



HARVARD Kennedy School
JOHN F. KENNEDY SCHOOL OF GOVERNMENT

Real-Time Economic Analysis and Policy Development During the BP Deepwater Horizon Oil Spill

Faculty Research Working Paper Series

Joseph E. Aldy

Harvard Kennedy School

September 2011
RWP11-037

The views expressed in the **HKS Faculty Research Working Paper Series** are those of the author(s) and do not necessarily reflect those of the John F. Kennedy School of Government or of Harvard University. Faculty Research Working Papers have not undergone formal review and approval. Such papers are included in this series to elicit feedback and to encourage debate on important public policy challenges. Copyright belongs to the author(s). Papers may be downloaded for personal use only.

www.hks.harvard.edu

September 20, 2011 Draft

Real-Time Economic Analysis and Policy Development During the BP *Deepwater Horizon* Oil Spill

Joseph E. Aldy¹

Assistant Professor of Public Policy, Harvard Kennedy School
Nonresident Fellow, Resources for the Future
Faculty Research Fellow, National Bureau of Economic Research

September 20, 2011

Introduction

Late in the evening of April 20, 2010, the Transocean *Deepwater Horizon*, a mobile drilling rig operating for BP in the Gulf of Mexico's Macondo Prospect, lost control of an exploratory well and suffered a catastrophic blowout. The U.S. Coast Guard immediately dispatched vessels for search and rescue and fire fighting. By early the next morning, as the fire raged on the drilling rig and eleven rig workers remained missing, a senior executive at BP reached out to the White House to inform senior staff of this major accident. On April 22, the drilling rig collapsed and sank nearly a mile to the seafloor resulting in an oil spill that lasted for nearly three months. Soon after an event celebrating Earth Day with environmental leaders on the White House South Lawn, the President met with senior Administration officials in the Oval Office to discuss the oil spill and the government's response. The President tasked his team to mobilize all necessary government assets to search for the lost rig workers, to contain the spill, and to mitigate the economic and environmental harm from the spill. To complement the operational response, the Administration began to develop measures to mitigate the economic risks posed by the oil spill and to assess policy measures that could reduce the risks of future oil spills.

¹ Aldy served as the Special Assistant to the President for Energy and Environment, reporting through the White House National Economic Council and Office of Energy and Climate Change in 2009 and 2010. During the BP *Deepwater Horizon* oil spill, Aldy coordinated the Obama Administration's economic analysis of the oil spill and the legislative policy response to improve offshore drilling safety (including revising the liability regime), undertook analysis to inform and participated in the negotiations over the independent claims facility and escrow account, and engaged oil industry stakeholders on the need for improved deepwater well containment capacity and processes.

Over the course of the spring and summer of 2010, the government managed an unprecedented response to the largest oil spill in U.S. history. The U.S. Coast Guard coordinated the multi-agency response and directed BP, the responsible party, in mobilizing more than 800 specialized skimmers, 120 aircraft, 8,000 vessels, nearly 50,000 responders, and two drilling rigs to drill relief wells.² The response included the deployment of nearly four million feet of boom, numerous controlled burns, effective use of dispersants, and the recovery of nearly one million barrels of oil. An ad hoc team of scientists and experts from U.S. government agencies, Department of Energy national laboratories, BP, and the oil and gas industry designed, evaluated, and executed various well control options. Some of these included a cofferdam, a dome placed above a large leak intended to collect the escaping hydrocarbons; a top kill, where heavy drilling mud is pumped into the top of the well through the choke and kill lines of the blowout preventer; a junk shot, where various material (including golf balls and rubber pieces) are pumped into the bottom of the blowout preventer; and a top hat, a collection device installed atop the severed riser above the blowout preventer.³ In a procedure requiring the removal of the top hat and the remainder of the riser (and temporarily increasing the flow of oil), a so-called capping stack, effectively a modified blowout preventer, stopped the release of oil from the well on July 15, 2010, and a relief well permanently killed the Macondo Prospect well on September 19, 2010.⁴ As the first large-scale test of containing an offshore spill by both the U.S. oil and gas industry and the government agencies responsible for spill response under the policy regime established by the 1990 Oil Pollution Act,⁵ some elements of the response were more effective than others.⁶ There should be no doubt, however, that the aggressive deployment of spill control assets, such as boom and skimmers, and development of

² Press Release, The White House, *Ongoing Responses and Recovery to the Deepwater Horizon Oil Spill* (June 2011).

³ For more details, refer to the discussion of well containment in chapter 5 of the NAT'L COMM'N ON THE BP DEEPWATER HORIZON OIL SPILL & OFFSHORE DRILLING, *DEEP WATER: THE GULF OIL DISASTER AND THE FUTURE OF OFFSHORE DRILLING* 129-71 (2011).

⁴ *Id.* at 161-170.

⁵ 33 U.S.C. §§ 2701-2761 (2006).

⁶ Refer to the recommendations made by the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling. NAT'L COMM'N ON THE BP DEEPWATER HORIZON OIL SPILL & OFFSHORE DRILLING, *supra* note 3, at 249-91.

innovative techniques, such as subsea dispersant application and the eventually successful capping of the well, significantly mitigated the adverse economic and environmental impacts of the spill.

As the operational response proceeded, the Administration undertook a rapid evaluation of the potential economic impacts of the spill and initiated a policy review. In this essay, I review the Administration's assessment of the economic vulnerabilities to the spill, the Administration's May 12, 2010, legislative proposal focused on minimizing the adverse economic impacts to workers and small businesses in the Gulf of Mexico, and the effort to secure an agreement with BP to ensure that those harmed by the spill will receive full compensation. Then, I turn to discuss several of the policy reforms advanced by the Administration to reduce the risks of future catastrophic oil spills. The essay closes with a few policy lessons learned from the BP *Deepwater Horizon* oil spill.

Assessing the Oil Spill's Economic Impacts

In its initial assessment of the spill's impacts, the Administration's economic team focused on vulnerable industries, such as fishing and tourism, and vulnerable infrastructure, such as shipping channels and ports, oil pipelines and port facilities, and industrial facilities along the coast.⁷ Through this effort, the team compiled and reviewed high-frequency data such as weekly unemployment insurance claims, private sector data, such as retail lodging vacancy rates, and historic employment and revenue data for vulnerable industries in the Gulf Coast region.

In evaluating the potential economic impacts of the spill, the economic team did not address the question of potential damages borne by the U.S. government. For example, a Natural Resource Damage Assessment, which is necessary to assess the economic harm experienced by federal and state resource

⁷ The economic team referenced in this essay was coordinated by the National Economic Council and included significant participation by the Council of Economic Advisers, as well as contributions of data and analysis by the Department of Commerce, Department of Energy, Department of Homeland Security, Department of Interior, Department of Labor, Department of Transportation, Department of the Treasury, the Domestic Policy Council, and the Office of Management and Budget.

trustees, was beyond the scope of this effort. The resource trustees did initiate efforts to collect and analyze data on baseline conditions during the period after the spill began and before oil impacted the shoreline. The trustees continue their work in evaluating the environmental damage and will eventually take their case for natural resource damages to the responsible parties.

The fishery industry quickly experienced adverse impacts from the spill. By the first week in May 2010, just as the spring shrimping season began, the State of Louisiana closed some state waters and the federal government closed some federal waters to fishing.⁸ This presented several economic problems that the team analyzed. First, the economic team pulled together data to understand the scope of economic activity associated with Gulf fishing. This included consideration of both commercial and recreational activities that could be affected by the spill and involved addressing several questions such as the following: How did the timing, duration, and geographic coverage of fishery closures map to typical seasonal and locational fishery activities? What impact could this have on related businesses, such as seafood processing facilities and restaurants that use commercially-harvested fish and lodging and other tourism activities associated with recreational fishing? Next, the Administration recognized that consumers might react negatively to Gulf fish due to concerns about oil contamination, even if the fish were harvested in open federal or state fisheries located far from the spill. This motivated the Administration's efforts to enhance Gulf of Mexico seafood testing to assure the public that the fish were safe to eat.⁹

In the end, businesses that relied on coastal tourism experienced significant losses from the fear of oil-covered beaches throughout the Gulf. As one way to assess the effect of the spill, the economic

⁸ Press Release, Nat'l Oceanic & Atmospheric Admin., NOAA Closes Commercial and Recreational Fishing in Oil-Affected Portion of Gulf of Mexico (May 4, 2010), *available at* <http://www.restorethegulf.gov/release/2010/05/04/noaa-closes-commercial-and-recreational-fishing-oil-affected-portion-gulf-mexico>.

⁹ To further signal confidence in the safety of the Gulf Coast harvest, the White House Mess made a point of serving Gulf-sourced seafood – fish and shrimp – during the summer of 2010. In August 2010, the Louisiana Seafood Board served a 30-foot shrimp-and-oyster po boy sandwich to White House staff. Colleen Rush, *30-Foot Po-Boy Served at White House*, NEWORLEANS.COM (Aug. 12, 2010, 5:11 PM), <http://dining.neworleans.com/2010/08/30-foot-po-boy-served-at-white-house/>.

team obtained vacancy data for many hotels on the Gulf Coast. While some hotels in Louisiana experienced a decline in vacancies from the year before (reflecting both a weak 2009 tourism season and the concentration of spill response activity in Louisiana), beach destinations further east, in Mississippi, Alabama, and Florida, appeared to be taking an economic hit despite never witnessing oil.¹⁰

Given significant uncertainties about the duration, magnitude, and location of spill impacts, understanding potentially vulnerable infrastructure served a key role in informing both the operational response to and the economic assessment of the spill. The Macondo Prospect spilled oil about fifty miles south of the Mississippi River, a major shipping channel. The Coast Guard established procedures for inspecting and, if necessary, cleaning the hulls of vessels to prevent oil from being carried upstream into freshwater and ports.¹¹ This informed the economic team's assessment of potential adverse impacts of shipping delays that could occur if sufficient amounts of oil moved toward the Mississippi River and the Intracoastal Waterway. The Coast Guard established several monitoring and cleaning stations to minimize the risk of oil carried up-river and to limit the length of shipping delays if cleaning became necessary.¹²

The Department of Homeland Security shared its evaluation of potentially vulnerable infrastructure, beyond the ports and shipping lanes covered by the U.S. Coast Guard. For example, a number of power plants and manufacturing facilities situated on the shoreline use Gulf of Mexico water in the production process and could have had to shut down if impacted by a sufficient quantity of oil.

¹⁰ David Segal, *Should the Money Go Where the Oil Didn't?*, N.Y. TIMES, Oct. 24, 2010, at BU1,

¹¹ The U.S. Coast Guard's Maritime Transportation System Recovery Unit focuses on restoring the commercial capacity of waterways after a natural or manmade disruption of activity pursuant to the National Maritime Transportation Security Plan, 46 U.S.C.A. § 70103 (West 2011) and the Maritime Transportation Security Act of 2002, Pub. L. No. 107-295, 116 Stat. 2064 (2002).

¹² In May 2010, NOAA began to survey sites for anchoring vessels for inspection and, if necessary, oil decontamination. Press Release, Nat'l Oceanic & Atmospheric Admin., NOAA Surveys Proposed New Ship Anchorage Site for Vessel Decontamination (May 28, 2010), *available at* <http://www.restorethegulf.gov/release/2010/05/28/noaa-surveys-proposed-new-ship-anchorage-site-vessel-decontamination>. By June 2010, the Coast Guard had established 17 stations for decontamination of vessels. See Press Release, Unified Command, Vessel Decontamination Stations Available Around Louisiana (June 20, 2010), *available at* <http://www.restorethegulf.gov/release/2010/06/20/vessel-decontamination-stations-available-around-louisiana>.

This information also assisted the operational response, including the deployment of assets, such as boom and skimmers, to minimize these economic risks.

The economic team closely followed potential impacts of the spill on the oil market. First, the spill posed risks to oil-related infrastructure. During the first week of the spill, the Nakika crude oil pipeline, which runs on the seafloor near the Macondo Prospect and transports about 75,000 barrels per day, was shut down as a precautionary measure due to concern that debris from the oil rig could damage it.¹³ In addition, some tanker operators expressed concern about traversing oil-sheen waters to access to the Louisiana Offshore Oil Port (“LOOP”), the only major U.S. offshore oil facility that typically handles more than one million barrels per day of oil imports. Regular monitoring of the LOOP, northwest of the Macondo Prospect, informed both the economic team and those in the Coast Guard responsible for responding to risks posed by oil sheen to oil tankers.¹⁴

Second, the team tracked crude oil futures markets on a daily basis, including the front-month contract price, which is a high-quality predictor of spot prices, and more distant futures and options contracts to assess expectations about oil prices. The regular analysis of these markets presented policymakers with an understanding of expected (average) prices over the next few months, as well as the probability that the price of oil would exceed a specified level (e.g., \$100 per barrel) over the coming months.¹⁵ The price of oil did not change much in response to the oil spill or to spill-related news over the course of the summer. Crude oil prices averaged about \$76 per barrel during the nearly three months that oil spilled from the Macondo Prospect, about \$4 per barrel less than the average price of oil

¹³ Joshua Schenyer, *Shell Oil Pipeline, Platform Restart in U.S. Gulf*, REUTERS, Apr. 27, 2010, <http://www.reuters.com/article/2010/04/27/oil-shell-pipeline-idUSN2725289620100427>

¹⁴ Bruce Nichols, *LOOP Offshore Oil Port Staying Open Despite Spill*, REUTERS, June 3, 2010, <http://www.reuters.com/article/2010/06/03/oil-spill-loop-idUSN0352654020100603>.

¹⁵ U.S. ENERGY INFO. ADMIN., *SHORT-TERM ENERGY OUTLOOK: ENERGY PRICE VOLATILITY AND FORECAST UNCERTAINTY (May 2010)*, http://www.eia.gov/emeu/steo/pub/uncertainty/may10_uncertainty.pdf.

from January 1, 2010, through April 20, 2010.¹⁶ A variety of other economic factors—such as the risk of Greek debt default and weak U.S. employment data—appeared to drive crude oil prices in the spring and summer of 2010.

Mitigating the Oil Spill’s Economic Impacts

As the economic team developed its assessment of real-time and near-term potential economic impacts of the spill, the Administration proposed a legislative package to enhance the federal government’s capacity to respond to the spill, including its ability to mitigate the economic harm to fishermen, small businesses, and those left unemployed by the spill. On May 12, 2010, the Administration submitted to Congress its legislative proposal.¹⁷ The assistance component of the policy response focused on a variety of measures, some of which were similar to what is available after a Stafford Act declaration for a natural disaster.

When there is a natural disaster, such as a tornado or a hurricane, there isn’t a “responsible party” as there is with an oil spill. After a natural disaster, the Federal Emergency Management Agency provides resources to assist those who have lost their jobs, property, etc. under the Stafford Act.¹⁸ The Administration’s unemployment assistance proposal for the oil spill, modeled after unemployment assistance under the Stafford Act, was designed to benefit immediately those who were potentially ineligible for standard unemployment insurance (e.g., the self-employed). It also included a provision that would allow the U.S. government to recoup unemployment assistance expenditures from the

¹⁶ Declining oil prices moving from spring into summer 2010 countered the typical seasonal trend in the United States. Over 2000-2009, crude oil prices during the May-August months averaged about 17% more than crude oil prices during the January–April months.

¹⁷ OFFICE OF MGMT. & BUDGET, EXEC. OFFICE OF THE PRESIDENT, FY 2010 SUPPLEMENTAL PROPOSAL IN THE FY 2011 BUDGET (2010) [hereinafter FY 2010 SUPPLEMENTAL PROPOSAL], *available at* http://www.whitehouse.gov/sites/default/files/omb/assets/budget_amendments/supplemental_05_12_10.pdf; Press Release, The White House, Fact Sheet: Deepwater Horizon Oil Spill Legislative Package (May 12, 2010), *available at* <http://www.whitehouse.gov/the-press-office/fact-sheet-deepwater-horizon-oil-spill-legislative-package>.

¹⁸ 42 U.S.C. §§ 5121-5206 (2006).

responsible party. In doing so, the proposal to assist the unemployed mirrored the provisions under the Stafford Act while maintaining financial liability for the responsible party. In a similar fashion, the Administration proposed to expand the coverage of the Supplemental Nutrition Assistance Program (“SNAP”) by replicating the use of this assistance tool under a Stafford Act natural disaster declaration. Like the unemployment assistance provision, the oil spill SNAP provision permitted the U.S. Government to seek full payment by the responsible party for all SNAP expenditures associated with the oil spill.¹⁹

The economic environment on the Gulf Coast and ambiguity about compensation by the responsible parties made near-term assistance essential. For example, anecdotal evidence showed that many fishermen were cash-strapped after making investments to recover from the 2005 and 2008 hurricane seasons that damaged many fishing vessels and related assets.²⁰ Without some form of support, a lost fishing season could have devastating effects on some of these fishermen and their families. To ameliorate these problems, the Administration proposed \$15 million in fishery disaster aid, conditioned upon the declaration of a disaster and triggered when compensation by the responsible parties is insufficient. On May 24, 2010, the Secretary of Commerce declared a fisheries disaster under the Magnusson-Stevens Fishery Conservation and Management Act,²¹ and Congress appropriated \$15 million for fisheries disaster aid on July 29, 2010.²²

To address concerns about seafood contamination, potentially resulting in reduced demand for Gulf Coast harvested fish, the Administration implemented an extensive seafood testing protocol in the Gulf and proposed additional funding for the Food and Drug Administration to monitor and respond to

¹⁹ Congress did not pass legislation establishing these new authorizations and appropriating funds.

²⁰ Refer to the discussion of impacts on fishing communities in NAT’L COMM’N ON THE BP DEEPWATER HORIZON OIL SPILL & OFFSHORE DRILLING, *supra* note 3, at 193.

²¹ 16 U.S.C. § 1861a (2006); Press Release, Dep’t of Commerce, Secretary Locke Announces Fishery Failure Determination in Gulf of Mexico (May 24, 2010), *available at* <http://www.commerce.gov/blog/2010/05/24/secretary-locke-announces-fishery-failure-determination-gulf-mexico>.

²² Supplemental Appropriations Act of 2010, Pub. L. No. 111-212, § 2004, 124 Stat. 2302, 2338 (2010).

the adverse environmental health impacts from the spill. Congress provided \$2 million in supplemental appropriations for the salaries and expenses incurred from this enhanced testing activity.²³

These elements of the Administration's proposal complemented various forms of assistance available through existing programs. For example, the Small Business Administration made economic injury disaster loans available to small businesses in Louisiana within weeks of the start of the spill.²⁴ The Coast Guard also attempted to orient spill response activities to those impacted by the spill. The Coast Guard worked with BP to implement the Vessels of Opportunity Program, which contracted local commercial and charter fishing vessels for use in spill response and thus created employment opportunities for many fishermen impacted by the fisheries' closure.²⁵

This focus on providing supplemental resources to assist those most impacted by the oil spill reflected a weakness in the status quo legal framework. When family and financial needs are dire, the timing of the compensation process under the Oil Pollution Act of 1990 may be too slow. For example, a harmed party can submit a claim to a responsible party, which may take up to ninety days to process and can still result in rejection of the claim.²⁶ The harmed party could then go to the Oil Spill Liability Trust Fund ("OSLTF"), and potentially wait another ninety days before receiving compensation.²⁷ If the harmed party is not satisfied by the compensation offered by either the responsible party or the OSLTF, then the party can go to the courts with an unknown time until resolution. This is further complicated by the ambiguity about whether the responsible parties in the BP *Deepwater Horizon* oil spill would pay

²³ *Id.* at tit. II, 124 Stat. at 2336.

²⁴ Press Release, Small Bus. Admin., SBA Makes Economic Injury Assistance in More La. Parishes (May 12, 2010), available at <http://www.restorethegulf.gov/release/2010/05/12/sba-makes-economic-injury-assistance-more-la-parishes>.

²⁵ BP, FACTSHEET ON BP VESSELS OF OPPORTUNITY PROGRAM 1 (2010), http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/incident_response/STAGING/local_assets/downloads_pdfs/factsheet_bp_vessels_of_opportunity_program.pdf.

²⁶ 33 U.S.C. § 2713(c)(2) (2006).

²⁷ NAT'L POLLUTION FUNDS CTR., U.S. COAST GUARD, CLAIMANT'S GUIDE: A COMPLIANCE GUIDE FOR SUBMITTING CLAIMS UNDER THE OIL POLLUTION ACT OF 1990 6 (rev. Nov. 2009), available at <http://www.uscg.mil/npfc/docs/PDFs/urg/Ch6/NPFCClaimantGuide.pdf>.

more than \$75 million in economic damages, the limit on liability under the Oil Pollution Act.²⁸

Imposition of a limit on liability would mean that taxpayers or those harmed would have to bear any damages exceeding \$75 million.²⁹

Establishing an Independent Claims Facility and Escrow Account

By early May 2010, Lamar McKay, the President of BP America, stated in a Congressional hearing that BP “is committed to paying legitimate claims for other loss and damages caused by the spill,” which signaled that BP would go beyond the \$75 million liability limit under the Oil Pollution Act of 1990.³⁰ These statements did not eliminate uncertainty about both BP’s liability and the operation of the claims and compensation process. Would BP actually go beyond \$75 million? If BP did so, how would that affect an assessment of gross negligence or violation of an applicable government regulation that serve as the two bases for removing the liability limit under the Oil Pollution Act of 1990?³¹ For claims paid beyond \$75 million, would BP go to the OSLTF and try to recover those expenditures?³²

The residents of the Gulf, politicians in Washington, D.C., and BP’s investors remained concerned about uncertainty regarding the compensation to those harmed by the oil spill. By June 2010,

²⁸ 33 U.S.C. § 2704 (2006). Note that the \$75 million limit on liability for economic damages does not apply in the cases of gross negligence or the violation of an applicable Federal safety, construction, or operating regulation.

²⁹ In the case of the BP *Deepwater Horizon* oil spill, if the responsible parties did not pay for damages in excess of \$75 million, then harmed parties could make claims to the Oil Spill Liability Trust Fund. NAT’L POLLUTION FUNDS CTR., *supra* note 27, at 4. The payouts from the OSLTF for economic damages and government-incurred clean-up costs (including those subsequently reimbursed by the responsible parties) cannot exceed \$1 billion per spill under the Internal Revenue Code of 1986. 26 U.S.C. § 9509(c)(2)(A) (2006). With U.S. government clean-up costs of about \$700 million through May 2011, *see* U.S. DEP’T OF HOMELAND SEC., U.S. COAST GUARD, BILL N10036-009-11 (May 10, 2011), *available at* <http://www.restorethegulf.gov/sites/default/files/documents/pdf/bp-bill-11.pdf>, this would have resulted in available funds for damage compensation of about \$300 million. The parties with the balance of damages would have gone uncompensated unless the government appropriated additional monies to keep them whole.

³⁰ *Written Testimony: Hearing Before the S. Energy & Natural Res. Comm.*, 111th Cong. 8 (2010), *available at* http://energy.senate.gov/public/_files/McKayTestimony051110.pdf.

³¹ 33 U.S.C. § 2704(c)(1) (2006).

³² 33 U.S.C. § 2708 (2006) permits the responsible party to assert a claim if the limit on liability applies and its removal (clean-up) costs and damages exceed the amount of the limit established in 33 U.S.C. § 2704.

anecdotes of frustration with BP's claims process from Gulf residents became more common.³³ BP's market capitalization had fallen by half, from about \$190 billion on April 20, 2010, to about \$95 billion by mid-June 2010. BP's bonds and credit default swaps traded as if the company had lost its investment-grade rating, and, in some cases, there were emerging problems of finding counterparties for the credit default swaps (i.e., sellers of such derivatives on BP corporate bonds experienced difficulty in finding willing buyers).³⁴ Members of Congress expressed skepticism about BP's willingness and ability to compensate for the harm caused by the spill, with some speculation among politicians and Wall Street analysts that BP would declare bankruptcy.³⁵

To resolve this legal and economic uncertainty, on June 16, 2010, the President convened a meeting with BP's Chairman of the Board, BP's senior management, Vice President Biden, and senior Administration officials to negotiate the claims and escrow process. After an initial discussion, a smaller group consisting of a few White House senior staff, one of the top lawyers from the Department of the Justice, and the Coast Guard Commandant, worked with BP to negotiate the parameters of the agreement. The one-page fact sheet issued by the White House represented the framework of the agreement that was elaborated on by Department of Justice staff attorneys and BP.³⁶

The June 16, 2010, agreement transferred the processing of claims from BP to a new, independent entity headed by Kenneth Feinberg, who had previously led the September 11th Victim Compensation Fund. Responsibilities of this new facility included developing and publishing its own standards for claims and establishing a three-judge panel to review appeals of the facility's decisions.

³³ John Leland, *Local Officials Simmer Over BP Recovery Efforts*, N.Y. TIMES, June 5, 2010, at A20.

³⁴ John Detrixhe & Shannon D. Harrington, *BP Trades as Junk, Credit-Default Swaps Invert: Credit Markets*, BLOOMBERG BUSINESSWEEK, June 10, 2010, <http://www.bloomberg.com/news/2010-06-10/bp-junked-by-bond-investors-as-credit-default-swaps-invert-credit-markets.html>.

³⁵ Andrew Ross Sorkin, *Imagining the Worst in BP's Future*, N.Y. TIMES, June 8, 2010, at B1; Sumeet Desai, *British PM Fears BP's 'Destruction,' Stock Plunges*, REUTERS, June 25, 2010, <http://www.reuters.com/article/2010/06/25/us-oil-spill-idUSN1416392020100625>. While bankruptcy risk did not appear likely given the productivity of BP's assets outside of the Macondo Prospect, some had speculated more credibly about takeover risk. This could have impacted spill response operations and corporate policy on compensation and claims in unknown ways.

³⁶ Press Release, The White House, Fact Sheet: Claims and Escrow (June 16, 2010), *available at* <http://www.whitehouse.gov/the-press-office/fact-sheet-claims-and-escrow>.

Individuals and businesses had the option to submit claims to the independent facility, but they retained their rights to take the responsible party to court or to submit a claim to the Oil Spill Liability Trust Fund if unsatisfied with the independent claims facility's decision. BP continued to handle claims by local, state, tribal, and federal governments.

The agreement also established a \$20 billion escrow account that represented neither a floor nor a ceiling on BP's liability for damages.³⁷ The escrow paid both claims processed through the independent claims facility and claims for economic liability determined through negotiations between BP and natural resource trustees, which remained beyond the scope of coverage of the claims facility. In addition, BP had the ability to draw from the escrow to pay for local- and state-requested spill response costs.³⁸ BP agreed to fund the \$20 billion escrow account at a rate of \$5 billion per year over four years and provide U.S. assets as collateral. Given the tremendous uncertainties at that time about the duration and magnitude of the spill, and hence the ultimate economic damages, the \$20 billion figure was consistent with the economic team's review of more than a half dozen financial institutions' damage estimates, which by June 2010, were in the \$10 to \$20 billion range.³⁹

This agreement had a very important impact for the people of the Gulf, for BP, and for the Administration. With this deal, BP provided assurance for their investors. This deal helped to reassure many people residing along the Gulf Coast. BP had a concrete, public plan to show that they had the intent and the means to compensate those harmed by the spill. The creation of the independent claims facility addressed many of the criticisms of BP's initial claims effort. In effect, it reflected a recognition that damage claims are not a part of the core competency of BP, so BP should exit the business of reviewing and processing claims. While the Feinberg claims facility has experienced a few criticisms as

³⁷ *Id.*

³⁸ This final category of local and state response costs reflected BP's concerns that state requests, such as Louisiana's request to construct berms, could become very expensive (if not very effective).

³⁹ Most of the published estimates are available only in for-pay analyst reports. According to Andrew Ross Sorkin, *supra* note 35, Credit Suisse estimated BP's economic damage claims for gulf fishermen and the tourism industry at \$14 billion.

well, it has worked fairly well and certainly better than its predecessor.⁴⁰ This may be best evidenced by the fact that some believe the fund has been too stringent, slow, and unfair in distributing monies,⁴¹ while BP has argued that the fund has been too generous.⁴²

Reducing the Risk of Future Oil Spills

Over the past few decades, technological innovations have significantly advanced the exploration and production of hydrocarbons in deep water. In 1980, the maximum water depth drilled in the Gulf of Mexico was about two thousand feet. In 1990, the maximum water depth exceeded six thousand feet, and over the past ten years, the maximum water depth of offshore wells has ranged near ten thousand feet.⁴³ Technological progress on the resource extraction dimension, especially into fundamentally new frontiers, such as depths measured in miles in pitch black deep-water environments with pressures several orders of magnitude greater than the pressure at sea level, suggests the value in pushing on technological innovation in the safety dimension as well.

Promoting safety in offshore drilling to reduce the risk of future oil spills will require active involvement by the industry. Of course, the government expects the private sector to implement the

⁴⁰ In addition to the creation of the \$20 billion escrow account and the Gulf Coast Claims Facility operated by Feinberg, BP also agreed on June 16 to create a \$100 million Rig Worker Assistance Fund to benefit those workers temporarily unemployed as a result of the deepwater drilling suspension that occurred from May through October 2010. Claims made by rig workers only totaled about \$5 million in 2010. This fund expanded its coverage in 2011 to provide assistance to workers who provided support to offshore drilling rigs, and interest in this second round continued to be very modest. See David Hammer, *Offshore Workers Shun Aid from BP*, TIME-PICAYUNE (New Orleans), May 9, 2011, at A1, available at http://www.nola.com/news/index.ssf/2011/05/bps_rig_worker_assistance_fund.html (last visited Sept. 5, 2011).

⁴¹ Moira Herbst, *For \$20 Billion BP Claims Fund, Legal Challenges Loom*, REUTERS, Apr. 21, 2011, <http://uk.reuters.com/article/2011/04/20/uk-oil-spill-fund-idUKTRE73J76A20110420>.

⁴² Catherine Clifford, *BP: Gulf Oil Spill Payments Are Too Generous*, CNNMONEY, Feb. 17, 2011, http://money.cnn.com/2011/02/17/smallbusiness/bp_payments_generous/index.htm.

⁴³ *A Brief History of Offshore Oil Drilling*, (Nat'l Comm'n on the Deepwater Horizon Oil Spill & Offshore Drilling, Staff Working Paper No. 1, 2010, at 10, 12, available at <http://www.oilspillcommission.gov/sites/default/files/documents/A%20Brief%20History%20of%20Offshore%20Drilling%20Working%20Paper%208%2023%2010.pdf> (last visited Sept. 5, 2011).

promulgated safety regulations.⁴⁴ More importantly, the private sector has the resources and the technological expertise to develop new safety processes, procedures, and equipment. It's important to recognize the value in tapping the expertise within the industry because the private sector has a significant information advantage over government regulators in offshore drilling. Given this information asymmetry, the government could promote a safer drilling regime by creating the incentive for the private sector to police itself. Some may counter that the industry shouldn't have sole authority to police itself—a critique commonly made of the cozy relationship between the oil industry and the old Minerals Management Service in the mid-2000s.⁴⁵ But, the government can establish a regulatory environment that maintains government oversight, takes advantage of the industry's expertise, and shapes the economic incentives to deliver a much safer drilling regime.⁴⁶

Containing Future Deep-water Wild Wells

⁴⁴ The Department of the Interior issued two safety-related Notices to Lessees in June 2010 (NTL No. 2010-N05, NTL No. 2010-N06) to enhance the safety of offshore drilling. U.S. DEP'T OF THE INTERIOR, MINERALS MGMT. SERV., NATIONAL NOTICE TO LESSEES AND OPERATORS OF FEDERAL OIL AND GAS LEASES, OUTER CONTINENTAL SHELF (OCS): INCREASED SAFETY MEASURES FOR ENERGY DEVELOPMENT ON THE OCS (2010), *available at* <http://www.doi.gov/deepwaterhorizon/upload/FINAL-Safety-Measures-NTL.pdf>; U.S. DEP'T OF THE INTERIOR, MINERALS MGMT. SERV., NATIONAL NOTICE TO LESSEES AND OPERATORS OF FEDERAL OIL AND GAS LEASES, OUTER CONTINENTAL SHELF (OCS): INFORMATION REQUIREMENTS FOR EXPLORATION PLANS, DEVELOPMENT AND PRODUCTION PLANS, AND DEVELOPMENT OPERATIONS COORDINATION DOCUMENTS ON THE OCS (2010), *available at* <http://www.doi.gov/deepwaterhorizon/loader.cfm?csModule=security/getfile&pageid=35724>. In addition, the Department promulgated a Drilling Safety Rule and a Workplace Safety Rule in September 2010. Press Release, Dep't of the Interior, Salazar Announces Regulations to Strengthen Drilling Safety, Reduce Risk of Human Error on Offshore Oil and Gas Operations (Sept. 30, 2010), *available at* <http://www.doi.gov/news/pressreleases/Salazar-Announces-Regulations-to-Strengthen-Drilling-Safety-Reduce-Risk-of-Human-Error-on-Offshore-Oil-and-Gas-Operations.cfm> (last visited Sept. 5, 2011).

⁴⁵ See, e.g., *Establishing Office of Inspector General Oversight for MMS' Royalties Collection Program: Hearing Before the Subcomm. on Energy & Mineral Resources*, 110th Cong. (2008) (statement of the Honorable Earl E. Devaney, Inspector Gen., U.S. Dep't of the Interior), *available at* http://www.doi.gov/images/stories/pdf/TESTIMONY%20for%20March%202011_2008%20MMS%20hearing.pdf.

⁴⁶ For a more extensive review of the information asymmetry problem and the need to orient private sector incentives toward the socially optimal level of safety, see W. Kip Viscusi and Richard J. Zeckhauser, *Strict and Tiered Liability for Catastrophic Environmental Risks: Lessons from the BP Deepwater Horizon Oil Spill*, 64 VAND. L. REV. ____ (2011).

The BP *Deepwater Horizon* oil spill demonstrated that technological innovation on the safety dimension had not kept up with innovation on extraction in deep water.⁴⁷ Neither the government nor the industry had the tools to contain a wild well in deep water. With the exception of a relief well—drilling a new well to intercept the wild well at the bottom of the wellbore near the hydrocarbon field, which would require three months or more for deep fields like the Macondo Prospect—there were no off-the-shelf, ready-to-go well containment measures for a deep-water wild well. In a press conference on May 27, 2010, President Obama proposed an industry consortium develop the technology necessary to contain future deep-water spills. This reflected the view that neither the public nor the Administration (nor, for that matter, Members of Congress from both sides of the political aisle) would have the patience to tolerate a technological response, such as a relief well, taking three months or more to stop a well from gushing oil into the Gulf of Mexico in the future.

The President's suggestion of an industry consortium would improve the safety of offshore drilling by tapping into private sector technical expertise. By drawing on the resources and knowledge of multiple companies, this approach could also spread the costs of containment capacity across the industry. Given the public-good nature of an investment in deep-water well containment, individual firms may face inadequate incentives to develop their own capacity.⁴⁸ The perception of a small probability for catastrophic loss-of-well-control events like the BP *Deepwater Horizon* oil spill also suggests that multiple, redundant deep-water well containment regimes may be socially excessive.

In June 2010, the White House hosted several meetings with oil companies to discuss well containment, lessons from the industry's Marine Spill Response Corporation ("MSRC"), and the need to

⁴⁷ For further elaboration of this point, see *Response/Clean-Up Technology Research and Development and the BP Deepwater Horizon Oil Spill* (Nat'l Comm'n on the BP Deepwater Horizon Oil Spill & Offshore Drilling, Staff Working Paper No. 7 2011), available at <http://www.oilspillcommission.gov/sites/default/files/documents/Updated%20Response%20RD%20Working%20Paper.pdf>.

⁴⁸ Any individual firm that invests in deep-water well containment capacity may face significant industry, public, and political pressure to deploy its assets for another drilling company that lacks such resources and has a deep-water wild well.

fill this gap in the offshore drilling safety regime. The MSRC serves as one example of how a deep-water well containment consortium could work. In response to the Oil Pollution Act of 1990, which required facilities and vessels to have resources to respond to a “worst case discharge,”⁴⁹ the oil industry created the MSRC. This entity invests in boom, skimmers, *in situ* burn equipment, dispersants, full-time personnel, etc. As a part of the spill response plans required by the government before a firm can secure a drilling permit, the firm operating the lease must show that it has access to adequate spill response resources in the event of a spill. Many firms, including BP, use the MSRC as their means (or part of their means) for complying with this statutory mandate. Unfortunately, for the case of the BP *Deepwater Horizon* oil spill, the MSRC did not have assets or a plan for deep-water wellhead containment.

To their credit, ExxonMobil led an effort with Chevron, ConocoPhillips, and Shell to mobilize significant financial and human resources to launch the Marine Well Containment Company (“MWCC”) in July 2010. The MWCC has since integrated BP—and its containment resources developed in response to the *Deepwater Horizon* oil spill—for an interim response capacity. As of June 2011, the membership of the MWCC had expanded to include Anadarko, Apache, BHP Billiton, Hess, and Statoil, and the ten firms in total represent about seventy percent of the deep-water wells drilled in the Gulf of Mexico between 2007 and 2009.⁵⁰ The members have equal ownership in the MWCC. Non-members may pay a fee for access to the MWCC resources on a per-well basis. The MWCC plans to have an expanded well containment system available in 2012.

The availability of deep-water well containment, while a necessary investment in light of the known risks of deepwater drilling, could result in moral hazard by some firms operating in the Gulf of Mexico. To mitigate this possibility, the MWCC could require obligations by member firms beyond simply paying annual dues. For example, access to the MWCC “club” could be predicated on operators

⁴⁹ 30 C.F.R. §254 (2011).

⁵⁰ Press Release, Marine Well Containment Co., Marine Well Containment Company Establishes Membership (April 19, 2011), *available at* http://marinewellcontainment.com/pdfs/US-MWCC_Establishes_Membership_041811.pdf.

satisfying a third-party, private sector safety review. Drawing from industry expertise in undertaking inspections could result in safer drilling operations and could be more effective than government inspections. Developing the technical capacity to contain a deep-water wild well should not weaken incentives for safe drilling operations. It should also be recognized that the MWCC does not remedy the inadequate incentives for safety under the current law's liability regime.⁵¹

Promoting Safer Drilling Through an Improved Liability Regime

The Oil Pollution Act of 1990 provides insufficient incentives for firms to mitigate the potential harm from offshore drilling by limiting liability to \$75 million for damages.⁵² Limiting liability represents an implicit subsidy for offshore oil and gas development. The Administration proposed removing the limit on liability.⁵³ This would provide a stronger financial incentive for improved safety and would also increase the likelihood that liable private firms, as opposed to taxpayers, would compensate those harmed by future spills. By removing the liability limit, major shareholders and senior management of firms engaged in offshore drilling may elevate the importance of drilling safety within their company operations and in their business relationships (e.g., among lease operators, rig operators, and various contractors). This could yield a more effective culture of safety by motivating a more systems-oriented

⁵¹ See Robert Anderson et al., *Organizational Design for Spill Containment in Deepwater Drilling Operations in the Gulf of Mexico: Assessment of the Marine Well Containment Company* (Res. for the Future Discussion Paper 10—63, 2011) for recommendations on the design, implementation, and oversight of deepwater well containment capacity and procedures.

⁵² 33 U.S.C. § 2704(a)(3) (2006). For a brief overview of oil spill liability, see NATHAN RICHARDSON, DEEPWATER HORIZON AND THE PATCHWORK OF OIL SPILL LIABILITY LAW (2010), available at <http://www.rff.org/rff/documents/RFF-BCK-Richardson-OilLiability.pdf> (last visited Sept. 5, 2011).

⁵³ FY 2010 SUPPLEMENTAL PROPOSAL, *supra* note 17; OFFICE OF MGMT. & BUDGET, EXEC. OFFICE OF THE PRESIDENT, STATEMENT OF ADMINISTRATION POLICY: H.R. 3534—CONSOLIDATED LAND, ENERGY AND AQUATIC RESOURCES ACT OF 2010 (2010), available at http://www.whitehouse.gov/sites/default/files/omb/legislative/sap/111/saphr3534r_20100729.pdf; Press Release, The White House, Fact Sheet: Deepwater Horizon Oil Spill Legislative Package (May 12, 2010), available at <http://www.whitehouse.gov/the-press-office/fact-sheet-deepwater-horizon-oil-spill-legislative-package> (last visited Sept. 5, 2011).

approach to safety on drilling rigs through the integration of technology, process, and management safety considerations.⁵⁴

A recent Supreme Court case complicates efforts to apply a change to the liability regime to the thousands of active oil and gas leases in the Gulf of Mexico. In the *Mobil Oil* case, decided in the year 2000, the majority opinion of the Court found that the U.S. government would be in breach of contract if existing leases were subjected to future regulations under new statutes.⁵⁵ While there is some ambiguity whether this interpretation applies to legislative modifications to existing provisions of the Oil Pollution Act of 1990, some legal commentators have identified this as a challenge to a new liability regime for existing Gulf of Mexico operations.⁵⁶ An appropriate policy that transitions from the existing liability regime to a new regime without limits on liability could be necessary.

As the White House worked with the Senate on oil spill legislation, some stakeholders expressed an interest in integrating a mutual insurance entity with a change in the liability regime. For example, in a future, large oil spill, the responsible party would be responsible for an initial tranche of damage liability (i.e., an insurance deductible), the mutual would be responsible for the second tranche (i.e., an insurance payout subject to a cap), and any residual liability would revert back to the responsible

⁵⁴ The Department of the Interior promulgated a regulation in September 2010 mandating Safety and Environmental Management Systems. Press Release, U.S. Dep't of the Interior, *supra* note 46. These are generally consistent with the recommendation of The National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling for operators in U.S. waters to implement the "safety case" model to drilling based on the UK and Norwegian experience. NAT'L COMM'N ON THE BP DEEPWATER HORIZON OIL SPILL & OFFSHORE DRILLING, *supra* note 3, at 252.

⁵⁵ *Mobil Oil Exploration & Producing Se., Inc. v. United States*, 530 U.S. 604, 620 (2000).

⁵⁶ *The Risky Business of Big Oil: Have Recent Court Decisions and Liability Caps Encouraged Irresponsible Corporate Behavior?: Hearing Before the S. Comm. on the Judiciary*, 111th Cong. (2010) (statement of W. Jackson Coleman, Managing Partner, EnergyNorthAmerica), available at <http://judiciary.senate.gov/pdf/10-06-08ColemansTestimony.pdf> (last visited Sept. 5, 2011). As an example of this interpretation beyond the liability context, the Congressional Budget Office's budget score of H.R. 3534 notes that a significant fraction of revenues raised through a new per barrel conservation fee applied to existing leases would be offset through litigation premised on the *Mobil Oil* decision. Consolidated Land, Energy, and Aquatic Resources Act of 2010, H.R. 3534, 111th Cong. § 802 (2010); Letter from Douglas W. Elmendorf, Dir., Cong. Budget Office, to John M. Spratt, Jr., Chairman, Comm. on the Budget, U.S. House of Representatives (July 27, 2010), available at <http://www.cbo.gov/ftpdocs/117xx/doc11709/SprattLtrhr3534.pdf> (last visited Sept. 5, 2011).

party.⁵⁷ Such an approach could be appealing if the mutual insurance provided credible third-party inspections of drilling operations that drew from private sector expertise to complement government safety inspections.

This could be similar, in part, to the liability regime for civilian nuclear power under the Price-Anderson Nuclear Industries Indemnity Act.⁵⁸ There are three important differences between the Price-Anderson Act's approach and what the Administration considered supporting during talks with Congressional staff in 2010. First, the Price-Anderson Act capped total damage liability at about \$12 billion in 2011, which may not be sufficient to cover all potential economic damages of a nuclear accident and thus may not deliver sufficient safety incentives.⁵⁹ The Administration unambiguously supported eliminating the cap on damage liability for offshore drilling. Second, the Price-Anderson Act's scheme does not operate as a mutual. Instead of paying regular premiums for insurance, nuclear power plant operators only pay into a compensation fund and, in the event of a disaster at a facility in the nuclear industry, these monies go to cover the damages that exceed the initial \$375 million that are the responsibility of the operator of the facility with the accident. Given the existing insurance market for offshore drilling (and, by extension, the reinsurance market that could support a mutual), any new regime should maintain actual insurance requirements and include a full-functioning mutual insurance company. Third, it's important to create the capacity for the mutual to inspect and ensure high levels of

⁵⁷ In other words, this system of liability and insurance is very similar to what most Americans face with respect to auto insurance. If a driver is found to be at fault in an accident, then the responsible driver pays a deductible (first tranche of liability), then the insurance company makes further necessary payments subject to the limits of insurance coverage (second tranche of liability). If the damages exceed the limits of coverage for collision insurance, then the liability for the remainder reverts to the responsible driver (final tranche of liability).

⁵⁸ 42 U.S.C. § 2210 (2006).

⁵⁹ See Geoffrey Heal & Howard Kunreuther, *Environmental Assets and Liabilities: Dealing with Catastrophic Risks* 14 (Wharton Sch. Working Paper No. 2008-11-06, 2008), available at http://opim.wharton.upenn.edu/risk/library/WP2008-11-06_GH,HK_EnvAssets.pdf (discussing how similar damage caps in Canada and current nuclear power plant insurance premiums both disincentivize safety precautions).

safety for those firms participating in the insurance scheme.⁶⁰ Given the rarity of catastrophic blowouts, there is a lack of data to estimate actuarially fair premiums. Since it would be quite difficult to assess risks and price premiums efficiently, the mutual should have the regular opportunity to inspect and demand high levels of safety. If a firm doesn't meet a pre-set standard, then the mutual could charge a higher premium or consider cutting off the firm's access to the mutual pool and making this information public. Of course, this would raise concerns among the firm's shareholders about whether it should operate in deep water in the first place.

The mutual could tap into industry knowledge and experience for its inspection measures. This could create additional incentives for safety, mitigate the moral hazard that could arise from the creation of the mutual, and, very importantly, take advantage of private sector expertise to complement government inspections. The government could require mutual insurance as a condition for a firm to secure a drilling permit. This would strengthen the role of third-party, private-sector inspections. In addition, the potential liability borne by other firms operating in deep water through the mutual insurance entity would create the right incentive for this industry self-policing to identify those firms with sub-standard safety regimes.⁶¹

⁶⁰ In the U.S. nuclear power industry, a system of industry self-regulation emerged in response to the 1979 Three Mile Island accident. The industry created the Institute of Nuclear Power Operations (INPO), a private entity dedicated to promoting safety in civilian nuclear power plants. In the preface of JOSEPH V. REES, *HOSTAGES OF EACH OTHER: THE TRANSFORMATION OF NUCLEAR SAFETY SINCE THREE MILE ISLAND x* (1994), the author notes that "Robert Pollard, a former NRC inspector now with the Union of Concerned Scientists, thought highly enough of INPO to suggest (only half-jokingly) that the federal government should nationalize INPO and disband the NRC [Nuclear Regulatory Commission]. 'INPO is doing the job that the NRC inspectors ought to be doing,' as he puts it. "And if NRC inspections were even half as good as INPO's, we would not have the types of problems we have today.'" This is in line with the preferred approach of aligning private incentives to facilitate the use of oil and gas industry expertise in inspections to improve drilling safety. In contrast to the proposal made in this paper, INPO does not make information on individual power plant safety inspections public.

⁶¹ These safety inspections under a mutual insurance/multiple-tranche liability regime could be integrated with the inspections suggested for access to the MWCC in the previous section. *See supra* notes 51-52 and accompanying text.

On July 30, 2010, the House of Representatives passed the Consolidated Land, Energy, and Aquatic Resources Act of 2010, which removed the limit on liability.⁶² While several Senate committees passed oil spill legislation, including one that removed the limit on liability,⁶³ the full Senate did not debate an oil spill bill in the 111th Congress.

Lessons Learned

The costs of the BP *Deepwater Horizon* oil spill were undoubtedly catastrophic—eleven lives lost, millions of barrels of oil spilled, a lost fishery and tourism season, coastal ecosystem and wildlife habitat damage, and the remains of a half a billion dollar rig resting on the seafloor. Although the oil and gas industry’s innovations have made tremendous strides in advancing the technological frontier of hydrocarbon extraction, they have not made similar strides in safety technology that would decrease the probability of a catastrophe. Three policy lessons from the *Deepwater Horizon* oil spill may inform efforts to mitigate the risks of future deep-water oil spills.

First, it is better to provide a coherent, comprehensive legal framework for offshore drilling before the government and an oil company find themselves in the so-called “heat of the battle” of another spill. The BP *Deepwater Horizon* oil spill resulted in ad hoc negotiations between the government and the responsible party to try to design new liability rules and a compensation scheme for those bearing damages from the spill. The outcome for the residents of the Gulf could have been very different if the responsible party did not have (a) deep pockets; and, (b) a willingness to compensate for damages beyond the \$75 million threshold prior to a legal determination regarding either gross negligence or regulatory violations. In the end, the independent claims facility and the escrow account benefitted both the responsible party and the government, but a new liability regime

⁶² H.R. 3534, 111th Cong., § 702 (2010).

⁶³ Big Oil Bailout Prevention Unlimited Liability Act of 2010, S. 3305, 111th Cong., § 2 (2010).

would eliminate uncertainty about compensation and obviate such a need for negotiations during a catastrophic spill in the future.

Second, incentives for safer systems of drilling are necessary. Oil spills often reflect more than just technology and engineering problems, and that was certainly the case with the decisionmaking and risk management that precipitated the BP *Deepwater Horizon* oil spill.⁶⁴ Investing in deep-water well containment capacity is critical, but not sufficient. New government regulations may not be sufficient given the information advantage that the industry has over the regulator. Changing the incentives in the industry by ensuring that safety becomes an important operational concern for companies active in offshore drilling is critical to enhancing safety. Designing mechanisms for independent and rigorous inspections by industry experts can also drive safer drilling. Additionally, removing the limit on liability would further enhance incentives for firms to develop safer systems for drilling.

Third, effective planning for low-probability, catastrophic events requires creativity, both to envision unlikely events and to develop policies and deploy resources that facilitate resilience to a broad array of risks. Technical responses are not sufficient, since they may run the risk of solving the last catastrophe's problem. For example, one could note that the MSRC was designed to mitigate an *Exxon Valdez* style of accident. The emerging MWCC is designed to mitigate a BP *Deepwater Horizon* style of accident.⁶⁵ Planning for the next, unforeseen accident should take advantage of these assets and associated response procedures, but it should also focus on improving the systems—including personnel training, risk surveillance, decision tools, etc.—that manage risk. As exploration and extraction technologies continue to push into new frontiers, research and development on safety measures, procedures, and systems—in both the private sector and in concert with government agencies and

⁶⁴ NAT'L COMM'N ON THE BP DEEPWATER HORIZON OIL SPILL & OFFSHORE DRILLING, *supra* note 3, at vii.

⁶⁵ Richard Zeckhauser emphasized this point during his remarks at the oil spill conference on April 1, 2010. See Richard Zeckhauser, Frank Plumpton Ramsey Professor of Political Econ., Harvard Kennedy Sch., Remarks at Keynote Event at Vanderbilt University Law School Conference on the BP Oil Spill: Strict and Tiered Liability for Catastrophic Risks: Lessons from the Deepwater Horizon Oil Spill (Apr. 1, 2010).

experts—should likewise continue. Broader research on catastrophic risk in complicated systems would also help inform the management of the risks of offshore drilling. Indeed, there may be knowledge spillovers from evaluations of a variety of low-probability, catastrophic events experienced over the past decade (from September 11th to Hurricane Katrina to the financial market collapse to the BP *Deepwater Horizon* to the Fukushima nuclear accident) and insights of value for potential catastrophic events of the future (e.g., impacts of global climate change).

In 2011, Republicans and Democrats alike talked about the importance of domestic oil and gas development. In April, the President gave a speech about energy security in which he addressed the need to increase domestic oil and gas production.⁶⁶ The Republicans also called for expanding drilling but have expressed no enthusiasm for government policies that could promote a safer drilling environment.⁶⁷ The failure to learn lessons from the last spill runs the risk that another major spill could test Americans' patience for oil and gas development, especially if the industry and the government does not have either the technical means to contain it or the legal and financial means to secure full compensation for those bearing the damages. Indeed, another catastrophic oil spill could result in the public turning against oil and gas as a major part of our energy economy. Thus, we need to design a regime that delivers the right incentives for safety so that we can continue domestic production of hydrocarbons without having people who live in oil and gas intensive regions bear the costs from this activity.

⁶⁶ President Barack Obama, Remarks by the President on America's Energy Security (Mar. 30, 2011) (transcript available at <http://www.whitehouse.gov/the-press-office/2011/03/30/remarks-president-americas-energy-security>).

⁶⁷ See Restarting American Offshore Leasing Now Act, H.R. 1230, 112th Cong. (2011) (proposing an expansion of drilling leases without any mention of safety measures, and passed in the House of Representatives primarily along party lines on May 5, 2011).