

Deep Water Offshore Oil Exploration Regulation: The Need For a Global Environmental Regulation Regime

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Abstract

Government regulation of deepwater offshore explorations has found it either difficult to evaluate the environmental impact, or too costly to perform the required review.¹ Corporate self-regulation without effective government oversight will not adequately reduce the risk of accidents within the offshore oil exploration industry, nor will it ensure that corporations prepare effectively to respond to a major spill. The potential, near-term, financial benefit for the oil company prevails over the low-probability risk that a major spill will occur.

Recognizing that current domestic regulation lacks effective, continuous monitoring of complex offshore operations, another form of regulation appears necessary. If already-emerging principles were to be recognized within industry and governmental agencies on the international level, this would help achieve safer operations in areas where domestic environmental regulation is weak or non-existent.

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1. See NAT'L COMM'N ON THE BP DEEPWATER HORIZON OIL SPILL AND OFFSHORE DRILLING, REPORT TO THE PRESIDENT (Jan. 2011) [hereinafter REPORT TO THE PRESIDENT], available at <http://www.oilspillcommission.gov/final-report> (discussing the various policy complications and technological limitations contributing to the failure of effective deepwater monitoring).

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I. Introduction

As of the 1890s, oil companies began drilling offshore from wooden piers connected to shore.² In the 1940s drilling detached from shore, operating within a few miles at relatively shallow depths.³ Shell was the first company to develop new technology that allowed offshore oil and gas exploration in deep water during the 1960s (at 300–600 feet).⁴ This opened the door to increased operations and the development of new technologies, which, in turn, allowed for deeper offshore oil explorations.⁵

Current offshore oil and gas exploration projects are occurring in ever-growing depths of in and over 5,000 feet.⁶ British Petroleum’s *Deepwater Horizon* rig was drilling the Macondo well in the Gulf of Mexico at 4,992 feet.⁷ Noble Energy’s *Tamar* rig is drilling in the Mediterranean Sea at 5,500 feet.⁸ Petrobras’ *Ocean Clipper* rig is drilling offshore Brazil at 8,500 feet.⁹ Dragon Oil’s *Astra* rig is drilling in the

2. See *id.* at 21 (“Beginning in the 1890s, oil companies had drilled wells in the ocean, but from wooden piers connected to shore.”).

3. See *id.* at 24 (discussing Kerr-McGee Oil’s first productive “out-of-sight-of-land” well platform, built in 1948).

4. See *id.* at 25 (detailing Shell’s advent of the “floating drilling platform.”).

5. See *id.* (discussing the far-reaching implications of Shell’s deepwater drilling innovations).

6. See *id.* at 37 (“Drilling contractors developed a new generation of vessels that took drilling from 5,000 to 10,000 feet of water, and from 20,000 to 30,000 feet of sub-seafloor depth.”).

7. See NAT’L COMM’N ON THE BP DEEPWATER HORIZON OIL SPILL AND OFFSHORE DRILLING, MACONDO: THE GULF OIL DISASTER, CHIEF COUNSEL’S REPORT 25 (Jan. 2011) [hereinafter CHIEF COUNSEL’S REPORT], available at <http://www.oilspillcommission.gov/chief-counsels-report> (discussing BP’s well depths).

8. See Operations, Eastern Mediterranean, Noble Energy, Inc., (Nov. 2009), available at http://www.nobleenergyinc.com/_filelib/FileCabinet/PDFs/MISC/FINAL_Israel_article_O&G_Investor_Magazine.pdf?FileName=FINAL_Israel_article_O%26G_Investor_Magazine.pdf (discussing the Tamar rig’s depth levels).

9. See RIGZONE, Rig Data: Ocean Clipper, http://www.rigzone.com/data/rig_detail.asp?rig_id=566 (last visited Mar. 14, 2013) (listing data pertaining to the Ocean Clipper) (on file with the Washington and Lee Journal of Energy, Climate, and the Environment).

Caspian Sea at about 14,770 feet.¹⁰ Expanding the operation into the depths of the sea, however, brings with it bigger, sometimes unknown, risks.

Deepwater, offshore oil and gas exploration occurs at a significant distance from land and at distances, depths and pressures that require sophisticated inspection systems in order to scan and monitor the operation of mechanics.¹¹ This operation has the potential to be highly lucrative, but also extremely fraught. Once a major oil spill has occurred at the depth, it is almost uncontainable.¹² It is difficult to identify that a spill has occurred, to locate its origin, and finally to bring the spill to a halt—indeed, deepwater repairs have been described as “open-heart surgery at 5,000 feet, in the dark.”¹³ Following the 2010 British Petroleum (BP) blowout, five million barrels of crude oil continued to spill into the ocean water for almost three months.¹⁴ The damage caused to the ecologic system will take years to assess and overcome.¹⁵

In May 2010, President Barack Obama announced the creation of the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling.¹⁶ The Recommendation of the Commission recognized that the oil industry has regional effects beyond state boundaries.¹⁷ There is

10. See Dragon Oil Operating and Financial Review 2 (2010), <http://dragonoil.annualreport2010.com/performance/operating-and-financial-review> (detailing Astra’s depth level at 4,502 meters, or 14,770 feet) (on file with the Washington and Lee Journal of Energy, Climate, and the Environment).

11. See CHIEF COUNSEL’S REPORT, *supra* note 7, at 7 (discussing the challenges and opportunities of deepwater drilling).

12. See Mike Soraghan, *Industry Claims of Proven Technology Went Unchallenged at MMS*, N.Y. TIMES (June 2 2012), available at <http://www.nytimes.com/gwire/2010/06/02/02greenwire-industry-claims-of-proven-technology-went-unch-55514.html?pagewanted=all> (discussing the difficulties of responding to events in a deepwater setting).

13. See *id.*

14. See Thomas B. Ryerson, et al., *Chemical Data Quantify Deepwater Horizon Hydrocarbon Flow Rate and Environmental Distribution*, PNAS (Jan. 2012), <http://www.pnas.org/content/early/2012/01/04/1110564109.full.pdf+html> (discussing the after-effects of the Macondo well blowout) (on file with the Washington and Lee Journal of Energy, Climate, and the Environment).

15. See *Oil Rig’s Owner Settles With Justice Dept. in Spill Case*, N.Y. TIMES, (Jan. 3, 2013), http://topics.nytimes.com/top/reference/timestopics/subjects/o/oil_spills/gulf_of_mexico_2010/index.html (discussing *ex post facto* settlement claims) (on file with the Washington and Lee Journal of Energy, Climate, and the Environment).

16. See Press Release, The White House, Office of the Press Secretary, Weekly Address: President Obama Establishes Bipartisan National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling (May 22, 2010), [hereinafter Press Release] available at <http://www.whitehouse.gov/the-press-office/weekly-address-president-obama-establishes-bipartisan-national-commission-bp-deepwa> (announcing the creation of the Commission).

17. See NAT’L COMM’N ON THE BP DEEPWATER HORIZON OIL SPILL AND OFFSHORE DRILLING, RECOMMENDATIONS 36 (Jan. 2011) [hereinafter Recommendations of the National

little known on the environmental effect of a major oil spill on deepwater ecologic systems and on aquatic species.¹⁸ Further, deepwater oil and gas exploration occurs at a distance from the coastal state, which has an effect on a shared global water resource and, as such, becomes a joint interest for the international community.¹⁹ Finally, since the damage from a major oil spill is likely to be significant and costly, governments may find themselves operating cleanup programs after oil spills, as eventually happened in the BP Oil Spill in the Gulf of Mexico. For all of these reasons, there is an incentive for governments to closely regulate offshore oil and gas explorations in order to decrease, to the extent possible, the risk of a major spill.²⁰

This Paper suggests that offshore oil exploration projects should be administered based on a global environmental regulatory regime. It will examine recent reports regarding environmental regulation of offshore drilling published in the United States²¹ and the United Kingdom,²² as well as ‘good oilfield practices,’ developed throughout years of offshore exploration by oil companies, in order to establish a list of preliminary basic principles in establishing a global environmental regulatory regime on deep water offshore oil and gas exploration. Part II will delineate the main existing obligations under the law of the sea in the area where deepwater explorations are being performed. Part III will examine regulation options by the governments, self-regulation by oil companies, and global regulation, drawing from this the justifications to regulating offshore oil and gas exploration on the international level. Part IV will uncover the

Commission], *available* at http://www.oilspillcommission.gov/sites/default/files/documents/OSC_Deep_Water_Summary_Recommendations_FINAL.pdf (discussing the vast regional effects of the Macondo spill).

18. *See id.* at 52–53 (“When the Macondo blowout dumped enormous volumes of oil into the Gulf waters, scientists and policymakers realized how little was known about biological systems, environmental conditions, and even key aquatic and coastal species.”).

19. *See id.* at 4–6 (emphasizing the importance of working with the international community to develop shared standards regarding drilling, production, and emergency response).

20. *See id.* at vii (“Deepwater energy exploration and production, particularly at the frontiers of experience, involve risks for which neither industry nor government has been adequately prepared, but for which they can and must be prepared in the future.”).

21. *See, e.g.,* REPORT TO THE PRESIDENT, *supra*, note 1 (detailing the full sequence of events leading to the blowout of the Macondo well, and the spectrum of measures that might be implemented to prevent future such incidents).

22. *See* 1 HOUSE OF COMMONS, ENERGY AND CLIMATE CHANGE COMMITTEE, UK DEEPWATER DRILLING—IMPLICATIONS OF THE GULF OF MEXICO OIL SPILL, 10–13 (Jan. 6, 2011) [hereinafter UK Report], *available* at <http://www.publications.parliament.uk/pa/cm201011/cmselect/cmenergy/450/450i.pdf> (discussing offshore regulations of the United States and United Kingdom in the context of the Macondo incident).

‘good oilfield practices,’ and lessons learned from the 2010 BP blowout, in search for industry and regulators’ policies and practices that should be incorporated into a global environmental regulatory regime. Part V will introduce the main principles the global environmental regulatory regime should include, as well as a suggested incentive mechanism to complement it. Part VI will conclude the discussion.

II. Obligations under the Law of the Sea

The status of the adjacent water and, subsequently, the seabed underneath it has been the subject of international debate for a while. The General Assembly resolution 2692 (XXV) on Permanent Sovereignty over Natural Resources of Developing Countries included reference to the right of states to permanent sovereignty over natural resources in the superjacent water.²³ This was reaffirmed in a later resolution, recognizing the right of states to permanent sovereignty over natural resources in the seabed and the subsoil in the superjacent waters.²⁴ However, behind the scenes at the United Nations, the inclusion of the superjacent waters and its definition were the subject of long discussions in the General Assembly.²⁵ Some of the countries there expressed their concern that the law of the sea is still evolving and being discussed as part of the process of drafting several conventions on the law of the sea.²⁶

The United Nations Convention on the Law of the Sea (UNCLOS) divided the sea into zones, each subject to a different legal status and applicable law.²⁷ A state’s territorial sea extends out to twelve nautical miles from the coast²⁸ where the sovereignty of the coastal state continues to apply. The contiguous zone stretches to twenty-four nautical miles. Within this area, the coastal State may exercise its control, as necessary, to

23. See G.A. Res. 2692 (XXV), 25th Sess. (Dec. 11, 1970) (“Recognizing also the necessity for all countries to exercise fully their rights so as to secure the optimal utilization of their natural resources, both land and marine, for the benefit and welfare of their peoples and for the protection of their environment . . .”).

24. See G.A. Res. 3016 (XXVII), 27th Sess., Doc. A/RES/3016 (Dec. 18, 1972), and G.A. Res. 3171 (XXVIII), 28th Sess. (Dec. 17, 1973) (reaffirming states’ sovereign rights to natural resources found in the sea-bed and the subsoil within their national jurisdictions and the superjacent waters).

25. See U.N. GAOR, 25th Sess., 1926th plen. mtg. at 1–2, U.N. Doc. A/PV/1926 (Dec. 11, 1970); U.N. GAOR, 28th Sess., 2203d plen. mtg., U.N. Doc. A/PV/2203 (Dec. 17, 1973).

26. See *id.*

27. See generally United Nations Convention on the Law of the Sea, Dec. 10, 1982, 1833 U.N.T.S. 397 [hereinafter UNCLOS] (establishing demarcated territorial zones for state signers to the Convention).

28. See *id.* art. 3 (establishing the breadth of territorial waters).

prevent infringement of its customs, fiscal, immigration or sanitary laws and regulations.²⁹

The Continental Shelf “comprises the seabed and subsoil of the submarine areas that extend beyond its territorial sea throughout the natural prolongation of its land territory to the outer edge of the continental margin, or to a distance of 200 nautical miles from the baselines from which the breadth of the territorial sea is measured where the outer edge of the continental margin does not extend up to that distance.”³⁰ Jurisdiction over the continental shelf is defined functionally, asserting the state holds exclusive control for limited purposes of exploration and exploitation of natural resources of the seabed and subsoil.³¹

The Exclusive Economic Zone (EEZ) is an area beyond and adjacent to the territorial sea, where the coastal state holds sovereign rights for the purpose of exploring, exploiting, conserving, and managing the natural resources.³² In addition to jurisdiction over seabed and subsoil resources, which are already covered by the continental shelf rule, the EEZ regime establishes state jurisdiction over natural resources in the water (mainly fisheries).³³

Most offshore oil explorations take place within the EEZ, at the continental shelf seabed and subsoil.³⁴ Within this area, the coastal state has jurisdiction as required for the exploration and exploitation of natural resources.³⁵ However, this is subject to the state’s responsibility to ensure, through proper conservation and management measures, that the maintenance of the living resources within the EEZ is not endangered by over-exploitation.³⁶ This suggests that the coastal state has an obligation

29. *See id.* art. 33 (establishing the rights of a nation to engage in zones contiguous to its territorial seas).

30. *See id.* art. 76(1) (defining the continental shelf).

31. *See* Eric A. Posner & Alan O. Sykes, *Economic Foundations of the Law of the Sea*, 104 AM. J. INT’L L. 569, 584–85 (2010) (explaining the functional jurisdiction principle of the Convention as it pertains to the continental shelf).

32. *See* UNCLOS, *supra* note 27, at. 55–56 (defining the area, rights, jurisdiction, and duties of the exclusive economic zone).

33. *See* Posner & Sykes, *supra* note 31, at 585 (“In addition to seabed resources that are in any event covered by the continental shelf regime, the EEZ regime establishes the coastal state’s exclusive jurisdiction over natural resources in the water column, notably fisheries.”).

34. *See* Posner & Sykes, *supra* note 31, at 585 (“[M]ost exploitable deposits of hydrocarbons are likely to be found within the limits of the continental shelf as defined in UNCLOS . . .”).

35. *See* Posner & Sykes, *supra* note 31, at 585 (noting that exclusive jurisdiction of the continental shelf mitigates inefficient races to control resources there, while UNCLOS grants “similar exclusive rights for the EEZ”).

36. *See* UNCLOS, *supra* note 27, art. 61 (“The coastal State, taking into account the best scientific evidence available to it, shall ensure through proper conservation and

under international law to protect and conserve living resources from impacts of development operations occurring within the EEZ.³⁷

III. Justifications for regulation of offshore drilling on the International Level

Recognizing that the current domestic regulation is lacking effective continuous monitoring of complex operations far from land, another form of regulation is required. Still, there is a myriad of regulatory methods regularly used to monitor environmental issues.³⁸ This chapter will review available systems of regulation and will draw from this discussion justifications for regulating offshore oil and gas exploration on the international level. First, the paper will turn to examine the traditional government regulation, usually in the form of command and control.³⁹ Later, the possibility of incorporating incentives to induce self-regulation by oil companies will be considered.⁴⁰ Finally the characteristics of the offshore oil and gas exploration industry will be analyzed to find whether an international regulation is applicable.⁴¹

A. Government regulation

Government oversight alone cannot reduce the risks of overexploitation and environmental impact to the full extent possible.⁴² Resources at the deep sea require regulation to avoid overexploitation, excessive investment in search, and related externality issues.⁴³ However, there is an inverse relationship between the value of sea resources and the cost of regulation for land-based actors: as the value of sea resources tends to diminish, the cost of regulating that resource rises with distance from the

management measures that the maintenance of the living resources in the exclusive economic zone is not endangered by over-exploitation.”).

37. See UNCLOS, *supra* note 27, art. 61 (imposing the conservation and management requirement on coastal states).

38. See *infra* notes 42–92 and accompanying text (discussing modes of regulation using federal, private, and international means).

39. See *infra* notes 42–65 and accompanying text (discussing the difficulty of government regulation over distant deepwater drilling sites).

40. See *infra* notes 66–87 and accompanying text (discussing economic and public relations incentives for companies to police themselves).

41. See *infra* notes 91–93 and accompanying text (discussing prospects for a global environmental regime).

42. See REPORT TO THE PRESIDENT, *supra* note 1, at 217 (stating that effective government oversight is necessary to avoid accidents and to ensure effective response, but insufficient without the reinvention of the oil and gas industry).

43. See Posner & Sykes, *supra* note 31, at 595 (“[M]any of the resources of the sea require regulation to protect against overexploitation, excessive investment in search, and related externality problems.”).

shore.⁴⁴ It follows, therefore, that a coastal state's "regulatory authority declines with distance from the shore."⁴⁵ This makes it difficult for a state regulator to evaluate a cost of harming fish species, birds, or water quality, where people never go.⁴⁶ It is also hard to justify research of deep-sea aquatic ecosystems, as this kind of research requires sophisticated technologies, which are very expensive.⁴⁷

As offshore oil and gas explorations are technologically possible in greater depths and distances with growing technological development, the domestic regulatory authority is less operative.⁴⁸ The core challenge for an international agreement on regulatory authority over activities at sea is to allocate that authority to the most efficient regulator.⁴⁹ The logic underlined in the law of the sea is that the further away from the coast, the more the international community would be involved in the management of the resource, with the high seas representing total freedom from state sovereignty.⁵⁰ While the EEZ is subject to the coastal state sovereignty, the international community has an interest in the activities performed within the EEZ.⁵¹ This interest is reflected in the responsibility of the coastal state to ensure, through proper conservation and management measures, that living resources are maintained within the EEZ.⁵²

44. See Posner & Sykes, *supra* note 31, at 595 ("[T]he value of a sea resource to land-based actors tends to diminish with distance from the shore, and the cost of regulating that resource for land-based actors rises with distance from the shore.").

45. See Posner & Sykes, *supra* note 31, at 595.

46. See Posner & Sykes, *supra* note 31, at 577 (noting that states may be reluctant to expend resources to police a vast area of the high seas without substantial return, while "the environmental costs of activities further out to sea are not (yet) perceived to be as serious").

47. See Laura Ruth, *Gambling in the Deep Sea*, 7 EMBO REPORTS 17, 18 (2006) (noting that commercial partnerships are often necessary to support academic deep-sea research, which can cost \$30,000 per day and six-figure sums over the course of a year).

48. See REPORT TO THE PRESIDENT, *supra* note 1, at 250–51 (discussing the inadequacy of current regulatory systems in the face of "the near certainty that the oil and gas industry will seek to expand into ever more challenging environments in the years ahead").

49. See Posner & Sykes, *supra* note 31, at 576 (noting that allocating regulatory authority to proximate coastal states is usually the efficient choice, but this assumption may not hold where competing claims and distant resources are involved).

50. See Posner & Sykes, *supra* note 31, at 578–80 (discussing how state maritime rights and control diminish with distance from shore, and how the principle of freedom on the high seas results in an international regime of rights and duties).

51. See Posner & Sykes, *supra* note 31, at 585 (noting that UNCLOS grants coastal states exclusive rights of exploitation and conservation of maritime resources in the EEZ, but that foreign states retain high seas rights in these areas, as well as an attenuated interest in fishery resources).

52. See UNCLOS, *supra* note 27, art. 61 ("The coastal State, taking into account the best scientific evidence available to it, shall ensure through proper conservation and management measures that the maintenance of the living resources in the exclusive economic zone is not endangered by over-exploitation.").

The above theoretical analysis of the law of the sea can explain the degradation in environmental regulation of offshore oil and gas explorations in the Gulf of Mexico. Compared with other regions in the world, the United States has elaborate government regulation: the National Environmental Policy Act (NEPA)⁵³ requires all major federal actions that will significantly affect the quality of the human environment to prepare an environmental impact statement (EIS).⁵⁴ The Outer Continental Shelf Lands Act (OCSLA) gives the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) in the Department of the Interior the authority and responsibility to approve oil and gas leasing, exploration, and development process in the outer continental shelf.⁵⁵ BOEMRE was then split into two separate entities; the new Bureau of Ocean Energy Management (BOEM) and the new Bureau of Safety and Environmental Enforcement (BSEE). The authority and responsibility to approve oil and gas leasing, exploration, and development process in the outer continental shelf remained with BOEM.⁵⁶ The process of approval is divided into four stages: (1) preparation of a five year program, (2) planning for specific lease sales, (3) a private company's exploration plan approval, and (4) approval of a company's development and production plan.⁵⁷ OCSLA requires that BOEMRE only permit offshore oil and gas activities that comply with NEPA.⁵⁸ BOEMRE would regularly conduct a NEPA review at each stage of the oil and gas exploration process, requiring an EIS to be submitted by the oil company at each stage of the process.⁵⁹ However, the

53. National Environmental Policy Act of 1969, 42 U.S.C. §§ 4321–4370(h) (2011).

54. *See id.* at § 4332 (imposing on federal agencies NEPA's reporting and consultation requirements, including the EIS).

55. *See* Outer Continental Shelf Lands Act § 5, 43 U.S.C. § 1334 (2011) (“The Secretary shall administer the provisions of this subchapter relating to the leasing of the outer Continental Shelf”); *see* Outer Continental Shelf Lands Act § 11, 43 U.S.C. § 1340 (2011) (providing for management of geological explorations in the outer Continental Shelf by the Secretary of the Interior); *see* Outer Continental Shelf Lands Act § 25, 43 U.S.C. § 1351 (2011) (providing for secretarial review of development plans).

56. *See* DEP'T OF THE INTERIOR, Fact Sheet: The BSEE and BOEM Separation, An Independent Safety, Enforcement and Oversight Mission, *available at* http://www.doi.gov/news/pressreleases/upload/01-19-11_Fact-Sheet-BSEE-BOEM-separation-2.pdf (last visited Apr. 19, 2013) (describing the restructuring of BOEMRE and the authority granted to each agency).

57. *See* BUREAU OF OCEAN ENERGY MANAGEMENT, OIL AND GAS LEASING ON THE OUTER CONTINENTAL SHELF, at 3–7, *available at* http://www.boem.gov/uploadedFiles/BOEM/Oil_and_Gas_Energy_Program/Leasing/5BOEMRE_Leasing101.pdf (last visited Feb. 4, 2013) (describing the process from the five-year program through development review).

58. *See* 43 U.S.C. § 1866(a) (2006) (“Except as otherwise expressly provided in this chapter, nothing in this chapter shall be construed to amend, modify, or repeal any provision of . . . the National Environmental Policy Act of 1969”).

59. *See* OIL AND GAS LEASING ON THE OUTER CONTINENTAL SHELF, *supra* note 57, at 3 (noting that BOEM prepares an EIS in the course of developing a five-year program and

Gulf of Mexico has been categorically excluded from NEPA review in the approval of offshore lease exploration, development and production plans, and development operation coordination documents.⁶⁰

According to BOEM, the primary justification for the categorical exclusion of exploration plans in the Gulf of Mexico is that hundreds of Environmental Assessments (EAs) were prepared for oil and gas explorations in the Central and Western Gulf of Mexico.⁶¹ Previous EAs found no possibility of significant impacts from drilling, therefore, it appears that future drilling would not pose a significant impact.⁶² Others have suggested that the thirty day timeframe for responding to an application of an exploration plan does not allow for a full NEPA review.⁶³ Whatever the actual reason, it is clear that there is degradation in environmental regulation of offshore oil and gas explorations in the Gulf of Mexico; despite having an elaborate regulation system, when it came to distant deepwater explorations, the governing authority found it either difficult to evaluate the environmental impact, or too costly to perform the required review to figure it out.⁶⁴

planning a specific sale); Jaclyn Lopez, *BP's Well Evaded Environmental Review: Categorical Exclusion Policy Remains Unchanged*, 37 *ECOLOGY L. CURRENTS* 93, 95 (2010) (stating that the leasing companies' exploration plans are subject to NEPA review in the form of an EA, while development and production plans are subject to NEPA review as an EIS); 43 U.S.C. §§ 1351(e), (h) (providing that at least one production plan in each area shall be declared Federal action subject to NEPA review, and that such plans will be approved, rejected, or subject to modification based on that review).

60. See 43 U.S.C. § 1351(l) (2006) (leaving the decision whether to apply NEPA review of leases to the Secretary's discretion); Lopez, *supra* note 59, at 95 (stating that Interior Department policy has been to exclude categorically the exploration, development, and production plans from NEPA review).

61. See Bureau of Ocean Energy Management, Regulation and Enforcement, National Environmental Policy Act (NEPA)—Categorical Exclusion Reviews, <http://www.boem.gov/Environmental-Stewardship/Environmental-Assessment/NEPA/policy/ce/index.aspx> (last visited Feb. 8, 2013) (“[H]undreds of Environmental Assessments (EAs) were prepared for approval of certain types of oil and gas exploration and development and production plans in the Central and Western Gulf of Mexico.”) (on file with the Washington and Lee Journal of Energy, Climate, and the Environment).

62. See *id.* (“If a certain type of BOEM action . . . would not normally result in any environmental effects that are potentially significant, it is unnecessary to expend resources to repeatedly document that fact.”); Lopez, *supra* note 59, at 97 (“[BOEM] appears to have concluded that because the previous EAs found no possibility of significant impacts from drilling, no future drilling would ever pose significant impacts.”).

63. See Lopez, *supra* note 59, at 97 (“Others have suggested that the categorical exclusion policy is necessary in light of OCSLA Section 11 requirement that the MMS approve or deny an exploration plan within thirty days, which means it only has thirty days to complete an environmental review.”).

64. See COUNCIL ON ENVIRONMENTAL QUALITY, REPORT REGARDING THE MINERALS MANAGEMENT SERVICE’S

B. Self-regulation

Corporate self-regulation is enjoying a growing support as an approach to environmental compliance mechanisms.⁶⁵ The oil industry has shifted its working model throughout the years: from an industrial culture of evading international standards to a compliance culture, where companies complied with minimum regulation, to the current safety culture, in which companies constantly strive to improve their safety measures as a means to promote productivity and profitability.⁶⁶ This type of regulation suggests that a mechanism of incentives may be established to enable and require oil companies to regulate their own operation.⁶⁷

Under domestic jurisdiction the benefits of self-regulation are mainly that corporations may enjoy “tangible benefits of compliance, such as avoiding the high cost and fines of Environmental Protection Agency (EPA) enforcement actions . . . and EPA-mandated compliance programs.”⁶⁸ Also, corporate managers may rely on the companies’ compliance plan to avoid personal liability.⁶⁹ However, based on corporate self-regulation alone, “without effective government oversight, the offshore oil [exploration] industry will not adequately reduce the risk of accidents, nor prepare effectively to respond in emergencies” such as a major spill.⁷⁰

An example of the inability of oil companies to regulate their own activity can be found in a Shell Environmental Impact Assessment (EIA)

NATIONAL ENVIRONMENTAL POLICY ACT POLICIES, PRACTICES, AND PROCEDURES AS THEY RELATE TO OUTER CONTINENTAL SHELF OIL AND GAS EXPLORATION AND DEVELOPMENT, at 17–19 (Aug. 16, 2010), *available at* <http://www.whitehouse.gov/sites/default/files/microsites/ceq/20100816-ceq-mms-ocs-nepa.pdf> (noting that in the context of BP’s Macondo well, the former Minerals Management Service relied on a multi-sale EIS in the lease sale, did not prepare a site-specific impact analysis during NEPA review, and did not prepare an analysis for BP’s exploration plan during categorical exclusion review).

65. See Dennis H. Esposito & Jenna Algee, *A Common Sense Approach to Corporate Environmental Compliance*, 60 R.I. B. J. 5, 5 (2012) (arguing that environmental compliance policies “should be viewed as a prudent investment and as insurance” against significant monetary fines and personal criminal liability resulting from noncompliance).

66. See Barbara E. Ornitz, *Oil Spill Prevention and Response: A Model for a Developing Marine Ethic in the Shipping Industry*, in *VALUES AT SEA: ETHICS FOR THE MARINE ENVIRONMENT* 183, 183 (Dorinda G. Dallmeyer ed., 2003) (noting this shift in the industry as a result of external regulatory pressures and public attitudes).

67. See *id.* at 191–92 (stating that because “[e]conomics is a prime motivator for the shipping industry,” imposing costs on polluters and rewarding best practices in accident response produces a safer culture and more effective regulation).

68. Esposito & Algee, *supra* note 65, at 5.

69. See Esposito & Algee, *supra* note 65, at 5 (“The best defense against most deficiencies targeted in environmental enforcement actions is an effective Environmental Compliance Program (ECP) with routine compliance.”).

70. REPORT TO THE PRESIDENT, *supra* note 1, at 217.

from 2000.⁷¹ The report was filed under the OCSLA because Shell found that “the potential for a high-volume blowout during the proposed activities may have highly controversial environmental effects.”⁷²

Shell identified in the report that “the likelihood of spills from loss of control (blowouts) in deep water may be different from the risk of spills in shallow water,” and that “[f]urther investigation is required before the consequences of blowouts in deep water can be fully evaluated.”⁷³ These statements recognize that oil exploration projects in deepwater areas may raise greater risks and difficulties in controlling a spill.⁷⁴ Different model assessments were performed from 1995 to 1997 to research the impacts of subsurface spills and the areal extent that the formation oil would reach once at the sea surface.⁷⁵ These reports reached distinct results as to the probability oil would reach the water’s surface and how far from the drilling the oil could appear.⁷⁶

The S.L. Ross Environmental Research paper found that in blowouts at depths greater than 900 meters (about 2,950 feet), all discharged gas will quickly convert to solid hydrate (crystalline solids formed under pressure when coming to contact with water).⁷⁷ The discharged oil will be shattered into droplets and saturated with gas, later forming a rigid hydrate shell around the oil.⁷⁸ These oil droplets will continue rising to the sea surface at a speed of their regular buoyancy

71. See generally Shell Deepwater Development Inc., Document no. N-6570, Site-Specific Environmental Assessment: Initial Development Operations Coordination Document Green Canyon Area, Blocks 158 and 202 (May 9, 2000) available at <http://www.data.bsee.gov/PI/PDFImages/PLANS/1/1263.pdf>.

72. *Id.* at 1.

73. *Id.* at App. D-3.

74. See *id.* at App. D-4–D-5, D-9–D10 (describing the measures needed to contain a deepwater blowout and the uncertain behavior of leaking oil in such a scenario).

75. See generally Henrik Rye & Per Johan Brandvik, *Verification of Subsurface Oil Spill Models*, in: *Proceedings*, 1997 International Oil Conference, American Petroleum Institute Publication No. 4651, 551 (1997), available at <http://ioscproceedings.org/doi/pdf/10.7901/2169-3358-1997-1-551>; S.L. Ross Environmental Research Ltd., *Fate and Behavior of Deepwater Subsea Oil Well Blowouts in the Gulf of Mexico*, Minerals Managements Service (1997), available at <http://bsee.gov/Research-and-Training/Technology-Assessment-and-Research/Project-287.aspx>. Both reports are mentioned in Shell’s EA.

76. See generally Rye & Brandvik, *supra* note 75 (discussing the behavior of slicks, and whether they will come to the surface, through numerous case studies).

77. See S.L. Ross Environmental Research, *supra* note 75, at 20 (“Blowouts at depths greater than 900 meters will result in a very fast conversion of all of the gas to hydrate.”).

78. See S.L. Ross Environmental Research, *supra* note 75, at 20 (“The discharged oil will be shattered into small droplets and will be saturated with gas. As the gas devolves from the oil as it rises hydrates will likely form a rigid shell around the oil droplet.”).

(depending on the size of each droplet).⁷⁹ They will reach the surface within three to fifteen hours of the initial spill, depending on the oil density and release depth.⁸⁰

An experiment performed by Rye and Brandvik also examined subsurface oil release and, in particular, the size of the plume a spill would create on the surface. Their results showed that subsurface plume might not reach the sea surface at all.⁸¹ If it does reach the sea surface, it is likely to form a relatively thin surface slick spread over a larger area.⁸² This should eventually accelerate the rate of oil dissolution.⁸³ However, the trials they performed were at a depth of up to 107 meters (about 351 feet),⁸⁴ which is not nearly as deep as the exploration permit Shell is requesting.

Despite recognizing that the likelihood of blowouts in deep water may be different from the likelihood in shallow water, their highly controversial environmental effects, and lack of scientific knowledge on the behavior of oil and gas chemicals following a subsurface blowout, Shell submitted an EA requesting a permit for an even deeper exploration of 2,895 feet.⁸⁵ The potential financial benefit in the near future for the oil company prevailed over the low risk a major spill will occur. The option of relinquishing potential financial benefits for some vague and distant risk would almost seem irrational for an oil company to consider. From the industry point of view, the probabilities are favorable.⁸⁶

79. See S.L. Ross Environmental Research, *supra* note 75, at 20 (“Because the density of the hydrate is very close to that of water, it will not affect the buoyancy of the oil droplet.”).

80. See S.L. Ross Environmental Research, *supra* note 75, at 22 (describing case two of blowouts at depths greater than 900 meters).

81. See Rye & Brandvik, *supra* note 75, at 555 (“Thus the oil droplets may have been trapped within the subsurface plume instead of rising to the sea surface.”).

82. See Rye & Brandvik, *supra* note 75, at 555 (“However, the thickness was found to be about 10 to 30 μm , accounting for only 15% to 20% of the total amount of oil released.”).

83. See Rye & Brandvik, *supra* note 75, at 555 (“This velocity may be large enough to create small droplets with a small rise velocity.”).

84. See Rye & Brandvik, *supra* note 75, at 551 (“The first field exercise involved the release of 25 m^3 of oil at 107-m depth . . . and the 1996 field exercise . . . at 102-m depth . . .”).

85. See Shell Deepwater Development Inc., *supra* note 71, at 2 (proposing a development site 2,895 feet below sea level).

86. See Oliver A. Houck, *Worst Case and the Deepwater Horizon Blowout: There Ought to be a Law*, 40 ENVTL. L. REP. NEWS & ANALYSIS 11033, 11034 (2010) (“From the industry point of view, and indeed from any gambler’s point of view, the probabilities were favorable. Not one major blowout had occurred in 37 years from American operations in the deep Gulf, they would claim, before and after the event.”).

C. Global regulation

The characteristics of the oil industry entail a unified global approach to assess, regulate, and develop safety measures.⁸⁷ Global oil and gas companies operate in various locations under different regulatory regimes.⁸⁸ This could create a situation where companies exploit weak countries' lack of regulation, exploring recklessly and applying old technology.⁸⁹ The offshore oil exploration industry has long been considered a global industry and should be regarded as such by regulating authorities.⁹⁰ The United Kingdom report also recognized the need to work with regulators in other offshore oil and gas provinces to ensure that the highest standards of safety can be achieved globally through an exchange of best practice lessons.⁹¹ Therefore, a global environmental regime can empower governments when regulating the industry, making information from regulators around the world available to them.

ExxonMobil's announcement that it has incorporated a marine well containment system improving capabilities for containing an underwater well control incident in the U.S. Gulf of Mexico is an example for companies employing different measures under different regulatory regimes.⁹² This innovative safety measure only operates in the Gulf of Mexico, and could indicate that oil companies apply different means in different explorations.⁹³ The Gulf of Mexico was subject to a moratorium following the 2010 BP blowout, and oil companies operating there tried to prove that they were employing groundbreaking technologies to avoid

87. See REPORT TO THE PRESIDENT, *supra* note 1, at 43–44 (describing the movement toward global restructuring and mergers of oil companies in the late 1990s).

88. See REPORT TO THE PRESIDENT, *supra* note 1, at 66 (“What began as a policy allowing offshore drilling in the Gulf under a more relaxed regulatory regime than applied elsewhere gradually became a policy of allowing offshore drilling, as a practical matter, almost only in the Gulf.”).

89. See REPORT TO THE PRESIDENT, *supra* note 1, at x (“To date, we have made the decision as a nation to exploit the Gulf’s offshore energy resources—ruling much of the Florida, Atlantic, and Pacific coasts out of bounds for drilling.”).

90. See REPORT TO THE PRESIDENT, *supra* note 1, at 44 (“During this era, offshore oil exploration and production became an increasingly global enterprise.”).

91. See UK Report, *supra* note 22, at 20 (“We would urge the Government to work with regulators in other offshore oil and gas provinces to ensure that the highest standards of safety can be achieved globally through an exchange of best practice lessons.”).

92. See *Marine Well Containment System*, EXXONMOBIL, http://www.exxonmobil.com/Corporate/Imports/mwc/safety_response_mwc.aspx (last visited Mar. 14, 2013) (describing the containment system operations) (on file with the Washington and Lee Journal of Energy, Climate, and the Environment); see also *Safety in Our Operations*, EXXONMOBIL, http://www.exxonmobil.com/Corporate/safety_ops.aspx (last visited Mar. 14, 2013) (describing general safety principles) (on file with the Washington and Lee Journal of Energy, Climate, and the Environment).

93. See *Marine Well Containment System*, *supra* note 92 (stating that the Marine Well Containment System only operates in the Gulf of Mexico).

similar blowouts in the future.⁹⁴ The problem with giving special attention to one region is that projects in other regions are left behind or their safety development is held back to cover the expenses for developing safety mechanisms for highly-regulated regions.⁹⁵

The argument is not that global regulation should completely replace government authority or oil company's safety development policies. But a global regime can guide governments and oil companies in establishing practices, reviewing processes, and preventing degradation in regulation practices.⁹⁶ In the ExxonMobil example, this regime could encourage companies to apply the same policies globally and could direct the governments to compare safety policies employed in their region to those employed in other regions.

In conclusion, a global regime would minimize existing difficulties in government regulation and in self-regulation by oil companies. The international community holds a significant interest in preserving living resources within the EEZ, where the coastal state lacks competence to evaluate harm. Where oil companies cannot rationally hold back their operations for distant risk in fear of being left behind by other companies, it will assure equal limitations (so that when Shell reports a risk, all such explorations will be affected, and not only its lease). Finally, it will prevent the risk of over-exploitation and use of old technologies in regions where regulation is weak or non-existent.

IV. Best Practices and Procedures

Existing environmental safety practices are a good place to start exploring for principles to guide the practice of oil and gas explorations. Later, we can consider whether they should constitute part of the global environmental regulation regime. This chapter will review industry practices, as well as regulatory recommendations reached following the BP blowout.

A. Industry 'good oilfield practice'

The oil industry has developed its own safety model and regulation over the years. Although clearly not sufficient to regulate the activity, the

94. See REPORT TO THE PRESIDENT, *supra* note 1, at 152 (describing the moratorium imposed and oil companies' reactions to it).

95. See REPORT TO THE PRESIDENT, *supra* note 1, at 153 (noting the focus on Louisiana and subsequent failure to adequately provide safety measures for Florida).

96. See REPORT TO THE PRESIDENT, *supra* note 1, at 242 (claiming that an industry-wide commitment to rigorous auditing and continuous improvement would include measurements against global benchmarks).

future global environmental regulation regime can learn and absorb much from these years of practice.

BP indicates three principles at the heart of its safety approach: (1) fostering a culture focusing on safety, on managing and reducing risk and on safe, reliable and compliant operations; (2) establishing an operating management system (OMS) with expectations of conduct and leadership approach; (3) independent, effective checks and balances and self-verification being carried out at all levels of the organization.⁹⁷ BP is also sharing its experience and knowledge from the recent spill in the Gulf of Mexico to help develop the enhanced capabilities and practices needed to prevent this type of accident from recurring.⁹⁸

Shell also wishes to create a culture of safety, incorporating ongoing training for employees. The company identifies three principles central to safety: (1) do no harm to people; (2) protect the environment; and (3) comply with internal health, safety, security, and environment laws and regulations.⁹⁹ The company is also preparing emergency reaction plans, including a global response for major spills.¹⁰⁰ Shell's global emergency reaction plan indicates that once a major spill has occurred it would require all available measures to handle the spill.¹⁰¹ It also shows that in the companies' view, the operation under different countries is merely a technical one.¹⁰²

Noble Energy generally concentrates on continuous improvement of environmental performance, internal responsibility, and preservation of

97. See SUSTAINABILITY REVIEW 2011, BP, 31, (2011), available at http://www.bp.com/assets/bp_internet/globalbp/STAGING/global_assets/e_s_assets/e_s_assets_2010/downloads_pdfs/bp_sustainability_review_2011.pdf (stating BP's approach to safety).

98. See generally *A Culture of Safety*, BP, <http://www.bp.com/sectiongenericarticle800.do?categoryId=9040147&contentId=7073364> (last visited Mar. 14, 2013) (on file with the Washington and Lee Journal of Energy, Climate, and the Environment); *Preventing Major Accidents and Oil Spills*, BP, <http://www.bp.com/sectiongenericarticle800.do?categoryId=9040149&contentId=7066981> (last visited Mar. 14, 2013) (on file with the Washington and Lee Journal of Energy, Climate, and the Environment).

99. *HSSE in Shell*, SHELL, 2, available at http://www-static.shell.com/static/environment_society/downloads/safety/hsse_in_shell_lr.pdf (last visited Mar. 14, 2013).

100. See generally *Oil Spill Emergency Response*, SHELL, available at <http://s08.static-shell.com/content/dam/shell/static/environment-society/downloads/safety/oil-spill-emergencyresponselr.pdf> (last visited Mar. 14, 2013) (planning for response in case of emergency).

101. See *id.* at 5 ("For response to larger spills we use global resources and mobilise Shell staff from around the world. Shell has access to oil industry-funded centres that provide equipment and personnel to manage major spills.")

102. See *id.* ("Shell ensures that adequate resources are maintained for managing regional and local spills. We cooperate with industry neighbours and local or national authorities.")

wildlife.¹⁰³ ExxonMobil has incorporated a marine well containment system improving capabilities for containing an underwater well control incident in the U.S. Gulf of Mexico.¹⁰⁴

Industry practice indicates an increasing concern for environmental effects from offshore oil and gas exploration.¹⁰⁵ Oil companies consider possible environmental effects and are progressively more willing to employ safety measures and incorporate safety policies to avoid environmental risk.¹⁰⁶ However, much of the information is not available to the public. There is no doubt that oil companies possess valuable information about safety measures, geologic explorations, and risk assessments.¹⁰⁷ It seems that the competitive oil exploration market has led oil companies to maintain the information, usually disclosing information to the regulating authority only when required to do so.¹⁰⁸ While internal company policies have developed to incorporate innovative safety policies, they are reluctant to share knowledge with other oil companies, or third parties that are not considered directly related to the project.¹⁰⁹

103. See *Environment*, Noble Energy, <http://www.nobleenergyinc.com/responsibility/environment-301.html> (last visited Mar. 14, 2013) (“We are committed to conducting our business in a manner that protects the environment, health and safety (EHS) of our employees and communities. To achieve this, we strive to comply with EHS laws and minimize injuries and incidents while protecting the environment.”) (on file with the Washington and Lee Journal of Energy, Climate, and the Environment).

104. ExxonMobil, *Safety in Our Operations*, http://www.exxonmobil.com/Corporate/safety_ops.aspx (last visited Mar. 25, 2013) (on file with the Washington and Lee Journal of Energy, Climate, and the Environment); ExxonMobil, *Marine Well Containment System*, http://www.exxonmobil.com/Corporate/Imports/mwc/safety_response_mwc.aspx (last visited Mar. 25, 2013) (on file with the Washington and Lee Journal of Energy, Climate, and the Environment).

105. See REPORT TO THE PRESIDENT, *supra* note 1, at 293–306 (describing the trend toward considering environmental concerns in the American oil industry).

106. See, e.g., SUSTAINABILITY REVIEW 2011, *supra* note 97 (detailing BP’s new safety and environmental policies).

107. See generally SUSTAINABILITY REVIEW 2011, *supra* note 97 (showing the information that BP has to disclose about safety and risk balancing concerns).

108. See, e.g., REPORT TO THE PRESIDENT, *supra* note 1, at 144 (“Environmental groups pressured Nalco, the company that manufactures Corexit, to disclose its formula. Although it had given the formula to EPA during the pre-listing process, Nalco declined to make the formula public, citing intellectual property concerns.”).

109. See, e.g., REPORT TO THE PRESIDENT, *supra* note 1, at 241 (“Technology and design apparently are more uniform in nuclear power than in offshore drilling. . . . Director of . . . (the successor to MMS), cautioned that an INPO-like approach might run into problems if companies perceived the potential for inspections of offshore facilities to reveal technical and proprietary and confidential information that companies may be reluctant to share with one another.” (internal quotations omitted)).

B. Lessons from the 2010 BP blowout

Operating offshore oil exploration projects, particularly moving deeper and farther into the sea, increases the risk and scale of a spill.¹¹⁰ Comprehensive reports were published following the BP blowout in the United States and the United Kingdom, both discussing the regulation of offshore oil and gas explorations.¹¹¹ While it would be impossible to completely eliminate oil spills, learning from past spills about industry and regulatory failures could be beneficial in structuring global environmental regulation regime.

Two approaches were historically applied for offshore oil and gas exploration regulation. In the United States, the regulatory approach used is of prescriptive safety standards.¹¹² In the United Kingdom, the prevailing approach is the safety case approach.¹¹³ The prescriptive safety approach in the United States is founded on specific requirements prescribed by the relevant government agencies.¹¹⁴ The safety case approach utilized by the United Kingdom involves an abandonment of safety rules developed by government agencies and a placement of the key responsibility on the operator through goal-setting regulations.¹¹⁵

The United States' regulatory approach to offshore oil and gas exploration is the outcome of responses to accidents, short-term political calculations, and lobbying campaigns.¹¹⁶ Based on the 1953 legislation

110. See REPORT TO THE PRESIDENT, *supra* note 1, at vii (“Deepwater energy exploration and production, particularly at the frontiers of experience, involve risks for which neither industry nor government has been adequately prepared, but for which they can and must be prepared in the future.”)

111. See, e.g., REPORT TO THE PRESIDENT, *supra* note 1, at vii (chronicling the history of U.S. oil and gas regulation).

112. See REPORT TO THE PRESIDENT, *supra* note 1, at 68 (noting that the U.S. Department of the Interior, Minerals Management Service, which was the federal agency responsible for the safety of offshore drilling, “subjected oil and gas activities to an array of prescriptive safety regulations”).

113. See REPORT TO THE PRESIDENT, *supra* note 1, at 69 (“All these foreign regulators—the United Kingdom, Norway, and Canada—had previously relied on the kind of prescriptive approach used in the United States, but in the aftermath of these fatal accidents in harsh, remote offshore environments, authorities elsewhere concluded that adding a risk-based approach was essential.”).

114. See REPORT TO THE PRESIDENT, *supra* note 1, at 72–74 (detailing the requirements posed by MMS in off-shore drilling).

115. See John Paterson, *The Significance of Regulatory Orientation in Occupational Health and Safety Offshore*, 38 B.C. ENVTL. AFF. L. REV. 369, 371–84 (2011), available at <http://lawdigitalcommons.bc.edu/> (detailing the formation UK’s safety approach).

116. See Juliet Eilperin, *Troubled Waters: Federal Oversight of Offshore Oil Drilling*, 17 ROGER WILLIAMS U. L. REV. 89, 89 (2012) (“As a result, some of the most critical energy decisions policymakers have undertaken in recent years have been driven by a myriad of factors, ranging from short-term political calculations to well-orchestrated lobbying campaigns.”).

governing offshore oil explorations, the Interior Department viewed its authority to prescribe rules “for the prevention of waste and conservation of natural resources”¹¹⁷ as mostly regarding avoiding waste or destruction of the oil reservoir. Environmental concerns, in particular to wildlife-endangered species, were under the authority of the Fish and Wildlife Service.¹¹⁸ Following a blowout in a Union Oil Company well in the Santa Barbara Channel in January 1969, the Department of Interior toughened the rules, and Congress began furthering environmental legislation.¹¹⁹ NEPA was enacted in 1970.¹²⁰ The OCSLA was amended a few years later in 1978.¹²¹ This new set of legislation dramatically changed the federal role in overseeing exploration and exploitation of natural resources on public lands—including offshore oil explorations.¹²² The amended OCSLA added detailed procedures requiring the Secretary of the Interior to prepare a five year schedule of proposed lease sales,¹²³ approval of exploration plans submitted by oil companies,¹²⁴ and upon discovery of oil in commercial quantities, approval of development and production plans.¹²⁵ The act also made clear that environmental considerations were a relevant part of the Secretary’s decision-making.¹²⁶ The Secretary would need to balance the potential for discovery of oil with the potential for environmental damage.¹²⁷

117. 43 U.S.C. § 1334 (2012).

118. REPORT TO THE PRESIDENT, *supra* note 1, at 58 (“The Department did announce, however, that the Fish and Wildlife Service would have to approve all offshore drilling in wildlife refuges and that oil and gas leasing there that endangered ‘rare’ wildlife species (like whooping cranes or trumpeter swans) would not be allowed.”).

119. See REPORT TO THE PRESIDENT, *supra* note 1, at 58 (“The Interior Department toughened its rules in response to the spill.”).

120. REPORT TO THE PRESIDENT, *supra* note 1, at 59.

121. REPORT TO THE PRESIDENT, *supra* note 1, at 59.

122. See generally REPORT TO THE PRESIDENT, *supra* note 1, at 58–63 (noting the OCSLA’s “particular significance for federal oversight of offshore drilling”).

123. See 43 U.S.C. § 1344 (2012) (detailing the administration leases and permits).

124. See Outer Continental Shelf Lands Act Amendments of 1978 § 206, 43 U.S.C. § 1340(c)(1) (2012) (“[P]rior to commencing exploration pursuant to any oil and gas lease issued or maintained under this subchapter, the holder thereof shall submit an exploration plan to the Secretary for approval.”).

125. See *id.* § 208, 43 U.S.C. § 1351(a)(1) (2012) (“Prior to development and production pursuant to an oil and gas lease . . . with respect to which no oil or gas has been discovered in paying quantities prior to September 18, 1978, the lessee shall submit a development and production plan . . . to the Secretary.”).

126. See REPORT TO THE PRESIDENT, *supra* note 1, at 61 (“At the same time, the statute also made clear that environmental safeguards are a relevant, important part of the Secretary’s decisionmaking.”).

127. See Outer Continental Shelf Lands Act Amendments of 1978 § 208, 43 U.S.C. 1344(a)(3) (2012) (“The Secretary shall select the timing and location of leasing . . . so as to obtain a proper balance between the potential for environmental damage, [and] the potential for the discovery of oil and gas.”).

The next major event that led to legislative changes was the 1989 Exxon Valdez oil spill in Alaska's Prince William Sound.¹²⁸ In response to the Exxon Valdez spill, the Oil Pollution Act (OPA) added additional requirements for facility response plans in worst-case scenarios, including annual training plans, and the identification of facilities technology, and financing.¹²⁹

The 2010 BP blowout presented a crisis on a scale for which oil companies and the United States regulators had not been prepared to respond. It made clear that changes had to be made in safety and environmental practices, safety training, drilling technology, containment and cleanup technology, preparedness, corporate culture, and management behavior for energy operations to be pursued in the future.¹³⁰ On May 22, 2010, President Obama announced the creation of an independent nonpartisan commission to determine the causes of the disaster, to improve the ability to respond to future spills, and to recommend reforms in offshore oil and gas drilling regulations.¹³¹

The commission identified three major issues that would need to be addressed in order to improve the safety of offshore operations: (1) reducing and managing risk effectively using strategies, while keeping pace with the complex and rapidly evolving industry, especially in high-risk and frontier areas; (2) assuring the independence and integrity of government institutions charged with protecting the public interest; and (3) securing resources for leasing functions and regulatory oversight.¹³² These issues represent a delicate balance between the need to strengthen regulation of offshore oil and gas exploration, and the interest in maintaining the conditions for the industry to function and grow, providing the energy needs of the nation.

128. See 136 CONG. REC. 6936 (1990) (statement of Rep. Walter Jones, sponsor of the Oil Pollution Act) ("This biggest oilspill in U.S. history proved what my committee had been saying for years: we had to completely rewrite and update our woefully inadequate oilspill laws.").

129. See Houck, *supra* note 86, at 11036 (The OPA, responding to the *Exxon Valdez* spill, added additional prescriptions for facility response plans to a worst-case scenario, including the identification of facilities, technology, and financing."); see also 30 C.F.R. § 254.5 (2013) (providing general overview of response plan requirements).

130. See REPORT TO THE PRESIDENT, *supra* note 1, at 215 (listing changes to industry practices demanded by the Deepwater Horizon disaster).

131. See Press Release, *supra* note 16 ("[T]he purpose of this Commission is to consider both the root causes of the disaster and [to] offer options on what safety and environmental precautions we need to take to prevent a similar disaster from happening again.").

132. See REPORT TO THE PRESIDENT, *supra* note 1, at 250–51 (describing the three issues that must be addressed for a successful overhaul of regulatory policies and organizations).

The conclusions reached by the commission included a list of significant changes to the methods of operation and regulation of offshore oil and exploration.¹³³ The commission recommended reforming regulatory authorities and requiring the oil industry to take unilateral steps to improve safety throughout the industry, including self-policing mechanisms.¹³⁴ The commission also acknowledged the need to incentivize government and industry cooperation in supporting scientific understanding of environmental conditions in deep water, as well as development of innovative technology capable of undertaking the risks associated with deepwater drilling.¹³⁵

Following the BP blowout, the United Kingdom published its own report examining the effect of the BP blowout on offshore oil and gas exploration regulation in the North Sea.¹³⁶ The United Kingdom regulatory approach to offshore oil and gas exploration is the result of a continued learning process. After finding natural gas under the continental shelf of the North Sea, the Continental Shelf Act was enacted in 1964.¹³⁷ This law merely applied existing onshore oil exploration regulation to offshore explorations.¹³⁸ The next year, a spill from the Sea Gem drilling rig led to the development of prescriptive regulations for offshore drilling, enacted as the Mineral Workings (Offshore Installations) Act in 1971.¹³⁹

It was the Piper Alpha disaster, on July 6, 1988, which prompted the United Kingdom to change its approach completely, and to develop the “safety case” approach.¹⁴⁰ This approach is based on an understanding that no matter how flexible, safety rules developed by government agencies cannot provide detailed and comprehensive code covering all aspects of the industry.¹⁴¹ Since the industry possesses significantly greater knowledge

133. See Recommendations of the National Commission, *supra* note 17, at vii–viii (outlining the Commission’s conclusions).

134. See Recommendations of the National Commission, *supra* note 17, at vii–viii.

135. See Recommendations of the National Commission, *supra* note 17, at vii–viii.

136. See UK Report, *supra* note 22, at 3 (explaining the impetus for the report).

137. See Paterson, *supra* note 115, at 371–72 (stating that upon the discovery of natural gas under the continental shelf, the Continental Shelf Act was enacted in the United Kingdom).

138. See Paterson, *supra* note 115, at 372 (“Once the Continental Shelf Act of 1964 was passed, the United Kingdom simply lifted the existing onshore regulatory regime for the exploration and production of oil and gas, which dated from the 1930s, and transferred it to the offshore environment.”).

139. See Paterson, *supra* note 115, at 371–74 (explaining the background of the Mineral Workings (Offshore Installations) Act).

140. See UK Report, *supra* note 22, at 9 (“[I]t was from [the Piper Alpha disaster] that the whole concept of the safety case came and the whole concept of independent verification and inspection.”).

141. See Paterson, *supra* note 115, at 379–80 (“[T]his approach involved an abandonment of any notion that safety rules developed by government agencies, no matter

and expertise than the regulator, and offshore oil exploration projects are characterized by constant technological progress and striving to find and extract oil and gas from ever more difficult conditions, the government finds itself at a disadvantage.¹⁴² Therefore, companies were required to draft a “safety case,” relying mainly on the companies’ self-regulation.¹⁴³

The U.K. commission recommended the government to ensure that the licensing regime takes full account of high consequence, low probability events.¹⁴⁴ They also urge the need that someone offshore has the authority to bring a halt to drilling operations at any time, without recourse to onshore management.¹⁴⁵ While the flexibility of the U.K. safety case approach appears to have worked well so far, the commission recommended that fail-safe devices, such as the blowout preventer, which should be adopted as a minimum prescriptive safety standard.¹⁴⁶ This would suggest that although the operator may be well informed on technology and best practices in the oil industry, there is still room for prescriptive requirements when such measures are clearly effective and necessary for safety operations.

In comparing the United States commission report and the United Kingdom commission report, it seems that each state took a step toward the other regulatory approach. As the United States is requiring more self-policing mechanisms developed within oil companies,¹⁴⁷ the United Kingdom acknowledges the necessity to incorporate a minimum prescriptive safety standard.¹⁴⁸

how flexible the form, could provide a detailed and comprehensive code covering all aspects of the industry.”).

142. See *id.* (explaining the rationale of the reforms to the United Kingdom regulatory regime); see also Recommendations of the National Commission, *supra* note 17, at 1 (“Federal efforts to regulate the offshore oil and gas industry have suffered for years from . . . a deepening deficit of technical expertise.”).

143. See Paterson, *supra* note 115, at 379 (describing the elements of a safety case).

144. See UK Report, *supra* note 22, at 23 (“We recommend that as part of the drilling-licence process, the Government require companies to consider their responses to high-consequences, low-probability events. . . . We urge the Government to introduce this requirement as drilling ventures into increasingly extreme environments.”).

145. See UK Report, *supra* note 22, at 41 (“It is imperative that there is someone offshore who has the authority to bring a halt to drilling operations at any time, without recourse to onshore management.”).

146. See UK Report, *supra* note 22, at 41 (“[W]e recommend that for fail-safe devices such as the blowout preventer the Government should adopt minimum, prescriptive safety standards or demonstrate that these would not be a cost-effective, last-resort against disasters.”).

147. See Recommendations of the National Commission, *supra* note 17, at 3 (“[Regulators] should shift their focus . . . to a foundation of augmented prescriptive regulations . . . supplemented by a proactive, risk-based performance approach. . . . This would be similar to the “safety case” approach that is used in the North Sea.”).

148. See UK Report, *supra* note 22, at 17 (“[T]he Government should adopt minimum, prescriptive safety standards.”).

V. The Global Environmental Regulation Regime

The significant development in technologies of offshore drilling has transformed the offshore oil and gas exploration industry into a high-risk industry, making domestic regulation impracticable. A global environmental regulation regime directing the operation of offshore drilling can address the incapacities of domestic regulation.

Previous chapters have presented an array of principles currently employed in the offshore oil exploration industry. A recurring principle within industry, ‘good oilfield practice’ is the creation and maintenance of a *culture of safety operations*.¹⁴⁹ The implementation of this principle may include whistleblower’s protection within the oil industry, constant re-evaluation of custom practices, and employees’ orientation.

A second principle arising from industry practice is the *consideration of environmental effect* from the exploration.¹⁵⁰ This principle could require a significant scientific research learning the ecologic systems in the location prior to beginning exploration and actualizing externalities on the environment into the companies’ decision whether to move forward with the exploration.

Some oil companies are pursuing innovative technologies following the BP blowout.¹⁵¹ This would suggest the necessity to employ a principle of *constant innovation and development*. Similar recommendations were made by the U.S. and U.K. commissions following

149. See UK Report, *supra* note 22, at 20 (“It is important and necessary that the offshore safety culture is cascaded throughout the supply chain, from existing contractors at all levels, through to new-entrants on to the UK Continental Shelf.”); REPORT TO THE PRESIDENT, *supra* note 1, at 217 (“Government oversight must be accompanied by the oil and gas industry’s internal reinvention: sweeping reforms that accomplish no less than a fundamental transformation of its safety culture.”).

150. See UK Report, *supra* note 22, at 12 (recommending the incorporation of environmental expertise into the management of oil companies); Recommendations of the National Commission, *supra* note 17, at 18 (describing possible improvements to the U.S. regulatory regime that would better protect the environment).

151. See Chris Lo, *After Macondo: Emergency Well Capping*, OFFSHORE-TECHNOLOGY.COM, (Jun. 27, 2011), <http://www.offshore-technology.com/features/feature122252/> (“[T]he Marine Well Containment Company (MWCC), a non-profit organisation formed after the Deepwater Horizon disaster and dedicated to improving spill response in the Gulf of Mexico, has developed a containment system for use in the Gulf in the event of an emergency.”) (on file with the Washington and Lee Journal of Energy, Climate, and the Environment); Daniel Schiller, *Well-Containment Group Hires Lobbyist*, THE SCHILLER REPORT, (Nov. 6, 2012), <http://www.schillerreport.com/energy-news/well-containment-group-hires-lobbyist/> (stating that MWCC is a consortium “founded by large oil companies after the 2010 BP spill”) (on file with the Washington and Lee Journal of Energy, Climate, and the Environment).

the BP blowout.¹⁵² This principle would require funding technological research leading to better practices minimizing the risk of major spills in the future.

The commissions' reports also raise the principle of *taking into account high consequence, low probability events*.¹⁵³ This principle should direct the oil company in assessing the risks posed by its operation, as well as the government's regulation agencies in approving such operations.

Finally, both industry and commissions' reports mention the principle of *information and knowledge exchange*.¹⁵⁴ This could require each project to make available information from environmental assessments performed prior to beginning exploration, as well as sharing knowledge with other oil companies, in furtherance of safety. Although nowadays it may seem illogical that oil companies would share their most innovative technologies, this has actually happened before. In 1961, Shell developed the first floating drilling platform,¹⁵⁵ and decided to share the new technology.¹⁵⁶ For \$100,000 each, Shell presented this innovative technology to competitors.¹⁵⁷

This paper suggests that this list of preliminary basic principles should form the basis for establishing a global environmental regulation regime on deepwater offshore oil and gas explorations. Since this list of general principles has emerged from industry practice and government regulation recommendations, it should be representative of some general agreement within industry and government officials.

152. See Recommendations of the National Commission, *supra* note 17, at 6 ("The federal government has relevant expertise . . . that could and should be transferred to the offshore industry.").

153. See UK Report, *supra* note 22, at 13 ("[W]e are concerned that the offshore oil and gas industry is responding to disasters, rather than anticipating worst-case scenarios and planning for high consequence, low-probability events."); Recommendations of the National Commission, *supra* note 17, at 24 ("Oil spill response planning and analysis across the government needs to be overhauled in light of the lessons of the Deepwater Horizon blowout.").

154. See UK Report, *supra* note 22, at 42 ("We would urge the Government to work with regulators in other offshore oil and gas provinces to ensure that the highest standards of safety can be achieved globally through an exchange of best practice lessons."); Recommendations of the National Commission, *supra* note 17, at 4 ("Transparent information and data sharing within the offshore industry and among international regulators is critical to continuous improvement in standards and risk management practices.").

155. TYLER PRIEST, *THE OFFSHORE IMPERATIVE: SHELL OIL'S SEARCH FOR PETROLEUM IN POSTWAR AMERICA* 97 (2007) (describing the successful testing of a system for keeping a floating vessel in place without anchors or mooring lines).

156. See *id.* at 96 ("Shell had pioneered a whole new frontier in offshore drilling, but it could not go at it alone. . . . Thus, in January and February 1963, Shell held an unprecedented three-week 'school' on offshore technology for representatives from industry and government.").

157. See *id.* (The company charged tuition of \$100,000 per company, a sizeable amount of money for the time.").

Once the general principles pertinent to a global environmental regulatory regime have been identified, it will be important to consider whether countries and oil companies have an interest in supporting its establishment. The offshore oil and gas industry is clearly a competitive industry and countries have interests in maintaining a healthy oil market both to supply energy needs and to protect the economy. However, a major oil spill poses a threat to those same interests once the risk is realized. The entire industry is continually assessing risk and attempting to anticipate potential liabilities associated with technological developments.¹⁵⁸

Recognizing the aspect of risk inherently within the operations of offshore oil and gas exploration, the global environmental regulation regime should suggest proper incentives for countries to sign the new document and for oil companies to incorporate it into their internal policies of operations. One possibility of doing this could be by responding to a difficulty within the industry to purchase proper insurance for their high-risk operations.

Despite the fact major oil spills threaten to cause widespread loss, existing insurance options do not provide sufficient coverage of the losses or liabilities that result from such major spills.¹⁵⁹ Low-probability risk with catastrophic potential magnitude if it materializes (like pollution caused by a blowout), is not covered by the available insurance.¹⁶⁰ The largest oil companies often do not purchase the most inclusive insurance to cover their potential pollution liability, in spite of the fact that they are likely to cause the largest harm and incur the largest liabilities.¹⁶¹ For example, BP was in a way self-insured, setting up a \$20 billion compensation fund to pay for the losses caused by the blowout.¹⁶²

In the case of a major spill, the government will pay significant amounts for cleanup and liability, effectively rendering the oil company

158. See W. Kip Viscusi & Richard J. Zeckhauser, *Deterring and Compensating Oil-Spill Catastrophes: The Need for Strict and Two-Tier Liability*, 64 VAND. L. REV. 1717, 1727 (2011) (“The mere magnitudes involved imply significant risk, but beyond that, all work at the frontiers of technology involves techniques, systems, and equipment that have not been tested in the field, imposing new risks that are little understood.”).

159. See Kenneth S. Abraham, *Catastrophic Oil Spills and the Problem of Insurance*, 64 VAND. L. REV. 1769, 1772 (2011) (“In short, there is a mismatch between the losses resulting from oil spills, the insurance available to the victims of spills, the liability of the parties responsible for losses caused by spills, and the insurance available to the parties who face such liability.”).

160. See *id.* at 1771 (describing the gaps in available insurance).

161. See Viscusi & Zeckhauser, *supra* note 158, at 1728 (“Oil spills impose severe external financial and environmental harms that a profit-maximizing firm will not take into full account absent liability and/or government sanctions.”).

162. See Abraham, *supra* note 159, at 1788 (stating that the fact that BP could set up a compensation fund to pay for losses suggests that very large enterprises often do not need full insurance to cover potential liability).

judgment-proof for extreme accidents.¹⁶³ Absent other arrangements, operators will therefore take excessive risks.¹⁶⁴

A global regime that is able to answer this need of the industry, providing more predictability through insurance-type mechanism could attract countries and companies to join. For example, a similar mechanism to that proposed by Viscusi and Zeckhauser could provide the underlying incentive to join the global environmental regulation regime.¹⁶⁵

The Viscusi and Zeckhauser two-tier liability system creates strong financial incentives for safety.¹⁶⁶ Applying an analogous mechanism through the global regime would require oil companies to pay an international coordination body a Prospective Excess Liability fee.¹⁶⁷ The fee would be relative to each company's expected external losses imposed beyond the amount that it will be able to cover by its own funds.¹⁶⁸ Once a company joined the global regime, it would gain access to information, technologies, and the reputation for taking on the most innovative safety measures, in addition to insurance.¹⁶⁹ Countries would gain a safely operated and insured offshore oil and gas exploration industry.¹⁷⁰

163. See Viscusi & Zeckhauser, *supra* note 158, at 1724 (“No corporation has sufficient resources to cover the most extreme potential losses from an accident. In the case of a megacatastrophe, the government will pay significant amounts and/or losses will go uncompensated. The operator is essentially judgment proof for extreme accidents.”).

164. See Viscusi & Zeckhauser, *supra* note 158, at 1722 (stating that the limited potential for liability leads firms to take excessive risk).

165. See Viscusi & Zeckhauser, *supra* note 158, at 1722 (“Our proposal jettisons the current structure of a low damages cap coupled with ineffective regulation. It replaces that system with a greatly expanded level of liability coupled with a tax to provide incentives for risks beyond the liability limit, which we call a two-tier liability system.”).

166. See Viscusi & Zeckhauser, *supra* note 158, at 1722 (“This system creates strong financial incentives for safety.”).

167. See Viscusi & Zeckhauser, *supra* note 158, at 1753 (explaining that a tax could be routinely assessed on oil companies, and placed in a compensation fund “not unlike the current Oil Liability Trust Fund”).

168. See Viscusi & Zeckhauser, *supra* note 158, at 1753 (“[F]or the [tax] to be workable, one must be able to ascertain the distribution of possible harms. . . . Our proposed two-tier liability system would rely on . . . the responsible firm to cover damages, with the money raised by the tax only used for . . . damages exceeding the firm’s financial resources.”).

169. See Viscusi & Zeckhauser, *supra* note 158, at 1753 (“[B]y scaling down the payments to the expected losses rather than the actual losses inflicted, . . . [m]ore companies will pay for the expected prospective damages, including those that do not experience any adverse events, thus creating incentives to foster safe drilling operations.”).

170. It should be mentioned that other insurance mechanisms for major spill risks have been proposed. See, e.g., Abraham, *supra* note 159, at 1789 (analyzing two such proposals). However, of those I have read, the Viscusi and Zeckhauser proposal seems the most adequately applicable to a global regime.

VI. Conclusions

The offshore oil and gas exploration industry has long operated in different areas of the world under disparate regulation regimes. The 2010 BP blowout has highlighted the entangled interests that emerge during major oil spills. A unified, clear, global environmental regulatory regime is required due to the complexity of these offshore operations, and the difficulties of monitoring them.

By cooperating more widely to recognize and to operationalize the emerging principles discussed above, companies and governments could achieve safer operations in areas where environmental regulation is currently weak or non-existent. A measurable advancement in safety through increased international cooperation is especially likely due to the current weakness of state regulators in developing countries that are interested in competing to attract large development projects.

Considering the general character of these emerging principles, they would not be applicable in a legally-binding convention. However, it might be useful to incorporate the principles into a declaration between states, endorsed by oil companies as good practice. Including an insurance mechanism in such a system would create a significant incentive for countries to sign on to this global regime, and for oil companies to endorse it. Due to its ability to facilitate greater certainty and a safer industry, such a regime would positively influence both public and private interests moving forward.