Regulatory Blowout:

How Regulatory Failures Made the BP Disaster Possible, and How the System Can Be Fixed to Avoid a Recurrence

By CPR Member Scholars Alyson Flournoy, William Andreen, Rebecca Bratspies, Holly Doremus, Victor Flatt, Robert Glicksman, Joel Mintz, Daniel Rohlf, Amy Sinden, Rena Steinzor, Joseph Tomain, and Sandra Zellmer, and CPR Policy Analyst James Goodwin

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This white paper is a collaborative effort of the following Member Scholars and staff of the Center for Progressive Reform: **William Andreen**, University of Alabama School of Law; **Rebecca Bratspies**, CUNY School of Law; **Holly Doremus**, University of California, Berkeley Law, Boalt Hall; **Victor Flatt**, University of North Carolina, Chapel Hill School of Law; **Alyson Flournoy**, University of Florida Levin College of Law; **Robert Glicksman**, George Washington University Law School; **Joel Mintz**, Nova Southeastern University Law Center – Fort Lauderdale, FL; **Daniel Rohlf**, Lewis and Clark Law School; **Amy Sinden**, Temple University Beasley School of Law; **Rena Steinzor**, University of Maryland School of Law; **Joseph Tomain**, University of Cincinnati College of Law; **Sandra Zellmer**, University of Nebraska College of Law; and **James Goodwin**, CPR Policy Analyst.

For more information about the authors, see pages 66-67.

www.progressivereform.org

For media inquiries contact Matthew Freeman at mfreeman@progressivereform.org
or Ben Somberg at bsomberg@progressivereform.org.

For general information, email info@progressivereform.org

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Transocean's development driller continues to dig the relief well in the Gulf of Mexico in May.

Executive Summary

The BP oil spill in the Gulf of Mexico is destined to take its place as one of the greatest environmental disasters in the history of the United States, or for that matter, of the entire planet. Like so many other disasters on that list, it was entirely preventable.

BP must shoulder its share of the blame, of course. Similarly, the Minerals Management Service (MMS)—since reorganized and rebranded—has come under much deserved criticism for its failure to rein in BP's avaricious approach to drilling even where it was unable to respond to a worst-case scenario in a responsible and timely fashion. But the problems run much deeper than a single risk-taking company and a single dysfunctional regulatory agency.

This report sketches out widespread regulatory failure, touching several agencies of the federal government and affecting several critical environmental statutes. Prepared by Member Scholars of the Center for Progressive Reform (CPR), it has two goals: (1) to identify how and why the regulatory system failed to protect the public and environment and prevent the BP disaster, and (2) to recommend the priority reforms that are essential to correct these regulatory deficiencies.

The Deepwater Horizon explosion and well blowout have already been the subject of intensive congressional investigation and will continue to be investigated by the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling and other bodies in the months to come. Witnesses before Congress, internal agency investigations, and media reports have also brought to light pieces of the picture of inadequacies in the regulatory system, typically with a focus on a single agency or regulatory flaw. This report builds on, but does not duplicate, this work uncovering the factual and technical detail surrounding the disaster.

The report connects the dots among the various statutory and regulatory regimes that should have prevented this disaster and the attendant human, environmental, and economic loss. It lays out a map of the regulatory failures and provides a succinct guide to the key reforms that are needed to avoid similar catastrophes in the future. Specifically, it finds:

- Regulators at the Department of the Interior's MMS routinely accepted assurances that a blowout was unlikely and adopted safety and environmental standards developed by industry. The absence of any technology-forcing mandate in the Outer

Continental Shelf Lands Act (OCSLA) meant that industry lacked any incentive to develop new and better safety technology.

- The OCSLA authorizes the Secretary of the Interior to cancel oil leases or permits if they "would probably cause serious harm or damage to life (including fish and other aquatic life), to property, to any mineral (in areas leased or not leased), to the national security or defense, or to the marine, coastal, or human environment." But the provision requires an extremely high level of proof to trigger protective action, proof that is rarely available, thus making the standard virtually meaningless. A companion provision governing exploration plan approval requires even greater proof to trigger protection, directing that an exploration plan shall be approved unless it would result in a similar condition.
- The OCSLA is silent on how to incorporate consideration of environmental impacts into leasing decisions, even though this stage of the energy development process provides one of the most critical opportunities for environmental assessments. Although the MMS regulations require consideration of all available environmental information in deciding to conduct lease sales and direct the MMS to "evaluate fully the potential effect of leasing on the human, marine and coastal environments" and to develop mitigation measures, it is unclear whether any new information is generated or whether the agency merely assesses the very general information already prepared at an earlier stage in the process.
- Compliance with regulatory standards has been far from consistent, and the threat of enforcement has not been a meaningful deterrent. The industry has operated in a climate in which costs were routinely balanced against safety and environmental protection. To motivate compliance with regulatory standards in such a climate, the cost of a failure to comply must be high. Beyond profound problems associated with the culture and funding of the MMS, several provisions in the OCSLA ensured that the cost of noncompliance was minimal—most notably the feeble fine structure for violators. A maximum of $35,000 per day in civil penalties and $100,000 per day for criminal penalties does little to deter risk-taking in a multi-billion dollar industry.
- Difficult as it is to look beyond the egregious ethical violations and regulatory failures at the MMS, it is nevertheless important to recognize that the agency lacks important resources it needs to do the job of protecting the public and the environment, particularly in light of the scientific and engineering complexities inherent in deepwater and ultra deepwater drilling. In addition, resources for enforcement are lacking. According to one Department of the Interior official, the agency has 60 inspectors charged with covering almost 4,000 facilities in the Gulf of Mexico. It needs more scientists, engineers, and inspectors.

- Over the course of several administrations, the MMS was "captured" by the oil industry, and came to see industry, rather than public, as its constituency. That made regulators particularly subject to pressure and influences from industry, and led to an appalling lack of energy in its efforts to protect against industry excesses.
- In 1986, the White House Council on Environmental Quality (CEQ) rescinded a 1978 regulation under the National Environmental Policy Act (NEPA) that required agencies to conduct a "worst-case analysis" in their Environmental Impact Statements when important information regarding the potential consequences of a proposed action was unknown or missing. Had that provision still been in place, it would have forced more rigorous planning by the MMS, BP, and its industry colleagues, which in turn might have prevented the disaster or at least led to a more effective response.
- Over the years, some agencies have abused language in the CEQ's NEPA regulations allowing them to use "categorical exclusions" to avoid preparing Environmental Impact Statements and Environmental Assessments for whole classes of activities. Such exclusions are sometimes appropriate, but their excessively broad application—most specifically in instances in which agency actions pose serious environmental risks—has meant that many environmentally hazardous activities are approved and implemented without any consideration of potential adverse consequences. The MMS was a serial abuser of the process, and that contributed to the failed response to the BP disaster in the Gulf.
- The MMS routinely ignored a requirement in the NEPA regulations that it consider reasonably foreseeable significant adverse impacts—catastrophic ones, in particular—even when they are improbable. In the BP case, the MMS completely ignored the risk of a serious oil spill, examining in its Environmental Impact Statement the prospect of spills no larger than 4,600 barrels of oil. Further, in assessing the aggregate risks of oil and gas drilling in the Gulf over the 40-year life of its plan for the region, it contemplated only that 11,000 to 31,000 barrels might be spilled. In the actual event, the BP spill unleashed an estimated 4.9 million barrels into the Gulf.
- In enforcing the Endangered Species Act (ESA), the National Marine Fisheries Service and the U.S. Fish and Wildlife Service (collectively, "the Services") generally rely on the "action agencies"—in the BP case, the MMS—to provide information to complete their assessments of the dangers of certain actions to wildlife. Since the MMS routinely underestimated the likelihood and magnitude of a spill, the Services were handicapped in their assessments. Moreover, the Services tend to discount risks, even catastrophic ones, if they are deemed to be low probability events, instead focusing on more predictable impacts, opening the door to disastrous results.
- The Services, in carrying out consultations under the ESA, routinely fail to aggregate low probability risks of multiple federal or federally approved actions, despite

regulations requiring consideration of such aggregate effects during the consultation process.

- Despite language in multiple statutes imposing the "Precautionary Principle" on federal decision-making, the MMS proceeded in precisely the manner that the principle is designed to protect against—an indication that the principle is largely unobserved. That is true not just at the MMS, but at other agencies charged with protecting against harm to people and the environment.

Throughout the report, we offer a series of proposed reforms—some legislative, some regulatory—aimed at closing the gaps in the regulatory safety net that allowed the BP disaster to occur. They include:

- Congress should amend the OCSLA to overhaul environmental review procedures, require inter-agency consultation, and extend deadlines for review.
- Congress should act to increase the OCSLA's penalty and bonding amounts and to provide for debarment of serious violators.
- Congress should amend the OCSLA to adopt strong mandates for environmental protection and safety, and to create incentives for continual safety innovation.
- The President should request, and Congress should provide, adequate funding for the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE)—the successor agency to the MMS—so that it can perform its regulatory functions and hire, train, and retain competent staff.
- The Department of the Interior leadership, including Secretary Ken Salazar, should implement new ethics standards, ending the revolving door, and creating a culture that supports the agency's regulatory mission.
- The reorganization that led to the creation of BOEMRE should be built upon with further organizational reforms, including separating several of the agency's existing programs into separate shops.
- The Administration, with leadership from the Department of the Interior, should develop a proposed national policy for offshore oil and gas development that should be the basis for debate in Congress.
- With respect to NEPA, the CEQ should reinstate the regulatory requirement for worst-case analysis planning, specifically, the entire 1978 regulation requiring worst-case analysis by agencies whenever they undertake an action despite the absence of important or essential information regarding the action's adverse environmental impacts.
- The CEQ should strengthen the categorical exclusion process, so that agencies cannot inappropriately exclude entire categories of activity from NEPA's requirements.

- BOEMRE, like its predecessor, the MMS, lacks sufficient independent scientific capacity to carry out its regulatory mission. The U.S. Geological Survey would be a natural choice to provide such expertise, but would need authority and funding to do so.
- With respect to the Endangered Species Act, the Services should revise their regulations to ensure better assessment of low probability risks of harm to listed species. Similarly, the Services should revise their regulations to ensure that agencies consider the aggregate impacts of low probability risks of serious harm, rather than considering each in isolation.

We also offer several broader recommendations aimed at systemic regulatory or energy-related issues. They include:

- Across the regulatory system, regulatory agencies, with leadership from the White House Office of Management and Budget's Office of Information and Regulatory Affairs, should move to reinvigorate the Precautionary Principle, which embodies two concepts: (1) we should act on the basis of reasonable evidence even before we have full scientific proof that a particular industrial activity causes harm, and (2) because some harms are irreversible, cost-benefit analyses are particularly inadequate measures for deciding whether action is required.
- Congress should repeal all subsidies for offshore oil drilling, applying to the energy industry the same logic that it applies to other areas of human activity: The government need not subsidize highly profitable risky and dangerous activities.
- Because the nation's thirst for oil from all sources is the driver for the risks we take by drilling for oil in remote locations and at considerable peril, Congress and the President should adopt an effective climate change policy that reduces the demand for offshore oil.
- Congress should ensure that BOEMRE undertakes an ongoing, systematic evaluation of the lessons learned elsewhere in the wake of serious accidents off the shores of other nations, and of alternative regulatory measures and techniques that have proven effective in those settings.

In Table 1 (next page), we summarize the regulatory failures identified in this paper as contributing to the BP oil spill, as well as the relevant proposed reforms for addressing these regulatory failures, which, if adopted, will enable us to avoid similar catastrophes in the future.

Table 1.

Summary of Regulatory Failures and Related Reforms

	Regulatory Failure	Proposed Reform
The OCSLA	Inadequate Mandates for Safety and Environmental Protection	• Congress should require BOEMRE to incorporate consideration of the environment and safety alongside energy production, as a goal, policy, and mandate • Congress should incorporate a clear technology-forcing standard, such as best available technology, for regulating oil development technology • Congress should condition BOEMRE's authority to approve exploration and development plans on the submission by industry of adequate data and analysis to demonstrate the safety of the proposed activity and the adequacy of the spill response plan • Congress should direct BOEMRE to set federal spill response performance standards • Congress should direct BOEMRE to study accident investigation, information collection, and dissemination procedures employed in other high risk industries that involve complex systems, such as airlines and nuclear energy, and to develop a program that maximizes the opportunity for continuous learning and improvement
	Inadequate Environmental Review Processes	• Congress should establish procedures for environmental review at each step of the OCSLA's four-stage decision-making process • Congress should establish an interagency consultation requirement for each step of the OCSLA's four-stage decision-making process • Congress should remove time limits for the Department of the Interior to rule on exploration plans or, at the very least, should extend those time limits considerably • Congress should clarify that compensation is not required when the agency denies permits or plans for failure to comply with statutory or regulatory requirements, including standards for safety or environmental protection
	Inadequate Penalties and Assurance Bonds	• Congress should increase the maximum penalties exponentially • The detailed recommendations of the Outer Continental Shelf Safety Oversight Board regarding inspection and enforcement should be implemented, with additional authority and funding from Congress as needed • Congress should create strong and clear debarment provisions • Congress should require that lessees post an assurance bond that more accurately reflects the risks associated with the exploration and development process

Table 1.

Summary of Regulatory Failures and Related Reforms (cont.)

	Regulatory Failure (cont.)	Proposed Reform (cont.)
The MMS/ BOEMRE	Inadequate Agency Funding	• The President and Congress should provide adequate funding to enable BOEMRE to perform necessary regulatory functions and to hire, train, and retain competent staff
	A Captive Agency	• BOEMRE should implement new ethical standards • Congress should increase BOEMRE's funding to permit reasonably competitive salaries and adequate training for agency staff • To help to clarify and rebalance the agency's mission and enhance its authority, Congress should amend the OCSLA to put safety and the environment on par with energy development; this will strengthen the agency's culture and make it more resistant to external pressures • BOEMRE should be further reorganized so that enforcement and monitoring are conducted independently of planning, leasing, and exploration and production plan approval and permitting activities • BOEMRE should be further reorganized so that policy development is conducted independently from other agency activities; and the President and Congress should provide the agency with a coherent offshore energy development policy
NEPA	Failure to Plan for the Worst-Case Scenario	• The CEQ should reinstate the original 1978 regulation requiring a worst-case analysis
	Taking Shortcuts Through Categorical Exclusions and Inappropriate Tiering	• Agencies should document the application of existing categorical exclusions, including providing supporting analysis for why the exclusion is not barred by extraordinary circumstances • Agencies should ensure adequate public involvement before both establishing new and applying existing exclusions • Agencies should periodically review existing exclusions • The CEQ should consider developing regulations that would require agencies to seek public input and to solicit the views of federal agencies with relevant expertise before proposing to rely on a categorical exclusion • The CEQ should consider revising its tiering regulations to clarify the limits of appropriate tiering, so that it is used only to avoid inefficient repetition of material already covered

Table 1.

Summary of Regulatory Failures and Related Reforms (cont.)

	Regulatory Failure (cont.)	Proposed Reform (cont.)
NEPA (cont.)	Bad Science Undermines NEPA's Efficacy	• Through additional funding and a clear legislative mandate, Congress should establish the U.S. Geological Survey as an independent science advisor for BOEMRE on complying with environmental laws • For technical information, Congress should create an advisory board—independent of both industry and the agency—to review risk assessments as well as agency safety regulations and standards
The ESA	Ignoring Low Probability Risks of Catastrophic Harm to Listed Species	• BOEMRE should improve its capacity to generate sound scientific and technical assessments of the risk of drilling • The U.S. Fish and Wildlife Service and the National Marine Fisheries Services (the Services) should exercise their authority to demand that action agencies use all the available information to supply an analysis of possible outcomes of the proposed action, and should suspend consultations if this information is not provided • The Services should amend the regulatory definition of "indirect effects" to include low probability but catastrophic effects
	Failure to Aggregate Low Probability Risks	• The Services should amend the regulatory definition of "environmental baseline" to ensure that low probability risks of harm to listed species are properly aggregated
Regulatory Design	Failure to Incorporate the Precautionary Principle into the Regulatory Process	• The Precautionary Principle should be reinvigorated and reinstated into the regulatory process to ensure that environmental, health, and safety regulations are designed to account for low probability but catastrophic risks
Energy Policy	Subsidizing Unreasonably Risky Offshore Drilling	• Congress should identify and eliminate all the various oil extraction industry tax breaks that have accumulated in the U.S. tax code • Congress should repeal the Deep Water Royalty Relief Act • Congress should take action to terminate the errant leases issued under the Deep Water Royalty Relief Act that allow oil companies to continue enjoying royalty reductions even though oil prices are high • Congress should repeal the various subsidies provided to the oil extraction industry in the Energy Policy Act of 2005

Table 1.

Summary of Regulatory Failures and Related Reforms (cont.)

	Regulatory Failure (cont.)	Proposed Reform (cont.)
Energy Policy (cont.)	Ignoring Climate Change Linkages	• The United States must place a price on carbon, either through a carbon tax or through a cap-and-trade regimen, so that all social costs are incorporated into the price of energy • To ensure the effectiveness of carbon pricing, the United States should eliminate all remaining subsidies for fossil fuels • The United States should seek to promote innovations in alternative energy and energy efficiency, so that these technologies are able to compete on a level playing field with fossil fuels in the energy market
Lessons from the North Sea	Ignoring Other Countries' Experiences with Offshore Drilling Disasters	• Congress should require BOEMRE to undertake an ongoing, systematic evaluation of the lessons learned elsewhere in the wake of serious offshore oil drilling accidents, and of alternative regulatory measures and techniques that have proven effective

Introduction

In the weeks following the explosion of the Deepwater Horizon drilling rig and the blowout of the well that BP was drilling in the Gulf of Mexico, the picture that has emerged points not just to large-scale environmental and economic damage after the explosion, but to massive failures before the accident in the regulatory systems designed to protect public health, safety, and the environment. The facts suggest that the disaster and the attendant human, environmental, and economic loss were entirely preventable, had stronger regulation and enforcement been in place.

As leaders from across the political spectrum have acknowledged in the wake of the financial crisis and again in the wake of this oil spill, regulation has an essential role to play in protecting core American values: human life and health; a healthy and robust environment; and a thriving economy. We unfortunately now have vivid proof that the economic and environmental costs of regulatory failure can be far greater than anyone knew and perhaps even greater than anyone had imagined.

The report begins by laying out the shortcomings in the primary statute under which deepwater oil drilling is regulated—the Outer Continental Shelf Lands Act (OCSLA)—and outlines key reforms needed to provide the authority necessary to protect the public interest.

It then turns to systemic problems within the agency charged with regulation of deepwater oil drilling under the OCSLA—the Mineral Management Service (MMS), renamed the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) in the wake of the disaster. These include problems of agency capture and inadequate funding.

The third topic addressed in the report is the role of the National Environmental Policy Act (NEPA)—how and why this landmark statute was disabled from performing its critical role in the case of the BP well, and what regulatory changes can ensure that it functions effectively in the future.

The report next details the problems that surrounded the implementation and enforcement of the Endangered Species Act (ESA) as it applied to oil drilling and recommends several key reforms.

The report then discusses a systemic problem that is a theme in each prior section and that specific statutory reforms cannot fully remedy: obstacles to making sound regulatory decisions in the face of uncertain, low probability risks of potentially catastrophic or irreversible harm. This section highlights a common sense solution: adoption of a precautionary stance. A precautionary approach would replace the current widely-adopted presumption that regulation must await a high—and often unattainable—degree of certainty, even when the potential costs are irreversible or catastrophic.

In the last sections of the report, we step back to look at the regulatory system from a broader perspective. We consider first how the regulatory system and its failures in this case were caused in part by the absence of coherent policies on energy and climate change. Our current policy provides vast incentives for risky oil and gas development like deepwater drilling and few for low-carbon alternative energy sources. In the wake of yet another painful lesson on the cost of our current incoherent approach, it is time to focus political attention on the difficult but necessary task of debating and adopting a coherent and sound energy policy.

In the final section, we step back geographically to suggest why another lesson of this disaster is that the United States should undertake to learn more from the experience abroad, offering the example of the North Sea. Had we been paying closer attention, the investigations and reforms in the wake of the infamous Piper Alpha spill or the Bravo platform blowout might have offered insights to help us avoid this disaster.

I. The Outer Continental Shelf Lands Act (OCSLA)

Legal Context: The Role of the OCSLA in Deepwater Offshore Drilling

The Outer Continental Shelf Lands Act (OCSLA)[1] is the principle statute governing the development of oil and gas resources on the Outer Continental Shelf (OCS). In the statute, Congress charged the Department of the Interior with overseeing the "expeditious and orderly development [of offshore oil resources], subject to environmental safeguards, in a manner which is consistent with the maintenance of competition and other national needs . . . ."[2] The OCSLA also directed that operations be conducted "in a safe manner by well-trained personnel using technology, precautions, and techniques to prevent or minimize the likelihood of blowouts . . . or other occurrences which may cause damage to the environment or to property, or endanger life or health."[3] At the time of the Deepwater Horizon blowout, the Minerals Management Service (MMS), a bureau within the Department of the Interior, had primary responsibility for implementing the OCSLA; following the blowout, the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE), the successor agency to the MMS, has had implementing authority for the OCSLA.

In offshore oil exploration and drilling, health, safety, and environmental protection are inextricably intertwined. Some regulations, like those requiring blowout preventers, have the goal of protecting the safety of both workers and the environment, by preventing dangerous situations that may cause well blowouts or spills. Others, such as a requirement that the agency consider the impacts of oil exploration on species that live in the area of proposed drilling, have a goal of avoiding impacts to the marine or coastal environment and human health. In this report, we consider the adequacy of both types of protections.

Oil and gas development activities managed under the OCSLA occur in four distinct stages: (1) development of a five-year leasing plan;[4] (2) issuance of oil and gas leases (often called the lease-sale);[5] (3) approval of a lessee's exploration plan;[6] and (4) approval of a lessee's development and production plan.[7] This four-tiered structure was intended to start with broad-based planning and then move "to an increasingly narrower focus as actual development grows more imminent."[8] For a variety of reasons, this statutory framework has failed to protect public health, safety, and the environment adequately. Key shortcomings are outlined below, along with recommendations for addressing each.

Regulatory Failures and Proposed Reforms

Regulatory Failure: Inadequate Mandates for Safety and Environmental Protection

The OCSLA directs the Department of Interior to consider "the potential impact of oil and gas exploration on other resource values of the outer Continental Shelf and the

marine, coastal, and human environments,"[9] and to balance "between the potential for environmental damage, the potential for the discovery of oil and gas, and the potential for adverse impact on the coastal zone."[10] The Secretary of the Interior is charged to develop a leasing program that considers environmental values and impacts. Operations in the OCS are also to be conducted to promote safety and to prevent blowouts, loss of well control, or other occurrences "which may cause damage to the environment or property or endanger life or health."[11]

Despite this general language requiring consideration of health, safety, and the environment, the statute lacks clear enforceable mandates setting forth adequate environmental and safety standards with which oil and gas drilling activities must comply.[12] Instead, the statute focuses heavily on development of oil and gas resources, providing incidental consideration of environmental impacts in select provisions. The most specific standards the statute incorporates provide that the Secretary *may* cancel a lease or permit if it "would probably cause serious harm or damage to life (including fish and other aquatic life), to property, to any mineral (in areas leased or not leased), to the national security or defense, or to the marine, coastal, or human environment."[13] This provision requires an extremely high level of proof to trigger protective action, proof that is rarely available, thus making the standard virtually meaningless. A lease or permit may be cancelled only if it *would probably* cause serious harm or damage. A companion provision governing exploration plan approval requires even greater proof to trigger protection, directing that an exploration plan shall be approved unless it *would result* in a similar condition.[14]

Unlike the Clean Air Act or the Clean Water Act, the OCSLA also sets no baseline about the kinds of environmental protection and safety technology the agency must require of lessees. Instead, the agency is given broad discretion to balance competing interests in oil and gas development, safety, and environmental protection. In consequence, although the MMS did promulgate detailed and extensive regulations about the safety technology to be employed, these were based largely on standards recommended and developed by industry. As has become clear in the wake of the Deepwater Horizon explosion and blowout, these regulations were far from forcing technological innovation and left the United States and its citizens with far less protection than is required by other countries.

Although the MMS did promulgate detailed and extensive regulations about the safety technology to be employed, these were based largely on standards recommended and developed by industry.

In fact, in 2002, the Coast Guard warned that, unless forced to do so by regulation, oil producers would not develop new spill response and prevention technologies to match their rapidly expanding extraction capabilities.[15] Nevertheless, the MMS routinely accepted industry recommendations about the level and kinds of safety technologies and techniques sufficient to protect the environment. BP's Deepwater Horizon spill showed how unwise this approach has been. Instead of requiring that the lessees demonstrate that their safety technology performed as well as the best available technology, regulators simply accepted assurances that a blowout was unlikely and adopted industry standards. The absence of any technology-forcing mandate in the statute meant that industry lacked any incentive to develop new and better safety technology.

Also lacking under current law is an enforceable standard to ensure that adequate technology exists to respond to potential spills. The Oil Pollution Act requires that the owner or operator of a tank vessel or facility "prepare and submit . . . a plan for responding, to the maximum extent practicable, to a worst case discharge."[16] But, by regulation, the MMS tethered this responsibility to "the limitations of available technology" and only required consideration of a worst-case discharge that continues for 30 days.[17] Thus, not only is there no specific performance standard that a lessee must meet, there is also no assessment of whether the available technology is adequate to protect the environment. This is a regulatory scheme that encourages stagnation. In fact, it creates a perverse incentive for industry not to develop newer technologies capable of cleaning up more oil, because doing so increases industry's clean-up obligations. Moreover, the MMS regulations authorize operations for up to two years while a response plan is under agency review, prior to its approval; and, as the recent report by the OCS Safety Oversight Board noted, oil spill response plans "are designed to deal with surface oil cleanup, not containment and control of wells at the spill's source."[18] These provisions demonstrate the lax attitude towards the serious risks inherent in oil and gas activities and the need for clear direction from Congress to change this approach.

As the experience with the BP oil spill revealed, in practice, development of oil and gas has been allowed to go forward at the expense of both safety and environmental protection. This will remain the status quo so long as there is a lack of strong enforceable mandates for protection of the environment and safety to govern planning, leasing, exploration, production, and spill response actions.

Proposed Reform: Adopt Strong Mandates for Environmental Protection and Safety and Create Incentives for Continual Safety Innovation

To protect the public's interest in safe and environmentally sound oil production, Congress should provide BOEMRE with more explicit direction about how to strike the balance between oil production, safety, and environmental protection. Throughout the OCSLA, consideration of the environment and safety should be incorporated alongside energy production, as a goal, policy, and mandate. The statements of policy in the OCSLA should be clarified so that oil exploration and development will be permitted only where it can occur without posing a significant risk to public health, safety, and the environment. The goals of the statute should include managing offshore oil and gas exploration, development, and extraction in a fashion that best protects public health, safety, and the marine and coastal environments while helping to meet national energy needs. Exploration, development, and production should occur only when these activities can be done in a manner that protects life, health, the coastal and marine environment, sea life (including fish, marine mammals, coral, and other species), property, and other uses of the seabed, subsoil, and water.

In addition to strengthening the policy of the OCSLA, Congress should incorporate clear substantive mandates for safety and environmental protection at each of the OCSLA's four-stage development process. These provisions should implement the policies outlined above,

by requiring agency decision-makers to ensure that OCS oil and gas development does not pose a risk of significant harm to safety, health, or the environment, and that it minimizes possible impacts on marine and coastal environments before approving plans, leases, or other activity. This would replace current language that merely directs the agency to consider such impacts at various points in the statute.

Congress should also amend the OCSLA to incorporate a clear technology-forcing standard, such as best available technology, defining clearly as it has in other statutes what that standard means. It is clear that existing regulations have not been adequate to ensure safety and environmental protection. At a minimum, Congress should direct BOEMRE to thoroughly review existing safety requirements and adopt new requirements for key safety technology, including but not limited to blowout preventers. Congress may wish to specify some of the contours of the new safety requirements, based on the extensive technical information that has emerged in various congressional hearings on the subject as well as the anticipated report of the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling. However, Congress should also direct BOEMRE to revisit existing regulations in light of these investigations, to adopt new standards that represent the best available technology, and to update these standards on a regular basis to ensure their adequacy. Given the overall inadequacy of the safety and environmental measures under current law, it would be a mistake to focus only on addressing the shortcomings that contributed directly to the BP blowout. A comprehensive review is needed to anticipate and prevent other types of foreseeable disasters, and routine ongoing review is essential to avoid regulatory stagnation in the future. A stronger mandate and better funding for agency research on safety will be necessary to support such a program.

In addition, Congress should condition the agency's authority to approve exploration and development plans on the submission by industry of adequate data and analysis to demonstrate the safety of the proposed activity and the adequacy of the spill response plan.

Congress should also remove the perverse disincentive for development of better clean-up technologies by directing BOEMRE to set federal spill response performance standards. In doing so, Congress should require that the agency specify two distinct aspects of the required spill response capacity: 1) the level of spill response capacity that must be demonstrated, and 2) the level of certainty that the identified technologies can actually achieve that result.

With regard to the level of spill response capacity, Congress should direct the agency to set spill response standards that are based on expert assessments of the level of spill mitigation necessary to avert negative environmental impacts should a worst-case spill occur. Lessees should be required to demonstrate that their equipment and procedures are capable of meeting these standards, and that the necessary equipment and personnel are available to respond to an occurrence. Those bidding on leases should be required to demonstrate that they meet these standards as a pre-requisite for eligibility. This obligation should include the requirement that response technologies and practices be proven effective under site-

specific conditions, and should include same-season relief well capabilities (an issue of particular concern in the Arctic.). Where no technologies or operation techniques exist to protect against a known, significant risk, approval to proceed should be withheld until such technologies or techniques are developed. Such an approach builds into the statute an incentive for continual innovation in developing and improving new spill response technologies.

Finally, Congress should direct BOEMRE to study accident investigation, information collection, and dissemination procedures employed in other high risk industries that involve complex systems, such as airlines and nuclear energy, and to develop a program that maximizes the opportunity for continuous learning and improvement. The recent report by the OCS Safety Oversight Board began this task by comparing BOEMRE post-accident investigation protocol with several relevant agencies, a foundation on which the agency should continue to build.[19] Effective analysis and dissemination of accident or incident information can provide both industry and regulators with the opportunity to observe patterns and to develop effective responses. This can help to avert further accidents by warning of equipment or human error risks and could provide regulators information on patterns involving repeat players that warrant stepped up monitoring or enforcement.

Regulatory Failure: Inadequate Environmental Review Processes

In addition to the lack of a clear and enforceable mandate for protection of the environment, the four-stage planning-leasing-exploration-development process poses inherent challenges for incorporating meaningful environmental review. At present, the statute does not clearly require environmental consideration at every stage. The statute contemplates environmental review in preparation of the five-year plan, and historically this has been the stage that has received the greatest attention.[20] To be sure, critical decisions with important environmental consequences are made at this stage, such as what areas will be open to leasing and on what schedule. However, planning may cover a vast area—tens of millions of acres. Therefore, the environmental data and assessment that can be done at that stage is necessarily somewhat general.

Currently, the OCSLA is silent on consideration of environmental impacts at the second stage of the process—namely, leasing—even though this stage provides one of the most critical opportunities for environmental assessments. Although the MMS regulations require consideration of all available environmental information in deciding to conduct lease sales and direct the MMS to "evaluate fully the potential effect of leasing on the human, marine and coastal environments" and to develop mitigation measures,[21] and although an environmental review is performed at this stage under NEPA, it is unclear whether any new information is generated or whether the agency merely assesses the very general information already prepared as part of the planning process. The environmental assessment for the lease area that included the BP well contains very little by way of new information. Instead,

it repeatedly refers back to the analysis of environmental impacts found in a multi-sale environmental impact statement and then offers a summary of it.[22]

Moreover, at the lease-sale stage, the MMS routinely designated lease-sale areas without seeking input from agencies with specialized expertise in managing marine resources and marine safety, like the Fish and Wildlife Service (FWS), the National Oceanic and Atmospheric Administration (NOAA), and the Coast Guard. Nor is the agency required to amend a proposed lease sale in light of interagency objections. The result is that decisions are made without adequate consideration of their impacts on marine and coastal ecosystems. Assessment at this stage is extremely important. It is at this stage that the agency can perhaps best identify critical areas and resources that should be *excluded* from leasing because of their environmental or economic values. It is important that the agency be required to consult with other relevant agencies at this stage and respond to their objections, and that it be provided the authority to exclude important ecological areas from oil and gas development activity and to require measures to preserve their integrity.

There are financial reasons why consideration of environmental values at the leasing stage is important under current law, and why subsequent decisions on exploration and development plans do not offer an appropriate opportunity to assess whether the area of proposed activity has environmental or economic attributes that are too valuable to expose to the inherently risky operations associated with oil development. Specifically, by the time it develops exploration or development plans, the lessee may be entitled to compensation if the Secretary cancels a lease or permit for site-specific environmental reasons.[23] This has provided the MMS with a strong incentive to ignore or downplay significant environmental concerns that emerge at the exploration or development stages of the OCSLA's development process.

The MMS regulations developed pursuant to the OCSLA currently require submission of some environmental data and analysis at the exploration and development and production stages, but the requirements lack specificity.[24] Environmental assessment at the exploration and development stages is the best opportunity to focus on specific impacts of the precise plan of exploration or development proposed. Yet, the environmental data and analysis that MMS has accepted at even this stage has been exceedingly general and in some cases generic.[25]

Moreover, even if adequate environmental information and analysis accompanied the exploration plan, under the OCSLA, the agency has only 30 days in which to approve or disapprove an exploration plan and accompanying documents such as the spill response plan.[26] Thirty days is not enough time to adequately assess the environmental impacts of an exploration plan. The agency is forced by this artificially short deadline to make critical decisions without due consideration. The short time line, coupled with the statutory compensation requirement, mean that in the end there is rarely any serious consideration of site-specific environmental concerns, or of cumulative effects of multiple leases.

Under the OSCLA, the MMS has only 30 days in which to approve or disapprove an exploration plan and accompanying documents such as the spill response plan.

Indeed, after BP's Deepwater Horizon spill, it became clear that BP's Regional Oil Spill Response Plan for the Gulf,[27] and its site-specific plan for the Deepwater Horizon rig were riddled with omissions and glaring errors. For example, the plan identified sea lions, sea otters, and Pacific Walrus as sensitive biological resources despite the fact that these animals are not found in the Gulf of Mexico. (Obviously, significant portions of the Gulf response plan had been cut-and-pasted from a response plan for development activities in Alaskan waters.) The documents also included phone numbers for long-dead experts, and incorrect Internet addresses. Plans submitted by other Gulf drillers, all of which had been prepared by the same consultant, contained identical errors. It is clear that oil companies had simply been going through the motions of environmental planning, creating meaningless documents crammed with recycled and inaccurate information rather than considered response plans tailored to the Gulf. Given the short deadline imposed on agency environmental review by the OCSLA, industry no doubt knew it would be virtually impossible for the MMS to give these plans any careful scrutiny.

Proposed Reform: Overhaul Environmental Review Procedures, Require Agency Consultation, and Extend Deadlines

Establishing procedures for environmental review at each step of the OCSLA's four-stage decision-making process is a substantial undertaking. Determining the type of review appropriate to each stage of the oil and gas development process involves many technical questions about scale, data availability, and appropriate analytic methods, among other issues. To assist BOEMRE in addressing these questions, Congress should consider convening a panel of independent experts, following the model of the highly successful Committee of Experts convened pursuant to the National Forest Management Act.[28] The Committee would be charged to assist BOEMRE in the development of detailed regulations outlining the environmental data to be submitted at each stage and the appropriate environmental review to be undertaken by the agency at each stage, to ensure compliance with the new environmental mandates.

Congress should also amend the OCSLA to establish a consultation requirement, thereby ensuring that BOEMRE draws on the relevant expertise of other federal agencies. In this way, interagency consultation would become a critical part of the planning and approval processes. Congress should designate other agencies with relevant expertise, including the Coast Guard, the Environmental Protection Agency (EPA), the FWS, and NOAA, as cooperating agencies[29] for the purposes of all environmental analyses associated with the planning and leasing process. In addition, Congress should amend the statute to require a public comment period before any exploration plan is approved. These changes will ensure that a variety of views are considered during the planning and approval processes, and will increase the transparency and accountability of this process.

Congress should remove time limits for the Department of the Interior to rule on exploration plans or, at the very least, should extend those time limits considerably. This

is essential to allow BOEMRE to conduct thorough analyses of potential environmental impacts of proposed oil and gas development activities. They will also provide BOEMRE with adequate time to assess an oil company's proposed response plan to ensure that it is sufficient for minimizing environmental harms in the event that a blowout or other technological catastrophe occurs.

Finally, the burden of environmentally sound planning must rest squarely on the lessee. Along with the new environmental and safety standards, the statute should be clarified to ensure that compensation is not required when the agency denies permits or plans for failure to comply with statutory or regulatory requirements, including standards for safety or environmental protection.

Regulatory Failure: Inadequate Penalties and Assurance Bonds

The information that has emerged in the months since the blowout has made clear that industry has operated in a climate in which costs were routinely balanced against safety and environmental protection. Compliance with regulatory standards was far from consistent, and the threat of enforcement was not a meaningful deterrent. Beyond the problems associated with the culture and funding of the MMS, discussed below, several provisions in the statute helped to allow this climate to develop.

The OCSLA contains clear enforcement authority for the agency to seek civil and criminal penalties as well as injunctive relief, and it also authorizes enforcement through citizen suits. Furthermore, the OCSLA provides for specific liability for corporate officers and agents. All of these are important tools. However, the fines authorized by the statute are grossly inadequate and undermine any deterrent effect of the enforcement provisions. In light of the vast profits associated with oil and gas development, the maximum civil penalty of $35,000 a day, and even the criminal penalty of $100,000 per day are trivial sums. Indeed, industry has treated these civil penalties, on the odd occasion when they were imposed, as merely a cost of doing business. The recent report by the OCS Safety Oversight Board reveals other constraints that impede the efficacy of inspection and enforcement that warrant follow-up as well.[30]

Assurance bonding requirements under the OCSLA are intended to assure that businesses undertaking oil and gas development activities can cover the costs associated with their activities. The scale of the damage caused by the BP oil spill demonstrates how vast these damages can be. It is unlikely that even BP's post-hoc commitment of $20 billion to cover claims will be adequate to cover the losses. At present, assurance bonding requirements are far from assuring anything—current regulations require a bond of only $200,000 at the time of submitting an exploration plan.[31]

Proposed Reform: Increase Penalty and Bonding Amounts and Provide for Debarment of Serious Violators

To deter lax compliance with health, safety, and environmental regulations, Congress should increase the maximum penalties exponentially. The detailed recommendations of the OCS Safety Oversight Board regarding inspection and enforcement should be implemented, with additional authority and funding from Congress as needed.[32] In addition, Congress should create strong and clear debarment provisions. Such measures should preclude entities with serious outstanding safety or environmental violations from bidding on new leases or obtaining further permits for new exploration or development activities. Congress should also include a more severe bar that would exclude companies from participating in oil and gas activities on the OCS for a period of years based upon a finding of a pattern of serious violations of safety or environmental standards.

Congress should also require that lessees post an assurance bond that more accurately reflects the risks associated with the exploration and development process. By requiring lessees to post meaningful bonds before any drilling commences, Congress would ensure lessees thoroughly assess the risks associated with their proposed activities, including any worst-case scenarios, before any drilling occurs. Such a requirement would create an upfront price tag associated with riskier drilling plans. This, in turn, would create a further incentive for companies to reduce their risk (and thereby their assurance bond costs) by following the safest plan and by developing new safety technologies and spill response capabilities.

II. The Minerals Management Service (MMS)

Legal Context: The Role of the MMS and the New Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE)

The prior section focuses on limitations of the Outer Continental Shelf Lands Act (OCSLA), the statute that should have prevented the well blowout and explosion of the Deepwater Horizon. But, in addition to shortcomings with the statute itself, severe problems within the agency charged with implementing the OCSLA contributed to the disaster. The shortcomings of the Minerals Management Service (MMS) are vast and deep and it is abundantly clear that reforms are needed to address the problems that plagued the agency. They have been the subject of extensive investigation by Congress, the Government Accountability Office (GAO), the Department of the Interior Inspector General's Office, and most recently, the Outer Continental Shelf (OCS) Safety Oversight Board.

The Department of the Interior has already taken a number of steps to try to address the problems, including replacing the MMS's Director and restructuring the agency to create separate programs that divide the leasing, safety, and enforcement functions from the revenue collection functions. In the process, the agency has been renamed the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE), to emphasize a new focus on alternative ocean-based energy technologies, such as wind.[33] Moreover, internal reforms to eliminate the royalty-in-kind program and remedy failures in collection of royalties had already begun before the Deepwater Horizon explosion. This report highlights areas of particular concern that persist notwithstanding these steps and recommends priority reforms to address these.

Regulatory Failures and Proposed Reforms

Regulatory Failure: Inadequate Agency Funding

There is little argument that both regulatory and response agencies involved in the BP disaster lacked adequate resources to perform effectively. At the time of the BP explosion and well blowout, the MMS regulated about 3,795 offshore production platforms and managed about 8,124 active oil and gas leases on approximately 43 million acres of the Outer Continental Shelf (OCS).[34] In the last 10 years, the operations the MMS regulated have undergone rapid technological change and have increasingly shifted to deepwater and ultra deepwater environments,[35] a change that has increased the level and complexity of monitoring and the time needed for permit and plan reviews and inspections of operations.[36]

In its 2006 budget request justification, the MMS noted:

> New technologies involved in the projects will continually challenge MMS. For example, industry has developed and installed several new types of spar

> production facilities, each requiring a structural soundness review by MMS. It is likely that additional new types of approaches will be developed and need review.[37]

Yet, during this period, the MMS's budget has remained relatively flat.[38] Staffing of the MMS has similarly remained stable at best, with some reductions.[39] As Representative Bart Stupak noted in a recent statement:

> The number of producing deepwater wells increased from 65 in the [*sic*] 1985 to more than 600 in 2009. But the number of federal inspectors working for Minerals Management Service (MMS) has not kept pace with the number and complexity of wells and the distance inspectors must travel. MMS had 55 inspectors in 1985 and just 58 some 20 years later. Currently, MMS has approximately 60 inspectors in the Gulf of Mexico region to inspect almost 4,000 facilities. Inspection has not been a priority.[40]

Acting Department of the Interior Inspector General Mary Kendall, while testifying before the House Committee on Natural Resources, compared the 60 inspectors for the almost 4,000 facilities in the Gulf of Mexico region with the Pacific Coast, which has 10 inspectors for only 23 facilities.[41] In its 2011 budget request, the MMS finally requested six additional inspectors for the Gulf of Mexico region,[42] and, in the wake of the spill, the Department of the Interior hired twice that many new inspectors, implicitly acknowledging the inadequacy of even the originally proposed increases.

Acting Inspector General Kendall also noted the difficulty the MMS faces in recruiting inspectors because of the considerably higher wages and bonuses offered by industry. Moreover, she noted:

> [I]nspectors for MMS receive primarily on-the-job training. The MMS Offshore Inspector Training program guidance and instructions appear to be considerably out of date, developed between 1984 and 1991, and credit individuals with industry experience. During our investigative efforts, we have found indications that inspector training and training programs have not kept pace with the technological advancements occurring within the industry.[43]

The GAO has expressed similar concerns regarding the MMS's ability to recruit and train well-qualified staff:

> Agencies should have sufficient staff with the technical expertise to oversee the activities under their authority. Oil and gas production methods on federal lands and waters have become increasingly sophisticated over the past decade. Additionally, oil and gas companies now rely on information technology to manage and oversee their operations. In a March 2010 review, we found that Interior had challenges in hiring, training, and retaining staff in critical oil and gas oversight roles, leading to questions about the technical capacity of Interior staff overseeing oil and gas activities.[44]

These and other similar revelations from the recent congressional investigations as well as the agency's own investigations and statements, including the recent OCS Safety Oversight Board Report, have made abundantly clear that the MMS lacked the resources and expertise it needed to effectively develop, implement, and enforce regulations for the complex, highly sophisticated, and rapidly changing technology employed in deepwater and ultra deepwater drilling. Instead, it has relied heavily on industry to self-monitor,[45] the disastrous results of which are now clear.

Proposed Reform: Provide Adequate Funding to Enable BOEMRE to Perform Necessary Regulatory Functions and to Hire, Train, and Retain Competent Staff

Without adequate funding, the agency cannot accomplish the important functions that have been assigned to it—to plan for and regulate oil drilling activities on the OCS and to monitor and enforce so as to protect public health, safety, and the environment. The President and Congress respectively need to develop a budget for and fund BOEMRE based on its mandates and mission, including any responsibilities clarified or created in new legislation. A budget approach based on authorizing only incremental increases from the inadequate funding levels of the predecessor agency would doom the new agency to failure. Substantial new funding is needed for research and development, regulatory development, staff salaries and training, and monitoring and enforcement. These will enable the new agency to stay ahead of new technology; develop safety regulations rather than following industry's lead; hire, train, and retain capable staff; and monitor and enforce effectively.

The Obama Administration has taken small but positive steps to increase funding for BOEMRE. In May of 2010, President Obama secured a supplemental appropriation for the MMS of $29 million to hire additional inspectors, step up enforcement, and thoroughly review agency policies in the wake of the Department of the Interior's 30-day report on the safety of the offshore drilling program.[46] While the President and Congress responded quickly in the glare of the publicity from the disaster, experience suggests that once media attention has turned elsewhere, small government/lower tax ideologues of the right will oppose reasonable and indeed essential increases in the budget of the MMS's successor agency. Yet, the recent modest allocations of additional funding merely represent a small down payment on the resources BOEMRE needs if it is to responsibly monitor and enforce health, safety, and environmental standards for the more than 8,000 wells in the OCS alone—much less perform additional functions consistent with the vision for the new agency, which includes a vastly expanded emphasis on renewable ocean energy resources.[47]

Regulatory Failure: A Captive Agency

In order to protect and advance the public's interest, government must be responsive to the voters through the democratic process and able to act independently in the public interest.

The history of the MMS reveals the dangers of a regulatory agency that identifies strongly with corporate interests and lacks accountability. The MMS is a regrettably apt illustration of the captive agency theory of administrative agencies.[48] This theory postulates that federal agencies have a tendency to move so far in the direction of accommodating the interests of the entities they are charged with regulating that ultimately those agencies may fairly be seen as a "captive" of the regulated companies.[49] Captive agency theory typically views regulators as subject to unique pressures and influences that can push their actions and policies in a direction favored by regulated firms. Among other things, the theory posits that captive agencies tend to be unduly passive, ponderous, and inefficient, failing to enforce regulatory requirements with needed vigor and enthusiasm. The MMS's inattentive, if not disdainful, implementation of safety and environmental requirements, its reliance on industry to develop standards, and its lax monitoring and enforcement all bespeak a captive agency.

The MMS is a regrettably apt illustration of the captive agency theory of administrative agencies.

One needn't look far to see the influence that industry had acquired. Indeed, the very culture of the MMS had become corrupted by close connections with industry and identification of the agency staff with the interests of the industry, as a series of GAO reports and the recent reports by the Department of the Interior Inspector General and OCS Safety Oversight Board have amply documented.[50] The MMS had developed so pervasive a culture of deference to and identity with corporate interests that agency staff failed even to recognize unethical, inappropriate, and unlawful behavior in many cases. The culture documented in various investigations and reports included inappropriate relationships between staff and members of the industry, widespread socializing, acceptance of impermissible or unreported gifts from oil and gas companies that the agency was charged with regulating, and a revolving door that appeared to impair agency staff's objectivity and zeal for enforcement.[51]

Commenting on the cozy relationship between the agency and industry, an MMS District Manager told an investigator with the Department of the Interior Inspector General's office:

> Obviously, we're all oil industry…. We're all from the same part of the country. Almost all of our inspectors have worked for oil companies out on these same platforms. They grew up in the same towns. Some of these people, they've been friends with all their life. They've been with these people since they were kids. They've hunted together. They fish together. They skeet shoot together . . . . They do this all the time.[52]

Conditions that fostered this unhealthy relationship and allowed it to prosper have roots deeper than inadequate ethics training or the failure of individual personnel to follow rules and policies. Most basically, the MMS's mandate was skewed to advance development of energy resources with insufficient attention to health, safety, and the environment, thereby encouraging this identification of the agency with the industry. In addition, the agency was structured without any measures to ensure that those officials charged with permitting and enforcement were completely independent of those charged with collecting revenue for the government from oil and gas operations, thus creating a potential conflict of interests.[53]

Exacerbating this structural flaw, in 1993, the MMS was granted authority to rely on offsetting collections from revenues it collected to fund the discretionary portion of its budget. Since 1998, this has become a significant source of funding for the agency, comprising from 40 to 50 percent of its discretionary budget in most years. As pressure to reduce agency budgets has grown, the MMS has thus become more dependent on drilling in order to fulfill its protective functions, a clear conflict.[54] At the staff level, the recent OCS Safety Oversight Board Report noted that employee performance plans and monetary awards may be tied to meeting deadlines for approving leases or development plans, incentives that could create a clear conflict of interest for staff.[55]

In addition to these structural and financial incentives, the MMS's inadequate level of funding, as discussed above, made the agency dependent on industry expertise to aid it in developing regulatory standards and made industry the primary training ground for agency staff. This, in turn, contributed to the revolving door between the agency and industry. Acting Department of the Interior Inspector General Mary Kendall highlighted this concern in submitting her report to Secretary of the Interior Ken Salazar: "Of greatest concern to me is the environment in which these inspectors operate—particularly the ease with which they move between industry and government."[56] Similarly, a GAO report observed:

> [K]ey technical positions responsible for oversight of oil and gas activities have experienced high turnover rates, which, according to Interior officials, impede these employees' capacity to oversee oil and gas activities. These positions included petroleum engineers, who process drilling permits and review oil and gas metering systems, and inspection staff—including BLM's petroleum engineer technicians and production accountability technicians onshore—who conduct drilling, safety and oil and gas production verification inspections.[57]

Even beyond engineering jobs with industry, many former MMS employees and federal legislators have gone on to serve as oil and gas industry lobbyists.[58]

In the wake of the BP well blowout, President Obama noted how this corrosive power dynamic led to lax regulation and enforcement. "What's also been made clear from this disaster is that for years the oil and gas industry has leveraged such power that they have effectively been allowed to regulate themselves."[59] The anti-regulatory culture is apparent in statements from the agency's own 2006 budget justification:

> The OMM [Offshore Minerals Management] regulatory program emphasizes performance results rather than strict conformance to prescriptive regulations. It clarifies and simplifies government requirements, and promotes a greater reliance on industry standards. The MMS is increasing its focus on finding ways to provide strong incentives for good performance while preventing those operators with poor records from participating.[60]

Tyler Priest, clinical professor of business history and director of global studies at the University of Houston's C.T. Bauer College of Business, and a member of the MMS's OCS

Scientific Advisory Committee describes the dynamic in this way: "MMS workers often rely on the offshore industry for the technical knowledge to do their jobs. In that respect, the agency is a sort of junior partner to the industry and prone to accepting its preference for self-regulation."[61] Thus, due to the revolving door problem and cozy industry-regulator relationship, even the regulations that are adopted are not uniformly enforced.[62]

Proposed Reform: Implement New Ethics Standards, End the Revolving Door, and Create a Culture that Supports the Agency's Regulatory Mission

Secretary Salazar and Director Michael Bromwich, the head of BOEMRE, have repeatedly emphasized their commitment to clarifying and enforcing ethical standards for BOEMRE staff, to ensure that the egregious pattern of violations does not continue. This is an important commitment that should help to change the culture within the new agency and may require regulatory or legislative measures to ensure its permanence. But, stronger steps are needed to end the revolving door and ensure that employment at BOEMRE is a dignified and realistic alternative to private sector employment, and not merely a stepping stone to a lucrative career "in industry." Increased funding to permit reasonably competitive salaries and adequate training for agency staff is a necessary component. While movement between industry and the agency should not be prohibited, strong legislative provisions to ensure the independence and absence of conflicts of interest of BOEMRE staff during their entire tenure at the agency are important.

The reforms to the OCSLA outlined above—placing safety and environmental protection on a par with oil and gas development, and strengthening the agency's enforcement powers—would represent another strong step, since they would help to clarify and rebalance the agency's mission and enhance its authority. This in turn would create a better foundation for building an agency culture that respects the role of regulation. Building such a culture is essential but is not something that can be accomplished solely through legislation or regulation. It will also require skillful managerial steps by Director Bromwich. The report by the OCS Safety Oversight Board is a promising sign. This report, based on extensive surveys of BOEMRE personnel and other research, confirms the existence of the serious problems outlined above and provides detailed recommendations that merit serious attention.[63]

Proposed Reform: Reorganize the Agency and Separate Its Key Functions

The reorganization of the new agency that is being implemented—separating royalty collection and resource leasing functions into two separate programs—is another positive step. However, the ongoing reorganization fails to address several fundamental conflicts that remain and may undermine the effort to establish a culture that values the role of regulation. There are at least six distinct functions that BOEMRE performs, some of which should not be undertaken by a single entity. These functions are policy development; planning and leasing; research; plan approval and permitting; royalty collection and management;

and enforcement. Royalty collection and management must be separated from the other functions, and the current reorganization properly assigns these to a separate program within the agency. Furthermore, in light of the culture of the agency and industry, enforcement and monitoring should be conducted independently of planning, leasing, and exploration and production plan approval and permitting activities.

Another key function that is often overlooked is policy development, a function that is currently performed to some extent under the rubric of planning and leasing. Under current law, BOEMRE is charged with developing a five-year offshore leasing plan and then with proposing specific lease sales consistent with the five-year plan. These actions form an important part of our national policy on offshore oil and gas development, identifying what areas to open for drilling and at what pace. The President and Congress can and do step in to remove or open certain areas or to specify other goals, but neither the President nor Congress has established a clear national policy for offshore oil and gas development. Therefore, the agency, by default, is charged with developing an important component of our national energy policy with little guidance or oversight.

While BOEMRE's broad discretion leaves it free to pursue any of a wide range of policies on development, it currently faces strong incentives to pursue a policy that heavily promotes offshore oil and gas development. Particularly in the absence of clear policy guidance, the agency is likely to and has in fact become strongly identified with the industry, thus becoming a promoter of development. Such a role is clearly inconsistent with other responsibilities, such as permitting and exploration and production plan approval. The President and Congress should recognize the overriding importance of policy development in this area and ensure that BOEMRE is not allowed to develop policy in the course of its plan development.

Indeed, unless BOEMRE is provided with a clear policy to guide its development of oil and gas leasing plans, the agency may be destined to experience the conflicts that bedeviled the MMS. Without that check, it seems inevitable that the agency will assume the role of "promoter" of oil and gas development, to some extent, as well as regulator of OCS oil and gas development activities. A similar conflict within the Atomic Energy Commission led to the creation of the Nuclear Regulatory Commission, to serve as a separate permitting and regulatory agency for nuclear power, while the role of policy development was assigned to the Department of Energy. Such a split may be similarly necessary here.

The President and Congress must also work together to develop a coherent offshore energy development policy. Absent such a policy, BOEMRE will likely develop some of the same captive agency characteristics that the MMS displayed. Moreover, a meaningful and sound policy on offshore oil and gas development can only be developed in the context of a broader national energy policy. Section VI below describes in greater detail the importance of developing a coherent energy policy and how the lack of such a policy contributed to this disaster in other ways.

III. The National Environmental Policy Act (NEPA)

Legal Context: The Role of NEPA in Deepwater Offshore Drilling

The National Environmental Policy Act (NEPA) was the first environmental statute of the modern era. The goal of NEPA is to require federal agencies to engage in a detailed and careful review of major actions that they propose—from the building of dams and highways to the issuance of permits and leases—before those proposed actions take place.

NEPA's key action-forcing provision is subsection 102(2)(C), the Environmental Impact Statement (EIS) requirement. This subsection mandates that for every "major federal action significantly affecting the quality of the human environment" the federal agency involved must prepare a detailed public statement, commonly known as an EIS. This statement must include:

- Information on the impact of the proposed action, alternatives to it, and any adverse effects which cannot be avoided if the action is implemented;
- The relation between short-term environmental uses and long-term productivity; and
- Any irreversible and irretrievable commitment of resources that would be involved in the proposed action should it be implemented.[64]

NEPA also established a Council on Environmental Quality (CEQ) in the Executive Branch, and authorized the CEQ to develop regulations for implementing NEPA's requirements.[65] In 1978, the CEQ finalized a set of binding NEPA regulations. These regulations require each federal agency to prepare its own procedures for complying with NEPA consistent with that agency's particular mission. Federal agencies are required to identify and establish criteria for distinguishing three categories of agency actions: 1) actions that are categorically excluded from further NEPA review because they do not individually or cumulatively have a significant effect on the environment; 2) actions that require preparation of an EIS, because they will have a significant effect on the environment; and 3) actions that call for the preparation of an Environmental Assessment (EA) to permit the agency to determine whether a full EIS must be prepared. For actions in the third category, the agency must then decide whether a full EIS is required or whether the action will have no significant effects, in which case a "Finding of No Significant Impact" must be prepared, explaining why the action will not have a significant effect on the environment.[66]

As described in Section I, deepwater offshore drilling activities, such as those that involved the Deepwater Horizon disaster, are regulated under the Outer Continental Shelf Lands Act (OCSLA). Pursuant to the OCSLA, the agency charged with implementing the statute undertakes actions that include preparation of a nationwide five-year oil and gas

development plan, specific lease sales, approval of exploration plans, and approval of development and production plans. Each of these steps constitutes an agency action subject to NEPA review.

At the time that decisions relating to BP's Macondo well were undergoing review, the Minerals Management Service (MMS) was the agency charged with implementing the OCSLA, and thus with ensuring that the required NEPA reviews were carried out properly at each stage. In April of 2007, the MMS released a "programmatic EIS" that purported to analyze the potential region-wide environmental impacts associated with the 2007-2012 Outer Continental Shelf Oil and Gas Leasing Program.[67] Also in April of 2007, the MMS released a final "Multisale EIS" that covered eleven lease sales in the Central and Western Planning Areas of the Gulf of Mexico, an area covering 80 million square acres that included the site of BP's Macondo well. In October of 2007, the MMS filed an EA for Lease Sale 206. This EA included a Finding of No Significant Impact. The EA relied almost entirely on the analysis performed in the Multisale EIS. Because it concluded that no new information could be found, the MMS did not perform any new analysis and found no need to prepare a Supplemental EIS. In April of 2009, the MMS approved BP's exploration plan for the Deepwater Horizon project without any environmental review. In its approval, the MMS stated that the drilling operation should be categorically excluded from NEPA because the danger of an oil blowout, and any resulting environmental damage, was minimal or non-existent.

We describe three major deficiencies in the implementation of NEPA below, and how they ultimately contributed to the BP oil spill. We also provide recommendations for reform in each of these areas.

Regulatory Failures and Proposed Reforms

Regulatory Failure: Failure to Plan for the Worst-Case Scenario

To promote full disclosure by project proponents and meaningful scrutiny by decision-makers and the public, the 1978 NEPA regulations issued by the CEQ required federal agencies to include a worst-case analysis (WCA), along with a discussion of the probability of its occurrence, in their EISs.[68] A WCA was not required for every proposed major federal action, but only when important information regarding the potential consequences of the action was unknown or missing. The regulation was a reasonable and even necessary means of dealing with uncertainty—it forced the federal agency to consider the severity and risk of possible catastrophic environmental effects, and to balance the need for the action against that risk. Rather than jumping blindly into the unknown, industries and agencies alike had to face the uncertainties related to their proposals, reveal those uncertainties to the public, and consider scenarios involving low probability but high impact events that might occur during the life of a project.

Including a WCA is an effective way to screen a proposed action and fill in uncertainties or gaps in existing data to ensure that potential defects, deficiencies, and consequences are identified and eliminated prior to implementation. In business, computing, and engineering, a WCA is used to help companies ensure reliable, stable operations throughout the entire life cycle of a product, device, or system under the most unfavorable combination of anticipated conditions. Similarly, in agency planning, performing a WCA during early design stages can dramatically decrease the risk of economic and environmental disasters, thereby saving human lives plus millions of dollars in environmental damages and lost revenues.

Despite its importance, the CEQ rescinded the WCA requirement in 1986 and replaced it with a new, watered-down regulation. The CEQ defended its change of heart by arguing that the WCA requirement called for mere conjecture, and therefore it was ineffective as a decision-making tool. Moreover, the CEQ posited that including a WCA in NEPA analyses was too "sensational" and would mislead the public with "endless hypothesis and speculation."[69]

Contrary to the CEQ's proffered rationale for the 1986 regulation, it is the *failure* to disclose and analyze all of a project's potential environmental effects—especially in the face of uncertainty—that is misleading. Without the benefit of a WCA, it is impossible for the public and the federal agency to assess the true costs and risks of a project, and it is equally impossible for the agency and the regulated industry to prepare effectively for disaster through appropriate emergency response plans and other measures. Moreover, the inclusion of a WCA in an EIS can benefit the decision-making process in other ways, by highlighting opportunities for mitigation and by stimulating ongoing monitoring of potential trouble spots during the life of the project.

In the case of the BP Deepwater Horizon rig, the industry and the agency failed to consider the "devastating sequence of equipment failures" that was clearly foreseeable but thought to be unlikely.[70] BP's own exploration plan, approved by the MMS in 2009, minimized the danger of a spill: "[I]t is unlikely that an accidental oil spill release would occur from the proposed activities." Although BP acknowledged that a spill could impact wetlands and beaches, it dismissed the significance by stating that, "due to the distance to shore (48 miles) and the response capabilities that would be implemented, no significant adverse impacts are expected."[71] The agency's assessment of the likelihood of a blowout or massive spill reflected these same assumptions, repeatedly describing these events as unlikely and therefore dismissing them with little or no analysis of their impacts. A proper WCA would have required BP and the MMS to consider and plan for these exigencies.

Proposed Reform: Reinstate the Regulatory Requirement of a WCA

The CEQ should reinstate the original 1978 regulation requiring a WCA in its entirety. As with the 1978 regulation, the CEQ should require agencies to perform a WCA whenever they undertake an action despite lacking important or essential information regarding the

action's adverse environmental impacts. This analysis should also include an indication of the probability or improbability of the worst-case scenario's occurrence.

Reinstating the WCA requirement is consistent with section 4331(b)(3) of NEPA, which states that federal agencies have a responsibility to avoid "unintended" environmental consequences. Requiring a WCA would also help fulfill NEPA's twin objectives of full disclosure and reasoned decision-making.

Considering the worst-case scenario, and airing it to the public, probably would not have precluded BP's oil lease or the development of the Macondo well. But including a WCA in the analysis for the Macondo well would have alerted the public and focused the responsible parties on the possibility of this kind of disaster *in advance*. Faced with the risk of an oil spill of this magnitude, it is far more likely that BP and the MMS would have done more to ensure that the blowout prevention systems were reliable and that an adequate response and containment plan was in place *before* the catastrophe occurred. Without any requirement that the agency acknowledge or consider this risk, the agency can continue to simply ignore or hide similar scenarios from the public as it makes decisions in the future.

Including a worst-case analysis in the NEPA analysis for the Macondo well would have alerted the public and focused the responsible parties on the possibility of this kind of disaster *in advance*.

The White House recently released a report on the MMS's compliance with NEPA indicating an awareness of this and other shortcomings with the NEPA process.[72] The recommendations in the report, which the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE), the successor agency to the MMS, has agreed to implement, include:

> Ensur[ing] that NEPA documents provide decision-makers with a robust analysis of reasonably foreseeable impacts, including an analysis of reasonably foreseeable impacts associated with low probability catastrophic spills for oil and gas activities on the Outer Continental Shelf.[73]

This is a good start. However, the flaw revealed in this case infects decisions beyond those involving the Outer Continental Shelf. The CEQ should revise its regulation to require agencies to perform a WCA whenever they undertake an action for which important or essential information regarding the action's adverse environmental impacts is lacking. To be effective, this analysis should also include an indication of the probability or improbability of the worst-case scenario's occurrence.

Regulatory Failure: Taking Shortcuts Through Categorical Exclusions and Inappropriate Tiering

As noted above, the CEQ regulations authorize agencies to use "categorical exclusions to define categories of actions which do not individually or cumulatively have a significant effect on the human environment and which are therefore exempt from requirements to prepare an environmental impact statement."[74] The exclusion of appropriate categories of actions from NEPA analysis makes sense. All agencies engage in minor actions, such as routine administrative decisions, that legitimately deserve to be exempt from NEPA.

Preparation of an EIS or even an EA for such actions would be a pointless exercise, given the nonexistent or benign environmental effects they have.

Over the years, however, some agencies have abused categorical exclusions to avoid preparing EISs and EAs for proposals that would clearly have, or create a non-trivial risk of, significant environmental effects. Due to excessively broad application of the categorical exclusion process, many agency actions that pose serious environmental risks are approved and implemented without *any* consideration of their potential adverse consequences. Further, the abuse of the categorical exclusion process allows these actions to proceed without public input because agencies sometimes fail to provide public notice before granting categorical exclusions.

The BP oil spill illustrates the harmful consequences that can result when agencies abuse categorical exclusions. The MMS approved BP's exploration plan for the Deepwater Horizon project under a categorical exclusion. As a result, the MMS did not consider the potential environmental impacts of BP's exploration plan for Deepwater Horizon on the immediately surrounding environment (Mississippi Canyon block 252). Instead, less than a month after BP submitted its exploration plan, the MMS approved it in a one-page letter dated April 6, 2009. The letter made no mention of the environmental risks the plan entailed, noting only that BP should "[e]xercise caution while drilling due to indications of shallow gas and possible water flow."

In essence, the MMS justified its categorical exclusion for BP's exploration plan on the basis that a NEPA analysis at that particular stage in the OCSLA development program would have been duplicative of those conducted earlier. As explained above, the MMS had conducted NEPA analyses at previous stages in the development of BP's Deepwater Horizon project, including a programmatic EIS purporting to analyze the potential region-wide environmental impacts of the nationwide five-year oil and gas development plan, an EIS covering the Central and Western Planning Areas of the Gulf of Mexico (which includes the site of the Deepwater Horizon project), and an EA for the Central Planning Area Lease Sale, of which the Deepwater Horizon project was a part. That EA concluded that the sale would have no significant environmental impacts.

This incorporation of earlier environmental analyses in subsequent EISs or EAs is known as "tiering." The use of tiering has become a well-accepted practice under NEPA, recognized in the CEQ regulations, that is designed to avoid duplicative analysis.[75] If an agency has prepared an EIS on a broad program, there may be no need to repeat that analysis when it later considers individual projects that are components of the broader program. Tiering is justified, however, only when all the potential effects of individual implementing actions have been fully considered at the programmatic stage. Often, it is impossible to engage in knowledgeable analysis of the effects of individual projects at the programmatic stage because the location or circumstances of implementing projects are not yet known. In such cases, reliance on a programmatic EIS to justify categorical exclusion of individual projects

disguises the agency's failure ever to consider site-specific, project-level effects, even if they are potentially catastrophic.

The categorical exclusion used to approve BP's drilling plan appears in a Department of the Interior manual governing the application of NEPA to the MMS. The manual largely endorses the use of tiering by categorically excluding from NEPA analysis many agency actions that occur later in the OCSLA oil development program, including:

> Approval of an offshore lease or unit exploration, development/production plan or a Development Operation Coordination Document in the central or western Gulf of Mexico . . . except those proposing facilities: (1) In areas of high seismic risk or seismicity, relatively untested deep water, or remote areas, or (2) within the boundary of a proposed or established marine sanctuary, and/or within or near the boundary of a proposed or established wildlife refuge or areas of high biological sensitivity; or (3) in areas of hazardous natural bottom conditions; or (4) utilizing new or unusual technology.[76]

This categorical exclusion is a slight modification of an exclusion adopted by the U.S. Geological Survey (USGS) when it supervised offshore drilling. The USGS provided no explanation of why these actions should be categorically excluded.[77] The range of actions currently excluded by the manual is remarkable, ranging from environmentally innocuous actions such as "approval of Sundry Notices and Reports on Wells" to those with the potential to create major environmental disruption, such as approval of BP's exploration plan for drilling the Macondo well.

Even a cursory look at the MMS's invocation of the offshore drilling categorical exclusion for the Deepwater Horizon plan shows that a tiering of NEPA analyses is inappropriate in the context of approving exploration plans. The MMS used the exclusion to sweep under the rug the potential risks of drilling a deepwater well in that location. The MMS indicated that BP's exploration plan was categorically excluded because the danger of an oil blowout, and any resulting environmental damage, was minimal or non-existent. The agency simply accepted at face value, without any independent evaluation or verification, BP's dubious assertions that:

- "The site specific environmental conditions have been taken into account for the proposed activities and no impacts are expected as a result of these conditions";
- "Due to the distance to shore (48 miles) and the response capabilities that would be implemented, no significant adverse effects [on wetlands] are expected";
- "In the event of an unanticipated blowout resulting in an oil spill, it is unlikely to have an impact based on the industry wide standards for using proven equipment and technology for such responses. . . ."; and
- Only "sub-lethal" effects on fish and marine mammals would occur in the event of a spill.

Remarkably, the plan admitted also that "[n]o alternatives to the proposed activities were considered to reduce environmental impacts," and that "[n]o agencies or persons were consulted regarding potential impacts associated with the proposed activities."[78]

If ever a project was unsuitable for categorical exclusion, this was it. The MMS at least owed some explanation of why the manual's bar on categorical exclusions for offshore oil and gas projects in "relatively untested deep water," "areas of high biological sensitivity," or "utilizing new or untested technology" did not preclude evisceration of the NEPA process through issuance of a categorical exclusion for the BP well. Similarly, the Department of the Interior regulations preclude a categorical exclusion if "extraordinary circumstances" exist. These include actions with significant impacts on public health or safety, significant impacts on natural resources such as wetlands and migratory birds, highly uncertain and potentially significant environmental effects or unique or unknown environmental risks, a direct relationship to other actions with individually insignificant but cumulatively significant environmental effects, or significant impacts on endangered or threatened species.[79] A drilling project such as BP's Macondo well would appear to raise serious questions in each of those areas.

Proposed Reform: Strengthen the Categorical Exclusion Process and Clarify the Limits of Tiering

Even before the BP oil spill, the CEQ had begun exploring possible changes in the NEPA process, and categorical exclusions in particular.[80] It recognized that categorical exclusions are no longer the rare exception to the need for NEPA compliance, but "the most frequently employed method of complying with NEPA."[81] According to the CEQ, the expanded use of categorical exclusions "has underscored the need for guidance" about their promulgation and use.

The CEQ's draft guidance includes worthy proposals that would confine categorical exclusions to the narrow circumstances for which they were initially envisioned—proposed actions that have no prospect of creating significant environmental effects and for which environmental assessment would provide no useful information. The CEQ has proposed that agencies considering a new categorical exclusion gather and evaluate information and issue findings to support any conclusion that the excluded activities will not result, individually or cumulatively, in significant environmental effects. Agencies should similarly document the application of existing categorical exclusions, including providing supporting analysis for why the exclusion is not barred by extraordinary circumstances. They should ensure adequate public involvement before both establishing new and applying existing exclusions. They should also periodically review existing exclusions to ensure that the predictions of minimal environmental effects on which they were based have turned out to be accurate, that circumstances have not changed so as to demand revocation of or limitations on those exclusions, and that unanticipated extraordinary circumstances have

not occurred in connection with excluded projects. All of these revisions would help avoid egregious applications of categorical exclusions such as the one the MMS approved for BP.

Since the blowout occurred, other reviews of the MMS's implementation of NEPA have been undertaken. The CEQ initiated a separate review of the MMS's environmental policies, practices, and procedures for applying NEPA to oil and gas leasing, exploration, and development.[82] In August, the White House released a more comprehensive report that includes a recommendation that BOEMRE review the use of categorical exclusions in light of the complexity and risk associated with deepwater operations, including revisiting its interpretation of what constitute extraordinary circumstances and reassessing the adequacy of its consideration of cumulative effects.[83] The report indicates that it anticipates that "for the foreseeable future," BOEMRE would prepare environmental assessments at the exploration plan stage.[84] This is a wise short-term recommendation but should not substitute for the broader reforms outlined above.

In addition, the CEQ should consider developing regulations that would require agencies to seek public input and to solicit the views of federal agencies with relevant expertise before proposing to rely on a categorical exclusion. For example, such a regulation would require BOEMRE, before it uses a categorical exclusion for an offshore drilling activity, to solicit the views of agencies with expertise on the aquatic environment, such as the National Oceanic and Atmospheric Administration and the Environmental Protection Agency (EPA), which can provide valuable input on whether the proposed categorical exclusion is appropriate. Further, the CEQ's regulations could be written to create a presumption that opposition to a categorical exclusion by an expert agency would prohibit its issuance. The presumption would shift the burden to the proposing agency to demonstrate that the project in question would not, individually or cumulatively, have significant environmental effects and that no extraordinary circumstances exist that make use of a categorical exclusion inappropriate.

Finally, on the subject of tiering of environmental analyses, the BP oil spill illustrated the dangers of casual references to more general NEPA documents, like the five-year leasing programmatic EIS, as a substitute for site-specific analysis of BP's exploration plan. In its recent report, the White House addresses this problem and recommends that BOEMRE review its policies on tiering to ensure that they are clear and are "not being used to limit site-specific environmental analysis that may be appropriate in certain circumstances, despite the availability of major, prior environmental reviews and studies."[85] This is an extremely important recommendation and may capture a problem found not only at the MMS but in other agencies that employ tiering routinely. The CEQ should consider revising its tiering regulations to clarify the limits of appropriate tiering, so that it is used only to avoid inefficient repetition of material already covered, rather than as an excuse to avoid site-specific assessment.

Regulatory Failure: Bad Science Undermines NEPA's Efficacy

Compounding the problems described above, NEPA's efficacy was undermined by two shortcomings in the MMS's compliance with NEPA. First, the analyses the MMS prepared to comply with NEPA were profoundly flawed, because they relied on unrealistically optimistic assumptions about the likelihood of a catastrophic oil spill and the industry's capability to contain one if it occurred. Even under the watered-down CEQ regulation, the agency's assessment of the risk was woefully inadequate to meet the requirement that the agency consider reasonably foreseeable significant adverse impacts, which the regulations define to include:

> [I]mpacts which have catastrophic consequences, even if their probability of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason.[86]

When, as with drilling in the Gulf of Mexico, there are thousands of oil wells and manned drilling rigs, the cumulative risks posed by the large number of activities in the same area will be highly significant.

Contrary to this requirement, the agency completely ignored the risk of a serious oil spill. The programmatic EIS analyzed the possibility of only one spill of about 4,600 barrels of oil and other smaller spills, and the MMS assumed that only 11,000 to 31,000 barrels might be spilled into the Gulf for the entire 40-year duration of the Gulf oil and gas development program. Then both the Multisale EIS and the EA for the specific lease sale relied on this same grossly inaccurate characterization. In describing the risks to various resources, including sea turtles, fisheries, and marine mammals, the assessment of the risks associated with a blowout relied on generalities—that the nature of the risk would depend on the magnitude and frequency of the accidents, the ability to respond to accidents, the location and date of accidents, and various meteorological and hydrological factors. This whitewashing of the prospect of a significant spill reveals a serious problem in the capacity or independence of the MMS's scientists who prepared the analysis.

The failure to consider the risk of a catastrophic spill from BP's Deepwater Horizon project contributed to the second serious shortcoming in the agency's assessment under NEPA. Because the risk of a large spill was simply excluded from consideration, the agency also overlooked the *cumulative* risk of a large spill—that is, the impacts on the environment from the incremental impact of the proposed action *when added to past, present, and reasonably foreseeable future actions*. The CEQ regulations require agencies to consider cumulative impacts even in deciding the threshold question of whether the environmental impacts of an activity will be significant, and thus require the preparation of an EIS.[87] When, as with drilling in the Gulf of Mexico, there are thousands of oil wells and manned drilling rigs, the cumulative risks posed by the large number of activities in the same area will be highly significant.[88] Although the risk of a blowout of any individual well may be very low, when the cumulative risk is considered, the picture of potential impacts changes. Consideration of the cumulative impact may provide agencies and the public crucial information in deciding whether the drilling is worth the risk, especially in an area of such environmental and economic importance as the Gulf of Mexico. But, because the agency failed to realistically

consider the risks associated with drilling—even setting aside the worst-case scenario—this information never received consideration.

Moreover, as is explained below, the MMS's inadequate science compromised the implementation of the Endangered Species Act (ESA), the statute designed to protect endangered and threatened species, such as whales and sea turtles. The wildlife agencies charged with implementation of the ESA must rely in large part on the expertise of the action agency—in this case the MMS—to describe the activity it proposes to take and the potential hazards the action presents. Indeed, the wildlife agencies cannot be expected to have the technical expertise necessary to assess the risk of an oil well blowout, or to determine the size of the spill that a major drilling accident might entail. Although, as is discussed further in Section IV, the wildlife agencies could and should have demanded more information and made better decisions, there is no substitute for sound scientific and technical risk assessments produced by the MMS when making decisions regarding oil and gas development pursuant to the OCSLA.

Proposed Reform: Provide BOEMRE with Strong and Independent Scientific Capacity

Section II above describes the institutional problems that have plagued the MMS and the challenges that must be overcome to eliminate the worst of the problems within BOEMRE. Given this history, it is critically important that the agency have accurate and independent scientific information to ensure that the agency makes sound decisions about safety and environmental protection measures. The reforms already undertaken by the Department of the Interior and those recommended for legislative action present an enormous challenge for the agency to integrate. The best option for reforming the BOEMRE's scientific capacity is to draw on and enhance existing capacity outside the agency. The USGS already possesses expertise on biology, geography, geology, geospatial information, and water. With adequate additional funding and a clear legislative mandate, the USGS would be a logical choice to support BOEMRE in its compliance with the OCSLA, NEPA, the ESA, the Marine Mammal Protection Act (MMPA), and other relevant statutes. For technical information, Congress should create an advisory board—independent of both industry and the agency—to review risk assessments as well as agency safety regulations and standards. This structural reform of BOEMRE would improve the agency's implementation of the OCSLA as well as ensuring better compliance with NEPA.

IV. The Endangered Species Act (ESA)

Legal Context: The Role of the ESA in Deepwater Offshore Drilling

The Endangered Species Act (ESA) is the primary U.S. law for protecting animal and plant species that are in danger of becoming extinct. Its goal is to protect species listed as threatened or endangered—as well as the ecosystems upon which those species depend—from being harmed by human activities, whether those activities are carried out by the federal government or by private individuals.

Section 7 of the statute governs actions taken by federal agencies, such as the Minerals Management Service (MMS). Specifically, this section requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of a listed species or destroy or adversely modify a listed species' designated critical habitat. To assist agencies in complying with these prohibitions, section 7 establishes a consultation process requiring federal agencies to consult with the U.S. Fish and Wildlife Service (FWS) and/or the National Marine Fisheries Service (NMFS), as appropriate, before undertaking a proposed action that may affect listed species or critical habitat. The FWS and/or the NMFS (collectively "the Services") then provide the agency with a "biological opinion" as to whether the proposed action is likely to run afoul of the ban on jeopardy and critical habitat destruction. In the consultation process, the Services consider both "direct effects" and "indirect effects." Direct effects are those that are directly caused by the proposed agency action. Indirect effects are "caused by the proposed action and are later in time, but still are reasonably certain to occur."

The massive scope of the Deepwater Horizon spill and its severe impacts to listed species and their habitat show that the section 7 process is not working to ensure protection of imperiled species from deepwater offshore drilling. Indeed, the Deepwater Horizon spill has already had serious or catastrophic adverse impacts on at least 11 species listed as threatened or endangered[89] under the ESA, and possibly several more. Yet, the NMFS issued a biological opinion concluding that the lease sales and associated oil and gas activities that encompassed the Deepwater Horizon project were "not likely to jeopardize" listed species or destroy or adversely modify designated critical habitat.[90] For its part, the FWS did not even perform a detailed analysis—it simply agreed with the MMS's finding that oil and gas activities were "not likely to adversely affect" listed species and their habitat.[91] We describe two failures of the section 7 process in addressing the threats of deepwater offshore drilling, and how they contributed to the BP oil spill. We also provide recommendations for reform in both areas.

Regulatory Failures and Proposed Reforms

Regulatory Failure: Ignoring Low Probability Risks of Catastrophic Harm to Listed Species

Two separate regulatory inadequacies led the Services to overlook the risk of harm to listed species and their habitat from a well blowout like the one that occurred. First, the regulatory mechanisms for ensuring that the Services have adequate information on which to base their biological opinions are lacking. During section 7 consultations, the Services typically rely primarily on action agencies to provide them with information to complete the consultation process, including assessments of risk. This has been problematic in the context of deepwater offshore drilling, since the MMS routinely underestimated the magnitude of harm posed by a potential oil spill. According to the lease sale that included the Deepwater Horizon project, the MMS contemplated only the "unlikely" possibility of a single large spill of up to 630,000 gallons over the 40 years of oil and gas activities in the lease area.[92] Consequently, the section 7 consultation documents provided to the Services for this lease sale also relied on this faulty estimate, which turned out to be a miniscule fraction of the oil actually released during the Deepwater Horizon blowout.

Second, apart from the inadequacies of the MMS's assessments of risk, the Services' tend to discount risks—even potentially catastrophic ones—if they are deemed to be low probability. In implementing the ESA's section 7 consultation process, the Services generally focus on assessing relatively predictable impacts of planned agency actions (such as impacts to species and their habitats that attend timber sales, dam operations, wetland fills, and similar activities), which the Services generally call "direct effects." While section 7 regulations also require consideration of "indirect effects" of agency actions, such effects are narrowly defined to include only effects caused by the proposed action that are "later in time, *but still are reasonably certain to occur*."[93] So, although there is no question that BP's exploration activities approved by the MMS caused the blowout, the definitions of both "direct" and "indirect" effects seem to permit the Services to ignore effects that are not "reasonably certain to occur"—such as the consequences of a low probability but catastrophic accident like what actually took place in the Gulf. In other words, low probability risks are in essence discounted to zero in the Services' current implementation of the ESA's section 7 process.

The Services took this approach to discounting risk when they consulted with the MMS for the lease sale that included the Deepwater Horizon project. For example, the FWS found 17 to 27 percent likelihood that an oil spill greater than 1,000 barrels would reach designated critical habitat of piping plovers. Finding this probability to be "low," the agency thus concurred with the MMS's determination that the leasing and associated activities were "not likely to adversely affect" listed species and critical habitat.[94] As such, the biological consequences of a potential oil spill—even a catastrophic one—did not constitute indirect effects, since a spill was not "reasonably certain to occur," and therefore the FWS was able to ignore this risk as part of its consultation.

Virtually no one would get on an airplane if it had a one-in-four risk of crashing. Similarly, discounting risks of this magnitude to threatened and endangered species and their habitat is inconsistent with Congress' intent that the ESA provide these species a high level of protection. For agency actions that have few direct impacts but pose an indirect, non-negligible risk of serious or catastrophic harm due to unanticipated problems arising from the proposed action, the section 7 regulations' "reasonably certain to occur" standard enables the Services to simply ignore the risk of potentially serious harm.

Proposed Reform: Ensure Better Assessment of Low Probability Risks of Harm to Listed Species

To begin with, it is imperative to ensure that the Services receive more accurate information regarding the magnitude of potential risks associated with proposed federal agency actions. Elsewhere in this paper, we have recommended improving BOEMRE's capacity to generate sound scientific and technical assessments of the risk of drilling. We have also recommended the reinstatement of worst-case analysis under the National Environmental Policy Act (NEPA) to ensure accurate assessment of the possible environmental consequences of oil and gas activities. Both of these reforms are also essential to the section 7 consultation process. Without an accurate risk assessment, no consultation will accurately assess the risks to listed species and their habitats.

However, the Services also have other tools they can employ in cases in which they realize that an action agency has provided them with information that fails to adequately consider the biological impacts of low probability events with potentially serious consequences for listed species. Specifically, by relying on the ESA's mandate that federal agencies act on the basis of the best available scientific information in complying with section 7, the Services can demand that the action agency use all the available information to supply an analysis of possible outcomes of the proposed action—including the biological consequences of outcomes that carry a relatively low risk of taking place, but would have devastating impacts if they did take place. Thus, the ESA essentially provides its own regulatory basis for requiring a worst-case analysis for actions that generate risk to listed species and their habitat. Moreover, the ESA's section 7 regulations give the Services authority to suspend the consultation process pending receipt of additional information from an action agency.[95] As such, the Services should begin using this authority aggressively to demand from action agencies better estimates of the magnitude of potential risk associated with their proposed actions.

In addition, the Services should significantly revise the regulations governing the ESA's section 7 consultation process in order to better account for the kind of low probability catastrophic risks that characterize deepwater offshore drilling. The section 7 process on the lease decision that included the Deepwater Horizon project demonstrates the need to revise the Services' definition of "indirect effects" under the ESA to include low probability but catastrophic effects. An additional sentence (noted here in italics) should be added so that

the definition reads as follows: "Indirect actions are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur. *Indirect effects also include any non-negligible risk of serious or catastrophic impacts due to unintentional consequences of the proposed agency action*."

This change will ensure that the Services do not discount risks of serious harm to listed species arising from the unintended consequences of proposed actions merely because such impacts are not "reasonably certain to occur." As the Deepwater Horizon spill dramatically illustrates, taking steps to reduce the *risk* of disasters that affect listed species is just as important as reducing *direct impacts* to these species and their habitat. This change is also consistent with Congress' intent that the ESA provide listed species a high level of protection. For agency actions that have few direct impacts but pose an indirect, non-negligible risk of serious or catastrophic harm due to unanticipated problems arising from the proposed action, this revision to the section 7 regulations' "reasonably certain to occur" standard will ensure that the Services can no longer simply ignore the risk of potentially serious harm.

Regulatory Failure: Failure to Aggregate Low Probability Risks

Because of their failure to consider low probability catastrophic risks as "effects," the Services have also failed to consider the *aggregate* low probability risks of consecutive federal actions. The ESA's section 7 regulations require consultations to measure the effects of a proposed federal action against the applicable "environmental baseline"—that is, the state of the potentially affected area in the absence of the proposed federal action. The purpose of this requirement is to ensure that the consultation process accounts for past, present, and reasonably foreseeable future insults to the environment when evaluating the impact that another insult—the proposed federal action—will have on that same environment. The section 7 regulations define "environmental baseline" to include "the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all Federal projects in the area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in progress."[96]

In their consultations on offshore oil and gas activities, however, neither the FWS nor the NMFS made any effort to consider the aggregate risk of oil spills due to the many separate MMS oil and gas leasing decisions. In other words, to the extent the Services considered risk at all, they simply characterized the risks posed by the specific lease sale at issue as low and thus concluded that the proposed sale was not likely to cause jeopardy or destruction of critical habitat. However, the combination of many activities with a low probability of serious harm invariably leads over time to an overall likelihood that such harm will occur (*e.g.*, an activity that carries a one-in-one hundred chance of causing a serious accident is virtually certain to cause such an accident if the activity is repeated one hundred times). Despite this fact, the Services never attempt to aggregate total risk to listed species stemming

from multiple federal decisions. As a result, the Services end up ignoring ever-increasing risks to listed species that a serious or catastrophic event, such as a massive oil spill, will occur, thus significantly under-protecting imperiled species.

Proposed Reform: Ensure That the Services Consider Aggregate Impacts of Low Probability Risks of Serious Harm

A modest addition to the section 7 regulations would ensure that the agencies no longer fail to add up risks to listed species from separate federal actions that have already been approved by the Services after going through the section 7 consultation process. To ensure proper aggregation of risks to listed species, the regulatory definition of "environmental baseline" should be expanded by adding the following sentence: "These impacts include any non-negligible risks of serious or catastrophic impacts due to unintentional consequences of relevant Federal, State, or private actions." This simple change would make clear that the Services should no longer ignore their previous decisions to approve risky activities when considering whether to authorize additional risks to affected species and their habitat.

The long term effects of the Deepwater Horizon spill could result in the extinction of one or more threatened or endangered species, and will certainly make recovery of all affected species much more difficult. The ESA reforms outlined above are crucial to guard against similar tragic consequences in the future.

V. The Precautionary Principle

Legal Context: The Role of the Precautionary Principle in Public Safety and Environmental Law

The last time images of oil-soaked birds and tarred beaches from a ruptured offshore oil rig flashed across American TV screens, it helped spur a flurry of bipartisan environmental lawmaking. The Santa Barbara oil spill dumped 80,000 barrels of crude into the Pacific Ocean off the southern California coast in 1969, and in the next seven years, Congress passed a half dozen of the major environmental statutes that still protect us today. Those statutes were animated by an attitude of *precaution* in the face of environmental risks. The National Environmental Policy Act (NEPA) forced federal agencies to prepare Environmental Impact Statements before authorizing risky activities, identifying, among other things, the potential "irreversible and irretrievable" effects of their actions.[97] The Clean Air Act mandated the adoption of national air quality standards stringent enough to protect the public health with "*an adequate margin of safety*."[98] The Endangered Species Act (ESA) mandated the protection of endangered species "whatever the cost."[99]

The *Precautionary Principle* has subsequently become a pillar of international environmental law, forming the basis for a whole host of international treaties and agreements. Perhaps the most prominent articulation of the Principle appears in the 1992 Rio Declaration, negotiated by the first President Bush: "Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation." It's basic common sense. If you don't know whether that dark pool ahead of you is quick sand, and you can walk around it without taking on some other life threatening danger, then spend the extra effort to walk around.

Two important notions animate the Precautionary Principle. The first is the idea that, in order to prevent harm before it happens, we should act on the basis of reasonable evidence even before we have full scientific proof that a particular industrial activity causes harm. The second arises from the insight that not all harms are equal. When harm is irreversible, you can't just tote it up alongside economic harms as dollars and cents. You have to take extra pains to prevent it from happening in the first place. Once oil has spread through thousands of square miles of ocean, suffocating fish and birds, fouling beaches, coating wetlands, and poisoning billions of microorganisms that form the building blocks of the aquatic food chain, you can't put the genie back in the bottle.

Although, to a large extent, the Precautionary Principle simply enshrines common sense, virtually all of the incentives that free markets create for corporations push in precisely the opposite direction. Driven by the profit motive, companies face constant pressure to save money in the short-term by cutting corners on measures that would reduce long-term risks of harm to the public and the environment. Their incentive is to downplay risks of irreversible harm and to emphasize scientific uncertainties as good reason for delaying

short-term expenditures to avert such harms. Thus, the Precautionary Principle serves as an important corrective to the distorted incentives created by free markets.

Given its tendency to push back against corporate incentives, it is perhaps no surprise that the Principle came under attack almost as soon as the ink was dry on Congress's legislative initiatives of the 1970s. Some critics charged that it was too strong—that it would require perfect safety and thus prohibit virtually all economic activity. This criticism, of course, painted an unduly rigid picture of the Principle, which, by its own terms, sets a clear threshold for action. The Rio Declaration, for example, requires "threats of serious or irreversible damage" before precaution is triggered. Other critics argued the opposite—that the Principle is so vague as to be worthless, or, in a variant of that charge, that it is indeterminate because all potential actions pose risks on all sides. Favorite and hackneyed examples included the banning of DDT creating a countervailing risk of increased malaria in Africa, or stricter screening of new medications by the FDA causing countervailing risks from the diseases the drugs might have treated. It is no doubt true that such examples pose difficult decisions for which neither the Precautionary Principle nor any other principle offers clear guidance. But not every instance of environmental risk takes this symmetrical form. If, for example, the alternative to assuming the risks of blowouts from offshore oil drilling is more extensive development of nuclear power, then certainly, there are risks on both sides. But, if the alternative to blowout risk is asking oil companies to spend a little more money on safety equipment or instituting measures to conserve energy in order to extract less oil in the first place, then the choice is not between equivalent risks, but rather between serious, catastrophic, and irreversible harm on one side and no appreciable risk on the other.

Despite having been convincingly refuted, these criticisms are continually repeated, and after decades of attack, the Precautionary Principle is looking worse for wear. It's been called "incoherent," "paralyzing,"[100] and "mythical,"[101] and the *Wall Street Journal* editorial page recently pronounced it a "thoroughly discredited theory."[102] In this atmosphere, it is not surprising that in the lead up to the Gulf disaster, BP and the Minerals Management Services (MMS) that was supposed to oversee it did precisely the things that the Precautionary Principle is designed to protect against. They downplayed and, in some instances, utterly dismissed the risks to environmental and human health posed by offshore drilling, demonstrated a complete disregard for the irreversibility of the harms at issue, and failed to analyze worst-case scenarios.

Regulatory Failures and Proposed Reforms

Regulatory Failure: Failure to Incorporate the Precautionary Principle into the Regulatory Process

If any economic activity could benefit from the guidance afforded by the Precautionary Principle, it is deepwater offshore drilling. Various sources have determined that such

drilling involved a significant risk of catastrophe—that is, a major spill or blowout, such as occurred at BP's Deepwater Horizon drilling project. The MMS estimated that the probability of a spill over 10,000 barrels occurring in the next 40 years was 99 percent.[103] A confidential study commissioned by Transocean last year found that in practice blowout preventers have a failure rate of 45 percent.[104]

And, as the pictures from the Gulf make all too clear, the potential damage from a catastrophic spill or blowout was "serious" and quite possibly irreversible. The marine and coastal ecosystems affected by the spill are some of the most productive in the world. The region of the gulf in which the spill occurred contains 8,332 species of plants and animals, including a substantial number of endangered and threatened species.[105] And the Louisiana shoreline contains 40 percent of the nation's wetlands.[106] There is no way to know for sure what the long-term effects of a spill of this magnitude in the Gulf will be, but research on past oil spills shows lingering impacts even from spills that occurred decades ago. Fiddler crabs in a bay on Cape Cod, whose normally deep burrowing behavior plays a crucial role in the salt marsh ecosystem, are still prevented from digging more than several inches into the soil by a persistent layer of oil just below the surface, a relic of a 1969 oil spill.[107] Studies in Alaska show that sea otters and other species continue to be harmed by exposure to oil deposited by the Exxon-Valdez spill over two decades ago.[108] And on another spot on Cape Cod, wetlands soaked in oil from a 1974 spill eroded away when the grasses died and have never recovered.[109]

There is no way to know for sure what the long-term effects of a spill of this magnitude in the Gulf will be, but research on past oil spills shows lingering impacts even from spills that occurred decades ago.

Nevertheless, BP and the MMS failed to follow the Precautionary Principle at several crucial stages in the lead-up to the massive oil spill. In its Initial Exploration Plan, BP asserted over and over again that an oil spill was "unlikely," and therefore concluded that, with respect to essential fish habitat, marine and pelagic birds, marine mammals, and sea turtles, "no adverse impacts . . . [were] anticipated."[110] The MMS took a similarly nonchalant attitude toward the risks. It labeled any spill over 1,000 barrels a "low-probability event,"[111] and did not analyze the impacts of any spill over 4,600 barrels.[112] (By the time the BP blowout was finally capped in mid-July, it had spilled an estimated 4.9 million barrels into the Gulf.) The MMS also specifically considered the possibility of a blowout, but assumed that most blowouts would last half a day,[113] and ultimately concluded that oil spills or blowouts "are expected to have temporary localized impacts on water quality," "are not expected to damage significantly any wetlands along the Gulf Coast," and "would have a negligible effect on [Gulf of Mexico] fish resources."[114]

In evaluating the risks to endangered and threatened wildlife, the MMS and the U.S. Fish and Wildlife Service (FWS) concluded that the chances of the drilling project harming such species' critical habitat was "low" based on the assumption that a spill would dump only 1,000 to 15,000 barrels of oil into the Gulf.[115] This was despite the Agency's conclusion that even a small spill of that magnitude would have up to a 27 percent chance of depositing oil in the critical habitat of some imperiled species. The *New York Times* quoted a FWS official as saying that as long as the risk of a catastrophic oil spill from an activity was under 50

percent, it did not warrant protections from her office.[116] This is a striking interpretation of a statute that the Supreme Court described in 1978 as adopting a stance of "institutionalized caution."[117]

Finally, when carrying out its drilling activities at the Macondo well, BP repeatedly made decisions to cut corners on safety in order to boost profits. "Time after time, it appears that BP made decisions that increased the risk of a blowout to save the company time or expense."[118] BP chose to have (and the MMS chose to require) just one blind shear ram (a critical component of the blowout preventer that failed on the Deepwater Horizon rig), even though experts have since 2001 recommended that each rig be outfitted with two.[119] It chose not to install (and the MMS chose not to require) a remote control trigger on its blowout preventer—a safety device that is standard operating procedure in many other countries.[120] It chose to use only a single rather than a double casing on the bottom section of the well, to forego use of a safety device called a "lockdown sleeve," and to bypass a recommended procedure called a "bottoms up" circulation of drilling mud that would have detected stray gas in the well.[121] It chose to use only six "centralizers" on the well casing even though an engineer from Halliburton advised BP to use 21 and warned that using only six would cause "a SEVERE gas flow problem."[122] It chose to flout the advice of experts and the requirements of the MMS's regulations by not performing a "cement bond log," a critical quality check that would have identified channels in the well casing's cement that could cause gas flow problems—a decision that one independent expert called "horribly negligent."[123]

Proposed Reform: Reinvigorate the Precautionary Principle

There are many lessons to be learned from the Deepwater Horizon tragedy. But one important lesson is that we need to reinvigorate the Precautionary Principle and reinstate it as a much-needed corrective against precisely the kind of short-cutting and short-sightedness that led to the catastrophe in the Gulf.

The choices that BP made (and that the MMS allowed them to make) leading up to the catastrophic blowout were not hard cases under the Precautionary Principle—that is, they did not involve choices that present significant risks on both sides. Rather, each of these choices involved on one side a significant risk of serious and irreversible harm—a blowout causing an unrestrained flow of oil into the Gulf of Mexico—and on the other side, an additional expenditure of time, money, or effort by BP and a consequent decrease in profits. Given that these were easy cases, it is likely that the Precautionary Principle would have led BP to make different decisions that would have been designed to minimize unnecessary risks of serious public health, safety, or environmental harms.

Quite clearly, the Precautionary Principle was MIA when BP and the MMS repeatedly took unnecessary risks related to the Macondo well. It has been beaten back by years of attack by industry and its political allies. Even a statute, like the ESA that was clearly intended to enshrine a precautionary stance is now interpreted to throw caution to the wind unless the chances of harm rise above 50 percent. NEPA is no longer interpreted to require analysis

of a worst-case scenario. In reforms to the OCSLA, Congress should adopt amendments that better institutionalize an attitude of precaution in the face of serious and irreversible harm. And the agencies interpreting and implementing NEPA and the ESA should revisit their interpretations that fail to respect the precautionary mandate that Congress clearly embodied in these laws.

VI. U.S. Energy Policy

Legal Context: The Role of U.S. Energy Policy in Deepwater Offshore Drilling

The United States has never really had a comprehensive energy policy. As a result, we have never had an effective strategy for balancing the competing interests that determine how we procure and use energy. These competing interests include energy security, cheap energy, and non-environmentally harmful energy. Often, the pursuit of one of these interests comes at the expense of another. Thus, trying to increase fossil fuel production in the United States may reduce dependency on foreign oil, but it is also likely to have significant environmental impacts and raise the price of fossil fuel. To make things more complicated, the United States has historically followed a natural resources policy of transferring publicly owned resources (such as energy supplies) to the private sector, which in turn has an incentive to make a profit from these transfers.[124]

The balancing of environmental concerns in energy policy is especially tricky. The extraction and utilization of the current dominant forms of energy (*i.e.*, fossil fuels, nuclear, and hydropower) can be some of the most environmentally harmful activities on earth; and yet energy supplies are also needed to support our economy and levels of human development. While we as a country have never fully reconciled these warring interests in a comprehensive energy and environmental policy, we have, through our environmental laws, expressed the policy that as energy is produced and utilized, it should not cause environmental externalities, which can fall on the general citizenry. These environmental laws include the Clean Air Act[125], the Clean Water Act[126], and the Resource Conservation and Recovery Act (RCRA).[127]

In addition, resource protection laws, such as the Endangered Species Act (ESA)[128], the Marine Mammal Protection Act (MMPA), wetlands protection in the Clean Water Act, and the National Environmental Policy Act (NEPA) have impacts on the extraction and use of energy in this country. Because many energy sources are located on federal land or require federal approval for extraction or utilization, laws that control the activities of federal agencies (*i.e.*, NEPA, the ESA, and wetlands protection in the Clean Water Act) also have a significant effect on energy supplies. The federal laws that allow the government to lease or sell energy resources to the private sector, such as the Outer Continental Shelf Lands Act (OCSLA), also require consideration of general environmental values.[129]

Together, these laws advance the goal of avoiding harm or serious risk of harm to human health or the environment when extracting or using energy. Put differently, they seek to ensure that energy pays its own way from cradle to grave. U.S. energy policy—primarily expressed through congressional legislation and executive orders—often undermines the pursuit of this goal, however. Several components of our energy policy allow the

energy sector to escape the full costs of their extraction or utilization activities, leading to unnecessary environmental and human harm.

Properly understood, the BP oil spill is a direct result of a dysfunctional energy policy, driven largely by our nation's addiction to fossil fuels. What else but an addiction to oil would drive the United States to drill over one mile beneath the ocean's surface in some of the most delicate and important ecosystems in the world? In 2007, the United States consumed an average of 20,680,000 barrels of oil every day.[130] With the world's oil supplies dwindling quickly, the United States has resorted to extracting oil from remoter and more challenging sources in order to satisfy its addiction.

Given the technological challenges and substantial risks involved in deepwater offshore drilling, the occurrence of something like the BP oil spill was not a matter of "if" but "when." Without serious reforms to our energy policy, the next BP oil spill will continue to loom on the horizon. Below, we describe some of the problematic aspects of our energy policy that contributed to the BP oil spill. We also provide recommendations for reforming these aspects of U.S. energy policy.

Regulatory Failures and Proposed Reforms

Regulatory Failure: Subsidizing Unreasonably Risky Offshore Drilling

As a general rule, the U.S. government does not subsidize dangerous or risky activities. Rather, it often finds that it is good policy to tax these activities to ensure that those who do engage in them bear their full costs. Thus, the government doesn't give public money to smokers to help them pay for cigarettes; instead, it taxes the sale of cigarettes and uses the proceeds to help offset the costs of providing healthcare services, which smokers presumably use more of, as a result of their unhealthy activity.

For many decades now, offshore drilling has somehow escaped this sound policy logic. Beginning with the Reagan Administration, the offshore oil industry has received billions of dollars in subsidies, in the form of earmarks, tax breaks, and royalty payment exemptions. These policies have deprived the U.S. Treasury of billions of dollars in revenue, while encouraging oil companies to engage in unreasonably risky oil extraction activities.

Some of the tax breaks from which the oil industry benefits have been around for nearly a century, dating back to a time when subsidies were arguably necessary to jumpstart the fledgling oil extraction industry. Moreover, Congress has failed to repeal to these tax breaks—and continued to add new ones—even as the oil extraction has grown into one of the most profitable industries in the world. As a result, today oil extraction is one of the most heavily subsidized industries in the world.[131] According to a 2005 Congressional Budget Office study, many capital investments associated with oil extraction, including oil field leases and drilling equipment, are taxed at a rate of only 9 percent—among the lowest rate for any industry, and significantly lower than the overall rate of 25 percent for

businesses in general.[132] Other oil industry tax breaks include deductions for many drilling costs and credits for low-volume oil and gas wells. These tax breaks save the oil extraction industry an estimated $4 billion per year.[133] BP's Deepwater Horizon project benefited from many of these tax breaks. For instance, before the oil spill, BP was deducting $225,000 a day by using an oil industry tax break that allowed it to write off 70 percent of the rent it was paying to Transocean for the Deepwater Horizon oil rig.[134]

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The royalty exemptions for oil extraction companies are of a more recent vintage, having been established by Congress in 1995 as part of the Deep Water Royalty Relief Act. The Act was intended to encourage deepwater drilling activities at a time when oil prices were so low—about $18 a barrel—as to make these activities unprofitable without a subsidy. Under the Act, oil extraction companies were permitted to pay reduced royalties on wells leased between 1996 and 2000 that were located 200 meters or more underwater. The reduction rate increased proportional to the depth of the well. All reduction rates were only supposed to be applicable when oil was selling for less than $34 a barrel.[135] However, roughly 1,000 leases issued in 1998 and 1999 continue to benefit from the reduced royalty rates—even though oil now sells for around $70 a barrel—since a clerical error in the leasing contracts omitted the $34-per-barrel threshold requirement. The Government Accountability Office (GAO) estimates that these royalty exemptions could cost the U.S. Treasury more than $55 billion in lost revenue over the lifetime of the leases.[136]

Even without the royalty reductions permitted by the Deep Water Royalty Relief Act, oil extraction companies operating in the United States enjoy some of the lowest royalty rates in the world. According to a 2008 GAO report, of the 104 jurisdictions that received royalties from oil revenue, only 11 had lower payment rates than the United States.[137]

The most recent comprehensive energy legislation—the Energy Policy Act of 2005—provided billions of dollars of additional subsidies to oil extraction companies at a time when offshore oil development in the Gulf of Mexico was already in full swing and oil companies were making record profits. Based on recommendations from then-Vice President Dick Cheney's energy task force, the Act contains new tax benefits and royalty payment exemptions for the oil industry. Significantly, the royalty exemptions apply to certain existing leases in the Western and Central Gulf of Mexico for wells located 400 meters or more under water, as well as new leases issued within five years after the Act went into effect.[138] The Act also included a $50-million annual earmark to support technical research for the industry.[139]

Proposed Reform: Repeal All Subsidies for Offshore Drilling

Congress should take immediate legislative action to eliminate existing subsidies for offshore drilling activities, including all tax breaks, royalty exemptions, and earmarks. These subsidies needlessly deprive the U.S. Treasury of billions of dollars in revenues at a time when the federal government is running up massive deficits. In addition, by enabling oil extraction companies to escape the full burden of their environmental costs, they encourage them

to engage in unreasonably dangerous drilling activities. The BP oil spill provides a stark reminder of the negative consequences that result when oil extraction companies undertake drilling projects in ecologically sensitive areas that push the technological envelope.

In particular, Congress should identify and eliminate all the various oil extraction industry tax breaks that have accumulated in the U.S. tax code. Congress should also repeal the Deep Water Royalty Relief Act. Likewise, Congress should take action to terminate the errant leases issued under the Deep Water Royalty Relief Act that allow oil companies to continue enjoying royalty reductions even though oil prices are high. For instance, it could adopt legislation authorizing the newly created Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) to require these oil companies to renegotiate the errant leases to reinstate the $34-per-barrel threshold requirement as a condition of negotiating future offshore drilling leases. Finally, Congress should repeal the various subsidies provided to the oil extraction industry in the Energy Policy Act of 2005.

The common refrain from the oil extraction industry is that the elimination of these various subsidies will decimate the offshore drilling industry in the United States, forcing us to import more oil from abroad and reducing our energy security. This argument doesn't hold up under closer scrutiny, however. Thanks to high oil prices, the oil extraction industry has been turning in record profits for years now, and can easily bear the losses associated with the elimination of these subsidies. In fact, a study by a Treasury Department economist concluded that the elimination of oil extraction industry subsidies would decrease production of American oil by less than one-half of one percent, since prices and industry profits were so high.[140] Consequently, Congress can eliminate these subsidies knowing that this action will help protect people and the environment without significantly affecting energy prices or undermining energy security.

Regulatory Failure: Ignoring Climate Change Linkages

The BP oil spill follows from an energy policy that is over a century old and continues to shape our production, distribution, and consumption of energy while paying scant attention or giving lip service only to the challenges of climate change. This traditional energy policy encourages an energy infrastructure and regulatory program that is largely built to support the production and consumption of large amounts of fossil fuels, regardless of their impact on the health and safety of citizens and workers, or on the environment in which we work and live.

With the threat of climate change looming ever larger, the United States needs to adopt a new approach to energy that is based on sound climate change policy. The failure to reorient U.S. energy policy to account for climate change concerns has served as a special kind of subsidy to the carbon intensive fossil fuel industries, enabling unreasonably dangerous extraction activities, such as the deepwater offshore drilling that led to the BP oil spill. A properly oriented energy policy will level the playing field, allowing new and emerging

alternative energy sources to become economically viable, so that the United States is able to develop a low carbon energy economy.

A sound climate change policy should seek to accomplish two basic goals. First, it should make sure that carbon intensive energy sources bear the full costs of their impact on climate change. Climate change already has and will continue to impose greater and greater costs on society, such as more frequent and more intense weather storm events, increased instances of disease and heat related deaths, and the extinction of numerous animal and plant species. Every barrel of oil that is burned to create energy contributes to these costs, but these costs are not reflected in the price of that oil. As such, that oil is artificially cheap, so producers tend to overproduce the oil, and consumers tend to over-consume it. By ensuring that carbon intensive energy sources bear the costs of climate change, marginal or inherently expensive sources of fossil fuels—including, most oil extracted through deepwater offshore drilling—would likely become prohibitively expensive, and would be abandoned immediately.

Second, a sound climate change policy should seek to help industry and academia develop and promote innovations in alternative energy sources and in energy efficiency so that low carbon energy becomes comparable in cost to fossil fuels. As noted above, there was a time when the United States subsidized the fossil fuel industries to help spur innovations in nascent extraction and distribution technologies, so that reliable and low cost energy could be made more widely available. A similar approach should be taken with respect to alternative energy sources and energy efficiency innovations. This will enable the U.S. economy to reorganize itself around low carbon energy sources on its own, since the low carbon energy sources will be competing on a more level playing field with traditional fossil fuels. In addition, by making cheap and reliable alternative energy and energy efficiency innovations more widely available, this will minimize economic dislocation for the poorest members of U.S. society, while we more toward a more environmentally sustainable future. Importantly, the transition to a low carbon energy economy will minimize, or possibly even eliminate, our current reliance on deepwater offshore drilling.

Proposed Reform: Adopt an Effective Climate Change Policy

The United States should adopt an effective climate change policy as soon as possible. Such a policy will not only help us to avoid the worst consequences of climate change, but it will also help to avoid the future occurrence of catastrophic oil spills arising from deepwater offshore drilling.

Consistent with a sound climate change policy, the United States should take a number of steps to ensure that carbon intensive energy sources bear the full costs of their impact on climate change. Most importantly, the United States must place a price on carbon, either through a carbon tax or through a cap-and-trade regimen, so that all social costs are incorporated into the price of energy. To ensure the effectiveness of carbon pricing, the United States should also eliminate all remaining subsidies for fossil fuels, as explained above. This should also include the normalization of tax and accounting rules so that the

oil industry is treated like all other businesses. These steps will ensure that the price of fossil fuels reflects its true social cost, so that it is not overproduced and over-consumed to the detriment of society.

In addition, the United States should seek to promote innovations in alternative energy and energy efficiency, so that these technologies are able to compete on a level playing field with fossil fuels in the energy market. Our future energy policy depends upon a significant increase in research, development, demonstration, and employment money for a wide variety of innovative energy technologies with the goal of bringing them to scale.[141] Federal research and development policy must act in partnership with the private sector, including for-profit and nonprofit actors, to fund innovation from basic science to commercial marketability. In addition, the United States should consider employing rate incentives to construct a smart grid (*i.e.*, an electricity transmission system that delivers electricity from suppliers to consumers using two-way digital technology to control appliances at consumers' homes to save energy, reduce cost, and increase reliability and transparency), expand the use of renewable resources to generate electricity, decentralize production and distribution of electricity through distributed generation, and promote energy efficiency measures such as net metering and smarter appliances and homes.

VII. Lessons from the North Sea

Legal Context: Regulation of Offshore Drilling in the United Kingdom and Norway

The United Kingdom Experience

On July 6, 1988, the Occidental Petroleum offshore oil and gas production platform known as Piper Alpha exploded and burned into the sea, killing 167 workers (59 people survived). Located about 120 miles northeast of the Scottish city of Aberdeen, which is the land headquarters of British oil and gas production on the Upper Continental Shelf, the platform rested in about 474 feet of water. It was enormous, accounting for approximately 10 percent of total North Sea production. Total insured loss was estimated at about $3.4 billion in 1988 dollars. The destruction of Piper Alpha remains the worst disaster in the history of offshore drilling in terms of lives lost.

The discovery of petroleum reserves in the North Sea in the late 1960s was perceived as an economic miracle in Britain, staving off grave financial hardship and allowing the country to reclaim its position as an industrial powerhouse within the European community. Few people have ever looked this providential gift horse in the mouth, and the responsibility for imposing worker safety regulation on the platforms and rigs that sprouted up across the stormy and forbidding North Sea was delegated to the same agency that granted drilling licenses and collected royalties for the government. The Piper Alpha disaster provoked a harshly negative public reaction and prompted work stoppages among a usually docile workforce. The government convened a two-year inquiry headed by Lord William Douglas Cullen, a senior Scottish judge, which culminated in the *Cullen Report*, a classic in both accident investigation and policy prescription.

Piper Alpha was originally designed to produce oil, but Occidental was in the process of converting it to gas production when the explosion occurred. Mistakes in that process undoubtedly contributed to the disaster. For example, the firewalls separating the control room from an area where produced gas was compressed were not built to withstand explosions. The control room was abandoned early in the crisis, destroying any hope of maintaining a semblance of command on the platform.

The proximate cause of the initial explosion was human error involving a lack of communication between two shifts of workers. During the course of routine maintenance, a crew had removed a pressure safety valve from the relief line of one of two condensate injection pumps (used to relieve the pressure of gas as it was pumped from the deep well) and replaced it with a blank flange assembly (akin to a flat metal disk). At the time, that pump was not operational. When the handover to the night shift occurred, no one mentioned this piece of routine maintenance verbally, although witnesses later testified that a sheet of paper, known as a "permit to work" had been completed instructing the night shift

not to turn on the second pump. This document was never found. The night shift tried to start the pump up, the blank flange assembly leaked, and a large amount of gas built up quite quickly.

Explosion of this gas led to a large crude oil fire, which in turn evolved into a second explosion and an even more devastating fire, largely because workers on two sister platforms, the Tartan and the Claymore, located within 12 and 22 miles from the mother platform, did not stop pumping into the pipelines they all shared, in effect feeding a fire that might otherwise have burned itself out. Lord Cullen discovered that even as they watched the Piper Alpha burn, the men in command on the Tartan came to blows, with one man refusing to listen to the other's advice that he shut down the pumping operation, claiming he needed permission from corporate headquarters in Aberdeen to take such a drastic step.

Lord Cullen also found that although Occidental had anticipated the possibility of such a disastrous chain reaction, neither the onshore regulatory authority nor the company had planned an effective response, including training workers on evacuation procedures. He noted that the regulatory authority had inspected Piper Alpha only a month before the explosion, but that the inspection was so superficial that it was of little use. He called for a comprehensive overhaul of the entire regulatory system, beginning with the separation of royalties collection from the safety inspection function.

The causes and consequences of the Deepwater Horizon disaster are eerily reminiscent of Lord Cullen's account of what happened on Piper Alpha:

- As at Piper Alpha, a weak and inherently conflicted regulatory regime left a complex industry operating in a dangerous, unforgiving environment to its own devices, with dire consequences that appear to have been entirely preventable.
- As at Piper Alpha, advance plans for the design and operation of the Horizon rig were grossly insufficient, leading to short cuts and pressure to forge ahead with production that would prove fatal.[142]
- Like the Piper Alpha incident, signs of trouble on the Horizon began to accumulate hours, days, and even weeks before the chain reaction began.[143]
- Poor communication between workers on both Piper Alpha and the Deepwater Horizon, as well as lax safety training with respect to routine maintenance activities, led to an unstoppable chain reaction.[144]
- Once the explosion and fire began, the chain of command on Piper Alpha and the Deepwater Horizon became dysfunctional, with rescue operations fundamentally compromised.[145]

The failure of U.S. regulators to learn from mistakes made in a country so closely related to the United States by history and language is a disconnect in public policymaking that we cannot afford to repeat.

The Norwegian Experience

As in Britain, the petroleum industry is central to the Norwegian economy, and the country ranks as the world's fifth largest oil exporter and 11th largest oil producer. Some 60 fields in the Norwegian Continent Shelf produce about 2.5 million barrels annually. Unlike Britain, the Norwegians made a decision to invest heavily in Statoil, the largest holder of drilling licenses in the county, 67 percent of which is publicly owned. One of the largest oil fields in the North Sea, known as Ekofisk, is located about 200 miles southwest of the Norwegian city of Stavanger, that country's equivalent of Aberdeen. In 1977, about six years after production in this area began, the Bravo platform owned by Phillips Petroleum had a blowout, once again due to human error, spilling an estimated 80,000-120,000 barrels of oil into the North Sea. No lives were lost, but the spill remains the largest on record in the area.

British regulators leave virtually all of the details of designing an effective safety system to corporate platform operators through the preparation of facility-specific "safety cases."

British and Norwegian Responses

In the wake of the *Cullen Report*, the British Parliament transferred responsibility for regulation of offshore drilling to the Health and Safety Executive (HSE), the English equivalent of the U.S. Occupational Safety and Health Administration. The HSE was already in the throes of adopting "goal-oriented" regulation to replace "command and control" regulation. Proponents justified this transformation as superior to the old regime because making individual companies responsible for designing their own safety systems would instill a far more effective "culture of safety" than prescribing a series of rigid rules that devolved to simple, relatively mindless "box ticking." To develop redundant systems capable of preventing accidents on facilities that are akin to building a dormitory on top of a deepwater volcano would take bottom up, fully integrated cooperation by everyone on a rig.

Consequently, the HSE leaves virtually all of the details of designing an effective safety system to corporate platform operators through the preparation of facility-specific "safety cases." The HSE's experts review each safety case and periodically inspect platforms and rigs to ensure that these plans are implemented. But, at least in theory, each plan could be very different from plans for other facilities, even facilities owned by the same company, and still receive regulatory approval. The HSE deemphasizes enforcement for failures to implement safety cases, once again focusing on establishing a positive, cooperative relationship with the oil and gas industry in the North Sea.

Safety cases are prepared by consultants in accordance with a set of regulations that explain, in essence, what topics must be covered in each plan, but do not specify the content of the plan.[146] So, for example, rather than specifying the equipment that must be kept in the infirmary on a large rig, the regulations specify that the rig operator must ensure that people present on the rig receive effective emergency medical treatment—a dicey proposition in the case of a serious accident since rigs can be located as far as a two or three hour helicopter ride offshore. Other topics to be addressed include standards and procedures for controlling risks, competence and training, selection of key personnel, control of change (of shifts,

of design, of production goals), selection and control over contractors, and planning and control for emergencies.

Safety cases are expected to achieve the overall goal of "an individual risk of death of 10^{-3} [1 in 1,000] per year."[147] This level of risk is quite high and compares unfavorably to the levels Americans typically accept in the context of environmental exposures: 1 in 100,000 or 1 in 1,000,000. In determining whether to require a company to install a specific piece of equipment or implement a specific design, the regulations state that the measure must not be "grossly disproportionate" to the benefit gained.[148] They add that an offshore operator should be expected to shoulder an "implied cost" generally measured as six times the value of each life saved, with a life worth £1 million (about $1.56 million in August of 2010). Again, this allocation is quite low compared to similar American cost-benefit analyses.

One final feature of the British system of overriding importance is that all safety cases are held in the strictest confidence. No one except the consultants, top level management, and the assigned agency official is allowed to see the finished document in its entirety, ostensibly because such documents include sensitive trade secrets such as the precise dimensions of the oil reservoir upon which the platform or rig is located.[149] Safety representatives chosen by oil rig workers may review safety cases as they are being formulated and can obtain summaries of the documents and extracts, but are not given a full copy to retain.

Britain does not have any independent auditing institutions such as America's Government Accountability Office or Inspectors General that can conduct independent reviews of circumstances on the rigs. However, Britain has a judicially-based process known as a "fatal accident inquiry" that is convened every time a person dies in custody or a worker is killed in an accident on the job.[150] Trial judges (called "sheriffs") hear witnesses and make findings, including recommendations about how to prevent similar incidents in the future. Several high-profile inquiries have involved safety offshore, and serve as a separate incentive for improving accident prevention and response.

In Norway, the combination of the Bravo blowout and the Piper Alpha catastrophe provoked the establishment of the country's systematic safety regulations, and an informal rivalry has since arisen between Norwegian and British authorities over which country enjoys the best safety record and has the most stringent regulations. The Petroleum Safety Authority (PSA) is the Norwegian equivalent of Britain's HSE. It has issued a comprehensive set of regulations governing everything from the design and safety equipment that must be installed on a platform to emergency response planning and preparedness.[151] The regulations provide for enforcement, including the assessment of penalties for violations of their requirements. They are significantly more prescriptive than their British counterparts, although Norwegian regulators also describe their regulatory structure as a "goal-oriented" and "cooperative" with industry, perhaps an easier claim to make since the largest share of the market is held by a nationalized corporation.

Regulatory Failures and Proposed Reforms

Regulatory Failure: Ignoring Other Countries' Experiences with Offshore Drilling Disasters

Congress and the MMS have failed to pay attention to the experience of other offshore oil producing countries. They have not assessed other regulatory approaches or incorporated the lessons learned from accidents, blowouts, and spills that have occurred elsewhere. Numerous reports have now brought to light regulatory requirements imposed by other countries—including the United Kingdom, Norway, Canada, and Brazil—that might possibly have prevented the BP oil spill or significantly improved the U.S. response capability. This reactive approach to evaluating the experience abroad simply made it more likely that we would have to suffer our own disaster before we learned lessons from the experience of other countries.

Proposed Reform: Mandate Systematic Review of the Experience of Other Countries and Incorporate into Routine Congressional Oversight

Numerous criticisms can and have been made of the British and Norwegian regulatory approaches, and aspects of their approaches may not be compatible with the American regulatory framework.[152] But investigations of accidents that occur abroad and analyses of the weaknesses in other countries' regulatory systems can highlight similar weaknesses in the U.S. system, prompting needed reforms. In the wake of the BP spill, the idea of the safety case, a prominent feature of the British system, is now being debated in congressional hearings and proposed legislation. Whether or not this concept or any particular technique or requirement is ultimately adopted, an evaluation of other approaches that have proven effective elsewhere should not occur simply in reaction to a disaster.

Instead, Congress should ensure that BOEMRE undertakes an ongoing, systematic evaluation of the lessons learned elsewhere in the wake of serious accidents, and of alternative regulatory measures and techniques that have proven effective. With greater attention to the regulatory approaches of other countries, BOEMRE and legislative oversight committees could ensure not only that U.S. safety and environmental regulation is the best it can be, but also that royalty rates, bonding requirements, and other aspects of the oil leasing system are adequate. These additional sources of experience and information can also help to enhance U.S. regulators' knowledge about industry practices and technology, an area that has been identified as a pervasive weakness in the MMS during the years leading up to the BP oil spill.

Endnotes

1 The Act defines the "outer Continental Shelf," as "all submerged lands lying seaward and outside of the areas . . . [under state control] and of which the subsoil and seabed appertain to the United States and are subject to its jurisdiction and control . . . ." Outer Continental Shelf Lands Act (OCSLA), 43 U.S.C. §1331(a).

2 OCSLA, 43 U.S.C. §1332(3).

3 OCSLA, 43 U.S.C. §1332(6).

4 OCSLA, 43 U.S.C. §1344.

5 OCSLA, 43 U.S.C. §§1337, 1345.

6 OCSLA, 43 U.S.C. §1340.

7 OCSLA, 43 U.S.C. §1351.

8 California v. Watt, 668 F.2d 1290, 1295-1300 (D.C. Cir. 1981).

9 OCSLA, 43 U.S.C. §1344(a)(1).

10 OCSLA, 43 U.S.C. §1344 (a)(1)-(3).

11 OCSLA, 43 U.S.C. §1332(6).

12 *See, e.g.,* OCSLA, 43 U.S.C. §1347(b). This provision contains a weak mandate for safety and health regulations, which appears to apply specifically to worker safety rather than safety of the operation. It directs the Department of the Interior to require "the use of the best available and safest technologies which the Secretary determines to be economically feasible, wherever the failure of equipment would have a significant effect on safety health or the environment, except where the Secretary determines that the incremental benefits are clearly insufficient to justify the incremental costs of utilizing such technologies." Even if interpreted to apply broadly to safety of the operation, this provision is extremely cumbersome in that it imposes the dual burden that the Secretary demonstrate not only that the technology is economically feasible but also that the failure of the equipment would have a significant effect on safety, health, or the environment, in order to trigger the mandate for technology-based regulations. Added to this, the statute leaves the Secretary with discretion not to require the best available equipment if he determines that the costs outweigh the benefits.

13 OCSLA, 43 U.S.C. §1334(a)(2)(A)(i). Similarly, an exploration plan shall be disapproved if it "would result in" any of these same conditions. OCSLA, 43 U.S.C. §1340(c)(1). As is noted below, in the event an exploration plan is denied on these grounds and the lease subsequently cancelled, the lessee is entitled to compensation. OCSLA, 43 U.S.C. 1334(a)(2)(C).

14 OCSLA, 43 U.S.C. §1340(c)(1).

15 U.S. Coast Guard et al., Spill of National Significance (Gulf SONS) Joint After Action Report 22 (2002), *available at* http://www.uscg.mil/history/docs/2002SONSAARfinalReport.pdf.

16 33 U.S.C. §1321(j)(5)(A)(i).

17 30 C.F.R. §§254.6, 254.47.

18 30 C.F.R. §254.2(b); Outer Continental Shelf Safety Oversight Board, U.S. Dept. of the Interior, Report to Secretary of the Interior Ken Salazar 28 (2010) *available at* http://www.doi.gov/news/pressreleases/loader.cfm?csModule=security/getfile&PageID=43677 [hereinafter OCSSOB, Report to the Secretary].

19 OCSSOB, Report to the Secretary, *supra* note 18, at 22-24.

20 This outcome is explained in part by the interaction with NEPA discussed in Section III below.

21 30 C.F.R §256.26 (a)-(b).

22 *See, e.g.,* Minerals Mgmt. Serv., U.S. Dept of the Interior, Proposed Gulf of Mexico OCS Oil and Gas Lease Sale 206, Central Planning Area, Environmental Assessment (2007), *available at* http://www.gomr.boemre.gov/PDFs/2007/2007-059.pdf. This problem with what is called "tiering" of environmental review is discussed further below in Section III in connection with failures in the implementation the National Environmental Policy Act (NEPA).

23 OCSLA, 43 U.S.C. §1334(a)(2)(C)(i).

24 *See, e.g.,* 30 C.F.R. §§250.212 (o), 252.227, 250.242(g), and 250.261.

25 As is discussed further in Section II, the MMS has failed to hold the producers to even the minimal standards in the OCSLA and the MMS's own regulations, with the result that producers submitted assessments that failed to provide accurate, much less complete, and up-to-date information.

26 OCSLA, 43 U.S.C §§1340, 1334(a)(2)(c).

27 BP, Gulf of Mexico Regional Oil Spill Response Plan 11-7 (2009), *available at* http://www.boemre.gov/DeepwaterHorizon/BP_Regional_OSRP_Redactedv2.pdf.

28 16 U.S.C. §1604(h).

29 40 C.F.R. §1501.6.

30 OCSSOB, Report to the Secretary, *supra* note 18, at 8-9.

Endnotes

[31] 30 C.F.R. §256.53.

[32] OCSSOB, Report to the Secretary, *supra* note 18, at 8-10, 17-19.

[33] Where possible to distinguish, we refer to the MMS where the context necessarily relates to activities before the renaming, and to BOEMRE where the context refers to the new agency.

[34] Minerals Mgmt. Serv., U.S. Dept. of the Interior, Budget Justifications and Performance Information, Fiscal Year 2011 at 113 (2010), *available at* http://www.boemre.gov/adm/PFD/2011BudgetJustification.pdf [hereinafter MMS, FY 2011 Budget Justifications].

[35] *Id.* at 56 ("Deepwater has continued to be a very important part of the total GOM [Gulf of Mexico] production, providing approximately 74 percent of the oil and 43 percent of the gas from the region in 2008.").

[36] Minerals Mgmt. Serv., U.S. Dept. of the Interior, FY 2006 Budget Request 70 (2005), *available at* http://www.boemre.gov/adm/PFD/2006BudgetJustification.pdf [hereinafter MMS, FY 2006 Budget Request]. *See also* Statement of John Martinez, Consulting Production Engineer, Production Associates, *Hearing On Legislation To Respond To The BP Oil Spill And To Prevent Future Oil Well Blowouts, Before the Subcomm. on Energy and Environment of the H. Comm. on Energy and Commerce* 4 (June 30, 2010), *available at* http://energycommerce.house.gov/documents/20100630/Martinez.Testimony.06.30.2010.pdf.

[37] MMS, FY 2006 Budget Request, *supra* note 36, at 68.

[38] *See* Statement of Gale Norton, Former Secretary of the Interior, 2001-2006, *Hearing on the Role of the Interior Department in the Deepwater Horizon Disaster, Before the Subcomm. on Energy and Environment and the Subcomm. on Oversight and Investigation of the H. Comm. on Energy and Commerce* 3 (July 20, 2010), *available at* http://energycommerce.house.gov/documents/20100720/Norton.Testimony.07.20.2010.pdf (discussing the MMS's budget during the period of 2001-2006).

[39] *Id.* at 3; MMS, FY 2011 Budget Justifications, *supra* note 34, at 64 (Table 12) (highlighting the addition of six new inspectors for the Gulf of Mexico region, representing a 10 percent increase).

[40] Opening Statement of Rep. Bart Stupak, Chairman, Subcomm. on Oversight and Investigations of the H. Comm. on Energy and Commerce, *Hearing on the Role of the Interior Department in the Deepwater Horizon Disaster, Before the Subcomm. on Energy and Environment and the Subcomm. on Oversight and Investigation of the H. Comm. on Energy and Commerce* 1 (July 20, 2010), *available at* http://energycommerce.house.gov/documents/20100720/Stupak.Statement.07.20.2010.pdf.

[41] Statement of Mary L. Kendall, Acting Inspector General, U.S. Dept. of the Interior, *Hearing on The Deepwater Horizon Incident: Are the Minerals Management Service Regulations Doing The Job?, Before the Subcomm. on Energy and Mineral Resources of the H. Comm. on Natural Resources* 2 (June 17, 2010), *available at* http://resourcescommittee.house.gov/images/Documents/20100617/2010_06_17_energy/testimony_kendall.pdf [hereinafter Kendall Statement].

[42] MMS, FY 2011 Budget Justifications, *supra* note 34, at 64 (Table 12).

[43] Kendall Statement, *supra* note 41, at 2; Outer Continental Shelf Safety Oversight Board, U.S. Dept. of the Interior, Report to Secretary of the Interior Ken Salazar 28 (2010) *available at* http://www.doi.gov/news/pressreleases/loader.cfm?csModule=security/getfile&PageID=43677 [hereinafter OCSSOB, Report to the Secretary].

[44] U.S. Gov't Accountability Office, Oil and Gas Management: Key Elements to Consider for Providing Assurance of Effective Independent Oversight 3 (2010) (citing U.S. Gov't Accountability Office, Oil and Gas Management: Interior's Oil and Gas Production Verification Efforts Do Not Provide Reasonable Assurance of Accurate Measurement of Production Volumes (2010)) *available at* http://www.gao.gov/new.items/d10852t.pdf [hereinafter GAO, Independent Oversight].

[45] Kendall Statement, *supra* note 41, at 3; MMS, FY 2006 Budget Request, *supra* note 36, at 70.

[46] U.S. Dept. of the Interior, Increased Safety Measures for Energy Development on the Outer Continental Shelf (2010), *available at* http://www.doi.gov/deepwaterhorizon/loader.cfm?csModule=security/getfile&PageID=33598. The report is commonly referred to as "the 30-day report," because on April 30, 2010, shortly after the blowout occurred, President Obama directed the Department of the Interior to report back to him within 30 days with recommendations for increased safety measures for energy development on the OCS.

Endnotes

47 *See generally* MMS, FY 2011 Budget Justifications, *supra* note 34.

48 This was first enunciated in 1955 by Professor Marver H. Bernstein in his book *Regulating Business by Independent Commission*.

49 Statement of Sidney A. Shapiro, Associate Dean for Research and Development and University Distinguished Chair in Law, Wake Forest University School of Law, and Member Scholar and Vice President, Center for Progressive Reform, *Hearing on Protecting the Public Interest: Understanding the Threat of Agency Capture, Before the Subcomm. on Administrative Oversight and the Courts of the S. Comm. on the Judiciary* 4-7 (Aug. 3, 2010), *available at* http://judiciary.senate.gov/pdf/08-03-10%20Shapiro%20Testimony.pdf.

50 Office of the Inspector General, U.S. Dept of Interior, Investigative Report: Island Operating Company et al. (2010) *available at* http://www.doioig.gov/images/stories/reports/pdf//IslandOperatingCo.pdf [hereinafter OIG, Island Operating Company]; GAO, Independent Oversight, *supra* note 44, at 10; OCSSOB, Report to the Secretary, *supra* note 43.

51 OIG, Island Operating Company, *supra* note 50, at 2-6; GAO, Independent Oversight, *supra* note 44, at 10.

52 OIG, Island Operating Company, *supra* note 50, at 3; OCSSOB, Report to the Secretary, *supra* note 43, at 15.

53 Secretary of the Interior Ken Salazar has implemented a reorganization of the agency and instituted various new ethics policies designed to address some of these concerns. *Change of the Name of the Minerals Management Service to the Bureau of Ocean Energy Management, Regulation, and Enforcement*, Order of the Secretary No. 3302, U.S. Dept. of the Interior (June 18, 2010) *available at* http://www.doi.gov/deepwaterhorizon/loader.cfm?csModule=security/getfile&PageID=35872; Statement of Ken Salazar, Secretary of the Interior, *Hearing on the Role of the Interior Department in the Deepwater Horizon Disaster, Before the Subcomm. on Energy and Environment and the Subcomm. on Oversight and Investigation of the H. Comm. on Energy and Commerce* 1-8 (July 20, 2010), *available at* http://energycommerce.house.gov/documents/20100720/Salazar.Testimony.07.20.2010.pdf.

54 This pattern is apparent from a review of the MMS Budget Justifications for the years 1998 through 2011. *See, e.g.*, Minerals Mgmt. Serv., U.S. Dept. of the Interior, Budget Justifications and Performance Information, Fiscal Year 1998 (1997), *available at* http://www.boemre.gov/adm/PFD/1998BudgetJustification.pdf; MMS, FY 2006 Budget Request, *supra* note 36; MMS, FY 2011 Budget Justifications, *supra* note 34.

55 OCSSOB, Report to the Secretary, *supra* note 43, at 20.

56 Memorandum from Mary Kendall, Acting Inspector General, U.S. Dept. of the Interior, to Ken Salazar, Secretary of the Interior, Accompanying the Office of the Inspector General's Investigate Report on Island Operating Company, et al. (May, 24, 2010), *available at* http://www.doioig.gov/images/stories/reports/pdf//IslandOperatingCo.pdf.

57 GAO, Independent Oversight, *supra* note 44, at 4.

58 *See* Dan Eggen & Kimberly Kindy, *Three of Every Four Oil and Gas Lobbyists Worked for Federal Government*, Wash. Post, July 22, 2010, *available at* http://www.washingtonpost.com/wp-dyn/content/article/2010/07/21/AR2010072106468.html.

59 Office of the Press Secretary, Exec. Office of the President, *Remarks by the President on the Gulf Oil Spill* (May 27, 2010), *available at* http://www.whitehouse.gov/the-press-office/remarks-president-gulf-oil-spill.

60 MMS, FY 2006 Budget Request, *supra* note 36, at 70.

61 Tyler Priest, Opinion, *The Ties That Bind MMS and Big Oil,* Politico, June 9, 2010, http://www.politico.com/news/stories/0610/38270.html (last visited Sept. 1, 2010).

62 GAO, Independent Oversight, *supra* note 44, at 8.

63 OCSSOB, Report to the Secretary, *supra* note 44.

64 42 U.S.C. §4332 (2)(C)(i)-(v).

65 42 U.S.C. §§4342-4344.

66 40 C.F.R. §§1500.5(1), 1501.4(e), 1508.13.

67 This EIS was later supplemented in 2009.

68 National Environmental Policy Act Regulations, Implementation of Procedural Provisions, 43 Fed. Reg. 55,978 (1978) (codified at 40 C.F.R. 1502.22 (1978)).

69 National Environmental Policy Act Regulations; Incomplete or Unavailable Information, 51 Fed. Reg. 15,618, 15,620 (1986) (codified at 40 C.F.R. 1502).

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[70] Jeff Donn, H. Josef Hebert, & Mitch Weiss, *Emerging Oil Rig Evidence Shows Lack of Regulation*, AP, May 13, 2010, *available at* http://www.wwltv.com/news/Emerging-oil-rig-evidence-shows-lack-of-regulation-93668639.html.

[71] Steven Mufson & Michael D. Shear, *Pressure Grows for Action by BP*, Wash. Post, May 1, 2010, *available at* http://www.washingtonpost.com/wp-dyn/content/article/2010/04/30/AR2010043002715.html.

[72] Exec. Office of the President, Report Regarding the Minerals Management Service's National Environmental Policy Act Policies, Practices, and Procedures as They Relate to Outer Continental Shelf Oil and Gas Exploration and Development (2010) *available at* http://www.whitehouse.gov/sites/default/files/microsites/ceq/20100816-ceq-mms-ocs-nepa.pdf [hereinafter EOP, Report on the MMS].

[73] *Id.* at 4, 26

[74] 40 C.F.R. §§1500.4(p), 1500.5(k).

[75] 40 C.F.R. §§1502.20, 1508.28.

[76] U.S. Dept. of the Interior, Department Manual, 516 DM 15.4(C)(10), *available at* http://www.blm.gov/wo/st/en/prog/planning/news/webguide/departmental_manual/516_dm_chapter_15.html.

[77] National Environmental Policy Act; Revised Implementing Procedures, 46 Fed. Reg. 7485 (1981).

[78] BP Exploration & Production, Initial Exploration Plan, Mississippi Canyon Block 252 (2009), *available at* http://www.gomr.mms.gov/PI/PDFImages/PLANS/29/29977.pdf.

[79] 43 C.F.R. §45.215.

[80] Memorandum from Nancy H. Sutley, Chair, Council on Envtl. Quality, to the Heads of Federal Departments and Agencies, on Establishing and Applying Categorical Exclusions Under the National Environmental Policy Act (Feb. 18, 2010), *available at* http://ceq.hss.doe.gov/nepa/regs/Categorical_Exclusion_Draft_NEPA_Guidance_FINAL_02182010.pdf.

[81] *Id.* at 2.

[82] Review of MMS NEPA Policies, Practices, and Procedures for OCS Oil and Gas Exploration and Development, 75 Fed. Reg. 29,996 (May 28, 2010).

[83] EOP, Report on the MMS, *supra* note 72, at 29.

[84] *Id.* at 31-32.

[85] *Id.* at 23.

[86] 40 C.F.R. §1508.27(b)(7).

[87] 40 C.F.R. §1508.27.

[88] Daniel Farber, *The Odds of Failure*, CPRBlog, May 3, 2010, http://progressivereform.org/CPRBlog.cfm?idBlog=5EB0FB1D-A96C-00D6-F49E2658B4604D4D (last visited Sept. 9, 2010).

[89] These include five species of sea turtles, sperm whales, Gulf sturgeon, piping plovers, whooping cranes, and two species of beach mice. Other species likely affected by the spill in some fashion include manatees, two additional beach mouse species, wood storks, and Alabama red-bellied turtles.

[90] Nat'l Marine Fisheries Serv., Nat'l Oceanic & Atmospheric Admin., U.S. Dept. of Commerce, Endangered Species Act - Section 7 Consultation Biological Opinion, Gulf of Mexico Oil and Gas Activities: Five-Year Leasing Plan for Western and Central Planning Areas 2007-2012 (2007), *available at* http://sero.nmfs.noaa.gov/sf/deepwater_horizon/02611%20MMS%20Leases%202007-2012.pdf [hereinafter NMFS, Biological Opinion].

[91] Letter of Concurrence from the U.S. Fish and Wildlife Serv. to the Minerals Mgmt. Serv. (Sept. 14, 2007). *See also* Leslie Kaufman, *Agency Agreed Wildlife Risk from Oil Was "Low,"* N.Y. Times, July 5, 2010, *available at* http://www.nytimes.com/2010/07/06/us/06wildlife.html.

[92] Minerals Mgmt. Serv., U.S. Dept. of the Interior, Biological assessment, U.S. Fish and Wildlife Service consultation, Gulf of Mexico OCS oil and gas lease sales: 2007-2012 (2007).

[93] 50 C.F.R. §402.02 (definition of "effects of the action") (emphasis added).

[94] Letter of Concurrence from the U.S. Fish and Wildlife Serv. to the Minerals Mgmt. Serv. (Sept. 14, 2007). *See also* Leslie Kaufman, *Agency Agreed Wildlife Risk from Oil Was "Low,"* N.Y. Times, July 5, 2010, *available at* http://www.nytimes.com/2010/07/06/us/06wildlife.html. The FWS's concurrence with MMS's finding was significant in part because it meant that the two agencies conducted only "informal" consultation under section 7, a much more cursory process that does not require FWS to produce a biological opinion detailing the proposed action's likely impacts on listed species and designated critical habitat.

[95] 50 C.F.R. §402.14(f)

[96] 50 C.F.R. §402.02 (definition of "effects of the action").

[97] 42 U.S.C. §4332(2)(C)(v).

[98] 42 U.S.C. §7409(b)(1).

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[99] TVA v. Hill, 437 U.S. 153, 184 (1978).

[100] Cass Sunstein, Risk and Reason (2002).

[101] John D. Graham, Administrator, Office of Info. and Regulatory Affairs, Remarks Prepared for a Conference on "The US, Europe, Precaution and Risk Management: A Comparative Case Study Analysis of the Management of Risk in a Complex World," *The Role of Precaution in Risk Assessment and Management: An American's View* (Jan. 11, 2002), *available at* http://www.whitehouse.gov/omb/inforeg/eu_speech.html.

[102] Editorial, *The Paralyzing Principle*, Wall St. J., June 21, 2010, *available at* http://online.wsj.com/article/SB10001424052748703389004575304931124455048.html.

[103] Minerals Mgmt. Serv., U.S. Dept. of the Interior, Gulf of Mexico OCS Oil and Gas Lease Sales: 2007-2012; Western Planning Area Sales 204, 207, 210, 215, and 218; Central Planning Area Sales 205, 206, 208, 213, 216, and 222; Final Environmental Impact Statement 4-75 (2007), *available at* http://www.gomr.boemre.gov/PDFs/2007/2007-018-Vol1.pdf [hereinafter MMS, Multisale EIS]; Kristina Alexander, The 2010 Oil Spill: The Minerals Management Service (MMS) and the National Environmental Policy Act (NEPA) 7, CRS Report R41265 (June 4, 2010), *available at* http://fpc.state.gov/documents/organization/145106.pdf [hereinafter Alexander, CRS Report].

[104] David Barstow et al., *Regulators Failed to Address Risks in Oil-Rig Fail-Safe Device*, N.Y. Times, June 20, 2010, *available at* http://www.nytimes.com/2010/06/21/us/21blowout.html.

[105] Cutler J. Cleveland, et al., *Deepwater Horizon Oil Spill: Ecological Concerns*, Encyclopedia of the Earth, http://www.eoearth.org/article/Deepwater_Horizon_oil_spill#Ecological_concerns (last visited Sept. 1, 2010).

[106] *See Id.*; *see also* Curry L. Hagerty & Jonathan L. Ramseur, Deepwater Horizon Oil Spill: Selected Issues for Congress 3-4, CRS Report R41262 (May 27, 2010) ("Coastal wetlands [in the Gulf] are nursery areas for many species.").

[107] *See* Justin Gillis & Leslie Kaufman, *After Oil Spills, Hidden Damage Can Last For Years*, N.Y. Times, July 17, 2010, *available at* http://www.nytimes.com/2010/07/18/science/earth/18enviro.html.

[108] *See Id.*; *see also* Melissa Gaskill, *What will Get Sick from the Slick?,* 466 Nature 14 (June 30, 2010) ("Studies of the 1989 *Exxon Valdez* spill in Alaska show that oil ingested by marine life accumulates in tissues, lowers reproductive rates and increases disease and mortality rates"; a population of killer whales near the Exxon-Valdez spill declined by 40 percent as a result of the spill and has not recovered), *available at* http://www.nature.com/news/2010/100630/full/466014a.html.

[109] *See* Gillis & Kaufman, *supra* note 107.

[110] BP Exploration & Production, Initial Exploration Plan, Mississippi Canyon Block 252 (2009), *available at* http://www.gomr.mms.gov/PI/PDFImages/PLANS/29/29977.pdf.

[111] MMS, Multisale EIS, *supra* note 103, at 4-228 (quoted in Alexander, CRS Report, *supra* note 103, at 7).

[112] Alexander, CRS Report, *supra* note 103, at 7.

[113] MMS, Multisale EIS, *supra* note 103, at 4-239; Alexander, CRS Report, *supra* note 103, at 8.

[114] Minerals Mgmt. Serv., U.S. Dept of the Interior, Proposed Gulf of Mexico OCS Oil and Gas Lease Sale 206, Central Planning Area, Environmental Assessment (2007), *available at* http://www.gomr.boemre.gov/PDFs/2007/2007-059.pdf.

[115] Leslie Kaufman, *Agency Agreed Wildlife Risk from Oil Was "Low,"* N.Y. Times, July 5, 2010, *available at* http://www.nytimes.com/2010/07/06/us/06wildlife.html.

[116] *Id.*

[117] TVA v. Hill, 437 U.S. 153, 194 (1978).

[118] Letter from Henry Waxman, Chairman, H. Comm. on Energy and Commerce, et al., to Tony Hayward, Chief Exec. Officer, BP 13 (June 14, 2010), *available at* http://energycommerce.house.gov/documents/20100614/Hayward.BP.2010.6.14.pdf [hereinafter House Committee Letter to Hayward].

[119] *See* David Barstow, et al., *supra* note 104.

[120] Tim Dickinson, *The Spill, the Scandal, and the President*, Rolling Stone, June 24, 2010, *available at* http://www.rollingstone.com/politics/news/17390/111965.

[121] House Committee Letter to Hayward, *supra* note 118, at 4-6, 11-12; Ben Casselman & Russell Gold, *BP Decisions Set Stage for Disaster*, Wall St. J., May 27, 2010, *available at* http://online.wsj.com/article/NA_WSJ_PUB:SB10001424052748704026204575266560930780190.html.

[122] House Committee Letter to Hayward, *supra* note 118, at 8-9.

Endnotes

123 *Id.* at 11.

124 While the leasing of federal energy resources are also subject to environmental reviews or may be prevented by other uses, a series of natural resources acts, like the Minerals Management Act, 30 U.S.C. §§601–604, the Hardrock Mining Act, 30 U.S.C. §§21–54, and the National Forest Management Act of 1976, 16 U.S.C. §§1600–1614, envision the use of federal lands, at least partially for energy and other resource production.

125 *See* Clean Air Act §§108-112, 42 U.S.C. §§7408–7412 (controlling stationary source emissions in these categories); *see also* Craig Johnston, Bill Funk, & Victor B. Flatt, Legal Protection of the Environment 287–90 (2d ed. 2007) (introducing the Clean Air Act's jurisdiction and regulatory provisions).

126 *See* Clean Water Act §§302-305, 33 U.S.C. §§1312–1315 (describing water quality standards); Clean Water Act §303(g), 33 U.S.C. §1313(g) (describing heat standards); Clean Water Act §502(6), 33 U.S.C. §1362(6) ("The term 'pollutant' means . . . heat.").

127 *See* Solid Waste Disposal Act (SWDA) §8002(n), 42 U.S.C. §6982(n) (concerning administrative findings about the adverse health effects of fossil fuel combustion); *see also* SWDA §3004(x), 42 U.S.C. §6924(x) (concerning mining and other special wastes); 42 U.S.C. §6966(a)(3)(B) (defining "recovered mineral component" as including coal combustion fly ash).

128 Endangered Species Act (ESA) §9, 16 U.S.C. §1538.

129 *See, e.g.,* Materials Act of 1947, 30 U.S.C. §§601–604 (containing rules governing the disposal of materials on public lands); Mineral Leasing Act, 30 U.S.C. §§181–196 (containing rules governing the leasing and permitting of public lands).

130 Jeremy Hance, *The Gulf Oil Spill in Context: US Oil Consumption*, Mongaybay.com, May 31, 2010, *available at* http://news.mongabay.com/2010/0531-hance_consumption.html.

131 David Kocieniewski, *As Oil Industry Fights a Tax, It Reaps Subsidies*, N.Y. Times, July 3, 2010, *available at* http://www.nytimes.com/2010/07/04/business/04bptax.html?_r=1.

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134 Kocieniewski, *supra* note 131.

135 Global Subsidies Initiative, *BP Oil Spill Dirties Reputation of U.S. Support for Fossil-Fuel Industry*, http://www.globalsubsidies.org/en/subsidy-watch/analysis/bp-oil-spill-dirties-reputation-us-support-fossil-fuel-industry (last visited Sept. 2, 2010).

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137 *Id.*

138 Global Subsidies Initiative, *supra* note 135.

139 Geiger & Hamburger, *supra* note 136.

140 Kocieniewski, *supra* note 131.

141 John P. Holdren, *The Energy Innovation Imperative: Addressing Oil Dependence, Climate Change, and Other 21st Century Energy Challenges*, 1 Innovations: Technology, Governance, Globalization 3 (Spring 2006); William B. Bonvillian & Charles Weiss, *Taking Covered Wagons East: A New Innovation Theory for Energy and Other Established Technology Sectors*, 4 Innovations: Technology, Governance, Globalization 289 (Fall 2009).

142 *See* Ben Casselman & Russell Gold, *BP Decisions Set Stage for Disaster*, Wall St. J., May 27, 2010 ("BP approved spending $96.2 million and about 78 days on the well. The target time was much less—about 51 days. By April 20, the well was in its 80th day, owing to [unforeseen delays]. . . . Each additional day cost BP $1 million in rig lease and contractor fees. . . . BP decided to install fewer of the [centering devices] than Halliburton recommended—six instead of 21."), *available at* http://online.wsj.com/article/NA_WSJ_PUB:SB10001424052748704026204575266560930780190.html.

143 *Id.* ("BP made choices over the course of the project that rendered this well more vulnerable to the blowout. . . . There was little keeping the gas from rushing up to the surface after workers, pushing to finish the job, removed a critical safeguard, the heavy drilling fluid known as 'mud.'").

Endnotes

144 *Id.* ("[A] BP manager overseeing final well tests apparently had scant experience in deep-water drilling. He told investigators he was on the rig to 'learn about deep water' . . . .").

145 Douglas A. Blackmon et al., *There Was "Nobody in Charge*," Wall St. J., May 27, 2010 ("In the minutes after a cascade of gas explosions crippled the Deepwater Horizon on April 20, confusion reigned on the drilling platform. Flames were spreading rapidly, power was out, and terrified workers were leaping into the dark, oil-coated sea. Capt. Curt Kuchta, the vessel's commander, huddled on the bridge with about 10 other managers and crew members. Andrea Fleytas, a 23-year-old worker who helped operate the rig's sophisticated navigation machinery, suddenly noticed a glaring oversight: No one had issued a distress signal to the outside world, she recalls in an interview. Ms. Fleytas grabbed the radio and began calling over a signal monitored by the Coast Guard and other vessels. 'Mayday, Mayday. This is Deepwater Horizon. We have an uncontrollable fire.' When Capt. Kuchta realized what she had done, he reprimanded her, she says."), *available at* http://air.wsj.com/article/SB10001424052748704113504575264721101985024.html?mod=todays-europe-front-section.

146 *See generally* Health and Safety Executive, Assessment Principles for Offshore Safety Cases (APOSC) (2006), *available at* http://www.hse.gov.uk/offshore/aposc190306.pdf [hereinafter APOSC Regulations].

147 APOSC Regulations, Principle 5 (Item 39), *supra* note 146.

148 APOSC Regulations, Principle 12 (Item 56), *supra* note 146.

149 Of course, the safety case is translated into hundreds of rules, expressed through operational manuals, training sessions, and on-the-job supervision both in writing and verbally, as well as the installation of equipment on and near the rig.

150 For more information, see Health and Safety Executive, *Fatal Accident Inquiries (FAIs),* http://www.hse.gov.uk/enforce/enforcementguidesc/fatal.htm (last visited Sept. 2, 2010).

151 *See* Petroleum Safety Authority Norway, *Regulations*, http://www.ptil.no/regulations/category87.html (last visited Sept. 2, 2010).

152 A comparison of the recent rates of fires, fatalities, and major injuries compiled by the International Regulators' Forum on Global Offshore Safety show that relative to its size, the United States is ahead of British and Norwegian operations, at least with respect to injury rates. *See* International Regulators' Forum, Global Offshore Safety, *IRF Country Performance Measures*, http://www.irfoffshoresafety.com/country/performance/ (follow "Link to the 2008 Data" and "Link to the 2007 Data" hyperlinks to access Excel spreadsheets containing data on injury rates) (last visited Sept. 2, 2010). But the fact remains that the BP spill is the largest accidental release of oil into marine waters and that it occurred in an area of exceptional ecological and economic value. Campbell Robertson & Clifford Krauss, *Gulf Spill is the Largest of Its Kind, Scientists Say*, N.Y. Times, Aug. 2, 2010, *available at* http://www.nytimes.com/2010/08/03/us/03spill.html. The ecological and economic harm from the spill has only begun to be assessed. *See, e.g.,* Amanda Mascarelli, *Deepwater Horizon: After the Oil*, Nature, Sept. 2, 2010, at 22-44, *available at* http://www.nature.com/news/2010/100901/full/467022a.html.

About the Authors

William Andreen is the Edgar L. Clarkson Professor of Law at the University of Alabama School of Law. Professor Andreen has taught courses in Administrative Law, Environmental Law, Torts, International Environmental Law, and Public International Law. He has published numerous chapters and articles on water pollution control, environmental law in the developing world, water law, environmental impact assessment, hazardous waste liability, and environmental enforcement.

Rebecca M. Bratspies is Professor of Law at the CUNY School of Law, New York, New York. Professor Bratspies has taught Environmental Law, Natural Resources Law, International Environmental Law, Property, Administrative Law, and Lawyering. Professor Bratspies has recently published two books: *Progress in International Institutions*, and *Transboundary Harm in International Law: Lessons from the Trail Smelter Arbitration*.

Holly Doremus is Professor of Law at the University of California, Berkeley, and co-faculty director of the California Center for Environmental Law and Policy. Professor Doremus has taught a variety of classes in the areas of environmental law, natural resources law, land use, and property. While in academia, Professor Doremus has been a consultant to the CalFed Bay Delta Program, a novel intergovernmental effort to protect the ecological resources of the San Francisco Bay-Delta system while minimizing disruptions to the local farming communities and municipal water users. She has been a member of two National Academy of Sciences/National Research Council advisory committees, one on the use of adaptive management by the Army Corps of Engineers and the other on the protection of endangered species in the Platte River basin.

Victor Flatt is the Taft Distinguished Professor of Environmental Law at the University of North Carolina, Chapel Hill School of Law, and the Distinguished Scholar of Carbon Trading and Carbon Markets, Global Energy Management Institute, University of Houston, Bauer College of Business. Professor Flatt's teaching and research emphasis are focused in the areas of environmental and administrative law. He has taught Environmental Law, the Law of Hazardous Waste, International Environmental Law, Administrative Law, Property, Constitutional Law, and Torts.

Alyson C. Flournoy is Professor of Law and Alumni Research Scholar at the University of Florida Levin College of Law where she directs the Environmental and Land Use Law Program. Professor Flournoy's scholarship focuses on environmental ethics, decision-making processes under environmental and natural resource laws, and on the intersection of science and law.

Robert Glicksman is a J. B. and Maurice C. Shapiro Professor of Environmental Law at the George Washington University Law School. He is a member of the Board of Directors of the Center for Progressive Reform. Professor Glicksman has expertise in both pollution control and public natural resources law. His recent research has focused largely on climate change issues, public natural resources issues, and the intersection of the two.

Joel Mintz is a tenured full professor at Nova Southeastern University Law Center in Fort Lauderdale, Florida. For more than 20 years, Professor Mintz has taught a variety of substantive and clinical environmental law courses, including offerings on the federal law of pollution control, comparative environmental law, environmental aspects of land use planning, and other subjects.

Daniel Rohlf is a Professor of Law and Director, Pacific Environmental Advocacy Center at the Lewis and Clark Law School. Professor Rohlf's areas of expertise are biodiversity conservation and management; public lands management; and the intersection of law and science in environmental law. Professor Rohlf has over 20 years of experience as a litigator, (with the past 11 years as Director of Pacific Environmental Advocacy Center at Lewis and Clark's domestic environmental law clinic), primarily in cases involving the federal Endangered Species Act.

Amy Sinden is a member of the Board of Directors of the Center for Progressive Reform, and an Associate Professor of Law at the Temple University Beasley School of Law in Philadelphia. Before joining the Temple Law faculty in 2001, Professor Sinden served as senior counsel for Citizens for Pennsylvania's Future and a staff attorney with Earthjustice. She has written extensively in the area of environmental law and regulatory analysis. Her recent academic writings have criticized the misuse of economic theory in environmental law and have analyzed the application of classical human rights norms to environmental conflicts.

Rena Steinzor is the President and a Director of the Center for Progressive Reform and a Professor of Law at the University of Maryland School of Law, with a secondary appointment at the University of Maryland Medical School Department of Epidemiology and Preventive Medicine. She joined the faculty of the University of Maryland School of Law in 1994 from the Washington, D.C., law firm of Spiegel and McDiarmid. From 1983 to 1987, she was staff counsel to the U.S. House of Representatives' Energy and Commerce Committee's subcommittee with primary jurisdiction over the nation's laws regulating hazardous substances. Professor Steinzor has published widely in the areas of environmental federalism, the implications of industry self-regulation on the protection of the environment and public health, and so-called "market based" alternatives to traditional regulation.

Joseph Tomain is Dean Emeritus and the Wilbert & Helen Ziegler Professor of Law at the University of Cincinnati College of Law. Dean Tomain's research and teaching interests have focused on Energy Law, Land Use, Government Regulation, and Contracts. Dean Tomain received his J.D. from George Washington University National Law Center and his A.B. from the University of Notre Dame.

Sandra Zellmer is the Alumni Professor of Natural Resources Law at the University of Nebraska College of Law, where she began teaching in 2003. She is also a co-director of the University's Water Resources Research Initiative, an interdisciplinary educational and research effort. Professor Zellmer teaches torts, environmental law, natural resources, water law, and related courses. She has published numerous articles and commentary on natural resources law, water conservation and use, environmental law and related topics, as well as a casebook, *Natural Resources Law* (West 2006), with Professors Laitos, Cole, and Wood.

James Goodwin works with CPR's "Clean Science" and "Government Accountability" issue groups. Mr. Goodwin joined CPR in May of 2008. Prior to joining CPR, Mr. Goodwin worked as a legal intern for the Environmental Law Institute and EcoLogix Group, Inc. He is a published author with articles on human rights and environmental law and policy appearing in the *Michigan Journal of Public Affairs* and the *New England Law Review*.

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