TESTIMONY
OF

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AND

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NATIONAL COMMISSION ON THE BP DEEPWATER HORIZON OIL SPILL AND OFFSHORE DRILLING

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I. Introduction

Chairman Boxer, Ranking Member Inhofe, and members of the Committee, thank you for the opportunity to testify today on behalf of the National Commission on the BP *Deepwater Horizon* Oil Spill and Offshore Drilling.

The explosion that tore through the *Deepwater Horizon* drilling rig last April 20, as the rig's crew completed drilling the exploratory Macondo well deep under the waters of the Gulf of Mexico, began a human, economic, and environmental disaster.

Eleven crew members died, and others were seriously injured, as fire engulfed and ultimately destroyed the rig. And, although the nation would not know the full scope of the disaster for weeks, the first of more than four million barrels of oil began gushing uncontrolled into the Gulf—threatening livelihoods, the health of Gulf coast residents and of those responding to the spill, precious habitats, and even a unique way of life. A treasured American landscape, already battered and degraded from years of mismanagement, faced yet another blow as the oil spread and washed ashore. Five years after Hurricane Katrina, the nation was again transfixed, seemingly helpless, as this new tragedy unfolded in the Gulf. The costs from this one industrial accident are not yet fully counted, but it is already clear that the impacts on the region's natural systems and people were enormous, and that economic losses total tens of billions of dollars.

On May 22, 2010, President Barack Obama announced the creation of the National Commission on the BP *Deepwater Horizon* Oil Spill and Offshore Drilling (the "Commission"): an independent, nonpartisan entity, directed to provide thorough analysis and impartial judgment. The President charged the Commission to determine the causes of the disaster, and to improve the country's ability to respond to spills, and to recommend reforms to make offshore energy production safer. And the President said we were to follow the facts wherever they led.

This Commission report (the "Report"), which we ask be made part of the hearing record in its entirety, is the result of an intense six-month effort to fulfill the President's charge. As a result of our investigation, we conclude:

- The explosive loss of the Macondo well could have been prevented.
- The immediate causes of the Macondo well blowout can be traced to a series of identifiable mistakes made by BP, Halliburton, and Transocean that reveal such systematic failures in risk management that they place in doubt the safety culture of the entire industry.
- Deepwater energy exploration and production, particularly at the frontiers of experience, involve risks for which neither industry nor government has been adequately prepared, but for which they can and must be prepared in the future.
- To assure human safety and environmental protection, regulatory oversight of leasing, energy exploration, and production require reforms even beyond those significant reforms already initiated since the *Deepwater Horizon* disaster. Fundamental reform will be needed in both the structure of those in charge of regulatory oversight and

their internal decision-making process to ensure their political autonomy, technical expertise, and their full consideration of environmental protection concerns.

- Because regulatory oversight alone will not be sufficient to ensure adequate safety, the oil and gas industry will need to take its own, unilateral steps to increase dramatically safety throughout the industry, including self-policing mechanisms that supplement governmental enforcement.
- The technology, laws and regulations, and practices for containing, responding to, and cleaning up spills lag behind the real risks associated with deepwater drilling into large, high-pressure reservoirs of oil and gas located far offshore and thousands of feet below the ocean's surface. Government must close the existing gap and industry must support rather than resist that effort.
- Scientific understanding of environmental conditions in sensitive environments in deep Gulf waters, along the region's coastal habitats, and in areas proposed for more drilling, such as the Arctic, is inadequate. The same is true of the human and natural impacts of oil spills.

We reach these conclusions, and make necessary recommendations, in a constructive spirit: we aim to promote changes that will make American offshore energy exploration and production far safer, today and in the future.

II. The Root Causes of the Explosion

The Commission examined in great detail what went wrong on the rig itself. Our investigative staff uncovered a wealth of specific information that greatly enhances our understanding of the factors that led to the explosion. There are recurring themes of missed warning signals, failure to share information, and a general lack of appreciation for the risks involved. In the view of the Commission, these findings highlight the importance of organizational culture and a consistent commitment to safety by industry, from the highest management levels on down.

To summarize, the Macondo blowout happened because a number of separate risk factors, oversights, and outright mistakes combined to overwhelm the safeguards—promised by both government and by private industry—to prevent just such an event from happening. But most of the mistakes and oversights at Macondo can be traced back to a single overarching failure—a failure of management by BP, Halliburton and Transocean. Set out below are what Commission investigative staff determined were "key facts."

Key Facts: The investigation team identified several key human errors, engineering mistakes and management failures including:

- A flawed design for the cement slurry used to seal the bottom of the well, which was developed without adequate engineering review or operator supervision;
- A "negative pressure test," conducted to evaluate the cement seal at the bottom of the well, identified a cementing failure but was incorrectly judged a success because of insufficiently rigorous test procedures and inadequate training of key personnel;

- Flawed procedures for securing the well that called for unnecessarily removing drilling mud from the wellbore. If left in place, that drilling mud would have helped prevent hydrocarbons from entering the well and causing the blowout;
- Apparent inattention to key initial signals of the impending blowout; and
- An ineffective response to the blowout once it began, including but not limited to a failure of the rig's blowout preventer to close off the well.

Key Findings: The "key facts" led investigators to make the following "key findings":

- Errors and misjudgments by at least three companies—BP, Halliburton and Transocean—contributed to the disaster.
- Management failures included:
  - Inadequate training of key personnel.
  - Inadequate management of numerous late-stage well design decisions.
  - Poor communication within and between the companies involved.
  - Inadequate risk evaluation and risk mitigation measures.
- The disaster could have been prevented. Notably, workers on the rig incorrectly interpreted clear warning signs of a hydrocarbon influx during the negative pressure test. If recognized, those warning signs would have allowed them to shut in the well before the blowout began.
- Government regulations did not address several key causes of the blowout, and regulators lacked the resources or technical expertise to address others.
- Whether purposeful or not, many of the risk-enhancing decisions that BP, Halliburton, and Transocean made saved those companies significant time (and money).

The Commission's investigation concludes that these failures were preventable. Errors and misjudgments by at least three companies – BP, Halliburton and Transocean – contributed to the disaster, and federal regulations did not address many of the key issues.

III. Regulatory Oversight and the Need for Reform

Regulatory Oversight

While our testimony will primarily focus on those areas that fall within the Committees jurisdiction, it is important to briefly discuss the lapses in regulatory oversight that contributed to this disaster, and the Commission's recommendations in this area.

The responsibilities assigned to the Minerals Management Services (MMS) in an effort to regulate the offshore oil and gas industry have created conflicts of interest and have been subject to pressure from political and industry interests. MMS was not only responsible for offshore leasing and resource management; it also collected and disbursed revenues from offshore

leasing, conducted environmental reviews, reviewed plans and issued permits, conducted audits and inspections, and enforced safety and environmental regulations.

Over the course of many years, political pressure generated by a demand for lease revenues and industry pressure to expand access and expedite permit approvals and other regulatory processes often combined to push MMS to elevate revenue and permitting goals over safety and environmental goals. These problems were compounded by an outdated organizational structure, a chronic shortage of resources, a lack of sufficient technological expertise, and the inherent difficulty of coordinating effectively with all of the other government agencies that have had statutory responsibility for some aspect of offshore oil and gas activities.

To remedy this conflict of interest, the Commission recommends that the roles and responsibilities of the former MMS should be separated into three entities with clearly defined statutory authorities. One entity would be responsible for offshore safety and environmental enforcement; another would perform functions related to leasing and environmental science; and the third would manage natural resource revenues. The safety and environment enforcement authority or entity, in particular, should have primary statutory responsibility for overseeing the structural and operational integrity of all offshore energy-related facilities and activities, including both oil and gas offshore drilling and renewable energy facilities.

Since the Commission issued its final report on January 11th, Secretary of the Interior Ken Salazar has already announced changes in the organization within Interior that reflect many of the Commission's recommendations.

Regulation to Better Manage Risk

The Commission also recommends a more comprehensive overhaul of both the leasing program and the regulatory policies and institutions used to oversee the safety and environmental protection of offshore activities. The goals must be to reduce and manage risk more effectively, using strategies that can keep pace with a technologically complex and rapidly evolving industry, particularly in high-risk and frontier areas, and to secure the resources needed to execute the leasing function and provide adequate regulatory oversight.

BOEMRE currently relies heavily on prescriptive regulations incorporating a number of industry technical standards. Prescriptive regulations must be the basis of an effective regulatory system, but given the many variables in deepwater drilling, prescriptive rules can never cover all cases. The federal agency responsible for offshore activity must have a regulatory approach that integrates more sophisticated risk assessment and risk management practices into its oversight of energy developers operating offshore. The focus should shift from prescriptive regulations covering only the operator to a *foundation* of augmented prescriptive regulations, including those relating to well design and integrity, *supplemented* by a proactive, risk-based performance approach that is specific to individual facilities (production platforms and drilling rigs), operations, and environments. Both the operator and the drilling rig owners would have a legal duty to assess and manage the risks of a specific activity by engaging all contractors and subcontractors in a coordinated safety management system.

IV. Environmental Review

As part of its inquiry into the existing regulatory structure for offshore drilling, the Commission reviewed existing mechanisms for protecting the environment. In its work on this question, the Commission focused on two issues: (1) the application of National Environmental Policy Act (NEPA) requirements to the offshore leasing process and (2) the need for better science and greater interagency consultation to improve decision-making related to management of offshore resources.

NEPA

Based on the Commission's review of leasing and permitting processes in the Gulf of Mexico before the *Deepwater Horizon* incident, the Commission concluded that the breakdown of the environmental review process for OCS activities was systemic and that Interior's historical approach to the application of NEPA requirements for offshore oil and gas activities needs significant revision. In particular, the application of tiering, use of categorical exclusions, the practice of area-wide leasing, and failure to develop formal NEPA guidance all contributed to this breakdown. The Commission recommends that the Council on Environmental Quality and the Department of the Interior revise and strengthen the NEPA policies, practices, and procedures to improve the level of environmental analysis, transparency, and consistency at all stages of the OCS planning, leasing, exploration, and development process.

Improved Interagency Consultation and Environmental Science

Under OCSLA, it is up to the Secretary of the Interior to choose the proper balance between environmental protection and resource development. In making leasing decisions, the Secretary is required to solicit and consider suggestions from any interested agency, but he or she is not required to respond to the comments or accord them any particular weight. Similar issues arise at the individual lease sale stage and at the development and production plan stage. As a result, NOAA—the nation's ocean agency with the most expertise in marine science and the management of living marine resources—effectively has the same limited role as the general public in the decisions on selecting where and when to lease portions of the OCS. The Commission recommends a more robust and formal interagency consultation process in which NOAA, in particular, is provided a heightened role, but ultimate decision-making authority is retained at DOI. The Commission further recommends the creation of an Office of Environmental Science, led by a Chief Environmental Scientist, with specified responsibilities in conducting all NEPA reviews, coordinating other environmental reviews, and whose expert judgment on environmental protection concerns would be accorded significant weight in leasing decision-making.

V. Reforming Industry Safety Practices

Changing Business As Usual

Without effective government oversight, the offshore oil and gas industry will not adequately reduce the risk of accidents, nor prepare effectively to respond in emergencies. However, government oversight alone cannot reduce those risks to the fullest extent possible. Government

oversight must be accompanied by the oil and gas industry's internal reinvention: sweeping reforms that accomplish no less than a fundamental transformation of its safety culture.

Just as the nuclear power industry created the Institute of Nuclear Power Operations (INPO), the nation's oil and gas industry needs now to embrace the potential for an industry safety institute to supplement government oversight of industry operations. To be credible, any industry-created safety institute would need to have complete command of technical expertise available through industry sources. To be successful, an oil and gas industry safety institute would require in the first instance strong board-level support from CEOs and boards of directors of companies for a rigorous inspection and auditing function. Such audits would need to be aimed at assessing companies' safety cultures and encouraging learning about implementation of enhanced practices. The inspection and auditing function would need to be conducted by safety institute staff, complemented by experts seconded from industry companies. There would also need to be a commitment to share findings about safety records and best practices within the industry, aggregate data, and analyze performance trends, shortcomings, and needs for further research and development. Accountability could be enhanced by a requirement that companies report their audit scores to their boards of directors and insurance companies.

VI. Financial Responsibility and Liability

Oil spills cause a range of harms, including personal, economic and environmental injuries, to individuals and ecosystems. The Oil Pollution Act makes the party responsible for a spill liable for compensating those who suffered as a result of the spill—through human health and property damage, lost profits, and other personal and economic injuries—and for restoring injured natural resources. The Act also provides an opportunity to make claims for compensation from a dedicated Oil Spill Liability Trust Fund. The Oil Pollution Act, however, imposes limits on both the amount for which the responsible party is liable, and the amount of compensation available through the trust fund. In the case of the *Deepwater Horizon* spill, BP (a responsible party) has placed $20 billion in escrow to compensate private individuals and businesses through the independent Gulf Coast Claims Facility. But if a less well capitalized company had caused the spill, neither a multi-billion dollar compensation fund nor the funds necessary to restore injured resources, would likely have been available.

Liability for damages from spills from offshore facilities is capped under the Oil Pollution Act at $75 million, unless it can be shown that the responsible party was guilty of gross negligence or willful misconduct, violated a federal safety regulation, or failed to report the incident or cooperate with removal activities, in which case there is no limit on damages. Claims up to $1 billion for certain damages can be made to, and paid out of, the Oil Spill Liability Trust Fund, which is currently supported by an 8-cent per-barrel tax on domestic and imported oil.

The Oil Pollution Act also requires responsible parties to "establish and maintain evidence of financial responsibility," generally based on a "worst-case discharge" estimate. In the case of offshore facilities, necessary financial responsibility ranges from $35 million to $150 million.

Inadequacy of Current System

There are two main problems with the current liability cap and financial responsibility dollar amounts. First, the relatively modest liability cap and financial responsibility requirements provide little incentive for oil companies to improve safety practices. Second, as noted, if an oil company with more limited financial means than BP had caused the *Deepwater Horizon* spill, that company might well have declared bankruptcy long before paying fully for all damages. In the case of a large spill, the Oil Spill Liability Trust Fund would likely not provide sufficient backup. Thus, a significant portion of the injuries caused to individuals and natural resources, as well as government response costs, could go uncompensated.

Any discussion of increasing liability caps and financial responsibility requirements must balance two competing public policy concerns: first, the goal of ensuring that the risk of major spills is minimized, and in the event of a spill, victims are fully compensated; and second, that increased caps and financial responsibility requirements do not drive competent independent oil companies out of the market. A realistic policy solution also requires an understanding of the host of complex economic impacts that could result from increases to liability caps and financial responsibility requirements.

Options for Reform

As this Committee and others in Congress consider options for addressing these problems, the Commission recommends that first, Congress significantly increase the liability cap and financial responsibility requirements for offshore facilities. To address both the incentive and compensation concerns noted above, Congress should significantly raise the liability cap. Financial responsibility limits should also be increased, because if an oil company does not have adequate resources to pay for a spill, the application of increased liability has little effect. Should a company go bankrupt before fully compensating for a spill, its liability is effectively capped. If, however, the level of liability imposed and the level of financial responsibility required are set to levels that bear some relationship to potential damages, firms will have greater incentives to maximize prevention and minimize potential risk of oil spills and also have the financial means to ensure that victims of spills do not go uncompensated.

Second, the Commission recommends that Congress increase the limit on per-incident payouts from the Oil Spill Liability Trust Fund. If liability and financial responsibility limits are not set at a level that will ensure payment of all damages for spills, then another source of funding will be required to ensure full compensation. The federal government could cover additional compensation costs, but this approach requires the taxpayer to foot the bill. Therefore, Congress should raise the Oil Spill Liability Trust Fund per-incident limit. Raising the Oil Spill Liability Trust Fund's per-incident limit will require the Fund to grow through an increase of the per-barrel tax on domestic and imported oil production. An alternative would be to increase the Trust Fund through a surcharge by mandatory provisions in drilling leases triggered in the event that there are inadequate sums available in the Fund.

Third, the Commission recommends that the Department of the Interior enhance auditing and evaluation of the risk of offshore drilling activities by individual participants (operator, driller, other service companies). The Department of the Interior, insurance underwriters, or other

independent entities should evaluate and monitor the risk of offshore drilling activities to promote enhanced risk management in offshore operations and to discourage unqualified companies from remaining in the market.

The Interior Department currently determines financial responsibility levels based on potential worst-case discharges, as required by the Oil Pollution Act. Although the agency's analysis to some degree accounts for the risk associated with individual drilling activities, it does not fully account for the range of factors that could affect the cost of a spill, and thus the level of financial responsibility that should be required. Interior should analyze a host of specific, risk-related criteria when determining financial responsibility limits applicable to a particular company, including, but not limited to: geological and environmental considerations, the applicant's experience and expertise, and applicable risk management plans. This increased scrutiny would provide an additional guard against unqualified companies entering the offshore drilling market.

VII. Response and Containment

As part of its charge from President Obama, the Commission looked at the effectiveness of the response to the spill. There were remarkable instances of dedication and heroism by individuals involved in the rescue and cleanup. Much was done well—and thanks to a combination of good luck and hard work, the worst-case scenarios did not all come to pass. But it is impossible to argue that the industry or the government was prepared for a disaster of the magnitude of the *Deepwater Horizon* oil spill. Twenty years after the *Exxon Valdez* spill in Alaska, the same blunt response technologies—booms, dispersants, and skimmers—were used, to limited effect. On-the-ground shortcomings in the joint public-private response to an overwhelming spill like that resulting from the blowout of the Macondo well are now evident, and demand public and private investment. So do the weaknesses in local, state, and federal coordination revealed by the emergency.

Neither BP nor the federal government was prepared to conduct an effective response to a spill of the magnitude and complexity of the *Deepwater Horizon* disaster. Three critical issues or gaps existed in the government's response capacity: (1) the failure to plan effectively for a large-scale, difficult-to-contain spill in the deepwater environment; (2) the difficulty of coordinating with state and local government officials to deliver an effective response; and (3) a lack of information and understanding concerning the efficacy of specific response measures, such as dispersants or berms. Moreover, the technology available for cleaning up oil spills had improved only incrementally since 1990. The technologies and methods available to cap or control a failed well in the extreme conditions thousands of feet below the sea were also inadequate. Although BP was able to develop new source-control technologies in a compressed timeframe, and the government was able to develop an effective oversight structure, the containment effort would have benefitted from prior preparation and contingency planning.

Improved Oil Spill Response Planning

The Department of the Interior should create a rigorous, transparent, and meaningful oil spill risk analysis and planning process for the development and implementation of better oil spill response. Several steps are needed for implementation:

- Interior should review and revise its regulations and guidance for industry oil spill response plans. The revised process should ensure that all critical information and spill scenarios are addressed in the plans.

- In addition to Interior, other agencies with relevant scientific and operational expertise should play a role in evaluating spill response plans to verify that operators can conduct the operations detailed in their plans. Specifically, oil spill response plans, including source-control measures, should be subject to interagency review and approval by the Coast Guard, EPA, and NOAA. Other parts of the federal government, such as Department of Energy national laboratories that possess relevant scientific expertise, could be consulted. Plans should also be made available for a public comment period prior to final approval and response plans should be made available to the public following their approval.

- Interior should incorporate the "worst-case scenario" calculations from industry oil spill response plans into NEPA documents and other environmental analyses or reviews.

Spills of National Significance

The Gulf oil spill presented an unprecedented challenge to the response capability of both government and industry. Though the National Contingency Plan permitted the government to designate the spill as one of "national significance," this designation did not trigger any procedures other than allowing the government to name a National Incident Commander.

EPA and the Coast Guard should establish distinct plans and procedures for responding to a "Spill of National Significance." Specifically, EPA should amend or issue new guidance on the National Contingency Plan to:

- Increase government oversight of the responsible party, based on the National Contingency Plan's requirement that the government "direct" the response where a spill poses a substantial threat to public health or welfare.

- Augment the National Response Team and Regional Response Team structures to establish additional frameworks for providing interagency scientific and policymaking expertise during a spill. Further, EPA, NOAA, and the Coast Guard should develop procedures to facilitate review and input from the scientific community—for example, by encouraging disclosure of underlying methodologies and data.

- Create a communications protocol that accounts for participation by high-level officials who may be less familiar with the National Contingency Plan structure and create a communications center within the National Incident Command—separate from the joint information center established in partnership with the responsible party—to help transmit consistent and complete information to the public.

Strengthening State and Local Involvement

The response to the *Deepwater Horizon* disaster showed that state and local elected officials had not been adequately involved in oil spill contingency planning, though career responders in state government had participated extensively. Unfamiliarity with, and lack of trust in, the federal response manifested itself in competing state structures and attempts to control response operations that undercut the efficiency of the response overall.

EPA and the Coast Guard should bolster state and local involvement in oil spill contingency planning and training and create a mechanism for local involvement in spill planning and response similar to the Regional Citizens' Advisory Councils mandated by the Oil Pollution Act of 1990.

In addition, a mechanism should be created for ongoing local involvement in spill planning and response in the Gulf. In the Oil Pollution Act of 1990, Congress mandated citizens' councils for Prince William Sound and Cook Inlet. In the Gulf, such a council should broadly represent the citizens' interests in the area, such as fishing and tourism, and possibly include representation from oil and gas workers as ex-officio, non-voting members.

Research and Development for Improved Response

The technology available for cleaning up oil spills has improved only incrementally since 1990. Federal research and development programs in this area are underfunded: In fact, Congress has never appropriated even half the full amount authorized by the Oil Pollution Act of 1990 for oil spill research and development.

Specifically, Congress should provide mandatory funding (i.e. funding not subject to the annual appropriations process) at a level equal to or greater than the amount authorized by the Oil Pollution Act of 1990 to increase federal funding for oil spill response research by agencies such as Interior, the Coast Guard, EPA, and NOAA. In addition, Congress and the Administration should encourage private investment in response technology more broadly, including through public-private partnerships and a tax credit for research and development in this area.

Dispersants

Prior to the blowout, the federal government had not adequately planned for the use of dispersants to address such a large and sustained oil spill, and did not have sufficient research on the long-term effects of dispersants and dispersed oil to guide its decision-making.

EPA should update and periodically review its dispersant testing protocols for product listing or pre-approval, and modify the pre-approval process to include temporal duration, spatial reach, and volume of the spill. EPA should update its dispersant testing protocols and require more comprehensive testing prior to listing or pre-approving dispersant products. The Coast Guard and EPA should modify pre-approvals of dispersant use under the National Contingency Plan to establish procedures for further consultation based on the temporal duration, spatial reach, or volume of the spill and volume of dispersants that responders are seeking to apply. EPA and NOAA should conduct and encourage further research on dispersants.

Containment

The most obvious, immediately consequential, and plainly frustrating shortcoming of the oil spill response set in motion by the events of April 20, 2010 was the simple inability—of BP, of the federal government, or of any other potential intervener—to contain the flow of oil from the damaged Macondo well.

At the time of the blowout on April 20, the U.S. government was unprepared to oversee a deepwater source-control effort. Once the Secretary of Energy's science team, the U.S. Geological Survey, the national laboratories, and other sources of scientific expertise became involved, the government was able to substantively supervise BP's decision-making, forcing the company to fully consider contingencies and justify its chosen path.

The National Response Team should develop and maintain expertise within the Federal government to oversee source-control efforts. The National Response Team should create an interagency group—including representation from the Department of the Interior, Coast Guard, and the Department of Energy and its national laboratories—to develop and maintain expertise in source control, potentially through public-private partnerships.

Industry's Spill Preparedness

Beyond attempting to close the blowout preventer stack, no proven options for rapid source control in deepwater existed when the blowout occurred. The Department of the Interior should require offshore operators to provide detailed plans for source control as part of their oil spill response plans and applications for permits to drill.

These plans should demonstrate that an operator's containment technology is immediately deployable and effective. In applications for permits to drill, the Interior should require operators to provide a specific source-control analysis for each well. As with oil spill response plans, source-control plans should be reviewed and approved by agencies with relevant expertise, including the Interior and the Coast Guard.

Improved Capability for Accurate Flow Rate Estimates

Early flow rate estimates were highly variable and difficult to determine accurately. However, the understated estimates of the amount of oil spilling appear to have impeded planning for and analysis of source-control efforts like the cofferdam and especially the top kill.

The National Response Team should develop and maintain expertise within the federal government to obtain accurate estimates of flow rate or spill volume early in a source-control effort. The National Response Team should create an interagency group—including representation from Interior, the Coast Guard, the national laboratories, and NOAA—to develop and maintain expertise in estimating flow rates and spill volumes. In addition, EPA should amend the National Contingency Plan to create a protocol for the government to obtain accurate estimates of flow rate or spill volume from the outset of a spill. This protocol should require the responsible party to provide all data necessary to estimate flow rate or spill volume.

More Robust Well Design and Approval Process

Among the problems that complicated the Macondo well-containment effort was a lack of reliable diagnostic tools and concerns about the well's integrity. The Department of the Interior should require offshore operators seeking its approval of proposed well design to demonstrate that:

- Well components, including blowout preventer stacks, are equipped with sensors or other tools to obtain accurate diagnostic information—for example, regarding pressures and the position of blowout preventer rams.
- Wells are designed to mitigate risks to well integrity during post-blowout containment efforts.

Industry Responsibilities for Containment and Response

Industry's responsibilities extend to efforts to contain any big spills as quickly as possible and to mitigate the harm caused by spills through effective response efforts. Both government, which must be capable of taking charge of those efforts, and industry were woefully unprepared to contain or respond to a deepwater well blowout like that at Macondo. All parties lacked adequate contingency planning, and neither had invested sufficiently in research, development, and demonstration to improve containment or response technology.

From now on, the oil and gas industry needs to combine its commitment to transform its safety culture with adequate resources for containment and response. Large-scale rescue, response, and containment capabilities need to be developed and demonstrated—including equipment, procedures, and logistics—and enabled by extensive training, including full-scale field exercises and international cooperation.

To that end, at least two industry spill containment initiatives have emerged that build on ideas and equipment that were deployed in response to the Macondo blowout and spill. The nonprofit Marine Well Containment Company was created in July 2010 by four of the major, integrated oil and gas companies. The second spill containment initiative is being coordinated by Helix Energy Solutions Group, which played a role in the Macondo well containment efforts.

Yet neither the Marine Well Containment Company's planned capabilities nor Helix's go past 10,000 feet despite the fact that current drilling technology extends beyond this depth. Also it seems that neither is structured to ensure the long-term ability to innovate and adapt over time to the next frontiers and technologies. What resources, if any, either initiative will dedicate to research and development going forward is unclear.

The primary long-term goal of a spill containment company or consortia should be to ensure that an appropriate containment system is readily available to contain quickly spills in the Gulf of Mexico with the best available technology. Any spill containment company or consortia should ensure that it remains focused on this goal, even when doing so potentially conflicts with the short-term interests of its founding companies, in the case of MWCC, or the parent company, in the case of Helix. An independent advisory board, with representatives from industry, the federal

government, state and local governments, and environmental groups could help keep any spill containment initiative focused on innovative, adaptive, effective spill response over the long term.

VIII. Spill Impacts and Gulf Restoration

Even before the highly visible damages caused by the spill became clear, many crucial Gulf economic and ecological resources—fisheries, transportation, tourism—faced long-term threats. First, more than 2,300 square miles of coastal wetlands—an area larger than the State of Delaware—have been lost to the Gulf since the United States raised the massive levees along the lower Mississippi River after the devastating Great Flood of 1927. Exceptionally powerful hurricanes, always a threat to the region, struck the coast in 2005 (Katrina and Rita) and 2008 (Gustav and Ike), causing even more wetland loss. Second, low-oxygen bottom waters were in the process of forming a massive "dead zone" extending up to 7,700 square miles during the summer of 2010. Referred to as hypoxia, this phenomenon has intensified and expanded since the early 1970s as a result of nutrient pollution, mainly from Midwestern agriculture. And finally, the *Deepwater Horizon* disaster made matters worse: 11 rig workers killed in the explosion and 17 injured; many thousands of people exposed to contaminated waters, coasts, beaches, and seafood; thousands out of work; birds and sea animals killed and significant habitats damaged or destroyed. The Commission's investigation made plain that existing authorities are not adequate to redress these significant harms and ensure restoration of the Gulf.

Human Health Impacts

The National Contingency Plan overlooks the need to respond to widespread concerns about human health impacts. For smaller oil spills, the response effort is generally carried out by trained oil spill response technicians, but given the scale of the response to the *Deepwater Horizon* spill and the need to enlist thousands of previously untrained individuals to clean the waters and coastline, many response workers were not screened for pre-existing conditions. This lack of basic medical information, which could have been collected if a short medical questionnaire had been distributed, limits the ability to draw accurate conclusions regarding long-term physical health impacts. EPA should amend the National Contingency Plan to add distinct procedures to address human health impacts during a Spill of National Significance. Spills of this magnitude necessarily require a significant clean-up effort, potentially exposing workers to toxic compounds in oil and dispersants.

Consumer Confidence

Images of spewing oil and oiled beaches in newspapers and on television set the stage for public concern regarding the safety of Gulf seafood. Additional factors contributed to the lingering impression that the public could not trust government assurances that the seafood was safe: the unprecedented volumes of dispersants used, confusion over the flow rate and fate of the oil, frustration about the government's relationship with BP in spill cleanup, and lawsuits filed by fishermen contesting the government's assurance of seafood safety. The economic blow to the Gulf region associated with this loss of consumer confidence is sizable. BP gave Louisiana and Florida $68 million for seafood testing and marketing, as well as money to assess impacts on

tourism and fund promotional activities. As of early December 2010, BP was considering a similar request from Alabama.

In future spills, however, there is no guarantee that a responsible party will have the means or the inclination to compensate such losses. Such indirect financial harms are currently not compensable under the Oil Pollution Act. Nevertheless, losses in consumer confidence are real and Congress, federal agencies, and responsible parties should consider ways to restore consumer confidence in the aftermath of a Spill of National Significance.

The Commission recommends that Congress, federal agencies, and responsible parties take steps to restore consumer confidence in the aftermath of a Spill of National Significance.

Lack of Sustained Funding for Gulf Restoration

A lack of sustained and predictable funding, together with failed project coordination and long-term planning, has resulted in incomplete and often ineffective efforts to restore the Gulf's natural environment. No funding source currently exists to support regional restoration efforts. While cost estimates of Gulf restoration vary widely, according to testimony before the Commission, fully restoring the Gulf will require $15 billion–$20 billion, or a minimum of $500 million per year, over 30 years. A number of different sources currently provide funding to individual states for restoration, however none of these sources provides funds for Gulf-wide coastal and marine restoration, and none is sufficient to support the sustained effort required. Most policymakers agree that without a reliable source of long-term funding, it will be impossible to achieve restoration in the Gulf.

Several Gulf States and the federal government have filed or are expected to file suit against BP and other companies involved in the spill, which will likely create opportunities to direct new restoration funds to the region. In some cases, congressional action will be required to ensure that funds are directed to this purpose. The Commission recommends that 80 percent of any Clean Water Act penalties and fines be directed to Gulf restoration. Should such penalties and fines not be directed to the Gulf, Congress should consider other mechanisms for a dedicated funding stream not subject to annual appropriations. Although such mechanisms face hurdles, the fact remains that resources are needed if progress on coastal restoration is to continue. Inaction is a prescription for further degradation. Should CWA penalties not be redirected to Gulf restoration, Congress should consider other mechanisms for a dedicated funding stream not subject to annual appropriations.

Decision-making Body for Expediting Work

In order for funding to be most efficiently directed at long-term restoration, a decision-making body is needed that has authority to set binding priorities and criteria for project funding. The Gulf Coast Ecosystem Restoration Task Force is now in place, as recommended by the September 2010 report on restoration from Secretary of the Navy Ray Mabus to the President, and subsequently established by Presidential Executive Order. According to the Executive Order, the job of the Task Force is to begin coordinating the different restoration projects being undertaken by various jurisdictions in the Gulf, coordinating related science activities and engaging stakeholders. However, as many in Congress and the Administration have suggested,

the Task Force lacks some features necessary to effectively direct long-term restoration efforts in the Gulf—most importantly the ability to set binding goals and priorities.

The Commission recommends that Congress establish a joint state-federal Gulf Coast Ecosystem Restoration Council. The Council should implement a restoration strategy for the region that is compatible with existing state restoration goals. Experience in major restoration endeavors, including those in the Gulf, has shown that, absent binding goals to drive the process, restoration projects are insufficiently funded, focused, or coordinated. Therefore, the restoration strategy should set short- and long-term goals with binding criteria for selecting projects for funding. Key criteria should include national significance; contribution to achieving ecosystem resilience; and the extent to which national policies—such as those related to flood control, oil and gas development, agriculture, and navigation—directly contributed to the environmental problem. Congress should also ensure that the priorities and decisions of the Council are informed by input from a Citizens Advisory Council that represents diverse stakeholders.

Restoration Rooted in Science

Finally, but essentially, restoration decisions must be rooted in science. An approach that draws heavily on information and advice from scientists will result in project selection and funding allocations that are more likely to lead to an effective region-wide restoration strategy. Such an approach will also advance transparency in decision-making and enhance credibility with the public.

The Commission accordingly recommends the establishment of a Gulf Coast Ecosystem Restoration Science and Technology Program that would address these issues in three ways: (1) by creating a scientific research and analysis program, supported by the restoration fund, that is designed to support the design of scientifically sound restoration projects; (2) by creating a science panel to evaluate individual projects for technical effectiveness and consistency with the comprehensive strategy; and (3) by supporting adaptive management plans based on monitoring of outcomes scaled both to the strategy itself and to the individual projects or categories of projects included in it.

Managing Ocean Resources

The Commission recommends that as a part of management and restoration efforts in the marine environment, greater attention should be given to new tools for managing ocean resources, including monitoring systems and spatial planning. Marine scientists have emerged from the *Deepwater Horizon* incident with more precise questions to investigate, as well as a better sense of monitoring needs in the Gulf of Mexico, which because of its multiple uses and economic value should be a national priority. To that end, the National Ocean Council, which the President initiated in July 2010, should work with the responsible federal agencies, industry and the scientific community to expand the Gulf of Mexico Integrated Ocean Observing System, including the installation and maintenance of an in situ network of instruments deployed on selected production platforms. Participation in this system by industry should be regarded as a reasonable part of doing business in nation's waters.

Coastal and marine spatial planning has the potential to improve overall efficiency and reduce conflicts among ocean users. Congress should fund grants for the development of regional planning bodies at the amount requested by the President in the fiscal year 2011 budget submitted to Congress. Ocean management should also include more strategically sited Marine Protected Areas, including but not limited to National Marine Sanctuaries, which can be used as "mitigation banks" to help offset harm to the marine environment. Given the economic and cultural importance of fishing in the Gulf region—and the importance of Gulf seafood to the rest of the country—scientifically valid measures, such as catch share programs, should be adopted to prevent overfishing and ensure the continuity of robust fisheries.

IX. The Future of Offshore Drilling

The central lesson to be drawn from the catastrophe is that no less than an overhauling of both current industry practices and government oversight is now required. The changes necessary will be transformative in their depth and breadth, requiring an unbending commitment to safety by government and industry to displace a culture of complacency. Drilling in deepwater, however, does not have to be abandoned. It can be done safely. That is one of the central messages of the Commission's final report. The Commission's recommendations are intended to do for the offshore oil and gas industry what new policies and practices have done for other high risk industries after their disasters. The Commission believes that the potential for such a transformation to ensure productive, safe, and responsible offshore drilling is significant, and provides reason for optimism even in the wake of a disaster.

The significance of the *Deepwater Horizon* disaster, however, is broader than just its relevance to the future of offshore drilling. The disaster signals the need to consider the broader context of the nation's patterns of energy production and use, now and in the future—the elements of America's energy policy. The explosion at the Macondo well and the ensuing enormous spill—particularly jarring events because of the belief they could never happen—force a reexamination of many widely held assumptions about how to reconcile the risks and benefits of offshore drilling, and a candid reassessment of the nation's policies for the development of a valuable resource. They also support a broader reexamination of the nation's overall energy policy.

Important decisions about whether, when, where, and how to engage in offshore drilling should be made in the context of a national energy policy that is shaped by economic, security, pace of technology, safety, and environmental concerns. Offshore drilling will certainly be an important part of any such policy, but its relative importance today will not, and should not, be the same a half-century from now. The nation must begin a transition to a cleaner, more energy-efficient future. Otherwise, its security and well-being will be increasingly dependent on diminishing supplies of nonrenewable resources and on supplies from foreign sources.

Drilling for oil in the Gulf of Mexico, however, is not solely a matter for U.S. consideration. Both Mexico and Cuba have expressed interest in deepwater drilling in the Gulf in the near future. Potential sites are close enough to the United States—Cuba's mainland lies only 90 miles from Florida's coast and the contemplated wells only 50 miles—that if an accident like the *Deepwater Horizon* spill occurs, fisheries, coastal tourism, and other valuable U.S. natural

resources could be put at great risk. It is in our country's national interest to negotiate now with these neighbors to agree on a common, rigorous set of standards, a system for regulatory oversight, and operator adherence to an effective safety culture, along with protocols to cooperate on containment and response strategies in case of a spill.

Frontier Areas

Our Commission also examined prospects in so called "frontier areas." On December 1, in the wake of the *Deepwater Horizon* experience, Interior Secretary Ken Salazar announced that the Administration would not proceed with drilling in areas where there are "no active leases" during the next five-year leasing plan. As a result, exploration and production in certain frontier areas—the eastern Gulf and off of the Atlantic and Pacific coasts—are deferred. The Secretary also indicated that plans for 2011 drilling in Alaska's Beaufort Sea would be subjected to additional environmental assessments.

The major interest in offshore Alaska reflects the likelihood of finding significant new sources of oil there. The Chukchi and Beaufort Sea off Alaska's north coast rank behind only the Gulf of Mexico in estimated domestic resources. But finding and producing those potentially important supplies of oil offshore Arctic Alaska requires the utmost care, given the special challenges for oil spill response and containment, and heightened risks associated with this frontier, especially its extreme cold, extended seasons of darkness, hurricane-strength storms, and pervasive fog—all affecting access and working conditions—and the extraordinary richness of its ecosystems and the subsistence native communities dependent upon their protection. To deal with these serious concerns about Arctic oil spill response, containment and the heightened environmental stakes the Commission recommends three approaches before the Department of the Interior makes a determination that drilling in a particular area is appropriate. First, the Department should ensure that the containment and response plans proposed by industry are adequate for each stage of development and that the underlying financial and technical capabilities have been satisfactorily demonstrated in the Arctic. Second, the Coast Guard and the oil companies operating in the Arctic should carefully delineate their respective responsibilities in the event of an accident—including search and rescue—and then must build and deploy the necessary capabilities. Third, Congress should provide the resources to establish Coast Guard capabilities in the Arctic, based on the Guard's review of gaps in its capacity.

The Arctic is shared by multiple countries, many of which are considering or conducting oil and gas exploration and development. The extreme weather conditions and infrastructure difficulties are not unique to the U.S. Arctic. Damages caused by an oil spill in one part of the Arctic may not be limited to the waters of the country where it occurred. As a result, the Commission recommends that strong international standards related to Arctic oil and gas activities be established among all the countries of the Arctic. Such standards would require cooperation and coordination of policies and resources.

Bringing the potentially large oil resources of the Arctic outer continental shelf into production safely will require an especially delicate balancing of economic, human, environmental, and technological factors. Both industry and government will have to demonstrate standards and a level of performance higher than they have ever achieved before.

Creating and implementing a national energy policy will require enormous political effort and leadership—but it would do much to direct the nation toward a sounder economy and a safer and more sustainable environment in the decades to come. Given Americans' consumption of oil, finding and producing additional domestic supplies will be required in coming years, no matter what sensible and effective efforts are made to reduce demand—in response to economic, trade, and security considerations, and the rising challenge of climate change.

The extent to which offshore drilling contributes to augmenting that domestic supply depends on rebuilding public faith in existing offshore energy exploration and production. We have proposed a series of recommendations that will enable the country and the oil and gas industry to move forward on this one critical element of U.S. energy policy: continuing, safe, responsible offshore oil drilling to meet our nation's energy demands over the next decade and beyond. Our message is clear: both government and industry must make dramatic changes to establish the high level of safety in drilling operations on the outer continental shelf that the American public has the right to expect and to demand. It is now incumbent upon the Congress, the executive branch, and the oil and gas industry to take the necessary steps.