, 2016);

ongoing advances in technology and safety practices.⁶³ This shortcoming results in weak, performance-based requirements that lead to the activity-based approach in which both industry and regulator can become preoccupied with the completion and documentation of activities without necessarily demonstrating that the implemented safety management activities can effectively control hazards and minimize risks. Moreover, SEMS regulations apply explicitly to the operator, whose SEMs program is intended to manage all the activities of third-party contractors. Finally, BSEE's safety management regulations do not adequately provide for worker participation throughout the lifecycle of hazardous operations.

To that end, companies' current SEMS plans may therefore not be adequate for major accident prevention because SEMS regulations:

- lack a risk-reduction methodology to drive continual improvement (e.g., ALARP);
- fail to facilitate the regulator's ability to require companies to make safety changes based on lessons learned from major incidents and newly identified hazards;
- lack a requirement for documented demonstration that the safety management system elements as implemented will reduce risk to the targeted level;
- favor of activity-based requirements;
- fail to focus specifically on process safety for major accident prevention, instead seeking to address health and safety matters as a general proposition;
- lack sufficient focus on human factors/safety critical task analysis requirements for each element;
- misapply legal responsibility for safety solely to operators even though contractors also create or control risk;
- lack clarity on the major accident safety responsibilities of key parties, such as operators and drilling contractors, for safety critical tasks; and
- do not adequately address the important role of workers and their representatives in safety management.

This chapter describes approaches taken by other international regimes that offer alternative means to ensure that those who control risk are responsible for managing it.

3.1 SEMS: No Goal-Setting Risk-Reduction Standard

A performance-based regulatory approach with a goal of reducing risk to ALARP increases both the industry's and regulator's flexibility. For industry, performance regulations provide freedom to conduct its work as it determines best as long as it can demonstrate the chosen methods will work consistently with good practice. Good practice, however, is not a static concept; in fact, it will evolve with time.⁶⁴ In some cases, standards for what is ALARP for a particular activity do not exist, so they will need to be developed to adequately control risks. As new technology is developed or costs of previously developed technologies decrease, the standard for "reasonably practicable" will change. Consequently, an ALARP approach provides the regulator with the flexibility to make ALARP judgements, keep what constitutes

⁶³ See Section 3.1.1.

⁶⁴ UK HSE. Principles and Guidelines to assist HSE in its judgements that duty-holders have reduced risk as low as reasonably practicable, <http://www.hse.gov.uk/risk/theory/alarp1.htm> (accessed March 1, 2016).

good practice under review, and influence the industry to adopt new practices. To that end, a credible, well-resourced regulator would have a full range of tools needed to advise and, if necessary, to challenge a company's assertion that its risk-reduction practices satisfy ALARP.

Pertinent to ALARP, the Baker Panel⁶⁵ notes in its 2007 report ("the Baker Report") on BP and its process safety performance following the 2005 BP Texas City disaster that an effective process safety management system builds on an "improvement cycle" that "should include, in practice, continual reduction of process risk and improvements in safety performance according to some measurable criteria."⁶⁶

The Baker Panel defined "continuous improvement" as

- improving controls for process hazards, including process safety knowledge and competence of workers;
- improving process safety leadership of supervisors;
- improving process engineering to identify and design to remove or mitigate the effects of process hazards;
- extending legal compliance to reducing risks through best practices;
- extending mere compliance with internal standards to learning from operating experiences, incident and near-miss investigations, hazard studies, audits, and other assessments to improve those internal standards; and
- identifying and implementing not only those external standards that must be observed, but also those that represent best practices that can lead to process safety excellence.⁶⁷

While offshore an SEMS regulations require companies to identify hazards and manage safety,⁶⁸ they do so without a goal either the industry or regulator can work toward, such as maintaining good practice as an ALARP approach would. Therefore, the US still lacks a goal-setting risk-reduction standard in its offshore regulatory scheme to encourage continual improvement and adaptability.

Volume 3 of this report describes ALARP as the level at which further risk reduction, through incremental sacrifice (in terms of cost, time, effort, or other expenditure of resources) becomes grossly disproportionate to the incremental risk reduction achieved.⁶⁹ In practice, prescriptive legislation is easier to comply with and for regulators to enforce compliance (e.g., by inspecting or auditing by checking boxes concerning requirements contained on a list), whereas goal-setting legislation is a more challenging regime to operate.⁷⁰ But, the goal-based ALARP requirements demand more effort by the company to

⁶⁵ In the aftermath of the BP Texas City Incident, BP followed the recommendation of the CSB and formed an independent panel known as the Baker Panel to conduct a thorough review of the company's corporate safety culture, safety management systems, and corporate safety oversight at its US refineries. For a copy of their findings and recommendations, see http://www.csb.gov/assets/1/19/Baker_panel_report1.pdf (accessed January 25, 2016).

⁶⁶ *Ibid.* pp 166.

⁶⁷ *Ibid.*.

⁶⁸ 30 C.F.R. § 250.1900.

⁶⁹ Volume 3, Section 4.1.

⁷⁰ The BSEE SEMS section Chief spoke on this issue. "We need to emphasize that compliance requires operators to demonstrate that they are implementing SEMS as a performance-based standard and not just checking off items on a list;" OTC: BSEE reports 100% SEMS compliance after first cycle. *Oil & Gas Journal*; Slocum, M., Ed.,

ensure risks are reduced to targeted levels, and they empower the regulator to drive further improvements over time.

The UK, Norwegian, and Australian offshore regulators have all adopted ALARP-type goals. The UK's Health and Safety Executive (HSE) has produced much guidance concerning ALARP. The agency's guidance on ALARP for onshore facilities explains that to achieve the goal of ALARP, the risk reduction measures to prevent major accidents should at least be "relevant good practice."⁷¹ The duty holder must demonstrate that the good practice is relevant and up to date, and must review risks and risk reduction measures as circumstances, technology, knowledge, and information evolve.⁷² When assessing whether risks are reduced to ALARP, companies in the UK weigh the risk "against the measures necessary to eliminate the risk. The greater the risk ... the less will be the weight to be given to the factor of cost."⁷³

In Norway, the Petroleum Safety Authority (PSA) regulates offshore safety⁷⁴ and ensures that companies adapt to safety and technological advances through its performance-based approach to regulatory oversight.⁷⁵ While Norwegian regulations do not specifically reference ALARP, they do require companies to choose the technical, operational, and organizational solutions that offer the best results, provided the costs are not significantly disproportionate to the risk reduction achieved.⁷⁶ For instance, the regulations call on "the operator and others participating in the activities" to address the goal of operational safety through any effective method, as opposed to requiring specific actions.⁷⁷ This approach ensures that duty holders are primarily responsible for determining the best methods to mitigate the risks they create, which in turn helps the regulator ensure that safety practices keep pace with advances in industry.

The Australian National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) requires companies to reduce risks to the health and safety of people onboard offshore facilities to a level as low as reasonably practicable.⁷⁸ NOPSEMA explains that to do this, the company

May 7, 2015, <http://www.ogj.com/articles/2015/05/otc-bsee-reports-100-sems-compliance-after-first-cycle.html> (accessed March 26, 2016).

⁷¹ UK HSE. *Guidance on ALARP Decisions in COMAH*. http://www.hse.gov.uk/foi/internalops/hid_circs/permissioning/spc_perm_37/ (accessed January 5, 2016).

⁷² *Ibid.*

⁷³ UK HSE. Principles and guidelines to assist HSE in its judgements that duty-holders have reduced risk as low as reasonably practicable. http://www.hse.gov.uk/risk/theory/alarp1.htm#P4_129 (accessed January 5, 2016).

⁷⁴ See <http://www.psa.no/about-us/category877.html> (accessed March 26, 2016).

⁷⁵ See Petroleum Safety Authority Norway, *Regulations Relating to Health, Safety and the Environment in the Petroleum Activities and at Certain Onshore Facilities (The Framework Regulations)* (2013), <http://www.ptil.no/framework-hse/category403.html> (accessed March 26, 2016).

⁷⁶ *Regulations Relating to Health, Safety and the Environment in the Petroleum Activities and at Certain Onshore Facilities (The Framework Regulations)*, Section 11 Risk Reduction Principles, http://www.ptil.no/framework-hse/category403.html#_Toc282603288 (accessed March 26, 2016).

⁷⁷ *Regulations Relating to Health, Safety and the Environment in the Petroleum Activities and at Certain Onshore Facilities (The Framework Regulations)*, Section 7 Responsibilities pursuant to these regulation, http://www.ptil.no/framework-hse/category403.html#_Toc282603288 (accessed March 26, 2016).

⁷⁸ NOPSEMA. *ALARP Guidance Note*; N-04300-GN0166, Rev 6; June, 2015; <http://www.nopsema.gov.au/assets/Guidance-notes/N-04300-GN0166-ALARP.pdf> (accessed March 26, 2016).

“has to show, through reasoned and supported arguments, that there are no other practical measures that could reasonably be taken to reduce risks further.”⁷⁹

In the US offshore, the OCSLA states that it “shall be the duty of any holder of a lease or permit under this subsection to (1) maintain all places of employment within the lease area or within the area covered by such permit in compliance with occupational safety and health standards and, in addition, free from recognized hazards to employees of the lease holder or permit holder or of any contractor or subcontractor operating within such lease area.”⁸⁰ Although it can be argued that this duty supports implementing a goal-setting regulatory requirement like ALARP, BSEE has yet to explicitly adopt such a requirement within its regulatory scheme or the SEMS rule. This may change with the proposal of new well control regulations described in Section 3.1.4.

The SEMS rule states that operators “through your management, are responsible for the development, support, continued improvement, and overall success of your SEMS program.”⁸¹ At specified intervals and at least annually, US operators are required to review their SEMS programs to determine if the program “continues to be suitable, adequate and effective (by addressing the possible need for changes to policy, objectives, and other elements of the program in light of program audit results, changing circumstances and the commitment to continual improvement) and document the observations, conclusions and recommendations of that review.”⁸² But without a benchmark such as ALARP in place establishing goals for risk reduction, this can become a documentation exercise that does not actually result in the reduction of risk.

Performance-based regulatory regimes already exist in the US. The US Nuclear Regulatory Commission (NRC) was an early adopter of the performance-based approach to regulation. The NRC defines performance-based regulation as “approach that focuses on desired, measurable outcomes, rather than prescriptive processes, techniques, or procedures” but does not specify precisely how to achieve the results.⁸³ According to the Commission, performance-based regulations permit licensees to “have flexibility to determine how to meet the established performance criteria in ways that encourage and reward improved outcomes.”⁸⁴ Under this approach, a regulator focuses on whether the goal of as low as reasonably achievable, or ALARA (see callout box), has been achieved in “processes, procedures, and judgments” related to both design and operational risk.⁸⁵ For design risk, quantitative judgements are more likely, but when operational risk is addressed, qualitative factors become more important. “What is essential, for ALARA practiced at any level, is that the choices be fully documented, together with the criteria which have [been relied on to make] those choices. When the criteria are qualitative, it is more

⁷⁹ *Ibid.*

⁸⁰ 43 U.S.C. § 1348 (b).

⁸¹ 30 C.F.R. § 250.1909.

⁸² 30 C.F.R. § 250.1909 (d).

⁸³ US Nuclear Regulatory Commission. Performance-based regulation, <http://www.nrc.gov/reading-rm/basic-ref/glossary/performance-based-regulation.html> (accessed January 19, 2016).

⁸⁴ US Nuclear Regulatory Commission. Background and Staff Guidance on Performance-Based Regulation, <http://www.nrc.gov/about-nrc/regulatory/risk-informed/concept/performance.html> (accessed January 19, 2016).

⁸⁵ Fassò, A.; Rokni, S. *Operational Radiation Protection in High Energy Physics Accelerators. Implementation of ALARA in Design and Operations of Accelerators*; SLAC-PUB-13800; SLAC National Accelerator Laboratory: May, 2009; pp 7. <http://www.slac.stanford.edu/cgi-wrap/getdoc/slac-pub-13800.pdf> (accessed March 26, 2016).

likely that subjective judgments play a large role, but those judgements must be equally recorded [as they are for quantitative judgements].”⁸⁶

[CALL OUT BOX START]

In the US, the nuclear industry provides a model of continual risk reduction. Similar to ALARP, the target is “as low as reasonably achievable” (ALARA). The Nuclear Regulatory Commission’s Reactor Oversight Process (ROP), its primary performance-based regulation, is the means by which it achieves its mission of public health and safety in commercial nuclear power plant operations.⁸⁷ The ROP uses seven “cornerstones,” such as mitigating systems and barrier integrity, to monitor three performance areas (reactor safety, radiation safety, and security safeguards).⁸⁸ Licensee performance data, inspection plans, quarterly assessments, and assessment and inspection responses are tied to each performance area and several cross-cutting objectives, such as worker involvement and human performance.⁸⁹ Licensees may choose their own methods to meet overarching performance goals, which are guided by their duty to reduce risks to ALARA.⁹⁰ The Commission has stated that this flexibility is one of the main reasons its regulatory philosophy encourages continual improvement.⁹¹

[CALL OUT BOX END]

3.1.1 The Use of Standards and Guidance in ALARP-based Regulatory Regimes

For the most part, the goal-setting regulations in the UK, Norway, and Australia do not use prescriptive requirements to follow either national or international or industry standards. Where prescription is used, it is in connection with, for example, the areas to be covered in hazard analysis documentation or the frequency of examination and testing of lifting equipment.⁹² Both the UK HSE and Norway PSA publish regulatory topic guidance to advise duty holders on how to achieve compliance with their respective regulations. For example, the UK has an Approved Code of Practice (ACOP) for preventing fire, explosion, and emergency response on offshore installations.⁹³ It is not mandatory to follow the guidance in an ACOP, but HSE has indicated “if you do follow the guidance you will normally be doing enough to comply with the law.”⁹⁴ A duty holder can also comply with the law if it demonstrates that alternative

⁸⁶ *Ibid.*, pp. 6-7.

⁸⁷ US Nuclear Regulatory Commission. Reactor Oversight Process (ROP), <http://www.nrc.gov/NRR/OVERSIGHT/ASSESS/> (accessed March 26, 2016).

⁸⁸ US Nuclear Regulatory Commission. *Reactor Oversight Process*; December, 2006; pp 2. <http://pbadupws.nrc.gov/docs/ML0708/ML070890365.pdf> (accessed March 26, 2016).

⁸⁹ *Ibid.* pp 3.

⁹⁰ US Nuclear Regulatory Commission. *Guidance for Performance - Based Regulation*; NUREG/BR-0303; December, 2002; pp 1. <http://www.nrc.gov/reading-rm/doc-collections/nuregs/brochures/br0303/br0303.pdf> (accessed March 26, 2016).

⁹¹ US Nuclear Regulatory Commission. Background and Staff Guidance on Performance-Based Regulation, <http://www.nrc.gov/about-nrc/regulatory/risk-informed/concept/performance.html> (accessed January 19, 2016).

⁹² Whewell, I. Former Director, UK HSE Offshore Division, Personal communication, July 6, 2011.

⁹³ UK HSE. *Prevention of fire and explosion, and emergency response on offshore installations*; L65; HSE: 2012; <http://www.hse.gov.uk/pUbns/priced/l65.pdf> (accessed March 2, 2016).

⁹⁴ UK HSE. Legal status of HSE guidance and ACOPs, <http://www.hse.gov.uk/legislation/legal-status.htm> (accessed March 3, 2016).

measures are likely to be just as effective as those specified in the ACOP. ACOPs tend not to refer to specific technical standards, but describe the way of achieving a specific outcome. ACOPs are being used less as they can have the effect of discouraging technical progress and innovation.

HSE also publishes guidance with every set of regulations it produces, giving the duty holder advice on interpreting the legislation and information on how to achieve compliance.⁹⁵ Following this guidance is not mandatory, but like ACOPs, in most cases an inspector will accept that if the duty holder follows the guidance, it complies with the requirement.

Guidance published HSE's Energy Division comes in a variety of forms:⁹⁶ leaflets, books on its webpages, advisory notices,⁹⁷ and research reports. While the latter is not strictly guidance, research reports represent available knowledge on hazards and risks, and duty holders would be expected to take into account the latest research in forming their hazard and risk control strategies. Although HSE does not publish lists of approved technical and other standards, some are referenced in the guidance HSE publishes. The best example is in Guidance for the Topic Assessment of Major Accident Hazard Aspects of Safety Cases (GASCET).⁹⁸ Ultimately, while industry good practices can form the basis for hazard assessments, the duty holder is required to effectively identify and control risks as lessons are learned, technology improves, and information is shared.⁹⁹ The key question for assessing major hazard risk is whether anything more can be done to reduce risk.¹⁰⁰ While technical guidance like GASCET helps relate assessors' technical judgements to good practice, it does not cover all major accident event hazards posed offshore. For instance, GASCET identifies basic well design and equipment hazards,¹⁰¹ but it does not identify guidance and standards for the assessment of well conditions and operational activities, such as those occurring at Macondo at the time of the blowout. In effect, assessors and industry will rely on the general ALARP guidance previously described to assess the adequacy of organizational and operational barriers identified in Volumes 2 and 3.

Norway's offshore regulator publishes guidelines on how to achieve the requirements in its provisions.¹⁰² When using a recommended standard in a regulatory guideline, the "party can normally assume that the regulatory requirements have been met."¹⁰³ If a party wants to adopt an approach not specified in the guideline standards, the party must document how the same level of health, safety and environmental

⁹⁵ Whewell, I. Former Director, UK HSE Offshore Division, Personal communication, July 6, 2011.

⁹⁶ UK HSE. Guidance, <http://www.hse.gov.uk/guidance/index.htm> (accessed March 2, 2016).

⁹⁷ UK HSE. Safety alerts and notices, http://www.hse.gov.uk/offshore/notices/sn_index.htm (accessed March 2, 2016).

⁹⁸ UK HSE. GASCET (Guidance for the topic assessment of the major accident hazard aspects of safety cases), <http://webcommunities.hse.gov.uk/connect.ti/gascet/view?objectId=62036> (accessed March 2, 2016).

⁹⁹ *Ibid.*

¹⁰⁰ UK HSE. *Guidance on Risk Assessment for Offshore Installations*; Offshore Information Sheet No. 3/2006; <http://www.hse.gov.uk/offshore/sheet32006.pdf> (accessed March 2, 2016).

¹⁰¹ The main hazard sources identified in GASCET are intermediate formations, reservoir-introduced fluids, explosive, radioactive sources, pressure vessels, and dropped objects.

¹⁰² PSA. Guidelines Regarding the Framework Regulations, <http://www.psa.no/framework/category408.html> (accessed March 2, 2016).

¹⁰³ Regulations Relating to Health, Safety and the Environment in the Petroleum Activities and at Certain Onshore Facilities (The Framework Regulations), Section 24 Use of recognized standards, http://www.psa.no/framework-hse/category403.html#_Toc357595254 (accessed March 26, 2016).

protection is achieved.¹⁰⁴ The regulatory guidelines are mostly technical in nature,¹⁰⁵ but parties must demonstrate “strategies and principles that form the basis for design, use and maintenance of barriers, so that the barriers' function is safeguarded throughout the offshore or onshore facility's life” for operational and organizational barriers not addressed in the guideline standards.¹⁰⁶

In Australia, NOPSEMA does not endorse any ACOPs or standards.¹⁰⁷ NOPSEMA has clarified its stance on good practice, “the term ‘good practice’ in NOPSEMA guidance documentation therefore is taken to refer to any well-defined and established standard or codes of practice adopted by an industrial/occupational sector, including ‘learnings’ from incidents that may yet to be incorporated into standards. Good practice generally represents a preferred approach; however, it is not the only approach that may be taken. While good practice informs, it neither constrains, nor substitutes for, the need for professional judgement.”¹⁰⁸

3.1.2 Insufficient US Alternative Legal Mechanisms to Drive Continual Safety Improvements

The OCSLA calls upon the Secretary of the Interior to promulgate safety regulations that include “the use of the best available and safest technologies which the Secretary [of the Interior] determines to be economically feasible, wherever failure of equipment would have a significant effect on safety, health, or the environment.”¹⁰⁹ But these requirements do not apply if the Secretary of the Interior determines that the safety improvements do not justify the costs of implementing the technology.¹¹⁰

A BSEE regulation calls for using the “best available and safest technology (BAST) whenever practical on all exploration, development, and production operations”¹¹¹ ... “in general, we consider your compliance with BSEE regulations to be the use of BAST.”¹¹² Limiting BAST to compliance with BSEE regulations, however, undermines the potential impact of requiring the use of the best available and safest technology not required in the BSEE regulatory scheme.

The BSEE Director may require additional measures to ensure using BAST to avoid equipment failure that would have a significant effect on safety, health, or the environment, so long as it is “economically

¹⁰⁴ *Ibid.*

¹⁰⁵ For a summary, see OGP. *Regulators' use of standards*; Report No. 426; OGP Standards Committee: March, 2010; pp 33 and Annex F1.

¹⁰⁶ Regulations Relating to Management and the Duty to Provide Information in the Petroleum Activities and at Certain Onshore Facilities (The Management Regulations), Section 5, Barriers, http://www.psa.no/management/category401.html#_Toc377975494 (accessed March 26, 2016).

¹⁰⁷ NOPSEMA. *Guidance Note: ALARP*; N-04300-GN0166, Revision 6; June, 2015; pp 6. <http://www.nopsema.gov.au/assets/Guidance-notes/N-04300-GN0166-ALARP.pdf> (accessed March 2, 2016).

¹⁰⁸ *Ibid*

¹⁰⁹ 43 U.S.C. § 1347 (b).

¹¹⁰ 43 U.S.C. § 1347(b). The Supreme Court explained that this provision of the OCSLA is one in which Congress has imposed two independent requirements: that an administrative action be “feasible” and that it is justified by a balancing of costs and benefits. *Indus. Union Dep't., AFL-CIO v. Am. Petroleum Inst.*, 448 U.S. 607, 709 n. 27 (1980).

¹¹¹ 30 C.F.R. § 250.107(c).

¹¹² 30 C.F.R. § 250.107(d).

feasible” and “the benefits outweigh the costs.”¹¹³ Nevertheless, the cost-benefit analysis needed to meet this requirement results in a high burden of proof on the regulator to require operators to do something not specifically stated in the regulations. It differs from the continual improvement mechanism of the North Sea and Australian regimes, which require companies to monitor new developments and continually drive risks to ALARP.¹¹⁴

30 C.F.R. § 250.198 is an example of a BSEE regulation that incorporates certain standards by reference, yet it is also an example of not being easily adaptable. The effect of incorporation by reference is that the incorporated documents are treated as if they were published in the Federal Register as part of the underlying regulation.¹¹⁵ The incorporated material, like any other properly issued regulation, has the force and effect of law.¹¹⁶ Some of the documents incorporated into that regulation include ANSI/ASME Codes, API Recommended Practices, ASTM Standards, American Welding Society Codes, and American Gas Association Reports. The regulation states that the documents incorporated in the rule are limited to the edition cited, but that BSEE will publish any changes to such documents in the Federal Register before amending the rule. Yet the regulation also states that BSEE may change the version of a document referenced in this rule without an opportunity for public comment if the agency determines the revisions would result in safety improvements or represent new industry standard technology and they do not impose undue costs on the affected parties.¹¹⁷ The aim of this rule, to be able to adapt BSEE requirements to changing practices and technology without having to go through the rulemaking process, could therefore be subverted if a party challenges BSEE’s finding that revisions do not impose “undue costs.” This situation leaves updating the regulation to the more traditional process, which is time-consuming, burdensome, and often difficult, even where the regulated matters are far less complex.

Finally, BSEE regulations have a provision for alternative procedures or equipment, but the requirements to receive approval are vague in comparison to the guidelines international regulatory regimes have provided their own assessors.¹¹⁸ Currently, to receive approval, “you must either submit information or give an oral presentation to the appropriate Regional Supervisor. Your presentation must describe the site-specific application(s), performance characteristics, and safety features of the proposed procedure or equipment.”¹¹⁹ As HSE has indicated, among other benefits, guidelines provide “transparency to the

¹¹³ 30 C.F.R. § 250.107(d).

¹¹⁴ Reducing to ALARP does not assure the best risk controls available are reasonably practicable. According to the UK HSE, “it is only if the cost of implementing these new methods of control is not grossly disproportionate to the reduction in risk they achieve that their implementation is reasonably practicable. For that reason, we accept that it may not be reasonably practicable to upgrade an older plant and equipment to modern standards. However, there may still be other required measures to reduce the risk ALARP: for example, partial upgrades or alternative measures;” UK HSE, Some fallacies about ALARP, <http://www.hse.gov.uk/risk/theory/alarplance.htm> (accessed March 26, 2016).

¹¹⁵ Update of Revised and Reaffirmed Documents Incorporated by Reference, 75 Fed. Reg. 22219 (Final Rule, April 28, 2010).

¹¹⁶ 30 C.F.R. § 250.198(a)(3); Update of Revised and Reaffirmed Documents Incorporated by Reference, 75 Fed. Reg. 22219 (Final Rule, April 28, 2010).

¹¹⁷ 30 C.F.R. §§ 250.198(a)(2)(i)-(ii).

¹¹⁸ 30 C.F.R. 250.141

¹¹⁹ 30 C.F.R. 250.141(c)

assessment decisions and criteria” and “a basis for consistency in the assessment process and its outcomes.”¹²⁰ BSEE does not yet provide such guidance to its intended audience.

3.1.3 Ineffective Regulatory “Workarounds”

Since US offshore regulations do not have an effective continual safety improvement requirement, rulemaking is required to change any part of an existing regulation that may become outdated or irrelevant after new safety information emerges. Since the rulemaking process is onerous, BSEE sometimes communicates safety messages to offshore lessees through Notices to Lessees (NTLs),¹²¹ Information to Lessees (ITLs),¹²² and Safety Alerts.¹²³ NTLs are “formal documents that provide clarification, description, or interpretation of a regulation or OCS standard; provide guidelines on the implementation of a special lease stipulation or regional requirement; provide a better understanding of the scope and meaning of a regulation by explaining BSEE interpretation of a requirement; or transmit administrative information”.¹²⁴ ITLs are “formal documents that provide additional information and clarification, or interpretation of a regulation, OCS standard, or regional requirement, or provide a better understanding of the scope and meaning of a regulation by explaining BSEE interpretation of a requirement”.¹²⁵ Safety Alerts are used to inform industry of the circumstances surrounding an incident or a near-miss and to provide “recommendations that should help prevent the recurrence of such an incident on the OCS.”¹²⁶

These documents may be helpful in providing guidance for regulatory compliance, but the NTLs, ITLs, and Safety Alerts themselves cannot expand upon what BSEE regulations require, and BSEE has no ability to force operators or contractors to comply with the guidance in these documents. For instance, in 2000, MMS issued a Safety Alert urging offshore lease holders to install a backup mechanism for activating subsea blowout preventers.¹²⁷ In the Safety Alert, MMS stressed that a secondary activation system was an “essential component” of any rig’s emergency response system. Although having a backup activation system for BOPs should have been a best safety practice, BSEE’s use of the Safety Alert could not require operators to install such backup systems because it was not contained in a regulation. Thus,

¹²⁰ UK HSE. GASCET (Guidance for the topic assessment of the major accident hazard aspects of safety cases), <http://webcommunities.hse.gov.uk/connect.ti/gascet/view?objectId=62036> (accessed March 2, 2016).

¹²¹ BSEE. Notices to Lessees and Operators, <http://www.bsee.gov/Regulations-and-Guidance/Notices-to-Lessees-and-Operators/> (accessed March 2, 2016).

¹²² BSEE. Information to Lessees and Operators, <http://www.bsee.gov/Regulations-and-Guidance/Information-to-Lessees-and-Operators/> (accessed March 2, 2016).

¹²³ BSEE. Current Safety Alerts, <http://www.bsee.gov/Regulations-and-Guidance/Safety-Alerts/Safety-Alerts/> (accessed March 2, 2016).

¹²⁴ BSEE. Notices, Letters, and Information to Lessees and Operators (NTL)s, <http://www.bsee.gov/Regulations-and-Guidance/Notices-to-Lessees/index/> (accessed March 2, 2016).

¹²⁵ *Ibid.*

¹²⁶ BSEE. Current Safety Alerts, <http://www.bsee.gov/Regulations-and-Guidance/Safety-Alerts/Safety-Alerts/> (accessed March 2, 2016).

¹²⁷ BSEE. *MMS Safety Alert: Accidental Disconnect of Marine Drilling Risers*; Safety Alert No. 186; March 2, 2000; http://www.bsee.gov/uploadedFiles/BSEE/Regulations/Safety_Alerts/Safety%20Alert%20No%20186.pdf accessed March 26, 2016).

Safety Alerts and Notices can provide useful guidance on a short-term basis, but because they are not incorporated into regulation, they cannot require timely adaptation of best safety practices.

3.1.4 Recent BSEE-proposed Regulatory ALARP-type Language

In April 2015, BSEE proposed new regulations that it described as “most substantial rulemakings in the history” of offshore safety in the United States.¹²⁸ As part of these regulations, BSEE introduced ALARP-type language to “reduce risks to the lowest level practicable” that if adopted, could empower BSEE with a more proactive regulatory authority. Table 3-1 lists some of the current language in § 250.107 and BSEE’s proposed changes.

Table 3-1. Current and BSEE proposed language for § 250.107, What must I do to protect health, safety, property, and the environment?

Current	Proposed
<p>(a) You must protect health, safety, property, and the environment by:</p> <ul style="list-style-type: none"> (1) Performing all operations in a safe and workmanlike manner; and (2) Maintaining all equipment and work areas in a safe condition. 	<p>Paragraph (a) of this section would be revised to include a general performance-based requirement that operators utilize recognized engineering practices <i>that reduce risks to the lowest level practicable</i> during activities covered by the regulations and conduct all activities pursuant to the applicable lease, plan, or permit terms or conditions of approval. Recognized engineering practices may be drawn from established codes, industry standards, published peer-reviewed technical reports or industry recommended practices, and similar documents applicable to engineering, design, fabrication, installation, operation, inspection, repair, and maintenance activities. This risk reduction objective is used in other regulatory programs and is consistent with BSEE’s goal of taking a more risk-based approach in its regulations. This risk reduction principle has also been included in a recently published industry document (API Bulletin 97) which addresses drilling, completion, and workover activities.</p>
<p>Does not currently exist.</p>	<p>Proposed paragraph (e) would be added to clarify BSEE’s authority to issue orders when necessary to protect health, safety, property, or the environment. The first sentence authorizes BSEE to issue orders to ensure compliance with the regulations. The second sentence clarifies that BSEE may order that operations of a component or facility be shut-in because of a threat of serious, irreparable, or immediate harm to health, safety, property, or the environment posed by those operations or because the operations violate law, including a regulation, order, or provision of a lease, plan, or permit.</p>

¹²⁸ Oil and Gas and Sulphur Operations in the Outer Continental Shelf—Blowout Preventer Systems and Well Control, 80 Fed. Reg. 21504 (Proposed Rule, April 17, 2015) (to be codified at 30 C.F.R. Part 250).

BSEE explained the proposed regulations were intended to consolidate equipment and operational requirements with a focus on blowout preventer equipment, well design, well control, casing, cementing, real-time well monitoring, and subsea containment. Just has described in Section 3.1.1, few standards exist for assessing well conditions and operational activities that form the basis of organizational and operational barriers intended to prevent a major accident. So, while BSEE and industry may be able to rely on good practice to guide the judgment on technical barriers, demonstrating that organizational and operation barriers reduce risks to the lowest level practicable will be a continual improvement process based on company's SEMS program.

As Volume 3 documents, neither BP nor Transocean effectively implemented their numerous programs to manage safety at Macondo. Furthermore, their indicators tended to be lagging instead of leading; thus, they did not sufficiently monitor the real-time health and effectiveness of the physical barriers and safety management systems to prevent a major accident. Therefore, a provision to "reduce risks to the lowest level practicable" will empower BSEE to challenge the efforts and claims that risks are being managed by companies' and require that more be done if necessary.

3.2 SEMS Activity-Based Requirements: A Compliance-Based Mentality

Although intended to deliver features of a performance-based regime, the SEMS rule does not drive improved safety performance as do the NRC or other international offshore regimes. SEMS requires operators to develop and implement a safety and environmental management system that incorporates several safety elements typically found in SMS models, including hazard analysis, management of change, operating procedures, and incident investigations. It directs operators to address all required elements and "maintain a safety and environmental management system."¹²⁹ But the SEMS rule does not contain a risk-reduction goal or target that would provide the regulator with the tools to drive continual risk-reduction at offshore facilities. It does not function like a strong performance-based regulation because completing these actions does not necessarily result in a reduction of risk. Directives such as "maintain,"¹³⁰ "comply,"¹³¹ and "manage"¹³² do not suggest what must be achieved with safety elements. In contrast, a goal-setting, risk-reduction, performance-based regulation would include a target (ALARP) and would specify what should be accomplished in order to meet the requirements of existing good practice.

Nor does SEMS require the operators to document recognized methodologies, rationales, and conclusions to claim that safeguards to control hazards will be effective. Rather, SEMS requires that facilities "manage" identified hazards,¹³³ with no further requirement regarding how far the operator must go to control those hazards. This is, in fact, weaker language than OSHA's PSM regulation, which specifically

¹²⁹ 30 C.F.R. § 250.1900.

¹³⁰ 30 C.F.R. § 250.1900.

¹³¹ 30 C.F.R. § 250.1901.

¹³² 30 C.F.R. § 250.1901.

¹³³ 30 C.F.R. § 250.1911(a).

requires that hazards be controlled.¹³⁴ Terms such as “manage hazards” and “resolve recommendations” are activity-based, as they do not include a performance-based requirement to control hazards or prevent major accidents.¹³⁵ In fact, this formulation allows for managing hazards and resolving recommendations without determining that action be taken. Therefore, companies may conduct a weak or inadequate hazard analysis and not identify or manage the appropriate safety critical tasks and equipment—yet still comply with the regulation.¹³⁶

Volume 2 highlights that while the SEMS regulations Rule promotes safety and environmental protection, it lack requirements for companies to explicitly address potential major accident events.¹³⁷ By identifying potential MAEs, companies can draw clear linkages between barriers created by safety critical tasks and equipment and the major accident hazards they are designed to prevent or mitigate.¹³⁸ As part of the process to reduce MAE risk to ALARP, companies could explicitly demonstrate the adequacy of the barriers and the distribution of the types of controls implemented (e.g., engineering, procedural, or administrative), among other factors.¹³⁹

BSEE incident investigation regulations are another example of activity-based requirements. Under SEMS requirements, operators must “establish” investigation procedures to “identify” contributing factors (human or otherwise) and “recommend” changes as a result of findings.¹⁴⁰ Companies must also “establish” corrective action plans based on the findings for investigations. BP actually met these requirements when it investigated the March 8, 2010 kick at Macondo, exemplifying the weakness of the current regulatory language.¹⁴¹ During BP’s investigation, Transocean identified the need to improve hazard recognition among the crew,¹⁴² but neither BP nor Transocean examined Transocean’s safety management systems meant to prevent a lack of hazard awareness. So while a human factor was “identified” as causal to the incident—delayed crew well kick response—only technical recommendations resulted from the investigation rather than effectively addressing the identified need to improve kick response—a causal factor in the Macondo incident. Ultimately, SEMS language requires an activity of conducting an investigation, but not implementing effective recommendations to reduce risk to a targeted level. Therefore, companies can still be in compliance with regulations without actually reducing risk when investigating incidents and resolving recommendations.

Critics have voiced their concern over the lack of robust performance-based, risk-reduction requirements in SEMS. The safety management subcommittee of BSEE’s own advisory group, the Ocean Energy

¹³⁴ 29 C.F.R. § 1910.119(e)(1).

¹³⁵ The CSB Macondo Investigation Report Volume 2, Section 6.1.1 details this point.

¹³⁶ Volume 2 of this report concludes the SEMS regulations are insufficient in guaranteeing safety performance improvements throughout the SCE lifecycle.

¹³⁷ Volume 2, Section 4.1.

¹³⁸ Volume 2, Section 4.2.3.

¹³⁹ Volume 2, Section 4.2.3.

¹⁴⁰ 30 C.F.R. § 250.1919.

¹⁴¹ Volume 3, Section 2.4.

¹⁴² *Ibid.* and Email from Macondo Rig Manager, Transocean, to Wells Team Leader, BP, Subject: Hazard Recognition, 18 March, 2010, BP-HZN-2179MDL00289217, <http://www.md12179trialdocs.com/releases/release201305171200030/TREX-000684.pdf> (accessed October 7, 2015).

Safety Advisory Committee (OESAC), stated that the SEMS regulation, although well-intended, is essentially a prescriptive rule “promotes the idea that operators only have to meet the minimal requirements in order to comply with the regulations.”¹⁴³ Similarly, the International Association of Drilling Contractors (IADC) called the SEMS rules “overly prescriptive” in its comments to BSEE.¹⁴⁴ IADC urged BSEE to “consider a wholesale re-write of 30 C.F.R. Subpart S to make it more goal-setting and less prescriptive.”¹⁴⁵ Without sufficient goal-setting, risk-reduction features, a regime risks losing focus on risk reduction because companies are doing only the activities the rule requires—which may not be the safest practicable action.

IADC’s position should carry some weight in this debate. The IADC HSE Case Guidelines have been required for use in 10 countries and are recognized as best practice in 10 additional countries, some of which had regulations pending to require adoption or use of the Guidelines, suggesting more jurisdictions are moving toward ALARP-type risk-reduction approaches.¹⁴⁶

Australia provides another example of a regulation requiring a performance-based hazards analysis, in contrast to BSEE’s hazards analysis requirement in the SEMS rule. In Australia, safety case assessments must provide a “well-considered, detailed description of a suitable and sufficient formal safety assessment.”¹⁴⁷ In that analysis, the duty holder must evidence an understanding of “the factors that influence risk and the controls that are critical to controlling risk, the magnitude and severity of consequences arising from major accident events for the range of possible outcomes, and the likelihood of potential major accident events.”¹⁴⁸ These requirements are more nuanced, but similar in spirit, to the US SEMS requirement to “identify, evaluate, and manage the hazards involved in the operation,”¹⁴⁹ to “control technology applicable to the operation,¹⁵⁰ and to “evaluate possible safety and health effects on employees and potential impacts to the human and marine environments, which may result if the control technology fails.”¹⁵¹

¹⁴³ OESAC. *Safety Management System Enhancement Recommendation*; SMS SC – Vector #2 Recommendation; April 10, 2012; pp 4.

¹⁴⁴ IADC. *Re: Revisions to Safety and Environmental Management Systems (SEMS)*; Docket ID BOEM; November 11, 2011; pp 4-5. <http://www.bsee.gov/uploadedFiles/IADC%2011-11-2011.pdf> (accessed March 26, 2016).

¹⁴⁵ *Ibid.*

¹⁴⁶ Countries having required use of the guidelines by force of regulation include Australia, Cuba, Denmark, Faeroe Islands, Germany, Ireland, the Netherlands, New Zealand, Norway, and the United Kingdom, while Angola, Canada, Brazil, India, Malaysia, Oman, Qatar, Senegal, South Africa, and Trinidad & Tobago have recognized the guidelines as best practice. Recent regulatory changes may have affected the status afforded the Guidelines by these countries. See <http://www.iadc.org/iadc-hse-case-guidelines/> (accessed March 26, 2016).

¹⁴⁷ NOPSEMA. *Guidance Note: Hazard Identification*; N- 04300-GN0107, Rev. 5; December, 2012; pp 7. <http://www.nopsema.gov.au/assets/Guidance-notes/N-04300-GN0107-Hazard-Identification.pdf> (accessed March 26, 2016).

¹⁴⁸ *Ibid.*

¹⁴⁹ 30 C.F.R. § 250.1911(a).

¹⁵⁰ 30 C.F.R. § 250.1911(a)(1)(iii).

¹⁵¹ 30 C.F.R. § 250.1911(a)(1)(iv).

In contrast, the Australian regime also requires hazard analyses to clarify linkages between hazards, control measures, and the potential major accident events.¹⁵² This is how Australian duty holders show that their chosen control measures will manage the risks to ALARP. Australia requires a prioritized list of actions in the hazard analysis to reduce risks to ALARP.¹⁵³ Because the SEMS rule is not accompanied by an ongoing duty to reduce risks to ALARP (or another appropriate goal-based target), the hazards analyses could be outdated (i.e., the controls could be ineffective or may not reduce risks to a practicable level) but still comply with the rule, which must be updated “when an internal audit is conducted to ensure that it is consistent with your facility’s current operations.”¹⁵⁴

In Australia and the UK, the hazard analysis is a key component of a safety case document, which the regulator must accept before obtaining a license to operate. In these regimes, the regulator proactively reviews the operator’s identified hazards and risk-reduction strategies to ensure that risks are reduced to the required standard. The regulator may require the installation of a missing control or barrier if it would further reduce risks to ALARP. Moreover, during the UK safety case acceptance process, the regulator often questions the hazard and risk analyses, and if necessary, updates or changes them if discovered to be insufficient, thus creating robust industry/regulator interaction before hazardous activities begin.¹⁵⁵

3.3 Safety Responsibility Offshore

Volume 3 introduced two categories of well risk: design and operational.¹⁵⁶ The operator’s well design and drilling program are the basis for the drilling and well control operations undertaken by a drilling contractor and other well services providers. The well design is the first opportunity to assess hazards and ensure risks are reduced to ALARP. Once the well design has been determined, the operator then holds the primary responsibility to plan the work and apply the ALARP principle in selecting the contractor and rig. The well operator should review hazards throughout the lifecycle of the well, from initial spudding to final abandonment, and assess any significant changes to ensure well design risks remain ALARP. While the well operator controls design risk, the drilling contractor has the most direct control over the management of day-to-day operations, and a primary responsibility for the overall safety of the drilling installation and the personnel onboard.¹⁵⁷ The combination of facility and wellsite specific conditions could increase the risk or complexity of various drilling operations. Therefore, an integral second opportunity arises to assess hazards and ensure operational, organizational, and technical control

¹⁵² NOPSEMA. *Guidance Note: Hazard Identification*; N- 04300-GN0107, Rev. 5; December, 2012; pp 7. <http://www.nopsema.gov.au/assets/Guidance-notes/N-04300-GN0107-Hazard-Identification.pdf> (accessed March 26, 2016).

¹⁵³ *Ibid.*

¹⁵⁴ 30 C.F.R. § 250.1911(a).

¹⁵⁵ Discussed in more detail in Section 4.1.2.

¹⁵⁶ Volume 3, Section 1.8.1.

¹⁵⁷ As stated in Transocean’s Well Control Handbook, “The OIM is responsible for overall safety of the Installation and all personnel onboard,” Internal Company Document, Transocean. Well Control Handbook, Issue HQS-OPS-HB-01, Revision 00, July 22, 2011, Well Planning Considerations, Exhibit 5781, http://www.mdl2179trialdocs.com/releases/release201302281700004/Braniff_Barry-Depo_Bundle.zip (accessed October 7, 2015).

measures are sufficient to reduce risks to ALARP, namely a review of the hazards in the facility’s activities, equipment, personnel, and drilling and well control operations provides.

By illustration, Figure 3-1 depicts Transocean’s corporate well delivery process, beginning with the development of a Well Construction Plan in conjunction with the operator (referred to as the “Customer” in Figure 3-1) that was considered a key component of the development, communication, and execution of a well plan.¹⁵⁸ The process depicted in Figure 3-1 is a joint endeavor, and as such, the control of major accident risk requires the operator and the drilling contractor to play a role in managing risk. Central to this effort are the safety management systems the parties use to plan, conduct, and monitor well design and operational risk. While these safety management systems will overlap in some cases, they will each have their own focus and attributes.

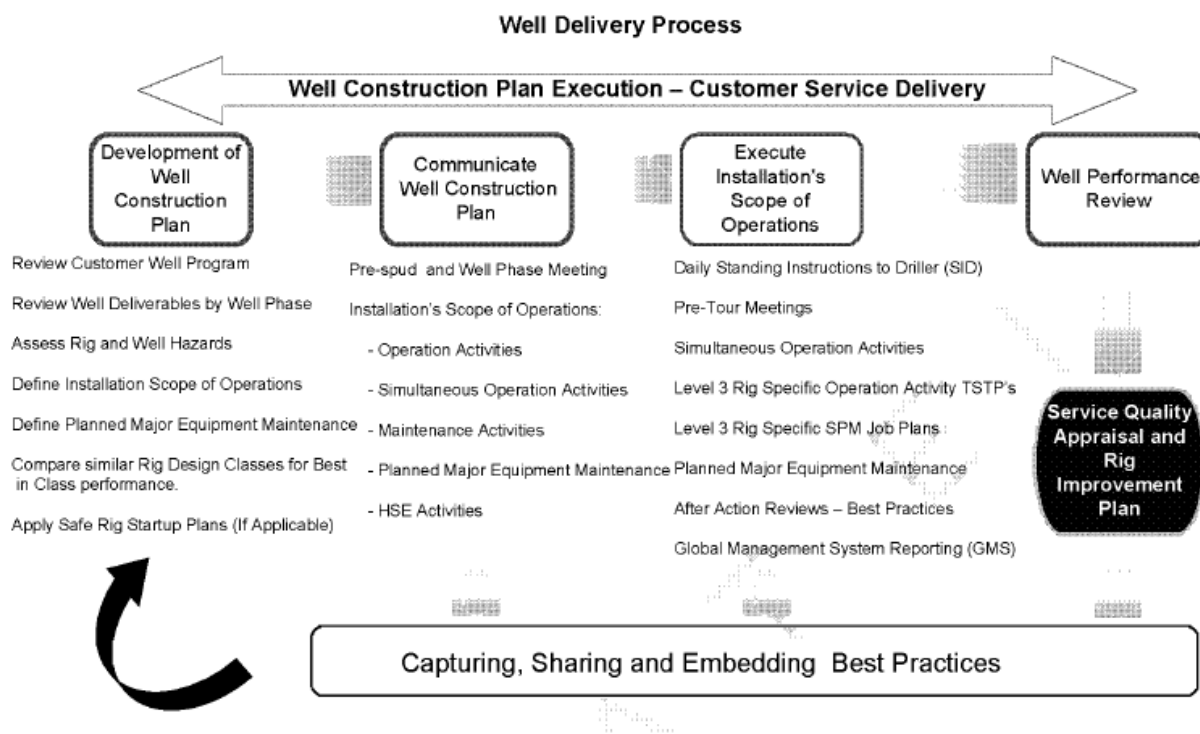


Figure 3-1. Transocean’s Well Delivery Process.

Despite this, SEMS applies explicitly to the operator, and drilling contractors are not required to develop and implement a SEMS program.¹⁵⁹ Instead, an operator’s SEMS program is intended to manage all the activities on an offshore facility, including those of the operator and any third-party contractors. The Rule states that operators have sole responsibility for creating and managing their SEMS program, even though

¹⁵⁸ Volume 3 provides evidence to indicate that Transocean did not follow its own internal well delivery process; Internal Company Document, Transocean. Field Operations Policies & Procedures Manuel, Issue 01, Revision 00, HQS-POP-PP-01, August 8, 2009, Performance Management: Rig and Well Operation Management, TRN-CSB-0002274-TRN-CSB-00023200.

¹⁵⁹ As stated by BSEE, “[BSEE] does not regulate contractors; we regulate operators;” Oil and Gas and Sulphur Operations in the Outer Continental Shelf, 75 Fed. Reg. 63609 (Final Rule, October 15, 2010) (to be codified at 30 C.F.R. Part 250).

contractors “may adopt appropriate sections of the operator’s SEMS program.”¹⁶⁰ This exclusion goes against a basic tenet of managing safety within high-hazard operations: those that create or have the greatest control of the risks associated with a particular activity are responsible for managing them.¹⁶¹ Members of BSEE’s own advisory committee, the Ocean Energy Safety Advisory Committee, pointed out the dangers of this gap in contractor coverage in the SEMS Rule, which the committee described as “very confusing.”¹⁶² In fact, the committee recommended in April 2012 that BSEE address the jurisdiction the SEMS Rule covers¹⁶³ as well as the responsible party.¹⁶⁴

Section 3.3.1 of this chapter describes the difficulties BSEE has had in holding contractors responsible for safety. Section 3.3.2 describes international regulatory obligations placed on both operators and drilling contractors to conduct a risk assessment of all major hazards, define the systems and barriers to control those hazards, and demonstrate their effectiveness throughout the drilling process.

3.3.1 Offshore Regulatory Ambiguity and Industry/Stakeholder Response

BP and Transocean had corporate policies for risk management that reflected their roles in the Macondo project, but neither company ensured the policy implementation, which could have minimized the gap between Transocean’s work-as-done by BP and work-as-imagined.¹⁶⁵ Instead, a lack of clarity regarding hazard identification and risk management roles and responsibilities resulted in significant safety gaps, leaving the companies vulnerable to a major accident. Clarifying these roles and responsibilities is important because contractors compose an estimated 80% of offshore workers performing drilling and

¹⁶⁰ The rule exempts contractors from primary responsibility for compliance by stating that operators must document contractor selection criteria, obtain and evaluate information about the contractor’s safety and environmental performance, and ensure that contractors have their own written safe work practices. 30 C.F.R. § 250.1914.

¹⁶¹ UK HSE. *Planning to do business in the UK offshore oil and gas industry*; October, 2011; pp 2. <http://www.hse.gov.uk/offshore/guidance/entrants.pdf> (accessed March 26, 2016); NOPSEMA, What is a safety case, <http://www.nopsema.gov.au/safety/safety-case/what-is-a-safety-case/> (accessed March 26, 2016).

¹⁶² “As currently written the SEMS regulations state that only Operators are responsible for developing and implementing a SEMS program. In fact the preamble for the SEMS regulations specifically states, “This final rule does not require that a contractor have a SEMS program;” OESAC. *Safety Management System Enhancement Recommendation*; SMS SC – Vector #2 Recommendation; April 10, 2012; pp 3.

¹⁶³ The Committee explained that the term “system,” when used in conjunction with the term “safety management system,” typically represents a complete structure such as vessel or a fixed facility, and therefore encompasses all operations, processes, activities and systems that make up each structure. The BSEE SEMS regulations do not follow this logic because they apply only to operators and cover only operations and activities that fall under BSEE jurisdiction.

¹⁶⁴ OESAC. *Safety Management System Enhancement Recommendation*; SMS SC – Vector #2 Recommendation; April 10, 2012; pp 13.

¹⁶⁵ Volume 3, Section 1.8 illustrates the gap between Transocean’s work-as-imagined and work-as-done at Macondo.

well completion activities.¹⁶⁶ In the case of Macondo, only 8¹⁶⁷ of the 126 individuals on the rig at the time of the blowout were BP employees, while 79 were Transocean employees, 25 were other third-party well providers, and 14 were caterers.¹⁶⁸ Despite the high reliance on contractors, a historical examination of MMS citations and regulatory action leading up to the Macondo blowout reveals that the regulator did not hold all employers accountable to this responsibility.¹⁶⁹ The data show that MMS chose to limit responsibility for safety (and other potential liability) to the operator/lessee.

In the aftermath of Macondo, BSEE issued Incidents of Noncompliance (INCs) to two contractors, Transocean (drilling contractor) and Halliburton (provider of cementing services), for violations of regulations leading to the Macondo incident.¹⁷⁰ This was the first time in the history of the agency or its predecessors that such action was taken against the drilling contractor and another well service provider. The INCs issued to Transocean were resolved in a 2013 consent decree, in which BSEE agreed not to pursue enforcement if Transocean paid \$400 million in fines and met certain health and safety conditions.¹⁷¹ This consent decree does not affect BSEE's overall ability to issue INCs because it did not address their validity vis-à-vis Transocean. Halliburton appealed its INCs, and the Interior Board of Land Appeals will consider that appeal after the District Court litigation (MDL) has concluded.¹⁷²

Although BSEE started citing contractors under 30 C.F.R. § 250.107(a) pursuant to the agency's authority under the OCSLA, ambiguity still exists in US legislation and regulations regarding contractor accountability for safety. In a congressional hearing about the release of the Joint Investigation Team final report in October 2011, former Director Bromwich cited 43 U.S.C. § 1350(b), as the provision in the

¹⁶⁶ MMS made this observation in 2003, and then it was reiterated after Macondo by the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling: Oil and Gas and Sulphur Operations in the Outer Continental Shelf—Incident Reporting Rule, 68 Fed. Reg. 40585 (Proposed Rule, July 8, 2003) and National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, *A Competent and Nimble Regulator: A New Approach to Risk Assessment and Management*, Staff Working Paper No. 21, pp 7.

¹⁶⁷ Two of the individuals from BP were not part of the crew, but visiting management (the Vice President of Drilling & Completion and the Drilling & Completions Operations Manager.)

¹⁶⁸ Internal Company Document, Transocean. *Personnel On-Board as of 20 Apr 2010 17:09:15*, April 20, 2010, TRN-MDL-00030435, <http://www.mdl2179trialdocs.com/releases/release201303071500008/TREX-00687.pdf> (accessed March 26, 2016).

¹⁶⁹ For an example, BSEE Civil Penalties and Appeals, available at <http://www.bsee.gov/Inspection-and-Enforcement/Civil-Penalties-and-Appeals/Civil-Penalties-and-Appeals/> (accessed March 26, 2016).

¹⁷⁰ BSEE. BSEE Issues Violations Following Investigation Into Deepwater Horizon: Notices Sent to BP, Transocean, and Halliburton. October 12, 2011, <http://www.bsee.gov/BSEE-Newsroom/Press-Releases/2011/BSEE-Issues-Violations-Following-Investigation-Into-Deepwater-Horizon/> (accessed March 26, 2016).

¹⁷¹ Partial Consent Decree Between the Plaintiff United States of America and Defendants Triton Asset Leasing GMBH, Transocean Holdings LLC, Transocean Offshore Deepwater Drilling Inc., and Transocean Deepwater Inc., Doc. 8608, case 2:10-md-02179 (E.D. La.) (Feb. 19, 2013).

¹⁷² "In January 2012, the IBLA, in response to our and the BSEE's joint request, suspended the appeal and ordered us and the BSEE to file notice within 15 days after the conclusion of the MDL and, within 60 days after the MDL court issues a final decision, to file a proposal for further action in the appeal. The BSEE has announced that the INCs will be reviewed for possible imposition of civil penalties once the appeal has ended." Halliburton Form 10-K, report to the Securities and Exchange Commission for Fiscal Year 2012 (pp 18), <http://www.sec.gov/Archives/edgar/data/45012/000004501213000086/hal-12312012x10k.htm#sBEA207F94C6DF488FB8EE5FD8404B586> (accessed January 26, 2016).

Outer Continental Shelf Lands Act (OCSLA) that supports expanding BSEE enforcement oversight of contractors. OCSLA § 24(b), codified at 43 U.S.C. § 1350(b), states:

[e]xcept as provided in paragraph (2), if any person fails to comply with any provision of this subsection, or any terms of a lease, license, or permit issues pursuant to this subsection, or any regulation or order issued under this subsection after notice of such failure and expiration of any reasonable period allowed for corrective action, such person shall be liable for a civil penalty of not more than \$20,000 for each day of the continuance of such failure.

Presumably, BSEE can regulate contractors because they are encompassed within the broad definition of “person” in the aforementioned provision.¹⁷³ Additionally, in 43 U.S.C. § 1334(a), the introductory section covering “Administration of Leasing” on the Outer Continental Shelf,¹⁷⁴ explains the subject and scope of regulations that the Secretary of the Interior can promulgate for OCS activities. The scope of this clause is broad.¹⁷⁵

the Secretary shall administer the provisions of this subsection relating to the leasing of the outer Continental Shelf, and shall prescribe such rules and regulations as may be necessary to carry out such provisions. The Secretary may at any time prescribe and amend such rules and regulations as he determines to be necessary and proper in order to provide for the prevention of waste and conservation of the natural resources of the Outer Continental Shelf . . . such rules and regulations shall, as of their effective date, apply to all operations conducted under a lease issued or maintained under the provisions of this subsection.¹⁷⁶

Immediately, the drilling industry and its stakeholders publicly opposed BSEE’s position and the issuance of INCs to Transocean and Halliburton, claiming the Bureau had “no express statutory authority to extend its jurisdiction”¹⁷⁷ to contractors and “there are no definitions of exactly who is covered, nor are there standards for performance.”¹⁷⁸ Even some members of Congress are not persuaded by BSEE’s asserted

¹⁷³ In the statute, “person” means, in addition to a natural person, “an association, a State, a political subdivision of a State, or a private, public, or municipal corporation.” 43 U.S.C. § 1331(d). In the accompanying regulations, “person” is similarly defined to include “a natural person, an association (including partnerships, joint ventures, and trusts), a State, a political subdivision of a State, or a private, public, or municipal corporation.” 30 C.F.R. § 250.105. The Part 250 regulations define the word “you” as “a lessee, the owner or holder of operating rights, a designated operator or agent of the lessee(s), a pipeline right-of-way holder, or a State lessee granted a right-of-use and easement.” 30 C.F.R. § 250.105 (emphasis added). A plain language reading of the statute and these defining regulations could support BSEE’s position that a contractor, as an agent of the lessee, may be legally responsible for compliance.

¹⁷⁴ In an Interim Policy Document issued on August 15, 2012, BSEE cites this section of the OCSLA to support its regulatory jurisdiction over all entities that perform activities under OCSLA leasing provisions; BSEE, *Issuance of an Incident of Non Compliance (INC) to Contractors*; IPD No. 12-07; August 15, 2012; <http://www.bsee.gov/uploadedFiles/Issuance%20of%20an%20Incident%20of%20Non%20Compliance%20to%20Contractors.pdf> (accessed March 26, 2016).

¹⁷⁵ A look at the legislative history for this section of the Act reaffirms its breadth. Congress contemplated that oil companies would be the primary actors in OCS leasing and related activities and did not differentiate among leaseholders, operators, or contractors. H. CONF. REP. 95-1474 at 1679 (1978).

¹⁷⁶ 43 U.S.C. § 1334(a).

¹⁷⁷ <http://www.perkinscoie.com/bsee-asserts-jurisdiction-over-offshore-oil-and-gas-service-companies-12-08-2011/> (accessed August 28, 2012).

¹⁷⁸ http://rigzone.com/news/article.asp?a_id=116394 (accessed August 28, 2012).

authority to hold contractors liable. In the Committee Report for the Department of Interior, Environment and Related Agencies Appropriations Bill for Fiscal Year 2013, congressional appropriators noted:

The Committee continues to be concerned with the Bureau's stated intentions for the expansion of regulatory authority over nonlease holders under the Outer Continental Shelf Lands Act (OCSLA). The authority and need for this action has not been explained or justified to the Committee, nor how this diversion of limited resources would impact the Bureau's current mission and objectives identified in the fiscal year 2013 budget request. . . . the Committee directs that no funds be expended for other purposes until the agency has fully explained its authority, intentions, and objectives to the Committee and the public.¹⁷⁹

Furthermore, regulations in Title 30 Part 250, which include safety requirements, define the Secretary's authority to regulate oil, gas, and sulphur exploration, development, and production operations on the Outer Continental Shelf under the OCSLA.¹⁸⁰ The definitions section states that when the word "you" is used in the Part 250 regulations, it "means a lessee, the owner or holder of operating rights, a designated operator or agent of the lessee(s), a pipeline right-of-way holder, or a State lessee granted a right-of-use and easement."¹⁸¹ Still, other regulations confuse the definition. For instance, one regulation ensures that only co-lessees are jointly and severally liable for regulatory compliance, but then adds in a subsequent part that the "person" actually performing the activity to which the lessee requirement applies is also jointly and severally responsible for complying with the regulation.¹⁸²

3.3.1.1 Post-Macondo BSEE Efforts to Hold Contractors Responsible for Safety

BSEE's decision to issue the INCs to Transocean and Halliburton post-Macondo reflected "the severity of the incident, the findings of the joint investigation, as well as Secretary Ken Salazar's and Director Bromwich's commitment to holding all parties accountable."¹⁸³ In his keynote address to the IADC annual conference in November 2011, former BSEE Director Bromwich reaffirmed the departure from the agency's previous practice of issuing INCs only to operators. Bromwich noted that law did not require the MMS historical practice of limiting its citations to operators. He explained, "the fact that we had unilaterally decided to grant immunity to all non-operators was a misguided act of administrative grace

¹⁷⁹ Committee on Appropriations. *Department of the Interior, Environment, and Related Agencies Appropriation Bill, 2013*; Report No. 112-586; July 10, 2012; <https://www.gpo.gov/fdsys/pkg/CRPT-112hrpt589/html/CRPT-112hrpt589.htm> (accessed March 26, 2016).

¹⁸⁰ 30 C.F.R. § 250.101.

¹⁸¹ 30 C.F.R. § 250.105.

¹⁸² "When you are not the sole lessee, you and your co-lessee(s) are jointly and severally responsible for fulfilling your obligations . . . unless otherwise provided in these regulations." 30 C.F.R. § 250.146(a). "Whenever the regulations in 30 C.F.R. parts 250 through 282 and 30 C.F.R. parts 550 through 582 require the lessee to meet a requirement or perform an action, the lessee, operator (if one has been designated), and the person actually performing the activity to which the requirement applies are jointly and severally responsible for complying with the regulation." 30 C.F.R. § 250.146(c).

¹⁸³ BSEE. BSEE Issues Violations Following Investigation Into Deepwater Horizon: Notices Sent to BP, Transocean, and Halliburton. October 12, 2011, <http://www.bsee.gov/BSEE-Newsroom/Press-Releases/2011/BSEE-Issues-Violations-Following-Investigation-Into-Deepwater-Horizon/> (accessed March 26, 2016).

rather than a result dictated by law or good policy. The fact that we had followed a bad practice was not a sufficient reason to continue it.”¹⁸⁴

On August 15, 2012, BSEE issued Interim Policy Document No. 12-07, entitled *Issuance of an Incident of Non Compliance (INC) to Contractors*,¹⁸⁵ which states that BSEE will issue enforcement actions against contractors who, after considering four factors,¹⁸⁶ it determines to have engaged in “egregious” conduct.¹⁸⁷ The document also notes that issuing INCs to contractors does not relieve lessees from liability, and in fact, INCs that are issued to contractors will also be issued to the lessee or operator.¹⁸⁸

Since the Macondo incident and the issuance of Interim Policy Document No. 12-07, BSEE has continued to issue INCs to non-operators. BSEE investigated a November 16, 2012, incident at a platform in the Gulf of Mexico operated by Black Elk Energy Offshore Operations.¹⁸⁹ An explosion and fire on Black Elk’s platform killed three workers and caused several other serious injuries during welding operations.¹⁹⁰ This was the second incident investigation for which BSEE issued INCs to contractors for failure to perform safe operations.¹⁹¹

On March 5, 2013, BSEE issued a single INC to Island Operating, a contractor working with Apache Corporation to work on an unmanned Apache platform. The INC, issued pursuant to 30 C.F.R. § 250.107(a) for failure to perform all operations on the Platform in a safe and workmanlike manner, followed an incident at the platform where two Island Operating employees improperly transferred

¹⁸⁴ BSEE. BSEE Director Delivers Keynote Address at International Association of Drilling Contractors Conference, November 11, 2011, <http://www.bsee.gov/BSEE-Newsroom/Press-Releases/2011/BSEE-Director-Delivers-Keynote-Address-at-International-Association-of-Drilling-Contractors-Conference/> (accessed March 26, 2016).

¹⁸⁵ BSEE. *Issuance of an Incident of Non Compliance (INC) to Contractors*; IPD No. 12-07; August 15, 2012; <http://www.bsee.gov/uploadedFiles/Issuance%20of%20an%20Incident%20of%20Non%20Compliance%20to%20Contractors.pdf> (accessed March 26, 2016).

¹⁸⁶ The four factors are: 1) the type of violation; 2) the harm resulting from the violation; 3) foreseeability of harm; and 4) the extent of the contractor’s involvement in the violation(s). *Ibid* at 1 and 2.

¹⁸⁷ *Ibid* at 2.

¹⁸⁸ *Ibid*.

¹⁸⁹ BSEE. *Investigation of November 16, 2012, Explosion, Fire and Fatalities at West Delta Block 32 Platform E*; BSEE Panel Report 2013-002; November 4, 2013; Gulf of Mexico Region, New Orleans Distric Lease No. OCS 00367; http://www.bsee.gov/uploadedFiles/BSEE/Enforcement/Accidents_and_Incidents/Panel_Investigation_Reports/Final%20BSEE%20Black%20Elk%20report.pdf (accessed March 26, 2016).

¹⁹⁰ *Ibid*. pp 1.

¹⁹¹ A total of 41 INCs were issued to Black Elk Energy Offshore Operations, Wood Group Production Service Network, Grand Isle Shipyard and Compass Engineering Consultants. See BSEE’s Notifications of Incidents(s) of Noncompliance at, http://www.bsee.gov/uploadedFiles/BSEE/Enforcement/Enforcement_Programs/Compass%20INC's%20Signed%2011-13-13.pdf; http://www.bsee.gov/uploadedFiles/BSEE/Enforcement/Enforcement_Programs/GIS%20INC's%20Signed%2011-13-13.pdf; and http://www.bsee.gov/uploadedFiles/BSEE/Enforcement/Enforcement_Programs/Wood%20Group%20INC's%20Signed%2011-13-13.pdf (accessed March 26, 2016).

chemicals into a chemical tank, causing a fire and damage to the platform.¹⁹² Island Operating appealed, challenging BSEE's jurisdiction. In a recent decision that will likely have far-reaching impact on offshore contractors, the Department of Interior Board of Land Appeals upheld BSEE's issuance of the INC despite the fact that Apache Corporation was the lessee.¹⁹³ The Board noted that the Secretary is authorized under the Outer Continental Shelf Land Act (OCSLA) to prescribe regulations "necessary" to ensure that "operations" on the OCS are "conducted in a safe manner ... sufficient to prevent or minimize ... [any] occurrences which may cause damage to the environment or to property, or endanger life or health."¹⁹⁴ The Board held that BSEE has general authority under OCSLA to issue a regulatory violation or civil penalty to "any person" who has violated the statute or related regulations.¹⁹⁵ The Board also relied on 30 C.F.R. § 250.146(c), which provides that "[w]henver the regulations in 30 C.F.R. [P]art 250 ... require the lessee to meet a requirement or perform an action, the lessee, operator[,] ... and *the person actually performing the activity to which the requirement applies* are jointly and severally responsible for complying with the regulation."¹⁹⁶ Island Operating then had 90 days from the date of the opinion to file an action with the federal district court seeking judicial review of the opinion.¹⁹⁷

BSEE has cited additional contractors under 30 C.F.R. § 250.107(a) as well: On March 9, 2013, BSEE issued one INC to Alliance Oilfield for allegedly failing to enact proper fall protection safeguards and creating hazardous conditions following a fatality in April 2011. On March 5, 2013, BSEE issued one INC to Nabors Offshore Corporation for failing to determine whether an electricity source was on or off, resulting in a serious injury. Finally, on March 5, 2013, BSEE issued four INCs to EnSCO Drilling, including three related to drilling operations, for an inadvertent disconnect of the blowout preventer, failure to properly lock out/tag out, and failure to prevent a discharge into the Gulf of Mexico. This pattern suggests that BSEE believes it has the authority to issue INCs to contractors and will continue to use INCs as an enforcement strategy for both operators and contractors as long as the agency has authority to do so.

The drilling industry disputes BSEE's position that contractors are as accountable as operators. For example, the IADC opposed BSEE's use of a policy document to announce contractor liability, proclaiming that "BSEE's guidance is inconsistent with the industry model and creates a whole new area of ambiguity."¹⁹⁸

¹⁹² See BSEE's Notification of Incident(s) of Noncompliance at http://www.bsee.gov/uploadedFiles/BSEE/Enforcement/Enforcement_Programs/Island%20INC.pdf (accessed December 22, 2015).

¹⁹³ *Island Operating Co., Inc.*, IBLA 2013-137 (September 25, 2015). <https://www.oha.doi.gov/IBLA/Ibladecisions/186IBLA/186IBLA199%20.pdf> (accessed December 22, 2015).

¹⁹⁴ 186 IBLA 207. Citing U.S.C. §§ 1332 and 1348(a) (2012).

¹⁹⁵ *Ibid.*

¹⁹⁶ 186 IBLA 213.

¹⁹⁷ The standard of review under the Administrative Procedures Act allows for reversal of the Board's decision only if it is found to be "arbitrary, capricious, an abuse of discretion...[or] in excess of statutory jurisdiction [or] authority..." 5 U.S.C. § 706(2).

¹⁹⁸ IADC. IADC criticizes BSEE policy for citing drilling contractors. August 17, 2012, <http://www.iadc.org/news/iadc-criticizes-bsee-policy-for-citing-drilling-contractors/> (accessed March 26, 2016).

3.3.1.2 Stakeholders Attempt to Fill Responsibility Gap with Voluntary Guidance

Despite industry pushback to BSEE oversight of contractors, the American Petroleum Institute attempted to fill safety management gaps with API Bulletin 97, *Well Construction Interface Document Guidelines*. API Bulletin 97 is voluntary industry guidance intended to help operators align their SEMS program with drilling contractors' safe work practices.¹⁹⁹ It envisions operators and drilling contractors creating bridging documents that delineate the operator's and contractor's responsibilities during well construction activities in light of the API RP-75/SEMS rule.²⁰⁰ If followed, this bulletin could help operators and contractors better follow the spirit of the SEMS rule; however, it is still voluntary guidance that cannot impose any legal requirement. Furthermore, because the regulator was not involved in its development and will not review the bridging documents or assess their use, there is no reliable way to know how Bulletin 97 is being adopted or how many companies are actually using it. Finally, it does not solve the primary issue—that the owner of the offshore installation and (typically) the employer of a workforce majority can strongly influence how the major accident risks are controlled, but the regulator does not hold them directly accountable to demonstrate that those risks are effectively managed.

3.3.2 Other Regimes' Focus on Safety Responsibilities of Operator/Lessee and Drilling Contractor

Outside the US, the UK and Australia avoid the ambiguity of responsibility through statutory directives over an offshore duty holder (or controller of risk). Norway takes a different approach by acknowledging different parties can bear either individual responsibility or co-responsibility, but makes it is the operators responsibility to ensure regulations are being adhered to by everyone on an offshore installation.

While placing safety and environmental duties on all entities that create or contribute to the control of the risks for a particular activity,²⁰¹ UK regulations place primary compliance responsibility on the duty holder. On production installations, this is the “operator,” which may be either the entity appointed by the lessee to manage the installation functions, or the lessee itself. On non-production installations such as MODUs like the Deepwater Horizon, the duty holder is the rig “owner, which is the entity that controls

¹⁹⁹ API Bulletin 97, 1st ed., *Well Construction Interface Document Guidelines*, November 2013.

²⁰⁰ *Ibid.* pp 1.

²⁰¹ “The ultimate purpose of the enforcing authorities, [including the Offshore Division], is to ensure that duty holders manage and control risks effectively, thus preventing harm.” This enforcement method is based in part on proportionality, or relating enforcement action to the risks. “Those whom the law protects and those on whom it places duties (duty holders) expect that action taken by enforcing authorities to achieve compliance or bring duty holders to account for non-compliance should be proportionate to any risks to health and safety, or to the seriousness of any breach, which includes any actual or potential harm arising from a breach of the law.” UK HSE Enforcement Policy Statement, Pub. No. 41 (revised December 2009), <http://www.hse.gov.uk/pubns/hse41.pdf> (accessed March 26, 2016).

the operation of that installation”²⁰² In either case, the duty holder is “in overall control of the installation and must co-ordinate the health and safety activities of all the companies and personnel present.”²⁰³

The responsibilities of the principal duty holder go beyond the basic requirement to develop and implement a basic safety and environmental management program. They must also:²⁰⁴

- Submit safety case documentation to the regulator that demonstrates how the major hazards will be controlled and mitigated and risks are reduced to as low as reasonably practicable;
- Submit appropriate revisions to the safety case documentation when the stipulated hazards management plan changes;
- Review the safety case documentation for accuracy and completeness every 5 years;
- Conform to the contents of the safety case documentation;
- Comply with the auditing requirements meant to verify conformance.

Thus, if the Macondo well were drilled in the North Sea, Transocean, as drilling contractor and owner of the rig, would be the designated duty holder, with primary legal responsibilities to ensure all operations on the rig were executed safely and that it conformed to all safety management practices and aspects of risk control as described within its safety case document.²⁰⁵

To be clear, in the UK arrangement, the leaseholder is not exempt from safety responsibility. BP, as the operator, would have primary responsibility to plan and design the well safely to ensure that “the well is so designed and constructed, and is maintained in such repair and condition, that (a) so far as reasonably practicable, there can be no unplanned escape of fluids from the well; and (b) risks to the health and safety of persons from it or anything in it, or in strata to which it is connected, are as low as reasonably practicable.”²⁰⁶ The leaseholder is legally required to communicate and cooperate fully with the rig owner to ensure safe execution of those plans,²⁰⁷ and the leaseholder would be held liable for any of its actions found to be contributory to an incident. These shared legal requirements ensure that key participants are fully aware that they may be held liable in the event of an incident and that they cannot rely on legal responsibility falling on another party. As such, both the operator and owner have specific and explicit risk-reduction responsibilities, which are auditable by the regulator, to ensure that they safely conduct drilling and completion operations.

²⁰² Offshore Installations (Safety Case) Regulations 2005; Offshore Installations (Offshore Safety Directive)(Safety Case etc.), 2015, Interpretation, Regulation 2(1) “duty holder.”
<http://www.legislation.gov.uk/ukxi/2015/398/regulation/2/made> (accessed March 26, 2016).

²⁰³ UK HSE. *A guide to the Offshore Installations (Safety Case) Regulations 2005*, 3rd ed.; SCR 2005; 2006;
<http://www.hse.gov.uk/pubns/books/l30.htm> (accessed March 26, 2016).

²⁰⁴ Adapted from Offshore Safety Case Regulations: Duty Holder Relationships, presented to CSB by Ian Whewell, retired head of UK HSE OSD; July 2011.

²⁰⁵ UK HSE. *A guide to the Offshore Installations (Safety Case) Regulations 2005*, 3rd ed.; SCR 2005; 2006; pp 5,
<http://www.hse.gov.uk/pubns/books/l30.htm> (accessed March 26, 2016).

²⁰⁶ Offshore Installations (Offshore Safety Directive)(Safety Case etc.), 2015, Establishment of well examination scheme, Regulation 11, <http://www.legislation.gov.uk/ukxi/2015/398/regulation/11/made> (accessed March 26, 2016).

²⁰⁷ Oil & Gas UK. *Well Integrity Guidelines, Issue 1*; July, 2012; Section 2.

In Australia, NOPSEMA asserts the principle that “those who create the risk must manage it” and states that this is the “operator’s job” because the operator of the facility “has the greatest in-depth knowledge of their installation.”²⁰⁸ NOPSEMA defines the operator as a person nominated by a facility owner or titleholder who has or will have the day-to-day management and control of the facility (or proposed facility) and the operations at that facility.²⁰⁹ For a drilling and completion operation like Macondo, this would be the facility/installation owner, similar to the UK. The applicable offshore regulations stipulate that the operator with direct control of the facility identify the hazards and risks, describe how it controls those risks, and explain its safety management system to apply the controls effectively and consistently.²¹⁰ The titleholder (or leaseholder) also has specific safety responsibilities for the well. It must prepare a Well Operations Management Plan (WOMP) identifying all risks that can cause a loss of well integrity to adequately assess the control measures and performance standards.²¹¹ Guidance provided by the regulator on the WOMP states, “The description and explanation should summarize the well management system goals, the well lifecycle integrity philosophy and process and provide a detailed risk assessment showing how these risks are reduced to as low as reasonably practicable. The content and level of detail must be sufficient for NOPSEMA to assess the well management system to be applied by the titleholder.”²¹²

Norwegian regulations state, “in reducing the risk, the responsible party shall choose the technical, operational or organisational solutions that, according to an individual and overall evaluation of the potential harm and present and future use, offer the best results, provided the costs are not significantly disproportionate to the risk reduction achieved.”²¹³ They require the responsible party to “establish, follow up and further develop a management system designed to ensure compliance with requirements in the health, safety and environment legislation.”²¹⁴

²⁰⁸ NOPSEMA, What is a safety case, <http://www.nopsema.gov.au/safety/safety-case/what-is-a-safety-case/> (accessed March 26, 2016).

²⁰⁹ Offshore Petroleum and Greenhouse Gas Storage (Safety) Regulations 2009, Select Legislative Instrument No. 382, 2009 as amended, Chapter 2.3, <https://www.legislation.gov.au/Details/F2013C00945> (accessed March 26, 2016).

²¹⁰ NOPSEMA, What is a safety case, <http://www.nopsema.gov.au/safety/safety-case/what-is-a-safety-case/> (accessed March 26, 2016).

²¹¹ NOPSEMA. *Guidance Note: Well operations management plan content and level of detail*; N-04600-GN1602, Rev. 0; December, 2015; <http://www.nopsema.gov.au/assets/Guidance-notes/GN1602-Well-operations-management-plan-content-and-level-of-detail-Rev-0-December-2015.pdf> (accessed March 26, 2016).

²¹² *Ibid.*, pp 8.

²¹³ Petroleum Safety Authority Norway, Regulations Relating to Health, Safety and the Environment in the Petroleum Activities and at Certain Onshore Facilities (The Framework Regulations) (2013), Section 11, Risk reduction principles, http://www.psa.no/framework-hse/category403.html#_Toc357595238 (accessed March 26, 2016).

²¹⁴ Petroleum Safety Authority Norway, Regulations Relating to Health, Safety and the Environment in the Petroleum Activities and at Certain Onshore Facilities (The Framework Regulations) (2013), Section 17, Duty to establish, follow up and further develop a management system, http://www.psa.no/framework-hse/category403.html#_Toc357595245 (accessed March 26, 2016).

Norwegian PSA regulations use the neutral phrases “responsible party” or “obligated party” to encompass the leaseholder, drilling contractor, and any other third-party contractors.²¹⁵ PSA guidance explains the use of a neutral term because several parties can be responsible for compliance at the same time, and an individual’s responsibility will be limited to those tasks where the individual has control and instruction authority. The operator, however, has the duty to ensure that anyone working for it complies with the health, safety environmental regulations.²¹⁶ Therefore, if Macondo had happened in Norwegian waters, Transocean would have had to establish a safety management system and technical, organizational, and operational barriers for its activities at the well, but BP would have been ultimately held responsible for any failures to do so.

In these other regimes, the regulator would also have the authority to proactively assess the drilling contractor’s performance, such as Transocean’s management of hazards throughout the applicable phases of the lifecycle where it is recognized as the primary duty holder. For example, when the UK HSE became concerned about human and organizational factors aboard Transocean facilities, the regulator decided to audit five Transocean rigs in the North Sea to determine the extent of the problems.²¹⁷ Operators in this regulatory environment come to understand that safety is more than a checklist of completed required documents and tasks—that they must obey the rules and bear the burden of operating safely, acting “with confidence, knowing that they have a robust safety culture which can stand up to scrutiny, both externally and internally.”²¹⁸

3.3.3 Conclusion

Work conducted by contractors offshore directly impacts the risk of offshore operations. Sometimes personal safety risk is affected, but other times it plays a role in process safety risk that could increase the probability of multiple fatalities and large scale environmental damage, both consequences of the Macondo blowout. Risk management approaches for the latter are different from those intended to mitigate personal safety.²¹⁹ Just as the CSB argues that industry should approach personal and process safety differently, the CSB also sees value in the regulator having different approaches. To that end, the CSB sees the greatest potential to improve major accident prevention in US waters by explicitly focusing on the design and operation risks governed by the leaseholder/operators and drilling contractors for reasons. Ultimately, while this section describes the different approaches of several international regimes,

²¹⁵ Petroleum Safety Authority Norway, Guidelines Regarding the Framework Regulations, Re Section 7, Responsibilities pursuant to these regulations, <http://www.ptil.no/framework-hse/category408.html#p7> (accessed March 26, 2016).

²¹⁶ Petroleum Safety Authority Norway, Regulations Relating to Health, Safety and the Environment in the Petroleum Activities and at Certain Onshore Facilities (The Framework Regulations) (2013), Section 7, Responsibilities pursuant to these regulations, http://www.psa.no/framework-hse/category403.html#_Toc357595233 (accessed March 26, 2016).

²¹⁷ Specialist Inspection Report, Transocean Offshore (North Sea) Ltd., by Martin Anderson, Specialist Inspector (Human and Organizational Factors), Offshore Division (inspections conducted over four months from July to October 2008).

²¹⁸ Shaw, S. *What’s the Case for a US Version of the Safety Case?*; April 2, 2014; <http://www.erm.com/en/news-events/platform/whats-the-case-for-a-us-version-of-the-safety-case/> (accessed March 26, 2016).

²¹⁹ See Volume 3, Section 3.1

the US needs to develop a more effective system for the oversight of key contractors' work such as the drilling contractor during offshore operations who create or control major accident risk.

3.4 Insufficient SEMS Worker Participation Provisions

Workers participate in virtually every safety activity, whether onshore or offshore.²²⁰ At a minimum, management should encourage workers to participate in the following activities:

- Collaborating in hazard and management of change (MOC) reviews and job safety analyses;
- Investigating incidents and near-misses;
- Serving on health and safety committees;
- Conducting health and safety inspection/audits;
- Defining safe operating procedures and work practices for a task or job;
- Reporting unsafe conditions, tools, equipment, and practices to management; and
- Providing safety feedback through defined mechanisms to other workers.²²¹

Actively engaging the workforce, employees, and contracted personnel ensures all those involved with the hazardous work are participating in efforts to identify and manage safety risks. Enhanced workforce participation helps to create a strong safety culture and can lead to a safer workplace. The experience of companies in implementing enhanced efforts to engage and empower the workforce shows that efforts to increase workforce involvement greatly outweighs the costs of such programs.²²²

Inadequate worker involvement in policies, programs, and regulations limits a drilling crew's ability to help manage the hazards for major accident prevention. BP and Transocean used limited means to encourage and empower workers to be involved in managing major hazards. Efforts to include them in safety management primarily resided in company safety observation programs focused on occupational health and safety. As Volume 3 discussed in depth, occupational safety measures do not improve the process safety status of the organization. The CSB identified in previous investigation reports that effective process safety management and major accident prevention cannot be achieved without involving workers and their representatives. In its Chevron Regulatory Report, the CSB noted that the CCPS lists workforce involvement as one of 20 essential management components necessary to reduce process safety risks and prevent chemical accidents:²²³

...workers are potentially the most knowledgeable people with respect to

²²⁰ Center For Chemical Process Safety. *Guidelines for Risk Based Process Safety*; John Wiley & Sons: Hoboken, NJ, 2007; pp 125.

²²¹ American National Standards Institute/American Industrial Hygiene Association (ANSI/AIHA) Z10-2012, *Occupational Health and Safety Management Systems*, 2012, pp 34.

²²² Eves, D.; Gummer, J. *Questioning Performance: Essential Guide to Health, Safety and the Environment*; IOSH Services Ltd: Wigston, United Kingdom, 2011, pp 91.

²²³ Center For Chemical Process Safety. *Guidelines for Risk Based Process Safety*; John Wiley & Sons: Hoboken, NJ, 2007; pp liv.

the day-to-day details of operating the process and maintaining the equipment and facilities and may be the sole source for some types of knowledge gained through their unique experiences. Workforce involvement provides management a mechanism for tapping into this valuable expertise.²²⁴

Worker participation in the offshore oil and gas industry is of critical importance. Workers aboard a rig can contribute keen insights into the daily workings of an operation that upper management might miss. As such, workers should be engaged in a wide range of safety management activities, including project planning, risk analysis, and incident investigations, and thus can play an integral role in preventing accidents. As Volumes 2 and 3 demonstrate, decisions that people on a rig make can impact the potential for a well kick, or strengthen or weaken a barrier. For example, “any problems that did occur during the TA [temporary abandonment] plan would be dealt with by employing the knowledge, experience and skills of the drilling team”²²⁵ Therefore, if workers are not effectively engaged in the management of major hazards in these ways, a duty holder bypasses a key layer of insight and enhanced protection. Inclusion of workers also contributes significantly to creation of a positive safety culture, while omitting workers minimizes their contribution and weakens safety culture onboard a rig. A strong safety culture empowers individual workers and encourages them to be fully focused on safe working conditions. Thus, workforce engagement is vital to major accident prevention, and should be encouraged.

[CALL OUT BOX START]

The purpose of employee participation is to utilize the employees' collective knowledge and experience to ensure that matters are sufficiently explored before decisions are made that concern health, safety, and the environment, and to provide the employees with the opportunity to exert influence on their own work situation. — Norwegian PSA Framework Legislation, Section 13, Facilitating Employee Participation, <http://www.ptil.no/framework/category408.html#p13>.

[CALL- OUT BOX END]

At the time of the Macondo incident, there were no effective US offshore regulations that provided for worker participation in the management of process safety. While BSEE asserts that post-Macondo worker participation provisions within SEMS²²⁶ provide “several key ways for personnel to help ensure safe performance of oil and gas activities on the OCS,”²²⁷ these regulations could be substantially improved to enhance worker engagement in offshore safety management and major accident prevention efforts. Comparisons of the SEMS worker participation regulations with those of international offshore regimes and other high-hazard industries in the US illustrate opportunities for further improvement.

²²⁴ *Ibid.*, pp 124.

²²⁵ Volume 3, Section 1.8.2.

²²⁶ 30 C.F.R.250.1930-1932.

²²⁷ Final Rule, Oil and Gas and Sulphur Operations in the Outer Continental Shelf—Revisions to Safety and Environmental Management Systems, 78 Fed. Reg. 20,423 (Apr. 5, 2013).

3.4.1 Post-Macondo/SEMS Worker Participation Provisions

In April 2013, several provisions were added to the SEMS regulations for worker participation,²²⁸ but regulations do not guarantee that workers are effectively participating in managing offshore process safety. Effective worker participation requires active engaging workers in the designing, implementing, and improving an operation's safety management systems.²²⁹ BSEE intends to meet this goal with the SEMS provisions:

1. Operators must have an Employee Participation Plan (EPP) for their employees. Under the rule, operators must consult with employees regarding the SEMS. Furthermore, operators must create a "written plan of action" showing how "appropriate employees" will contribute to the "development and implementation" of an operator's SEMS. Employees are also required to have access to any part of the SEMS that relates to their duties.²³⁰
2. Operators must include Stop-Work Authority (SWA) procedures in their SEMS program. Such procedures would authorize and require all employees and other personnel who witness an activity presenting an imminent risk or danger to the health or safety of an individual, the public, or to the environment to stop the work creating the risk or danger. "Imminent risk or danger is defined as any condition, activity, or practice in the workplace that could reasonably be expected to cause:
 - Death or serious physical harm; or
 - Significant environmental harm"²³¹
3. Operators must define a process to designate an individual with Ultimate Work Authority (UWA) on each facility for operational and safety decision-making. After a Stop Work is initiated, work can resume upon determination by the UWA "that the imminent risk or danger no longer exists."²³²
4. Operators must provide all personnel with a system for reporting unsafe work conditions.²³³

These provisions are a marked improvement over the offshore safety regulations that existed at the time of the Macondo incident; however, the provisions are not adequate to ensure the workforce is engaged in creating and implementing a company's SEMS program.

²²⁸ *Ibid.*

²²⁹ Center For Chemical Process Safety. *Guidelines for Risk Based Process Safety*; John Wiley & Sons: Hoboken, NJ, 2007; pp 124.

²³⁰ 30 C.F.R. § 250.1932.

²³¹ 30 C.F.R. § 250.1930.

²³² 30 C.F.R. § 250.1930. The person with the ultimate work authority would be the person on the fixed, floating facilities or MODU with the final responsibility for making decisions. The operator's SEMS program must identify all persons that could have UWA, and the operator must designate those persons as such.

²³³ 30 C.F.R. § 250.1933. Furthermore, on August 28, 2013 BSEE reports it has launched a confidential near-miss reporting system with the Department of Transportation and Statistics. The system will "provide important trend analysis and statistical data to BSEE." See BTS and BSEE to Develop Confidential Near-Miss Reporting System, http://www.rita.dot.gov/bts/bts_bsee (accessed March 26, 2016).

3.4.2 Insufficient and Limited SEMS Worker Participation Provisions

In promulgating the Employee Participation Plans, BSEE sought to encourage an “environment that promotes participation by employees and management in order to eliminate or mitigate hazards on the OCS.”²³⁴ BSEE held that the rule would require “an operator who performs regulated activities on the OCS ... to consult with its employees [workers] regarding the development, implementation, and modification of its SEMS program.”²³⁵ “Consult,” however, is a vague term that does not ensure workers have a voice in process safety management matters. Consultation can be a one-way process, with operators simply telling their workers how the hazards will be managed without consideration of worker viewpoints or concerns. The purpose is to engage and empower the workforce throughout the entire SEMS lifecycle (development, implementation, and modification), incorporating the workforce’s views, accepting those that are valid, and explaining why they are rejected when appropriate. But the SEMS regulations do not provide a framework for how that should occur. Furthermore, management selects the workers it deems “appropriate” and defines their level of involvement²³⁶ in a way that makes the most sense for each company or operation, but the possibility exists for continued worker exclusion.

SEMS provisions that require worker participation are limited in scope. Additionally, other SEMS provisions that discuss aspects of worker involvement fail to require the level of active engagement that would help to drive safety improvement. For instance, the SEMS Job Safety Analysis (JSA) provision requires “the immediate supervisor of the crew performing the job onsite [to] conduct the JSA, sign the JSA, and ensure that all personnel participating in the job understand and sign the JSA.”²³⁷ Essentially, the supervisor must inform workers of risks associated with their respective jobs and have them sign off on the analysis, but the workers need not be involved in identifying, assessing, or mitigating such risks. By contrast, other offshore regimes provide specific requirements for including the workforce in safety management activities through worker-elected safety representatives.²³⁸ Moreover, the SEMS Rule states, “Your SEMS program must establish and implement a training program so that all personnel are trained in accordance with their duties and responsibilities to work safely and are aware of potential environmental impacts.”²³⁹ Thus, incorporating process safety concepts and effective practice should be part of the required training provided to the workers or their representatives.

The only other mechanism in SEMS directly addressing worker involvement besides EPP are the Stop-Work Authority (SWA) provisions;²⁴⁰ however, SWA provisions are a weak substitute for worker involvement in major accident prevention offshore. A regulatory SWA provision will not be successful if

²³⁴ Final Rule, Oil and Gas and Sulphur Operations in the Outer Continental Shelf—Revisions to Safety and Environmental Management Systems, 78 Fed. Reg. 20,423 (Apr. 5, 2013).

²³⁵ *Ibid.*

²³⁶ 30 C.F.R. § 250.1932(b).

²³⁷ 30 C.F.R. § 250.1911(b)(2).

²³⁸ See CSB Chevron Regulatory Report Section 4.4 for a detailed discussion of Active Workforce Participation in other jurisdictions; USCSB, 2013. *Regulatory Report: Chevron Richmond Refinery Pipe Rupture and Fire, Richmond, CA, August 6, 2012*, Report No. 2012-03-I-CA, April 2013, http://www.csb.gov/assets/1/19/Chevron_Regulatory_Report_11102014_FINAL_-_post.pdf (accessed January 25, 2016).

²³⁹ 30 C.F.R. § 250.1915

²⁴⁰ 30 C.F.R. §§ 250.1930, 250.1931.

the workforce is not aware of the specific safety risks of the work. For example, on the Deepwater Horizon, the majority of the frontline workers reported that they were “comfortable with identifying and understanding the hazards they were exposed to,”²⁴¹ but supervisors and rig leadership had concerns with hazard awareness amongst the crew. They noted that the crew did not always identify major hazards and appropriate controls in their THINK²⁴² plans.²⁴³ As one person stated, “they don’t know what they don’t know.” The stop-work programs of BP and Transocean allowed for any employee to call for a stop work to intervene in hazardous operating conditions, but without clear understanding of the risks, the workforce is hindered from effectively identifying situations when major hazard risk barriers have been compromised and, thus, will be less likely to initiate a stop work.

3.4.3 No SEMS Provisions for Worker-Elected Safety Representatives

Safety representatives are spokespeople elected by the workforce onboard offshore drilling or production vehicles or other facilities to advocate for workers on “both day-to-day and strategic health and safety issues.”²⁴⁴ Exact rules for using safety representative vary among jurisdictions. The UK initiated safety representatives post-Piper Alpha, resulting in stronger workforce commitment to implement safety management programs. Now frontline personnel encourage employees to share valuable input in identifying and controlling hazards.²⁴⁵

In many international regimes, the safety representative requirement is considered crucial to effectively implement worker participation measures.²⁴⁶ The regulator-mandated safety representative motivates companies to include workers in safety management activities and promotes an essential dialogue among labor, the regulator, and the operator.²⁴⁷ The explicit nature of the UK, Norwegian, and Australian

²⁴¹ Internal Company Document, Transocean. Safety Management and Safety Culture/Climate: North America Division Summary Report, July 2, 2010, TRN-HCEC-00090521, see Exhibit 0929 http://www.mdl2179trialdocs.com/releases/release201304041200022/Bertone_Stephen-Depo_Bundle.zip (accessed October 7, 2015).

²⁴² THINK is a planning and risk management tool that begins with task development and the identification of associated task hazards. After hazards are identified, the THINK process requires management to communicate hazards to people and to put in place controls to mitigate them. The complexity of a task determines the depth of assessment and formality of the THINK plan; See Volume 3, Section 1.8.3 for more detail.

²⁴³ Internal Company Document, Transocean. Safety Management and Safety Culture/Climate: North America Division Summary Report, July 2, 2010, TRN-HCEC-00090521, see Exhibit 0929 http://www.mdl2179trialdocs.com/releases/release201304041200022/Bertone_Stephen-Depo_Bundle.zip (accessed October 7, 2015).

²⁴⁴ UK HSE. *A guide to the Offshore Installations (Safety Representatives and Safety Committees) Regulations 1989*; 2012; <http://www.hse.gov.uk/pubns/priced/l110.pdf>. (accessed March 26, 2016).

²⁴⁵ *Ibid.*, pp 4.

²⁴⁶ See The Offshore Installations (Safety Representatives and Safety Committees) Regulations 1989, 1989 No. 971, 18 Sept. 1989; Regulations Relating to Health, Safety and the Environment in the Petroleum Activities and at Certain Onshore Facilities (The Framework Regulations); Offshore Petroleum and Greenhouse Gas Storage Act 2006, Volume 3, Schedule 3, Part 3, http://www.comlaw.gov.au/Details/C2013C00071/Html/Volume_3#_Toc347403628; Working Environment Act, December 14, 2012; available at: <http://www.arbeidstilsynet.no/binfil/download2.php?tid=92156>; http://www.ptil.no/framework-hse/category403.html#_Toc357595234 (accessed March 26, 2016).

²⁴⁷ UK HSE. *A guide to the Offshore Installations (Safety Representatives and Safety Committees) Regulations 1989*; 2012; pp 7. <http://www.hse.gov.uk/pubns/priced/l110.pdf>. (accessed March 26, 2016).

regulations pertaining to worker-elected safety representatives demonstrate the recognized integral role workers play in robust safety management. Such regulation fosters an environment where workers can participate with industry and the regulator in managing safety. In addition, empowering workers to elect safety representatives through regulation is an important step in overcoming fears of management retaliation for reporting concerns.²⁴⁸

UK regulations grant worker safety representatives a variety of defined functions and powers, including:

- Investigating potential hazards and examining the causes of accidents;
- Investigating workforce complaints relating to health and safety;
- Inspecting installation equipment;
- Reporting findings from investigations to installation managers;
- Reporting unsafe activities to the regulator when, for instance, the installation management does not take immediate remedial actions after safety representatives bring the circumstances to their attention;
- Participating as a member of the installation's safety committee; and
- Consulting in the development of a safety case document.²⁴⁹

Worker-elected safety representatives formally accomplish the worker participation in safety management.²⁵⁰ The UK captures the requirement that all workers participate in all phases of operation through the definition of the word “workforce” which “includes every person *who is for the time being working on or from an offshore installation.*”²⁵¹ Worker-elected safety representatives in the UK are also permitted by regulation to participate in a wide range of safety matters aboard an offshore installation, ranging from investigations of accidents to general matters affecting the occupational health and safety of members of the workforce, and all without the loss of pay.²⁵²

Norway provides workers with an opportunity to follow up on safety matters.²⁵³ For example, the working environment committee, which represents workers, “shall participate in planning safety and environmental work and shall follow up developments closely in [relation to] the safety, health and

²⁴⁸ Efforts to enhance worker participation should not conflict with provisions established under the National Labor Relations Act.

²⁴⁹ The Offshore Installations (Safety Representatives and Safety Committees) Regulations 1989, <http://www.legislation.gov.uk/uksi/1989/971/contents/made> (accessed March 26, 2016).

²⁵⁰ UK HSE. *A guide to the Offshore Installations (Safety Representatives and Safety Committees) Regulations 1989*; 2012; <http://www.hse.gov.uk/pubns/priced/1110.pdf>. (accessed March 26, 2016).

²⁵¹ The Offshore Installations (Safety Representative and Safety Committees) Regulations 1989, Interpretation, SI971 (1989), (emphasis added), available at: <http://www.legislation.gov.uk/uksi/1989/971/regulation/2/made> (accessed March 26, 2016).

²⁵² UK HSE. *Safety representatives and safety committees on offshore installations: A brief guide for the workforce*, INDG199(rev1), 1999, <http://www.hse.gov.uk/pubns/indg119.htm> (accessed April 12, 2016).

²⁵³ Petroleum Safety Authority Norway, Regulations Relating to Health, Safety and the Environment in the Petroleum Activities and at Certain Onshore Facilities (The Framework Regulations) (2013), Section 17, Duty to establish, follow up and further develop a management system, and Section 13, Facilitating employee participation, <http://www.psa.no/framework-hse/category403.html> (accessed March 26, 2016).

welfare of the employees [workers].”²⁵⁴ This helps workers to know that management takes their concerns seriously. Similarly, Norway provides workers with the opportunity to participate in safety matters throughout the lifecycle of the operation.²⁵⁵ Workers in Norway elect safety representatives called “safety delegates” to “see that work is carried out in such a manner that the safety, health and welfare of the employees [workers] are taken care of.”²⁵⁶ Through their elected representatives, workers are involved early in the safety management process.²⁵⁷ Relevant regulations provide that worker participation “shall be ensured in all various phases of the [petroleum] activities,” including the “establishment, follow-up and further development of management systems.”²⁵⁸ Norway believes “the employees’ experience and active participation is a significant precondition for a sound management system.”²⁵⁹ The Norwegian safety delegates also have duties and protections similar to those established in the UK.²⁶⁰ PSA believes that this mandate provides workers with the opportunity to actually participate in and influence safety in day-to-day operations.²⁶¹

Australia’s NOPSEMA requires that health and safety representatives be members of the workforce, which includes employees and contractors.²⁶² The representative is also selected by the workforce. By objective, this regulation intends to “ensure that expert advice is available on occupational health and

²⁵⁴ Working Environment Act, December 14, 2012; Section 7-2, <http://www.arbeidstilsynet.no/binfil/download2.php?tid=92156> (accessed March 26, 2016).

²⁵⁵ Petroleum Safety Authority Norway, Regulations Relating to Health, Safety and the Environment in the Petroleum Activities and at Certain Onshore Facilities (The Framework Regulations) (2013), Section 13, Facilitating employee participation, http://www.ptil.no/framework-hse/category403.html#_Toc357595240 (accessed March 26, 2016).

²⁵⁶ Ognedal, M. PSA, *Workforce Contribution*, June 11, 2011; <http://www.hse.gov.uk/aboutus/meetings/iacs/oiac/wig/110609/psa.pdf>, Slides 6-7. PSA. Guidelines Regarding the Framework Regulations, Re Section 13, Facilitating employee participation, http://www.ptil.no/framework/category408.html#_Toc407544828 (accessed March 26, 2016).

²⁵⁷ Petroleum Safety Authority Norway, Regulations Relating to Health, Safety and the Environment in the Petroleum Activities and at Certain Onshore Facilities (The Framework Regulations) (2013), Section 13, Facilitating employee participation, http://www.ptil.no/framework-hse/category403.html#_Toc357595240 (accessed March 26, 2016).

²⁵⁸ *Ibid.*

²⁵⁹ PSA. Guidelines Regarding the Framework Regulations, Re Section 17, Duty to establish, follow up and further develop a management system http://www.ptil.no/framework/category408.html#_Toc407544828 (accessed March 26, 2016).

²⁶⁰ PSA. Guidelines Regarding the Framework Regulations, Section 13, Facilitating employee participation, http://www.ptil.no/framework/category408.html#_Toc407544828; Working Environment Act, December 14, 2012; Chapter 6, <http://www.arbeidstilsynet.no/binfil/download2.php?tid=92156> (accessed March 26, 2016).

²⁶¹ Guidelines Regarding the Framework Regulations, Re Section 13, Facilitating employee participation, http://www.ptil.no/framework/category408.html#_Toc407544828 (accessed March 26, 2016).

²⁶² Offshore Petroleum and Greenhouse Gas Storage Act 2006, Volume 3, Schedule 3, Part 3, and Volume 3, Schedule 3, Part 1.3 “member of the workforce,” http://www.comlaw.gov.au/Details/C2013C00071/Html/Volume_3#_Toc347403628 (accessed March 26, 2016).

safety matters.”²⁶³ Such representation encourages a “consultative relationship between all relevant persons concerning the health, safety and welfare of members of the workforce at those facilities.”²⁶⁴

[CALL OUT BOX START]

Worker Participation in Mine Safety Regulation

In the US, the Mine Safety and Health Act of 1977 provides for two or more miners to designate a representative to advocate for their rights.²⁶⁵ While the representative may be an employee, he or she does not necessarily have to be.²⁶⁶ The miners’ representative can request inspections,²⁶⁷ participate in Mine Safety and Health Administration (MSHA) inspections,²⁶⁸ and learn of and participate in enforcement proceedings.²⁶⁹ Congress provided miners with worker participation rights because it believed the miners’ knowledge of the operation could provide the MSHA with critical safety information.²⁷⁰

[CALL OUT BOX END]

3.4.4 No SEMS Requirement for Contractor Participation

SEMS does not directly apply to contractors. The EPP in SEMS, which requires the operator to “consult with its employees regarding the development, implementation, and modification of its SEMS program,”²⁷¹ does not encompass contractor employees, including the drilling contractor and other well service providers.²⁷² Yet, most crew members aboard these offshore facilities are contracted.²⁷³ On the

²⁶³ Offshore Petroleum and Greenhouse Gas Storage Act 2006, Volume 3, Schedule 3, Part 1.1, http://www.comlaw.gov.au/Details/C2013C00071/Html/Volume_3#_Toc347403590 (accessed March 26, 2016).

²⁶⁴ Offshore Petroleum and Greenhouse Gas Storage Act 2006, Volume 3, Schedule 3, Part 1.1, http://www.comlaw.gov.au/Details/C2013C00071/Html/Volume_3#_Toc347403590 (accessed March 26, 2016).

²⁶⁵ *A Guide to Miners’ Rights and Responsibilities: Under the Federal Mine Safety and Health Act of 1977*; pp 11-15. <http://arlweb.msha.gov/s&hinfo/minersrights/minersrights.pdf> (accessed March 26, 2016); 30 C.F.R. 40.1.

²⁶⁶ *Ibid.*, pp 10-11.

²⁶⁷ Federal Mine Safety and Health Act of 1977 § 103(g).

²⁶⁸ Federal Mine Safety and Health Act of 1977 § 103(f).

²⁶⁹ Federal Mine Safety and Health Act of 1977 § 107(b).

²⁷⁰ *A Guide to Miners’ Rights and Responsibilities: Under the Federal Mine Safety and Health Act of 1977*; pp 10. <http://arlweb.msha.gov/s&hinfo/minersrights/minersrights.pdf> (accessed March 26, 2016).

²⁷¹ 30 C.F.R. § 250.1932; Oil and Gas and Sulphur Operations in the Outer Continental Shelf—Revisions to Safety and Environmental Management Systems, 78 Fed. Reg. 20423 (Final Rule, April 5, 2013).

²⁷² *Ibid.*

²⁷³ MMS made this observation in 2003, and then it was reiterated after Macondo by the National Commission on the BP Deepwater Horizon Oil Sill and Offshore Drilling: Oil and Gas and Sulphur Operations in the Outer Continental Shelf—Incident Reporting Rule, 68 Fed. Reg. 40585 (Proposed Rule, July 8, 2003) and National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, *A Competent and Nimble Regulator: A New Approach to Risk Assessment and Management*, Staff Working Paper No. 21, pp 7.

Deepwater Horizon, 118 of the 126 crew members were contractors,²⁷⁴ including most of the individuals involved in the well operations activities leading up to the incident. Further, contractors performed 54% of BP's 373 million total work hours in 2013.²⁷⁵

Many production facilities also have high numbers of contractors conducting hazardous operations. In the November 16, 2012, multi-fatality hot work incident on a Black Elk Energy production platform, all 24 crew members present were employed by one of three contractor companies. A number of safety management system failures were identified as causal, including poor hot work procedures, inadequate assessment of the hazards, insufficient supervision, and lack of monitoring for flammable gas.²⁷⁶ No Black Elk employees were working aboard the production platform at the time of the incident, and as a result, the contracting companies did not have to have a SEMS program, nor did the workers have a regulatory right to have an EPP and participate in the SEMS development process. Thus, no one aboard the Black Elk facility had a regulatory right to be involved in the safety management aspects of their work.

The failure of the SEMS rule to include contract workers who comprise the majority of the frontline workforce presents significant risks for offshore oil and gas operations. The UK, Norway, and Australia offshore regulations grant participation rights to both employed and contracted labor. In the UK, the Offshore Installations (Safety Representatives and Safety Committees) Regulations 1989 stipulate that “every person who is for the time being working on or from an offshore installation under a contract of service or a contract for services”²⁷⁷ has the authority to nominate and elect safety representatives “to ensure that the whole workforce is formally involved in promoting health and safety.”²⁷⁸

Similarly, Norwegian regulation provides that all workers elect a safety delegate, requiring each “individual employer” who carries out “simultaneous activities at the same workplace,” meaning all employees, including contractors, to comply with this mandate.²⁷⁹ In fact, PSA requires that the employer

²⁷⁴ Internal Company Document, Transocean. *Personnel On-Board as of 20 Apr 2010 17:09:15*, April 20, 2010, TRN-MDL-00030435, <http://www.mdl2179trialdocs.com/releases/release201303071500008/TREX-00687.pdf> (accessed March 26, 2016).

²⁷⁵ BP. *Sustainability Review 2013*; Working with our contractors, suppliers and partners; pp 27, http://www.bp.com/content/dam/bp/pdf/sustainability/group-reports/BP_Sustainability_Review_2013.pdf (accessed March 26, 2016).

²⁷⁶ BSEE. *Investigation of November 16, 2012, Explosion, Fire and Fatalities at West Delta Block 32 Platform E*; BSEE Panel Report 2013-002; November 4, 2013; Gulf of Mexico Region, New Orleans District Lease No. OCS 00367; http://www.bsee.gov/uploadedFiles/BSEE/Enforcement/Accidents_and_Incidents/Panel_Investigation_Reports/Final%20BSEE%20Black%20Elk%20report.pdf (accessed March 26, 2016).

²⁷⁷ UK HSE. *A guide to the Offshore Installations (Safety Representatives and Safety Committees) Regulations 1989*; 2012; pp 2. <http://www.hse.gov.uk/pubns/priced/l110.pdf>. (accessed March 26, 2016).

²⁷⁸ *Ibid.*, pp 7.

²⁷⁹ Petroleum Safety Authority Norway, Regulations Relating to Health, Safety and the Environment in the Petroleum Activities and at Certain Onshore Facilities (The Framework Regulations) (2013), Section 8, Employer's duties toward employees other than its own, http://www.ptil.no/framework-hse/category403.html#_Toc357595234 (accessed March 26, 2016).

coordinate its selection of a safety delegate with a contractor's selection,²⁸⁰ with the total number of representatives dependent on the operation size and the working conditions.²⁸¹

Australia's NOPSEMA also requires that health and safety representatives be members of the workforce, including employees and contractors, and be selected by the workforce.²⁸² Such representation encourages a "consultative relationship between all relevant persons concerning the health, safety and welfare of members of the workforce at those facilities"²⁸³ in order to "ensure that expert advice is available on occupational health and safety matters."²⁸⁴

3.4.5 SEMS Stop-Work Authority Impact on Worker Liability

The SEMS SWA provision does not sufficiently prohibit reprisal for stopping dangerous activities. It grants "all personnel the responsibility and authority, without fear of reprisal, to stop work or decline to perform an assigned task when an imminent risk or danger exists."²⁸⁵ Since the SWA provision obligates workers to report unsafe operations, workers could be blamed for failing to stop the work if an incident occurs.

Placing "the responsibility and authority" to halt dangerous activities on workers can create a culture of assigning blame to workers. The provision discusses that workers should not fear reprisal for initiating an SWA; however, the regulation does not speak to the protections granted to those who arguably failed to initiate an SWA when circumstances might have seemed to require it. If workers do not have a sufficient awareness of the hazards of an activity, they may be blamed or criticized after an incident for failing to initiate a stop work. Essentially, a worker is confronted with the dilemma of choosing between facing criticism (or worse) for stopping work or being blamed for failure to act.

The concept of imminent risk should not be a sole determinant for stop-work authority. Control of major hazards depends on defense-in-depth, or reliance on multiple barriers to prevent imminent danger because of barrier redundancy. Yet loss of a critical barrier should warrant a stop-work order even if risk is not imminent.

A poorly designed or supported SWA program may encourage workers to try to ignore certain activities in the hopes of avoiding fault in a potential stop-work situation – the antithesis of an engaged workforce.

²⁸⁰ *Ibid*; Working Environment Act, December 14, 2012; Section 2-2, <http://www.arbeidstilsynet.no/binfil/download2.php?tid=92156> (accessed March 26, 2016).

²⁸¹ *Ibid*; Working Environment Act, December 14, 2012; Section 6-1, <http://www.arbeidstilsynet.no/binfil/download2.php?tid=92156> (accessed March 26, 2016).

²⁸² Offshore Petroleum and Greenhouse Gas Storage Act 2006, Volume 3, Schedule 3, Part 3, and Volume 3, Schedule 3, Part 1.3 "member of the workforce," http://www.comlaw.gov.au/Details/C2013C00071/Html/Volume_3#_Toc347403628 (accessed March 26, 2016).

²⁸³ Offshore Petroleum and Greenhouse Gas Storage Act 2006, Volume 3, Schedule 3, Part 1.1, http://www.comlaw.gov.au/Details/C2013C00071/Html/Volume_3#_Toc347403590 (accessed March 26, 2016).

²⁸⁴ Offshore Petroleum and Greenhouse Gas Storage Act 2006, Volume 3, Schedule 3, Part 1.1, http://www.comlaw.gov.au/Details/C2013C00071/Html/Volume_3#_Toc347403590 (accessed March 26, 2016).

²⁸⁵ 30 C.F.R. § 250.1930.

Thus, involving workers in these situations can have the unintended effect of reducing safety reporting, increasing defensive posturing by workers, and minimizing the benefits of a reporting system.²⁸⁶

In contrast, both the UK and Norway remove from the workforce any duty to stop work.²⁸⁷ UK Safety Representative regulations state that “no function conferred on a [either the safety representative or the safety committee] by this regulation shall be construed as imposing a duty on [them].”²⁸⁸ Legislation in Norway provides the safety representative with the opportunity to stop work, but the “representative is not liable for any loss suffered by the undertaking as a result of work being halted.”²⁸⁹ In both instances, removing potential sources of blame on the worker for stopping work is crucial to improving offshore safety.

3.4.6 Inadequate SEMS Requirements to Protect Workers from Retaliation

The SWA provision in SEMS is designed for use when work stoppage is most challenging. When the work is being performed, time and economic pressures are likely high, and the crew well understands the consequences of stopping work.²⁹⁰ The CSB Tosco Avon Refinery investigation uncovered workers who stated they felt pressure to avoid using stop work because of economic implications and production pressures.²⁹¹ As such, they were greatly concerned about retaliation for initiating a stop work. Similarly, in the GoM, the fear of retaliation for stopping work is described in BSEE’s investigation of the 2012 Black Elk production platform explosion, where BSEE noted that contractors did not initiate a stop work because they feared losing their jobs for doing so.²⁹²

In many instances, simply requiring that companies have a stop-work program does not guarantee the workforce will actually use it. The workers must believe that using SWA will not result in disciplinary action. Indeed, the SEMS SWA provision creates the type of stop work programs already implemented by BP and Transocean at the time of the blowout, found to be lacking adequate worker protections.²⁹³

²⁸⁶ Dekker, S. *Just Culture: Balancing Safety and Accountability*; Ashgate Publishing Company: Hampshire, England, 2007; pp 20-27.

²⁸⁷ Working Environment Act, December 14, 2012; Section 6-3, <http://www.arbeidstilsynet.no/binfil/download2.php?tid=92156>; The Offshore Installations (Safety Representatives and Safety Committees) Regulations 1989, No. 16 <http://www.legislation.gov.uk/uksi/1989/971/contents/made> (accessed March 26, 2016).

²⁸⁸ The Offshore Installations (Safety Representatives and Safety Committees) Regulations 1989, No. 16 <http://www.legislation.gov.uk/uksi/1989/971/contents/made> (accessed March 26, 2016).

²⁸⁹ Working Environment Act, December 14, 2012; Section 6-3, <http://www.arbeidstilsynet.no/binfil/download2.php?tid=92156> (accessed March 26, 2016).

²⁹⁰ USCSB, 2001, *Refinery Fire Incident, Martinez, CA, February 23, 1999*, Report No. 99-014-I-CA, March 2001, http://www.csb.gov/assets/1/19/Tosco_Final_Report.pdf (accessed March 25, 2016).

²⁹¹ *Ibid.*

²⁹² BSEE. *Investigation of November 16, 2012, Explosion, Fire and Fatalities at West Delta Block 32 Platform E*; BSEE Panel Report 2013-002; November 4, 2013; Gulf of Mexico Region, New Orleans District Lease No. OCS 00367; pp 3-4. http://www.bsee.gov/uploadedFiles/BSEE/Enforcement/Accidents_and_Incidents/Panel_Investigation_Reports/Final%20BSEE%20Black%20Elk%20report.pdf (accessed March 26, 2016).

²⁹³ Bureau of Ocean Energy Management, Regulation, and Enforcement. *Report Regarding the Causes of the April 20, 2010, Macondo Well Blowout*; 2011; pp 189-190; OCEANA statement to BSEE, RE: Revisions to Safety and

SEMS also requires that operators establish a program for reporting unsafe working conditions that protect “a person’s identity to the extent authorized by law.”²⁹⁴ Initially, BSEE reported that it was developing a confidential near-miss reporting system with the Bureau of Transportation and Statistics.²⁹⁵ This program has now been implemented.²⁹⁶ According to the BSEE website, the program is both voluntary and anonymous.²⁹⁷ At this time, the toll-free hotline line is operational but the BSEE website has not yet been modified to accept online reporting.²⁹⁸ However, there are insufficient provisions within SEMS to protect workers from retaliatory action.

A bill that originated in 2010 in the House Committee on Education and the Workforce stated there was that no federal law that protects oil and gas workers if they are retaliated against after they blow the whistle on workplace health and safety violations on the Outer Continental Shelf.²⁹⁹ The bill eventually expired due to inaction during a previous Congress. Nevertheless, such legislation highlighted the regulatory gap in whistleblower protection that the SEMS program has not addressed.

BSEE itself, in its Safety Culture Policy Statement of May 9, 2013, identified an “Environment for Raising Concerns” as one of nine characteristics of a robust safety culture and that this meant that “A work environment is maintained where personnel feel free to raise safety and environmental concerns without fear of retaliation, intimidation, harassment, or discrimination.”³⁰⁰

Some existing statutes have jurisdictional language that may apply offshore and the possibility exists that offshore workers may have some, albeit limited, measure of whistleblower protection. OSHA currently oversees enforcement of many different whistleblower protection laws arising in areas such as occupational, environmental, nuclear, transportation, consumer, and other categories.³⁰¹ Some of the most

Environmental Management Systems (SEMS), 1010-AD73, November 14, 2011; pp 3.
<http://www.bsee.gov/uploadedFiles/Oceana%2011-9-11.pdf> (accessed March 26, 2016).

²⁹⁴ 30 C.F.R. § 250.1933; 30 C.F.R. § 250.193.

²⁹⁵ Notice of Voluntary Confidential Near-Miss Reporting System Public Workshop, 79 Fed. Reg. 17563; See also BTS and BSEE to Develop Confidential Near-Miss Reporting System, http://www.rita.dot.gov/bts/bts_bsee (accessed March 26, 2016).

²⁹⁶ This program was implemented on May 5, 2015 in SafeOCS. See Section 4.3.2.

²⁹⁷ “SafeOCS is a voluntary and completely confidential system, in which the Bureau of Transportation Statistics (BTS) will collect and analyze near-miss reports submitted by individual OCS workers, companies, and others. The aggregated data will be shared with the general public through the BTS website, and used to identify safety trends and increase understanding of offshore risk;” <http://www.bsee.gov/BSEE-Newsroom/Press-Releases/2015/BSEE-Director-Brian-Salerno-Announces-Key-Efforts-to-Reduce-Risk-Offshore/> (accessed March 26, 2016).

²⁹⁸ The CSB has not identified an anonymous online reporting tool on the BSEE website. The Bureau of Transportation Statistics does have a functioning SafeOCS near-miss reporting system link which can be found here: <https://near-miss.bts.gov/#contactUs> (accessed March 31, 2016).

²⁹⁹ 111 H.R. 5851. Offshore Oil and Gas Worker Whistleblower Protection Act of 2010. <https://www.congress.gov/bill/111th-congress/house-bill/5851> (accessed January 7, 2016). The House also brought forward subsequent versions of this bill in 2011, and then again in 2015. See 112 H.R. 503, Offshore Oil and Gas Worker Whistleblower Protection Act of 2011; 114 H.R. 2824, Offshore Oil and Gas Worker Whistleblower Protection Act of 2015.

³⁰⁰ BSEE, Safety Culture Policy, <http://www.bsee.gov/Safety/Safety-Culture-Policy/> (accessed October 7, 2015).

³⁰¹ US Department of Labor. The Whistleblower Protection Programs, http://www.whistleblowers.gov/wb_filing_time_limits.html (accessed March 31, 2016).

potentially applicable statutes that might help protect offshore workers tend towards environmental protection, are the Clean Air Act,³⁰² the Comprehensive Environmental Response, Compensation and Liability Act,³⁰³ and the Federal Water Pollution Control Act (the Clean Water Act).³⁰⁴

In the UK, the workforce brings forward its safety concerns to its designated safety representatives who present these matters to the installation manager.³⁰⁵ In effect, the workforce has a protective mechanism from retaliation. Norway and Australia take similar approaches.³⁰⁶

The Mining Safety and Health Administration, or MSHA, also provides protections for workers voicing safety concerns with mining operations. Neither a miner nor a miner's representative can be discharged or retaliated against for filing a complaint concerning safety related matters. Moreover, a miner or a miner's representative can seek legal relief if they believe they have been the subject of dismissal or harassment for filing such complaint.³⁰⁷

Effectively managed reporting programs provide the regulator a view of issues that may not otherwise be detected through inspections. To manage a reporting program effectively, the operator must remove penalties for reporting safety issues.³⁰⁸ As long as SEMS and other potential sources of federal oversight fail to provide protection for whistleblowers or workers seeking to stop work in the offshore environment, offshore process safety suffers.

3.4.7 No SWA Worker-Requested Regulatory Provision in Regulation

The SEMS regulations do not contain a provision allowing the workforce to seek intervention by the regulator should they feel that management is not responding adequately to their call for a stop work. Rather, SEMS states, "Work may be resumed when the individual on the facility with Ultimate Work Authority (UWA) determines that the imminent risk or danger does not exist or no longer exists."³⁰⁹ But management designates the individual with the UWA.³¹⁰ This creates the potential for resolving when to resume operations without adequate or impartial review. Workers may reasonably believe that operations

³⁰² 42 U.S.C. § 7422.

³⁰³ 42 U.S.C. § 9610.

³⁰⁴ 33 U.S.C. § 1367.

³⁰⁵ Malloy, J. Former Director, Regional Organizer, RMT Union Offshore Energy Branch, Personal communication, October 3, 2013; UK HSE. *Safety representatives and safety committees on offshore installations: A brief guide for the workforce*, INDG199(rev1), 1999, <http://www.hse.gov.uk/pubns/indg119.htm>.; The Offshore Installations (Safety Representatives and Safety Committees) Regulations 1989, <http://www.legislation.gov.uk/uksi/1989/971/contents/made> (accessed March 26, 2016).

³⁰⁶ Working Environment Act, December 14, 2012; Section 6-2, <http://www.arbeidstilsynet.no/binfil/download2.php?tid=92156>.; Offshore Petroleum and Greenhouse Gas Storage Act 2006, Volume 3, Schedule 3, Part 3, Subdivision B, http://www.comlaw.gov.au/Details/C2013C00071/Html/Volume_3#_Toc347403653.

³⁰⁷ 30 U.S.C. § 815(c).

³⁰⁸ Committee on Education and the Workforce. H.R. 503: Offshore Oil and Gas Worker Whistleblower Protection Act, <http://democrats.edworkforce.house.gov/bill/hr-503-offshore-oil-and-gas-worker-whistleblower-protection-act> (accessed March 26, 2016).

³⁰⁹ 30 C.F.R. § 250.1930(c).

³¹⁰ 30 C.F.R. § 250.1931(a).

still pose a significant risk if restarted. Therefore, SEMS should provide for regulatory intervention whenever management and workers disagree on whether work can be safely resumed.

UK law provides that if two or more safety representatives believe an “imminent risk” exists in any activity, they must inform the installation manager.³¹¹ The installation manager then must inform an HSE inspector of the issue through a report as soon as is reasonably practicable.³¹² The HSE may issue an enforcement notice either to prohibit the activity until matters have been corrected or to require some longer-term improvements, or in the worst case, to prosecute the responsible party.³¹³ The decision on when work can begin again is left to the regulator and is specified in the prohibition notice.³¹⁴

In Norway, the safety representatives have the right to halt dangerous work. The danger must be immediate and cannot be averted by other means. If the safety representative determines these conditions to be the case, work may be halted until the labor inspection authority decides whether work may continue.³¹⁵

Australia requires safety representatives to report an imminent danger to the supervisor or, if no supervisors can be located, to stop work.³¹⁶ If supervisors can be located, then the supervisor is required to take actions that he or she believes will remove the danger. If the safety representatives believe imminent danger still exists, they may make a request to NOPSEMA to conduct an inspection of the activity. This option also exists for the supervisors if they disagree with the safety representatives. Only after the NOPSEMA inspection determines that the activity is safe can work resume.³¹⁷

The SEMS failure to require regulatory intervention in a stop-work dispute between the workforce and management increases potential safety risk. Lack of regulatory participation in a stop-work situation can result in management’s always making the ultimate decision. Management may order work to resume after a stop work before eliminating or sufficiently mitigating the hazard in the interest of averting costs, lost time, and other economic impacts caused by the stop work. Management may decide even with limited understanding of the risks due to distance from the worksite or unfamiliarity with the work, the requirements of its special tasks, or other unique circumstances. Regulatory intervention of the type discussed in the UK, Norway, and Australia thus provide an avenue for improving the SEMS regulation.

³¹¹ The Offshore Installations (Safety Representatives and Safety Committees) Regulations 1989, <http://www.legislation.gov.uk/ukxi/1989/971/contents/made> (accessed March 26, 2016).

³¹² UK HSE, Safety Representatives and Safety Committees on Offshore Installations, <http://www.hse.gov.uk/pubns/indg119.pdf> (accessed March 26, 2016).

³¹³ UK HSE, HSE Public Register of Enforcement Notices, <http://www.hse.gov.uk/notices/> (accessed March 26, 2016).

³¹⁴ Joomla!. UK Health and Safety Legal System: Appendix A – UK Health and Safety Legal System, Prohibition Notice, http://www.simplesensible.com/index.php?option=com_content&view=article&id=22&catid=1&Itemid=82 (accessed March 26, 2016).

³¹⁵ Working Environment Act, December 14, 2012; Section 6-3, <http://www.arbeidstilsynet.no/binfil/download2.php?tid=92156> (accessed March 26, 2016).

³¹⁶ Offshore Petroleum and Greenhouse Gas Storage Act 2006, Volume 3, Schedule 3, Part 3, Division 5, 44, http://www.comlaw.gov.au/Details/C2013C00071/Html/Volume_3#_Toc347403653.

³¹⁷ Offshore Petroleum and Greenhouse Gas Storage Act 2006, Volume 3, Schedule 3, Part 3, Division 5, 44 & 45, http://www.comlaw.gov.au/Details/C2013C00071/Html/Volume_3#_Toc347403653.

The reality is, however, that the formality of involving the regulator in a stop work situation is only a backstop. Sound safety culture, with informed safety representatives and enhanced protection for workers who exercise stop work authority should resolve worker concerns about safety without frequent need for regulator involvement. Nevertheless, the right to involve the regulator is always available in those jurisdictions, and it remains a powerful driver to resolve issues. The US should emulate this important protection.

3.4.8 No SEMS Safety Committees or Tripartite Safety Forums Provision

A fundamental element in effective safety management for major accident prevention is active and equal participation from the regulator, industry, and labor. Each stakeholder provides unique and essential insights; removing the participation of any of them can result in losing a critical voice in safety management. While the regulator and industry management typically have the means to ensure that their voices are heard—they have the enforcement power on one hand and ownership or managerial authority on the other—the workers often lack similar means. Labor participation is vital as it gives workers the opportunity to provide management and the regulator with invaluable insights, and in many instances the workers are the only source of this information.³¹⁸ In other offshore regimes, workers are guaranteed rights to form safety committees, made up of both management and workforce members, to encourage dialogue on safety issues or concerns at each offshore facility. In contrast, SEMS lacks requirements for workforce-management safety committees that would promote dialogue on safety concerns between both entities.

The UK requires each offshore installation with more than one safety representative to establish a safety committee comprised of the installation manager, another person appointed by the installation manager, and all of the safety representatives.³¹⁹ Through the committee, management and the workforce discuss health and safety matters with the goal of developing mutual cooperation and ensuring the safety of the workforce.³²⁰

In addition to these safety committees, many regimes have developed larger forums where regulator, industry, and workforce all have equal opportunities to directly interact and discuss safety matters. The regulator often hosts and supports these forums. Yet no such regulator-supported forum has been developed for US offshore worker representatives can openly discuss safety issues with industry management and the regulator.

The UK has a tripartite forum which is enabled through Step Change in Safety,³²¹ an organization established in 1997 when industry decided to require significant improvements in health and safety, and

³¹⁸ Center For Chemical Process Safety. *Guidelines for Risk Based Process Safety*; John Wiley & Sons: Hoboken, NJ, 2007; pp 124.

³¹⁹ The Offshore Installations (Safety Representatives and Safety Committees) Regulations 1989, <http://www.legislation.gov.uk/ukxi/1989/971/contents/made> (accessed March 26, 2016).

³²⁰ UK HSE. *A guide to the Offshore Installations (Safety Representatives and Safety Committees) Regulations 1989*; 2012; pp 2. <http://www.hse.gov.uk/pubns/priced/l110.pdf>. (accessed March 26, 2016); note, in the United States, safety committees are required by some state laws and often, in unionized workplaces, through the collective bargaining process.

³²¹ <http://www.stepchangeinsafety.net/>; UK HSE. Offshore Oil & Gas Sector Strategy, <http://www.hse.gov.uk/offshore/priorities.htm> (accessed March 26, 2016).

when collaboration among the parties became a priority.³²² Through the years, Step Change influenced greater cooperation among labor, industry, and the regulator.³²³ The organization is led by a team of senior managers from industry, trade unions, trade associations, and the regulator. The workforce is specifically engaged through networks, including elected safety representatives, safety professionals, and site leaders. Regular meetings are held throughout the year to share safety information and to discuss safety issues. Through this framework, issues such as competence, leadership, workforce engagement, continual improvement, asset integrity, and communication are addressed to improve health and safety offshore.³²⁴ Step Change supports a number of steering groups, including the Workforce Engagement Support Team (WEST), which aims to maximize the value of both safety representatives and workforce engagement survey tools that strengthen workers' role in safety management.³²⁵ The UK HSE also chairs a more formal, higher level tripartite body, the Offshore Industry Advisory Committee (OIAC), which brings employer and worker representatives together with the regulator in another important forum to discuss offshore health and safety matters.³²⁶

Similarly, Norway's regulator established a number of tripartite bodies. A working environment committee is involved in planning safety issues such as construction work, work processes, and preventive safety measures. The committee receives paid time off to attend training sessions.³²⁷ A Regulatory Forum and the Safety Forum³²⁸ also facilitates discussion of safety issues such as trends in risk management, practical implementation of regulatory requirements, and safety standards for use offshore.³²⁹ PSA asserts that these forums are beneficial venues to raise awareness of safety issues and discuss potential solutions, especially for industry members who are less sophisticated.³³⁰

Australia's NOPSEMA uses its Offshore Petroleum Safety Tripartite Forum to actively engage all the stakeholders involved in the offshore petroleum industry.³³¹ NOPSEMA maintains that such engagement

³²² Step Change in Safety, *Strategic Plan 2010-2015: Making the UK the safest place to work in the worldwide oil and gas industry*, 2010.

³²³ *Ibid.*

³²⁴ *Ibid.*

³²⁵ Step Change in Safety, Workforce Engagement, <https://www.stepchangeinsafety.net/about-step-change-safety/steering-groups/workforce-engagement> (accessed March 26, 2016).

³²⁶ UK HSE, Offshore Industry Advisory Committee (OIAC), <http://www.hse.gov.uk/aboutus/meetings/iacs/oiac/> (accessed March 26, 2016).

³²⁷ Working Environment Act, December 14, 2012; Section 7, <http://www.arbeidstilsynet.no/binfil/download2.php?tid=92156> (accessed March 26, 2016).

³²⁸ Hauge, H., Okstad, E., Tinmannsvik, R., Lootz, E., Ovesen, M., Carlsen, I., Risk of Major Accidents: Causal Factors and Improvement Measures Related to Well Control in the Petroleum Industry, SPE Americas E&P Health, Safety, Security and Environmental Conference, Galveston, TX, March 18-20, 2013; SPE-163775-MS:

³²⁹ *Ibid.*; PSA, Regulatory Forum, 2014, <http://www.ptil.no/regulations/regulatory-forum-article9524-216.html#> (accessed March 26, 2016).

³³⁰ Sophistication refers to industry members who do not have the breadth and depth of offshore business experience as some of the oil majors, who have well-developed operational programs from decades of experience; CSB Norway trip notes, April 26 – May 1, 2012.

³³¹ NOPSEMA. Offshore Petroleum Safety Tripartite Forum, <http://www.nopsema.gov.au/safety/offshore-petroleum-safety-tripartite-forum/>.

will improve safety by promoting “information sharing, learning and innovation across the offshore petroleum industry.”³³²

The US lacks similar initiatives to encourage participation among the regulator, industry, and labor. This remains a missed opportunity.

3.4.9 Conclusion

The importance of worker participation in safety management cannot be overstated. Existing US offshore safety regulations addressing workforce participation are improved since Macondo; however, the regulations still suffer from significant gaps. The regulations fail to engage all members of the workforce; lack workforce-elected safety representatives and safety committees; rely heavily on SWA which is a weak form of worker involvement if not properly implemented or supported; and create potential opportunities for blaming the workforce without recourse to regulator intervention. These gaps diminish safety by discouraging workforce participation in managing offshore safety. The regulator should take additional steps to improve these regulatory provisions, provide for protection against retaliation for workforce participation in safety management activities, as well as play a lead role in establishing a tripartite forum to aid workers in having a larger voice in process safety management and major accident prevention.

³³² Offshore Petroleum Safety Tripartite Forum, Terms of Reference, Feb. 26, 2013, <http://www.nopsema.gov.au/assets/document/Terms-of-Reference-Offshore-Petroleum-Safety-Tripartite-Forum-Rev-0-Feb-2013.pdf>.

4.0 US Offshore Regulator Challenge in Effective Oversight

BSEE's goal of a SEMS program is "to promote safety and environmental protection."³³³ To accomplish that goal, operators must "ensure [their] SEMS program identifies, addresses, and manages safety, environmental hazards ..."³³⁴ This language is weaker than the corporate policies BP and Transocean had at the time of Macondo to prevent incidents that harmed people and the environment and to apply ALARP principles in their operations.³³⁵ Furthermore, BP and Transocean already had mandated internal safety management systems that would have satisfied post-Macondo SEMS requirements, including hazard analysis, management of change, operating procedures, and incident investigation.³³⁶ The analysis presented in Volume 3 demonstrates that BP and Transocean's failures to effectively implement these systems were causal factors in the blowout. Thus, merely having a documented safety management program that complies with SEMS regulations is not sufficient. A fundamental question arises: Have enough changes occurred in the US to make safety management programs, like those which BP and Transocean already had in place, effective? This chapter answers the question by describing the value of major hazard documentation that identifies the major hazards and the barriers intended to prevent or mitigate them, as well as the influential role of the regulator in proactive review and verification of that documentation. The chapter also describes potential opportunities for BSEE to drive further industry safety improvements through the use of effective process safety indicators and transparency.

In 2015 BSEE laid out two strategic goals:³³⁷

³³³ 30 C.F.R. § 250.1901.

³³⁴ *Ibid.*

³³⁵ BP's OMS Exploration and Production Drilling and Well Operations Practice (DWOP) states, "all risks shall be managed to a level which is as low as reasonably practical" or ALARP, Internal Company Document, BP. *GP 10-00 Drilling and Well Operations Practice*, Issue 1, October 2008, "This document contains the practices that have been agreed by BP management as current and relevant for drilling and well operations.", pp A-8, BP-HZN-BLY00034518, <http://www.mdl2179trialdocs.com/releases/release201304110900026/TREX-06121.pdf> (accessed May 26, 2015). Transocean policies requires employees to manage risks to ALARP, which Transocean defines as "... requiring personnel to consider the various additional risk reduction measures (additional controls) and determine if the effort and cost of those measures justify the additional amount of risk reduction obtained" Internal Company Document, Transocean. *Health and Safety Policies and Procedures Manual*, Issue 03, Revision 07, HQS-HSE-PP-01, December 15, 2009, Section 4 (Safety Policies, Procedures and Documentation), pp BP-HZN-2179MDL00132218, see Exhibit 4942, BP-HZN-2179MDL00132055, http://www.mdl2179trialdocs.com/releases/release201302281700004/Farr_Daniel-Depo_Bundle.zip (accessed October 7, 2015).

Internal Company Document, BP. *The BP Operating Management System Framework, Part 1, An Overview of OMS*, Issue 2, November 3, 2008, pp 24, BP-HZN-2179MDL0033320, see Exhibit 2352 http://www.mdl2179trialdocs.com/releases/release201302281700004/Lynch_Richard-Depo_Bundle.zip (accessed October 7, 2015).

Internal Company Document, Transocean. *Health and Safety Policies and Procedures Manual*, Issue 03, Revision 07, HQS-HSE-PP-01, December 15, 2009, General, BP-HZN-2179MDL00132067, see Exhibit 4942 http://www.mdl2179trialdocs.com/releases/release201302281700004/Farr_Daniel-Depo_Bundle.zip (accessed October 7, 2015).

³³⁶ 30 C.F.R. § 250.1902 and Volume 3.

³³⁷ The US Department of the Interior. *Budget Justifications and Performance Information Fiscal Year 2015: Bureau of Safety and Environmental Enforcement*;

- Regulate, enforce, and respond to OCS development using the full range of authorities, policies, and tools to compel safety, emergency preparedness and environmental responsibility and appropriate development and conservation of the offshore oil and natural gas resources.
- Build and sustain the organizational, technical, and intellectual capacity within and across BSEE's key functions – capacity that keeps pace with OCS industry technological improvements, innovates in regulation and enforcement, and reduces risk through systemic assessment and regulatory and enforcement actions.”

Yet despite these aims and the post-Macondo regulatory changes, BSEE still struggles with several limitations and untapped opportunities to more effectively regulate the offshore oil and gas industry:

- Limited proactive oversight mechanisms to drive industry to improve safety systems as evidenced by these shortfalls:
 - BSEE does not require documentation demonstrating control of major hazards before commencing the hazardous offshore operations;
 - Lack of sufficient direct involvement in SEMS audits, and the accompanying dialogue with the company that occurs as part of the auditing process, which minimizes BSEE's influence;
- Inadequate collection and use of safety performance indicator data to identify and analyze developing safety issues before they turn into more severe problems;
 - BSEE has not initiated industrywide or companywide audits to proactively assess safety trends;
- Historically inadequate levels of transparency in disseminating industry safety information and in the performance of oversight activities.

This chapter explores proactive mechanisms BSEE can use to counter these issues and more effectively oversee industry's efforts to manage major accident risk, while driving further safety improvements and promoting trust among members of industry, workforce, and the public.

4.1 No Required Review of Major Accident Hazard Documentation Before Hazardous Work Begins

Oil and gas companies operating in the US OCS are not required to provide major hazard documentation that: (1) identifies all major accident hazards, (2) implements the necessary barriers and controls to reduce risk to ALARP, and (3) describes an effective and operational safety management program to ensure that those barriers and controls will remain reliable and available as needed.³³⁸ While point 3 could potentially be addressed by a SEMS program, points 1 and 2 go beyond current SEMS requirements.³³⁹ BSEE could review major hazard documentation, and if necessary, challenge a company's assertions before and/or during hazardous activities. Furthermore, the assertions in major hazard documentation

http://www.bsee.gov/uploadedFiles/BSEE/About_BSEE/Budget/BSEE%20FY%202015%20Final%20Greenbook%20File.pdf (accessed March 25, 2015).

³³⁸ See Chapter 4, Volume 2.

³³⁹ As described in Section 6.1.1 of Volume 2, the hazard analysis requirement in SEMS (30 C.F.R. 250.1911) is not focused on targeted risk reduction of major accident events and the barriers intended to prevent or mitigate them.

could become the foundation for BSEE to conduct more effective preventative audits and inspections and have meaningful dialogue with the duty holder about its specific risk management policies and practices.³⁴⁰

As described in Chapters 2.0 and 3.0, the development of a written case for safety is critical to the UK and Australian offshore regulatory regimes, and a similar “internal control” plan requirement exists for companies operating in Norwegian waters.³⁴¹ Originally only UK and Australian offshore regulators had to accept³⁴² a facility’s written case for safety before it could commence operation, and as of June 28, 2013 that requirement now applies to all European Union members,³⁴³ including over 1,000 facilities in the North Sea, Mediterranean Sea, and Black Sea with offshore drilling and production activities.³⁴⁴ The regulator’s acceptance of a written case for safety in any jurisdiction (called a Major Hazard Report under the EU directive) still does not license the facility or installation as “fit,” nor does it shift the duty of risk control and reduction away from the facility owner or operator and onto the regulator. Rather, the duty of major accident prevention and risk-reduction to ALARP remains with the duty holder throughout the life of the facility. In fact, even in adopting the new directive, the EU noted that offshore safety remains primarily the obligation of the offshore operators and the individual countries in which they operate.³⁴⁵ Following the regulator’s acceptance of the safety case document, the duty holder must ensure that the installation is operated in accordance with the safety management system and other risk-reduction provisions described in the safety case.

The term “safety case” came about because in such a regime, the duty holder is expected to make a written case for safety to the regulator.³⁴⁶ In their documentation, duty holders must explain the processes they used to identify hazards and assess risks³⁴⁷ and their rationale for choosing a particular method of controlling them.³⁴⁸ The regulator reviews the case and accepts or rejects the document, which is a

³⁴⁰ Section 4.2 for further discussion.

³⁴¹ See, Hopkins, A. *Explaining the Safety Case*; Working Paper 87; National Research Centre for OHS Regulation, Australian National University: April, 2012.

³⁴² This concept is discussed in the CSB’s report on the Chevron Richmond Refinery. “Acceptance requires satisfaction with the duty holder’s approach to identifying and meeting health and safety needs ... HSE ‘accepts’ the validity of the described approach as being capable, if implemented as described, of achieving the necessary degree of risk control, but HSE does not confirm the outcomes of that approach.” Therefore, “HSE will accept a safety case or a revision ... when duty holders demonstrate and describe specified matters to HSE’s satisfaction. Acceptance will be based on HSE’s judgment that the arrangements and measures described in the safety case taken as a whole are **likely** to achieve compliance if implemented as described. To give acceptance HSE does not need to be satisfied that compliance **will** be achieved....” UK HSE. *A guide to the Offshore Installations (Safety Case) Regulations 2005, 3rd ed.*; SCR 2005; 2006; pp 6, <http://www.hse.gov.uk/pubns/books/130.htm> (accessed March 26, 2016).

³⁴³ [Http://ec.europa.eu/energy/en/topics/oil-gas-and-coal/offshore-oil-and-gas-safety](http://ec.europa.eu/energy/en/topics/oil-gas-and-coal/offshore-oil-and-gas-safety).

³⁴⁴ Safety of Offshore Oil and Gas Operations Directive, <http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32013L0030>.

³⁴⁵ European Commission, Offshore oil and gas safety, [Http://ec.europa.eu/energy/en/topics/oil-gas-and-coal/offshore-oil-and-gas-safety](http://ec.europa.eu/energy/en/topics/oil-gas-and-coal/offshore-oil-and-gas-safety) (accessed January 26, 2016).

³⁴⁶ *Ibid.* pp 4.

³⁴⁷ *Ibid.* pp 5.

³⁴⁸ *Ibid.* pp 5.

prerequisite to obtain a license to drill.³⁴⁹ Once a rig has an accepted safety case, it can operate anywhere in that jurisdiction without resubmitting the case, assuming it addressed the full range of hazard options. This presentation and acceptance feature of the Australian and UK safety case process forms the basis of the legal agreement between the company and the regulator.

According to UK HSE guidance on the offshore Safety Case Regulations, safety case reports are “intended to be living documents, kept up to date and revised as necessary during the operational life of the installation.”³⁵⁰ Similarly, Australian regulators explain that if carried out properly, the process of developing the safety case will “improve safety of offshore activities by ensuring a systematic review of the hazards, their associated risks and the control measures that are applied at the facility to either eliminate the hazards or otherwise reduce the risks. Progress, in terms of risk-reduction, is achieved by applying the process both during initial development of the safety case and subsequently in the course of continual improvement.”³⁵¹

[CALL OUT BOX START]

EU-wide safety standards

Under the Safety of Offshore Oil and Gas Operations Directive, the EU put in place a set of rules to help prevent accidents, as well as to respond promptly and efficiently should one occur before exploration or production begins. For their offshore installation, companies must prepare a Major Hazard Report, containing a risk assessment and an emergency response plan. They must keep resources at hand r to put them into operation when necessary when granting licenses. EU countries must ensure that companies are well financed and have the necessary technical expertise and solutions critical for the safety of operators' installations. These must be independently verified by the regulator before the installation commences operation. National authorities must verify safety provisions, environmental protection measures, and the emergency preparedness of rigs and platforms. If companies do not respect the minimum standards, EU countries can impose sanctions, including halting production. Information on how companies and EU countries keep installations safe must be made available for citizens. Companies will be fully liable for environmental damages caused to protected marine species and natural habitats. For damage to marine habitats, the geographical zone will cover all EU marine waters including exclusive economic zones and continental shelves.

[CALL OUT BOX END]

Internationally, both the UK HSE and NOPSEMA require acceptance of an operator’s safety case before beginning activities.³⁵² This framework requires operators to demonstrate that all risks were reduced to

³⁴⁹ Whewell, I. Former Director, UK HSE Offshore Division, Personal communication, July 6, 2011.

³⁵⁰ UK HSE. *A guide to the Offshore Installations (Safety Case) Regulations 2005*, 3rd ed.; SCR 2005; 2006; pp 7. <http://www.hse.gov.uk/pubns/books/130.htm> (accessed March 26, 2016).

³⁵¹ NOPSEMA. *ALARP Guidance Note*; N-04300-GN0166, Rev 6; June, 2015; pp 18. <http://www.nopsema.gov.au/assets/Guidance-notes/N-04300-GN0166-ALARP.pdf> (accessed March 26, 2016).

³⁵² See *The Offshore Installations (Safety Case) Regulations 2005*, No. 3117, Regulation 7 & 8, <http://www.legislation.gov.uk/ukxi/2005/3117/contents/made> (accessed March 26, 2016); *Offshore Petroleum and Greenhouse Gas Storage (Safety) Regulations 2009*, Division 2- Submission and acceptance of safety cases, <https://www.legislation.gov.au/Details/F2013C00945> (accessed March 26, 2016).

ALARP.³⁵³ Nevertheless, the safety case is “accepted” and not “approved,” as the safety of the facility is not guaranteed by the regulator, nor does it mean the operation as a whole is fit.³⁵⁴ Acceptance of the safety case indicates that the facility’s approach is valid in terms of good practice; however, confirmation of compliance is based on post-acceptance programs, such as inspections and audits.³⁵⁵ The requirement that the regulator accept an operator’s safety case before beginning activities is beneficial because it allows for meaningful dialogue to begin at the early stages of development.³⁵⁶

In Norway, the PSA does not formally review and “accept” the management system documentation before permitting companies to drill, but it does require that management system documentation be prepared and be made available for the regulator’s review at any time, such as during a facility audit. PSA then routinely reviews the documentation and discusses its contents with the operator to assess how the operator’s SMS is working.³⁵⁷ PSA does not require the facility to submit its safety management system for acceptance, and asserts that the benefits of this approach are: (1) it does not create the impression that the duty of ensuring safety has shifted to the regulator and (2) regulatory resources can focus on industry activities instead of the paperwork review.³⁵⁸

In the UK, Australia, and Norway, duty for assuring risks are reduced to ALARP remains with the entity responsible for creating or controlling the risk. The regulator checks that an operation is effectively reducing risk to ALARP through audits and inspections that verify the duty holder’s adherence to its own

³⁵³ UK HSE. *A guide to the Offshore Installations (Safety Case) Regulations 2005, 3rd ed.*; SCR 2005; 2006; *Demonstration of ‘as low as reasonably practical’*, pp 13. <http://www.hse.gov.uk/pubns/books/l30.htm> (accessed March 26, 2016); Offshore Petroleum and Greenhouse Gas Storage (Safety) Regulations 2009, 1.4 Objects, <https://www.legislation.gov.au/Details/F2013C00945> (accessed March 26, 2016).

³⁵⁴ Pitblado, R.; Bjerager, P.; Andreassen, E. *An Effective US Offshore Safety Regime*; Det Norske Veritas: 22 2010, July; pp 3. http://www.dnvusa.com/Binaries/1008-001%20Offshore%20Update_Key%20aspects_tcm153-430982.pdf (accessed March 16, 2016); Powell, T. *US Voluntary Semp Initiative: Holy Grail or Poisoned Chalice?*, Offshore Technology Conference, Housont, TX, May 8-9, 1996; OTC 8111.

³⁵⁵ CSB Public Hearing: Regulatory Approaches to Offshore Oil and Gas Safety, Washington, DC, December 15, 2010; see, for example, pp 32-35. http://www.csb.gov/assets/1/19/Transcript_of_Public_Meeting_12_15_2010.pdf (accessed March 7, 2015).

³⁵⁶ *Ibid*, pp 45.

³⁵⁷ Transportation Research Board of the National Academies. *Evaluating the Effectiveness of Offshore Safety and Environmental Management Systems*; Transportation Research Board Special Report 309; National Academy of Sciences: Washington, DC, 2012; pp 62-63. <http://onlinepubs.trb.org/onlinepubs/sr/SR309.pdf> (accessed March 31, 2016).

³⁵⁸ Center for Strategic & International Studies. *The International Regulatory Structures for Offshore Exploration*; November 8, 2010; pp 2. http://csis.org/files/attachments/101108_Summary_International%20Practices.pdf (accessed March 26, 2016).

safety assertions.³⁵⁹ The true strength of the regimes lie then in the regulators' abilities to test the validity of duty holder claims.³⁶⁰

Without such a review of the documentation detailing the planned risk reduction measures, a scenario could arise in which the operator assembles and executes a deficient safety management system and BSEE misses an opportunity to identify safety gaps. The permit-to-operate process that currently exists in the US OCS provides opportunities to evaluate aspects of a facility's management systems before certain design and operational phases of the well site. None, however, sufficiently address process safety concerns. For instance, in bidding on an OCS lease, BOEM can disqualify a potential lessee for various reasons, including unresolved or multiple incidents of noncompliance, civil penalties, or failure to adhere to lease obligations.³⁶¹ While civil penalties may touch upon aspects of process safety, disqualification largely depends on administrative or occupational safety matters.

Once a lease has been obtained, an operator must obtain approval from BSEE to drill by submitting information such as design criteria for the proposed well, drilling plans, and diverter and BOP system descriptions.³⁶² The information required by BSEE is a prescriptive-based series of technical specifications that does not contain a comprehensive list of best technical practices nor a comprehensive barrier-risk analysis that addresses both design and operational site specific risks.³⁶³ Further, there is no performance based requirement to ensure the design risks of the well are and will remain reduced to a level such as ALARP throughout the lifecycle of the well.

For the US to effectively implement a more robust regulatory regime for its offshore oil and gas operations, BSEE must play a proactive role in risk-reduction. In the CSB's view, this includes not only active review and response to third-party audit results, but independent BSEE audits and initiatives on identified safety issues or at-risk facilities/companies, and the authority and to accept, reject, or require

³⁵⁹ CSB Public Hearing: Regulatory Approaches to Offshore Oil and Gas Safety, Washington, DC, December 15, 2010; see, for example, pp 95. http://www.csb.gov/assets/1/19/Transcript_of_Public_Meeting_12_15_2010.pdf (accessed March 7, 2015). UK HSE. *A guide to the Offshore Installations (Safety Case) Regulations 2005, 3rd ed.*; SCR 2005; 2006; *Demonstration of 'as low as reasonably practical'*, pp 6. <http://www.hse.gov.uk/pubns/books/l30.htm> (accessed March 26, 2016).

³⁶⁰ "The fact is that the safety case is simply a series of 'claims' as to how an installation is being safely operated. The real strength in the regime is testing the validity of those claims through strategic intervention by competent regulators," Whewell, I. Former Director, UK HSE Offshore Division, Personal communication, August 23, 2013.

³⁶¹ 30 C.F.R. § 556.35; & 30 C.F.R. § 550.136; see also BSEE. Regional Leasing, <http://www.boem.gov/Oil-and-Gas-Energy-Program/Leasing/Regional-Leasing/Index.aspx> (accessed March 26, 2016).

³⁶² §250.410; §250.400 indicates that those subject to Subpart D—Oil and Gas Drilling Operations under which the permitting requirements are described include lessees, operating rights owners, operators, and their contractors and subcontractors.

³⁶³ For example, the regulations for cementing require that the operator provide "A written description of how you evaluated the best practices included in API Standard 65—Part 2, Isolating Potential Flow Zones During Well Construction, Second Edition...Your written description must identify the mechanical barriers and cementing practices you will use for each casing string (reference API Standard 65—Part 2, Sections 4 and 5)." Sections 4 and 5 in API Standard 65 state, "This section [4] is not exhaustive, nor does it provide the reader with a comprehensive set of detailed recommendations for well construction. The intent is to highlight the salient aspects that should be considered and summarize the interrelationship between drilling operations and cementing success. All topics discussed are covered in detail in various API, ISO, and other industry publications. [...] This [technical references] list is not all-inclusive. Other technical references are available in industry literature."

modifications to a company's major hazard risk management approach before or throughout the entirety of the offshore operation.

4.2 Regulatory Safety Oversight Audits and Initiatives

After BSEE's first audit of the SEMS program in 2013, it noted there was a significant variation in SEMS programs amongst operators.³⁶⁴ As might be expected, for companies like BP and Transocean, BSEE observed that complying with the SEMS regulations entailed mapping their corporate policies to the SEMS elements listed in 30 C.F.R. 250 Subpart S.³⁶⁵ BSEE noted that for other organizations, the SEMS rule "triggered a first effort to develop and implement a formal SEMS," and that for many organizations the focus was on compliance rather than "developing a tool to manage their respective operating health, safety, and environmental (HSE) risks."³⁶⁶

In a 2012 interview, former BSEE Director James Watson contended that BSEE did not "review and approve the safety and environmental management system programs and that's by design."³⁶⁷ BSEE did not want to create a system in which industry relied on the government to manage it.³⁶⁸ 'Reviewing' a company's SEMS program and major hazard documentation, however, is an opportunity for the regulator to challenge 1) if hazards and risks have been assessed and 2) if controls and proposed safety management systems meant to ensure their effectiveness have been established. In this framework, "approving" a SEMS program or major hazard documentation can simply be acknowledgement by the regulator that all the elements it has deemed necessary to manage safety have been addressed. The effectiveness of a SEMS program though can only be assessed or audited after being tested under the demands of actual operations.

In 2012, BSEE (then BOEMRE) engaged the Transportation Research Board (TRB) to provide guidance on how to evaluate the effectiveness of the SEMS regulations. TRB observed:³⁶⁹

- If BSEE's goal is, as it should be, to encourage a culture of safety so that individuals know the safety aspects of their actions and are motivated to think about safety, then the agency will need to evolve an evaluation system for Safety and Environmental Management Systems (SEMS) that emphasizes the evaluation of attitudes and actions rather than documentation and paperwork.

³⁶⁴ BSEE. *SEMS Program Summary—First Audit Cycle (2011-2013)*; July 23, 2014, http://www.bsee.gov/uploadedFiles/BSEE/Regulations_and_Guidance/Safety_and_Environmental_Management_Systems_-_SEMS/SEMS%20Program%20Summary%208132014.pdf (accessed March 29, 2016).

³⁶⁵ *Ibid.*

³⁶⁶ *Ibid.*

³⁶⁷ Dlouhy, J. Offshore enforcement chief outlines approach to safety. *Fuel Fix from the Houston Chronicle*, December 18, 2012, <http://fuelfix.com/blog/2012/12/18/offshore-enforcement-chief-outlines-approach-to-safety/> (accessed March 26, 2016).

³⁶⁸ *Ibid.*

³⁶⁹ Transportation Research Board of the National Academies. *Evaluating the Effectiveness of Offshore Safety and Environmental Management Systems*; Transportation Research Board Special Report 309; National Academy of Sciences: Washington, DC, 2012; pp 31 and 91. <http://onlinepubs.trb.org/onlinepubs/sr/SR309.pdf> (accessed March 31, 2016).

- BSEE can encourage or hurt the development of a culture of safety by the way it measures and enforces SEMS. Forcing an operation to satisfy checklists that require specific forms of documentation and penalizing those operations that do not is likely to encourage a culture of compliance and discourage the development of a culture of safety.

BSEE's findings two years later in 2014 on the SEMS programs validated TRB's observations. BSEE noted that audit questions "were focused on assessing compliance rather than focusing on successfully reducing or managing risk" and that some reports were submitted "as nothing more than a completed checklist with little incorporated information or analysis." BSEE stated that compliance checklists "limit [its] ability to assess degrees of implementation or effectiveness [of SEMS programs]." TRB reviewed existing approaches for assessing safety management systems and BSEE's potential role in the process. TRB's report summarizes several auditor characteristics it observed in US and international regulatory agencies from a variety of industries (not all inclusive).³⁷⁰

- Specialized training for auditors to ensure a working knowledge of SMS elements, worker duties, and the industry
- A variety of tools for auditors to assess the implementation of SMSs including observing operations, verifying procedures, seeking evidence of corrective actions, and in the case of offshore, speaking to workers and managers, both at the offshore facilities and shore-based offices.
- Scheduled audits, in response to an incident or risk-based.
- Regulatory tools to stop work if companies cannot demonstrate adequate risk management of operations.

Specific to Norway, TRB noted that PSA replaced the term "inspection" with "supervision," and "approvals" with "consents." PSA believes that the terminology change was significant because it helped move audits beyond monitoring exercises and created a climate "in which PSA worked with the industry to improve safety instead of acting in the role of a compliance inspector and guarantor of the acceptability of company."³⁷¹ This sentiment was paralleled both in the US and the UK. In 1990, a Marine Board charged with exploring alternative inspection measures for the OCS told MMS that regulatory presence on offshore installations conveys a sense of oversight and provides impetus for safety improvement by marginal and inexperienced operators.³⁷² In the UK, following the 2005 Buncefield incident,³⁷³ the HSE

³⁷⁰ Transportation Research Board of the National Academies. *Evaluating the Effectiveness of Offshore Safety and Environmental Management Systems*; Transportation Research Board Special Report 309; National Academy of Sciences: Washington, DC, 2012; Chapter 4. <http://onlinepubs.trb.org/onlinepubs/sr/SR309.pdf> (accessed March 31, 2016).

³⁷¹ Transportation Research Board of the National Academies. *Evaluating the Effectiveness of Offshore Safety and Environmental Management Systems*; Transportation Research Board Special Report 309; National Academy of Sciences: Washington, DC, 2012; pp 60-61. <http://onlinepubs.trb.org/onlinepubs/sr/SR309.pdf> (accessed March 31, 2016).

³⁷² Committee on Alternatives of Inspection of Outer Continental Shelf Operations, Marine Board, Commission on Engineering and Technical Systems National Research Council. *Alternatives for Inspecting Outer Continental Shelf Operations* [Online]; National Academy Press: Washington, 1990; pp 81, http://www.nap.edu/download.php?record_id=1517 (accessed March 26, 2016).

³⁷³ On December 11, 2005, a number of explosions occurred at Buncefield Oil Storage Depot in Hemel Hempstead, Hertfordshire, England, following the overfilling of a gasoline tank. There were no fatalities, 43 people were injured, and nearby commercial and residential property totaled \$1.5 billion; Buncefield Major Incident

onshore regulator began emphasizing regulatory inspections and audits to ensure companies implement safety management systems to reduce risks to ALARP, as described in their safety case reports. According to HSE, roughly 70 percent of an HSE onshore inspector's time is now spent inspecting.³⁷⁴ In conversations with CSB investigators, HSE management and inspectors emphasized the importance of inspections and the “creative tension” created during dialogue between the inspector and the duty holder.³⁷⁵

4.2.1 Challenges of Relying on Third-Party Audits in the GoM

Third-party SEMS program audits are required by BSEE,³⁷⁶ after which BSEE receives an audit report that then becomes its main source of information on the effectiveness of a SEMS program.³⁷⁷ Third-party audit service providers (ASP) can play an important role in achieving safety, but solely relying on them creates a gap between BSEE and the companies it regulates. For instance, BSEE does not accredit the ASPs itself, instead relying on BSEE-approved Accreditation Bodies (AB).³⁷⁸ Currently, the only AB BSEE has approved is the Center for Offshore Safety (COS), an industry sponsored organization.³⁷⁹ Therefore if BSEE does not independently determine the quality and effectiveness of the third-party audits, the process could potentially devolve into ineffective industry self-regulation.

As part of the auditing process, the ASP must provide BSEE with an Audit Plan 30 days prior to conducting the audit, whereby BSEE reserves the right to modify the list of facilities identified for audit.³⁸⁰ The auditor must provide BSEE a report of the audit findings and conclusions, including identified deficiencies, within 30 days of completion, and the company audited must provide a plan for addressing the deficiencies, the corrective actions that will be taken, and the person responsible for each.³⁸¹ BSEE has the legal authority to verify that the corrective actions have been taken.³⁸²

Yet, this approach has limitations and raises conflict-of-interest concerns. If BSEE does not conduct any of its own SEMS audits, it risks losing opportunities to: directly interact with the companies it regulates,

Investigation Board. *The Buncefield Incident, 11 December 2005*; Volume 1; UK HSE: 2008; <http://www.hse.gov.uk/comah/buncefield/miib-final-volume1.pdf> (accessed March 26, 2016).

³⁷⁴ Learned during CSB staff visit to the UK in March 2014.

³⁷⁵ The UK HSE uses third-party audits to augment its own work, not supplant it. See Chapter 5.5, Volume 2.

³⁷⁶ 30 C.F.R. § 250.1920(a) (2016). Prior to April 2013, BSEE also permitted “designated and qualified” personnel to complete the audits; 30 C.F.R. § 250.1920(a) (2012). With the introduction of SEMS II, BSEE removed this definition. Oil and Gas and Sulphur Operations in the Outer Continental Shelf—Revisions to Safety and Environmental Management Systems, 78 Fed. Reg. 20423 (Final Rule, April 5, 2013) (to be codified at 30 C.F.R. Part 250).

³⁷⁷ BSEE communication to the CSB in 2016.

³⁷⁸ 30 C.F.R. § 250.1921 and 1922.

³⁷⁹ BSEE can recognize other accreditation bodies, but currently has only named COS an AB; BSEE. *Information to Lessees (ITL) and Operators of Federal Oil and Gas Leases on the Outer Continental Shelf (OCS)*; June 18, 2015; <http://www.bsee.gov/uploadedFiles/Information%20To%20Lessees-%20Accreditation%20Body.pdf> (accessed March 26, 2016).

³⁸⁰ 30 C.F.R. § 250.1920(b)(4)

³⁸¹ 30 C.F.R. § 250.1920(c) and (d)

³⁸² 30 C.F.R. § 250.1920(e)

gain familiarity with those offshore facilities and well operations/technologies/equipment, and dialogue directly with the workforce. These lost opportunities inhibit the development of that “creative tension” between the regulator and those regulated. Additionally, the manner in which third parties conduct BSEE audits is potentially problematic for several reasons:

- No law requires third-party auditors to behave independently and consistently, especially without regulator review of, and routine calibration with, all accredited auditors.
- SEMS does not require BSEE to send staff to attend audits, even though it does; thus, if these audit practices do not evolve, BSEE’s own staff will not develop its own expertise.
- Problems with consistency are surfacing among accredited service providers. At a June 2015 Ocean Energy Safety Institute forum a presenter from DNV GL, an ASP, indicated inconsistent practices existed amongst ASPs.³⁸³ For instance, DNV GL will not conduct an audit of a non-operating asset, but it has been informed that other ASPs are.³⁸⁴

On December 7, 2015, BSEE announced the launch of a pilot Risk-Based Inspection Program.³⁸⁵ Industry data and BSEE reportable incident data indicates that four out of five incidents occur at just 20% of offshore facilities.³⁸⁶ Consequently, BSEE wanted to efficiently and effectively manage the limited inspection and auditing resources of the agency by focusing on facilities that present a higher safety risk.³⁸⁷ Such a program may prove to bridge the gap created by solely relying on third party audits, but as the pilot program is in its infancy, no conclusions concerning its effectiveness can be made at this time. Furthermore, lack of an accident does not guarantee no accidents in the future. Thus, BSEE must examine and follow-up on third-party audit results to proactively identify emerging safety issues at specific facilities/companies as well as industry-wide trends.

4.3 Regulatory Use of Safety Performance Indicator Data

One essential mechanism by which a regulator can check the pulse of industry and target major accident event risk is through comprehensive review of safety performance indicators. As the CSB learned in its July 2012 public hearing on Safety Performance Indicators³⁸⁸ and then emphasized in its Chevron Interim

³⁸³ Ilango, C. *Where has SEMS Been, an Auditors Perspective*, Taking SEMS to the Next Level Ensuring Continuous Improvement of Safety and Environmental Management Systems, Houston, TX, July 2015, 2015; <http://oesi.tamu.edu/events/forum/> (accessed March 16, 2016).

³⁸⁴ DNV also noted that initially, audit consistency was poor. While COS criteria has better defined audit expectations, new issues are emerging, for example “the minimum duration of audits allowing for wide variability in the depth of the audits – compliance vs. system audit;” *Ibid*.

³⁸⁵ *Bureau of Safety and Environmental Enforcement to Launch Pilot Risk-Based Inspection Program for Offshore Facilities*. December 7, 2015. <http://www.bsee.gov/BSEE-Newsroom/Press-Releases/2015/Bureau-of-Safety-and-Environmental-Enforcement-to-Launch-Pilot-Risk-Based-Inspection-Program-for-Offshore-Facilities/> (accessed December 21, 2015).

³⁸⁶ BSEE. BSEE Blog: Risk-Based Inspection Pilot Program: What’s in your facility?, <http://www.bsee.gov/safety/bsee-blog/> (accessed March 16, 2016).

³⁸⁷ *Ibid*.

³⁸⁸ Described more fully in Section 3.4.1 of Volume 3; CSB Public Hearing: Safety Performance Indicators, Houston, TX, July 23-24, 2012; <http://www.csb.gov/events/csb-public-hearing-safety-performance-indicators/> (accessed October 7, 2015). This information, including the agenda, the verbatim transcript of the proceedings,

and Regulatory Reports,³⁸⁹ leading process safety indicators help drive continual safety improvements in preventing major accidents, as long as regulators effectively use these indicators to focus inspections, audits, and investigations, and to share lessons learned throughout industry. Similarly, industry must simultaneously focus attention on indicators. Yet the indicators and other data BSEE collects do not adequately focus on process safety matters, especially relating to leading indicators. As such, BSEE's efforts are still insufficient in guiding industry concerning safety trends and deficiencies.

In contrast with the company-specific indicators tracked by individual companies, regulators can track more broad-based indicators, which they can then use to:

- Diagnose systemic problems in the safety management systems across industry;
- Develop and maintain industry benchmarks;
- Assess the effectiveness of their own regulations and policies to prevent major accidents;
- Measure the regulator's own performance with respect to core duties such as audits, inspection activities, and related regulatory initiatives; and
- Analyze macro trends to focus on big-picture issues and initiatives to improve industry safety performance.

4.3.1 Roadblocks to Regulatory Improvements in Data Collection and Analysis

Following the Piper Alpha incident in the UK in 1988, the US regulator received technical advice for improvement to its regulatory standards and practices. For example, a National Research Council Committee recommended that "MMS improve its collection, analysis, and use of safety-related data regarding offshore operations," since "improvements in safety performance derive in large part from past lessons."³⁹⁰ The Committee explained:

The committee recommends that MMS place its primary emphasis on detection of potential accident-producing situations—particularly those involving human factors, operational procedures, and modifications of equipment and facilities—rather than scattered instances of non-compliance with hardware specifications. . . . An important step is to extend the definition of a "mishap" to include near misses, i.e., drilling or production disruptions, and events that prompt the operator or an MMS inspector to shut down operations and require investigation of these less serious occurrences as well as events (accidents).³⁹¹

working papers submitted, slide presentations, and other materials from the proceedings, is available as part of the CSB's record pertaining to the Macondo investigation.

³⁸⁹ USCSB, 2012 and 2014. *Regulatory and Interim Reports: Chevron Richmond Refinery Pipe Rupture and Fire, Richmond, CA, August 6, 2012*, Report No. 2012-03-I-CA, http://www.csb.gov/assets/1/19/Chevron_Regulatory_Report_11102014_FINAL_-_post.pdf and http://www.csb.gov/assets/1/19/Chevron_Interim_Report_Final_2013-04-17.pdf, April 2013 and October 2015 (accessed October 7, 2015).

³⁹⁰ Committee on Alternatives of Inspection of Outer Continental Shelf Operations, Marine Board, Commission on Engineering and technical Systems National Research Council. *Alternatives for Inspecting Outer Continental Shelf Operations* [Online]; National Academy Press: Washington, 1990; pp 31, http://www.nap.edu/download.php?record_id=1517 (accessed March 26, 2016).

³⁹¹ *Ibid.* pp 831.

Thirteen years after the Committee’s study, in 2003, MMS proposed federal rulemaking to enhance reporting regulations.³⁹² At the time, MMS only required death or serious injury, fires, explosions, and blowouts be reported orally,³⁹³ but the rule proposed expanding requirements to include written reports of the incidents listed in Table 4-1. MMS’s intent was to capture those “near misses” that did not result in the accidents already being reported by industry. In proposing the rule, MMS noted that results from the voluntary SEMP program indicated there could be a marked increase in the number of incidents reported.³⁹⁴ Tracking this data, MMS hoped to develop regulatory initiatives, conduct risk-based inspections, and work with industry to develop new standards, among other approaches, to address safety issues on the OCS. Additionally, MMS requested industry comments on whether it should collect the total number of hours worked by employees and the kind of information it should collect about contractors.³⁹⁵ Without such data, MMS observed it could not normalize raw injury data and calculate injury rates or account for injury and illness cases that involved contractors, which MMS indicated made up 80% of the offshore workforce.³⁹⁶

Table 4-1. Abridged list of reportable incidents to BSEE from § 250.188.

1. All fatalities.
2. All injuries that require the evacuation of the injured person(s) from the facility to shore or to another offshore facility.
3. All losses of well control.
4. All fires and explosions.
5. All reportable releases of hydrogen sulfide (H₂S) gas.
6. All collisions that result in property or equipment damage greater than \$25,000.
7. All incidents involving structural damage to an OCS facility.
8. All incidents involving crane or personnel/material handling operations.
9. All incidents that damage or disable safety systems or equipment (including firefighting systems).
10. Any injuries that result in one or more days away from work or one or more days on restricted work or job transfer;
11. All gas releases that initiate equipment or process shutdown;
12. All incidents that require operations personnel on the facility to muster for evacuation for reasons not related to weather or drills;

³⁹² Oil and Gas and Sulphur Operations in the Outer Continental Shelf—Incident Reporting Rule, 68 Fed. Reg. 40585 (Proposed Rule, July 8, 2003).

³⁹³ 30 C.F.R. § 250.191 (2003)

³⁹⁴ MMS reported “injuries that required evacuation from the facility, and injuries that resulted in days away from work, restricted work, or job transfer) could require up to 291 additional injury reports.” Incidents due to hydrogen sulfide and gas releases, collisions, damage, and cranes could result in an increase of 60 incidents reported per year; Oil and Gas and Sulphur Operations in the Outer Continental Shelf—Incident Reporting Rule, 68 Fed. Reg. 40585 (Proposed Rule, July 8, 2003).

³⁹⁵ Oil and Gas and Sulphur Operations in the Outer Continental Shelf—Incident Reporting Rule, 68 Fed. Reg. 40585 (Proposed Rule, July 8, 2003).

³⁹⁶ *Ibid.*

13. All other incidents, not listed in paragraph (a) of this section, resulting in property or equipment damage greater than \$25,000.

Numerous objections to the proposed rule were raised by industry groups, including the Offshore Operator's Committee (OOC)³⁹⁷ the IADC, and the National Ocean Industries Association.³⁹⁸ They objected because the proposed rule was overly prescriptive and burdensome and too complex.³⁹⁹ One example the OOC gave was the proposed requirement to report "any unintentional release of gas at an OCS facility that could, without corrective action, raise hydrocarbon or other gas concentrations to the lower flammable (explosive) limit."⁴⁰⁰ OOC explained that it would be difficult to determine when an unintentional release could have raised gas concentrations to explosive limits. OOC noted that gas detectors in some areas could result in system shut-ins, but reporting such incidents would be burdensome to MMS and the industry and "serve no purpose in improving safety on platforms." MMS disagreed:

platforms have numerous sources of ignition, and there are many small fires reported on these facilities. Small fires have the potential to become major incidents that could cause serious injuries or deaths. By collecting the information on gas releases that result in equipment or process shut-in, we can track the trends, and possibly decrease the number of gas releases.⁴⁰¹

With gas releases, MMS began to address the National Research Council's recommendation to extend the definition of "mishap" to include near-misses, but the CSB notes that due to the qualifiers on the definition of a gas release,⁴⁰² the data has limitations as to its usefulness. A review of previous years' data demonstrates that most of the companies operating in the OSC will likely not experience a qualifying gas release in a given year. In fact, there were never more than 17 gas releases that met the reporting criteria per year during any of the last six years. If BSEE had previously mandated that operators were to report all hydrocarbon releases, they would have reported more incidents, which could assist the regulator in at least three different functions:

- To alert the regulator about incidents or near-miss events that could warrant an immediate regulator response such as an urgent offshore visit to investigate;
- To help the regulator gather industrywide data at a macro scale for assessing overall industry performance and trends, and to help direct the regulator's priorities; and
- To benchmark and compare individual operators and companies.

³⁹⁷ The Offshore Operator's Committee's comments to the proposed regulation were particularly strong citing "serious flaws" in "several areas" of the proposed regulation. Offshore Operator's Committee, letter referencing RIN 1010-AC57; NPRM Incident Reporting FR 68-40585, November 24, 2003, pp 2.

³⁹⁸ According to the group's website, "The National Ocean Industries Association (NOIA), founded in 1972 with 33 members, represents all facets of the domestic offshore energy and related industries. Today, over 300 member companies are dedicated to the safe development of offshore energy for the continued growth and security of the United States." <http://www.noia.org/about/> (accessed March 26, 2016).

³⁹⁹ Oil and Gas and Sulphur Operations in the Outer Continental Shelf—Incident Reporting Requirements, 71 Fed. Reg. 19640 (Final Rule, April 17, 2006).

⁴⁰⁰ *Ibid.*

⁴⁰¹ *Ibid.*

⁴⁰² A 'gas release' must result in either equipment or process shutdown; 30 C.F.R. § 250.188(b)(2).

At its most basic level, such data could alert the regulator to potentially dangerous trends that require initiating regulatory action or other industry improvements. This oversight role accords with the same industry methodology accepted and currently in use by other offshore regimes.

BSEE could also track other types of near misses. An examination of loss of well control events illustrates this point. The 2006 reporting rule essentially defined loss of well control as the point when formation (or other fluids) leaves the well.⁴⁰³ Analysis of the data collected from MMS's incident reporting rules since 2006 reveals that reported loss of well control events are infrequent. In fact they amounted to no more than eight events per year in the Gulf of Mexico over the last several years.⁴⁰⁴ This is not a surprise as MMS predicted "a very minor increase in the number of loss of well control incidents (blowouts) reported due to this rule."⁴⁰⁵

A loss of well control is different from a well kick, which is the unintended flow of formation fluids into the wellbore. While not all well kicks evolve into serious events, Macondo demonstrates that unmanaged ones can lead to dangerous 'gas-in-riser' events and blowouts.⁴⁰⁶ Therefore, variables related to kicks can produce trends to evaluate industry performance and create strategies to promote safety on the OCS. Ultimately, while the US offshore regulator recorded fewer than eight loss of well control events since 2006, internal Transocean kick data demonstrates that from 2006 to 2009 Transocean observed an increase in kicks in North America from 7 to 19,⁴⁰⁷ and this is only from a single driller. By focusing on the more severe, but less frequent, loss of well control events, the utility of the metric is limited and does not lend itself to trending. Researchers funded by BSEE recently proposed key performance indicators related to kicks that "require special consideration and consistent tracking."⁴⁰⁸ These include kick response time, kick volume, and the frequency of kicks during various drilling activities. In fact, the suggested key performance indicators echo kick indicators suggested by Transocean itself.⁴⁰⁹

⁴⁰³ The rule defined loss of well control as an (i) Uncontrolled flow of formation or other fluids. The flow may be to an exposed formation (an underground blowout) or at the surface (a surface blowout); (ii) Flow through a diverter; or (iii) Uncontrolled flow resulting from a failure of surface equipment or procedures; Oil and Gas and Sulphur Operations in the Outer Continental Shelf—Incident Reporting Requirements, 71 Fed. Reg. 19640 (Final Rule, April 17, 2006).

⁴⁰⁴ BSEE, OCS Incidents/Spills by Category: 1996-2007, <http://www.bsee.gov/Inspection-and-Enforcement/Accidents-and-Incidents/Spills-Archive-less-than/> and OCS Incidents/Spills by Category: CY 2008 - 2015 ytd, <http://www.bsee.gov/Inspection-and-Enforcement/Accidents-and-Incidents/Listing-and-Status-of-Accident-Investigations/> (accessed March 26, 2016).

⁴⁰⁵ Oil and Gas and Sulphur Operations in the Outer Continental Shelf—Incident Reporting Requirements, 71 Fed. Reg. 19640 (Final Rule, April 17, 2006).

⁴⁰⁶ See Volume 3, Section 1.3.

⁴⁰⁷ Volume 3, Section 3.5.1.1.; Internal Company Document, Transocean. *Well Control Events & Statistics 2005 to 2009*, TRN-INV-00760094, <http://www.md12179trialdocs.com/releases/release201303211200016/TREX-05649.pdf> (accessed June 24, 2015).

⁴⁰⁸ Fraser, D.; Lindley, R.; Moore, D.; Staak, V. Early Kick Detection Methods and Technologies, SPE Annual Technical Conference and Exhibition, Amsterdam, The Netherlands, October 27-29, 2014; SPE-170756-MS.

⁴⁰⁹ See Volume 3, Section 3.5.1.1.

MMS adopted the final reporting rule in 2006,⁴¹⁰ and required incident data (Table 4-1) for both operators and contractors.⁴¹¹ The 2006 rule did not ultimately require that the total number of employee hours worked to be reported, despite MMS's initial indication that it would like them.⁴¹² This did not change until 2011 when BSEE made a voluntary MMS Form-131 mandatory (renamed "BSEE-0131"⁴¹³).⁴¹⁴ This form collects personal safety statistics and infrequent lagging metrics listed in, such as recordable illness injuries, Days Away, Restrictions and Transfers (DART), injury/illness rate, notices of EPA noncompliance, and the total number of oil spills suffered over a specified period of time in a standardized written format not previously required.⁴¹⁵ The report format and reportable incidents mirrors that found in Appendix E of API 75. BSEE-0131 remains substantively similar to its predecessor.

At best, the regulator and the company reporting the information can use data from BSEE-0131 and Table 4-1 only to react to the circumstances giving rise to the incidents reported after the fact. It is good that a regulator would be responsive to data of any type, including personal safety matters and lagging indicators, but BSEE cannot effectively use the data on this form to shape audits or inspections because of its inherent limitations. It also is less useful in identifying precursor events that present warning signs, which could allow for the company's immediate responsive action, or even the regulator's own urgent attention. The result of this narrow data-gathering process is a small data set that does not lend itself to trending or other potentially helpful analysis because only serious incidents are reported.

BSEE continues to miss a critical opportunity to use performance safety indicators more proactively because it collects mostly infrequent lagging indicator data and does not use the data to inform its own performance in terms of special areas of focus, audit and inspection activities, and other targeted activities.

4.3.2 Inadequate Use of Safety Performance Indicators

One essential mechanism by which a regulator can check the pulse of industry and target major accident event risk is through comprehensive review of safety performance indicators. Neither MMS before Macondo, nor BSEE currently, had (has) direct indicator data that provides information on the effectiveness of the barriers and safety management systems meant to keep offshore operations safe (e.g., maintenance issues, audit results, failures of equipment during routine testing).⁴¹⁶ These are the Tier 3 and

⁴¹⁰ Oil and Gas and Sulphur Operations in the Outer Continental Shelf—Incident Reporting Requirements, 71 Fed. Reg. 19640 (Final Rule, April 17, 2006).

⁴¹¹ 30 C.F.R. § 250.189-190 (2016).

⁴¹² Oil and Gas and Sulphur Operations in the Outer Continental Shelf—Incident Reporting Rule, 68 Fed. Reg. 40585 (Proposed Rule, July 8, 2003).

⁴¹³ BSEE. *BSEE-0131, Performance Measures Data*; http://www.bsee.gov/uploadedFiles/BSEE/About_BSEE/Doing_Business_with_BSEE/OCS_Forms_New/Form%200131%20for%20exp%202018.pdf (accessed March 29, 2016).

⁴¹⁴ Reorganization of Title 30: Bureaus of Safety and Environmental Enforcement and Ocean Energy Management, 76 Fed. Reg. 64432 (Final Rule, October 18, 2011).

⁴¹⁵ See BSEE Form 131, <http://www.bsee.gov/About-BSEE/Procurement-Business-Opportunities/BSEE-OCS-Operation-Forms/BSEE-OCS-Operation-Forms.aspx> (accessed January 21, 2016).

⁴¹⁶ See Volume 3, Chapter 3, particularly Sections 3.4.1-3.4.2.

Tier 4 indicators described in Volume 3.⁴¹⁷ Instead, the original desire of MSS to use indicator data to influence safety strategies on the OCS remain limited by the type of data collected.

As the CSB has emphasized,⁴¹⁸ leading process safety indicators help drive continual safety improvements in the area of major accident prevention, as long as regulators effectively utilize these indicators to focus inspections, audits, and investigations, and to share lessons learned throughout industry.

[CALL OUT BOX START]

Global Indicator Data Sharing

The International Regulators' Forum (IRF) on Global Offshore Safety Performance Measurement Project was created to establish a framework based on a common set of indicators definitions and criteria. The IRF annually compiles indicators, such as numbers of fatalities and injuries, losses of well control, mass hydrocarbon releases, collisions, and fires, for each IRF member country and makes them publicly available on the IRF website.⁴¹⁹ The focus is on higher consequence lagging and personal safety data, and the IRF is still working on reporting consistency among members. But, as this global sharing network continues to improve, it should allow for even greater improved opportunities to uncover emerging safety risks.

[CALL OUT BOX END]

To date, BSEE does not have SEMS performance indicators, though it has reported sponsoring efforts to quantify such indicators.⁴²⁰ As such, BSEE's efforts are insufficient in guiding industry with respect to safety trends and deficiencies. In the meantime, indirect, lagging measures of a SEMS program could be gleaned from the reporting of the incidents listed in Table 4-1; presumably, an effective SEMS program would reduce the occurrence of fatalities, injuries, loss of well control, etc. On May 5, 2015, BSEE

⁴¹⁷ Section 3.4.2, as defined by API 754, Tier 3 indicators include challenges to a safety systems, which results when exceeding defined process limits and a safety system is initiated to bring the system back to an accepted safe state (e.g., the activation of a shutdown system or a pressure relief device); Tier 4 indicators include performance of barriers and management system components, such as management of change (MOC) compliance, inspections, or timely training schedules.

⁴¹⁸ Volume 3, Chapter 3.

CSB Public Hearing: Safety Performance Indicators, Houston, TX, July 23-24, 2012;

<http://www.csb.gov/events/csb-public-hearing-safety-performance-indicators/> (accessed October 7, 2015).

(including the agenda, the verbatim transcript of the proceedings, working papers submitted, and PowerPoint presentations and other materials from the proceedings are all available and included as part of the CSB's record pertaining to the Macondo investigation).;

⁴¹⁸ USCSB, 2012 and 2014. *Regulatory and Interim Reports: Chevron Richmond Refinery Pipe Rupture and Fire, Richmond, CA, August 6, 2012*, Report No. 2012-03-I-CA,

http://www.csb.gov/assets/1/19/Chevron_Regulatory_Report_11102014_FINAL_-_post.pdf and

http://www.csb.gov/assets/1/19/Chevron_Interim_Report_Final_2013-04-17.pdf, April 2013 and October 2015 (accessed October 7, 2015).

⁴¹⁹ IRF, IRF Performance Measurement Project, <http://www.irfoffshoresafety.com/country/performance/scope.aspx> (accessed December 21, 2015).

⁴²⁰ For example, there is an April 2016 SPE/BSEE Summit: Assessing the Processes, Tools, and Value of Sharing & Learning from Offshore E&P Safety Related Data, <http://www.spe.org/events/smsr/2016/> (accesses April 1, 2015).

announced its intention to initiate a new program called SafeOCS.⁴²¹ In addition to providing a voluntary and anonymous reporting channel for offshore workers, BSEE designed this program as a way to collect leading and lagging safety indicator data that could be made publicly available and inform prevention and mitigation efforts.⁴²² Although a positive step, BSEE currently has limited SafeOCS reports.⁴²³ Several companies have verbally indicated they will participate in the near future,⁴²⁴ but BSEE will need more time to determine the success of the voluntary program. Anonymous reporting and key performance indicators though are two different systems, and while they complement one another, they do not replace one another.

BSEE publishes incident statistics and summaries of the data received on incidents listed in Table 4-1 on its website,⁴²⁵ and could use this data to drive industry initiatives as observed in other oil-producing jurisdictions around the world. In the UK, the offshore regulator HSE uses focused Key Programme Initiatives (Key Programmes or KPs), which are multi-year efforts to collect data and assess trends to drive improvement in offshore areas of significant concern, such as hydrocarbon releases, deck and drilling operations, asset integrity, and aging facilities.⁴²⁶ The Key Programmes are not limited to data collection and trend assessments, but are detailed and coordinated programs covering other regulatory activities including inspecting sites, raising awareness, and facilitating the development of standards, all requiring some level of data gathering activity.

HSE launched these Key Programmes to formulate and share good practices with industry.⁴²⁷ During the first Key Programme (KP1), between 2000 and 2004, among other notable regulatory activities, the regulator worked with industry and unions to collect relevant data to reduce reportable hydrocarbon releases by 50 percent in four years. For KP1, gas releases were categorized as minor, significant, or major using release size, rate, and duration criteria developed with industry.⁴²⁸ While the number of major releases was reduced by 33%, the regulator noted a 50% increase in the number of reported minor releases.⁴²⁹ This was attributed to an increased awareness of the need to report minor releases, and demonstrates that regulator participation can lead to more robust data collection.

⁴²¹ BSEE. BSEE Director Brian Salerno Announces Key Efforts to Reduce Risk Offshore, <http://www.bsee.gov/BSEE-Newsroom/Press-Releases/2015/BSEE-Director-Brian-Salerno-Announces-Key-Efforts-to-Reduce-Risk-Offshore/> (accessed March 26, 2016).

⁴²² BSEE, 2014 Annual Report; pp 9, http://www.bsee.gov/uploadedFiles/BSEE/BSEE_Newsroom/Publications_Library/Annual_Report/BSEE%202014%20Annual%20Report.pdf (accessed December 21, 2015).

⁴²³ BSEE communication to the CSB.

⁴²⁴ BSEE communication to the CSB.

⁴²⁵ BSEE. Incident Statistics and Summaries, <http://www.bsee.gov/Inspection-and-Enforcement/Accidents-and-Incidents/Other-Incidents/> (accessed March 29, 2016).

⁴²⁶ UK HSE, Key Programme final reports, <http://www.hse.gov.uk/offshore/programmereports.htm> (accessed March 26, 2016).

⁴²⁷ UK HSE. *OSD hydrocarbon release reduction campaign, Report on the hydrocarbon release incident investigation project -1/4/2000 to 31/3/2001*; 2001; pp 1. <http://www.hse.gov.uk/research/otopdf/2001/oto01055.pdf> (accessed March 26, 2016).

⁴²⁸ *Ibid.* pp 2.

⁴²⁹ *Ibid.* pp iii.

In 2010, the UK HSE initiated KP4 to address the issue of aging equipment offshore and the operation of installations beyond their design life.⁴³⁰ That same year, the HSE published *Managing Aging Plant: A Summary Guide*,⁴³¹ to aid industry in preventing major accidents. The report provides an overview of plant and equipment failure due to age related mechanisms, their management, and suggested leading and lagging indicators to monitor them. It also presents analysis on how aging plant equipment may be a factor in loss of containment incidents. According to Jake Malloy, Regional Organizer of the National Union of Rail, Maritime and Transport Workers Union (UK), “it is our firm belief that the most influential and effective schemes using indicators to measure improvements and major accident prevention are those initiatives generated by our regulator, the Health and Safety Executive.”⁴³²

The Norwegian offshore regulator, PSA, runs a multi-year program to track indicators data. The program, *Trends in Risk Level in the Petroleum Activity* (RNNP), focuses on identifying trends in leading and lagging indicators such as near-miss incidents, barrier performance, chemical exposure, well control incidents, and maintenance management.⁴³³ PSA chose these indicators for its trends program because it noticed industry was relying on indicators such as lost-time incidents, which alone are unable to present a full picture of safety.⁴³⁴ PSA states, “RNNP has become an important management tool for all participants in the petroleum sector. Its findings are valuable for our planning of supervision activities and development of the regulations.”⁴³⁵ Furthermore, PSA indicates, “with solid facts on the table, employers and unions can drop time consuming discussions [on whether the industry is “safe”] and concentrate instead on achieving improvement.”⁴³⁶

If BSEE were to take the lead in establishing a robust system of safety performance indicators that includes information on barriers and safety management systems and use that information to target audits, inspections, enhanced rule-making, and other regulatory activity aimed at major offshore accident prevention, the risk of incidents like Macondo can be reduced. Ultimately, six years after the catastrophe, regulatory requirements are still needed for developing and implementing safety performance indicators to prevent major accidents.

[CALL OUT BOX START]

Safety performance indicators (SPIs) should be used as an aid to communication. They are not the entire message. . . . All stakeholders need to remember SPIs do not measure the level of safety. SPIs indicate

⁴³⁰ UK HSE. *Key Programme 4 (KP4): Ageing and life extension*, <http://www.hse.gov.uk/offshore/ageing/kp4-report.pdf> (accessed December 8, 2014).

⁴³¹ UK HSE. *Managing Ageing Plant, A Summary Guide*, <http://www.hse.gov.uk/research/rrpdf/rr823-summary-guide.pdf> (accessed November, 1, 2013).

⁴³² CSB Public Hearing: Safety Performance Indicators, Houston, TX, July 23-24, 2012; testimony of Jake Malloy, *Safety Performance Indicators—The Workforce Perspective*, pp 139, http://www.csb.gov/assets/1/19/CSB_20Public_20Hearing.pdf (accessed October 7, 2015).

⁴³³ Numerous reports available, PSA. Trends in risk level, <http://www.psa.no/risk-level/category876.html> (accessed March 26, 2016).

⁴³⁴ PSA. *Summary Report 2012—Norwegian Continental Shelf, Trends in Risk Level in the Petroleum Activity*, pp 1, http://www.ptil.no/getfile.php/PDF/RNNP_2012/Trends%20in%20risk%20level_2012.pdf (accessed March 26, 2016).

⁴³⁵ PSA, Trends in risk level in the petroleum activity (RNNP), <http://www.psa.no/about-rnnp/category911.html> (accessed March 26, 2016).

⁴³⁶ See video at <http://www.psa.no/about-rnnp/category911.html> (accessed March 26, 2016).

*how the measures to achieve safe operation are performing. SPIs offer a chance to improve transparency and communication between operators and inspectors. It is up to senior management to decide whether they wish to implement these tools. Government policy makers need to realize the potential and provide suitable training and resources to allow inspectors to be competent partners in the use of SPIs and thus enable the necessary dialogue to take place.*⁴³⁷

[CALL OUT BOX END]

4.4 Transparency of Offshore Safety

Public disclosure of offshore safety information encourages accountability, risk-reduction, effective enforcement, and sharing of lessons learned. Public disclosure of this type of information could also promote trust among workers, operators, and the regulator, and even help to provide a mechanism for members of the public to satisfy themselves about the safety of offshore operations and the adequacy of regulatory action. Historically, the US offshore safety regulator did not promote safety improvements through transparency.⁴³⁸ That may now be starting to change, however, as BSEE initiated an annual report, which is publicly available and published on the agency's website. The report contains industry safety performance indicator data, acknowledges operational and organizational BSEE deficiencies, and provides strategic goals and objectives for the agency. The report notes that BSEE is working to create a Data Stewardship team, with the primary responsibility of improving the overall quality, management, and use of offshore data.⁴³⁹ In addition, BSEE issues safety alerts and publishes them on its website to help share lessons learned from investigations of incidents.⁴⁴⁰ BSEE also makes available on its website a listing of "Incident Statistics and Summaries" which includes data covering a variety of topics back to 2008, with additional incident archive data back to 1996.⁴⁴¹ BSEE notes in its 2014 annual report that lessons learned from investigations in the Pacific Region triggered two safety alerts in 2014.⁴⁴² Currently, operators and drilling contractors are not required to provide public access to safety-related documentation or statistics. Some enforcement data and statistics on lagging indicators are available

⁴³⁷ Jennings, K.; Hailwood, M. OECD Guidance on Safety Performance Indicators - An International Approach to Assessing the Success of Industry, Public Authorities and Communities in Managing Major Accident Hazards; *ICHEM E Loss Prevention Bulletin* **2010**, 212, pp 10.

⁴³⁸ Steffy, L. Dearth of data leaves Gulf safety record in the dark. *Fuel Fix from the Houston Chronicle*, December 7, 2012, <http://fuelfix.com/blog/2012/12/07/steffy-dearth-of-data-leaves-gulf-safety-record-in-the-dark/> (accessed March 26, 2016).

⁴³⁹ BSEE. *2014 Annual Report*. May 5, 2015; pp 12. http://www.bsee.gov/uploadedFiles/BSEE/BSEE_Newsroom/Publications_Library/Annual_Report/BSEE%202014%20Annual%20Report.pdf (accessed December 21, 2015).

⁴⁴⁰ BSEE. Current Safety Alerts, <http://www.bsee.gov/Regulations-and-Guidance/Safety-Alerts/Safety-Alerts/> (accessed March 26, 2016).

⁴⁴¹ BSEE. Incident Statistics and Summaries, <http://www.bsee.gov/Inspection-and-Enforcement/Accidents-and-Incidents/Listing-and-Status-of-Accident-Investigations/> (accessed March 26, 2016).

⁴⁴² BSEE. *2014 Annual Report*. May 5, 2015; pp 17. http://www.bsee.gov/uploadedFiles/BSEE/BSEE_Newsroom/Publications_Library/Annual_Report/BSEE%202014%20Annual%20Report.pdf (accessed December 21, 2015).

publicly,⁴⁴³ but insufficient dialogue about these issues remains among industry, the regulator, and the public.

4.4.1 Regulatory Approaches to Transparency

Transparency can be achieved through publishing enforcement actions, safety case documentation, and annual reports of safety statistics. In Norway, the PSA disseminates offshore process safety data through its website, forums, and archives.⁴⁴⁴ The PSA website provides statistics, an annual Risk Assessment Report, and information on recent major accidents in Norwegian waters.⁴⁴⁵ PSA also uses numerous indicators to uncover trends and determine the overall process safety health offshore, which are published in an annual Risk Assessment Report. The agency then bases its priorities for the year on PSA data analysis and establishes forums in which it participates with industry and workers to engage in open discussion on how to improve safety.⁴⁴⁶ The PSA asserts this approach is necessary to reduce risks.⁴⁴⁷

Although the UK does not make public an operator's safety case documentation,⁴⁴⁸ it does publish guidance for compliance with ALARP, enforcement decision processes for the safety case, and aggregation of process safety indicators.⁴⁴⁹ The Seveso III Directive, enacted in UK law in June 2015 through Control of Major Accident Hazards (COMAH) regulations, requires active public disclosure of major accident risks at any operation.⁴⁵⁰ The UK HSE provides public access to its enforcement decisions regarding safety case violations.⁴⁵¹ The UK HSE also publishes its safety case assessment process online

⁴⁴³ 30 C.F.R. § 250.1929; and BSEE. Incidents of Noncompliance, <http://www.bsee.gov/Inspection-and-Enforcement/Enforcement-Programs/Incidents-of-Non-Compliance/>.

⁴⁴⁴ PSA. Transparency: Open and honest, <http://www.ptil.no/news/transparency-open-and-honest-article7627-878.html> (accessed March 26, 2016); CSB Public Hearing: Regulatory Approaches to Offshore Oil and Gas Safety, Washington, DC, December 15, 2010; see, for example, pp 70-71. http://www.csb.gov/assets/1/19/Transcript_of_Public_Meeting_12_15_2010.pdf (accessed March 7, 2015).

⁴⁴⁵ See PSA. Safety Stats and signals, http://www.ptil.no/?lang=en_US; Report following the audit of Exxon Mobil's use of quantitative risk analyses, <http://www.ptil.no/news/report-following-the-audit-of-exxon-mobil-s-use-of-quantitative-risk-analyses-article6019-878.html>; and Notification of orders to BP after investigation of Valhall PC fire, <http://www.ptil.no/risk-management/notification-of-orders-to-bp-after-investigation-of-valhall-pcp-fire-article8233-1029.html>; and Risk Level, <http://www.ptil.no/rnp/category876.html> (accessed March 7, 2015).

⁴⁴⁶ CSB Public Hearing: Regulatory Approaches to Offshore Oil and Gas Safety, Washington, DC, December 15, 2010; see, for example, pp 70-71. http://www.csb.gov/assets/1/19/Transcript_of_Public_Meeting_12_15_2010.pdf (accessed March 7, 2015).

⁴⁴⁷ PSA. Transparency: Open and honest, <http://www.ptil.no/news/transparency-open-and-honest-article7627-878.html> (accessed March 26, 2016);

⁴⁴⁸ The CSB Investigations staff learned in its March 2014 trip to the UK that before 9/11, the UK HSE made safety case report summary documents publicly available; however, for security reasons, the UK ceased to make these documents available under a Secretary of State order.

⁴⁴⁹ Learned during CSB staff visit to the UK in March 2014.

⁴⁵⁰ UK HSE, Public Information, <http://www.hse.gov.uk/seveso/public.htm> (accessed March 26, 2016).

⁴⁵¹ UK HSE, HSE Public Register of Enforcement Notices, <http://www.hse.gov.uk/notices/> (accessed March 26, 2016).

along with annual offshore safety statistics, safety alerts, and reports of key intervention programmes.⁴⁵² According to Ian Travers, the UK HSE Head of Chemical Industries Strategy Unit, Hazardous Installations Directorate, transparency revolutionized the offshore industry. For example, Travers explained that although UK HSE operates a hotline for confidential whistle-blowing, it is “rarely used” and tends to be used only in situations where companies operating offshore lack a good safety culture, which Travers attributed to an atmosphere of “transparency” in the North Sea.⁴⁵³ Travers also explained that the role of the regulator in terms of its relationship with industry, along with the unique place indicators play in that relationship:

The essential role of the regulator for major hazards is to provide public assurance that those whose activities give rise to risks to people and the environment are adequately controlling those risks. Industry in turn should ensure that there is transparency and openness in how well those risks are being controlled. KPIs are an essential ingredient in that dialogue between the regulator and the regulated in, for example, setting and agreeing on programmes for operators’ major hazard improvement and the regulator’s intervention strategies and plans.⁴⁵⁴

Travers’s testimony was corroborated by Bob Lauder, former Health and Safety Policy Manager of Oil & Gas UK, the industry trade association that serves as “the voice of the offshore industry” in the North Sea. Lauder testified this openness did not always exist:

There was significant reluctance on the part of lots of companies ... in the UK to go as public as we’ve now gone with our statistics. ... So, what we do now is ... we get this information directly back from the Health and Safety Executive from their managed database. And, on a quarterly basis, we put it on our website so it’s publicly available. ... And, on a quarterly basis, we—I hate to use the phraseology, but it has been called naming and shaming You can see that we named the duty-holder, we named the installation, and then we give some indication of the nature and scale of the release. So, that’s out there. It’s [visible to] anybody who wants to see it. A point I might want to make here is you’ll see some very familiar names on there. ... So, I think that really was a big deal for us to [become] as transparent as we now are with that and it didn’t happen overnight and it didn’t happen without some resistance.⁴⁵⁵

Mr. Lauder left unstated, however, that industry players in the UK are now working in a more mature regulatory environment that values disclosure of this type of safety information. Rather than viewing it as harmful to their respective competitive positions or to their standing within the industry, the operators came together through their trade association and formalized an arrangement to provide for openness about hydrocarbon releases. This intentional strategy is an important source of potential learning for the

⁴⁵² UK HSE, Key Programme final reports, <http://www.hse.gov.uk/offshore/programmereports.htm> (accessed March 26, 2016);

⁴⁵³ CSB Public Hearing: Safety Performance Indicators, Houston, TX, July 23-24, 2012; testimony of Ian Travers, Overview of Leading Indicator and Usage, pp 157, http://www.csb.gov/assets/1/19/CSB_20Public_20Hearing.pdf (accessed October 7, 2015).

⁴⁵⁴ CSB Public Hearing: Safety Performance Indicators, Houston, TX, July 23-24, 2012; written testimony of Ian Travers, The Implementation of Effective Key Performance Indicators for Major Hazard Enterprises, pp 3, <http://www.csb.gov/UserFiles/file/Travers%20%28HSE%29%20-%20Testimony%20-%20printed.pdf> (accessed October 7, 2015).

⁴⁵⁵ CSB Public Hearing: Safety Performance Indicators, Houston, TX, July 23-24, 2012; testimony of Bob Lauder, Major Hazard (Asset Integrity) Key Performance Indicators in Use in the UK Offshore Oil and Gas Industry, pp 175-176, http://www.csb.gov/assets/1/19/CSB_20Public_20Hearing.pdf (accessed October 7, 2015).

entire industry, and it can actually help to promote public and political trust and confidence in offshore operators.

In his testimony to the CSB at the agency's performance safety indicators event on July 24, 2012, Jake Malloy, Regional Organizer of the National Union of Rail, Maritime and Transport Workers Union (UK), further corroborated the transparency of the UK's offshore regulator, explaining the benefits of open, public and transparent safety information that he has observed over the course of his career in the UK offshore industry since the HSE initiated "Key Programmes." Malloy explained that Key Programme 1 (KP1), "Reducing Hydrocarbon Releases," was accompanied by publicly available results and other information relative to actions by North Sea operators and the regulator. Malloy noted that "since KP1 was launched the industry has been pro-active in setting its own targets for leak reduction." In addition, industry publishes details of the leaks, including volumes, locations, and operators as part of their own initiative to reduce leaks still further through sharing and learnings."⁴⁵⁶ Malloy attributed this improved performance to the general availability of the information explaining, "KP1 was launched publicly, meaning workers and moreover the press had the ability to report and monitor performance. In short, it is transparent and subject to public and governmental scrutiny."⁴⁵⁷

Some of Australia's safety regulators provide the public with summaries of safety case documentation produced by the duty holders.⁴⁵⁸ NOPSEMA, Australia's federal safety regulator, offers public access to a host of safety-related information, including monthly newsletters containing data on inspections and incidents, aggregated safety statistics, drilling guidance, and brochures on process safety.⁴⁵⁹ For instance, NOPSEMA publishes guidance on elements of a safety case report, including hazard identification with assistance on selecting a hazard identification technique.⁴⁶⁰

The Nuclear Regulatory Commission provides a positive example of using transparency to drive safety improvement. Testifying before the CSB, John Lubinski, Director of the Division of Inspection and Regional Support, Office of Nuclear Reactor Regulation, explained:

Yes, we believe [public reporting] does [influence safety] as far as impacting the performance. Under the old system ... [w]hen we had findings or we had people that were outside of a key performance indicator, we could take enforcement action issuing citations, issuing monetary civil

⁴⁵⁶ CSB Public Hearing: Safety Performance Indicators, Houston, TX, July 23-24, 2012; testimony of Jake Malloy, *Safety Performance Indicators, The Workforce Perspective*; 2012; <http://www.csb.gov/UserFiles/file/Molloy%20%28RMT%29%20Testimony.pdf> (accessed March 26, 2016).

⁴⁵⁷ *Ibid.*

⁴⁵⁸ See WorkSafe Victoria, *Guidance Note: Overview of the Safety Case regime for a Major Hazard Facility*; pp 14. "The local community must be provided with certain information, including a summary of the Safety Case," http://www.worksafe.vic.gov.au/_data/assets/pdf_file/0015/12381/50712_WS_3_Safety_Case_OV_5HR.pdf, (accessed March 26, 2016). Examples Safety Case Summaries can be found at: http://www.exxonmobil.com/Australia-English/PA/Files/publication_safetycase_altonaref.pdf; and http://www.exxonmobil.com/Australia-English/PA/Files/publication_Longford_Safety_Case_2013.pdf (accessed March 26, 2016).

⁴⁵⁹ IRF. Member Country Profile—Australia, <http://www.irfoffshoresafety.com/country/Australia.aspx> (accessed March 26, 2016).

⁴⁶⁰ NOPSEMA. *Guidance Note: Hazard Identification*; N- 04300-GN0107, Rev. 5; December, 2012; <http://www.nopsema.gov.au/assets/Guidance-notes/N-04300-GN0107-Hazard-Identification.pdf> (accessed March 26, 2016).

penalties. What we found is this is actually a more risk informed and also a benefit from the standpoint of moving forward to increasing performance. Number one is it focuses the licensee's effort and the NRC inspection efforts in the correct area. But, number two is because all of the information is made public, not just when a bad event occurs at a plant, all the information. It requires all the licensees to look at it and say "how are we being publicized on the NRC website?" The performance indicators are not a report card; however, they are information. And we think that information being available, not only does it have the licensees more accountable for safety but it also has us as the regulator more accountable. When the public is looking at this website and saying how can you have a plant that has white performance indicators, yellow findings and you're still letting them operate, what is your technical basis for doing that? So it holds us accountable in being able to describe what the safety performance is of that plant. So, that's where we see the benefits to making all this information available to the public. The final [reason] is just the fact that from our standpoint we believe in open and transparent regulation and we want the people in the community to understand what the hazards are associated with the plant and what the safety implications are of any activities that are occurring.⁴⁶¹

In addition to boosting public goodwill for a high-hazard industry, transparency provides a tangible safety benefit: deterrence. Public scrutiny can be a significant deterrent against bad practices in offshore operations through publications, discussions, and political pressure.⁴⁶² The Environmental Protection Agency (EPA) enforces anti-pollution laws and makes them public. Former EPA Administrator William Reilly recently noted, "I see no reason not to publicize these violations," Reilly explained during his investigation of the Macondo incident for a Presidential Commission.⁴⁶³

Further elaborating on the desirability of publicly available safety information, Lois Epstein, Engineer and Arctic Program Director for The Wilderness Society, explained, "the public interest community strongly supports making operator-specific data publicly available with shielding of company names kept to a minimum and only with a very strong justification. Sunshine⁴⁶⁴ improves the quality and increases the learning opportunities associated with accident prevention data. Potential litigation should not be a reason to withhold data, as litigation will occur regardless."⁴⁶⁵

Complete transparency is not necessary. For instance, the UK does not require that an operation's safety case be made publicly available.⁴⁶⁶ In contrast, certain states and territories of Australia make safety case

⁴⁶¹ CSB Public Hearing: Safety Performance Indicators, Houston, TX, July 23-24, 2012; testimony of John W. Lubinski, Questions & Answers by CSB Board, Staff and Public, pp 94, http://www.csb.gov/assets/1/19/CSB_20Public_20Hearing.pdf (accessed October 7, 2015).

⁴⁶² CSB Public Hearing: Safety Performance Indicators, Houston, TX, July 23-24, 2012; testimony of Jake Malloy, *Safety Performance Indicators, The Workforce Perspective*, pp 139-40, http://www.csb.gov/assets/1/19/CSB_20Public_20Hearing.pdf (accessed October 7, 2015).

⁴⁶³ Dlouhy, J. After spill, offshore enforcement remains murky. *Fuel Fix from the Houston Chronicle*, December 12, 2012, <http://fuelfix.com/blog/2012/12/12/after-spill-offshore-enforcement-remains-murky/> (accessed March 26, 2016).

⁴⁶⁴ "Sunshine" refers to openness or transparency in matters of public importance, relating back to a famous quote from former US Supreme Court Justice Brandeis. "Publicity is justly commended as a remedy for social and industrial diseases. Sunlight is said to be the best of disinfectants; electric light the most efficient policeman."

⁴⁶⁵ CSB Public Hearing: Safety Performance Indicators, Houston, TX, July 23-24, 2012; testimony of Lois N. Epstein, *Safety Performance Indicators*, pp 152, http://www.csb.gov/assets/1/19/CSB_20Public_20Hearing.pdf (accessed October 7, 2015).

⁴⁶⁶ CSB UK trip notes, March 6 & 7, 2014.

summaries publicly available. There are also limits on disclosing some information due to commercial sensitivity (e.g., trade secrets, confidential business information) that provides a competitive advantage in a challenging sector of the economy, as well as physical security issues, among other concerns. Companies must strike a balance between disclosing all relevant information and protecting information not appropriate for disclosure. Yet global experience suggests that an effective offshore regulatory regime will seek opportunities to use transparency to drive continual safety improvements.

5.0 Insufficient and Inadequate Staff for Appropriate Oversight

BSEE's ability to regulate safety is contingent upon adequate numbers of staff with multifaceted competencies in not only technical disciplines, but human and organizational factors, communication and interpersonal skills such as negotiation, persuasion and advocacy, and process safety, among others. These skill sets provide inspectors with the tools to conduct effective preventive audits and inspections, and to regularly engage with duty holders. To date, the staffing changes in BSEE have not fully met these requirements. Congress has not appropriated sufficient funding on an ongoing and consistent basis for BSEE to meet such staffing needs, and along with these constraints, continuing conflicts between political and legislative priorities are structural impediments to BSEE's ability to fulfill its difficult mission. The Department of Interior has confronted this issue recently, noting that continuing resolutions and a sequester of 5 percent in fiscal years 2013 and 2014 significantly impacted the Department's agencies, requiring a hiring freeze and reducing funding for staffing and oil and gas activities.⁴⁶⁷

To ensure that companies are managing major hazard risks and employing the best available standards and technology effectively, the regulator must hire and retain knowledgeable and skilled staff who can critically assess company safety practices. The CSB discusses in the Chevron Regulatory Report the importance of having a well-funded, technically competent regulator that has the ability to conduct proactive, preventive inspections. To operate a robust performance-based regulatory regime in which the regulator directly oversees and evaluates total safety performance of the industry, BSEE's enhanced recruiting, hiring, and retention efforts must continue and must include senior specialists with experience in areas such as petroleum engineering, process safety, human factors, and organizational performance.

5.1 Models for Building a Competent Regulator

The UK and other US safety regulators, particularly in the nuclear sector, use effective methods for recruiting, training, and retaining highly proficient staff that could help inform BSEE efforts.

5.1.1 UK Offshore Safety Directive Regulator

The UK Offshore Safety Directive Regulator (OSDR) is part of the UK Health and Safety Executive (HSE). It provides detailed guidance for companies, inspectors, and the public on how the regulator assesses companies' plans to reduce major accident hazards.⁴⁶⁸ It published pamphlets and handbooks, geared toward duty holders, on offshore topics ranging from corrosion to human factors to process integrity. The "Assessment Principles for Offshore Safety Cases" is an agreed framework for inspector conduct during the offshore assessment process.⁴⁶⁹ Those principles emerge from the definitive, 300+

⁴⁶⁷ US Government Accountability Office. *Report to Congressional Requesters. Oil and Gas: Interior Has Begun to Address Hiring and Retention Challenges but Needs to Do More*; US Government Accountability Office: January, 2014; pp 77; <http://www.gao.gov/assets/670/661025.pdf> (accessed March 26, 2016).

⁴⁶⁸ UK HSE, Guidance, <http://www.hse.gov.uk/offshore/safetycases.htm> (accessed March 26, 2016).

⁴⁶⁹ UK HSE. *Assessment Principles for Offshore Safety Cases (APOSC)*; March, 2006; <http://www.hse.gov.uk/offshore/aposc190306.pdf> (accessed March 26, 2016).

page inspector's manual, Guidance for the Topic Assessment of the Major Accident Hazard Aspects of Safety Cases (GASCET).⁴⁷⁰

The OSDR can hire competent personnel to develop guidance and perform safety case reviews because it is authorized to pay offshore staff higher specialist salaries. Offshore assessor work involves time away from family in uncomfortable conditions. To incentivize it, most mid-level OSDR technical staff were paid between £67,213 and £77,499 in 2012, the equivalent of \$109,241 to \$125,959.⁴⁷¹ Specialist staff in Aberdeen receive a location enhancement on top of these "standard" pay scales that enables HSE to recruit to that location and compete with the oil industry. The enhancement is currently £10,000 (approximately \$15,600). These salaries are significantly higher than their onshore inspector counterparts, whose mid-level salaries ranged from £37,303 to £46,937 in 2012, the equivalent of \$60,628 to \$76,286.

Former UK Offshore regulatory staff reported that the OSDR looks for new recruits with good communication skills in addition to relevant education, licensure, and experience because their job requires getting companies to aspire to make safety improvements that the companies may not want to do.⁴⁷² Once on board, new recruits directly from industry undertake a rigorous regulator training program during their first two years, including significant on-the-job training.⁴⁷³ They are required to take a series of courses and related assessments, and they may be fired if they do not pass the assessments.⁴⁷⁴ At the same time, new inspectors receive training by working alongside more experienced inspectors on safety case procedures, technical assessment procedures (such as electrical and mechanical safety), audit and regulatory intervention activities.⁴⁷⁵ For inspectors who have a primary interface role with offshore companies, OSDR aims to rotate them to different companies every two to three years to avoid the inspectors becoming too comfortable with their surroundings.⁴⁷⁶ One message that UK offshore industry and regulatory staff repeated to CSB investigators is that the industry believes having proficient regulatory staff adds significant value to their business.⁴⁷⁷ Professional proficiency, as well as technical and risk management acumen, allow regulatory staff the wherewithal to pushback against industry claims, should that be necessary.⁴⁷⁸ This competence is also essential for companies' confidence in the accuracy of the regulatory staff's advice, inspections, and citations.

⁴⁷⁰ HSE. (<http://webcommunities.hse.gov.uk/connect.ti/gascet/view?objectId=62036>) (accessed March 2, 2016).

⁴⁷¹ In contrast, BSEE pays mid-level petroleum engineers somewhere between \$62,000 and \$84,000 per year. <https://www.usajobs.gov/GetJob/ViewDetails/341573400> (accessed March 26, 2016).

⁴⁷² Whewell, I. Former Director, UK HSE Offshore Division, and Wilkinson, P. principal "architect" for the development of Australia's National Offshore Petroleum Safety Authority, (NOPSA), Personal communication, July 11, 2011.

⁴⁷³ Whewell, I. Former Director, UK HSE Offshore Division, Personal communication, July 11, 2011.

⁴⁷⁴ Whewell, I. Former Director, UK HSE Offshore Division, Personal communication, July 11, 2011.

⁴⁷⁵ Whewell, I. Former Director, UK HSE Offshore Division, Personal communication, July 11, 2011.

⁴⁷⁶ Whewell, I. Former Director, UK HSE Offshore Division, Personal communication, July 11, 2011.

⁴⁷⁷ Whewell, I. Former Director, UK HSE Offshore Division, Personal communication, July 13, 2011.

⁴⁷⁸ Wilkinson, P. *Australia Department of Industry, Tourism and Resources, Presentation to the National Research Centre for Occupational Health and Safety*; May 15, 2002.

5.1.2 US Government Incentives to Build Competent Staff

The federal government has used extensive resources to retain the best available talent to focus on health and safety oversight of US commercial and defense nuclear facilities.⁴⁷⁹ Many nonsupervisory technical staff at the US Nuclear Regulatory Commission (NRC)⁴⁸⁰ and the Defense Nuclear Facilities Safety Board (DNFSB) are paid at the top of the General Schedule.⁴⁸¹ Virtually all technical staff at the DNFSB hold technical master's degrees, and approximately 25 percent hold doctorates.⁴⁸²

The US government has a unique category of non-executive positions, Scientific or Professional,⁴⁸³ which involve high-level research and development in the physical, biological, medical, or engineering sciences, or a closely related field.⁴⁸⁴ These positions are classified above the highest general schedule pay level. These special salary authorizations contribute to the ability of technical agencies to compete with private industry in recruiting and retaining highly proficient staff.

The NRC's extensive training programs also help attract and retain competent technical staff. For new inspection staff, the NRC requires a series of courses, assessments, and simulations, all of which take approximately two years to complete.⁴⁸⁵ Inspectors must have a bachelor's degree in engineering or a degree in a relevant scientific field and Professional Engineer certification.⁴⁸⁶ The agency operates a technical training center in Chattanooga, Tennessee, with various control room simulators that mirror licensees' facilities. NRC staff are expected to understand how this equipment operates so that they can conduct audits and investigations.⁴⁸⁷ Before they are deemed qualified to inspect, inspector candidates must be recommended by the NRC inspector qualification board and certified by the regional administrator or division director.⁴⁸⁸

⁴⁷⁹ *FY 2013 Budget Request to the Congress*; Defense Nuclear Facilities Safety Board: 2012; pp 1-3; http://www.dnfsb.gov/sites/default/files/About/Budget%20Requests/2013/FY%202013_CONG%20BUDGET_FINAL.PDF (accessed March 26, 2016).

⁴⁸⁰ Presentation by NRC Executive Director Bill Borchardt to CSB, January 2011.

⁴⁸¹ \$123,758 to \$155,500 per year in 2012 in Washington, DC.; OPM. Pay & Leave, Salaries & Wages, <https://www.opm.gov/oca/12tables/html/dcb.asp> (accessed March 26, 2016).

⁴⁸² *FY 2013 Budget Request to the Congress*; Defense Nuclear Facilities Safety Board: 2012; pp 7; http://www.dnfsb.gov/sites/default/files/About/Budget%20Requests/2013/FY%202013_CONG%20BUDGET_FINAL.PDF (accessed March 26, 2016).

⁴⁸³ See, e.g., 5 C.F.R. § 319.103. This category covers non-executive positions classified above the GS-15 level. See <https://www.opm.gov/policy-data-oversight/senior-executive-service/scientific-senior-level-positions/> (accessed January 7, 2016).

⁴⁸⁴ OPM. Senior Executive Service, <http://www.opm.gov/ses/recruitment/stpositions.asp> (accessed March 26, 2016).

⁴⁸⁵ NRC. *NRC Inspection Manual, Qualification Program for Operating Reactor Programs (Ch. 1245)*; 2011; pp 4; <http://pbadupws.nrc.gov/docs/ML11110/ML11105A153.pdf> (accessed March 26, 2016).

⁴⁸⁶ NRC Reactor Inspector Job Posting No. R-I/DRS-2013-0001.

⁴⁸⁷ See, e.g., IAEA. NS Tutorial, <http://www.iaea.org/ns/tutorials/regcontrol/regbody/reg2124.htm> (accessed March 26, 2016).

⁴⁸⁸ NRC. *NRC Inspection Manual, Qualification Program for Operating Reactor Programs (Ch. 1245)*; 2011; ; <http://pbadupws.nrc.gov/docs/ML11110/ML11105A153.pdf> (accessed March 26, 2016).

5.2 Disproportionate Regulator Resources for Gulf of Mexico Offshore Activity

Historically, the number of MMS employees working on permitting, permit modifications, and inspections did not increase proportionally to the increase in production—in fact, those staff numbers decreased by 36 percent between 1983 and 2010.⁴⁸⁹ Meanwhile, MMS found that OCS leasing experienced a 200 percent increase, and oil production increased by 185 percent between 1982 and 2007.⁴⁹⁰ In addition, an internal MMS report issued a few months after the Macondo incident put it more bluntly: the Gulf of Mexico district offices did not have enough engineers to conduct permit reviews, and they had only about 55 inspectors for 3,000 facilities.⁴⁹¹

Following these reports and associated recommendations to increase hiring,⁴⁹² BSEE stated that it intended to triple the number of inspectors in the Gulf of Mexico,⁴⁹³ but hiring efforts initially focused on recent graduates, who lacked relevant professional experience. Former-Director [of BOEMRE] Bromwich began the hiring effort by visiting several universities with petroleum engineering departments to entice new graduates to work for the offshore regulator.⁴⁹⁴ The agency also sought recently retired petroleum engineers to work temporarily until permanent hires could join, but several potential applicants lost interest when they saw that the starting salaries were significantly lower than what industry offered for similar work.⁴⁹⁵ In March 2012, former BSEE Director Watson stated to Congress that the agency increased inspector hiring by 50 percent since April 2010, but engineers hiring had only increased by ten percent.⁴⁹⁶ Watson later explained that BSEE intended to hire another 200 people to conduct permit and

⁴⁸⁹ Lewis, W.; Kendall, M.; Suh, R. *U.S. Department of the Interior Outer Continental Shelf Safety Oversight Board Report to the Secretary of the Interior Ken Salazar*; US Department of the Interior: September 1, 2010; pp 6 and 13; <http://www.noia.org/wp-content/uploads/2015/12/DOI-OCS-Safety-Oversight-Board-Report.pdf> (accessed March 26, 2016).

⁴⁹⁰ *Ibid.*, pp 13.

⁴⁹¹ The report highlighted a 71% increase in permit modification applications in the New Orleans District in 2009; *Ibid.* pp 6.

⁴⁹² See, e.g., National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling. *Deepwater: The Gulf Oil Disaster and the Future of Offshore Drilling - Report to the President*; January, 2011; pp 256, Recommendation A5.

⁴⁹³ *Budget Justifications and Performance Information Fiscal Year 2013*; US Department of the Interior: 2012; pp 30; <http://www.bsee.gov/About-BSEE/Budget/FY2013BudgetJustification/> (accessed March 26, 2016).

⁴⁹⁴ Snow, N. BOEMRE seeks recently retired petroleum engineers, Bromwich says. *Oil & Gas Journal*, April 22, 2011, <http://www.ogj.com/articles/2011/04/boemre-seeks-recently.html> (accessed March 26, 2016).

⁴⁹⁵ Snow, N. BOEMRE seeks recently retired petroleum engineers, Bromwich says, *Oil & Gas Journal*. *Oil & Gas Journal*, April 22, 2011, <http://www.ogj.com/articles/2011/04/boemre-seeks-recently.html> (accessed March 26, 2016).

⁴⁹⁶ Watson, J. *Statement of James Watson, Director Bureau of Safety and Environmental Enforcement United States Department of the Interior Committee on Appropriations Subcommittee on Interior, Environment and Related Agencies House of Representatives*; March 7, 2012; http://www.bsee.gov/uploadedFiles/BSEE/Newsroom/Congressional_Testimony/Congressional%20Testimony%2020120307.pdf (accessed March 26, 2013).

spill response plan reviews, inspect offshore facilities, and ensure environmental compliance.⁴⁹⁷ He added there was “still a considerable amount of positions yet to be filled, including additional inspectors, engineers, regulatory specialists, environmental specialists, and other critical disciplines.”⁴⁹⁸

BSEE stated in its 2014 annual report that the Bureau hired 88 personnel in 2014, a net gain of 9 full-time-equivalent employees, and 56 of the 88 newly hired personnel were from critical scientific, inspection, and engineering fields.⁴⁹⁹ BSEE noted in the report that it will maintain its long-term focus on growing its workforce by attracting the top talent available to fill the agency’s ranks.⁵⁰⁰ In April 2015, BSEE reported that the number of inspectors in the Gulf of Mexico OCS region increased from 55 in April 2010 to 92 (as of April 20, 2015).⁵⁰¹ Additionally, the number of engineers in the BSEE workforce increased from 106 in October 2011 to 129 in April 2015.⁵⁰² Despite the challenges, BSEE made progress.

In 2015, BSEE received authorization to offer new recruits a salary incentive of 25% above base pay.⁵⁰³ The purpose of this authorization was to help BSEE better compete with the private sector, which is not bound by the federal government’s salary and retention rules;⁵⁰⁴ however, the authorization brought entry-level starting salaries up to only approximately \$40,000, nowhere near equivalent to private industry offerings for equivalent jobs, which average \$80,849.⁵⁰⁵ Also, this authorization focused exclusively on geophysicists, geologists and petroleum engineering positions, but did not incentivize hiring specialists with other critical professional backgrounds such as environmental science, human factors, psychology,

⁴⁹⁷ Dittrick, P. OTC: BSEE director calls for industry to promote safety culture. *Oil & Gas Journal*, May 1, 2012, <http://www.ogj.com/articles/2012/05/otc-bsee-director-calls-for-industry-to-promote-safety-culture.html> (accessed March 26, 2016).

⁴⁹⁸ Watson, J. *Statement of James Watson, Director Bureau of Safety and Environmental Enforcement United States Department of the Interior Committee on Appropriations Subcommittee on Interior, Environment and Related Agencies House of Representatives*; March 7, 2012; http://www.bsee.gov/uploadedFiles/BSEE/Newsroom/Congressional_Testimony/Congressional%20Testimony%2020120307.pdf (accessed March 26, 2013).

⁴⁹⁹ BSEE. *2014 Annual Report*. May 5, 2015; pp 13. http://www.bsee.gov/uploadedFiles/BSEE/BSEE_Newsroom/Publications_Library/Annual_Report/BSEE%202014%20Annual%20Report.pdf (accessed December 21, 2015).

⁵⁰⁰ *Ibid.* pp 3.

⁵⁰¹ BSEE and BOEM. *Reforms since the Deepwater Horizon Tragedy*; http://www.eenews.net/assets/2015/04/16/document_gw_03.pdf (accessed March 26, 2016).

⁵⁰² *Ibid.*

⁵⁰³ BSEE. *Understanding the Special Salary Rate for Certain Geologist, Geophysicist, and Petroleum Engineer Positions in the BSEE and BOEM Gulf of Mexico Region*; pp 1. http://www.boem.gov/uploadedFiles/BOEM/About_BOEM/Jobs/FAQs_BOEM-PayTables.pdf (accessed December 21, 2015).

⁵⁰⁴ BSEE. Director’s Corner, August 27, 2014, <http://www.bsee.gov/safety/directorscorner/> (accessed March 26, 2015).

⁵⁰⁵ BSEE starting salaries for entry level petroleum engineers range from \$35,657.00 to \$56,859.00. See BSEE position announcement for Petroleum Engineer, GS-0881-05/07, <https://www.usajobs.gov/GetJob/ViewDetails/331348800>. Meanwhile, the median salary for a highly recruited petroleum engineer in the private sector is \$127,970, with average starting salaries around \$80,000. See, e.g., <http://www.reuters.com/article/2012/01/18/us-energy-jobs-idUSTRE80H1GQ20120118>; <http://www.forbes.com/pictures/efkk45eghj/1-petroleum-engineering/> (accessed March 26, 2015).

toxicology, or other complementary engineering disciplines relevant to offshore exploration, drilling and production. More remains to be done to help BSEE attract and retain the staff needed to execute its important mission.

[CALL OUT BOX START]

The BSEE salary incentive allows for only 25% more than a new hire's base pay, not above the locality pay. Locality pay is a supplemental pay amount added to account for regional differences in cost of living, among other factors.⁵⁰⁶ The specific duty locations that can offer this special pay rate in the Gulf of Mexico Region are Jefferson, Lafayette, Lake Charles, and Houma, Louisiana.⁵⁰⁷ Although the Lake Jackson, Texas, District Office is part of the Gulf of Mexico Region, its basic pay plus locality pay is higher than the 25 percent allotted by Congress, so employees of that office cannot receive this supplemental pay.⁵⁰⁸

For instance, a new graduate hired for a petroleum engineer position at general schedule Grade 7, step 5 in Jefferson County, Louisiana would receive a base salary of \$38,511 per year in 2012.⁵⁰⁹ Even without the special authority, he or she would automatically receive the locality pay increase for that area, which means the salary would actually be \$43,964 per year.⁵¹⁰ BSEE's incentive authority would permit an increase of up to 25 percent of base salary, or \$9,628, for a total salary of \$48,138 per year. If the engineer were hired for the Lake Jackson, Texas, District Office, he or she would not get the bonus pay, because the locality-adjusted salary of \$49,568 per year⁵¹¹ is already more than the 25 percent bonus. In effect, this special pay authority is able to bring only the other Gulf of Mexico district office salaries for geophysicists, geologists, and petroleum engineers closer to their peers' salaries in Lake Jackson.

[CALL OUT BOX END]

Unfortunately, a 2014 report published by the US Government Accountability Office (GAO) found that the actual pay increase provided to support BSEE's hiring initiative was lower than the 25 percent target envisioned because the increase did not include locality pay.⁵¹² The report also found that US Department of Interior oil and gas departments, such as BSEE and BOEM, continue to struggle hiring and retaining key oil and gas oversight positions, including inspectors and petroleum engineers.⁵¹³ The report attributes

⁵⁰⁶ OPM. Pay & Leave, Salaries & Wages, <http://www.opm.gov/oca/payrates/LPA.asp> (accessed March 26, 2015).

⁵⁰⁷ BSEE. *Understanding the Special Salary Rate for Certain Geologist, Geophysicist, and Petroleum Engineer Positions in the BSEE and BOEM Gulf of Mexico Region*; pp 1. http://www.boem.gov/uploadedFiles/BOEM/About_BOEM/Jobs/FAQs_BOEM-PayTables.pdf (accessed December 21, 2015).

⁵⁰⁸ *Ibid.*

⁵⁰⁹ For an example, see BSEE position announcement for Petroleum Engineer, GS-0881-05/07, <https://www.usajobs.gov/GetJob/ViewDetails/331348800> <http://www.opm.gov/oca/payrates/LPA.asp>; OPM. Pay & Leave, Salaries & Wages, <http://www.opm.gov/oca/payrates/LPA.asp> (accessed March 26, 2015).

⁵¹⁰ OPM. Pay & Leave, Salaries & Wages, <http://www.opm.gov/oca/payrates/LPA.asp> (accessed March 26, 2015).

⁵¹¹ *Ibid.*

⁵¹² US Government Accountability Office. *Report to Congressional Requesters. Oil and Gas: Interior Has Begun to Address Hiring and Retention Challenges but Needs to Do More*; US Government Accountability Office: January, 2014; pp 22-23; <http://www.gao.gov/assets/670/661025.pdf> (accessed March 26, 2016).

⁵¹³ *Ibid.*, pp 14.

this difficulty to competitive oil and gas industry salaries and signing bonuses for new hires,⁵¹⁴ although low oil and natural gas prices in recent quarters started to impact this dynamic. The report also stated that these challenges have resulted in less time available for oil and gas oversight activities, including inspections. Surveys conducted by GAO showed that the number and thoroughness of inspections were “somewhat or greatly reduced because of ... vacancies.”⁵¹⁵ To compound the problem, the report noted that a “high proportion of staff in key oil and gas positions ... will be eligible to retire within a few years.”⁵¹⁶ GAO analysis found that roughly 35 percent of BSEE’s petroleum engineers would be eligible to retire by 2017 compared with a government-side average of 27.5 percent for all federal employees during the same period.⁵¹⁷

BSEE staff has to cover three geographical regions (Alaska, GoM, and the Pacific), and the GoM alone has 2,481 active platforms, with 329 new wells drilled during 2014, and 133 designated operators.⁵¹⁸ Thus, total staffing resources leveraged against the current GoM assets and accompanying drilling and production activity, supports the agency’s human capital aspirations “to meet the consistent challenge of recruiting and retaining top talent.”⁵¹⁹ With its efforts in place, BSEE may be able to take advantage of macroeconomic conditions and the current low prices of oil and natural gas which are driving down GoM activity and job cuts in the industry.⁵²⁰ It is only a matter of time, however, before the trend reverses, therefore BSEE needs to remain ready for these cycles.

5.3 The Deficit in Regulator Technical Competency and Credibility

Earlier reports on the Macondo incident, such as the Presidential Oil Spill Commission Report⁵²¹ and MMS’s own report,⁵²² explained MMS permit reviewers and inspectors historically lack technical competency, noting that it struggled to retain competent staff. In the version of the proposed SEMS rule issued the year before the Macondo incident, MMS noted that most comments received in response to the 2006 advanced notice of proposed rulemaking expressed that API RP 75 provided excellent guidance, but

⁵¹⁴ *Ibid.*, pp 19.

⁵¹⁵ *Ibid.*, pp 31-32.

⁵¹⁶ *Ibid.* pp 17.

⁵¹⁷ *Ibid.*, pp 17

⁵¹⁸ BSEE. *2014 Annual Report*. May 5, 2015; pp 8.

http://www.bsee.gov/uploadedFiles/BSEE/BSEE_Newsroom/Publications_Library/Annual_Report/BSEE%202014%20Annual%20Report.pdf (accessed December 21, 2015).

⁵¹⁹ *Ibid.* pp 13.

⁵²⁰ As of April 1, 2016, the total number of active rigs in the US dropped by 545; Baker Hughes. Rig Count Overview & Summary Count, <http://phx.corporate-ir.net/phoenix.zhtml?c=79687&p=irol-rigcountsoverview>; and Reed, S. Stung by Low Oil Prices, BP Will Cut 4,000 Jobs. January 12, 2016, <http://www.nytimes.com/2016/01/13/business/energy-environment/bp-jobs-oil-prices.html> (accessed March 26, 2016).

⁵²¹ See e.g., National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling. *Deepwater: The Gulf Oil Disaster and the Future of Offshore Drilling - Report to the President*; January, 2011; pp 74.

⁵²² Lewis, W.; Kendall, M.; Suh, R. *U.S. Department of the Interior Outer Continental Shelf Safety Oversight Board Report to the Secretary of the Interior Ken Salazar*; US Department of the Interior: September 1, 2010; pp 13-16; <http://www.noia.org/wp-content/uploads/2015/12/DOI-OCS-Safety-Oversight-Board-Report.pdf> (accessed March 26, 2016).

that MMS should not approve SEMS plans, “rather, a third party should determine or certify whether a SEMS plan is viable, because MMS may not have the resources and expertise to approve a minimum of one plan for each OCS operator.”⁵²³ MMS’s inadequate budget and conflicting missions resulted in serious management deficiencies and a pervasive culture of deference to the offshore industry for guidance on reviews and inspections at the time of the Macondo incident.⁵²⁴

5.4 Post-Macondo Efforts to Improve Competency

BSEE has been working to correct many of the deficiencies in MMS’s recruitment and training programs for offshore inspectors and investigators. In March 2010, it issued an internal handbook to improve the conduct of internal investigations, but it did not significantly change the basic protocol or management responsibilities outlined in an earlier manual.⁵²⁵ More importantly, it did not provide special procedures for conducting catastrophic or serious accident investigations, nor did it contain a protocol for evidence gathering.⁵²⁶

To improve training at the agency, BSEE opened its virtual National Offshore Training Center in 2011.⁵²⁷ According to BSEE, agency staff logged more than 10,000 hours of technical and safety training in FY 2012,⁵²⁸ and 38 staff attended a two-week boot camp in petroleum geology, drilling engineering, production engineering and permitting, with lectures by college professors complemented by hands-on exposure to equipment in August 2012.⁵²⁹ Additionally, BSEE Director Salerno recently stated that the National Offshore Training Program grew in FY 2014, offering 79 technical courses, an increase of 29 courses over FY 2013.⁵³⁰ The BSEE 2014 Annual Report noted the agency remains committed to employee development and that in calendar year 2014, BSEE offered 105 training courses with 145

⁵²³ Safety and Environmental Management Systems for Outer Continental Shelf Oil and Gas Operations, 74 Fed. Reg. 28639 (Proposed, June 17, 2009).

⁵²⁴ Forty-two percent of inspectors interviewed for the Safety Oversight Board’s Report to Secretary Salazar stated that “headquarters management does not provide sufficient direction and support;” Lewis, W.; Kendall, M.; Suh, R. *U.S. Department of the Interior Outer Continental Shelf Safety Oversight Board Report to the Secretary of the Interior Ken Salazar*; US Department of the Interior: September 1, 2010; pp 15; <http://www.noia.org/wp-content/uploads/2015/12/DOI-OCS-Safety-Oversight-Board-Report.pdf> (accessed March 26, 2016).

⁵²⁵ *Ibid.*, pp 22.

⁵²⁶ *Ibid.*, pp 22.

⁵²⁷ BSEE. BSEE Director Delivers Remarks at the International Regulators Forum 2011 Global Offshore Safety Summit Conference. October 4, 2011, <http://www.bsee.gov/BSEE-Newsroom/Press-Releases/2011/BSEE-Director-Delivers-Remarks-at-the-International-Regulators-Forum-2011-Global-Offshore-Safety-Summit-Conference/> (accessed March 26, 2016).

⁵²⁸ Dlouhy, J. Tougher offshore scrutiny? Not yet. *Fuel Fix from the Houston Chronicle*, December 13, 2012, <http://fuelfix.com/blog/2012/12/13/tougher-offshore-scrutiny-not-yet/> (accessed March 26, 2016).

⁵²⁹ *Ibid.*

⁵³⁰ BSEE. The National Offshore Training Program Shows Continued Growth in 2014: Remains a Priority for BSEE Moving Forward. October 28, 2014, <http://www.bsee.gov/BSEE-Newsroom/BSEE-News-Briefs/2014/The-National-Offshore-Training-Program-Shows-Continued-Growth-in-2014/> (accessed December 9, 2014).

engineers attending an average of three classes each, and 124 inspectors attending an average of approximately four classes each, for a total of 24,486 training hours conducted.⁵³¹

Additional insights into BSEE's intentions to equip its staff with needed skills appear in the 2014 US Department of the Interior Office of Inspector General (IG) *Report on Offshore Oil and Gas Permitting*.⁵³² According to the report, BSEE issued an internal policy document in spring 2013, *Training Requirements for Engineers*, which requires all engineers to complete at least 32 hours of approved technical training annually and newly hired engineers with fewer than 3 years of oil and gas engineering experience to complete BSEE's engineering boot camp or a similar program.⁵³³ The report found that BSEE did not "effectively or efficiently" implement that policy, and "did not ensure that all employees were aware of the new requirement."⁵³⁴ As a result, the IG recommended that BSEE "document that all permitting employees are aware of IPD [Interim Policy Document] requirements; and monitor and track all training to ensure that training requirements, including training hours, are met and that all training is recorded."⁵³⁵ BSEE stated in its response that in April 2014, it finalized a mandatory online training awareness module, that by August 29, 2014, "more than 94 percent of BSEE engineers had completed their fiscal year 2014 training requirements ... [and that] by January 1, 2015, BSEE will ensure that all technical courses offered in FY15 will have the training hours listed on the engineer's transcript, as well as the class completion certificate."⁵³⁶

In addition to needing technical competency, inspectors must have excellent communication, advocacy, and negotiation skills. Hiring and developing regulatory personnel with a full range of skill sets is essential to help build a knowledgeable, credible regulator who can recognize deficiencies and engage with operators to develop appropriate risk-reduction strategies and persuade them to make changes when necessary.⁵³⁷

5.5 Insufficient Regulatory Funding Mechanism for Securing Staff

At the time of the Macondo incident, the US offshore safety regulator did not have sufficient, sustainable funding to manage major accident prevention activities. To drive continual improvement in the offshore industry and hire and retain sufficient competent staff, the offshore regulator needs adequate and sustainable funding. Insufficient funding is often cited as the main reason that MMS was unable to hire

⁵³¹ BSEE. *2014 Annual Report*. May 5, 2015; pp 13.

http://www.bsee.gov/uploadedFiles/BSEE/BSEE_Newsroom/Publications_Library/Annual_Report/BSEE%202014%20Annual%20Report.pdf (accessed December 21, 2015).

⁵³² IG. *Offshore Oil and Gas Permitting US Department of the Interior*; Report No. CR-EV-BSEE-0006-2013; September, 2014; <https://www.doioig.gov/sites/doioig.gov/files/CR-EV-BSEE-0006-2013Public.pdf> (accessed March 26, 2016).

⁵³³ *Ibid.*, pp 12.

⁵³⁴ *Ibid.*, pp 1.

⁵³⁵ *Ibid.*, pp 13.

⁵³⁶ *Ibid.*, pp 18.

⁵³⁷ Wilkinson, P. *Creating a New Offshore Petroleum Safety Regulator*, Presentation to IADC, Australian Petroleum Production & Exploration Association Conference, March 25, 2003; pp 6
<http://www.nopsema.gov.au/assets/document/IADC-Annual-General-Meeting.pdf> (accessed March 26, 2016).

and retain sufficient staff or to adequately oversee deepwater drilling.⁵³⁸ Beginning in 2011, BSEE received a sizeable budget increase; however, this funding is by congressional appropriations that may (and likely will) vary from year to year. Other offshore regimes ensure the regulator is funded at variable but appropriate levels through an industry self-funding or “cost recovery” mechanism. As offshore activities increase or decrease, so too does the regulator funding to ensure adequate resources for regulatory oversight.

5.5.1 Ineffectual Funding Appropriations for Offshore Activity

As offshore drilling activities increase and expand into deeper and riskier waters, the need for a stronger, more effective offshore regulator becomes greater.⁵³⁹ Adequate and sustainable funding is a necessary attribute of a competent regulator.⁵⁴⁰ One way to ensure consistent funding in the appropriation process is to provide agencies with an independent funding mechanism.⁵⁴¹ An independent funding mechanism based on the number and type of active offshore sites renders a straightforward means of ensuring sufficient funding. When offshore operations decline, the overall level of risk that the industry assumes declines, and so too would the funding.

As a component of the Department of the Interior, MMS was, and BSEE is, appropriated funding by Congress through the General Fund.⁵⁴² Each year, the agency sends a budget justification and request to its appropriators in Congress, whose jurisdiction extends to the rest of the Department of the Interior, the Environmental Protection Agency, and several smaller independent agencies.⁵⁴³ The appropriators then determine the size of each agency’s annual budget. In March 2012, former BSEE Director Watson attributed recent regulatory action and increased hiring of inspectors partly to the budget increase that Congress provided.⁵⁴⁴ By spring 2012, however, Interior officials expressed concern to the Government Accountability Office that current and future budgetary constraints may prevent BSEE from fully implementing reforms as planned, and that this would handicap BSEE’s ability to manage oil and gas

⁵³⁸ MMS’s inability to keep up with technological advances was made more problematic because its level of funding and technical staffing remained static or decreased as industry’s offshore drilling activity increased; National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling. *Deepwater: The Gulf Oil Disaster and the Future of Offshore Drilling - Report to the President*; January, 2011; pp 72.

⁵³⁹ “Interior’s capacity to identify and evaluate risk remains limited, raising questions about the effectiveness with which it allocates its oversight resources;” US Government Accountability Office. *Oil and Gas Management: Interior’s Reorganization Complete, but Challenges Remain in Implementing New Requirements*; GAO-12-423; July 30, 2012; pp 106. <http://www.gao.gov/assets/600/593110.pdf> (accessed March 26, 2016).

⁵⁴⁰ National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, *A Competent and Nimble Regulator: A New Approach to Risk Assessment and Management*, Staff Working Paper No. 21.

⁵⁴¹ Barkow, R. Insulating agencies: avoiding capture through institutional design, *Texas Law Review*, 89, 2010, p 15, 44. 146-47. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1717037.

⁵⁴² The General Fund is the US Treasury account that appropriates funds to most federal agencies.

⁵⁴³ US House of Representative Committee on Appropriations. Interior Subcommittee Jurisdiction, <http://appropriations.house.gov/about/jurisdiction/interiorenvironment.htm> (accessed March 26, 2016).

⁵⁴⁴ Watson, J. *Statement of James Watson, Director Bureau of Safety and Environmental Enforcement United States Department of the Interior Committee on Appropriations Subcommittee on Interior, Environment and Related Agencies House of Representatives*; March 7, 2012; http://www.bsee.gov/uploadedFiles/BSEE/Newsroom/Congressional_Testimony/Congressional%20Testimony%2020120307.pdf (accessed March 26, 2013).

activities in the Gulf of Mexico.⁵⁴⁵ BSEE officials from the Gulf of Mexico regional office said that they could not reliably anticipate budget increases for new hiring and helicopter operating costs.⁵⁴⁶ This budget uncertainty, the officials explained, hindered BSEE's ability to review permits and conduct inspections.⁵⁴⁷

The fiscal year 2012 appropriations bill, passed in March 2012, included a line item for inspection fees of \$62 million,⁵⁴⁸ which BSEE officials agreed would cover most of the resources needed to increase BSEE's inspection and permitting capacity for that year.⁵⁴⁹ In a given year, fees for inspections and additional offsetting collections can comprise a portion of BSEE's operating costs, and they are subtracted from the appropriated budget.⁵⁵⁰ Despite the increase for fiscal year 2012, BSEE officials expressed concern that public and congressional attention to oversight of offshore oil and gas drilling may diminish over time and that future appropriations may decrease, which would endanger their ability to provide effective safety oversight offshore.⁵⁵¹ Despite these concerns, BSEE total appropriations have not drastically changed since 2012. BSEE total appropriations were \$182.4 million in FY 2012,⁵⁵² \$200.8 million in FY 2013,⁵⁵³ \$202.6 million in FY 2014,⁵⁵⁴ and \$204.6 million in FY 2015.⁵⁵⁵

The Mine Safety and Health Administration (MSHA) provides a particularly compelling example of how appropriations funding can decrease over time. MSHA was formed in 1977, following a slew of mining

⁵⁴⁵ US Government Accountability Office. *Oil and Gas Management: Interior's Reorganization Complete, but Challenges Remain in Implementing New Requirements*; GAO-12-423; July 30, 2012; pp 101. <http://www.gao.gov/assets/600/593110.pdf> (accessed March 26, 2016).

⁵⁴⁶ *Ibid.* pp 101.

⁵⁴⁷ *Ibid.* pp 101.

⁵⁴⁸ For FY 2015, the BSEE budget requested \$204.6 million, which includes \$50.4 million from offsetting rental collections, \$8.2 million from cost recovery fees, and \$65.0 million inspection fees; The US Department of the Interior. *Budget Justifications and Performance Information Fiscal Year 2015: Bureau of Safety and Environmental Enforcement*; http://www.bsee.gov/uploadedFiles/BSEE/About_BSEE/Budget/BSEE%20FY%202015%20Final%20Greenbook%20File.pdf (accessed March 25, 2015).

⁵⁴⁹ US Government Accountability Office. *Oil and Gas Management: Interior's Reorganization Complete, but Challenges Remain in Implementing New Requirements*; GAO-12-423; July 30, 2012; pp 101. <http://www.gao.gov/assets/600/593110.pdf> (accessed March 26, 2016).

⁵⁵⁰ For example, in FY2013, BSEE anticipated receiving half of its appropriation from fees and offsetting collections. The portion has varied significantly, but it has typically been 25% or less of the total appropriation; *Budget Justifications and Performance Information Fiscal Year 2013*; US Department of the Interior: 2012; pp 6, Table 1; <http://www.bsee.gov/About-BSEE/Budget/FY2013BudgetJustification/> (accessed March 26, 2016).

⁵⁵¹ US Government Accountability Office. *Oil and Gas Management: Interior's Reorganization Complete, but Challenges Remain in Implementing New Requirements*; GAO-12-423; July 30, 2012; pp 101. <http://www.gao.gov/assets/600/593110.pdf> (accessed March 26, 2016).

⁵⁵² *Budget Justifications and Performance Information Fiscal Year 2013*; US Department of the Interior: 2012; pp 3; <http://www.bsee.gov/About-BSEE/Budget/FY2013BudgetJustification/> (accessed March 26, 2016).

⁵⁵³ *Budget Justifications and Performance Information Fiscal Year 2014*; US Department of the Interior: 2013; pp 3; http://www.doi.gov/budget/appropriations/2014/upload/FY2014_BSEE_Greenbook.pdf (accessed March 26, 2016).

⁵⁵⁴ *Budget Justifications and Performance Information Fiscal Year 2016*; US Department of the Interior: 2015; pp 3; http://www.doi.gov/budget/appropriations/2016/upload/FY2016_BSEE_Greenbook.pdf (accessed March 26, 2016).

⁵⁵⁵ *Ibid.* pp 3.

disasters when Congress and the public realized that the predecessor agency, the Mining Enforcement and Safety Administration, had prioritized revenue generation over safety.⁵⁵⁶ Congress recognized that the increased enforcement, legal, and administrative responsibilities for MSHA would require additional funds for hiring and support services. Yet it did not create a special mechanism to ensure increased funding was available year after year. Instead, Congress expected that MSHA's funds "can be provided through the normal appropriation process as necessary."⁵⁵⁷ So in 1979, the year it became a fully operational agency, MSHA's budget peaked at an inflation-adjusted \$355 million. By 2007, despite some increases in spending, the budget dropped 15 percent.⁵⁵⁸ The President recommended to Congress that MSHA receive a budget of \$395 million in 2016.⁵⁵⁹ The MSHA experience is a powerful reminder that the source of an agency's funding is critical to achieving its mission.

If it is to avoid repeating MSHA's good intentions and budget woes, a renewable, sustainable funding structure is the best way to ensure that BSEE will have adequate funding to regulate environmental and safety activity on the OCS in future years. One argument against an industry-funded regulator is that it can become "captured" by the industry that funds it.⁵⁶⁰ Conversely, interest groups can exert pressure on Congress to control an agency's activities through its budget, which is just another type of agency capture.⁵⁶¹ Yet other federal safety regulators transitioned to industry-funded appropriations precisely to avoid the inadequacies and lack of a consistent budget. The Nuclear Regulatory Commission (NRC) was reorganized in response to the Three Mile Island incident in 1979. As part of the regulatory overhaul in the 1980s and 1990s, the NRC transitioned to a fee-for-service model of regulating. Now, Congress sets the agency's budget, but the NRC is required by law to recover at least 90% of its funding through licensing and inspection fees.⁵⁶² For instance, each year the agency determines and publishes fee amounts for new reactor license applications (\$17,800), amendments to licenses (\$9,600), and inspections (\$273

⁵⁵⁶ Senate Report 95-181 at 3405 (95th Congress), May 16, 1977
<http://arlweb.msha.gov/SOLICITOR/COALACT/leghist2.htm> (accessed March 26, 2016).

⁵⁵⁷ *Ibid.*

⁵⁵⁸ OMB Watch. *Coal Mine Safety Shortchanged by Years of Budget Cuts*; OMB Watch: Washington, D.C., 2008; http://miningquiz.com/pdf/NEC/US_Coal_Mine_Safety_Shortchanged_by_Years_of_Budget_Cuts.pdf (accessed March 26, 2016); meanwhile, mining production had increased significantly since the 1970s. In 1973, the U.S. Department of Energy, Energy Information Administration reported 591 million short tons of coal produced in the U.S. By 2007, production increased to 1.147 billion short tons; The American Resource, Trends in U.S. Coal Mining 1923-2001, http://www.nma.org/pdf/c_trends_mining.pdf. (accessed March 26, 2016).

⁵⁵⁹ US Department of Labor. Budget request for FY 2016 outlines priorities for future, <http://www.msha.gov/fromthedesk/2015/0203.asp> (accessed March 26, 2016).

⁵⁶⁰ Rachel E. Barkow, *Insulating Agencies: Avoiding Capture Through Institutional Design*, 89 TEX. L. REV. 15, 42 n. 146-47 (2010); see also Steven A. Ramirez, *Depoliticizing Financial Regulation*, 41 WM. & MARY L. REV. 503, 517 (2000) (noting with surprise that most proposals for offshore regulatory reform have not focused on agency financing).

⁵⁶¹ Capture of a federal agency can be defined as strong responsiveness to the desires of the industry or groups being regulated. See Rachel E. Barkow, *Insulating Agencies: Avoiding Capture Through Institutional Design*, 89 TEX. L. REV. 15, pp 21 (2010); Roger G. Noll, REFORMING REGULATION 99-100 (1971). This document explains that capture happens most often when an agency assigns undue weight to the interests of the regulated industries as opposed to public interests.

⁵⁶² Section 6101 "NRC User Fees and Annual Charges," Omnibus Budget Reconciliation Act, Pub. L. 103-66. 107 Stat. 312 (Aug. 10, 1993).

per hour).⁵⁶³ This funding mechanism ensures that the agency's budget adequately covers the regulatory activities it performs, but no more. It also simplifies the agency's budget planning. Because fees directly correspond to the actions the NRC performs, the agency does not worry about potential budget shortfalls from year to year. BSEE could use this same approach to fund additional hires. Offshore revenue from existing drilling and production activities could cover necessary inspection staff. Salaries could then be calculated at a rate comparable to a private third-party auditor in the GoM, making the structure more cost effective.

The Pipeline and Hazardous Materials Safety Administration (PHMSA) within the Department of Transportation provides another example of an industry-supported federal safety regulator. PHMSA is authorized to assess and collect pipeline user fees to fund its pipeline safety activities.⁵⁶⁴ The pipeline safety statute that authorized PHMSA recognized a need for consistent funding for the pipeline regulator's safety oversight. It reflected Congress's intention that the total costs of administering certain federal pipeline safety programs be recovered through charges to the industry.⁵⁶⁵ PHMSA assesses operators of interstate and intrastate natural gas and hazardous liquid transmission pipelines so that the operators each pay a share of the total federal pipeline safety program costs in proportion to the number of miles of pipeline they have in service at the end of a calendar year.⁵⁶⁶

At least one county safety regulator is industry funded. In Contra Costa County, California, the California Accidental Release Prevention Program (CalARP) works to prevent catastrophic accidental releases of highly toxic or flammable chemicals through its Risk Management Program.⁵⁶⁷ CalARP engineers review industry risk-management program plans, conduct regular audits of sites, and follow up with action items to verify compliance.⁵⁶⁸ The county uses a Certified Unified Program Agency (CUPA) single-fee system, which assesses fees to users of all CUPA programs, including CalARP.⁵⁶⁹ Under this system, a single invoice is issued annually to each of the regulated business sites for review and audit services that CalARP performs. The collected fees cover salaries and benefits, services and supplies, and overhead costs of the CUPA programs.⁵⁷⁰

5.5.2 Industry Funding of International Offshore Regulators

In contrast to the US offshore regulator's hybrid fee and congressional appropriation scheme, the North Sea and Australian offshore regimes use a cost-recovery model. Since 1999, the UK offshore regulator

⁵⁶³ 10 C.F.R. § 170.21.

⁵⁶⁴ 49 U.S.C. § 60301.

⁵⁶⁵ *Skinner v. Mid-America Pipeline Co.*, 490 U.S. 212 (1989).

⁵⁶⁶ The 2010 fee assessed on liquid pipelines was offset by \$18.8 million, roughly half of the total program allocated, from the Oil Spill Liability Trust Fund. Letter from Cynthia Quarterman, Administrator, Pipeline and Hazardous Materials Safety Administration, to Senator Daniel K. Inouye, Chairman, Committee on Appropriations (April 5, 2010).

⁵⁶⁷ Contra Costa Health Services, California Accidental Release Prevention (CalARP) Program, http://cchealth.org/groups/hazmat/california_accidental_release_prevention.php (accessed March 26, 2016).

⁵⁶⁸ *Ibid.*

⁵⁶⁹ <http://cchealth.org/groups/hazmat/pdf/cupa/fee-exhibits.pdf>.

⁵⁷⁰ Contra Costa Health Hazardous Materials. *List of Exhibits: To Staff Report on the Determination and Apportionment of CUPA Fees*; <http://cchealth.org/hazmat/pdf/cupa/fee-exhibits.pdf> (accessed March 26, 2016).

aimed to recover its costs entirely through fees or “charges” to duty holders.⁵⁷¹ The UK government wanted to ensure appropriate funding for the offshore safety and health program, so it decided the industry benefiting from the regulator’s services should support that program. It instituted a per-hour cost recovery rate for offshore regulatory activities, such as safety case document review and inspections.⁵⁷²

Not long after the fee schedule was established, an independent consulting firm authored a report for UK HSE examining the potential effects on UK HSE charging industry in this manner. Relying on extensive interviews with duty holders, unions, UK HSE staff, document review, and statistical analysis,⁵⁷³ the report explained that the majority of the industry respondents interviewed indicated their relationship with the regulator had not been “negatively affected”, and they observed no change in regulatory performance or in efficiency on the part of the regulator.⁵⁷⁴

Although there were some faults in the program in terms of implementation, including some negative feedback concerning administrative issues (primarily proper invoicing and difficulties for duty holders with anticipated budgeting based on anticipated inspector activity at particular locations),⁵⁷⁵ cost did not turn out to be an issue. Only half of the companies surveyed claimed to have incurred additional costs after the UK transitioned to this system, most of which were less than £3,000 (approximately \$4,516).⁵⁷⁶

The single most important focus in terms of statistical analysis covered by the report was to determine if any change in outcomes on health and safety resulted across the population of duty holders.⁵⁷⁷ The study concluded that it was impossible to prove statistically whether the new system affected health and safety issues due to the low probability of events, resulting in a relative paucity of data from which to try to draw such conclusions.⁵⁷⁸ The study documented, however, a significant statistical increase in documented activity across all regulatory areas by inspectors, including increased issuance of improvement notices, prohibition notices, enforcement notices, and prosecutions.⁵⁷⁹ The total number of safety cases presented, and accepted, also increased significantly from 1996-2001, but the percentage of safety cases accepted remained relatively constant.⁵⁸⁰

⁵⁷¹ *Offshore Oil and Gas in the UK—An Independent Review of the Regulatory Regime*; https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48252/3875-offshore-oil-gas-uk-ind-rev.pdf (accessed March 26, 2016). “The Panel comprised three independent appointees, including myself, all with an element of experience and knowledge relevant to the industry, alongside a senior representative of each of the three national regulatory bodies with responsibilities for the offshore oil & gas sector, namely: the Department of Energy and Climate Change (DECC), the Health and Safety Executive (HSE) and the Maritime and Coastguard Agency (MCA);” *Ibid.* pp 1.

⁵⁷² Since April 2016, the charge is £266 per inspector hour. <http://www.hse.gov.uk/charging/offshore/chgoffsh.htm> for information on the UK HSE’s charging process (accessed March 26, 2016).

⁵⁷³ *Ibid.* § 1.2.

⁵⁷⁴ *Ibid.* e.g., §§ 1.6-1.7, 1.10, 1.16-1.17.

⁵⁷⁵ *Ibid.* § 1.12.

⁵⁷⁶ *Ibid.* § 1.2.

⁵⁷⁷ *Ibid.* § 3.2.

⁵⁷⁸ *Ibid.* § 4.1.

⁵⁷⁹ *Ibid.* § 4.1-4.4.

⁵⁸⁰ *Ibid.* § 4.5-4.6.

Australia's offshore safety regulator, NOPSEMA, is also industry-funded, but in a slightly different way than the UK OSD. ⁵⁸¹ Much like the UK, NOPSEMA collects funds through safety case levies on the offshore industry, which it determines by individual activity levels. ⁵⁸² Rather than hourly rates, levies paid by the duty holders are flat fees based on the facility in use. ⁵⁸³ This arrangement ensures that each operator is well aware of the cost it will incur for regulatory services. Also, the regulator is aware of its budget for the year, and it does not cause industry any misgivings over the need for additional inspections or audits. In addition, this funding scheme helps regulatory staff build healthy and appropriate relationships with industry.

While BSEE's most recent budget suggests that it is well-funded, an industry funding mechanism guarantees that future funding is always commensurate with industry activity offshore, regardless of cyclical movements of oil and gas prices, which can impact the industry, along with changing political will in terms of the desirability of an enhanced regulatory presence versus production pressures during times of peak energy demand.

5.6 The Importance of an Independent Regulator

To ensure that safety is a priority offshore, the regulator must maintain its independence from the economic aspects of offshore drilling activities. Independence is an essential feature of an effective safety regulator for major hazard facilities because offshore leasing and revenue generation goals are often in conflict with safety and environmental protection. In mining and nuclear safety, Congress recognized that an independent safety regulator requires full isolation of the safety mission from the government agency tasked with production and revenue management. A regulator must be regarded as independent from stakeholder community it regulates while still maintaining appropriate levels of engagement. UK HSE communications with the CSB corroborate this, noting that even the perception of a conflict of interest with industry in the UK would undermine that regulator's effectiveness.

BSEE has taken steps to establish and maintain independence, but evidence suggests it has yet to achieve full independence, and the appearance of a conflict of interest may remain. Reorganization of offshore safety regulator in the Department of Interior fails to reflect the lessons from previous congressional safety reforms and the experiences of other international offshore regulatory regimes.

5.6.1 The Minerals Management: The Safety Versus Revenue Conflict

The Minerals Management Service (MMS) regulated offshore safety from 1982 until its reorganization following Macondo in 2010. Through the Secretary of the Interior, MMS used the Outer Continental

⁵⁸¹ Australian Petroleum (Submerged Lands) Act Section 138 specifies industry payment of fees to the regulator.

⁵⁸² NOPSEMA, Cost Recovery and Levies, <http://www.nopsema.gov.au/about/cost-recovery-and-levies/> (accessed March 26, 2016).

⁵⁸³ NOPSEMA. *Guideline: Safety Case Levies*; December 19, 2013; <http://www.nopsema.gov.au/assets/Guidelines/N-11000-GL0238-Safety-Case-Levies.pdf> (accessed March 26, 2016); *Ibid*.

Shelf Lands Act to promulgate regulations outlining leasing, revenue collection, environmental compliance, and safety requirements for activities on the outer continental shelf (OCS).⁵⁸⁴

MMS was created in 1982, during a period of rising inflation and market uncertainty about oil prices.⁵⁸⁵ Then-Secretary of the Interior James Watt, expressing concern about offshore revenue, attempted to expand offshore federal leasing to promote drilling and oil production. Soon after, an administration blue ribbon commission issued a report that exposed ineffective revenue management for energy production on federal lands, describing it as “a failure for more than 20 years.”⁵⁸⁶

To expand leasing and revenue-promotion goals, Secretary Watt used his discretion under the Outer Continental Shelf Lands Act to transition the authority for revenue collection from the Bureau of Land Management and for regulatory oversight of offshore activity from the US Geological Survey. These functions, previously separated, were now vested in one agency, the new Minerals Management Service.⁵⁸⁷ This created an inherent conflict of interest within one agency because through the fall of 2010, the MMS would oversee both regulatory and revenue functions for offshore drilling operations on the OCS. In many ways, Secretary Watt’s actions were reinforcing the purpose of the Outer Continental Shelf Lands Act of “expeditious and orderly development [of OCS resources], subject to environmental safeguards, in a manner which is consistent with the maintenance of competition and other national needs.”⁵⁸⁸ Nevertheless, the inherent conflict remained, with the desire for enhanced revenue generation potentially pitted against the drive for offshore safety.

One of Watt’s first actions were to streamline the OCS leasing process and to encourage drilling with an ambitious five-year leasing plan for up to five billion acres of the US Outer Continental Shelf.⁵⁸⁹ Though it succeeded in invigorating lease sales, the 1982-1987 five-year plan was dampened by a longstanding congressional leasing moratorium,⁵⁹⁰ which was followed by a series of executive offshore leasing moratoria, the first issued by President George H. W. Bush in 1990.⁵⁹¹ The western Gulf of Mexico,

⁵⁸⁴ See 30 C.F.R. Part. 250.

⁵⁸⁵ Bernanke, B.; Gertler, M.; Watson, M.; Sims, F.; Friedman, B. Systematic Monetary Policy and the Effects of Oil Price Shocks; *Brookings Papers on Economic Activity* **1997** (1), 1997, pp 91-157; see also International Monetary Fund. Global Economy Learns to Absorb Oil Price Hikes, <http://www.imf.org/external/pubs/ft/survey/so/2012/num052512a.htm> (accessed March 26, 2016); *Ibid*.

⁵⁸⁶ Commission on Fiscal Accountability of the Nation's Energy Resources. *Fiscal Accountability of the Nation's Energy Resources*; January, 1982; http://www.onrr.gov/laws_R_D/FRNotices/PDFDocs/linowesrpt1-5.pdf (accessed March 26, 2016).

⁵⁸⁷ Secretarial Order No. 3071 (Jan. 19, 1982).

⁵⁸⁸ 43 U.S.C. § 1332(3).

⁵⁸⁹ Department of the Interior Notice, Tentative Proposed Final 5-Year OCS Oil and Gas Leasing Program, 47 Fed. Reg. 11980 (March 19, 1982).

⁵⁹⁰ Over Secretary Watt’s objections, Congress reined in his proposal to offer almost all of the US coastline for offshore oil and gas development by 1987. The 1984 Interior appropriations bill banned drilling along most of California and Cape Cod. See e.g., Russakoff, D. Watt's Adversaries Would Almost Hate To See Him Resign. *The Washington Post*, October 7, 1983, <https://www.washingtonpost.com/archive/politics/1983/10/07/watts-adversaries-would-almost-hate-to-see-him-resign/f324ed56-31d7-4b59-ae52-2b756cf53e91/>; and Vann, A. *Offshore Oil and Gas Development: Legal Framework*; RL33404 2-3; Congressional Research Service: 2011.

⁵⁹¹ *President George Bush: Statement on Outer Continental Shelf Oil and Gas Development*; June 26, 1990; <http://www.presidency.ucsb.edu/ws/?pid=18638> (accessed March 26, 2016).

however, was not part of the leasing and drilling moratoria, and the lease sales and resulting revenue became the second largest revenue source for the federal treasury.⁵⁹² An assessment of the scope of MMS activities from that time through the date of the Macondo incident shows the agency's emphasis on maximizing revenue generation as compared to safety and environmental regulation.⁵⁹³

5.6.2 BSEE Organizational Structure

Changes in the Department of the Interior post-Macondo are in line with the September 2010 US Department of Interior Outer Continental Shelf Safety Oversight Board's *Report to Secretary of the Interior Ken Salazar*, which recommends "In future institutional structures implemented through the ongoing BOEMRE reorganization, separate the management of environmental functions from the leasing and development to ensure that environmental concerns are given appropriate weight and consideration."⁵⁹⁴ They are also consistent with the Presidential Commission's recommendation to create "an independent agency within the Department of the Interior with enforcement authority to oversee all aspects of offshore drilling safety."⁵⁹⁵ The recommendation did not resolve the inherent problems with the Secretary of Interior's continued responsibility for simultaneous missions that often conflict. The Department of the Interior retains offshore production and revenue collection authority.

The various bureaus and services composing the Interior Department are not independent agencies; each is one part of a strict, hierarchical structure with the Secretary at the top of the pyramid.⁵⁹⁶ These line bureaus operate only on delegated authority because the statutes they implement do not even mention the bureau. Instead, final powers of decision remain with the Secretary of the Interior.⁵⁹⁷ The following organizational charts for the Department of the Interior illustrate the similarities between MMS and BSEE's positions within the Department. Both agencies report to the Assistant Secretary for Land and Minerals Management, who reports to the Deputy Secretary of the Interior, who reports to the Secretary. The Director of BSEE is three levels of authority below the Secretary of the Interior, as was the MMS Director. The agency branch responsible for safety follows the same hierarchical structure as before the Macondo blowout.

⁵⁹² National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling. *Deepwater: The Gulf Oil Disaster and the Future of Offshore Drilling - Report to the President*; January, 2011; pp 63.

⁵⁹³ House Committee on Energy and Commerce, JIT hearing, July 20, 2010, statement of Rep. Sutton, <http://www.gpo.gov/fdsys/pkg/CHRG-111hhrg77922/html/CHRG-111hhrg77922.htm>.

⁵⁹⁴ Lewis, W.; Kendall, M.; Suh, R. *U.S. Department of the Interior Outer Continental Shelf Safety Oversight Board Report to the Secretary of the Interior Ken Salazar*; US Department of the Interior: September 1, 2010; pp 33; <http://www.noia.org/wp-content/uploads/2015/12/DOI-OCS-Safety-Oversight-Board-Report.pdf> (accessed March 26, 2016).

⁵⁹⁵ National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling. *Deepwater: The Gulf Oil Disaster and the Future of Offshore Drilling - Report to the President*; January, 2011; pp 26, Recommendation A4.

⁵⁹⁶ George Cameron Coggins and Doris K. Nagel, Nothing Beside Remains: *The Legal Legacy of James G. Watt's Tenure as Secretary of the Interior on Federal Land Law and Policy*, 17 B.C. ENVTL. AFF. L. REV. 473, 482 (1990).

⁵⁹⁷ *Ibid.*

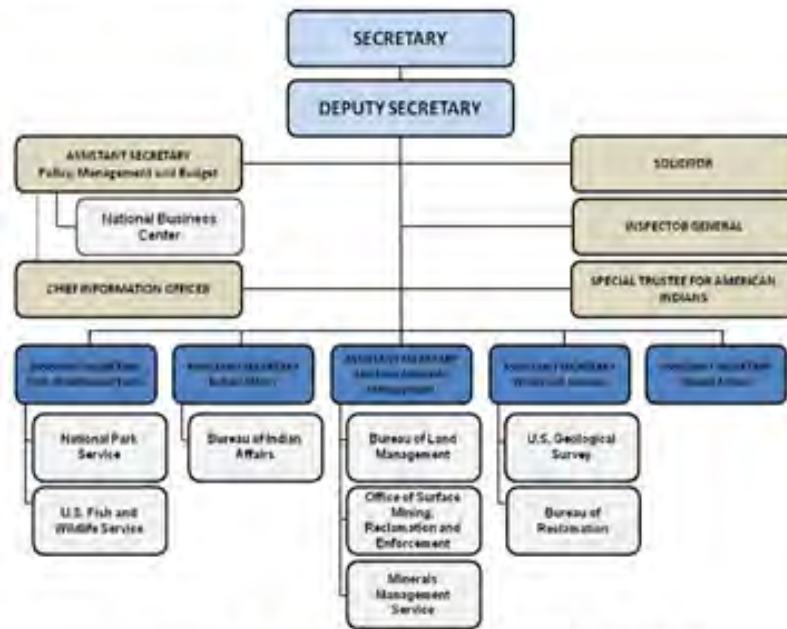
Other agencies with competing missions exist in the federal government.⁵⁹⁸ The federal administrative agencies and bureaus that manage public lands, like the former MMS, the Bureau of Land Management, and the US Forest Service, probably have the most diverse and sweeping range of goals, including production, environmental protection, public use, and worker and public safety, all of which are difficult to address equally.⁵⁹⁹ Each of these agencies has either admitted to or been accused of emphasizing one or more of their missions, typically the economic or production-related ones, over others such as safety.⁶⁰⁰ There are signs that BSEE may continue to emphasize the economic or production-related aspects of DOI's mission, particularly for permitting offshore operations.

⁵⁹⁸ In addition to the Department of the Interior, they include the Federal Bureau of Investigation, the US Forest Service, and the Department of Homeland Security, among others. *See, e.g.*, Eric Biber, Too Many Things To Do: How to Deal With the Dysfunctions of Multiple-Goal Agencies, 33 HARV. ENVT'L. L. REV. 1 (2009).

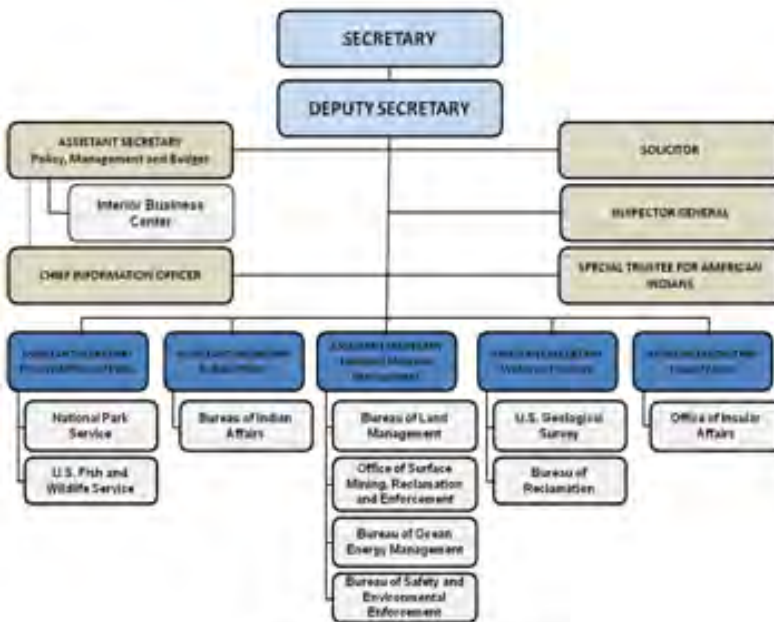
⁵⁹⁹ For an example, see Eric Biber, Too Many Things to Do: How to Deal With the Dysfunctions of Multiple-Goal Agencies, 33 HARV. ENVT'L. L. REV. 1, 2 (2009).

⁶⁰⁰ *Ibid.*

Interior Organizational Chart



Structure at the time of the Macondo Incident



Structure Post-Macondo

Figure 4-1. Department of Interior organization chart: at the time of the April 20, 2010, Macondo incident and currently.

5.6.3 Critical BSEE Drilling Permit Concerns

Post-Macondo, there has been a resurgence of pressure for BSEE to approve drilling permits. In more than one committee hearing that purported to explore other topics, the focus of questioning shifted to Gulf-area congressional representatives' concerns about oil production and the pace of drilling permit review. In an October 2011 House Natural Resources committee hearing about the results of the Joint Investigation Team,⁶⁰¹ committee members chided then-Director Bromwich for not focusing enough on speeding up drilling permit reviews and production.⁶⁰² A few months later, after testimony before the House and Senate appropriations subcommittees in 2012, members repeatedly questioned former Director Watson about BSEE's slow pace of drilling permit approvals.⁶⁰³ In episodes reminiscent of early MMS OCS subcommittee discussions, congressional representatives expressed concern about a decrease in drilling permits and about rigs "leaving our shores and going to Brazil" because the country needs to "get [offshore] production going up and prices at the pump going down."⁶⁰⁴ Less than two years following the incident, congressional attention to safety reform was nearly eclipsed by a seeming preoccupation with the potential effects of a drilling moratorium that had been in place while the Macondo well was still leaking oil into the Gulf. Thus, the inherent conflict between production and safety remains on the shoulders of the DOI Assistant Secretary, Deputy Secretary, and Secretary, all whom also face economic development and production pressures. By remaining under the DOI umbrella, the offshore safety regulator is not truly independent from these pressures, potentially compromising major accident prevention initiatives.

⁶⁰¹ As offshore safety regulators in the US, BOEMRE and USCG formed a Joint Investigation Team to investigate the Deepwater Horizon disaster. BOEMRE and the USCG published separate reports addressing their respective areas of safety responsibility; USCG, *Report of the Investigation into the Circumstances Surrounding the Explosion, Fire, Sinking and Loss of Eleven Crew Members Aboard the Mobil Offshore Drilling Unit Deepwater Horizon in the Gulf of Mexico, April 20-22, 2010*, Volume 1, MISLE Activity Number 3721503; pp 127. <http://www.uscg.mil/hq/cg5/cg545/dw/exhib/DWH%20ROI%20-%20USCG%20-%20April%2022,%202011.pdf> (Accessed March 26, 2016).

⁶⁰² Full Committee Oversight Hearing on the BOEMRE/U.S. Coast Guard Joint Investigation Team Report, U.S. House of Representatives Committee on Natural Resources, October 13, 2011, see e.g., pp 3 <https://www.gpo.gov/fdsys/pkg/CHRG-112hhrg70720/pdf/CHRG-112hhrg70720.pdf> (accessed March 26, 2016).

⁶⁰³ House Natural Resources Subcommittee on Energy and Mineral Resources Hearing on President Obama's Fiscal 2013 Budget Proposal for the Bureau of Ocean Energy Management and Bureau of Safety and Environmental Enforcement, March 8, 2012 <http://naturalresources.house.gov/calendar/eventsingle.aspx?EventID=282268> and Senate Appropriations Subcommittee on Interior, Environment and Related Agencies Hearing on the Proposed 2013 Appropriations for the Interior Department's Onshore and Offshore Energy Development Programs, March 14, 2012 http://www.appropriations.senate.gov/imo/media/doc/hearings/03_14_12%20Interior%20&%20Environment%20On&Off%20Shore%20energy%20GPO%20Record.pdf (accessed March 26, 2016).

⁶⁰⁴ House Natural Resources Subcommittee on Energy and Mineral Resources Hearing on President Obama's Fiscal 2013 Budget Proposal for the Bureau of Ocean Energy Management and Bureau of Safety and Environmental Enforcement, March 8, 2012 <http://naturalresources.house.gov/calendar/eventsingle.aspx?EventID=282268> (accessed March 26, 2016).

5.6.4 Historical Recognition for Separating Safety Oversight from Resource Development

Congress can rely on several precedents for separating safety and environmental oversight from a predecessor agency to an independent regulator. Some of the most analogous situations that resulted in legislative actions to separate safety oversight were prompted by a catastrophic incident much like Macondo. As it has done with mining and nuclear safety, Congress would need to take action to move offshore safety regulation into an independent agency separate from the Department of Interior.

5.6.4.1 Creation of the Mine Safety and Health Administration

The current Mine Safety and Health Administration (MSHA) was once the Mining Enforcement and Safety Administration (MESA), a subcomponent of the Department of the Interior. After a string of serious mining disasters in the 1970s (including Sunshine Silver, Buffalo Creek, Blacksville, and Scotia), Congress reviewed MESA's enforcement record, finding the fatality and injury numbers unacceptably high.⁶⁰⁵ Congress determined that a conflict existed between MESA, which was responsible for enforcing and administering the mine safety and health laws, and the Department of Interior, which "pursued the goal of maximizing production."⁶⁰⁶ Congress reasoned that separating the mine safety and health regulator from revenue-related activities would solve the problem of conflicting missions.⁶⁰⁷ MSHA was moved to the Department of Labor because its primary mission is to keep workers safe.⁶⁰⁸ Congress enacted the Federal Mine Safety and Health Amendments Act of 1977 to formalize MSHA's authority.⁶⁰⁹

5.6.4.2 Creation of the Nuclear Regulatory Commission

Just as the reorganization of MESA was prompted by a catastrophic accident, nuclear safety regulatory structures were reformed again after the Three Mile Island nuclear incident in 1979. The original Atomic Energy Commission (AEC) had three conflicting goals: managing the atomic weapons program, promoting the peaceful use of atomic power, and protecting public health and safety.⁶¹⁰ The AEC came under attack for its focus on developing nuclear technology and a cozy relationship with industry. Critics complained that it was "like letting the fox guard the henhouse."⁶¹¹ In response, Congress split the AEC, assigning safety regulation to the new Nuclear Regulatory Commission (NRC) and placing the development and research in what is now the Department of Energy.⁶¹² But the NRC's Reorganization

⁶⁰⁵ Senate Report 95-181 at 3405 (95th Congress), May 16, 1977
<http://arlweb.msha.gov/SOLICITOR/COALACT/leghist2.htm> (accessed March 26, 2016).

⁶⁰⁶ *Ibid.*

⁶⁰⁷ *Ibid.*

⁶⁰⁸ *Ibid.*

⁶⁰⁹ *Ibid.*

⁶¹⁰ Mazuzan, G.; Walker, S. *Controlling the Atom: The Beginnings of Nuclear Regulation, 1946-1962*, 1st ed.; University of California Press: 1984.

⁶¹¹ *Ibid.*

⁶¹² Energy Reorganization Act of 1974, Pub. L. No. 93-438, 88 Stat. 1233; *see also* Alice L. Buck, U.S. Dep't of Energy, *A History of the Atomic Energy Commission* 8 (1983) (describing history of conflict); *see also* Eric Biber, *Too Many Things To Do: How to Deal With the Dysfunctions of Multiple-Goal Agencies*, 33 HARV. ENV'TL. L. REV. 1, 33 (2009).

Plan No. 1 of 1980, a major overhaul of the agency, was the direct result of Three Mile Island accident. The 1980 plan established a program to integrate NRC findings about licensee performance into a public report, expanded performance-oriented and safety-oriented inspections and risk assessment, and strengthened and reorganized a separate, independent NRC enforcement office.⁶¹³

5.6.4.3 Creation of the UK HSE Offshore Division

In the UK, the offshore regulator was initially organized within the Department of Energy—Petroleum Engineering Division. This division held responsibility for developing and enforcing health and safety regulations in addition to licensing and resource development.⁶¹⁴ Although the conflict between these missions was apparent before then, a 1972 inquiry identified fundamental flaws in this arrangement.⁶¹⁵ In 1988, the Piper Alpha disaster confirmed that a complete reorganization of offshore safety regulation was necessary.⁶¹⁶

A major recommendation of the Lord Cullen report was to transfer the responsibility for offshore safety regulation from the Department of Energy to the UK's HSE. In response, the UK HSE Offshore Division was created in 1991, with sole responsibility for offshore safety oversight.⁶¹⁷ This separation of responsibility for regulating offshore safety from licensing and revenue collection continued in the UK ever since, despite various subsequent organizational changes. Following the recent implementation of the EU Offshore Safety Directive by the UK, the offshore regulator is now the Offshore Safety Directive Regulator (OSDR). In the US, a similar structure without inherent conflicts would strengthen BSEE in its regulatory function.

⁶¹³ See, e.g., NRC. Backgrounder on the Three Mile Island Accident, <http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/3mile-isle.html#impact>; Nuclear Regulatory Legislation: 113th Congress; 2nd Session (Volume 1, Number 11), <http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr0980/v1/sr0980v1.pdf> (accessed March 26, 2016).

⁶¹⁴ T. Hunter and J. Paterson, Offshore Petroleum Facility Integrity in Australia and the United Kingdom: A Comparative Study of Two Countries Utilising the Safety Case Regime, Oil, Gas & Energy Law Intelligence (October 2011), pp 7.

⁶¹⁵ T. Hunter and J. Paterson, Offshore Petroleum Facility Integrity in Australia and the United Kingdom: A Comparative Study of Two Countries Utilising the Safety Case Regime, Oil, Gas & Energy Law Intelligence (October 2011), pp 7.

⁶¹⁶ T. Hunter and J. Paterson, Offshore Petroleum Facility Integrity in Australia and the United Kingdom: A Comparative Study of Two Countries Utilising the Safety Case Regime, Oil, Gas & Energy Law Intelligence (October 2011), pp 7.

⁶¹⁷ UK HSE, Who we are, <http://www.hse.gov.uk/offshore/who.htm> (accessed March 26, 2016).

6.0 Conclusion

This final volume on the Macondo blowout focuses on several key attributes of more robust process safety management regulatory regimes that the CSB believes would enhance existing US offshore regulations. Many of the attributes of an effective goal-setting, risk-reduction regime focused on major accident prevention were not present pre-Macondo, and recent changes to the US offshore regulator's organization and regulations, particularly the establishment of SEMS, do not go far enough to ensure effective industry management and control of major hazards or prevent possible future Macondo-type incidents. Specifically, the US offshore regulatory regime does not adequately put the onus on industry to minimize risk and empower the regulator proactively to ensure effective industry management and control of major hazards.

The CSB finds that more robust US and international regimes focus on major accident prevention and continual improvement and they identify gaps and weaknesses that were causal to the Macondo incident. When taken together:

- Foster continual improvement by requiring companies to reduce their risks through goal-setting risk reduction techniques such as ALARP;
- Cultivate more adaptability;
- Clarify safety responsibility to focus accountability on key parties such as leaseholder/operator and drilling contractor that create or control major accident risks;
- Create opportunities for active workforce participation;
- Require written safety documentation by duty holders;
- Require proactive regulatory assessment and verification;
- Establish and use helpful process safety indicators to drive performance;
- Employ appropriately trained and experienced regulatory staff; and
- Feature a transparent, independent, and well-resourced regulator.

Collectively, these attributes provide the foundation for a more robust goal-setting risk-reduction regulatory model for US offshore drilling and production operations. Based upon its analysis of other high-hazard industries that use similar performance-based regulations, as well as other offshore regimes, the CSB concludes that augmenting the current US offshore regulatory model will better ensure major accident risk reduction.

7.0 Recommendations

The CSB issues four recommendations to the US Department of Interior for additional improvements in offshore safety.

CSB2010-I-OS-R11 Recommends Revision to the Offshore Safety Regulations to Establish a Regulatory Framework with a Specific Goal Of Preventing Major Accidents Based on the Attributes Described in CSB Macondo Investigation Report Volume 4.

United States Department of Interior

Revise and augment the offshore safety regulations, including the SEMS Rule (C.F.R. 250 subpart S), and issue guidance as it relates to those revisions/augmentations, to:

- a. Establish clear and consistent safety and environmental management responsibilities to prevent major accidents for the companies having primary control over the hazardous activities being undertaken (e.g., the owner/drilling contractor for a non-production installation and the leaseholder/operator for the production installation);
- b. Require all responsible parties as defined in R5(a) to develop documentation for each hazardous operation/facility it maintains primary control over, where the documentation demonstrates the party's systematic analysis that risks posed by all identifiable major accident hazards are reduced to As Low As Reasonably Practicable (ALARP) or similar risk-reduction target. The documentation shall include:
 1. Identification of major hazards and the barriers and safety management systems controls (including augmented SEMS elements) that will be used to reduce risk to ALARP or similar risk reduction target;
 2. Use of the hierarchy of controls to the greatest extent feasible in establishing safety barriers and controls;
 3. Identification of safety critical elements and tasks to establish and maintain safety barriers and controls, in fulfillment of R1 (See Volume 2);
 4. Demonstrate use of established qualitative, quantitative and semi-quantitative methods in determining (1) the barriers and safety management systems necessary to achieve ALARP risk reduction levels and (2) the performance requirements of those barriers and controls (e.g., reliability, functionality, and availability) to ensure their effectiveness;
 5. Identification of all US and international standards that have been applied, or will be applied, in relation to the facility, hazardous operation, or equipment used on/in connection with the operation for which required documentation is submitted. Should the responsible party wish to use standards other than well-recognized US or international consensus safety standards developed by a representative committee of diverse stakeholders, a detailed technical justification that those standards achieve risk-reduction to ALARP must accompany submitted documentation. The regulator may challenge or reject the technical justification. Remove from the US offshore safety regulatory scheme

the provisions that allow companies to substitute requirements to use the best available and safest technology with a showing of compliance with BSEE regulations.

- c. Require responsible parties as defined by R5(a) to fully implement all aspects of the documentation stipulated in R5(b) and establish a documented process to verify that all methods to manage, reduce, and control those hazards are effectively maintained throughout the lifecycle of the operation/facility.

CSB2010-I-OS-R12 Recommends Strengthening Preventative Oversight by the Offshore Safety Regulator

United States Department of Interior

Augment the capabilities and functioning of BSEE to incorporate the following proactive oversight mechanisms:

- a. Review of the documentation required to be submitted under CSB 2010-I-OS-R5(b) by technically qualified regulatory personnel who have the capability and authority to require modifications and improvements to the major hazards report as necessary, either before an acceptance process and commencement of the major hazards operation(s) or during periodic proactive review by the regulator;
- b. Establish a program for preventive, comprehensive inspections and audits with technically qualified staff as described in R7(a) to ensure that the responsible party as defined in R5(a) can demonstrate the risk reduction commitments stipulated in its major hazards report.

CSB2010-I-OS-R13 Recommends Continued Efforts to Develop a Sufficiently Resourced, Technically Qualified, and Diverse Staff

United States Department of Interior

Further enhance the qualifications, professional competency, and diversity of BSEE staff to implement major accident prevention programs by:

- a. Continuing efforts to enhance recruiting and retention of sufficient staff with a diversity of expertise, professional backgrounds and skill sets, such that BSEE has staff competencies in a variety of safety-critical and technical areas, including petroleum, chemical, and mechanical engineering; human and organizational factors; well design and control; and process safety, as well as those with industry experience to perform an even more expanded mission as envisioned in this report;
- b. Retaining the services of a human resources consulting firm to complement BSEE's efforts to date on human capital management and workforce planning issues, in light of documented difficulties in recruiting and retaining necessary staff, including the development of a plan with respect to large numbers of retirements facing the agency in the coming decade, as well as a compensation analysis (and a plan for subsequent periodic market analyses and benchmarking) to ensure BSEE remains competitive with other employers in the offshore industry. Augment the agency's compensation system as necessary to enable BSEE to attract and retain the level of staffing needed to perform BSEE's mission.

- c. Continuing to assess, expand, and improve ongoing BSEE training programs for new hires to provide all employees with robust skill sets, including appropriate technical training as well as interpersonal skills such as communications, negotiation and advocacy.

If funding, legislative authority, or other approvals are required to implement the recommended regulatory provisions in Recommendation R5 – R7, the Secretary of the Interior shall seek such authority from Congress or expedited hiring authority from the Office of Personnel Management.

CSB2010-I-OS-R14 Recommends Improving the Regulatory Reporting Program to Drive Continual Safety Improvement of Industry

United States Department of Interior

Expand the offshore safety regulatory program that collects, tracks, and analyzes safety performance indicators from industry to further influence industry efforts in reducing major accident risks to ALARP.

At a minimum, this program shall:

- a. Require the reporting of safety indicator data by all responsible parties, as defined in R5(a);
- b. Emphasize the greater preventive value of using leading indicators to actively monitor the health and performance of major accident safety barriers and the management systems meant to ensure their effectiveness, and work with industry to develop leading indicators that are measurable, actionable, normalized across industry, and that occur with sufficient frequency to allow for meaningful trending and analysis at the facility and corporate levels;
- c. Augment current reporting requirements to include leading safety performance indicators;
- d. Use the safety performance indicator data to:
 1. identify industrywide, companywide, and facility-specific safety trends and deficiencies;
 2. set annual process safety goals or targets for the industry, company and/or facility, as appropriate, based upon those identified safety trends and deficiencies;
 3. issue, at a minimum, annual reports that publicly communicate those trends, deficiencies, targets, and goals; and
 4. determine future appropriate allocations of BSEE resources and the prioritization of BSEE inspections;
- e. Include use of significant lagging indicators data (including those already mandated by 30 C.F.R. 250.188(a) and (b), such as major events like explosions, fires, gas releases, fatalities, INCs) as qualification criteria in the lease-approval and permit-to-drill decision-making processes by the regulator.

CSB2010-I-OS-R15 Recommends Strengthening Regulatory Requirements for Worker Engagement in the Management of Safety

United States Department of Interior

Issue participation regulations and training requirements for workers and their representatives that include the following:

- a. Worker-elected safety representatives and safety committees for each staffed offshore facility chosen under procedures overseen by the regulator; these safety representatives will have the

authority to interact with employers (such as operators and drillers) and regulators on issues of worker health and safety risks and the development and implementation of the major hazard report documentation;

- b. The elected worker representative has the right to issue an enforceable stop-work order if an operation or task is perceived as unsafe; all efforts should be made to resolve the issue at the workplace level, but if the issue remains unresolved, BSEE shall establish mechanisms such that the worker representative has the right and ability to seek regulator intervention to resolve the issue, and the regulator must respond in a timely fashion;
- c. The regulator will host an annual tripartite forum for workforce representatives, industry management, and the regulator to promote opportunities for interaction by all three entities on safety matters and to advance initiatives for major accident prevention.
- d. Protections for workers participating in safety activities with a specific and effective process that workers can use to seek redress from retaliatory action with the goal to provide a workplace free from fear that encourages discussion and resolution of safety issues and concerns. Protected activities include, but are not limited to reporting unsafe working conditions, near misses, and situations where stop work authority is used.

CSB2010-I-OS-R16

Recommends Incorporating API 75 by Reference upon Revision in
Response to CSB Recommendation R5

United States Department of Interior

Incorporate by reference into the offshore safety regulations the revised version of Recommended Practice 75, *Development of a Safety and Environmental Management Program for Offshore Operations and Facilities, 3rd Ed.*, May 2004 (reaffirmed May 2008) upon the inclusion of the CSB recommendations in R5 by API.

Appendix A: International Offshore Incidents and the US Response

Alexander Kielland and Regulatory Change in Norway

On March 27, 1980, the Alexander L. Kielland installation capsized in the North Sea, killing 123 of the 212 people on board.⁶¹⁸ The incident had a dramatic impact on the offshore industry and the Norwegian regulator, which was called the Norwegian Petroleum Directorate.⁶¹⁹ The day after the incident, a Commission was appointed to determine the causes of the accident and recommend actions to prevent similar incidents.⁶²⁰ The Commission's final report identified weaknesses in Norwegian inspection routines, safety training, and technical expertise in rescue equipment.⁶²¹ It also recommended centralizing regulatory authority and finalizing the Petroleum Activities Act, which licensed internal controls for offshore operations and implemented risk-analysis requirements.⁶²²

By the mid- to late-1980s, dramatic changes took place for the regulator and the overall management of major accident risk. New regulations and requirements were established for companies operating offshore to develop and implement internal control plans for safety management, which required regulatory approval.⁶²³ The aim of these regulatory changes was to shift from adherence to prescriptive requirements to a more comprehensive understanding of risk.⁶²⁴ In addition to centralizing regulatory authority, new concepts were introduced, including a "compliance responsibility" whereby companies were required to verify acceptable risk management.⁶²⁵

The Norwegian government began to consider its role as supervisor instead of inspector of the offshore industry.⁶²⁶ The regulator began interacting with industry professional associations and studies, adding to

⁶¹⁸ Norwegian Public Reports, Presented to Ministry of Justice and Police (March 1981), NOU 1981: 11 "The Alexander L. Kielland accident" p. 9.

⁶¹⁹ Melberg, Eldbjørg Vaage (13 Aug 2010) "Determined to learn from history," Norwegian Petroleum Directorate, <http://www.npd.no/en/publications/norwegian-continental-shelf/no1-2010/determined-to-learn-from-history/>

⁶²⁰ Norwegian Public Reports, Presented to Ministry of Justice and Police (March 1981), NOU 1981: 11 "The Alexander L. Kielland accident" p. 1-2.

⁶²¹ Norway PSA, "From prescription to performance in petroleum supervision," available at <http://www.ptil.no/news/from-prescription-to-performance-in-petroleum-supervision-article6696-878.html> (accessed on 10/31/2013), p. 5.

⁶²² Norway PSA, "From prescription to performance in petroleum supervision," available at <http://www.ptil.no/news/from-prescription-to-performance-in-petroleum-supervision-article6696-878.html> (accessed on 10/31/2013), p. 6.

⁶²³ Alternatives for Inspecting Outer Continental Shelf Operations, Committee on Alternatives for Inspection of Outer Continental Shelf Operations, Marine Board Commission on Engineering and Technical Systems National Research Council, (National Academy Press 1990, p.111.

⁶²⁴ Melberg, Eldbjørg Vaage (13 Aug 2010) "Determined to learn from history," Norwegian Petroleum Directorate, <http://www.npd.no/en/publications/norwegian-continental-shelf/no1-2010/determined-to-learn-from-history/>

⁶²⁵ Norway PSA, "From prescription to performance in petroleum supervision," available at <http://www.ptil.no/news/from-prescription-to-performance-in-petroleum-supervision-article6696-878.html> (accessed on 10/31/2013), p. 7.

⁶²⁶ Norway PSA, "From prescription to performance in petroleum supervision," available at <http://www.ptil.no/news/from-prescription-to-performance-in-petroleum-supervision-article6696-878.html> (accessed on 10/31/2013), p. 7.

its audit, verification, investigation and consideration responsibilities.⁶²⁷ Additionally, it began issuing “consents” to operate in lieu of “approvals.”⁶²⁸ These shifts helped the Norwegian offshore regulator transform from a compliance-based regime that shifted some of the responsibility for safety from the regulator into a goal-based regime that allowed industry to determine how best to meet those goals.⁶²⁹

Ocean Ranger and Regulatory Change in Canada

The *Ocean Ranger* drilling rig capsized off the Canadian coastal region of Newfoundland during a severe storm with hurricane-force winds, ending 84 lives.⁶³⁰ A Royal Commission on the Ocean Ranger Marine Disaster formed to investigate the incident found the prescriptive offshore regulatory regime overly complex and inadequately enforced. Recommendations from the Commission’s resulting two reports involved consolidation of regulatory powers under a single body.⁶³¹ At the time of the incident, the Canada Oil and Gas Lands Administration, Newfoundland Labrador Petroleum Directorate, and the US Coast Guard all held some regulatory authority over the Ocean Ranger’s drilling operation.⁶³² In 1985, the Canada-Newfoundland Offshore Petroleum Board was formed to centralize regulatory authority.⁶³³ As offshore development continued to grow into more complex and challenging geographical locations, the offshore safety regulators for Canada’s eastern provinces, the Nova Scotia and Newfoundland Labrador Offshore Petroleum Boards, worked with the Norwegians to implement changes they considered necessary to safely develop their resources.⁶³⁴ They have replaced many of their prescriptive offshore regulations for goal-based rules, moving much of their prescription to guidance documents. The boards

⁶²⁷ Norway PSA, “From prescription to performance in petroleum supervision,” available at <http://www.ptil.no/news/from-prescription-to-performance-in-petroleum-supervision-article6696-878.html> (accessed on 10/31/2013), p. 7.

⁶²⁸ Norway PSA, “From prescription to performance in petroleum supervision,” available at <http://www.ptil.no/news/from-prescription-to-performance-in-petroleum-supervision-article6696-878.html> (accessed on 10/31/2013), p. 7.

⁶²⁹ Melberg, Eldbjørg Vaage (13 Aug 2010) “Determined to learn from history,” Norwegian Petroleum Directorate, <http://www.npd.no/en/publications/norwegian-continental-shelf/no1-2010/determined-to-learn-from-history/>

⁶³⁰ Higgins, Jenny (2012) “Response to the Ocean Ranger disaster,” in Provincial Politics: The Peckford Government, 1979-1989, Newfoundland and Labrador Heritage, http://www.heritage.nf.ca/law/or_response.html, retrieved on 12/17/2014.

⁶³¹ Higgins, Jenny (2012) “Response to the Ocean Ranger disaster,” in Provincial Politics: The Peckford Government, 1979-1989, Newfoundland and Labrador Heritage, http://www.heritage.nf.ca/law/or_response.html, retrieved on 10/16/2013. This regulatory body is now known as the Canada-Newfoundland and Labrador Offshore Petroleum Board. There is also a Canada-Nova Scotia Offshore Petroleum Board which regulates offshore oil and gas industry safety for the Nova Scotia and frontier lands and a National Energy Board, which regulates offshore areas not otherwise covered by provincial or federal management systems. <http://www.neb-one.gc.ca/clf-nsi/rthnb/whwrndrgvrnnc/nbfctsh-eng.html> (accessed January 26, 2016).

⁶³² The Ocean Ranger was owned by Ocean Drilling and Exploration Company, an American corporation that had been contracted by Mobil Oil to drill. Higgins, Jenny (2012) “Response to the Ocean Ranger disaster,” in Provincial Politics: The Peckford Government, 1979-1989, Newfoundland and Labrador Heritage, http://www.heritage.nf.ca/law/or_response.html, retrieved on 10/16/2013.

⁶³³ Higgins, Jenny (2012) “Response to the Ocean Ranger disaster,” in Provincial Politics: The Peckford Government, 1979-1989, Newfoundland and Labrador Heritage, http://www.heritage.nf.ca/law/or_response.html, retrieved on 10/16/2013.

⁶³⁴ Trip notes from CSB meeting with the Canada Newfoundland and Labrador Offshore Petroleum Board (CNLOOPB), St. John’s, Newfoundland, Canada (March 7, 2011).

recognized that this fundamental change allowed for the regulator not only to keep step with industry advances, but also to demand continual safety improvement from industry without rule-making.⁶³⁵

Piper Alpha and Regulatory Change in the United Kingdom

On July 6, 1988, an explosion occurred aboard the Piper Alpha oil production platform 120 miles off the coast of Scotland in the North Sea.⁶³⁶ A series of explosions and fire killed 167 workers and almost completely destroyed the platform.⁶³⁷ This accident is the deadliest in the history of the offshore operations.⁶³⁸ Multiple systemic, organizational, and regulatory deficiencies caused the incident.⁶³⁹

The UK government conducted an inquiry that called into question the adequacy of the detailed prescriptive regulatory regime that existed at the time of the incident.⁶⁴⁰ Lord Cullen, the judge leading the inquiry, listed 106 recommendations to revamp offshore safety regulation in the UK, which included a recommendation for the responsible party providing a written case for safety identifying the hazards and demonstrating the adequacy of the safety management systems in place to control for each hazard at every offshore site.⁶⁴¹

The intent of the safety case was to shift the responsibility for identifying and mitigating hazards and risks from the regulator to the duty holder.⁶⁴² ⁶⁴³ Lord Cullen reasoned that “a regulator cannot be expected to assume direct responsibility for the on-going management of safety. ... this is and remains in the hands of the operator.”⁶⁴⁴ The UK government accepted all of the 106 recommendations,⁶⁴⁵ ushering in new goal-setting regulations to replace the existing prescriptive ones.⁶⁴⁶ The Offshore Installations (Safety Case)

⁶³⁵ Trip notes from CSB meeting with the Canada Newfoundland and Labrador Offshore Petroleum Board (CNLOOPB), St. John's, Newfoundland, Canada (March 7, 2011).

⁶³⁶ Dep't of Energy, The Public Inquiry into the Piper Alpha Disaster, 1990, 13 & 43; John Paterson, The Significance of Regulatory Orientation in Occupational Health and Safety Offshore, p. 378.

⁶³⁷ John Atherton, Incidents that Define Process Safety, 277; Bob Cavnar, Disaster on the Horizon, pp. 140-143.

⁶³⁸ Cullen Report ¶2.1; John M.T. Balmer, The BP Deepwater Debacle and Corporate Brand Exuberance, 18 J. Brand Mgmt. 97, 100 (2010).

⁶³⁹ Dep't of Energy, The Public Inquiry into the Piper Alpha Disaster, 1990, 121-22; John Paterson, The Significance of Regulatory Orientation in Occupational Health and Safety Offshore, 378.

⁶⁴⁰ Tina Hunter & John Paterson, Offshore Petroleum Facility Integrity in Australia and the United Kingdom, 9.

⁶⁴¹ Tina Hunter & John Paterson, Offshore Petroleum Facility Integrity in Australia and the United Kingdom, 9.

⁶⁴² Duty holders are considered to be “those who create and/or have the greatest control of the risks associated with a particular activity. Those who create the risks at the workplace are responsible for controlling them.” HSE. *Planning to do business in the UK offshore oil and gas industry? What you should know about health and safety*; October 2011; p 2. These entities may include operators, contractors, and subcontractors. <http://www.hse.gov.uk/offshore/guidance/entrants.pdf> (accessed June 5, 2013).

⁶⁴³ Tina Hunter & John Paterson, Offshore Petroleum Facility Integrity in Australia and the United Kingdom, pp. 9-10.

⁶⁴⁴ Tina Hunter & John Paterson, Offshore Petroleum Facility Integrity in Australia and the United Kingdom, pp. 9-10.

⁶⁴⁵ 180 Parl. Deb., H.C. (6th ser.) (1990) 329-45; Paterson, The Significance of Regulatory Orientation in Occupational Health and Safety Offshore, p. 381.

⁶⁴⁶ Paterson, The Significance of Regulatory Orientation in Occupational Health and Safety Offshore, p. 382.

Regulations came into force in 1992. By November 1993, a safety case for every installation had been submitted to the HSE, and by November 1995, all had had their safety case accepted by the HSE.

The Safety Case Regulations require the duty holder of every installation operating in UK waters to submit a safety case to HSE for acceptance. The safety case must fully explain the duty holder's plans for managing health and safety and controlling major accident hazards on the installation.⁶⁴⁷ It must demonstrate that the company has established safety management systems, identified risks and reduced them to as low as reasonably practicable, introduced management controls, provided a temporary safe refuge on the installation, and provided for safe evacuation and rescue.⁶⁴⁸ Duty holders are required to revise and update their safety cases as needed throughout the life cycle of their installation.

Outside the UK, other regulators also heeded the Cullen Report recommendations. A few months after the incident, Australia formed the Consultative Committee on Safety in the Offshore Petroleum Industry to advise the Minister for Resources on safety issues related to Australia.⁶⁴⁹ The Committee recommended that the key outcomes of the UK Piper Alpha inquiry be implemented in Australia, and regulatory reform ensued that made the safety case a requirement for offshore.⁶⁵⁰ The UK Safety Case Regulations were revised in 2005 to improve their effectiveness and reduce the burden of three yearly resubmissions.

Montara and Regulatory Change in Australia

On August 21, 2009, approximately six months prior to the Macondo incident, the Montara Wellhead Platform suffered a blowout in the Timor Sea off the coast of Australia.⁶⁵¹ The Montara rig caught fire and a well leaked tens of thousands of barrels of oil over two-and-a-half months before it was shut down.⁶⁵² Although it was similar to the Macondo event in many ways, including well capping and misunderstandings about cement,⁶⁵³ this blowout did not result in any fatalities. At the time of the Montara incident, Australia was already using a goal-setting regulation that required operating companies to set their own standards based on the hazards and risks posed by their activities, and then follow through on their commitment.⁶⁵⁴ The duty holder on the Montara platform failed to comply with its own well construction standards (WCS) in numerous ways, including (1) failure to test the cemented casing shoe and subsequent reliance on this untested barrier, (2) reliance on pressure containing corrosion caps (PCCCs) as a well barrier when these are not approved in the WCS, (3) failure to install sufficient barriers to meet the requirements for long-term suspension of the well, and (4) failure to monitor completion fluid

⁶⁴⁷ Piper Alpha Lessons Learnt (2008), Oil and Gas UK, p. 5.

⁶⁴⁸ Piper Alpha Lessons Learnt (2008), Oil and Gas UK, p. 5.

⁶⁴⁹ Patrick Brazil and Peter Wilkinson, The Establishment of a National Offshore Petroleum Safety Authority (2005) 24 Australian Resources and Energy Law Journal 87, pp. 88-89.

⁶⁵⁰ Tina Hunter & John Paterson, Offshore Petroleum Facility Integrity in Australia and the United Kingdom, pp. 15-16.

⁶⁵¹ David Borthwick, Report of the Montara commission of Inquiry, 5 (Commonwealth of Australia, 2010).

⁶⁵² POSC Report, p. 224.

⁶⁵³ Jan Hayes, Operator Competence and Capacity – Lessons from the Montara Blowout, p. 8.

⁶⁵⁴ Jan Hayes, Operator Competence and Capacity – Lessons from the Montara Blowout, p. 24.

parameters to ensure overbalance and subsequent reliance on this unmonitored barrier during temporary suspension.⁶⁵⁵

As a result of the accident, the Australian government organized an inquiry to identify the likely causes of the release, including regulatory failures.⁶⁵⁶ The Australian government report confirmed that the blowout was immediately caused by the failure of the primary well control barrier—the cement casing shoe.⁶⁵⁷ In addition, the report also criticized the operator’s reliance on improper secondary well control barriers, inadequate well management plans, improper pressure testing, and inexperienced personnel.⁶⁵⁸ The Montara blowout was the worst of its kind in Australia’s offshore industry history.⁶⁵⁹ The inquiry helped the Australian government realize that the provincial regulation of offshore safety was inadequate for preventing major accident. In other words, no problem was uncovered concerning the quality of the well-integrity regulations, but a failure of the provincial regulator (the Northern Territory) to adequately enforce the existing regulations, primarily based on the authority being too trusting of industry. It has since implemented changes to bring offshore operations under the purview of NOPSEMA, a national agency with the necessary resources to enforce existing regulations more effectively.

History of Regulatory Change in the US

The lessons learned from major industrial accidents helped shape the major hazard regulatory regimes around the world, both on and offshore. In most cases, post-accident regulatory changes involved replacing compliance-based regulations with performance-based, goal-setting risk-reduction models that support adaptability and continued risk-reduction to as low as reasonably practicable (ALARP) or some roughly equivalent standard, while providing the regulator with the needed resources and tools to drive continual improvement among major hazard facilities.

For example, the international offshore energy industry experienced several catastrophic accidents in the 1980s, including the *Alexander Kielland* in Norway in 1980, the *Ocean Ranger* in Canada in 1982 and *Piper Alpha* in the UK in 1988. These accidents prompted significant shifts in the offshore regulatory structures of Norway, Canada, the UK, and Australia from prescriptive compliance-based regulation to performance-based goal-setting models. The CSB’s Chevron Regulatory Report also provides a helpful discussion of the accidents that spurred global development of the safety case regulatory regime for onshore and offshore major hazards.⁶⁶⁰

At the time of the Alexander Keilland accident in 1980, the US GoM OCS region still consisted of shallow-water (defined here as less than 1,000 feet) exploration, drilling, and production operations, though some offshore drilling operations reached depths of approximately 1,500 feet in the California

⁶⁵⁵ Jan Hayes, Operator Competence and Capacity – Lessons from the Montara Blowout, p. 24.

⁶⁵⁶ Peter Wilkinson presentation on Montara to CSB, July 2011 (slide 14).

⁶⁵⁷ David Borthwick, Report of the Montara commission of Inquiry (Commonwealth of Australia, 2010), p. 7.

⁶⁵⁸ David Borthwick, Report of the Montara commission of Inquiry (Commonwealth of Australia, 2010), pp. 7-11.

⁶⁵⁹ David Borthwick, Report of the Montara commission of Inquiry (Commonwealth of Australia, 2010) p. 5.

⁶⁶⁰ US Chemical Safety and Hazard Investigation Board, *Chevron Richmond Refinery Pipe Rupture and Fire, Regulatory Report*, October 2014, http://www.csb.gov/assets/1/19/Chevron_Regulatory_Report_11102014_FINAL_-_post.pdf. See Chapter 3 for a helpful discussion of the accidents that spurred global development of the safety case regulatory regime for onshore and offshore major hazards.

OCS as early as 1975, which were considered “deepwater” drilling operations at the time.⁶⁶¹ The GoM also enjoys more hospitable weather, as well as calmer seas, minus the occasional hurricane, and warmer temperatures than the North Sea. Thus, it is perhaps not surprising that lessons learned overseas in foreign offshore oil-producing jurisdictions did not result in full-scale changes to the US offshore regulatory regime, especially with an accident such as the Alexander Keilland which was not a drilling platform or vessel but an accommodations vessel. Drilling and production regulations in the US thus remained prescriptive and focused heavily on equipment rather than on hazard assessments and safety management systems.

Yet a decade later, regulatory changes did not keep pace with changes in the field, as the US GoM OCS industry began exploring deeper waters, encountering ever more complex subsea geology and higher pressures during more dangerous drilling operations.⁶⁶² Approximately one year after the Piper Alpha incident,⁶⁶³ when the US experienced its own major offshore event—a 1989 explosion at the ARCO platform in the Gulf of Mexico resulting in 7 fatalities⁶⁶⁴—MMS commissioned a task force to review its regulatory program. It also requested that the Marine Board of the National Research Council recommend improvements in MMS’s operational safety and environmental protection inspection practices.⁶⁶⁵

The National Research Council Marine Board, referencing Piper Alpha, recommended adopting a more systems-based risk analysis focused on human factors, operational procedures, and modifications of equipment and facilities rather than adding equipment-specific prescriptive regulations.⁶⁶⁶ The Marine Board report identified that MMS’s prescriptive approach to regulating offshore operations actually forced industry into a compliance mentality that did not promote effective risk identification or comprehensive accident mitigation.⁶⁶⁷ The Board highlighted its long-held belief that the offshore regulatory regime should itself evolve by exploring different inspection, enforcement, and compliance approaches.⁶⁶⁸ For example, the Board found that MMS’s program at the time “incorporates no

⁶⁶¹ A Brief History of Offshore Oil Drilling, Presidential Oil Spill Commission Working Paper (Aug. 2010), <http://cybercemetery.unt.edu/archive/oilspill/20121211011815/http://www.oilspillcommission.gov/sites/default/files/documents/A%20Brief%20History%20of%20Offshore%20Drilling%20Working%20Paper%208%2023%2010.pdf>.

⁶⁶² Andrew Hopkins, *Disastrous Decisions* (CCH Australia, 2012), p. 138.

⁶⁶³ See Appendix C for an in-depth discussion of the Piper Alpha incident.

⁶⁶⁴ E.P. Danenberger et al., Investigation of March 19, 1989 Fire, South Pass Block 60 Platform B, Lease OCS-G 1608, OCS Report MMS 90-0016 (New Orleans: U.S. Dept of the Interior, MMS, April 1990), p.15, as cited in POSC, p. 70. It is important to note that the ARCO incident involved shallow-water drilling at approximately 200 feet below sea level. See <http://incidentnews.noaa.gov/incident/6687>.

⁶⁶⁵ Marine Board of the National Research Council Committee on Alternatives for Inspection of Outer Continental Shelf Operations, Alternatives for Inspecting Outer Continental Shelf Operations (Washington: National Academy Press, 1990): v, http://www.nap.edu/openbook.php?record_id=1517&page=1.

⁶⁶⁶ Marine Board of the National Research Council Committee on Alternatives for Inspection of Outer Continental Shelf Operations, Alternatives for Inspecting Outer Continental Shelf Operations (Washington: National Academy Press, 1990): 83, http://www.nap.edu/openbook.php?record_id=1517&page=1.

⁶⁶⁷ Alternatives for Inspecting Outer Continental Shelf Operations, Committee on Alternatives for Inspection of Outer Continental Shelf Operations, Marine Board Commission on Engineering and Technical Systems National Research Council, (National Academy Press 1990).

⁶⁶⁸ Alternatives for Inspecting Outer Continental Shelf Operations, Committee on Alternatives for Inspection of Outer Continental Shelf Operations, Marine Board Commission on Engineering and Technical Systems National Research Council, (National Academy Press 1990) at v.

mechanism or analytical basis for systematically upgrading safety requirements for OCS operations.”⁶⁶⁹ Specifically, the Board found that MMS failed to:

- analyze data to identify safety trends;
- collect data consistently across operators and facilities that would permit such analyses;
- document operator safety histories; or
- cross-reference PINCs (potential incidents of non-compliance) and incidents of noncompliance (INCs) to events (accidents).⁶⁷⁰

The Board recommended that MMS enhance its collection and analysis of safety-related data to “permit systematic targeting of spot inspections, and ... to support a variety of continuing safety analysis to be used to improve safety and environmental protection on the OCS.”⁶⁷¹ The Board noted these activities were “essential to an ongoing ‘risk assessment and management’ program.”⁶⁷² It recommended that MMS emphasize “detection of potential accident-producing situations—particularly those involving human factors, operational procedures and modifications of equipment and facilities—rather than scattered instances of non-compliance and hardware specifications.”⁶⁷³ MMS was not slow to act on the Board’s recommendations, perhaps because, along with the US Coast Guard, it was preoccupied with the effects of the Exxon Valdez oil spill, in March 1989.⁶⁷⁴

Two years later, in 1991, MMS introduced a regulatory model for offshore safety management, the Safety and Environmental Management Program (SEMP).⁶⁷⁵ Industry pushback led to SEMF stagnating and it became a voluntary program whereby MMS asked offshore operators⁶⁷⁶ to adopt active safety and environmental management approaches in their operations.⁶⁷⁷

[CALL OUT BOX START]

Offshore Operators Historically Opposed SEMF Due to Its Prescriptive Nature

Industry opposition to SEMF’s incorporation as regulation, as documented in public comment (excerpted below) submitted during consideration of the issue, revealed industry’s concerns about the limiting and compliance-based nature of a prescriptive regime. These concerns could be ameliorated by supplementing the existing regulatory structure with the attributes identified in this volume..

⁶⁶⁹ *Ibid.*, p. 81.

⁶⁷⁰ *Ibid.*, p. 81.

⁶⁷¹ *Ibid.* p. 75.

⁶⁷² *Ibid.*, p. 75.

⁶⁷³ *Ibid.*, p. 83.

⁶⁷⁴ On March 24, 1989, the tanker *Exxon Valdez* grounded on Bligh Reef in Alaska’s Prince William Sound, rupturing spilling nearly 11 million gallons of Prudhoe Bay crude oil into the Sound. Before the 2010 *Deepwater Horizon* oil spill, it was the largest single oil spill in US coastal waters.

⁶⁷⁵ Oil and Gas and Sulphur Operations in the Outer Continental Shelf, 56 Fed. Reg. 30,400 (July 2, 1991).

⁶⁷⁶ “Operators” as referenced in US offshore regulations refer explicitly to the leaseholders of the well; this term does not include drilling contractors or other well service providers.

⁶⁷⁷ Advanced Notice of Proposed Rulemaking, Oil and Gas and Sulphur in the Outer Continental Shelf (OCS)—Safety and Environmental Management Systems, 71 Fed. Reg. 29,277 (May 22, 2006).

“As MMS has noted, most industrial accidents and spill result from human error or organizational errors, not device or equipment failures and we agree. So, the question is, How do we overcome human error? It is difficult for us to see how a mandatory, highly prescriptive program proposed in the rulemaking will overcome human error.” Offshore Operators Committee, OOC/API Comments on Proposed Subpart S-SEMS, RIN 1010-AD 15; FR Vol. 74, No. 115, (June 17, 2009).

“While BP is supportive of companies having a system in place to reduce injuries, risks, accidents and spills, we are not supportive of the extensive, prescriptive regulations proposed in this rule.” — BP America⁶⁷⁸

“The proposed rule takes the approach of incorporating API RP 75 into the regulation and then rewords the requirements. Complicating these proven processes with additional prescriptive requirements may be detrimental to the overall implementation and will take away from the key elements of an integrity management system.” — Exxon Mobil⁶⁷⁹

[CALL OUT BOX END]

Before the Macondo incident, MMS maintained an insular view of learning from international accidents. In particular, eight months prior to the Macondo incident, MMS largely disregarded the causes of a blowout in Australian waters from the Montara Wellhead Platform.⁶⁸⁰ Especially concerning about this situation were the similarities between that incident and Macondo,⁶⁸¹ and despite differences in the regulatory framework between the two countries, and some differences in the operations, sufficient similarities between Montara and Macondo blowouts made Montara a missed learning opportunity for MMS. For example, the failure of the cement to seal in the well, improper pressure testing, and reliance on limited and compromised (or missing) barriers all presented MMS with opportunities to study a major offshore accident. This could have aided MMS in identifying potential deficiencies in the US regulatory system, or in sharing some lessons learned with industry to enhance major accident prevention in US waters.

MMS might have learned lessons from Montara if it had mechanisms for assessing major incidents and implementing needed changes from the lessons learned. But MMS lacked those mechanisms. Despite the enormous concern in Australia about the Montara incident, the Director of MMS at the time said, “what had happened in Australia was not going to happen here.”⁶⁸² She also reported the US had little to learn from the event because Australia’s offshore regulatory standards were not as strong as those in the US.⁶⁸³ The CSB observed that such statements from MMS offshore regulatory personnel made during interviews reflected an agency that was not attuned to learning best-practice lessons from other jurisdictions and lacked a broader continual learning philosophy aimed at major accident prevention and continued improvement. Rather, at the time of the Montara incident, MMS appeared to focus more on issues such as

⁶⁷⁸ Comment on Proposed Rule (74 Fed. Reg. 1010-AD15), from Richard Morrison, BP, to MMS, (September 19, 2009).

⁶⁷⁹ Comment on Proposed Rule (74 Fed. Reg. 1010-AD15) from Jonathan Armstrong, Exxon, to MMS (September 14, 2009).

⁶⁸⁰ U.S. Chemical Safety and Hazard Investigation Board interview of former MMS Director, April 5, 2011; David Borthwick, Report of the Montara commission of Inquiry, 5 (Commonwealth of Australia, 2010).

⁶⁸¹ POSC Report, pp. 125, 327.

⁶⁸² U.S. Chemical Safety and Hazard Investigation Board interview of former MMS director, 65, April 5, 2011.

⁶⁸³ U.S. Chemical Safety and Hazard Investigation Board interview of former MMS director, 63-64, April 5, 2011.

offshore production and oil and gas royalty revenue collection than on major accident prevention.⁶⁸⁴ Thus, notwithstanding Montara, it took the Macondo disaster to spur increased dialogue regarding safety management offshore in the US.

History demonstrates that the broad lessons of Macondo were not new. While other regimes made drastic changes to their regulatory frameworks after major offshore accidents, it was not until the US had an accident in its own waters that change was spurred. In a break from the past, and in an effort to prevent similar incidents, the US offshore regulatory regime reorganized and introduced new safety regulations beginning in 2010 in the aftermath of Macondo.

Two months after the Macondo incident, MMS was renamed the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE). On October 1, 2010, the revenue collection arm of the former MMS moved to its own office, the Office of Natural Resources Revenue.⁶⁸⁵ In October 2011, then-Department of Interior Secretary Salazar created the Bureau of Ocean Energy Management (BOEM) and BSEE from the former BOEMRE.⁶⁸⁶ BOEM, with leasing responsibilities, and BSEE, with environmental and safety responsibilities,⁶⁸⁷ both report to the same Assistant Secretary for Land and Minerals Management, and the heads of these two bureaus still report to Secretary of the Interior.⁶⁸⁸ According to communications from former Secretary Salazar and the Department of the Interior, however, this restructuring had been intended to eliminate conflicts associated with the differing missions of promoting resource development, enforcing safety regulations, and maximizing revenue from offshore oil and gas development.⁶⁸⁹

The reorganization was in line with the Presidential Oil Spill Commission's recommendation to create "an independent agency within the Department of the Interior with enforcement authority to oversee all aspects of offshore drilling safety."⁶⁹⁰ The Presidential Commission's recommendation did not resolve the inherent problems associated with the Secretary of Interior's continued responsibility for missions that often conflict with one another. The Department of the Interior retains offshore production and revenue collection authority. In addition, the various bureaus and services that compose the Interior Department

⁶⁸⁴ U.S. Chemical Safety and Hazard Investigation Board interview of former MMS director, 9-17, April 5, 2011. Issues included (1) an offshore renewable energy program, (2) five-year plans for offshore oil and gas production under the OCSLA, (3) environmental sensitivity analysis for the current five-year plan, and (4) ongoing issues about oil and gas royalty revenue collection.

⁶⁸⁵ Fact Sheet, BSEE and BOEM Separation: An Independent Safety, Enforcement and Oversight Mission (January 19, 2011). [http://www.bsee.gov/uploadedFiles/BOEMRE%20Reorganization%20Fact%20Sheet\(1\).pdf](http://www.bsee.gov/uploadedFiles/BOEMRE%20Reorganization%20Fact%20Sheet(1).pdf).

⁶⁸⁶ Fact Sheet, BSEE and BOEM Separation: An Independent Safety, Enforcement and Oversight Mission (January 19, 2011), available at [http://www.bsee.gov/uploadedFiles/BOEMRE%20Reorganization%20Fact%20Sheet\(1\).pdf](http://www.bsee.gov/uploadedFiles/BOEMRE%20Reorganization%20Fact%20Sheet(1).pdf).

⁶⁸⁷ The US Coast Guard shares responsibility with BSEE for regulating safety and the environment offshore.

⁶⁸⁸ Secretarial Order No. 3299 (May 19, 2010), available at <http://www.doi.gov/deepwaterhorizon/loader.cfm?csModule=security/getfile&PageID=32475>.

⁶⁸⁹ BSEE. *The Reorganization of the Former MMS*. <http://www.bsee.gov/About-BSEE/BSEE-History/Reorganization/Reorganization/>.

⁶⁹⁰ POSC Report Recommendation A4, p. 256. Both the US Coast Guard (regulates safety of navigation and environmental protection on OCS units and vessels) and BSEE have shared responsibilities for safety regulation on the OCS. The two entities have a Memorandum of Agreement to establish a process for the identifying offshore safety and environmental management requirements within the jurisdiction of both agencies and to spur joint development of policies and guidance. See http://www.bsee.gov/uploadedFiles/BSEE/Newsroom/Publications_Library/BSEE-USCG%20MOA_FINAL%20SIGNED%2004-30-13.pdf (accessed January 6, 2016).

are not independent agencies; each is part of a strict, hierarchical structure with the Secretary at the top of the pyramid.⁶⁹¹ These line bureaus also operate only on delegated authority because the statutes they implement do not even mention the bureaus.⁶⁹² Instead, final decision authority remains with the Secretary.⁶⁹³

Once BSEE was created, the agency made an effort to increase its staffing and hire additional inspectors. According to former BSEE Director James Watson, between April 2010 and March 2012, BSEE increased its number of inspectors by 50 percent and its number of engineers by nearly 10 percent.⁶⁹⁴ In conjunction with changes to the regulatory body, new safety regulations were also established. The Safety and Environmental Management Systems (SEMS) rule is the new regulation through which BSEE oversees oil and gas offshore safety. Its stated purpose is to ensure safe operations on the OCS. In promulgating this regulation, BSEE stated that “requiring operators to implement SEMS will reduce the risk and number of accidents, injuries, and spills during OCS activities.”⁶⁹⁵ The final rule, issued in October 2010, incorporated by reference and made mandatory API RP 75(3rd edition). As a result, SEMS established requirements pertaining to 13 specific safety management elements, including hazard analysis, management of change, operating procedures, and training, among others.⁶⁹⁶ Any permissive language found in API RP 75 was also amended in the final version of the rule and made mandatory.

In April 2013, BSEE published additional safety provisions as amendments to SEMS. Informally called “SEMS II,”⁶⁹⁷ it provided additional requirements for stop-work authority and ultimate work authority, employee participation in developing and implementing SEMS programs, reporting unsafe working conditions, conducting independent third-party audits of operators’ SEMS programs, and performing job safety analyses (JSAs) for activities identified in an operator’s SEMS program.⁶⁹⁸

⁶⁹¹ George Cameron Coggins and Doris K. Nagel, *Nothing Beside Remains: The Legal Legacy of James G. Watt’s Tenure as Secretary of the Interior on Federal Land Law and Policy*, 17 B.C. ENV’T L. AFF. L. REV. 473, 482 (1990).

⁶⁹² Since the Secretary of the Interior created each bureau without presidential or congressional direction, the bureaus are operating through authority delegated to the Secretary, not to the head of the bureaus. Thus, the bureaus are purely creations of the Secretary of the Interior.

⁶⁹³ George Cameron Coggins and Doris K. Nagel, *Nothing Beside Remains: The Legal Legacy of James G. Watt’s Tenure as Secretary of the Interior on Federal Land Law and Policy*, 17 B.C. ENV’T L. AFF. L. REV. 473, 482 (1990).

⁶⁹⁴ See *Statement of James Watson, Director Bureau of Safety and Environmental Enforcement, United States Department of the Interior Committee on Appropriations Subcommittee on Interior, Environment and Related Agencies House of Representatives, March 7, 2012*, http://www.bsee.gov/uploadedFiles/BSEE/Newsroom/Congressional_Testimony/Congressional%20Testimony%2020120307.pdf (accessed December 3, 2014). Director Watson noted that there was still a considerable number of positions to be filled, including additional inspectors, engineers, regulatory specialists, and other disciplines.

⁶⁹⁵ Final Rule, Oil and Gas and Sulphur Operations in the Outer Continental Shelf—Safety and Environmental Management Systems, 75 Fed. Reg. 63,610 (Oct. 15, 2010).

⁶⁹⁶ 30 C.F.R. § 250, Subpart S (2011).

⁶⁹⁷ Final Rule, Oil and Gas and Sulphur Operations in the Outer Continental Shelf—Revisions to Safety and Environmental Management Systems, 78 Fed. Reg. 20,423 (Apr. 5, 2013).

⁶⁹⁸ Proposed Rule, Oil and Gas and Sulphur Operations in the Outer Continental Shelf—Revisions to Safety and Environmental Management Systems, 76 Fed. Reg. 56,684 (Sept. 14, 2011).

By the

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