

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

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“The industry needs a robust, expertly staffed, and well-funded regulator that can keep pace with and augment industry's technical expertise. A competent and nimble regulator will be able to establish and enforce the rules of the road to assure safety without stifling innovation and commercial success.”

Testimony of Marvin Odum, President, Shell Oil Company, and Upstream Americas Director, Royal Dutch Shell.¹

The regulation of the offshore oil and gas industry in the U.S. Gulf of Mexico has not been robust, expertly staffed, well funded, competent or nimble. The fatality rate for U.S. offshore oil and gas workers has been more than four times higher per hour worked than in Europe, according to data collected by industry groups and government regulators (see below), despite many of the same companies working in both venues. This fatality data suggest that regulators in developed offshore oil and gas producing countries – Norway, the United Kingdom, Australia and Canada – regulate for safety much more effectively than their US peers.

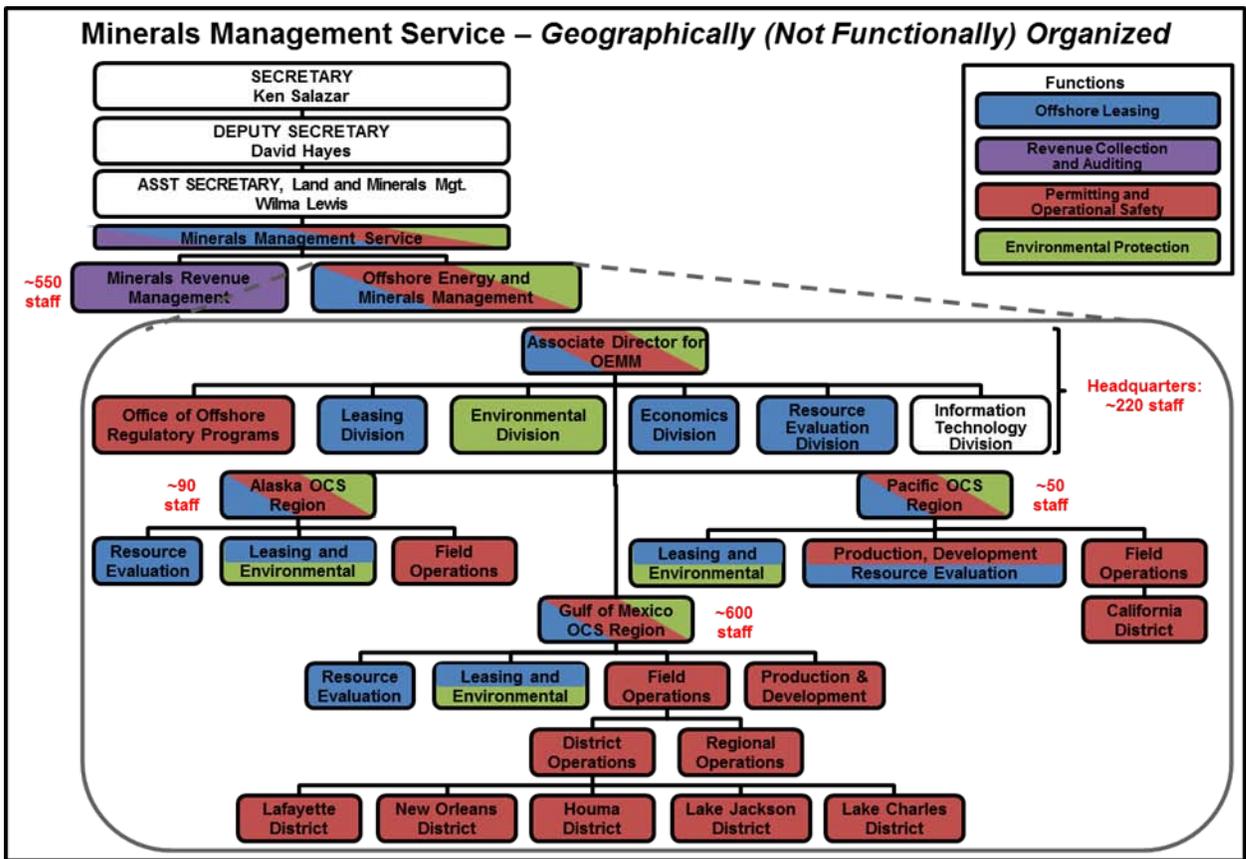
The paper examines some shortcomings in the US regulatory approach, particularly its failure to embrace a risk-based oversight approach. It presents a case for restructuring the Offshore Program, now the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) and creating a separate, independent safety regulator with consolidated authority over energy-related operations, structures, and workers. It discusses institutions, processes, and resources in the U.S. context for effective risk

¹ Testimony before the National Commission on BP Deepwater Horizon and Offshore Drilling, November 9, 2010.

assessment and management of the offshore energy sector, and it examines other countries' regulatory approaches.

The U.S. Offshore Program: Unclear Purpose, Limited Resources, and Conflicts of Interest

The Minerals Management Service (MMS, now BOEMRE) was created by Secretary of the Interior James Watt to regulate offshore oil and gas development, and manage revenue collection from all federal and Indian lands. It was organized with regional managers responsible for all aspects of program implementation - leasing, safety, and environmental protection – with wide variation in resources and personnel across the three regional offices: the Gulf of Mexico, Pacific, and Alaska.²

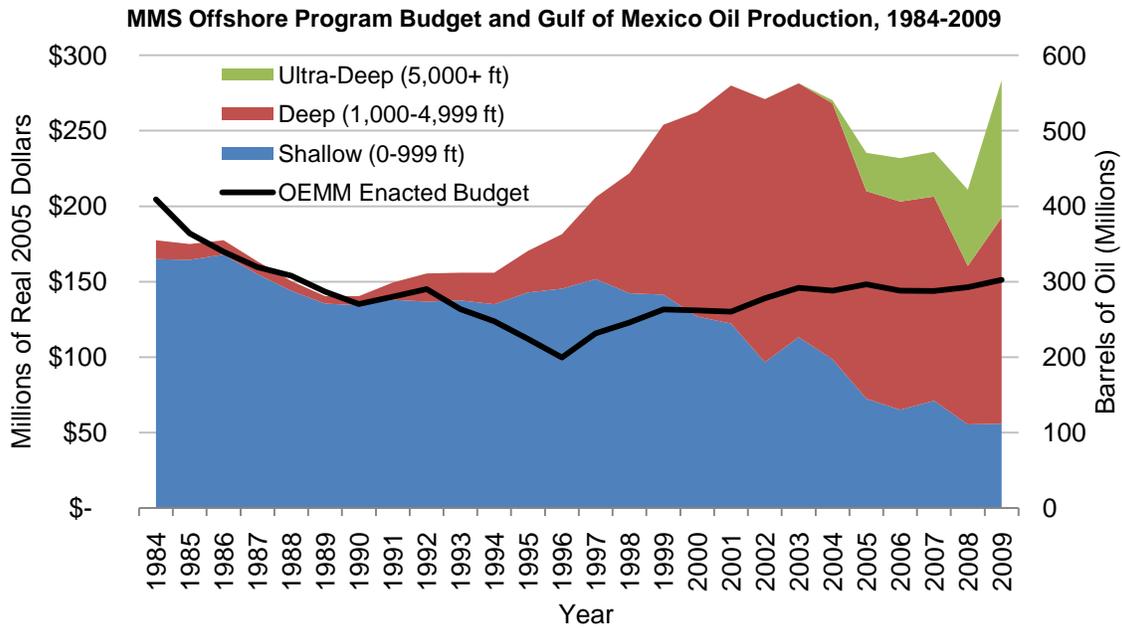


Safety oversight of the offshore oil and gas industry was under a structure where leasing and increasing production were most visible and valued at the top of the organization. Senior managers generally agreed that expanded oil and gas production on the outer continental shelf (OCS) was in the national interest, and many saw the safety program

² See "Who is BOEMRE?" <http://www.boemre.gov/aboutBOEMRE/>

as being necessary to protect and expand opportunities for such oil and gas development.³

A lull in offshore activity in the early 1990s turned into a boom with the expansion into deepwater; in fact a record number of wells were drilled in 1997.⁴ This acceleration in activity dramatically increased the workload for the Offshore Program, in particular in the Gulf of Mexico regional office. The new drilling operations tended to be more complex and farther from shore, with well production rates orders of magnitude higher than were common for the shallow water shelf leases. In the midst of this expansion, the Offshore Program in 1996 reached the nadir of its resources in terms of total budget.⁵ The budget austerity of the 1990s also affected the Coast Guard, leaving MMS to fill in the gaps with respect to safety of offshore personnel—an added responsibility without additional resources.⁶



Source: Commission staff, adapted from DOI and EIA
 Note: The budget numbers do not include revenue management or general administration.

³ Interview with Bud Danenberger, former Chief Engineer of MMS.
⁴ One of the reasons for the dramatic scale-up in drilling was the greater proportion of oil than natural gas in deepwater reservoirs, therefore higher profitability even with the higher production costs. Commission staff analysis of BOEMRE historical wells-drilled data.
⁵ Commission staff analysis of MMS yearly budget request and enactments, tracked by nominal and real (2005) dollars.
⁶ Inspection Under, and Enforcement of, Coast Guard Regulations for Fixed Facilities on the Outer Continental Shelf by the Minerals Management Service, 67 Fed. Reg. 5912 (February 7, 2002).

MMS Actions to Manage Deep Water Expansion

In 1998, MMS implemented a performance management approach for the larger, more complex deepwater production systems then being developed by industry. *Notice to Lessees and Operators (NTL) 98-8N* required operators to engage MMS at the conceptual stage for a Deep Water Operations Plan (DWOP). A DWOP is required any time a non-conventional production technology is to be used, even if the project is in shallow water. DWOPs are first submitted at the conceptual stage so that major investments are not made before BOEMRE is satisfied with the mitigation of safety and environmental risks. If the conceptual plan is approved, a final DWOP covering all aspects of the structure, station keeping, riser, subsea components, safety systems, and operating procedures must be submitted. Proposed use of any new technology or alternative compliance plans must be identified and described.⁷

As in the regimes of the peer regulators in other countries with similar safety and environmental concerns, the intent was to “allow MMS to review a project from a total system approach, emphasizing operational safety and environmental protection” to demonstrate that the project was being developed in an acceptable manner prior to major expenditures for engineering design.⁸ Given the known risks associated with large offshore installations,⁹ the industry embraced the standards for risk assessment and failure analysis for these deepwater production facilities by developing an industry standard which was referenced in the regulation.

Philosophically, the agency was moving toward a regulatory regime tied more to performance and less to prescription. At an international conference of the Society of Petroleum Engineers (SPE) in 1998, a senior MMS manager laid out the current thinking with regard to regulation, “[B]oth the Marine Board and an internal MMS Inspection task force report reinforced the point that operators bear the primary responsibility for safety. The Marine Board report noted that the major factors in safety operations are (1) management’s safety policy and (2) the attitudes and training of personnel who manage and operate the facility.”¹⁰ This extended to voluntary adoption by industry of Safety and Environmental Management Plans rather than being required to do so.

⁷ Scarlett, Lynn, Igor Linkov, and Carolyn Kousky. Discussion Paper, Risk Management Practices, Cross-Agency Comparisons with Minerals Management Service, January 2011, RFF DP 10-67. P. 24

⁸ Notice of revised guidelines for Deepwater Operations Plans
<http://www.gomr.boemre.gov/homepg/whatsnew/newsreal/1998/980617s.html>

⁹ Ten years earlier, a gas leak on Occidental Petroleum’s Piper Alpha platform in the U.K. North Sea caused an explosion that killed 167 people. http://home.versatel.nl/the_sims/rig/pipera.htm Arco’s South Pass Block 60 Platform B had been destroyed by fire and explosion in 1989, killing seven people.
<http://www.gomr.boemre.gov/PDFs/1990/90-0016.pdf>

¹⁰ A Performance-Based Approach to Offshore Regulation, C.U. Kallaur, Minerals Management Service, presented at the 1998 SPE International Conference on Health, Safety and Environment in Oil and Gas Exploration and Production. Caracas, Venezuela, June 7-10, 1998. The Marine Board of the National Academy of Sciences report had been in response to a request from MMS in the aftermath of the Piper Alpha and South Pass Block 60 accidents.

The technical reviews of these complex deepwater systems strained the agency's resources since they called for trained engineers and scientists to complete them.¹¹ To manage an expanding workload in an environment of budget austerity, MMS announced an increase in the rental rates on deepwater leases that had been issued under royalty waivers. Rent paid on a lease during the exploration and development stage prior to production, was the only significant source of funds beyond appropriations available to support the agency's expanding deepwater oversight responsibilities. Industry successfully lobbied its supporters in the Gulf Coast Congressional delegations to prevent any increase in these rental rates.¹²

As it introduced the deepwater operations plans, MMS also initiated efforts to modify the incident reporting requirements to better assess risks. (As explained below, the sort of data on accidents collected by regulators abroad can become the basis for improved standards.) Industry opposed such reporting as duplicative of Coast Guard requirements. MMS proposed instead a system of voluntary reporting of performance measures.¹³

In 2003, after five years of voluntary reporting proved inadequate, MMS proposed a new rule to require more detailed incident reporting.¹⁴ This new data collection rule would have included all unintentional gas releases, a hazard for fires and explosions and significant indicator of process safety risks. The Offshore Operators Committee (OOC)¹⁵ vehemently objected, stating that the "proposed rulemaking is very prescriptive, complicated and burdensome. Since it is so prescriptive compared to the existing performance based regulations, the proposed rulemaking may actually limit the reporting of certain incidents and the data received." The comments again cited possible duplication with reporting to the Coast Guard. According to a former head of

¹¹ Reviews of the facilities were a priority given the risk of structural failures, as happened with the BP Thunder Horse platform. Structural defects were revealed during a relatively minor hurricane months after deployment which then took three years to repair. http://www.rigzone.com/news/article.asp?a_id=36258.

¹² In 1998, in the bill funding MMS for fiscal year 1999 the Congress directed MMS "to maintain its current financial terms for deepwater leases for the remainder of the incentive period." (U.S. Congress Conference Report, Making Omnibus Consolidated And Emergency Supplemental Appropriations For Fiscal Year 1999, Report 105-825, October 19, 1998. P. 1207.) Representative Bob Livingston (R-LA) and Senator Kay Bailey Hutchison (R-TX) took the lead on the appropriations riders in their respective chambers. Inside Energy, Oct 5, 1998.

¹³ U.S. Minerals Management Service. "NTL No. 98-6N, Performance Measures for OCS Operators and Form MMS-131," Notice to Lessees and Operators (NTLs) of Federal Oil, Gas, and Sulphur Leases in the Outer Continental Shelf. April 1, 1998. <http://www.boemre.gov/ntls/Attachments/ntl98-6n.htm>. The industry in the U.K. had formed an organization, Step Change for Safety, the previous year with the explicit purpose of improving offshore safety. <http://stepchangeinsafety.net/stepchange/About.aspx>

¹⁴ U.S. Minerals Management Service, "Oil and Gas and Sulphur Operations in the Outer Continental Shelf - Incident Reporting Requirements," *Federal Register* 68, no. 147.44910 (July 8, 2003). http://www.boemre.gov/federalregister/PDFs/July8_FR.pdf.

¹⁵ The Offshore Operators Committee (OOC) is the lobbying group representing most of the offshore industry including BP, Shell, Exxon, and Chevron, as well as a number of smaller operators. Comments filed November 24, 2003.

MMS in an interview with Commission staff, the MMS held firm, only to be overruled by the White House Office of Management and Budget (OMB).¹⁶

The final rule, not issued until 2006 required a gas release be reported to MMS only if it resulted in an “equipment or process shut-in” or mechanical closure.¹⁷ This was significantly less information than the companies had to report to their regulators in Norway and the U.K. Not only had the offshore industry long been required to track and report in detail on the circumstances of such releases to regulators in the North Sea, such information was subject to extensive scrutiny by operators as well as regulators (see further discussion below). Duplication with the Coast Guard or not, the reporting requirement applied only to accidental releases; without a system failure there would be no reporting requirement. During the time it took to complete the narrowed down rule, there were 246 fires or explosions, at least 21 with injuries or fatalities. Better understanding of the likelihood and circumstances of such unintended gas releases – precursors to a fire or explosion – might have helped prevent some of these incidents.

Offshore Statistics for Fires and Explosions (1996-2009)¹⁸

Years	Fires & Explosions	Events with Injuries	Events with Fatalities
1996-'02	657	47	4
2003-'05	246	21	1
2006-'09	506	7	1

From 1996 through 2009, in addition to the fires and explosions shown in the chart above, there were 79 losses of well control in the Gulf of Mexico, some of which led to an explosion or fire. The Macondo blowout in April 2010 led to both. (Appendix A includes a complete listing of the losses of well control in the Gulf of Mexico since 1996.)

A month after the rule was final, the Offshore Operators Committee cited the limited voluntary data in comments opposing a requirement that all operators have a

¹⁶ The decision by OMB to overrule the agency was from an interview with E.P. Danenberger via teleconference, September 2, 2010, confirmed via email dated October 25, 2010. The draft proposed rule submitted by MMS to OMB would have been a pre-decisional document not available to the public.

¹⁷ U.S. Minerals Management Service, “Oil and Gas and Sulphur Operations in the Outer Continental Shelf – Incident Reporting Requirements,” *Federal Register* 71, no. 73.19640 (April 17, 2006). <http://www.boemre.gov/federalregister/PDFs/AC57-4-17-06.pdf>. This was insufficient for the purposes of comparing data with regulatory peers, and MMS was not able to participate in this important aspect of the IRF performance measures project. (<http://www.irffshoresafety.com/country/performance/>)

¹⁸ Based on MMS data received via e-mail on August 31, 2010. Due to changing reporting requirements, various data recording methods, and spreadsheet design, it’s challenging to determine the severity of events. Reporting requirements for fires changed in 2006, so rates of fires per year are not comparable pre and post 2006. Note: numbers do not represent *number* of injuries or fatalities, but rather number of fires and/or explosions that resulted in *at least one* injury or fatality. For example, the Deepwater Horizon blowout and explosion that killed 11 men is one of the two events that resulted in a fatality since 2006.

documented safety and environmental management plan: “as demonstrated in the MMS performance measures, the rate of incidents has significantly decreased since 1996 which we believe can be attributed to operators focusing on safety and protecting the environment.”¹⁹ Having made sure the government did not have access to the best and most complete information as to what was going on offshore, the industry group then used lack of information to argue that it was getting safer out there.

By 2003, five years into the new performance based approach to regulating deep water, neither the regulator nor the industry were collecting and analyzing the data that other safety regulators consider to be the most critical hazard precursor to monitor.²⁰

The U.S. Record for Offshore Worker Safety

The conventional wisdom is that the safety culture of an offshore operation is affected by the tenor set by the senior management of the individual operator as well as the regulatory regime. Contractors working on drilling rigs are under constant pressure to get the next job. If the regulatory regime does not include rigorous management oversight, contract awards may be based as much on willingness to "accommodate" an operator as on cost.²¹ Given that roughly 80% of offshore workers are contractor employees, this has serious implications for worker safety. In addition to the reporting on hazardous occurrences described above, the statistics for occupational, as opposed to system safety, in the U.S. do not compare well to the those of the peer regulators.

Safety regulators in Norway and the U.K. are part of the labor ministries. These regulators have consolidated safety responsibility for the offshore workforce engaged in oil and gas related activities (see below). In the United States, responsibility for worker safety offshore is divided between the Coast Guard and BOEMRE. The Coast Guard has responsibility for vessels, including Mobile Offshore Drilling Units (MODUs); the overlaps in statutory jurisdiction have been addressed in a series of Memoranda of Agreement between the Coast Guard and BOEMRE.²² Neither agency requires drilling rigs or MODUs to have a safety management plan. There are also situations where it is not clear whether there is any federal agency with oversight responsibility, for example, as with helicopters servicing offshore oil and gas facilities.²³

¹⁹ The OOC comments also stated that limited resources made it difficult for the agency to oversee such a requirement anyway.

²⁰ UK report on hydrocarbon releases. <http://www.ptil.no/news/trends-in-risk-level-2009-employees-positive-gas-leaks-cause-concern-article6836-79.html>

²¹ Based on staff interviews and conversations with a number of people in industry, international regulators and the World Bank. One North Sea regulator told Commission staff that some workers have told him they feel safer in the harsh environment of the North Sea than on rigs in the Gulf of Mexico.

²² There are a series of Memoranda of Understanding and Agreement between the two agencies to clarify which agency will carry out which responsibilities where they overlap. <http://www.boemre.gov/MOU/MOUindex.htm>

²³ A helicopter crash in 2009 took eight lives without even registering in the MMS statistics because it did not occur taking off or landing on a platform. The Sikorsky S-76 C crashed on January 4, 2009 near Morgan City, Alabama. This information was obtained from a query of the National Transportation Safety Board database on

The fatality rate for U.S. offshore oil and gas workers has been more than four times higher per hour worked than in Europe, according to data collected by industry groups and government regulators (see graph below). While the relationship between injury rates in U.S. waters as compared to Europe vary widely by data source, a comparison of official data filed with the national regulators shows only 34 injuries reported for every fatality in U.S. waters, whereas 545 injuries were reported for every fatality in European waters.²⁴ The North Sea and Maritime Canada are much harsher offshore environments than the Gulf of Mexico, and the presence of organized labor and legal requirements for worker safety representatives undoubtedly increase the likelihood of reporting compliance. (According to Commission staff interviews with a number of industry officials, the U.S. has virtually no organized labor presence in the offshore sector, nor are there any provisions of law requiring a worker safety representative on offshore facilities.²⁵)

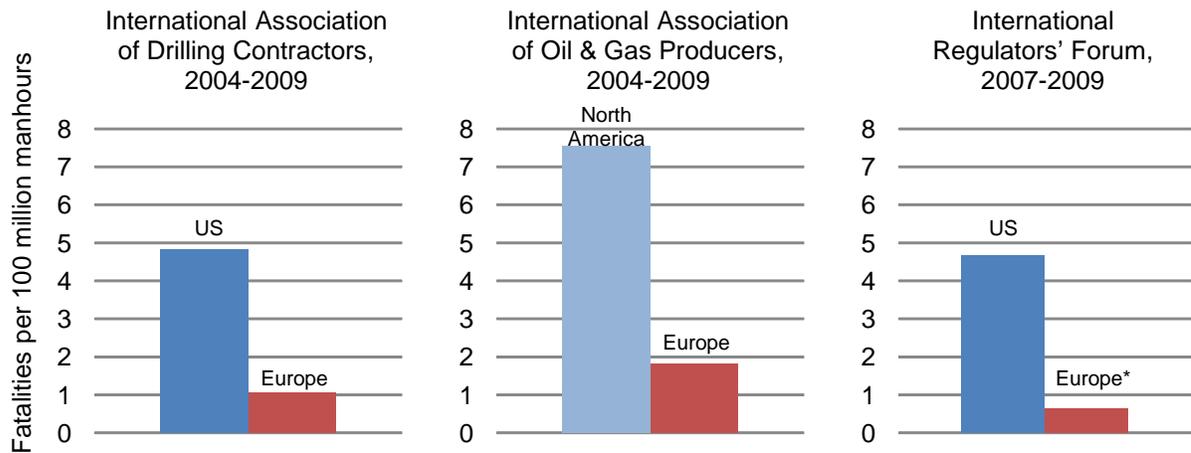
However, it seems unlikely that those factors account for such a significant difference. Conversations with BOEMRE staff revealed that the operators are responsible for reporting injuries and fatalities for themselves and contractors. The agency does not request any such data from contractors or subcontractors.

helicopter accidents. <http://www.nts.gov/ntsb/Response2.asp>. Based on various interviews with the BOEMRE staff, there appears to be a lack of clarity with regard to responsibility for worker safety offshore, including gaps in worker protection. The MMS staff confirmed the agency initiated taking over inspections on fixed platforms when it became apparent the Coast Guard was not able to do so. They noted the lack of any OSHA presence in the offshore. The Commission staff has not had the time or resources for a complete investigation.

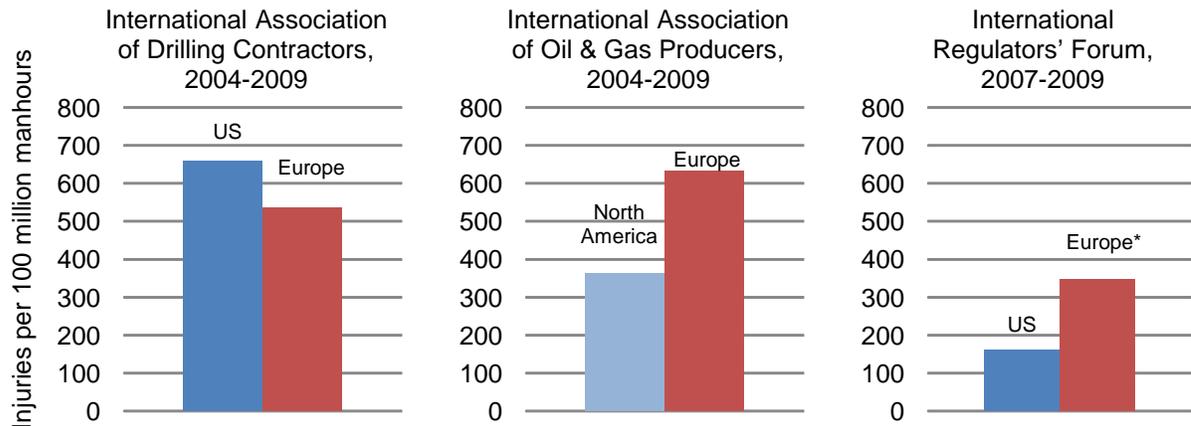
²⁴ Injury statistics are based on standardized reporting metrics for the International Regulators Forum.

²⁵ Based on conversations with a number of industry sources.

Fatalities from Offshore Oil and Gas Operations



Injuries from Offshore Oil and Gas Operations



Note: Data from the International Association of Oil & Gas Producers includes helicopter-related incidents. Data from the International Association of Drilling Contractors and the International Regulators' Forum include helicopter-related incidents only if it is at or near an offshore installation.

*Europe for the International Regulators' Forum data represents the United Kingdom, Norway, and the Netherlands.

Source: IADC Incident Statistics Program, International Association of Drilling Contractors, <http://www.iadc.org/asp.htm>; Safety performance indicators, International Association of Oil & Gas Producers, <http://www.ogp.org.uk/>; IRF Country Performance Measures, International Regulators' Forum, <http://www.irfshoresafety.com/country/performance/>.

Most offshore inspections in the Gulf of Mexico are carried out by one or two people, often visiting more than one facility in a day.²⁶ BOEMRE inspection findings are not public documents. Further, since the data collection requirements were revised in 2006, detailed analysis of the incident information has not been published, nor is there any formal interaction with the industry on trends in offshore safety.

Strained budgets and lack of backup staff have seriously limited training and professional development in recent years. In addition, BOEMRE does not have a

²⁶ Based on staff review of inspection records, conversations with BOEMRE staff and nonpublic government documents, significantly more resources are apparently available in California relative to the number of platforms, including more inspectors, more extensive inspections of each platform, use of laptops to track and compare records over time

competitive salary scale to recruit and retain licensed and highly skilled non-managerial technical staff as its peer regulators do.

Laxity in regulation and data collection appears to have caused deterioration in the safety culture in the Gulf. Max Ruelokke²⁷, the chief regulator in Newfoundland, Canada, was blunt in describing the condition of a Transocean rig that returned to Canada after a stint in the Gulf of Mexico under contract to Statoil. "The deficiencies on the Henry Goodrich were numerous - more than 50, and were split - about 50% being in non-compliance with "good oilfield practice", and 50 % in non-compliance with our regulations. Of the latter, many of them would not pass the "good practice" test either."²⁸

Peer Offshore Regulatory Regimes – Risk Based Approach to Managing Safety

As part of its investigation, the Commission examined the safety oversight of offshore oil and gas activity in other developed countries. The United Kingdom and Norway, after tragic disasters, transformed from prescriptive regimes to a model built on baseline prescriptive regulations with performance requirements that force industry to go well beyond simple compliance. Australia and Maritime Canada, both in transition now after their own accidents, and the agenda of the International Regulators Forum (IRF) offer additional insights.²⁹ (See attached Appendix B: Comparison of National Offshore Oil and Gas Regulatory Regimes for more information.)

Risk-Based Approach to Regulating Offshore Oil and Gas Activities. All of these other regulators have undergone a shift in philosophy and practice from a focus on prescriptive-only regulations enforced with inspections to a risk-based performance approach specific to individual facilities, operations, and environments. This approach, sometimes referred to as a *safety case* or more generally, a safety assurance review, puts the burden on the companies seeking license to operate in sovereign waters to demonstrate they have identified all of the hazards and risks associated with a specific activity and developed a plan to manage those risks. In addition to production platforms, the petroleum-related activities of MODUs, like the Deepwater Horizon, are also regulated under a safety case or subject to a certification and safety management requirement.³⁰

These regulators all require a careful identification of the hazards, risks, and consequences of a specific activity, whether drilling exploratory wells in a frontier province or managing an aging production platform. These regulators are under no illusion that this approach can eliminate risk or dangers. They do, however, believe such

²⁷ Max Ruelokke is the Chairman and Chief Executive Officer of the Canada-Newfoundland and Labrador Offshore Petroleum Board. http://www.cnlopbnl.ca/abt_management.shtml.

²⁸ Conversation with Max Ruelokke, at IRF meeting then confirmation details in an email dated November 24, 2010.

²⁹ The information on the international regulators is based on a number of conversations and interviews as well as research on the websites of the regulators from Norway, the United Kingdom, Australia and Newfoundland, Canada.

³⁰ Based on interviews with the staff of BOEMRE and various public statements and testimony, the agency holds the operator responsible for the activities of its contractors, including the MODUs.

an approach is essential to avoid the complacency inherent in a regime too reliant on prescription-based regulations only.

All of the peer regulators also require reporting of major uncontrolled hydrocarbon releases, which are categorized as “dangerous occurrences.” Root cause investigations are a priority with such incidents, as they are the most significant leading indicator for dangerous accidents. Annual reports with detailed summary operational and occupational statistics, including injuries and lost work time, incidents by type and severity, and root cause investigations, are actively reviewed with industry.

A report from the Norwegian Petroleum Safety Authority’s ongoing *Risk Level in Petroleum Activity* study has reaffirmed that “[t]he two types of near misses for the probability of acute discharges are well control incidents and hydrocarbon leaks. Although the latter largely relate in practice to gas escapes, they have been included in this study because they could cause very serious explosions. These in turn might escalate to cause well damage and thereby acute discharges to the sea. The Piper Alpha disaster on the UK continental shelf in 1988 provides a case in point.”³¹ Steve Walker of the Health and Safety Executive called the UK statistics not good enough when he released the 2009 statistics: “Major and significant hydrocarbon releases are up by more than a third on last year. This is a key indicator of how well the offshore industry is managing its major accident potential, and it really must up its game to identify and rectify the root causes of such events.”³² In a newsletter to offshore workers, he exhorted their cooperation as well.³³

Norway. Following a tragic platform failure that took 123 lives, by the mid-1980s Norwegian regulators had recognized that the inspection-based approach was wholly inadequate.³⁴ Thus the Norwegian system evolved toward regulations “that describe what must be achieved, not how it must be.”³⁵ The Petroleum Activities Act, effective in 1985, made three key changes: first, creation of a new overarching body of rules on safety for petroleum activities; second, a requirement on licensees to implement

³¹ Risk level in the petroleum activity – project report – acute discharges – Norwegian continental shelf – 2001-09, released 11/18/2010, available at <http://www.ptil.no/news/new-rnnp-report-surveys-acute-discharge-risk-on-the-ncs-article7407-79.html>.

³² HSE has maintained a data base of hazard indicators since the Cullen Report. https://www.hse.gov.uk/hcr3/help/help_public.asp#Severity "Offshore industry warned over 'not good enough' safety statistics", August 24, 2010. <http://www.hse.gov.uk/press/2010/hse-offshorestats.htm>. While this report was clearly in the aftermath of the Macondo and Montara blow outs, the report out of the prior year’s safety statistics referenced related marine and helicopter fatalities not under HSE’s remit as well as the intent to be take a “tough approach to poor performers to help preserve and improve the industry’s safety performance as a whole.” <http://www.hse.gov.uk/press/2009/e09061.htm>

³³ <http://www.hse.gov.uk/offshore/teashacknews/nov10.pdf>

³⁴ In March 1980, the Alexander Kielland—built as a drilling rig but under lease to Phillips Petroleum Company to house offshore workers at the Ekofisk Field in the Norwegian North Sea—capsized, killing 123 of the 212 people on board the “flotel.” <http://www.ptil.no/news/learning-from-incidents-in-focus-at-the-safety-forum-annual-conference-article6986-79.html>.

³⁵ Commission Staff Interview with Magne Ognedal, Director General of the Norwegian Petroleum Safety Authority, Sept. 7, 2010.

internal controls; and third, the use of risk analyses.³⁶ The law also unified responsibility for mobile units, formerly under the jurisdiction of the maritime authority, and fixed installations under the National Petroleum Directorate (NPD). Safety regulation in Norway has since been moved to a separate entity, the Petroleum Safety Authority (PSA).

The regulations are risk-based and must be applied as appropriate for each location and activity. Guidance documents refer to codes and standards that are considered acceptable. The regulator has asked industry to develop standards for specific purposes: for example, aging infrastructure.

Drilling rigs, some of which are MODUs, are required to have an *Acknowledgement of Compliance (AOC)* in order to operate; the AOC is similar to the safety case used elsewhere.³⁷ A rig or MODU owner must go through a detailed certification process and meet the requirements for equipment and workforce to obtain the AOC. If the rig or MODU leaves the Norwegian North Sea, it must continue to operate under all terms and conditions of the AOC or resubmit to an extensive recertification process.

According to PSA Director General Magne Ognedal, Norway asks companies to do everything required in the U.K. safety case but has less emphasis on a comprehensive set of documents. (Uniquely, the Norwegian Petroleum Directorate is a member of the operator's management committee and has access to all documentation that is shared with the PSA.) Prior to any drilling activities, a company must file a consent application that includes use of an AOC rig, spill response plan, and specific drilling plans. The PSA reviews the plans for "fit for purpose," then may either consent or require changes and/or more information.

United Kingdom. The use of the safety case in the U.K. came from the recommendations of Lord Cullen in his Report of the Public Inquiry into the Piper Alpha Disaster.³⁸ A critical recommendation was for a single regulatory body for offshore safety that would be responsible for fixed installations as well as mobile production and drilling units. Responsibility for regulating the offshore industry was also brought under the Health and Safety Executive (HSE).³⁹ Lord Cullen's first three recommendations laid out the main requirements for the safety case:⁴⁰

³⁶ "From prescription to performance in petroleum supervision" <http://www.ptil.no/news/from-prescription-to-performance-in-petroleum-supervision-article6696-79.html>

³⁷ Guidelines for AOC application is available at http://www.ptil.no/getfile.php/Regelverket/SUT-veiledningen_e.pdf

³⁸ The Piper Alpha production platform operated by Occidental Petroleum 120 miles northeast of Aberdeen, Scotland, exploded and sank, killing 167 people, including 2 rescuers in July 1988. http://home.versatel.nl/the_sims/rig/pipera.htm.

³⁹ Moving the responsibility for offshore safety into the larger HSE allowed the program to draw on a pool of expertise in areas such as fire protection and management of other hazardous industries.

⁴⁰ Recommendations 4-13 provided specific details for compliance as well as transition issues. (p. 387-8). Magne Ognedal had testified before Lord Cullen regarding the evolution in thinking and practice in the Norwegian North Sea.

- 1) The operator should be required to submit to the regulatory body a Safety Case in respect of each of its installations.
- 2) The Safety Case should demonstrate that certain objectives have been met, including the following:
 - (i) that the safety management system (SMS) and that of the installation⁴¹ are adequate to ensure that (a) the design and (b) the operation of the installation and its equipment are safe;
 - (ii) that the potential major hazards of the installation and the risks to personnel thereon have been identified and appropriate controls provided, and
 - (iii) that adequate provision is made for ensuring in the event of a major emergency affecting the installation (a) a Temporary Safety Refuge (TSR) for personnel on the installation; and (b) their safe and full evacuation, escape and rescue...
- 3) The SMS should be in respect of (a) the design (both conceptual and detailed) of the operator's installations; and (b) the procedures (both operational and emergency) of those installations. The SMS should set out the safety objectives, the system by which these objectives are to be achieved, the performance standards which are to be met and the means by which adherence to these standards is to be monitored. It should draw on quality assurance principles similar to those stated in BS 5750 and ISO 9000.

HSE is involved from the initial design stage in reviewing the safety case and issues extensive guidance "intended to help decision-makers assess the relative importance of codes and standards, good practice, engineering judgment, risk analysis, cost benefit analysis and company and societal values when making decisions."⁴² The safety case must be presented and defended to a review team at HSE prior to commencement of any activities, where a major focus is especially on major hazards or (process) safety. The standard is to manage risks to "a level as low as reasonably practicable" (ALARP)⁴³. A third party evaluation is required for well designs and all critical safety elements of the project including equipment, such as blowout preventers.

Lord Cullen acknowledged that testimony in his recommendations. The Public Inquiry into the Piper Alpha Disaster, Cullen, The Honourable Lord, HM Stationery Office, 1990, p. 387.

⁴¹ "installation" refers to any facility, whether a platform or mobile offshore drilling unit (MODU).

⁴² The system as now implemented by HSE is detailed in the Offshore Installations (Safety Case) Regulations 2005 (SCR05). HSE Information Sheet, Offshore Information Sheet No. 2/2006, Offshore Installations Regulations 2005, Regulation 12 Demonstrating compliance with the relevant statutory provisions, U.K. Health and Safety Executive, <http://www.hse.gov.uk/offshore/is2-2006.pdf>

⁴³ ALARP is not a recognized standard in the U.S. See Steinzor, Rena I., *Lessons from the North Sea: Should 'Safety Cases' Come to America?* (2011). Boston College Environmental Affairs Law Review, Vol. 38, 2011; U of Maryland Legal Studies Research Paper No. 2011-3. Available at SSRN: <http://ssrn.com/abstract=1735537>

Some have criticized the safety case as implemented by HSE as industry self-regulation or an extensive, contractor-driven paper exercise. Steve Walker, Head of the Offshore Division, HSE, flatly denies those criticisms.⁴⁴ He described the HSE approach as follows:

- our Safety Case Regulations do not set standards of control - those are set in other more specific regulations such as those that require the prevention of fire and explosion, proper well design and control, emergency evacuation arrangements, etc;
- a Safety Case demonstrates that the duty holder has arrangements in place, which, if implemented, are capable of achieving compliance with the legal objectives of the specific regulations. HSE's assessment (and eventual acceptance) of the Safety Case is based on our judgment that the arrangements and measures described in it, taken as a whole, are likely to achieve compliance with the specific regulations if implemented as described;
- a Safety Case is a document that gives confidence to both the duty holder and the regulator that the duty holder has the ability and the means to control the major accident risks effectively - it provides an extra level of regulatory control on top of the specific regulations;
- but (and this is the point I think missed by [many]) confirmation of compliance is made by the post-acceptance programmes of inspection and enforcement, based on the accepted safety case.⁴⁵

Australia. The offshore safety policies and practices in Australia are modeled to some extent on those of the U.K. HSE. The National Offshore Petroleum Safety Authority (NOPSA)⁴⁶ is the safety regulator in federal as well as in state and territorial waters, but has not had jurisdiction over well design and integrity. Australia also took on the recommendations of the Cullen Report and moved to a safety case approach to regulate production.⁴⁷ The safety case, in the words of NOPSA CEO Jane Cutler, is characterized by an acceptance that “the ongoing management of safety on facilities is the responsibility of those best placed to manage the risks - the operators. The role of role of the regulator is to provide robust challenge and oversight.”⁴⁸

As in the U.K., all facilities – drilling ships, MODUs, and platforms – must have a safety case. Unlike the U.K. HSE, NOPSA is not engaged in the safety review process until after the production design plans under the safety case have been developed.

⁴⁴ Steve Walker described the safety case as “not like a magic toad you wave over a platform like a blessing. It’s a living document.” Discussion with Steve Walker and other regulators in Herndon, VA, September 9, 2010.

⁴⁵ Email from Steve Walker dated October 24, 2010.

⁴⁶ <http://nopsa.gov.au/>

⁴⁷ The transition to the current regime in response to Piper Alpha (1988) began with a series of amendments to the legislation the offshore oil & gas industry between 1992 and 1996 to transition to a safety case regime.

⁴⁸ Interview with Jane Cutler and Simon Schubach, September 10, 2010 (Washington, D.C.)

In the case of the Montara well blowout in Australian waters in 2009, the authorities of the Northern Territory were responsible for the review of the well design and operator's safety case. The outcome of the inquiry into the Montara blowout is a recommendation to transfer responsibilities for well design and integrity to NOPSA.⁴⁹

Maritime Canadian Provinces. The Canadian Maritime provinces have independent joint boards with the federal government - Canada-Newfoundland and Labrador Offshore Petroleum Board and Canada-Nova Scotia Offshore Petroleum Board.⁵⁰ Unlike the North Sea and Australian models, leasing, as well as safety and environmental regulation are managed by the same entity.⁵¹ While not using the term *safety case*, "the Operations and Safety Department has an established safety assessment process to review Operators' applications in a systematic manner prior to the Board issuing a work authorization. This process considers the safety of the activity as a whole and its component parts including the installation, its facilities, personnel and procedures. This process also provides confidence that each Operator has an appropriate system in place to manage risk to personnel both from major hazards and from day to day occupational hazards. As part of the safety assessment process, Safety Officers may visit installations or vessels to conduct a safety audit or safety inspection."⁵² As in the North Sea and Australia, individual safety plans are required for facilities – drillings ships, MODUs, and production platforms.

Independence and Professional Standing of the Safety Regulator. As noted, the safety regulators in Norway and the U.K. are part of the labor ministry and have no responsibility for leasing or revenue matters. They are charged solely with safety oversight and have the final authority to consent to or prohibit drilling plans and production operations. Such authority is proposed for the Australian regulator, but not yet in force. The Canadian regulators for Nova Scotia and Newfoundland and Labrador also manage the leasing, but each has a designated Chief Safety Officer with complete authority to shut down operations in the interest of safety or environmental protection.

These regulators are responsible for overseeing and ensuring the integrity of hazardous activities, including and especially the protection of the offshore workforce. Each of these regulators is headed by someone selected competitively based on technical credentials and experience, and their decisions with regard to safety are not lightly or easily circumvented or overturned. The harsh offshore environments of the North

⁴⁹ Release of the Montara Commission of Inquiry Report and Draft Government Response, <http://www.ret.gov.au/Department/responses/montara/Pages/MontaraInquiryResponse.aspx>

⁵⁰ Information on the Canadian systems from discussions with Max Ruelokke, Chairman and CEO, Canada-Newfoundland and Labrador Offshore Petroleum Board, <http://www.cnlopb.nl.ca/>, and Stuart Pinks, CEO, Canada-Nova Scotia Offshore Petroleum Board, <http://www.cnsopb.ns.ca/>, September 9, 2010 (Washington, DC) and October 18-19, 2010 (Vancouver, BC, Canada) and from the websites.

⁵¹ The Newfoundland and Labrador government have called for an independent safety agency for its offshore oil sector.

⁵² Quoted from the description of the Safety Assessment on the website of the Canada-Newfoundland and Labrador Offshore Petroleum Board. http://www.cnlopb.nl.ca/safe_assess.shtml

Atlantic and remoteness of the Australian offshore, especially as compared to the Gulf of Mexico, have required each to have specialized, professional staff. All of the regulators have the hiring authority and benchmarked salary scales to recruit a highly skilled technical staff. The emphasis tends to be on advanced degrees in engineering and/or experience in oil and gas or other high-risk industries.

Continuous and specialized training is a priority. Several of the regulators believe the emphasis on ongoing training is a competitive advantage in recruitment. All either have or are working toward tailored training and certification programs. Some technical training is offered in-house by the regulators, but personnel often attend specialized university courses and training programs certified by industry organizations. All of these regulators have their own programs in inspection practices. Some have courses on investigation techniques put on by the national police.

Other areas of commonality among the peer regulators discussed above include the approach to inspections and responsibility for and engagement with the offshore workforce. All of these regulators have team approaches to supervision, audits and inspections. Oversight is planned and scheduled with staffing determined based on the scope of activities and, to an extent, familiarity with specific facilities and operations. Shore-based audits start the process, with offshore inspections carried out using a systems approach rather than a checklist. The emphasis is on assessing the actual performance of management systems. Some continuity in staffing for audits is valuable but all have safeguards to avoid “capture.”

These regulatory systems all have active tri-partite engagement involving the regulator with the offshore workforce as well as the companies. Labor has an official voice in all of these regimes, whether through unions or statutorily guaranteed worker safety representatives. The North Sea industry is heavily unionized, whereas Canada and Australia have some union presence. The U.K. and Australia have specific statutory requirements for worker-elected safety representation with both authority and responsibility. In Canada individual workers have a duty of safety. All actively promote labor engagement in industry efforts to improve safety management. The U.K. regulator, for example, has a quarterly newsletter for the offshore workforce where it reaches out for support to address critical challenges.⁵³ Surveys of the offshore workforce are conducted on a periodic basis to assess the safety culture.

Recommendation for an Independent U.S. Safety Authority

In the United States, efforts to move toward the sort of regulatory reforms described above in other countries have met with little success. In recent years, as lucrative deepwater oil production grew, so did the political pressure on the Department of the

⁵³ The November 2010 issue of the “Teashack,” a newsletter published by HSE for offshore workers, calls on workers to help reduce hydrocarbon releases. <http://www.hse.gov.uk/offshore/teashacknews/nov10.pdf>

Interior to increase revenues. As the *Wall Street Journal* reported, “Stephen Allred, who as Assistant Secretary of the Interior oversaw MMS from 2006 to 2009, said the agency does conduct spot inspections of oil rigs, and checks operators’ compliance with safety procedures. However, ‘Their role is not to baby-sit’ the operators, he said. The agency’s primary task during inspections is to verify how much oil is being pumped, which is key to another MMS duty, maximizing payments the government receives for oil and gas rights from energy producers.”⁵⁴

Allred’s comments reflect the Congressional pressure on the agency to generate revenues. Inspectors were under constant pressure to ensure production and verify pipeline meters, even to the point of inspecting meters at onshore processing plants, in place of time spent on the safety aspects of offshore facilities.⁵⁵

The Offshore Program, recognizing the need to better manage its responsibilities, hired LMI Government Consulting in 2006, tasking the company with evaluating “its organizational effectiveness by functionally assessing the program, with the goal of improving organizational efficiency and effectiveness in an environment of increasing workload and requirements.”⁵⁶ Although the program had a record for effectively awarding and managing oil and gas leases,⁵⁷ LMI pointed to the inherent conflict of awarding leases while also regulating the operations of the oil and gas industry.⁵⁸ This conclusion was demonstrated clearly when a survey of senior leaders showed that they believed the dominant focus of the program was on *Access to Resources* over all other priorities.⁵⁹

Other findings of the study included:

- Need to clarify roles and responsibilities, resource requirements, and funding.⁶⁰
- Inconsistent and unstructured approach to information management...difficulties in determining and disseminating best practices, over reliance on long-service members of staff as sources of knowledge, cultural barriers between head office and regional staff, and duplication of effort between regions.⁶¹
- Some functions appeared to overlap...coordination of resources could be improved in the permitting function, and research could be streamlined if all efforts were consolidated.⁶²

⁵⁴ [“Oil Regulator Ceded Oversight to Drillers”](#), Wall Street Journal, May 7, 2010.

⁵⁵ Non-public government document and interviews with BOEMRE staff.

⁵⁶ Offshore Minerals Management, Business Assessment and Alignment, report INT60TI, LMI Government Consulting, May 2007. (Hereafter referred to as “LMI”). p. 1-1. The review involved “not for attribution” interviews of 96 staff members and 22 external stakeholders, as well as workshops and a series of sessions to develop an implementation plan. . P. 2-5.

⁵⁷ In fact, the MMS offshore program had been in the top 11% for program effectiveness rated by the Office of Management and Budget (OMB) for Fiscal Year 2005. p.3-7.

⁵⁸ LMI p.3-6.

⁵⁹ LMI, p. 3-3.

⁶⁰ LMI, p. 3-6.

⁶¹ LMI, p. 5-3.

⁶² LMI, p. 3-7.

- At times decisions are made ad hoc and tend to be reactive rather than proactive. Too many functions were geographic or personality-based rather than process driven⁶³.

Among the report's conclusions:

- Roles and responsibilities need clarification.⁶⁴
- Services, such as inspections, would become increasingly complex, with more operations, including possible operations in the Arctic. [The program] will best serve both its customers and the public if it has access to the same technology as industry and can base its decisions on up-to-date science.⁶⁵
- The workforce appeared to be more risk-averse than most government agencies with which LMI had worked.⁶⁶

Based on Commission staff interviews with the MMS staff involved, the last conclusion foreshadowed the agency's oversight role during the early days of the response to the Macondo blowout, as agency staff appeared hesitant to assert themselves.⁶⁷

The overarching recommendation of the LMI review was that the program should realign its workforce in a more efficient functional structure to better use its existing expertise.⁶⁸ Senior staff spent months on the review in 2006-7, only to have it shelved, not implemented. DOI Secretary Ken Salazar's Safety Oversight Board came to similar findings and conclusions, albeit from a more dispirited workforce, in 2010.⁶⁹

The overlapping authorities of BOEMRE and the Coast Guard have encouraged industry to argue against duplication, while both agencies, underfunded and without a unique mandate, have failed to protect offshore workers. The gap posed by the lack of OSHA responsibility offshore can be filled by a single agency. An agency with its own organic act⁷⁰ and a clear, unambiguous portfolio could eliminate the conflicts of interest and political pressures existing today. Such an authority would consolidate the responsibility for safety, including infrastructure and operational integrity, as well as spill prevention and response, for all offshore oil and gas and renewable energy development activities, structures, and workers. That agency would also have a statistical and analytical responsibility to collect and produce data that contribute to better risk analysis.

⁶³ LMI, p. 3-9.

⁶⁴ LMI, p. 3-9

⁶⁵ LMI, p. 3-6

⁶⁶ LMI, p. 3-11.

⁶⁷ Staff Working Paper No. 6, entitled "Stopping the Spill: The Five-Month Effort To Kill the Macondo Well." P. 7

⁶⁸ LMI, p. 3-11

⁶⁹ Outer Continental Shelf Safety Oversight Board, Report to Secretary of the Interior Ken Salazar, September 1, 2010, available at <http://www.doi.gov/news/pressreleases/loader.cfm?csModule=security/getfile&PageID=43677>

⁷⁰ An organic act is a statute enacted by Congress that creates an administrative agency and defines its authorities and responsibilities.

In Europe, change followed major accidents. Magne Ognedal, the Director General of the Norwegian Petroleum Safety Authority, described the evolution of the Norwegian system in a number of conversations with Commissioners and staff. “My experience is that you unfortunately often need a major accident, or even a disaster, to engender political support for streamlining regulatory regimes. Moreover, history shows that major accidents apparently must happen in your own jurisdiction to have such an effect on political support. Before 1985, we had 13 different agencies or authorities with self-contained powers and regulations to regulate parts of our offshore activities.”⁷¹ The U.S. can similarly learn from the *Deepwater Horizon* disaster and consolidate responsibility.

An organic act delineating the authorities and responsibilities for an independent safety authority would constructively consolidate the various responsibilities now under the Outer Continental Shelf Lands Act (OCSLA), the Pipeline Safety Act, and various Coast Guard Authorizations. A standalone safety act would lead to focused Congressional oversight on the new agency’s record in personal as well as system safety as is the case already with other hazardous industries, including onshore pipelines.⁷²

Ensuring Independence. Though some aspects of a new, independent safety agency can be implemented by the administration, Congressional action would still be needed. Only statutory requirements for a fixed term for the director and the primacy of technical judgment over politics can ensure the long-term independence of the safety agency. The director position should be held by someone with technical qualifications and experience recruited through a professional search. The authority to assess program costs on the regulated industry would also require legislation. Legislation would also be required to consolidate responsibility and authority for energy worker safety whether on a mobile drilling unit, a production platform, or engaged in installing a wind tower.

Funding the Regulator. To ensure the agency has the ability to provide adequate regulatory oversight to the increasingly complex OCS program, the budget for the agency should be funded directly from an assessment on the regulated industry, recovered under a formula related to production volumes, for example. Experience has clearly shown that the regulator must be adequately funded on a consistent basis in order to maintain staff capability and competence at the highest standard to regulate and supervise high hazard activities in remote offshore locations. That requires funds for helicopters and other vessels, ongoing training and the capability to respond immediately as needed in emergencies.

⁷¹ The exact quote is from an interview available at <http://budsoffshoreenergy.wordpress.com/interviews/magne-ognedal/> but he shared the same perspective information directly with the commission in a meeting on November 10, 2010 in Washington, DC.

⁷² The Pipeline Inspection, Protection, Enforcement, and Safety Act of 2006, Public Law No: 109-468, imposed new requirements for previously unregulated low-stress pipelines in response to the BP pipeline spills on the North Slope of Alaska in 2006. The act also authorized funding for the program for fiscal years 2007-2010.

Many other U.S. federal regulators are funded with such assessments.⁷³ Comparable to the Department of the Interior's role related to the offshore energy sector, the Federal Communications Commission sells access to the spectrum under a competitive bidding process, but recovers its cost of regulating industry activities in the public interest through a formula based assessment on the regulated industry.⁷⁴ Other parts of the oil and gas industry pay such assessments for safety oversight programs, including the Office of Pipeline Safety.⁷⁵

These assessments on regulated industries are consistent with OMB guidance, "[I]f the benefits accrue to a limited number of private individuals or organizations and do not have special social or distributional benefits, then the program should be financed by charges paid by the private beneficiaries."⁷⁶ The performance of other hazardous industries subject to federal safety regulation, such as petroleum and natural gas pipelines, are reviewed periodically by the Congress under a regular reauthorization process. The agency and the Congressional oversight committees are forced through that process to ensure the statutory responsibilities and funding are adequate to the challenge.

Challenges with Opportunities

Creating a more competent and nimble regulator faces several major challenges. First, there has been reluctance among some in the oil and gas industry to acknowledge that safety standards for offshore drilling in the Gulf of Mexico fall below those elsewhere in

⁷³ The Federal Energy Regulatory Commission also "recovers the full cost of its operations through annual charges and filing fees assessed on the industries it regulates as authorized by the Federal Power Act (FPA) and the Omnibus Budget Reconciliation Act of 1986. The Commission deposits this revenue into the Treasury as a direct offset to its appropriation, resulting in no net appropriation." <http://www.ferc.gov/about/strat-docs/FY11-budg.pdf>.

⁷⁴ Section 6003 (a) of the Omnibus Budget Reconciliation Act of 1993 (Public Law 103-66) added a new Section 9 to the Act. Section 9 (a) of the Communications Act authorizes the Commission to collect annual **regulatory fees** to recover the annual costs of its enforcement, policy and rulemaking, user information, and international activities. 47 U.S.C. 159 (a). 47 U.S.C. 159 (b) (1) (A) and 47 U.S.C. 159 (g). The Schedule of Fees sets forth annual regulatory fees for specific categories of regulates in the Mass Media, Common Carrier, Wireless, International and Cable Television Services. <http://www.fcc.gov/fees/>. The Federal Communications Commission also auctions licenses for commercial use of the electromagnetic spectrum, <http://wireless.fcc.gov/auctions/>.

⁷⁵ "Section 60301 of Title 49, United States Code, authorizes the assessment and collection of pipeline user fees to fund the pipeline safety activities conducted under 49 U.S.C. 60101 et seq. The Pipeline and Hazardous Materials Safety Administration (PHMSA) assesses each operator of regulated interstate and intrastate natural gas transmission pipelines (as defined in 49 CFR Part 192), and hazardous liquid pipelines carrying petroleum, petroleum products, anhydrous ammonia and carbon dioxide (as defined in 49 CFR Part 195) to pay a share of the total Federal pipeline safety program costs in proportion to the number of miles of pipeline each operator has in service the end of calendar year 2008." <http://www.phmsa.dot.gov> 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 dated April 5, 2010, from Cynthia Quarterman, Administrator, Pipeline and Hazardous Materials Safety Administration, to Senator Daniel K. Inouye, Chairman, Committee on Appropriations.

⁷⁶ Analytical Perspectives, Budget Of the U.S. Government, Office of Management and Budget, fiscal Year 2011, www.budget.gov, p. 201. See also OMB Circular No. A-25: "User Charges" (July 8, 1993).

the world; if there is no problem, this is no need to change. Second, new approaches to regulation will require additional funding to implement during a period when focus will be on reducing the costs of government. Third, needed reforms will take time, particularly for incorporating greater competence to analyze risk at an agency where the necessary skills sets are not adequately represented.

But there are opportunities as well. The spill at Macondo demonstrated that there are costs to accepting higher than necessary risks of blowouts and led to a reexamination of the historic safety statistics, some of which are presented here, which demonstrated a poor safety record in the Gulf, even before Macondo. Moreover, regulatory models in other countries, earlier planning at the Department of the Interior, and reinvigorated planning after last year's spill mean that reforms will not have to start from scratch.

Appendix A: Loss of Well Control Incidents

FIGURE 8.1: Loss of Well Control Accidents



Source: Bureau of Ocean Energy Management, Regulation, and Enforcement

Loss of Well Control Accidents and Resulting Consequences

- Loss of Well Control
- Panel Investigation
- Fire or Explosion
- Fatalities
- Fire or Explosion with Fatalities or Injuries

Between 1996 and 2009, in the U.S. Gulf of Mexico, there were 79 reported loss of well control accidents—when hydrocarbons flowed uncontrolled either underground or at the surface.

The regulator considers the following three factors when determining whether or not an accident will undergo a panel investigation: the actual and potential severity of the incident; the complexity of the incident; and, the probability of similar incidents occurring.

Loss of Well Control Accidents & Consequences		
Date	Company	Consequence Code
01/24/96	Oryx Energy Company	
11/10/96	Norcen Explorer, Inc.	
11/27/96	Tana Oil and Gas Corporation	
12/03/96	Amoco Production Company	
01/10/97	BHP Petroleum, Inc.	
03/04/97	Shell Offshore, Inc.	
04/01/97	American Exploration Company	
05/31/97	Houston Exploration Company	
10/20/97	Freeport-McMoran Resource Partners	
01/06/98	Hall-Houston Oil Company	
01/16/98	Chevron U.S.A., Inc.	
04/30/98	Vastar Resources Inc.	
07/08/98	Newfield Exploration Company	
11/22/98	Ocean Energy Inc.	
12/09/98	Petrobras America Inc.	
02/10/99	Union Pacific Resources Company	

08/11/99	Freeport McMoran Sulphur Inc.	
09/09/99	Newfield Exploration Company	
12/02/99	Apache Corporation	
12/05/99	Freeport McMoran Sulphur LLC	
01/02/00	Callon Petroleum Operating Company	
01/05/00	Apache Corporation	
01/12/00	Murphy Exploration & Production Company	
02/28/00	Murphy Exploration and Production Company	
03/22/00	Forcenergy Inc.	
04/07/00	Union Oil Company of California	
08/15/00	Houston Exploration Company	
11/18/00	Houston Exploration Company	
03/01/01	Forest Oil Corporation	
04/02/01	Newfield Exploration Company	
04/04/01	Matrix Oil & Gas, Inc.	
05/10/01	Devon Energy Production Company	
05/24/01	BHP Petroleum (Americas) Inc.	
07/06/01	Tri-Union Development Corporation	
07/13/01	William G. Helis Company	
10/24/01	Argo, L.L.C.	
11/21/01	BP Amoco Corporation	
01/12/02	BP Amoco Corporation	
08/08/02	BP Exploration & Oil Inc	
09/07/02	El Paso Production Oil & Gas Company	
10/03/02	Murphy Exploration & Production Co.	
11/14/02	BP Exploration & Production Inc.	
12/06/02	Kerr McGee Corporation	
03/08/03	Anadarko E&P Company	
04/12/03	Helis Oil & Gas Corporation	
04/22/03	Chevron/Texaco Corporation	
09/02/03	Manti Operating Company	
12/04/03	Walter Oil & Gas Corporation	
02/09/04	Energy Partners, Ltd.	
02/17/04	Orca Energy (Dunhill), L.P.	
02/22/04	ATP Oil & Gas Corporation	
10/21/04	Amerada Hess Corporation	
03/08/05	Hunt Oil Company	
05/28/05	W & T Offshore, Inc.	
11/30/05	W & T Offshore, Inc.	
12/01/05	Chevron USA.	
02/20/06	Forest Oil Corporation	
11/18/06	Dominion Exploration & Production, Inc.	
01/23/07	Fairways Offshore Exploration, Inc.	
03/16/07	East Cameron Partners, LP	
06/24/07	Stone Energy Corporation	
08/22/07	Apache Corporation	
09/07/07	Eni US Operating Co. Inc.	
11/20/07	BP Corporation North America Inc.	
12/03/07	Rooster Petroleum, LLC	
02/14/08	Apache Corporation	
04/23/08	Apache Corporation	
04/26/08	LLOG Exploration Offshore, Inc.	
05/06/08	Mariner Energy, Inc.	
08/19/08	Energy Resource Technology GOM, Inc.	
10/31/08	Chevron U.S.A. Inc.	
11/01/08	Union Oil Company of California	
12/20/08	El Paso E&P Company, L.P.	
04/19/09	LLOG Exploration Offshore, Inc.	
04/23/09	Stone Energy Corporation	
05/27/09	Stone Energy Corporation	
08/26/09	Stone Energy Corporation	
12/22/09	Not Listed	
12/29/09	Murphy Exploration & Production Company	

Appendix B: Comparison of National Offshore Oil and Gas Regulatory Regimes

The purpose of this appendix is to give interested readers more information on, and links to, the various offshore regulatory agencies outside the United States. Unless otherwise stated, the material is from the agencies' websites.

Norway.¹ Management of offshore activities is divided among a number of Norwegian government entities. Under the [Ministry of Energy](#),² the [Norwegian Petroleum Directorate \(NPD\)](#)³ is responsible for negotiating lease concessions based on competition among companies on technical competence and financial commitments. The [Petroleum Safety Authority \(PSA\)](#)⁴, under the Department of Labor, participates in the evaluations. Companies must be approved by the PSA, which sets standards and limits on participation depending on the location, both at the initial leasing stage and subject to review prior to any development activity. Companies new to the region or lacking experience are accepted only as part of an experienced team. Projects are managed collectively, with all parties liable. The NPD participates on the management committee of each development and has access to all data and plans, which it shares with the PSA. If the PSA is not convinced that the companies have adequately considered all risk, a project is not allowed to proceed. The NPD approves development plans to ensure efficient and optimal recovery of resources, but the PSA must consent to drilling plans before activity proceeds.

By the mid-1980's⁵ Norwegian regulators recognized the need to shift from the traditional inspection-based approach, which had not proved sufficient. The Norwegian system evolved toward regulations that describe what must be achieved, not how it must be achieved. The regulations are risk-based and must be applied as appropriate for each location. Guidance documents refer to codes and standards that are considered acceptable. The PSA has asked industry to develop standards for specific purposes – aging infrastructure, for example. The regulatory process is one of consent, not approval, with the burden on industry to prove that its plans should gain consent.

The PSA created a requirement for an [Acknowledgement of Compliance \(AOC\)](#)⁶ for drilling rigs – similar to a safety case for a rig. A rig owner must go through a detailed

¹ Information on the Norwegian system partly from discussions with Magne Ogdal, Director General, and senior staff of the Petroleum Safety Authority, September 7, 2010 (Washington, DC) and November 4, 2010 (Washington, DC).

² Norwegian Ministry of Petroleum and Energy, <http://www.regjeringen.no/en/dep/oed.html?id=750>

³ Norwegian Petroleum Directorate, <http://www.npd.no/en/>

⁴ The Petroleum Safety Authority was part of the National Petroleum Directorate until January 2004. <http://www.ptil.no/main-page/category9.html>

⁵ In March 1980, the Alexander Kielland—built as a drilling rig but under lease to Phillips Petroleum Company to house offshore workers at the Ekofisk Field in the Norwegian North Sea—capsized, killing 123 of the 212 people on board the “flotel.” <http://www.ptil.no/news/learning-from-incidents-in-focus-at-the-safety-forum-annual-conference-article6986-79.html>.

⁶ Guidelines for AOC application is available at http://www.ptil.no/getfile.php/Regelverket/SUT-veiledningen_e.pdf

certification process and meet the requirements for equipment and workforce. If the rig leaves the Norwegian North Sea, it must continue to operate under all terms and conditions of the AOC or it will have to go through an extensive recertification process in order to return.

The PSA staff is largely comprised of degreed technical professionals in fields ranging from engineering to anthropology. “[C]ore competencies for personnel performing offshore audits and verifications were identified as high level skills within: *incident investigation, auditing practices, risk management and Human Factor methodology*. These core competency skills were to accompany the various professional backgrounds of PSA personnel. The PSA has worked with the University of Stavanger to develop a graduate level curriculum that has evolved into a Masters in Risk and Safety Management, open to industry as well as staff of the PSA. Some of the course modules are available online.⁷

The training across core competencies provides a common basis for supervisory activities independent of discipline background. The PSA believes the training program provides a recruitment advantage. In addition to being a two-way, synergistic learning arena it also leaves the formal handling of content and overall responsibility for modules and the masters program to the university.

The professional staff participates in all activities: development of regulations, audits, and verification of industry operations offshore. Audits of company facilities are scoped prior to visits to offshore facilities with the team picked to address the specific situation. Norway asks companies to do everything required in the UK safety case approach but has less emphasis on a comprehensive set of documents. Four weeks prior to any drilling activities, a company must file a consent application that includes use of an AOC rig, spill response plan, and specific drilling plans. PSA reviews the plans then, and may either consent or require changes and/or more information.

The agency sets priorities in its annual supervision plan for audits and verifications. This is a strategic document not disclosed to the public or the affected industry. Inspections are organized based on perceived risks, including recent experience and trends with accidents and incidents, industry plans, input from other cooperating agencies, and the consequences of new or revised regulations. The PSA visits each facility at least once every three years.

⁷ In 2005 a strategic PSA Competency Plan was developed, aimed at developing core competency modules at the masters level through a University of Stavanger cooperation project. The initial activities resulted in an ongoing parallel development approach by the 5 cooperating state agencies (covering health and environment). The master program is being introduced in the spring 2011 with 7 PSA participants. From an email from Odd Bjerre Finnstad dated January 14, 2010.

An annual safety report is released at a Safety Forum⁸ with industry and labor. The health and safety environment in general and recent incident and spill experience is reviewed with industry to focus efforts at improving performance. The annual Trends in Risk assessment effort, initially focused on major accidents, has shifted scrutiny to risks of hydrocarbon releases.⁹ A biannual confidential survey of industry workers is conducted to assess their experience.

Audits and inspections of individual operators are planned based on the overall set of risk-based priorities. Through audits (systematic examination of management and control systems) the PSA carries out supervision of the established systems. Norway has without question the most transparent oversight and supervision process of the peer group, including posting summaries of audit reports on the website.¹⁰ Audits are supplemented with verification measures including measurement, testing, and inspection.

United Kingdom (U.K).¹¹ The [Department of Energy and Climate Change \(DECC\)](#)¹² and the [Health and Safety Executive \(HSE\)](#)¹³ manage offshore oil and gas activities in the U.K. The Director for Energy Development in DECC oversees both the Office of Oil and Gas Licensing, Exploration and Development and the Office of Environment and Decommissioning, which is responsible for environmental consultation and permitting. Safety and risk management are under the offshore office within HSE, a division of the Department for Work and Pensions. As in Norway, the DECC geologists and engineers evaluate development plans from the perspective of optimal resource recovery. HSE is responsible for setting standards and oversight of the safety case for all drilling and production activities.

HSE requires a [safety case](#)¹⁴ for each “facility;” the mobile offshore drilling units (MODU) would be required to have a safety case for any drilling operation. For production

⁸The Safety Forum, led by Director Magne Ognedal, includes the following: Norwegian Oil Industry Association (OLF), the Federation of Norwegian Industries, the Norwegian Shipowners' Association, the Norwegian Union of Energy Workers (SAFE), Lederne, the Norwegian Union of Marine Engineers (DSO), Industry Energy (IE), the Norwegian Confederation of Trade Unions (LO) and the Norwegian United Federation of Trade Unions.
<http://www.ptil.no/safety-forum/category167.html>

⁹The Risk Level Project, initiated in 1999, monitors risk levels using quantitative and qualitative measures, including incident indicators, barrier data, interviews, work seminars, field work and a major questionnaire survey every other year. <http://www.ptil.no/trends-in-risk-level/category155.html>. See also a paper titled “PSA's Risk Level Measuring Scheme and how available data are collected and used” presented by [Torleif Husebø](#), *Discipline Leader for Process Safety, at the International Regulators Offshore Safety Conference in October 2010*, available at <http://www.irfconference2010.com/uploadfiles/documents/Tuesday/1110%20Torleif%20Husebo.pdf>

¹⁰ See the PSA website for a more thorough description of the supervision program as well as posted reports at <http://www.ptil.no/audit-reports/category156.html>

¹¹ Information on the U.K. system from discussions with Steve Walker, Head Offshore Division, HSE on September 9, 2010 (Herndon, VA) and October 19, 2010 (Vancouver, BC, Canada) and from the HSE website.

¹² The office Heads for offshore licensing and environment both report to the Director, Energy Development.
http://www.decc.gov.uk/assets/decc/About%20us/1_20100622105016_e_@@_deccorganogram.pdf

¹³ <http://www.hse.gov.uk/offshore/index.htm>

¹⁴ “The [Offshore Installations \(Safety Case\) Regulations 2005 \(SCR05\)](#) aims to reduce the risks from major accident hazards to the health and safety of the workforce employed on offshore installations, and in connected activities. The

facilities, the operator would be required to have a safety case. The safety case must be presented and defended to a review team at HSE prior to any activities. HSE is involved from the initial design stage in reviewing the safety case. The operator must notify HSE 21 days prior to any planned activities to have the well design reviewed. These reviews focus on major hazards safety (process safety). A third party evaluation is required for well designs and all safety critical elements of the project including equipment, such as blowout preventers.

Responsibility for regulating the offshore industry was brought under HSE after the report into the Piper Alpha disaster found that the “comparatively small size of the Safety Directorate appears to have been a factor restricting the scope of the in-house expertise” leading to a reactive approach rather than proactive systems management. Moving the responsibility for offshore safety into the larger HSE allowed the program to draw on a pool of expertise in areas such as fire protection and management in other hazardous industries. The transition to a safety case approach to managing offshore activities took several years and required a significant increase in staffing levels and expertise. Within HSE, the offshore program has a cadre of inspectors with backgrounds in oil and gas and other high-risk industries. Recruitment emphasis is on advanced degrees in technical fields and/or extensive experience. The strategy is to recruit experts, then train them to be inspectors.

Safety culture is at the center of the management of all risks offshore, including major accident hazard risks (process safety). The regulations require the “safety case duty holders” to cooperate with all others to ensure the health and safety of all personnel on an installation. Documented safety management systems are required.

The system is one of industry responsibility for demonstrating risk assessment and risk management, with an underpinning of minimum requirements. The safety case requires a demonstration by duty holders that all hazards that could cause a major accident have been identified; that all major accident risks have been evaluated; and that measures have been, or will be, taken to control the major accident risks to ensure compliance with the relevant statutory provisions. The standard is to manage risks to “a level as low as reasonably practicable” (ALARP). HSE issues extensive guidance for risk assessment and development of safety cases. “These guidelines describe a framework that is intended to help decision-makers assess the relative importance of codes and standards, good practice, engineering judgment, risk analysis, cost benefit analysis and company and societal values when making decisions. They aim to encourage the

regulations implement the main recommendations of Lord Cullen's Report of the Public Inquiry into the Piper Alpha Disaster.” HSE provides extensive guidance on the requirements for developing a safety case as well as the oversight and audit process. <http://www.hse.gov.uk/offshore/safetycases.htm>

development of transparent decision-making processes, thereby helping duty holders meet their regulatory obligations.”¹⁵

Inspections are planned based on the activities and past experience at a specific facility. Manned platforms are subject to inspection 3-4 times per year, drilling units at least once a year. Pre-meetings are held with the companies prior to the offshore visits. Surprise inspections are not considered useful, as the intent is to test and validate the key elements of the safety case, including the management systems. Each facility’s safety case is thoroughly reviewed at least once every five years.

HSE encourages offshore workers, especially through the trade unions, to be involved in managing their own health and safety. The Offshore Installations (Safety Representatives and Safety Committees) Regulations of 1989 provides the legal framework for safety representatives among the workforce who are independent of the management. These safety representatives have independent powers to investigate complaints, potential hazards, and accidents, and to make representations to management and the HSE on behalf of the workforce. To ensure the system is working as intended, HSE set up a [Workforce Involvement Group \(WIG\)](#)¹⁶ to review progress.

The [Step Change in Safety](#)¹⁷ program was established in 1997 by the oil and gas industry trade associations with the aim of reducing the offshore injury rate through the development and sharing of best practices. The original plan to measure safety performance in relation to Lost Time Injury Frequency on offshore installations was expanded to include aviation safety, marine safety, and the prevention of major accidents. The membership has also expanded to include HSE and the trade unions. *Step Change* appears to serve as an active communication and awareness tool for all stakeholders and is considered by HSE to be a critical part of maintaining the safety culture.

Australia¹⁸. With the exception of safety, the offshore industry in Australia is managed by the state and territorial governments in near coastal waters and by the federal [Department of Energy, Resources and Tourism](#)¹⁹ in waters beyond the three-mile limit. Leasing is handled jointly by the state and federal authorities, depending on location.

¹⁵ HSE Information Sheet, Offshore Information Sheet No. 2/2006, Offshore Installations Regulations 2005, Regulation 12 Demonstrating compliance with the relevant statutory provisions, U.K. Health and Safety Executive, <http://www.hse.gov.uk/offshore/is2-2006.pdf>

¹⁶ <http://www.hse.gov.uk/aboutus/meetings/iacs/oiac/wig.htm>

¹⁷ <http://stepchangeinsafety.net/stepchange/>

¹⁸ Information on the Australian system from discussions with Jane Cutler, head of NOPSA and Simon Schubach, September 10, 2010 (Washington, DC) and October 18-19, 2010 (Vancouver, BC, Canada) and from the NOPSA website.

¹⁹ <http://www.ret.gov.au/Pages/default.aspx>

The [National Offshore Petroleum Safety Authority \(NOPSA\)](#)²⁰ is the safety regulator in federal as well as in the state and territorial waters. Australia took to heart the recommendations of the Piper Alpha Cullen Report and moved to a safety case approach with active worker involvement in safety culture. The policies and practices of NOPSA are modeled closely on, and appear to be implemented in very nearly the same manner as, those of the U.K. HSE.

The transition to the current regime in response to Piper Alpha (1988) began with a series of amendments to the legislation covering the offshore oil and gas industry between 1992 and 1996 to transition to a safety case regime. The safety case is characterized by an acceptance that the direct responsibility for the ongoing management of safety on facilities is the responsibility of those best placed to manage the risks: the operators. The role of the regulator is to provide robust challenge and oversight. In 1999, the Australian government commissioned an Independent Review Team (IRT), which endorsed the move to a consistent national approach to offshore safety. The principles for regulation that established NOPSA, included: 1) a consistent national approach, 2) a safety case approach, and 3) a legislative framework that is clear and enforceable and that requires operators to discharge their responsibilities for safety. NOPSA opened its doors on January 1, 2005.²¹

As in the U.K., all facilities – drilling ships, MODUs, and platforms – must have a safety case. Unlike the U.K. HSE, NOPSA is not engaged in the safety review process until after the production design plans under the safety case have been developed. In the case of the Montara well blowout in 2009, the authorities of the Northern Territory were responsible for the review of the well design and operator’s safety case. Based on the findings of the official inquiry into the Montara incident, Martin Ferguson, the Minister for Resources and Energy, declared the government’s intention to extend the functions of NOPSA to include structural integrity of facilities, wells, and well-related equipment, environmental regulation.²²

“The [Montara] Inquiry concurs with the view of other recent inquiries that responsibility for well integrity should be moved to the National Offshore Petroleum Safety Authority (NOPSA) (see below). Ensuring the integrity of the well is essential for ensuring safety and environmental outcomes. The Designated and Joint Authority (JA) arrangements currently in place pursue a mix of objectives: policy, promoting industry development and regulatory. The Inquiry is concerned that under these arrangements

²⁰ <http://nopsa.gov.au/>

²¹ Presentation by Jane Cutler, Vancouver, October 19, 2010
<http://www.irfconference2010.com/uploadfiles/documents/Wednesday/Jane%20Cutler.pdf>

²² Statement by the Minister for Resources and Energy, the Honorable Martin Ferguson AM, MP, November 24, 2010. <http://www.ret.gov.au/Department/Documents/MIR/montara-ministerial-statement.pdf>.

well integrity issues do not receive necessary priority, thereby prejudicing safety and environmental objectives.”²³

The Minister’s speech and the draft Government Response to the Montara Report emphasize the government’s commitment to establish a single national regulator for offshore petroleum activities by January 2012. The proposed National Offshore Petroleum Safety and Environmental Management Authority will become the regulator for all offshore petroleum activities conducted more than three nautical miles from the territorial sea baseline. To ensure that the focus of the agency is clearly on the safety, integrity, and environmental performance of the offshore industry, title administration and related activities will be managed separately.²⁴

The level of unionization is low in the Australian offshore; however, the occupational health and safety legislation provides some authority and protection for non-management workplace safety representatives. Incident reporting is kept confidential to encourage compliance, but a move to greater transparency is under consideration. The industry association does not have an equivalent to the U.K.’s *Step Change in Safety* program.

Maritime Canada²⁵: The Canadian Maritime provinces have independent joint boards - [Canada-Newfoundland and Labrador Offshore Petroleum Board](#)²⁶ and [Canada-Nova Scotia Offshore Petroleum Board](#)²⁷ - with the federal government to lease and manage offshore oil and gas development. Unlike the North Sea and Australian models, leasing, safety, environmental oversight, and regulation are managed by the same entity. However, the Newfoundland and Labrador government have called for an independent safety agency for its offshore oil sector.

While not called a “safety case”, the regulators have “an established safety assessment process to review Operators' applications in a systematic manner prior to the Board issuing a work authorization. This process considers the safety of the activity as a whole and its component parts including the installation, its facilities, personnel and procedures. This process also provides confidence that each Operator has an appropriate system in place to manage risk to personnel both from major hazards and from day-to-day occupational hazards. As part of the safety assessment process, Safety Officers may visit installations or vessels to conduct a safety audit or safety

²³ Report of the Montara Commission of Inquiry, Commissioner David Borthwick AO PSM, June 2010, <http://www.ret.gov.au/Department/Documents/MIR/Montara-Report.pdf>, p. 18

²⁴ Details on the Government’s response to the Montara Inquiry may be found at <http://www.ret.gov.au/Department/responses/montara/Pages/MontaraInquiryResponse.aspx>

²⁵ Information on the Canadian systems from discussions with Max Ruelokke, Chairman and CEO, Canada-Newfoundland and Labrador Offshore Petroleum Board and Stuart Pinks, CEO, Canada-Nova Scotia Offshore Petroleum Board, September 9, 2010 (Washington, DC) and October 18-19, 2010 (Vancouver, BC, Canada) and from the websites.

²⁶ <http://www.cnlopb.nl.ca/>

²⁷ <http://www.cnsopb.ns.ca/>

inspection.”²⁸ As in the North Sea and Australia, individual safety plans are required for facilities: drillings ships, MODUs, and production platforms.

Oversight and inspections are managed in a manner similar to the North Sea, with comprehensive reviews of each facility’s safety plan once every three years. The Boards meet with the industry quarterly for a thorough review of activities and incidents, including a review of lessons learned. The Boards use the same training matrix for their staff to maintain up to date expertise as the Canadian industry,²⁹ supplemented with conferences on investigations put on by the Royal Canadian Mounted Police

The Boards are independent and operate at arms-length from the Federal and Provincial Ministers of Natural Resources, and ministers cannot easily override the decisions of a Board Chief Executive. Each Board has designated a Chief Safety Officer with complete authority to shut down operations, based on unacceptable safety or environmental risk.

An inquiry panel that investigated a 2009 helicopter crash that killed 17 offshore workers has recommended that a new, independent safety regulator be established for oil and gas activities offshore Newfoundland and Labrador. This recommendation has been endorsed by the provincial government and is being reviewed by the Federal government.³⁰

International Regulators Forum

A growing group of regulators from countries with offshore oil and gas activity – certainly the U.S. and its peers - are members of the [International Regulators Forum \(IRF\) on Global Offshore Safety](#).³¹ The [International Committee on Regulatory Authority Research and Development \(ICRAD\)](#)³², an adjunct of the regulator’s forum, serves as the mechanism for sharing research and studies on health, safety, and environment in the petroleum sector. After two of the worst offshore blowouts and oil spills in history on opposite sides of the globe – the Montara well off Australia and the Macondo well in the U.S. Gulf of Mexico – the IRF held two meetings and an international safety

²⁸ Quoted from the description of the Safety Assessment on the website of the Canada-Newfoundland and Labrador Offshore Petroleum Board. http://www.cnlopb.nl.ca/safe_assess.shtml

²⁹ <http://www.capp.ca/getdoc.aspx?DocId=181712&DT=PDF>, Atlantic Canada Offshore Petroleum Industry: Standard Practice for the Training and Qualifications of Personnel, Canadian Association of Petroleum Producers (CAPP)

³⁰ Offshore Helicopter Safety Inquiry Report, St. John's Newfoundland, 11/17/10: http://www.cnlopb.nl.ca/ohsi_information.shtml

Globe and Mail article, Sue Bailey, 12/13/10: <http://www.theglobeandmail.com/news/national/atlantic/newfoundland-premier-wants-independent-agency-to-monitor-offshore-oil-safety/article1835221/>

³¹ National Offshore Petroleum Safety Authority, (NOPSA); Petroleum Safety Authority, Norway, (PSA); US Bureau of Ocean Energy Management, Regulation & Enforcement (BOEMRE); New Zealand Department of Labor, (DOL); Canada-Nova Scotia, and Canada-Newfoundland and Labrador, Offshore Petroleum Boards, (CNSOPB / C-NLOPB); Brazilian National Petroleum Agency, (ANP); The Health and Safety Executive, Great Britain, (HSE); and State Supervision of Mines, the Netherlands, (SSM)

³² The International Committee on Regulatory Authority Research and Development (ICRAD) is focused on transferring knowledge in the area of health, safety and environment in the petroleum sector, <http://www.icrad.org/>

conference in 2010.³³ A consensus list of finding and recommendations providing guidance for assessing and improving offshore safety was developed by the 200+ attendees at the annual conference. The consensus findings and recommendations of the conference, which provide guidance for assessing and improving offshore safety programs, are summarized below.³⁴

- Regulatory regimes function most effectively when a single entity has broad safety and pollution prevention responsibility. Gaps, overlap, and confusion are not in the interest of safety or regulatory efficiency.
- The regulator's core responsibilities and objectives must be clearly identified. Managers must minimize distractions so that regulatory personnel can focus on these objectives.
- Safety management and regulatory priorities should be identified through a comprehensive risk assessment program. Training and competency development programs should be updated to reflect the new risk information. Contracting strategies should be reviewed to assess their safety and risk implications.
- Government and industry should promote an improvement mentality, not a compliance mentality. Continuous communication among regulators, operators, contractors, workers, industry associations and public interest groups is essential for continuous improvement.
- Operators and contractors must manage their companies to achieve safety objectives and must continually assess the effectiveness of their management programs. Regulators should challenge industry to resolve potential safety problems rather than seek to resolve the problems for them.
- Regulators should serve as catalysts for learning by distributing information, hosting workshops, participating in research, and identifying gaps in standards and best practices. Wherever possible, the best standards should be identified and applied internationally.
- Accident investigations should be conducted independently and findings should be promptly and broadly distributed. Industry or government should maintain comprehensive and verified incident data bases. Offshore companies should regularly discuss the causes and implications of past accidents with their employees.
- Industry and government cannot rely solely on incident data to identify risks. New indicators must be explored and assessed, particularly for major hazards and safety culture. Worker input is also essential.
- Peer-based audit programs should be considered for both regulators and operators.

³³ The IRF held a special meeting in September in Herndon, VA to discuss the two blowouts as regulators were seeking information from industry and assessing the risks of such an occurrence in their own domains. The second meeting was held on October 21, 2010 following the 3rd International Regulators' Offshore Safety Conference, 18-20 October 2010 Vancouver, British Columbia, Canada.

³⁴ <http://www.irfconference2010.com/showcontent.aspx?MenuID=940>

- Industry and regulators should make better use of technology for real time monitoring of safety parameters.
- Sustaining outstanding safety performance is critical to the reputation of industry and government. All personnel should be trained to be safety leaders and should be empowered to stop work without blame.
- Industry and government should investigate other actions and programs that might help promote, sustain, and monitor a culture of safety achievement.

Following the conference, IRF members met and approved a strategic agenda focusing on the following topics³⁵:

- Safety culture and leadership;
- Blowout preventer integrity and operational issues;
- Performance indicators;
- Operator competency/capacity criteria; and
- Use of standards and industry best practice.

³⁵ <http://www.irfoffshoresafety.com/conferences/2010conference/communique.aspx>