How Deepwater Offshore Drillers Have Failed to Uphold Their End of the Bargain: The Policy Infirmities of BSEE's Current Oil Spill Response Framework

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ABSTRACT

When Congress made the decision to allow private entities to drill and produce oil in federal waters, it entered into a bargain with these producers. In exchange for access to our shared resources, these entities agreed to operate in a manner that would prevent or mitigate damage to the environment, property, and human health. Unfortunately, producers have failed to uphold their end of the bargain, and regulators have allowed producers to renege on their commitment. This is evidenced by recent oil spills in the Gulf of Mexico, such as the on-going spill by Taylor Energy that began in 2004 and the infamous BP Deepwater Horizon spill in 2010. Both companies had produced oil spill response plans to the government that detailed how, in case of a spill, the companies would respond to mitigate the spill in a timely and effective fashion. Yet, when a spill did occur, neither was prepared to handle the disaster, consequently allowing oil to flow continuously and to damage our natural resources in direct violation of the statutory policy and mandate.

This Note will argue the federal government must reform its offshore leasing program to require more specific and stringent oil spill response plans. The past failures have been a direct result of the government's reliance on outdated and ineffective practices. Furthermore, this Note will recommend certain regulatory reforms to develop incentives for third parties to create innovative methods and for operators to evolve response plans with the same pace as new drilling technologies. To ensure our shared resources are mined in a safe manner as contemplated by Congress, the federal government must adjust the incentives of producers and enforce these regulations.

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INTRODUCTION

The current regulatory framework for offshore drilling focuses on addressing issues encountered during previous accidents rather than anticipating future challenges. This post-hoc response will not protect our nation's waters when it fails not only to anticipate new problems associated with rapidly evolving offshore drilling methods, but also to acknowledge known weather and environmental risks. The traditional methods upon which the current framework relies have proven slow, ineffective, and harmful, causing greenhouse gas emissions, wildlife fatalities, and the spread, rather than containment, of oil. Furthermore, climate change induced storms in the Gulf of Mexico ("The Gulf") and changing weather patterns will increase in intensity.[1] This will pose greater dangers to offshore drilling platforms and may cause delays in any oil spill response. The ineffectiveness of traditional oil spill response and recovery methods (as evidenced by the recent Taylor Energy and BP oil spills in the Gulf), the inherent risk of deepwater and ultra-deepwater offshore drilling, and the sensitive locations in which such

1. Tropical cyclones will increase in intensity by 1 to 10% on average globally, which implies an even larger percentage increase in the destructive potential per storm. There has been a pronounced in increase category 4 to 5 hurricanes since the mid-1940's in the Atlantic Basin, which includes the Gulf of Mexico. *See* GEOPHYSICAL FLUID DYNAMICS LAB., NAT'L OCEANIC AND ATMOSPHERIC ADMIN., GLOBAL WARMING AND HURRICANES: AN OVERVIEW OF CURRENT RESEARCH RESULTS, https://www.gfdl.noaa.gov/global-warming-and-hurricanes/ (last updated Sept. 20, 2018).

drilling occurs require a more sophisticated and proactive plan for responding to oil spills in our nation's waters.

This Note will focus on deepwater (deeper than 125 meters) and ultra-deepwater (deeper than 1,500 meters) offshore drilling due to the unique characteristics of these drilling methods. The failure of adequate spill response protocols in keeping pace with the technological evolution of these complex drilling methods has contributed to recent disasters. Furthermore, the tonnage of oil spilled during recent disasters has shown that the drilling depths of these methods, and the significant pressure encountered at such depths, increases the risk of harm.

Focusing on these novel and complex methods, this Note will analyze how the current regulatory framework's outdated and ineffective response methods, as well as related regulatory requirements, have failed to sufficiently prevent or minimize the damaging effects of deepwater and ultra-deepwater drilling in the Outer Continental Shelf ("OCS"). Part I will provide background on the offshore drilling regulatory regime and will discuss the details of the 2004 Taylor Energy spill and the 2010 BP Deepwater Horizon spill. Part II will analyze how the companies' oil spill response plans, which ignored known risks and relied on outdated strategies and technologies, contributed to the severity of the disasters. Part III will recommend certain regulatory reforms to develop incentives for third parties to create innovative methods and for operators to evolve response plans with the same pace as new drilling technologies.

I. Background

When granting the authority to the Department of Interior to authorize and approve permits to drill in federal waters, Congress created a regulatory framework requiring operators to conduct themselves in a safe manner in return for the privilege to develop shared natural resources. Operators must submit plans detailing how they would respond to an oil spill from their facility prior to receiving drilling authority. However, two recent oil spills—the 2004 Taylor Energy spill and the 2010 BP Horizon oil spill—underscore the shortcomings of the current legal and policy structure. In both instances, the operators were wholly unprepared to respond to the oil spills despite approved oil spill response plans. This failure allowed two of the worst oil spills in global history to occur only seven miles from and within one decade of another.

A. The Offshore Drilling Regulatory Regime

The Outer Continental Shelf Lands Act ("OCSLA") granted the authority and defined the parameters of our nation's offshore exploration and development program. Congress declared,

> [O]perations in the Outer Continental Shelf should be conducted in a safe manner by well-trained personnel using technology, precautions, and techniques

> *sufficient to prevent or minimize* the likelihood of blowouts, loss of well control, fires, spillages, physical obstruction to other users of the waters or subsoil and seabed, or other occurrences which may cause damage to the environment or to property, or endanger life or health.[2]

This agreement between producers and the American public, as outlined by Congress, underscores that drilling in the OCS is a privilege earned through responsible planning and operations.[3] To enforce this balance of safety and energy independence, offshore drilling is managed by three bureaus within the Department of Interior. Prior to 2011, only one department, the Minerals Management Service, oversaw our nation's offshore drilling program. The reorganization was accomplished to "create a tough-minded but fair regulator that can effectively evaluate and keep pace with the risks and challenges of offshore drilling and will promote the development of safety culture in offshore operators."[4] The Bureau of Ocean Energy Management manages the leasing of federal offshore resources.[5] The Office of Natural Resources Revenue ensures a fair return to the taxpayer from royalty and revenue collection and disbursement.[6] The Bureau of Safety and Environmental Enforcement ("BSEE") manages permitting, offshore regulatory programs, and oil spill responses. It is tasked with "ensuring safe and environmentally responsible exploration and production and enforcing applicable rules and regulations."[7]

Pursuant to the Oil Pollution Act of 1990 ("OPA"), executive orders, and the OCSLA, the Oil Spill Preparedness Division within BSEE oversees oil spill planning and preparedness for oil and gas exploration, development, and production in state and federal waters.[8] This includes reviewing and approving oil spill response plans, inspecting oil spill response equipment, conducting and disseminating oil spill response research, managing the Ohmsett National Oil Spill Response Research Test Facility, and supporting the National Response Team,

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2. 43 U.S.C. § 1332(6) (2012).

3. NAT'L COMM'N ON THE BP DEEPWATER HORIZON OIL SPILL AND OFFSHORE DRILLING, DEEP WATER: THE GULF OIL DISASTER AND THE FUTURE OF OFFSHORE DRILLING REPORT TO THE PRESIDENT viii (January 2011).

4. U.S. DEP'T OF THE INTERIOR BUREAU OF OCEAN AND ENERGY MGMT., FACT SHEET: THE BSEE AND BOEM SEPARATION—AN INDEPENDENT, SAFETY, ENFORCEMENT, AND OVERSIGHT MISSION (Jan. 19, 2011), https://www.doi.gov/sites/doi.gov/files/migrated/news/pressreleases/upload/01-19-11_Fact-Sheet-BSEE-BOEM-separation-2.pdf; BUREAU OF OCEAN AND ENERGY MANAGEMENT, U.S DEP'T OF THE INTERIOR, THE REORGANIZATION OF THE FORMER MMS, https://www.boem.gov/About-BOEM/Reorganization/Reorganization.aspx (last visited Feb. 25, 2019).

5. *Id.*

6. *Id.*

7. *Id.*

8. Oil Pollution Act of 1990, Pub. L. No. 101-380 104 Stat. 485, *appearing generally* as 33 U.S.C. § 2701 (2012); Outer Continental Shelf Lands Act, 43 U.S.C. §§ 1331–1365(b) (2012).

Regional Response Team, Area Committees, and the Interagency Coordinating Committee on Oil Pollution Research.[9]

The OPA requires lessees and operators of oil and gas leases to submit regional oil spill response plans, which include all of the entity's facilities within a designated region.[10] When developing a response strategy, BSEE encourages lessees and operators to consider certain factors. These factors include a potential worst-case discharge ("WCD") scenario and its estimated discharge, location, proximity to sensitive resources, and resource risks, as well as the oil's particular characteristics and the potential for source control.[11] BSEE also encourages certain response and clean-up methods, such as surface and subsea dispersants,[12] in-situ burning,[13] mechanical recovery, wildlife protection, rescue and rehabilitation strategies, and real-time response capabilities.[14]

Lessees and operators must develop a WCD scenario, identify the resources required to implement a response strategy for the designated region, and then identify the necessary equipment and logistics of accomplishing the WCD response strategy.[15] BSEE then reviews the description of each WCD response strategy to determine if the strategy is sufficient to contain and recover the discharge *to the maximum extent practicable*.[16] Lessees and operators must review the plan biennially and revise the WCD response plans if significant changes in information or circumstances occur, such as a change in assumptions or

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9. BUREAU OF SAFETY AND ENVTL. ENF'T, U.S. DEP'T. OF THE INTERIOR, WHAT WE DO: OIL SPILL PREPAREDNESS DIVISION, https://www.bsee.gov/what-we-do/oil-spill-preparedness (last visited Nov. 24, 2018).

10. 30 C.F.R. § 254.1 (2018).

11. BUREAU OF SAFETY AND ENVTL. ENF'T, U.S. DEP'T OF THE INTERIOR, GUIDANCE TO OWNERS AND OPERATORS OF OFFSHORE FACILITIES SEAWARD OF THE COAST LINE CONCERNING REGIONAL OIL SPILL RESPONSE PLANS, NTL No. 2012-N06 (August 10, 2012) [hereinafter Guidance to Owners and Operators].

12. Dispersants use a mixture of emulsifiers and solvents to break oil into small droplets, which mix with water more readily and sink to the seafloor. This stops the oil's progression to the coastline, where it is more difficult to clean up and has a higher chance of contaminating wildlife and sensitive ecosystems like marshlands. Elizabeth Shogren, *In Cleaning Oiled Marshlands, A Sea of Unknowns*, NPR (April 20, 2011), https://www.npr.org/2011/04/20/135571426/in-cleaning-oiled-marshlands-a-sea-of-unknowns.

13. In-situ burning is a technique in which oil is burned off the surface of the water in a controlled manner. A boom is used to contain the oil, and the contained surface area is then set ablaze, preventing the progression of oil to the coastline.

14. U.S. DEP'T OF THE INTERIOR BUREAU OF SAFETY AND ENVTL. ENF'T, GUIDANCE TO OWNERS AND OPERATORS OF OFFSHORE FACILITIES SEAWARD OF THE COAST LINE CONCERNING REGIONAL OIL SPILL RESPONSE PLANS, NTL No. 2012-N06 (August 10, 2012) [hereinafter Guidance to Owners and Operators].

15. 30 C.F.R. § 254.47 (2018). WCD scenario volumes are calculated according to statutory formula. For production facilities, this includes production volume, storage tanks and flowlines, and the volume of oil calculated to leak from a break in the pipelines. *See* Guidance to Owners and Operators, *supra* note 11, at 28–29. For exploratory or development drilling, operators and lessees must calculate the daily volume possible from an uncontrolled blowout by finding the sum of flow from all possible reservoirs in the open wellbore. *Id*. at 29.

16. 30 C.F.R. § 254.26 (2018) (*emphasis added*).

calculations used to estimate the WCD or the installation of an additional facility.[17] Final approval of the plan is tantamount to BSEE "telling the American public that the Government believes the owner or operator of an offshore facility has demonstrated the ability to respond to a worst-case discharge to the maximum extent practicable."[18]

BSEE verifies the effectiveness of the response plans through routine exercises with the facility operators, spill response contractors, and regulatory officials. Such exercises are the primary tool for identifying areas for improvement.[19] To effectuate a plan, the OPA requires coordination among federal, state, and local responders, responsible parties, and with the Marine Spill Response Corporation, an industry corporation with five regional centers. The response plans, approved by the federal government and supported by local, regional, and national efforts, are the country's assurance that, in return for harvesting natural resources from our country's waters, companies agree to use appropriate safety and disaster response measures. These response plans prevent, *to the maximum extent possible*, harm to the environment and human health. And yet, drillers have failed to uphold their end of the bargain when response plans have proven ineffective in minimizing environmental harm in recent decades. Congress laid out its vision in the OCSLA of how companies should conduct themselves. Through the OCSLA, it provided government agencies with a framework against which to judge whether a producer deserves to operate in our nation's waters. Unfortunately, recent disasters show the shortcomings of the current regulatory structure.

B. RECENT OIL SPILLS IN THE UNITED STATES

Two of the largest deepwater offshore drilling-related oil spills occurred in the past two decades. In 2004, a mudslide pulled a drilling rig owned by Taylor Energy underwater and dragged it across the seafloor, resulting in a tangled web of pipelines and wells. This web continues to leak oil into the Gulf today. In 2010, a drilling platform leased to BP experienced a "kick" during the final phases of drilling, causing an explosion on the surface and eventually sinking the drilling rig. This caused oil to spill into the Gulf for eighty-seven days. The 2004 spill associated with Taylor Energy and the 2010 BP Deepwater Horizon were magnified by the operators' failure to appreciate issues inherent in their drilling methods and the novel territories where they drilled. The sheer magnitude of these spills and the clear failure to properly plan for such a catastrophe underscore the problems in our nation's current oil spill response framework.

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17. BUREAU OF SAFETY AND ENVTL. ENF'T, U.S. DEP'T OF THE INTERIOR, NATIONAL NOTICE TO LESSEES AND OPERATORS OF FEDERAL OIL AND GAS LEASES AND PIPELINE RIGHT-OF-WAY HOLDERS: SIGNIFICANT CHANGE TO OIL SPILL RESPONSE PLAN WORST CASE DISCHARGE SCENARIO, NTL No. 2013-N0 (August 26, 2013).

18. BUREAU OF SAFETY AND ENVTL. ENF'T, U.S. DEP'T OF THE INTERIOR, FY18 BUDGET JUSTIFICATION 62.

19. *Id.* at 62–63.

1. The 2004 Taylor Energy Co. LLC Oil Spill

Taylor Energy Company LLC ("Taylor") purchased and expanded the offshore ultra-deepwater drilling Mississippi Canyon 20 site ("MC-20") in 1984 in the Eastern Gulf, only seven miles north of the future site of the Deepwater Horizon spill.[20] The MC-20 site, after certain improvements by Taylor, included twenty-eight wells reaching reservoir depths of up to 2.08 miles.[21] On September 16, 2004, Hurricane Ivan (a category 4-5 hurricane) passed sixty miles east of MC-20.[22] The hurricane created wave heights and periods exceeding the calculations relied upon for the site's structural designs. The result was an underwater sea floor collapse and mudslide capsizing the drilling rig and dragging it across the seafloor, leaving the rig around 550 feet from its original location.[23] The twenty-five active wells and drilling system were compromised during this drag.[24] The wells and tangled pipelines were covered with mud and sediment, with the conductor pipes—piping that provides the stable structural foundations for oil wells and boreholes[25]—covered with sixty-nine to 153 feet of mud.[26]

In 2008, Taylor entered into a trust agreement with the United States government, pursuant to regulations requiring lessees to ensure the availability of funding for decommissioning activities.[27] The agreement required Taylor to put $666 million into a trust. The funds associated with each decommissioning obligation imposed by the U.S. government would be returned when the company met each of the relevant requirements.[28] The trust requires Taylor to use outside funds to pay for the decommissioning activities. Taylor receives up to a pre-determined amount of funds from the trust for the actual cost of each activity completed.[29]

In 2016, Taylor Energy filed suit against the federal government. Taylor alleged that, due to unforeseen technical and environmental issues, the remaining

20. UNIFIED COMMAND, UNIFIED COMMAND SUMMARY: TAYLOR ENERGY COMPANY LLC MC20 FINAL RISK ASSESSMENT AND COST ESTIMATE 8 (March 25–26, 2014) [hereinafter UNIFIED COMMAND SUMMARY]; Mark Schleifstein, *Taylor Energy Oil Platform, Destroyed in 2004 during Hurricane Ivan, is Still Leaking in Gulf*, TIMES-PICAYUNE, July 1, 2013, https://www.nola.com/environment/2013/07/taylor_energy_oil_platform_des_1.html.

21. UNIFIED COMMAND SUMMARY, *supra* note 20, at 22; Taylor Complaint, *infra* note 28 at 14, Exhibit 2 at 9.

22. UNIFIED COMMAND SUMMARY.

23. *Id.* at 56.

24. *Id.*

25. Schlumberger Limited, *Oilfield Glossary: Conductor Pipe*, https://www.glossary.oilfield.slb.com/en/Terms/c/conductor_pipe.aspx (last visited Dec. 12, 2018).

26. UNIFIED COMMAND SUMMARY, *supra* note 20, at 24.

27. Defendant's Response to Plaintiff's Motion for Summary Judgment with Respect to Count One at 4, Taylor Energy Co. LLC v. United States of America, Docket No. 1:16-cv-00012 (Fed. Cl. Sept. 14, 2018) [hereinafter "USA Defendant Response"].

28. *Id.* at 1, Taylor Energy Co. LLC v. United States of America, Docket No. 1:16-cv-00012 (Fed. Cl. Sept. 14, 2018); Complaint at 8, Taylor Energy Co. LLC v. United States of America, 16-cv-00012 (Fed. Cl. Jan. 4, 2016) (No. 1) [hereinafter Taylor Complaint].

29. Taylor Complaint at 10.

obligations are infeasible.[30] For this reason, it sought to recoup the remaining funds in the trust (over $432 million).[31] Citing expert opinions, Taylor argued it would be impossible to plug and abandon the remaining sixteen wells without creating significant additional harm to the environment, which would be in violation of the OCSLA.[32] Citing mutual error, Taylor argued the trust should be partially rescinded as it applies to the remaining obligations that had become infeasible.[33] Taylor explained such funds will nevertheless be put towards continued efforts to comply with its legal responsibilities.

The government has remained steadfast throughout the litigation in its opinion that the trust will remain in existence until all of the decommissioning obligations have been completed.[34] The government argues that such obligations may be satisfied in the future with the development of new and improved technology.[35] In September 2018, it was estimated that approximately 250 to 700 barrels of oil are leaking per day from the MC-20 site. And it is estimated, based on the oil's chemical characteristics, that such oil is being released *from* the well (rather than from oil already settled on the seafloor).[36] The continuing releases from this decade and a half old spill show how unprepared operators may be for catastrophes.

2. The 2010 BP Deepwater Horizon Oil Spill

On April 20, 2010, the crew at the Deepwater Horizon platform was nearing completion of the ultra-deepwater[37] Macondo well, having recently finished the initial steps of casing (fortifying the well with steel tubing and cement) the well. During this phase, testing showed natural gas pockets were beginning to form in the drilling system, but the signs were dismissed. An unplanned flow of oil and natural gas into the wellbore (known as a "kick") occurred undetected.[38] The unplanned flow of oil and gas in the drilling system pushed the mud in the pipeline, previously inserted to prevent "kicks," through the system and eventually out at the surface. Realizing the occurrence of a kick, the crew activated the blowout preventer ("BOP").[39] The BOP triggered the pipe ram to temporarily close

30. *See generally id.*

31. *Id.* at 2–5.

32. *Id.* at 3.

33. *Id.* at 4.

34. USA Defendant Response, *supra* note 27, at 2.

35. U.S. DEP'T OF THE INTERIOR BUREAU OF SAFETY AND ENVT'L ENFORCEMENT, THE UNITED STATES' VIEWS ON THE STATUS OF TAYLOR ENERGY COMPANY LLC'S OBLIGATIONS AT THE WELL SITE MC-20 AND TAYLOR ENERGY'S ONGOING OIL SPILL (May 2015).

36. USA Defendant Response, *supra* note 27, at 2.

37. The maximum drilling depth of the Macondo well was 30,000 ft. *See* TRANSOCEAN, *Our Rigs: Deepwater Horizon*, https://web.archive.org/web/20100619121120/http://www.deepwater.com/fw/main/Deepwater-Horizon-56C17.html (last visited Dec. 13, 2018).

38. *See* U.S. CHEMICAL SAFETY BOARD, MACONDO BLOWOUT AND EXPLOSION: DEEPWATER HORIZON BLOWOUT ANIMATION (June 5, 2014) [hereinafter ANIMATION]. *See Generally* U.S. CHEMICAL SAFETY BOARD, MACONDO BLOWOUT AND EXPLOSION: FINAL REPORT, VOL. 1-4 (April 2016).

39. *See* ANIMATION, *supra* note 38.

the drilling pipe. However, the unplanned flow of oil and gas had already risen above the location where the pipe would be closed. Thus, the fugit hydrocarbons rose through pipe and reached the surface.[40] Once on the surface, the flammable resource reacted with an ignition source, causing an explosion and resulting fire on the drilling rig.[41]

Due to the significant underwater pressure at such depths, oil and gas continued to flow from the reservoir into the drilling system, increasing the pressure on the pipe's closure.[42] The difference in pressure caused the drill pipe to buckle and bend off-center within the BOP.[43] This likely occurred at or around the time of the explosion.[44] The loss of power at the drilling rig and the increased hydraulic pressure activated a dead man's switch (a fail-safe triggered by loss of human operation).[45] This, in turn, triggered the blind shear ram blades (a method of last resort on the BOP) to shear and seal the drilling pipe. However, when the pipe buckled, part of it was pushed outside the reach of the blades.[46] Once activated, the blades only partially cut and sealed the pipe. Partially open and unsealed, the pipe allowed oil and gas to escape into the Gulf, flowing for eighty-seven days.[47]

Both ultra-deepwater drilling efforts provided response plans to the Minerals Management Service that detailed strategies to address any incident. Yet, neither plan was adequate to respond in a timely manner, with Taylor's incident continuing to spill oil fourteen years later while oil from Deepwater Horizon flowed for eighty-seven days. Thus, the failure of both companies to adequately plan led to the increased harm shared by the American public.

II. Analysis

When drilling in our nation's waters, operators enter into an agreement with the American public to operate in a safe and responsible manner that minimizes and mitigates harm. And yet, operators have failed to do so when they have ignored red flags associated with their chosen drilling methods or novel territories in which they drilled. Plans submitted and approved by the government in recent decades have failed to accommodate known risks that enabled, in part, two of the worst offshore oil spills. Additionally, operators have relied on outdated and ineffective tools when crafting a plan to respond to any incidents. These clean-up and response technologies, approved by the government, have proven to be difficult to implement and ineffective when implemented. What is more, even when such methods have been utilized, they have created collateral harms. Such a *laissez*

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40. *Id.*
41. *Id.*
42. *Id.*
43. *Id.*
44. *Id.*
45. *Id.*
46. *Id.*
47. *Id.*

faire attitude on the part of the operators and the government—who failed to impose higher standards—has caused the Gulf of Mexico undue harm, violating the bargain made with the United States.

A. THE OIL SPILL RESPONSE PLANS FAILED TO RESPOND TO KNOWN RISKS

Inadequate and ineffective response plans are to blame for the recent oil spills in the Gulf and will continue to allow man-made disasters if left unchecked. These plans by BP and Taylor Energy, approved by the U.S. Interior Department, failed to acknowledge known risks associated with the operator's drilling plans and relied on clean-up technologies that had been proven ineffective time and again. This failure to develop a full and effective plan as well as the government's approval of plans relying on ineffective methods have caused undue harm to the environment in violation of the Congressional policy set forth in the OCSLA.

1. BP's Failure to Consider and Plan for Known Risks Associated with BOPs

BP knew or should have known about the risks associated with a BOP and should have accounted for such potential failures when crafting a strategy to respond to a potential blowout. BP's failure to do so, and the government's failure to require it to do so, are partially to blame for the incident and resulting harm to the environment, property, and human health in the OCS. BOPs are relied upon as the last line of defense against the immense underwater pressure encountered in deepwater and ultra-deepwater offshore drilling. However, a study commissioned in 2004 found only three of the fourteen newly-built rigs that relied on BOPs could sufficiently cut off and seal the drilling pipe at the water pressure likely to be experienced at the equipment's maximum water depth.[48] A TransOcean executive recognized blind shear rams are not engineered for the conditions of a flowing deepwater well, analogizing it to "snipping a fire hose with a pair of scissors."[49]

And yet, BP was only required to test the BOP in the most perfect of conditions, when the pipe is correctly centered.[50] Such testing did not account for real-world conditions that may lead to the pipe's bending, such as underwater pressure or the pressure of an explosion. Had the testing been expanded to include such scenarios, it may have warned of the equipment failure experienced during Deepwater Horizon.

Many drilling operators in the Gulf continue to rely on this boilerplate design and BSEE continues to rely on many pre-Deepwater testing policies.[51] What is

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48. Ben Casselman & Russell Gold, *Device's Design Flaw Let Oil Spill Freely*, WALL STREET J., Mar. 24, 2011, https://www.wsj.com/articles/SB10001424052748704050204576218653335935720.

49. *Id.*

50. *Id.*

51. *See generally* Andrew Clark, *BP Contingency Plan for Dealing with Oil Spills was Riddled with Errors*, GUARDIAN, June 9, 2010, https://www.theguardian.com/environment/2010/jun/09/bp-oil-spill-

more, a recent regulatory proposal calls for rolling back requirements for a back-up plan for BOPs. It also proposes relaxing the standard applied to pressure tests such that a lessee or operator would only be required to show the equipment *could* withstand a surge in pressure, not show that it would.[52] Such a rollback would place testing regulations in a substantially similar position as they were prior to Deepwater.[53] This policy change would undercut efforts to minimize or prevent blowouts, rendering vulnerable once again our nation's waters to the complex dangers faced more than one thousand meters below the surface. BP's reliance upon a known faulty method as the last line of defense underscores its failure to uphold the duty to operate in the OCS in a manner "sufficient to prevent or minimize the likelihood of blowouts . . . and spillages."[54]

2. Taylor Energy's Response Plan Did Not Account for Likely Weather Conditions and Trauma in the Gulf

Taylor, during the course of litigation over its recovery and clean-up responsibilities, asserts the strength of Hurricane Ivan and the resulting wind and wave conditions were unprecedented in the Eastern Gulf, intimating that such incident was the result of an act of God.[55] For this reason, such considerations were not included in the structural design of the drilling platform and system. However, from 1992 to 2004, ten hurricanes ranging from category three to five passed through the Gulf, exhibiting similar wind and weather patterns.[56] Such weather patterns show strong hurricanes are not uncommon and can reach up to 150 miles per hour. Based on this data, Taylor should have recognized and considered the risk of hurricane-induced trauma to satisfy the congressional policy of operating

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contingency-plan. *See also Drilling Down on America's Energy-Future: Safety, Security, and Clean Energy*, *Hearings Before the Subcomm. on Energy and Env't, H. Comm. on Energy and Commerce*, 111 Cong. 134 (2010) (opening remarks by Rep. Markey).

52. Tedd Mann, *Proposed Changes to Offshore Drilling Rules Raise Safety Questions*, WALL STREET J., Jan. 2, 2018, https://www.wsj.com/articles/proposed-changes-to-offshore-drilling-rules-raise-safety-questions-1514750730; *see* 83 Fed. Reg 22, 128 (May 11, 2018). An additional controversial proposal is to eliminate the requirement for a BSEE-approved third party to certify the blowout preventer and other safety tests under the most extreme conditions. This, in conjunction with the aforementioned proposals, strikes at the heart of the policies enacted post-Deepwater. *See* Michael Marks, *Trump Administration Proposes Rollback of Obama's Oil Rig Safety Regulation*, TEXAS STANDARD (Jan. 2, 2018), http://www.texasstandard.org/stories/trump-administration-proposes-rollback-of-obamas-oil-rig-safety-regulation/.

53. Oil and Gas Sulfur Operations in the Outer Continental Shelf—Blowout Preventer Systems and Well Control Revisions, 83 Fed. Reg. 22128, 22130-22138 (May 11, 2018) (to be codified at 30 CFR pt. 250).

54. 43 U.S.C. § 1332(6) (2012).

55. *See* Taylor Complaint, *supra* note 28, at 6; *see also*, UNIFIED COMMAND SUMMARY, *supra* note 20, at 8.

56. From 1992–2004, the following hurricanes (ranging from category 3-5) traveled through the Gulf: Andrew (1992), Lidia (1993), Opal (1995), Roxanne (1995), Georges (1998), Mitch (1998), Bret (1999), Keith (2000), Isidore (2002), Lili (2002), Jeanne (2004), Ivan (2004), Frances (2004), and Charley (2004). *See* Historical Hurricane Tracks Search, NAT'L OCEANIC & ATMOSPHERIC ADMIN., https://coast.noaa.gov/hurricanes/.

in the OCS in a manner sufficient to prevent or minimize spillage that harms the environment, property, life, or health.[57]

Additionally, Taylor did not prepare a strategy for addressing hurricane-induced trauma, despite the design complexity of the ultra-deepwater drilling system—twenty-eight wells and thirty-seven wellbores in close proximity to one another and reaching as deep as 2.8 miles below the surface.[58] Taylor argues the close proximity of the wellbores makes it impossible and dangerous to perform any remedial operations to stem the flow of oil.[59] The dangers include the potential for well collisions, inadequately plugged perforations, resulting cross flow, the varying pressure levels of reservoirs, breaches of near-surface seals, and well integrity issues.[60] This "tangled web of wellbores," covered in mud and sediment, now poses an insurmountable problem according to the company.[61] However, given the frequency of hurricanes in the Gulf and the voluntary choice of highly complex and novel drilling methods and designs, Taylor bears the burden of considering and addressing these known risks in its OSRP. This consideration, as contemplated by the OCSLA and OPA, would have at least *minimized* if not sufficiently prevented the ongoing damage to the Gulf's environment and property as well as residents' lives and health.

B. TRADITIONAL RESPONSE AND RECOVERY METHODS ARE INEFFECTIVE AND EVEN HARMFUL

The oil spill response regulatory regime for deepwater and ultra-deepwater offshore drilling can no longer accept traditional methods of response and recovery. Historical events and research prove these methods to be ineffective because they are too slow, recover an insufficient amount of oil, and create additional harm. Relying on such methods despite evidence proving their ineffectiveness is a violation of the government's policy to ensure operations in the OCS are conducted in a safe manner using precautions and techniques sufficient to minimize any spills or blowouts that could affect the environment.[62] Traditional methods of response and recovery include booms to contain oil, skimmers to remove oil, fire to burn oil, and chemical dispersants to break oil into smaller pieces. In 2015, the City of Vancouver published a study stating that the removal process is most often ineffective; this is so even in calm water, let alone in real-world conditions that are often much harsher.[63]

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57. 43 U.S.C. § 1332(6).
58. Taylor Complaint, *supra* note 28, at 5, 17.
59. *Id.* at 17.
60. *Id.*
61. *Id.* at 13.
62. 43 U.S.C. § 1332(6) (2012).
63. Andrew Nikiforuk, *The Oil Spill Cleanup Illusion*, HAKAI MAGAZINE, July 12, 2016, https://www.hakaimagazine.com/features/oil-spill-cleanup-illusion/, *reprinted in* SMITHSONIAN MAGAZINE.

This ineffectiveness is likely due to several factors: timeliness, recovery percentage, and collateral harm. The failure to respond to an oil spill in a timely manner, as demonstrated by Taylor Energy and BP, creates new problems and diminishes the effectiveness of traditional response methods used to mitigate the harms created by a spill. Even if operators deployed response methods in a timely manner, such methods would fail to recover more than one-fourth of the oil spilled into the water, leaving the lion's share in the ocean to settle and create long-term damage. Furthermore, even if traditional methods were deployed in a timely manner and with increased effectiveness, such methods would nevertheless create collateral harm. Traditional response methods increase fatalities and reduce the reproductive capabilities of wildlife, while also endangering human health due to increased air pollution. For these reasons, the government must adjust the regulatory framework to ensure that only those companies who operate in a manner likely to adequately mitigate or prevent harm to the environment and human health may drill in our nation's shared resource.

1. Traditional Response and Recovery Methods Fail to Respond in Time to Effectively Minimize Harm

Current response strategies and recovery technologies are not utilized in a timely manner because significant amounts of oil spill and spread in the water before operators are able to implement such measures. The weeks it often takes to implement traditional methods and the resulting spread of oil can trigger secondary events or create multizone spill areas. This exacerbates the level of cleanup necessary and creates unnecessary environmental harm.[64] The spreading and thinning of oil can also minimize the efficacy of clean-up methods.

In the case of Deepwater Horizon, responders and BP were unable to stem the flow of oil for eighty-seven days, during which time oil was allowed to spread. BP's OSRP stated it could handle any spill up to 250,000 barrels per day and provided an appendix of equipment, vessels, and vehicles that would be used to effectuate the response. Yet, when the Macondo well blew out, BP did not have the appropriate equipment available for the well's ultra-deepwater conditions.[65] BP was forced to call on support equipment from around the globe and relied on the provision of such equipment by the federal government. BP's response was also delayed by strong winds and waves that interfered with the recovery techniques in place; oily water rose above the booms used to contain it and progressed towards shore. Due to this delay in response and recovery, "[i]n many cases, the oil had emulsified, thinned out, and increased in viscosity to a point where the oil was no longer dispersible or recoverable . . . within a few days of surfacing near

64. *Rethinking Oil-Spill Response*, RESTCo, http://www.restco.ca/Oil_Spill_Response.shtml (last visited Dec. 12, 2018).

65. *BP Didn't Plan for Major Oil Spill*, CBS News, Apr. 30, 2010, https://www.cbsnews.com/news/bp-didnt-plan-for-major-oil-spill/.

the wellhead."[66] Recovery technologies decrease in effectiveness as time drags on.[67]

In response to such shortcomings, BSEE commissioned a series of studies to fill the informational gaps in the aftermath of Deepwater Horizon. The results of the studies emphasized that response plans must realistically estimate the well kill times based on a range of potential delays.[68] This includes the time that it takes to acquire the support vessels and vehicles, to receive regulatory approval, to remove any debris, and to wait for unsafe working conditions to abate.[69] It is increasingly important given the lack of reliable technology to swiftly stop a catastrophic oil flow due to the heightened pressure encountered during deepwater and ultra-deepwater drilling.[70] As such, these response plans must include a range of measures to stop the spill as quickly as possible, including temporary measures to plug the well and long-term measures to seal it.[71] Although the current response plan guidelines recommend operators to consider and address real-time response capabilities, such requirements lack sufficient weight if spills continue uninterrupted for eighty-seven days even though overseen by operators with approved response plans.

Response measures like real-time monitoring and surveillance capabilities were enhanced after the Deepwater Horizon spill but are currently subject to a proposed rollback by the Trump Administration.[72] Such a rollback would ignore the clear historical evidence that response plans do not adequately estimate the time that it takes to stop a spill. Rather than rolling back regulations, more regulation is needed to require operators to accommodate realistic timelines when devising their response and recovery plan to minimize environmental harms.

66. U.S. DEP'T OF THE INTERIOR BUREAU OF SAFETY & ENVT'L ENFORCEMENT, OIL SPILL RESPONSE EQUIPMENT CAPABILITIES ANALYSIS, Vol. 2, at x, Feb. 29, 2016.

67. RESTCo, *supra* note 64.

68. U.S. DEP'T OF THE INTERIOR, BUREAU OF SAFETY AND ENVTL. ENF'T, OIL SPILL RESPONSE EQUIPMENT CAPABILITIES ANALYSIS, VOL. II xiii (Feb. 29, 2016).

69. RESTCo, *supra* note 64.

70. *See generally* Nat'l Comm'n on the BP Deepwater Horizon Oil Spill & Offshore Drilling, *A Brief History of Offshore Oil Drilling* 17, 18 (Staff Working Paper No. 1, 2010).

71. *Id.*

72. *See* Oil and Gas Sulfur Operations in the Outer Continental Shelf—Blowout Preventer Systems and Well Control Revisions, 83 Fed. Reg. at 22,130-22, 138.The Trump Administration directed all federal agencies to review and rescind or revise any regulations that unnecessarily burden the development of domestic energy resources beyond the degree necessary to protect the public interest. Promoting Energy Independence and Economic Growth, Exec. Order 13783, 82 Fed. Reg. 16,093 (Mar. 2017). Pursuant to this direction, the Secretary of the Interior issued an order to department personnel to provide recommendations on whether to revise or rescind the well control rule in response to concerns raised by stakeholders that it includes prescriptive measures that are not needed to ensure the safe and responsible development of our nation's OCS resources. Implementing an America-First Offshore Energy Strategy, Exec. Order 13795, 82 Fed. Reg. 20,815 (Apr. 28, 2017).

2. Traditional Response and Recovery Methods Recover Little Oil, Leaving Much in the Ocean

Traditional response and recovery methods do not minimize the harms associated with OCS deepwater and ultra-deepwater drilling when such methods recover insufficient amounts, leaving around 75% of spilled oil in the water.[73] The OPA was enacted in 1990 in response to the Exxon Valdez incident in the Arctic and the subsequent failure to stop millions of gallons of oil from spilling: "the oil spill[ed] over the past five months clearly show that we are not using—or have not yet developed—technology capable of containing spills of less than a million gallons, let alone the size of Exxon Valdez."[74] In the aftermath of Exxon Valdez, responders and Exxon were only able to recover 14% of the oil spilled.[75] After the promulgation of such legislation and ensuing regulatory enforcement, recovery rates have improved, but not significantly.

During the Deepwater Horizon crisis, only 25% of the oil spilled into the Gulf was recovered: 3% from skimming, 17% from siphoning the oil at the wellhead, and 5% from in-situ burning.[76] The clean-up technologies used during the incident were outdated and inadequate to manage the complexity and magnitude of the task at hand. In fact, the technologies used were largely the same as those used in the Exxon Valdez incident.[77] At the time of the incident, industry insiders and executives recognized that current response plans and technologies presented only a 3–5% solution to an oil spill.[78] Had this passive acknowledgement spurred action and innovation *prior* to the incident, the impacts of the Deepwater Horizon spill would have been minimized through more effective clean-up technologies.[79]

In the case of the 2004 Taylor spill, Taylor claims it can no longer feasibly recover the remaining oil in the Gulf due to weather conditions and fear of collateral harm.[80] Taylor argues the removal of oil by dredging, disposal of the overlaying sediment, and the capping of the remaining sixteen wells is "not practical" due to seafloor sediment characteristics.[81] However, the methods *already* used to recover oil have been wholly inadequate, allowing more than 153 million gallons of oil to leak into the Gulf. Taylor's current argument of infeasibility thus relies

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73. Staff of the BP Deep Horizon Oil Spill Comm'n, *Response/Clean-up Technology Research & Development and the BP Deepwater Horizon Oil Spill* 25 (Nat'l Comm'n on the BP Deepwater Horizon Oil Spill and Offshore Drilling, Working Paper No. 7, updated 2011).

74. *See* S. REP. No. 101-94, at 2 (1990), *reprinted in* 1990 U.S.C.C.A.N. 722, 724.

75. Nikiforuk, *supra* note 63.

76. *Id.*

77. Staff of the BP Deep Horizon Oil Spill Comm'n, *supra* note 58, at 25–26.

78. *Id.* at 25 (citing a staff phone conversation with an unidentified oil executive).

79. *Id.* at 26.

80. Taylor Complaint, *supra* note 28, at 17 (relying on expert analysis).

81. *Id.; see also* U.S. DEP'T OF THE INTERIOR, MINERALS MGMT. SERV.: SITE-SPECIFIC ENVIRONMENTAL ASSESSMENT OF THE APPLICATION FOR PERMIT FOR THE DECOMMISSIONING OF PLATFORM A AND LEASE SITE REMEDIATION AT MC20 (Sept. 10, 2009) (concluding removal poses a greater risk than does merely leaving the contaminated soil in place).

on the fact that sufficient oil has already spread and settled onto the seafloor due to Taylor's own lack of response and recovery. Taylor's shortcomings have, in turn, made it more difficult to further recover the oil by dredging without disturbing and releasing additional oil. Taylor's predicament underscores the harm created by a delay in responding and recovering oil. Untimely responses ultimately affect the efficacy of operations once they are eventually initiated by decreasing the ability to prevent or minimize environmental harm.

Historical events, government reports, and third-party assessments emphasize the gap between response capabilities and the significant risk of environmental harm posed by deepwater and ultra-deepwater offshore drilling. A recent study concluded that oil spill countermeasures, techniques, and equipment would have limited effectiveness on ice-covered waters encountered in the new drilling frontier of the Arctic.[82] As operators move into deeper and more novel waters, they must ensure that the relied-upon technologies are not the same as those that have been wholly inadequate in previous incidents. Instead, they must devise plans to implement more effective technologies in a manner that ensures the recovery rates are, at the very least, more than negligible. In fact, Congress mandates BSEE to do so.

3. Traditional Methods and Technologies Create Additional, Collateral Harm to the Environment

Current response and recovery technologies create additional collateral harm when they increase wildlife fatalities, decrease wildlife reproduction, and increase air pollution. BSEE's approval of response plans that incorporate such techniques violates the congressional mandate that operations in the OCS should be conducted in a manner so as to minimize environmental harm when, in fact, such operations and associated responses *increase* certain harms and cause others.

Dispersants break oil into small droplets to enable the oil to mix with the water and settle on the seafloor. Rather than reducing the amount of oil in the water, this method only removes oil from the surface, preventing the migration of oil slicks to the coastline and reducing potential contact with wildlife.[83] In addition to *not* removing the oil, the dispersants increase, rather than decrease, the harm when they reduce the effectiveness of other recovery methods, have a higher toxicity level than the oil itself, and increase the harm to wildlife. Dispersants can also decrease the effectiveness of skimming. Dispersants break down oil into

82. Nikiforuk, *supra* note 63.

83. *Gulf Oil Spill: Dispersants*, CTR. FOR BIOLOGICAL DIVERSITY, https://www.biologicaldiversity.org/programs/public_lands/energy/dirty_energy_development/oil_and_gas/gulf_oil_spill/dispersants.html (last visited Dec. 10, 2018); Doug Helton, *The Deepwater Horizon Oil Spill: Five Years Later*, NAT'L OCEANIC & ATMOSPHERIC ADMIN. OFFICE OF RESPONSE AND RESTORATION (last revised Nov. 9, 2018), https://response.restoration.noaa.gov/about/media/attempting-answer-one-question-over-and-over-again-where-will-oil-go.html.

smaller pieces, which then migrate and settle onto the seafloor. As one might expect, this renders it more difficult to remove the oil from the ocean by "skimming" it off the top of the water. Additionally, chemicals in the dispersants can kill the bacteria that eat the oil; this is particularly harmful when the dispersant kills bacteria off the seafloor, where the smaller, previously dispersed oil particles reside.

Furthermore, the dispersants *increase* the harm to wildlife due to the chemicals' high toxicity levels, which are higher than even the oil itself. This higher toxicity causes the chemicals to interfere with birds' protective waterproofing and insulating features, leading to hypothermia.[84] The chemicals also contaminate internal organs when the animals, like birds or polar bears, lick the chemicals off their skin or feathers, leading to fatalities and decreased reproductive abilities. The chemicals have also been shown to have similar or worse effects than untreated oil on the eggs of birds.[85] A 1996 study conducted in California found that most brown pelicans died or failed to mate, even after being cleaned, in the aftermath of the Santa Barbara blowout.[86]

In the Deepwater Horizon cleanup, over 1.87 million gallons of dispersants, specifically Corexit, were used to disperse the oil[87] on the surface as well as 5,000 feet below on the subsea surface.[88] The chemical composition of Corexit is a trade secret, under the ownership of the oil industry and originally belonging to Standard Oil.[89] Known to be highly toxic, it is banned in many countries, including the United Kingdom, Sweden, and Denmark—countries considered to have the highest and most "mature" offshore drilling regulations.[90] It is estimated that over one million birds in the Gulf have perished due to oil spills and their aftermath, including clean-up methods like Corexit.[91] In addition to this known harm, researchers have found that Corexit's active ingredient does not significantly degrade one year after its use and the degradability of Corexit's other components

84. *See* REGION IV REGIONAL RESPONSE TEAM, USE OF DISPERSANTS IN REGION IV 81 (2010), http://perma.cc/0tVzi8V4XXb.

85. CTR. FOR BIOLOGICAL DIVERSITY, *supra* note 68.

86. Nikiforuk, *supra* note 63.

87. *Id.*

88. *See* U.S. COAST GUARD INCIDENT SPECIFIC PREPAREDNESS REVIEW TEAM, BP DEEPWATER HORIZON OIL SPILL INCIDENT SPECIFIC PREPAREDNESS REVIEW 35–37 (2011), http://perma.cc/0QyJE68BcNd.

89. *See* Elisabeth Rosenthal, *In Gulf of Mexico, Chemicals Under Scrutiny*, N.Y. TIMES, May 5, 2010, https://www.nytimes.com/2010/05/06/science/earth/06dispersants.html.

90. *See Drilling Down on America's Energy-Future: Safety, Security, and Clean Energy: Hearing Before the Subcomm. on Energy and the Env't of the H. Comm. on Energy and Commerce*, 111 Cong. 39 (2010) (statements of Rex Tillerson, CEO of ExxonMobil, and James Mulva, CEO of ConocoPhillips); *see also* Marian Wang, *In Gulf Spill, BP Using Dispersants Banned in U.K.*, PROPUBLICA (May 18, 2010), https://www.propublica.org/article/in-gulf-spill-bp-using-dispersants-banned-in-uk.

91. Nikiforuk, *supra* note 63.

is unknown.[92] This phenomenon is supported by scientific studies that suggest Corexit degrades more slowly in colder temperatures found in the deep ocean where deepwater and ultra-deepwater drilling occur.[93]

Yet, in the face of such known harmful effects, BSEE continues to recommend the use and consideration of dispersants, applauding BP for its novel use of the dispersants on the subsea surface.[94] Some may argue that this chemical is the lesser of two evils and, although not perfect, prevents additional contact that would occur if the oil were allowed to reach coastal wetlands.[95] The flaw in such rhetoric is that it provides an excuse for companies and the government to rely on technology known to be extremely harmful, reducing any incentive to innovate or to choose even less harmful alternatives. Partway through the BP cleanup, the government ordered BP to use a less toxic dispersant. However, this switch occurred only after repeated calls from environmental groups and after the lion's share of Corexit had been released.[96] Failing to call for this alternative *prior* to the spill increased the harm to the environment and violated the policy of minimizing harm to the environment and wildlife.

In-situ burning is another traditional, primary response method recommended by BSEE that creates significant collateral harm. In situ burning is a technique that contains oil with a boom, sets fire to the contained area, and burns the oil from the surface.[97] The burning releases carbon dioxide, carbon monoxide, sulfur oxide, and particles into the air.[98] The particles may lodge into the lungs of those already suffering from respiratory issues.[99] The burning may also increase the temperature of the surrounding water, potentially causing harm to, or even killing, the fish in the near vicinity.[100] Although both dispersants and in situ burning may be the better of two poor options, the mere lack of environmentally safe options calls into question BSEE's ability to uphold the policy of ensuring that

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92. David Biello, *One Year After BP Oil Spill, At Least 1.1 Million Barrels Still Missing*, SCI. AM., April 25, 2011, https://www.scientificamerican.com/article/one-year-after-bp-oil-spill-millions-of-barrels-oil-missing/.

93. Mark Schrope, *Oil Dispersants Used During Gulf Spill Degrade Slowly in Cold Water*, CHEM. & ENG'G NEWS (Feb. 13, 2013), https://cen.acs.org/articles/91/web/2013/02/Oil-Dispersants-Used-During-Gulf.html.

94. *See* Guidance to Owners and Operators NTL No. 2012-N06, *supra* note 11 ("BSEE will consider the proposed strategies, including but not limited to . . . dispersants (including subsea)").

95. Helton, *supra* note 83.

96. U.S. COAST GUARD, *supra* note 88, at 113.

97. *In Situ Burning*, OFFICE OF RESPONSE & RESTORATION, NAT'L OCEANIC & ATMOSPHERIC ADMIN. (last visited Dec. 13, 2018), https://response.restoration.noaa.gov/oil-and-chemical-spills/oil-spills/resources/in-situ-burning.html.

98. OFFICE OF RESPONSE & RESTORATION, NAT'L OCEANIC & ATMOSPHERIC ADMIN., IN-SITU BURNING, TEX. GEN. LAND OFFICE, http://www.glo.texas.gov/ost/spill-response-resources/additionaldocs/noaa/isb/isb.pdf.

99. *Id.*

100. OFFICE OF RESPONSE AND RESTORATION, NAT'L OCEAN SERV., NAT'L OCEANIC AND ATMOSPHERIC ADMIN., OPEN-WATER RESPONSE STRATEGIES: IN-SITU BURNING (Aug. 1997), available at https://response.restoration.noaa.gov/sites/default/files/open-water-response_ISBatPST_1997.pdf.

operations in the OCS are conducted in a manner that minimizes harm to the environment. The current strategy relies on methods that are known to *increase* harm and reduces any regulatory or commercial incentive to find safer options.

III. POLICY RECOMMENDATIONS

Government regulations should address the historical lack of response and recovery methods by creating a regulatory structure that incentivizes attention to and investment in innovation in this field. This will ensure that methods are constantly evolving and will address new issues associated with drilling innovations. The U.S. Department of the Interior has focused on researching the causes of recent incidents and recommending strategies to prevent future occurrences.[101] However, to "consistently make correct judgments on the validity of [a response plan], BSEE must stay abreast of the latest advances in oil spill response technologies, policies, and procedures."[102]

In order to do so, BSEE must focus on addressing *future* issues in cleanup and recovery rather than primarily focusing on addressing past accidents. The recent Taylor and Deepwater Horizon incidents underscore the ineffectiveness of a piecemeal strategy in preventing the destruction of our oceans. And yet, funding constraints have hampered government research and development efforts.[103] Based on this lack of funding and the slow pace of government innovation, the government should create incentives for operators or third parties to research and develop creative solutions to the ever-evolving problem of responding to oil spills.

The government cannot merely presume private industry will invest in creative solutions. Although the impact of a spill is extraordinary, the likelihood of a spill is extremely low. Thus, a corporation whose primary purpose is to maximize shareholder wealth will rely on technologies already approved and will not invest money in response and recovery. Some incentives do currently exist, such as removing crude oil rapidly enough to maintain a sufficiently high quality that it may be refined.[104] However, most companies argue investment is better served in prevention rather than recovery. Unfortunately, such thinking ignores the fact that, if a spill *does* occur, companies are unprepared to deal with it effectively. Instead, the government should incentivize third parties to innovate or establish

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101. *See generally* OFFICE OF THE INSPECTOR GEN., U.S. DEP'T OF THE INTERIOR, RECOMMENDATIONS 58–64 FROM THE REPORT TITLED "A NEW HORIZON: LOOKING TO THE FUTURE OF THE BUREAU OF OCEAN ENERGY MANAGEMENT, REGULATION AND ENFORCEMENT, Report No. 2018-EAU-021 (April 2018), https://www.doioig.gov/sites/doioig.gov/files/VerificationReview_NewHorizon_042318.pdf.

102. U.S. DEP'T OF THE INTERIOR, BUREAU OF SAFETY & ENVTL. ENF'T, BUDGET JUSTIFICATIONS AND PERFORMANCE INFORMATION FISCAL YEAR 2019 63, https://www.doi.gov/sites/doi.gov/files/uploads/fy2019_bsee_budget_justification.pdf.

103. *See* NAT'L COMM'N ON THE BP DEEPWATER HORIZON OIL SPILL AND OFFSHORE DRILLING, DEEP WATER: THE GULF OIL DISASTER AND THE FUTURE OF OFFSHORE DRILLING REPORT TO THE PRESIDENT 245, 279 (January 2011).

104. RESTCO, *supra* note 50.

performance-based regulatory requirements to incentivize operators to seek the best possible method for response and recovery.

BSEE could create incentives for private, third-parties to develop technologies. It could establish such incentives by mandating that operators maintain contracts with response management firms that have developed proven technologies. BSEE could further condition permit approval on the inclusion of these contracts. These required partnerships would create a commercial market for companies whose primary goal is developing technologies for response and recovery, without any bias or alternative cost-saving interests.

BSEE could also restructure the regulatory regime to create incentives for the operators themselves to innovate and find new, safer, and more effective methods of response and recovery. More commonly found in air pollution, technology-forcing regulations place the onus on the regulated industry and create incentives to continue to innovate. Certain Clean Air Act regulations require states to improve air quality levels to a minimum level regardless of currently available technology. The regulations provide a specified date by which the reduction should meet a certain target level.[105] The target gradually tightens to ensure the regulated entities continue to pursue the most effective technology. This increases the incentives of firms to maximize their resources in the most efficient manner.[106] To apply this structure to the field of deep and ultra-deepwater offshore drilling, regulators would need to adjust what it means to "respond and recover" to create an ideal target. Potential targets could be time-based, requiring operators to recover a certain percentage of the oil spilled by day ten of the spill. This would address the multi-zone spill problem experienced in the Gulf during Deepwater Horizon.

To combat enforcement issues, regular testing would need to occur at a new facility that could better emulate the conditions encountered in the field. Because the current Ohmsett National Oil Spill Response Research Test Facility is a contained space (667 ft. long, 65 ft. wide, and 11 ft. deep),[107] it fails to capture issues encountered when oil spreads too thinly. To ensure that those who profit from production bear this cost, the testing and monitoring of these techniques should be a condition of the operator's permit. Such a regulatory structure would necessarily require significant lag time with an enforcement date likely a decade after implementation. However, the looming deadline of harm to the operators' permits will likely incentivize innovation long before the implementation date. In addition to creating incentives for the operator, this regulatory structure would also foster a commercial market for response methods. The absence of this industry has often been cited as a factor in the slow growth of innovation by operators.

105. EPA, THE PLAIN ENGLISH GUIDE TO THE CLEAN AIR ACT 17 (2007).
106. Jay P. Kesan & Rajiv C. Shaw, *Shaping Code*, 18 HARV. J.L. & TECH. 319, 334–35 (2005).
107. BUREAU OF SAFETY & ENVTL. ENF'T, *supra* note 86, at 68.

Conclusion

BSEE asserts their approval is tantamount to acknowledging that response plans will be effective, even in the worst-case discharge scenario. However, past experience and current policy undermine that assertion. Crafting regulations post-hoc and relying on traditional methods will only perpetuate, rather than mitigate, these man-made disasters. The government must require and create appropriate incentives for increased innovation to truly balance our country's energy needs and our federal government's duty to protect our shared natural resources.