

## Boston College Environmental Affairs Law Review

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Volume 38

Issue 2 *Learning From Disaster: Lessons for the Future  
From the Gulf of Mexico*

Article 7


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5-1-2011

# Five Thousand Feet and Below: The Failure to Adequately Regulate Deepwater Oil Production Technology

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### Recommended Citation

Mark A. Latham, *Five Thousand Feet and Below: The Failure to Adequately Regulate Deepwater Oil Production Technology*, 38 B.C. Env'tl. Aff. L. Rev. 343 (2011), <http://lawdigitalcommons.bc.edu/ealr/vol38/iss2/7>

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# FIVE THOUSAND FEET AND BELOW: THE FAILURE TO ADEQUATELY REGULATE DEEPWATER OIL PRODUCTION TECHNOLOGY

MARK A. LATHAM\*

**Abstract:** Oil and gas production in the Gulf of Mexico is an important aspect of our domestic energy strategy, and to successfully obtain oil from deep beneath the ocean floor, in thousands of feet of water, an impressive array of technology is utilized by the oil and gas industry. One of the many lessons learned, however, from the Deepwater Horizon disaster is that this technology can present significant risks to human life and the environment if it fails. This Article presents an overview of the technology used to conduct deepwater oil and gas drilling operations, and then examines how the failure to adequately regulate this risky technology played a major role in the Deepwater Horizon catastrophe. This Article also summarizes the actions taken by regulators in response, and questions whether the actions taken are sufficient to prevent another deepwater disaster. The Article concludes by suggesting a number of other actions for consideration by policymakers to reduce the risks associated with producing oil from tens of thousands of feet beneath the ocean's floor.

## INTRODUCTION

With current domestic oil output becoming less productive and less reliable,<sup>1</sup> petroleum engineers are increasingly searching at depths far beneath the ocean's surface for potential new deposits of recoverable oil.<sup>2</sup> Today, oil companies are conducting exploration and produc-

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\* © 2011, Mark A. Latham, Professor of Law, Vermont Law School. My deepest thanks to Megan Sigur, Vermont Law School Class of 2012, for her timely and very capable research assistance.

<sup>1</sup> See PAUL ROBERTS, *THE END OF OIL: ON THE EDGE OF A PERILOUS NEW WORLD* 42 (2004) ("In 1970, U.S. oil production hit its peak. The flow from the big U.S. oil fields began to taper off, and the number of barrels that the [major oil companies] could bring out began to fall.").

<sup>2</sup> G. ED RICHARDSON ET AL., *MINERALS MGMT. SERV., U.S. DEP'T OF THE INTERIOR, MMS 2008-13, DEEPWATER GULF OF MEXICO 2008: AMERICA'S OFFSHORE ENERGY FUTURE 3* (2008), available at <http://www.gomr.boemre.gov/PDFs/2008/2008-013.pdf> (defining "deepwater" activities as those occurring in waters "greater than or equal to 1,000 ft" and "ultra-deep" activities as those occurring at "water depths greater than or equal to 5,000 ft.").

tion activities in the ocean at depths once believed impossible to reach.<sup>3</sup>

As the Deepwater Horizon spill demonstrates, this new frontier of oil exploration and production has successfully located recoverable oil deposits thousands of feet below the ocean's surface.<sup>4</sup> The oil pursued through deepwater drilling not only lies below thousands of feet of water, but also rests in deposits tens of thousands of feet beneath the ocean floor.<sup>5</sup> In the United States such deepwater oil exploration and production activities are largely confined to the Gulf of Mexico,<sup>6</sup> the site of the Deepwater Horizon disaster.<sup>7</sup>

Tapping into deepwater oil deposits involves remarkable and ever-increasingly sophisticated technology to first locate potential oil reserves thousands of feet below the ocean's surface.<sup>8</sup> Once a promising source of oil beneath the ocean's surface is located, an equally miraculous array of technology is then employed to extract the oil from thousands of feet beneath the ocean floor.<sup>9</sup> One can certainly marvel at the

<sup>3</sup> See *id.* at 9 (“In 2007, a record number of 15 rigs were drilling for oil and gas in water depths of 5,000 ft (1,524 m) or more in the [Gulf of Mexico]. At least 13 new drilling rigs are being built and contracted for use in the ultra-deepwater Gulf . . . they will be capable of operating in water depths up to 12,000 ft (3,658 m) and drilling to total depths of 40,000 ft (12,192m).”).

<sup>4</sup> See *id.* at 10 tbl.2.

<sup>5</sup> Joel K. Bourne, Jr., *The Deep Dilemma*, NAT'L GEOGRAPHIC, Oct. 2010, at 40, 44 (“BP’s Macondo well, in about 5,000 feet of water and reaching another 13,000 feet beneath the seafloor, wasn’t particularly deep. The industry has drilled in 10,000 feet of water and to depths of 35,000 feet—the latter a world record just set last year by the *Deepwater Horizon* in another BP field in the Gulf.”).

<sup>6</sup> See MINERALS MGMT. SERV., U.S. DEP’T OF THE INTERIOR, DEEP WATER: WHERE THE ENERGY IS 2 (2004), available at [http://www.boemre.gov/Assets/PressConference11152004/MSGlossySingle\\_110404.pdf](http://www.boemre.gov/Assets/PressConference11152004/MSGlossySingle_110404.pdf) (“With declining production from its near-shore, shallow waters, energy companies have focused their attention on oil and gas resources in water depths of 1,000 feet and beyond. Their progress in developing these resources has made the Gulf of Mexico the focal point of deep water oil and gas exploration and production in the world.”).

<sup>7</sup> See Campbell Robertson, *11 Remain Missing After Oil Rig Explodes off Louisiana; 17 Are Hurt*, N.Y. TIMES, Apr. 22, 2010, at A13.

<sup>8</sup> See John T. Cuddington & Diana L. Moss, *Technological Change, Depletion, and the U.S. Petroleum Industry*, 91 AM. ECON. REV. 1135, 1136 (2001) (“Technological advances such as three-dimensional seismic techniques, polycrystalline diamond compact drill bits, horizontal drilling, and offshore platforms capable of operating in hostile, deep-water environments are widely acknowledged to have had significant impact on [oil exploration and development] . . .”).

<sup>9</sup> See Jad Mouawad & Barry Meier, *Risk-Taking Rises to New Levels as Oil Rigs in Gulf Drill Deeper*, N.Y. TIMES, Aug. 30, 2010, at A1 (“[T]he Perdido platform is a vast hub that can drill and pump oil from wells across 30 miles of ocean floor. Below it is a subsea cityscape of pumps, pipes, valves, manifolds, wellheads and blowout preventers—all painted a bright yellow so as to be visible to the floodlights of the remote-controlled submarines that maintain it.”).

modern day engineering feats that have allowed for the discovery and extraction of oil from so deep below the ocean.

However, the several-months-long Deepwater Horizon oil gusher also taught us that this technology has significant limitations. When this miracle of complex technology fails, there is no readily available and reliable technology to promptly abate a catastrophic, uncontrolled flow of oil.<sup>10</sup> This fundamental technological shortcoming is additionally problematic because at the depths deepwater drilling takes place, the ocean is utterly inhospitable to direct human intervention when disaster strikes.<sup>11</sup>

While a confluence of factors from both industry and regulators led to the Deepwater Horizon oil spill,<sup>12</sup> there is little doubt that one of the root causes of this catastrophe was a failure of technology. The last line of defense to prevent a spill of this magnitude from occurring at a deep well—a device known as a blowout preventer—utterly failed.<sup>13</sup> Deepwater oil, it turns out, presents serious adverse consequences in the event of a catastrophic technological failure.

Without the astonishing technology required to find and extract oil from thousands of feet below the ocean's floor, deepwater would be off limits for oil drilling. We do possess such technology, however, and the Deepwater Horizon catastrophe properly raises questions concerning the sufficiency of federal government oversight, particularly the adequacy of regulation over the complex technology utilized in deepwater to extract oil. Indeed, as the events evolved concerning the Deepwater Horizon spill, the agency then responsible for oversight of virtually all aspects of deepwater exploration and production, the Minerals Management Services (MMS), came under harsh scrutiny, and any claim it may have had as an effective regulatory body shattered.<sup>14</sup>

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<sup>10</sup> *See id.*

<sup>11</sup> *See id.* (“[B]ecause the wells are deeper than human divers can go, oil companies must rely on remote-controlled submarines to maintain their equipment or perform repairs.”).

<sup>12</sup> *See* 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, at vii (2011) [hereinafter BP COMMISSION REPORT].

<sup>13</sup> Steven Mufson & David A. Fahrenthold, *Flaws in Key Oil Rig Device: Harsh Review in House*, WASH. POST, May 13, 2010, at A01; Katie Howell, *BP Should Have Shutdown Doomed Rig Weeks Before Explosion, Regulator Says*, GREENWIRE, July 20, 2010, available at <http://www.eenews.net/Greenwire/2010/07/20/archive/5>.

<sup>14</sup> Katie Howell, *Panel Faults MMS's Funding Woes, Lack of Political Support*, GREENWIRE, Oct. 13, 2010, available at <http://www.eenews.net/eenewspm/2010/10/13/archive/3> (“The presidential panel investigating the BP PLC oil spill said today that federal offshore-drilling regulators’ lack of resources and political backing contributed to the government’s failure to properly oversee the oil and gas industry.”). In a prior investigation of MMS and its regula-

Consequently, not too long after the magnitude of the disaster occurring in the Gulf of Mexico became evident, the Secretary of the Interior, Kenneth Salazar, promptly fired the head of MMS and completely restructured the agency.<sup>15</sup>

## I. DEEPWATER TECHNOLOGY OVERVIEW

Among the first deepwater oil production efforts in the Gulf of Mexico was Placid Oil's attempts in 1984 to recover oil from more than 1500 feet beneath the surface.<sup>16</sup> Production results were less than satisfactory, so the wells were eventually abandoned.<sup>17</sup> This failed effort at production nonetheless marked a major technological advancement, since it was the first time that a floating platform was used in an effort to retrieve oil from the deep.<sup>18</sup> Following Placid's attempt at deepwater production, the technology associated with offshore oil exploration and production quickly advanced, and opened the Gulf of Mexico as a feasible source of oil.<sup>19</sup>

### A. *Locating Deepwater Oil Deposits*

Locating oil thousands of feet beneath the surface of the ocean requires a combination of technical know-how, complex technology, and luck. At this exploratory stage, perhaps no technology is more important than three-dimensional seismic technology,<sup>20</sup> which relies upon sound waves transmitted by specially equipped vessels to produce a

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tion of the oil and gas industry, the Inspector General's Office for the Department of Interior found a wide range of troubling ethical issues between MMS regulators and industry. *See generally* OFFICE OF THE INSPECTOR GEN., U.S. DEP'T OF THE INTERIOR, INVESTIGATIVE REPORT: ISLAND OPERATING COMPANY ET AL. (2010).

<sup>15</sup> *See generally* U.S. Sec'y of the Interior, Order No. 3302, Change of the Name of the Minerals Management Service to the Bureau of Ocean Energy Management, Regulation, and Enforcement (June 18, 2010), *available at* <http://www.doi.gov/deepwaterhorizon/loader.cfm?csModule=security/getfile&PageID=35872>.

<sup>16</sup> WILLIAM L. LEFFLER ET AL., DEEPWATER PETROLEUM EXPLORATION & PRODUCTION: A NONTECHNICAL GUIDE 30 (2003).

<sup>17</sup> *Id.*

<sup>18</sup> *Id.*

<sup>19</sup> *See id.* at 31–34 for a summary of how advances in technology, coupled with a better understanding of subsurface geology, led to boom in deepwater oil exploration and production.

<sup>20</sup> *Id.* at 40 (“Seismic data, especially 3D data, is one of the handful of vital enablers that has made deepwater exploration so rewarding. No one ever *knows* what will turn up when the drillbit hits total depth, but seismic data provides a quantum leap in improving probability of success before the well is drilled. With deepwater wells running up to \$100 million, that's important.”).

three-dimensional record of the subsurface geology.<sup>21</sup> This three-dimensional record is then scrutinized by a variety of scientists for geological features strongly suggestive of the presence of oil.<sup>22</sup> In describing Chevron's seismic hunt for oil in the deep, one reporter noted that the company:

[D]eployed ships that cruised through the Gulf, popping off air guns—underwater cannons that emit a gigantic burp into the ocean, bouncing sound waves off under water rock formations. Hydrophones (aquatic microphones) tethered to the vessels recorded the response, taking in hundreds of thousands of recordings simultaneously. These allowed the company to determine the composition and shape of the rocks below.<sup>23</sup>

If the data retrieved from seismic technology is indicative of the likely presence of oil, then the next step is to drill a preliminary well, referred to as a “wildcat,”<sup>24</sup> to confirm whether there is oil.

### B. *Drilling the Production Well*

Putting a production well in deepwater is an incredibly challenging endeavor: “[D]rilling a well in 1500 ft of water is comparable to standing on top of the Sears Tower trying to stick a long straw in a bottle of Coke sitting on South Wacker Drive.”<sup>25</sup> A reporter related that “[b]uilding an oil well is like building a ship in an opaque bottle, threading massive pipes and intricate tools through a dark, narrow hole.”<sup>26</sup> In order to accomplish such a near impossible feat, a variety of sophisticated, technologically complex drilling platforms are available,<sup>27</sup> which allow operators to reach oil at depths greater than 25,000 feet beneath the sea floor.<sup>28</sup>

Because the oil found beneath deepwater is under tremendous pressure, “[p]ressure control sits at the top of the list of worries for the

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<sup>21</sup> *Id.* at 41–43.

<sup>22</sup> LEFFLER ET AL., *supra* note 16, at 46.

<sup>23</sup> Amanda Griscom Little, *Oil From The Deep*, WIRED, Sept. 21, 2007, at 110, 114–17.

<sup>24</sup> LEFFLER ET AL., *supra* note 16, at 46–48.

<sup>25</sup> *Id.* at 57–58.

<sup>26</sup> Eric Nalder, *Disaster in the Gulf: Despite Fatal Blowouts, Changes Come Slowly*, HOUS. CHRON., July 20, 2010, at A1.

<sup>27</sup> LEFFLER ET AL., *supra* note 16, at 57.

<sup>28</sup> *Id.* at 55. The Deepwater Horizon well reached 13,000 feet below the floor of the Gulf of Mexico. Bourne, *supra* note 5, at 44.

drilling engineer.”<sup>29</sup> To keep well pressure under control, a special heavy fluid, drilling mud,<sup>30</sup> is injected through the drillpipe and prevents oil and gas from surging uncontrolled through the well.<sup>31</sup> Once the well is completed, the drilling mud is replaced with a brine solution that maintains well control.<sup>32</sup>

Another step taken to control pressure involves pumping cement into the casing once it is in place.<sup>33</sup> In this step “cement is pumped down the casing and at the bottom it is forced into the annulus, the space between the casing and the rock.”<sup>34</sup> As a final pre-production seal, a cement plug is also placed in the well.<sup>35</sup>

### C. *Recovering Oil from the Well*

Once the well is in place, the next general phase is production—obtaining oil from the well for refining into a variety of petroleum products such as gasoline, aviation fuel, or diesel fuel. Production, too, involves incredibly complex technology on a massive scale.<sup>36</sup> Because the water depth can exceed the reach of fixed platform systems, floating systems predominate in deepwater production operations.<sup>37</sup> These floating production systems are often coupled with subsea technology in a type of hub-and-spoke arrangement, consisting of a production platform connected to several wells through miles of piping.<sup>38</sup> Once recovered, the oil is then transported through a network of undersea pipelines to an onshore refinery for final processing.<sup>39</sup>

<sup>29</sup> LEFFLER ET AL., *supra* note 16, at 58.

<sup>30</sup> See John K. Borchart, *Avoiding the Blowout*, MECHANICAL ENGINEERING, Aug. 2010, at 40, 40.

<sup>31</sup> *Id.*

<sup>32</sup> *Id.*

<sup>33</sup> Casing is the tubing that the oil flows through during production. LEFFLER ET AL., *supra* note 16, at 61.

<sup>34</sup> See Borchart *supra* note 30, at 40.

<sup>35</sup> *Id.* at 41.

<sup>36</sup> See Matthew Philips, *Journey to the Center of the Earth*, NEWSWEEK (Mar. 12, 2010), <http://www.newsweek.com/2010/03/11/journey-to-the-center-of-the-earth.html> (“Chevron’s Tahiti [ultra-deepwater production] platform, about 190 miles offshore, first appears as a speck in open water. Even up close, its size is deceiving. A three-level structure sits above the surface, but its 555-foot hull is entirely submerged. At 714 feet tall and weighing more than 80 million pounds, Tahiti is the equivalent of a 70-story skyscraper floating in 4,000 feet of water.”).

<sup>37</sup> See LEFFLER ET AL., *supra* note 16, at 90.

<sup>38</sup> See *id.* at 97, 107–19 (describing the subsea systems used in deepwater oil and gas drilling).

<sup>39</sup> See RICHARDSON ET AL., *supra* note 2, at 54, 56–57.

#### D. *The Pressure Control Technology of Last Resort: The Blowout Preventer*

In the event that drilling mud or cement fails to control well pressure, then the most critical piece of pressure control technology is the blowout preventer.<sup>40</sup> A blowout preventer has “three or more sets of hydraulic devices . . . [and t]he first line of defense is the *Hydril* or *annular preventer*,”<sup>41</sup> which once activated can seal off the well. Pipe rams are the second line of defense that can stop the flow through the well.<sup>42</sup> The final safe guards against the uncontrolled flow of oil through a well are the shear rams that can cut through the drill pipe and seal off the well.<sup>43</sup>

## II. REGULATORY OVERSIGHT OF BLOWOUT PREVENTER TECHNOLOGY

The regulations applicable to oil exploration and production operations in the Gulf of Mexico and other areas of the Outer Continental Shelf are found at 30 C.F.R. part 250, and were administered by MMS when the Deepwater Horizon spill occurred.<sup>44</sup> Two aspects of the regulatory approach to pressure control are noteworthy. First, to prevent a catastrophic loss of pressure control, the regulations require an operator to “use the best available and safest drilling technology.”<sup>45</sup> Second, operators must use blowout preventers to ensure pressure control.<sup>46</sup> Consequently, given the MMS mandate to use blowout preventers, the agency considered such equipment as among the “best available drilling technology” vital to maintaining well pressure control.<sup>47</sup>

Because of this reliance on blowout preventers, one can question whether MMS failed to adequately regulate the one piece of technology relied upon in the industry as a last resort to shut down an out-of-control well. Unfortunately, it appears that the heavy reliance on blowout preventers as essential fail-safe technology was misplaced, and this directly contributed to the magnitude of the Deepwater Horizon spill.<sup>48</sup>

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<sup>40</sup> See Borchardt, *supra* note 30, at 41 (“Massive pieces of equipment called blowout preventers are designed to close valves and use shear rams to seal the drill pipe and well casing to block oil and gas from escaping the wellbore. They are the third and final line of defense against a blowout.”).

<sup>41</sup> See LEFFLER ET AL., *supra* note 16, at 60.

<sup>42</sup> *Id.*

<sup>43</sup> *Id.*; see also Borchardt, *supra* note 30, at 41 (“[S]hear rams cut through and crush the pipe and then form a seal . . . . The ram blades also seal against each other forming a barrier blocking fluid flow.”).

<sup>44</sup> 30 C.F.R. pt. 250 (2010).

<sup>45</sup> *Id.* § 250.401(a).

<sup>46</sup> *Id.* § 250.440.

<sup>47</sup> See *id.* § 250.401(a), 250.440.

<sup>48</sup> See *id.*; BP COMMISSION REPORT, *supra* note 12, at 114, 121.



Once the blowout preventer failed, there was no other readily available solution to stop the uncontrolled flow of oil into the Gulf of Mexico.<sup>49</sup>

### A. Prior Blowout Preventer Failures

When one considers the reliability questions that MMS, engineers, and others in the industry raised concerning blowout preventers over the years,<sup>50</sup> it is shocking that this technology serves as the final fail-safe mechanism to control well pressure in an emergency. As a starting point in considering the questionable reliability of blowout preventer technology, we must realize that the Deepwater Horizon spill was not some unexpected, unanticipated, rare occurrence. It was an entirely foreseeable event. That is, the Deepwater Horizon was not the first time that a blowout preventer failed to stop a catastrophic flow of oil after pressure control was lost at a well in the Gulf of Mexico.<sup>51</sup>

In 1979, the Mexican national oil company PEMEX, while conducting oil exploration activities at the Ixtoc I well, experienced pressure control problems.<sup>52</sup> Realizing the critical need to capture well control, the Ixtoc I operators activated the shear rams on the blowout preventer.<sup>53</sup> But once activated, the rams failed to shear through the pipe and stem the flow of oil.<sup>54</sup> Thus, one lesson from the Ixtoc I spill was that, when most needed, blowout preventers can utterly fail.

More recently, in 2009, there was a well blowout off the coast of Australia. The Montara spill raged for more than ten weeks before flow was stopped.<sup>55</sup> Although this well was only in 250 feet of water,<sup>56</sup> it fur-

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<sup>49</sup> BP COMMISSION REPORT, *supra* note 12, at 114.

<sup>50</sup> See David Izon et al., Minerals Mgmt. Serv., *Absence of Fatalities in Blowouts Encouraging in MMS Study of OCS Incidents 1992–2006*, DRILLING CONTRACTOR, July/Aug. 2007, at 84, 84, available at [http://www.drillingcontractor.org/dcp/dcpjulyaug07/DC\\_July07\\_MMSBlowouts.pdf](http://www.drillingcontractor.org/dcp/dcpjulyaug07/DC_July07_MMSBlowouts.pdf).

<sup>51</sup> See Arne Jernelöv & Olof Lindén, *Ixtoc I: A Case Study of the World's Largest Oil Spill*, 10 AMBIO 299, 299 (1981).

<sup>52</sup> *Id.*

<sup>53</sup> W. ENG'G SERVS., SHEAR RAM CAPABILITIES STUDY 3-4 (2004) [hereinafter SHEAR RAM CAPABILITIES STUDY], available at [http://www.boemre.gov/tarprojects/463/\(463\)WestEngineeringFinalReport.pdf](http://www.boemre.gov/tarprojects/463/(463)WestEngineeringFinalReport.pdf) (“WEST researched known failures to shear and seal and located only the Ixtoc 1 blowout and spill off of the Yucatan peninsula. Undoubtedly, there are more failures that were either not reported well or had minimal exposure. Not included are the known failures to seal during pressure testing since these were repaired prior to the rams being used on the well.”).

<sup>54</sup> *Id.*

<sup>55</sup> Keith Bradsher, *Relief Well Was Used to Halt Australian Spill*, N.Y. TIMES, May 3, 2010, at A14.

<sup>56</sup> *Id.*

ther demonstrates the technical difficulties associated with capping a well even in relatively shallow waters.

If the Ixtoc I and Montara spills are representative of rare blowout events, perhaps then the reliance by MMS and industry on blowout preventers as technology might be understandable. Well blowouts, however, are not unheard-of events. According to MMS data evaluating blowouts on the Outer Continental Shelf, between 1971 and 1991, eight-seven blowouts occurred.<sup>57</sup> MMS also found that between 1992 and 2006, another thirty-nine blowouts happened.<sup>58</sup> While the data show that the number of blowouts decreased over the years, nonetheless, over the thirty-five year period studied by MMS there were a total of 126 blowouts on the Outer Continental Shelf. The data compiled from 1971 through 1991, according to MMS authors, correlated to one blowout for every 246 wells drilled,<sup>59</sup> and between 1992 through 2006 the blowout rate was one blowout for every 387 wells drilled.<sup>60</sup> Consequently, the potential for a well blowout is startlingly high since there are over 4000 wells in the Gulf of Mexico, and even more alarmingly, 700 of these are in waters deeper than 5000 feet.<sup>61</sup>

#### B. *MMS Research into and Knowledge of Unreliable Blowout Preventers*

For years MMS has been concerned about the effectiveness of blowout preventers as the critical technology in the event well pressure was compromised. A decade before the Deepwater Horizon incident, MMS funded a study to evaluate blowout preventer reliability.<sup>62</sup> The study examined a total of 117 failures associated with blowout preventers at eighty-three deepwater wells, and categorized fifty-seven percent of the failures as “safety critical failures.”<sup>63</sup>

In 2004, MMS retained WEST Engineering Services “to answer the question ‘Can a rig’s blowout preventer (BOP) equipment shear the pipe to be used in a given drilling program at the most demanding

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<sup>57</sup> Izon et al., *supra* note 50, at 84.

<sup>58</sup> *Id.*

<sup>59</sup> *Id.*

<sup>60</sup> *Id.*

<sup>61</sup> Mouawad & Meier, *supra* note 9.

<sup>62</sup> PER HOLAND, SINTEF, RELIABILITY OF SUBSEA BOP SYSTEMS FOR DEEPWATER APPLICATION, PHASE II DW 7 (1999), available at <http://www.boemre.gov/tarprojects/319/319AA.pdf> (summarizing a reliability study of blowout preventers funded by MMS and performed by Norwegian research group SINTEF).

<sup>63</sup> *Id.* at 85 (“All failures that occur in the BOP after the installation test are regarded as safety critical failures.”).

condition to be expected, and at what pressure?”<sup>64</sup> This was not simply a question of engineering curiosity, since “[t]he well control function of last resort is to shear pipe and secure the well with the sealing shear ram. As a result, failure to shear when executing this final option would be expected to result in a *major safety and/or environmental event*.”<sup>65</sup>

The 2004 WEST Engineering study pointed to improvements in drill pipe strength, coupled with the need to use larger, heavier pipe in deepwater drilling, which together “adversely affect[] the ability of a given ram BOP to successfully shear and seal the pipe in use.”<sup>66</sup> This concern was more than a theoretical possibility because “WEST is currently aware of several failures to shear when conducting shear tests using the drill pipe that was to be used in the well.”<sup>67</sup>

Others had also raised concerns about the reliability of blowout preventers. In a paper presented at the 2003 Offshore Technology Conference, the authors noted that “[f]loating drilling rig downtime due to poor BOP reliability is a common and very costly issue confronting all offshore drilling contractors.”<sup>68</sup>

Blowout preventer unreliability has not escaped scrutiny in the Deepwater Horizon congressional investigations. One congressional committee’s investigation noted that “in numerous cases, blowout preventers have failed to operate, often with catastrophic consequences. The blowout preventer installed on the Macondo well failed to control the blowout.”<sup>69</sup>

Not only did at least two studies conducted on behalf of MMS raise serious reliability questions concerning blowout preventer technology, but the agency also warned the offshore oil exploration and production industry about another shortcoming of blowout preventers—the inability to operate a blowout preventer in the event that primary control is lost.<sup>70</sup> In March 2000, MMS issued a notice advising lessees that “[t]he MMS considers a backup BOP actuation system to be an essential com-

<sup>64</sup> SHEAR RAM CAPABILITIES STUDY, *supra* note 53, at 1-1.

<sup>65</sup> *Id.* at 3-1 (emphasis added).

<sup>66</sup> *Id.*

<sup>67</sup> *Id.*

<sup>68</sup> EARL SHANKS ET AL., DEEPWATER BOP CONTROL SYSTEMS—A LOOK AT RELIABILITY ISSUES 2 (2003), available at <http://media.mcclatchydc.com/static/pdf/Les-oilspill-ABSC.pdf>.

<sup>69</sup> *Legislation to Respond to the BP Oil Spill and Prevent Future Oil Well Blowouts: Hearing Before the H. Comm. on Energy & Commerce*, 111th Cong. 6 (2010) (Memorandum by Rep. Henry A. Waxman, Chairman, H. Comm. on Energy & Commerce, and Rep. Joe Barton, Member, H. Comm. on Energy & Commerce).

<sup>70</sup> See generally MINERALS MGMT. SERV., U.S. DEP’T OF THE INTERIOR, MMS SAFETY ALERT NO. 186: ACCIDENTAL DISCONNECT OF MARINE DRILLING RISER (2000), available at [http://www.enews.net/public/25/15454/features/documents/2010/05/04/document\\_gw\\_03.pdf](http://www.enews.net/public/25/15454/features/documents/2010/05/04/document_gw_03.pdf).

ponent of a deepwater drilling system and, therefore, expects OCS operators to have reliable back-up systems for actuating the BOP.”<sup>71</sup>

In sum, there were several red flags about the unreliability of blowout preventers. Nonetheless, they remain the fail-safe device of last resort required by regulation, and the failure of one played a major role in the Deepwater Horizon spill.<sup>72</sup>

### III. THE REGULATORY RESPONSE

Among the regulatory steps taken after the spill was a six-month moratorium on deepwater drilling activities until November 30, 2010.<sup>73</sup> Despite the legitimate concerns raised about the ability to conduct deepwater drilling in a safe and environmentally responsible manner, the moratorium was controversial and ultimately was enjoined.<sup>74</sup> A second moratorium was issued shortly thereafter. It, too, was challenged in federal court. Before the court could rule on its validity, however, the second ban was lifted.<sup>75</sup>

MMS imposed new obligations upon deepwater drill rig operators to reduce the long-term risks associated with deepwater drilling, in particular technology-related regulations.<sup>76</sup> These regulations specifically targeted blowout preventers. In sum, these new regulations include: a requirement to certify compliance with existing regulations, signed by the operator’s chief executive officer;<sup>77</sup> submission of detailed information about blowout preventers in use;<sup>78</sup> retention of blowout preventer records;<sup>79</sup> third-party verification of blowout preventer fitness;<sup>80</sup> and the requirement to have in place redundant control mechanisms.<sup>81</sup>

Similar to the first moratorium, the validity of these new regulations was challenged. The same judge who enjoined the first moratorium found that the new drilling safety obligations issued by the Bureau of

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<sup>71</sup> *Id.*

<sup>72</sup> See 30 C.F.R. § 250.440 (2010); BP COMMISSION REPORT, *supra* note 12, at 114, 121.

<sup>73</sup> See *Enco Offshore Co. v. Salazar*, No. 10-1941, 2010 WL 4116892, at \*1 (E.D. La. Oct. 19, 2010).

<sup>74</sup> See *id.* at \*2.

<sup>75</sup> See *id.*

<sup>76</sup> MINERALS MGMT. SERV., U.S. DEP’T OF THE INTERIOR, NTL NO. 2010-N05: 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 1 (2010) [hereinafter MMS INCREASED SAFETY MEASURES].

<sup>77</sup> *Id.* at 2.

<sup>78</sup> *Id.* at 2–3.

<sup>79</sup> *Id.* at 4.

<sup>80</sup> *Id.* at 3.

<sup>81</sup> *Id.* at 4–5.

Ocean Energy Management, Regulation and Enforcement (BOEMRE) were invalid under the Administrative Procedure Act.<sup>82</sup>

Perhaps the court's invalidation of the safety alert requirements will have little practical effect on BOEMRE's efforts to impose heightened regulation over deepwater drilling activities. Shortly before the court rejected the new regulations, BOEMRE published an interim final rule that incorporated most of the safety alert requirements,<sup>83</sup> and it became effective upon publication.<sup>84</sup>

The need to adopt what appear to be such basic common sense regulations, essentially reminders to industry of the need to properly maintain and operate blowout preventers, is further troubling evidence of MMS's failure to adequately regulate technology. This is especially disconcerting given the critical importance of blowout preventers as the last-in-line, fail-safe mechanism if well control is lost thousands of feet beneath the ocean's surface. That BOEMRE found it necessary to obtain information about precisely what blowout preventers are in use is equally troubling. It reflects a past lack of robust oversight concerning the inherently risky activity of deepwater drilling, because it is strongly suggestive of agency ignorance about exactly what blowout preventers are in use to stop a catastrophic flow of oil from a runaway well.

In another post-Deepwater Horizon regulatory development, which serves as another example of less-than-diligent regulatory oversight, BOEMRE published a final rule requiring deepwater drill rig operators to adopt Safety and Environmental Management Systems (SEMS).<sup>85</sup> In promulgating this new directive, BOEMRE asserted that "[t]he ultimate goal of SEMS is to promote safety and environmental protection during OCS activities. The protection of human life and the environment are the top priorities and objectives of this rule."<sup>86</sup>

These are certainly laudable and important regulatory goals, but when one considers the procedural history of this new rule, it raises additional concerns about the vigor with which MMS regulated deep-

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<sup>82</sup> MMS INCREASED SAFETY MEASURES, *supra* note 76, at 4–5.

<sup>83</sup> Oil and Gas and Sulphur Operations in the Outer Continental Shelf—Increased Safety Measures for Energy Development on the Outer Continental Shelf; Final Rule, 75 Fed. Reg. 63,345, 63,346 (Oct. 14, 2010) (to be codified at 30 C.F.R. pt. 250). With the exception of one-time requirements, "[t]his rule incorporates specific details included in 2010-N05 by codifying these into regulations." *Id.*

<sup>84</sup> *Id.* at 63,346.

<sup>85</sup> Oil and Gas and Sulphur Operations in the Outer Continental Shelf—Safety and Environmental Management Systems; Final Rule, 75 Fed. Reg. 63,609, 63,610 (Oct. 15, 2010) (to be codified at 30 C.F.R. pt. 250).

<sup>86</sup> *Id.* at 63,644.

water drilling activities. MMS contemplated the need to improve safety and enhance environmental protection of deepwater drilling in 2006, years before the Deepwater Horizon spill occurred.<sup>87</sup> It then took several years for MMS to publish a proposed rule focusing on reducing the potential adverse safety and environmental aspects of deepwater drilling.<sup>88</sup> The impetus for the proposed rule was an evaluation of more than 1400 incidents that occurred during exploration and production activities on the Outer Continental Shelf, including forty-one fatalities and ten instances where well control was lost.<sup>89</sup> Despite the significant safety and environmental concerns that served as the catalyst for the advanced notice of proposed rulemaking and proposed rule, no final rule came forth until almost six months after the Deepwater Horizon disaster resulted in eleven deaths, numerous injuries, and spewed millions of gallons of oil into the Gulf of Mexico.<sup>90</sup>

Another federal regulatory development, aimed at the heart of MMS, was the decision to split it into three separate bureaus.<sup>91</sup> The new structure included BOEMRE, which would assume oversight of Outer Continental Shelf energy resources; the Bureau of Safety and Environmental Enforcement, responsible for safety and enforcement; and the Bureau of Natural Resources Revenue, which assumed responsibility for royalties.<sup>92</sup>

The restructuring of MMS indicated a realization that the single agency approach suffered from insurmountable problems that rendered MMS incapable of effectively regulating the oil and gas indus-

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<sup>87</sup> Oil and Gas and Sulphur in the Outer Continental Shelf (OCS)—Safety and Environmental Management Systems; Advanced Notice of Proposed Rulemaking, 71 Fed. Reg. 29,277, 29,277 (proposed May 22, 2006) (to be codified 30 C.F.R. pt. 250).

<sup>88</sup> See Safety and Environmental Management Systems for Outer Continental Shelf Oil and Gas Operations, 74 Fed. Reg. 28,639, 28,639 (proposed June 17, 2009) (to be codified at 30 C.F.R. pt. 250).

<sup>89</sup> *Id.* at 28,642.

<sup>90</sup> See Oil and Gas and Sulphur Operations in the Outer Continental Shelf—Safety and Environmental Management Systems, 75 Fed. Reg. at 63,610; BP COMMISSION REPORT, *supra* note 12, at vi.

<sup>91</sup> U.S. Sec’y of the Interior, Order No. 3299, Establishment of the Bureau of Ocean Energy Management, the Bureau of Safety and Environmental Enforcement, and the Office of Natural Resources Revenue (May 19, 2010), *available at* <http://www.doi.gov/deepwaterhorizon/loader.cfm?csModule=security/getfile&PageID=32475>; Press Release, U.S. Dep’t of the Interior, Salazar Divides MMS’s Three Conflicting Missions (May 19, 2010), *available at* <http://www.doi.gov/news/pressreleases/Salazar-Divides-MMSs-Three-Conflicting-Missions.cfm#>.

<sup>92</sup> Press Release, U.S. Dep’t of the Interior, *supra* note 91.

try.<sup>93</sup> The agency was entirely too cozy with the industry that it was supposed to oversee,<sup>94</sup> and also faced an inherent major conflict that prevented it from serving as a robust and feared regulatory agency.<sup>95</sup> This conflict arose from the dual role that the agency served when regulating the oil and gas industry.<sup>96</sup> On the one hand, MMS was responsible for enforcing the regulations governing oil and gas operations in the Outer Continental Shelf.<sup>97</sup> On the other hand, MMS was also responsible for the leasing program that authorizes oil and gas production activities to occur in federal waters.<sup>98</sup>

The importance of this latter function of the now defunct MMS—auktioning off the rights to search for and produce oil and gas discovered in federal waters—is significant. It was a lucrative aspect of MMS, reportedly only exceeded by the Internal Revenue Service as a revenue generating arm of the federal government.<sup>99</sup> This duality was at the nub of the agency’s conflicting role; regulate an industry engaged in a highly risky activity, but not with such a heavy hand as to adversely impact the revenue stream associated with the agency’s multibillion dollar offshore drilling lease and royalty program. This required a delicate balancing act that perhaps no single agency could perform, so what was once a single agency is now three bureaus.<sup>100</sup>

#### IV. WILL INTERIOR’S EFFORTS AVERT ANOTHER DEEPWATER DISASTER?

Is this new approach adequate to dramatically reduce the risk of another deepwater spill? This is literally a multibillion dollar, life-or-death question, given the devastating consequences that a blowout can

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<sup>93</sup> See *id.* (“The Minerals Management Service has three distinct and conflicting missions that—for the benefit of effective enforcement, energy development, and revenue collection—must be divided.”).

<sup>94</sup> See, e.g., Juliet Eilperin & Scott Higham, *How the Mineral Management Service’s Partnership With Industry Led to Failure*, WASH. POST (Aug. 24, 2010, 10:14 PM), [http://www.washingtonpost.com/wp-dyn/content/article/2010/08/24/AR2010082406754\\_pf.html](http://www.washingtonpost.com/wp-dyn/content/article/2010/08/24/AR2010082406754_pf.html).

<sup>95</sup> *Id.* (“The Minerals Management Service . . . created in 1982 would not only lease tracts for exploration and collect the government’s share of oil and gas revenue, it would also regulate the industry. That built-in conflict would hamstring the agency for decades.”).

<sup>96</sup> See KRISTINA ALEXANDER, CONG. RESEARCH SERV., R41265, *THE 2010 OIL SPILL: THE MINERALS MANAGEMENT SERVICE (MMS) AND THE NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) I* (2010).

<sup>97</sup> *Id.*

<sup>98</sup> *Id.* at 4.

<sup>99</sup> Les Blumenthal & Erica Bolstad, *U.S. Agency Let Oil Industry Write Offshore Drilling Rules*, McCLATCHY NEWSPAPERS, May 10, 2010, <http://www.mcclatchydc.com/2010/05/10/93859/us-agency-lets-oil-industry-write.html>. (“The MMS generates more revenue for the federal Treasury than any other agency except the Internal Revenue Service.”).

<sup>100</sup> See Press Release, U.S. Dep’t of the Interior, *supra* note 91.

cause to human life and the environment. There are several reasons for skepticism that another catastrophic deepwater spill will be prevented by the new regulatory regime.

First, there is the sheer technical complexity of the equipment involved in deepwater drilling.<sup>101</sup> This injects increased opportunities for equipment failures and malfunctions that can have devastating consequences, as amply illustrated by the Deepwater Horizon disaster. The technical complexity of the equipment required for drilling and extracting oil from miles beneath the surface of the ocean further increases the possibilities for human error, and when coupled with less-than-reliable “fail-safe” devices, another massive spill is just a new well away from occurring.

It may even be that the new requirements imposed by BOEMRE in response to the Deepwater Horizon spill will further increase the complexity of the equipment used in deepwater drilling by adding layers of redundancies.<sup>102</sup> Thus, the very regulations that designed to avert future spills could have the perverse effect of increasing the likelihood of another disaster in the deep.

Then there is the environment where this incredibly complex technology is employed. To describe it as harsh grossly understates the conditions that deepwater drilling technology must withstand. Deepwater is an environment of extreme pressures and extreme temperatures. The oil can be hundreds of degrees Fahrenheit and the water close to freezing.<sup>103</sup> The water pressure can be literally crushing.<sup>104</sup> This extreme environment only adds to the stresses and strains on the equipment, and increases the risk of failure.<sup>105</sup>

A second overall concern is the frequency with which blowouts occur.<sup>106</sup> Recall that according to an evaluation of blowouts that occurred between 1992 and 2006, MMS determined that blowouts occur

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<sup>101</sup> See Mouawad & Meier, *supra* note 9 (referring to experts who opined that the risks associated with deepwater drilling “do not directly increase with greater depth, . . . [b]ut they do rise as exploration and production rigs become more complex and more remote”).

<sup>102</sup> See Oil and Gas and Sulphur Operations in the Outer Continental Shelf—Increased Safety Measures for Energy Development on the Outer Continental Shelf, 75 Fed. Reg. 63,346, 63,348 (Oct. 14, 2010) (to be codified at 30 C.F.R. pt. 250) (listing additional proposed regulatory safeguards).

<sup>103</sup> See Little, *supra* note 23, at 120 (“When the boiling-hot oil hits the freezing-cold water, it could solidify and block the flow, rupturing the pipes.”).

<sup>104</sup> See *id.* at 118.

<sup>105</sup> See *id.* at 120.

<sup>106</sup> See Izon et al., *supra* note 50, at 84.



on average once for every several hundred wells drilled.<sup>107</sup> To put that ratio into perspective, consider that almost 4000 wells exist in the Gulf of Mexico,<sup>108</sup> and more are on their way as oil exploration and production fans out into deeper and deeper waters. Thus, at least ten wells in operation now are expected to experience a blowout, creating the likelihood for more blowouts to occur in the future.

Third, the critical equipment problems that came to light as a result of the Deepwater Horizon spill are indicative of industry-wide problems.<sup>109</sup> In fact, the blowout preventers that were employed during the relief well, drilled to stop the flow from the Macondo well, experienced multiple failures.<sup>110</sup> The multiple failures of the blowout preventers during such a critical emergency operation, concluded BOEMRE, “raise red flags as to the reliability of BOPs to adequately safeguard the lives of workers and protect the environment from oil spills in response to a large blowout.”<sup>111</sup>

Fourth, one can legitimately question whether BOEMRE and the other bureaus created in the aftermath of the Deepwater Horizon spill can truly serve as independent regulators of the oil and gas industry. One reason this question still lingers, even after MMS was dismantled, is because of BOEMRE’s continuing practice of adopting wholesale American Petroleum Institute (API) standards as regulatory requirements.<sup>112</sup> This means that an influential industry trade association continues to loom large in the regulation of deepwater drilling. As a recent post-Deepwater Horizon example, one only need look at the SEMS requirement adopted by BOEMRE in October 2010.<sup>113</sup> Publication of the final SEMS rule in the Federal Register proclaimed that “[t]his rule-making will incorporate in its entirety and make mandatory the American Petroleum Institute’s Recommended Practice 75, Development of a Safety and Environmental Management Program for Offshore Opera-

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<sup>107</sup> *Id.*

<sup>108</sup> Mouawad & Meier, *supra* note 9.

<sup>109</sup> See Oil and Gas and Sulphur Operations in the Outer Continental Shelf—Increased Safety Measures for Energy Development on the Outer Continental Shelf, 75 Fed. Reg. 63,346, 63,355 (Oct. 14, 2010) (to be codified at 30 C.F.R. pt. 250) (“Circumstances suggest that, while a blowout and spill of this magnitude have not occurred before on the OCS, it is unlikely that the problems are unique to the Deepwater Horizon and BP’s Macondo well.”).

<sup>110</sup> *Id.*

<sup>111</sup> *Id.*

<sup>112</sup> See, e.g., *id.* at 63,351.

<sup>113</sup> Oil and Gas and Sulphur Operations in the Outer Continental Shelf—Safety and Environmental Management Systems, 75 Fed. Reg. 63,610, 63,610 (Oct. 15, 2010) (to be codified at 30 C.F.R. pt. 250).

tions and Facilities . . . under the jurisdiction of BOEMRE.”<sup>114</sup> This is not the only time that API standards have been adopted by the agency as industry-wide regulatory requirements. According to one article raising questions about this practice, MMS, and now BOEMRE, have adopted almost 100 API standards as regulatory requirements.<sup>115</sup>

This is not to suggest that regulatory agencies should not work closely with industry representatives to develop regulations. In fact, one approach to regulation, “negotiated rulemaking,” involves actively seeking input from all stakeholders, including industry representatives, as a regulation methodology. In addition, one should not foreclose considering the expertise that industry can bring to bear in assisting regulators with the development of complex regulations.<sup>116</sup> However, when an agency has the well-deserved reputation for having ties too close to the industry it regulates,<sup>117</sup> doubts about regulator independence will legitimately follow, particularly when there is a practice of adopting wholesale numerous industry trade association standards as regulations.<sup>118</sup> Heavy reliance upon trade association standards also leads to questions about regulatory agency expertise.<sup>119</sup>

The fifth, and perhaps most disconcerting reason to have doubts about the future effectiveness of the new deepwater regulatory regime involves the question of execution. That is, do the newly formed bureaus have sufficient personnel, polices, and training in place to closely regulate industry as it engages in deepwater drilling and its attendant risks? Based on the findings of a specially appointed Safety Oversight Board,<sup>120</sup> there are a number of ongoing agency difficulties of such

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<sup>114</sup> *Id.*

<sup>115</sup> See Blumenthal & Bolstad, *supra* note 99.

<sup>116</sup> See OUTER CONT’L SHELF SAFETY OVERSIGHT BD., U.S. DEP’T OF THE INTERIOR, REPORT TO SECRETARY OF THE INTERIOR KEN SALAZAR 5, 26 (2010) [hereinafter SAFETY OVERSIGHT BOARD REPORT].

<sup>117</sup> See Blumenthal & Bolstad, *supra* note 99 (quoting an environmental attorney describing the MMS as “a revolving door where officials slip back and forth between the government and the oil industry. That only adds to the perception that the federal agency is too close to the interests it regulates.”).

<sup>118</sup> See SAFETY OVERSIGHT BOARD REPORT, *supra* note 116, at 26.

<sup>119</sup> See *id.* (questioning whether BOEMRE has “sufficient staff with the requisite expertise to review and vet standards that have been developed by industry group subject matter experts, such as the American Petroleum Institute (API), to determine the extent to which those standards should be used in developing regulations”).

<sup>120</sup> Creation of the Safety Oversight Board was one of the actions taken by Secretary Salazar in response to the Deepwater Horizon oil spill. *Id.* at 1. The Safety Oversight Board was directed to, among other tasks, recommend ways to improve oversight of Outer Continental Shelf activities. *Id.*

magnitude that addressing them by merely reorganizing MMS into three separate bureaus is not likely to resolve them.<sup>121</sup>

One of the most fundamental functions of any regulatory agency is to review permit applications. Regulator review is important to confirm that a sought-after permit and the activities it authorizes comply with the underlying statutory and regulatory requirements. This critical function, however, is likely to remain impaired because of a lack of personnel. According to the Safety Oversight Board, there are simply not enough engineers at BOEMRE to review the thousands of permit applications to conduct drilling activities in the Gulf of Mexico.<sup>122</sup>

Another shortcoming incapable of resolution by reorganization alone has to do with inspections, which are also among the core functions of a regulatory agency. In order to ensure that permittees are meeting their legal obligations on a consistent basis, routine inspections are among the most essential regulator activities. Furthermore, those conducting the inspections must have appropriate training and be apprised of the applicable statutes and regulations that underlie inspections and compliance determinations. A regulatory inspection program should also be random and unannounced if it is to maximize its effectiveness in evaluating compliance and deterring violations. Inspections that do not regularly occur or that are announced undercut this important regulatory tool and will fail to detect and deter violations.<sup>123</sup> If inspections uncover violations, then a critical part of any regulatory program is appropriate enforcement to punish violators, bring them into compliance, and deter future violations.

The inspection function of BOEMRE is compromised because of major shortcomings with each of the main components of an effective inspection and enforcement program outlined above. One problem, for instance, the Safety Oversight Board found was that BOEMRE “does not have a formal, bureau-wide compilation of rules, regulations, policies, or practices pertinent to inspections, nor does it have a comprehensive handbook addressing inspector roles and responsibilities.”<sup>124</sup> In addition, “unannounced inspections are rarely performed.”<sup>125</sup>

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<sup>121</sup> See *id.* at 4–5 (discussing agency difficulties).

<sup>122</sup> *Id.* at 6 (“With increasing workloads, [Gulf of Mexico] district offices do not have a sufficient number of engineers to efficiently and effectively conduct permit reviews.”).

<sup>123</sup> See JEFFREY F. BEATTY & SUSAN S. SAMUELSON, *BUSINESS LAW AND THE ENVIRONMENT* 92 (Jack W. Calhoun et al. eds., 4th ed. 2007).

<sup>124</sup> SAFETY OVERSIGHT BOARD REPORT, *supra* note 116, at 8.

<sup>125</sup> *Id.* at 9.

Lack of appropriate inspector training is another shortcoming adversely impacting the effectiveness of BOEMRE as a regulatory agency, since it “does not have a formal training and certificate program for its inspectors.”<sup>126</sup> In light of the breathtaking complexity involved in deepwater oil production activities, the lack of inspector training is very troubling.

The number of inspectors is yet another problem plaguing the BOEMRE offshore regulatory program. According to the Safety Oversight Board, there are approximately 3000 offshore facilities subject to BOEMRE jurisdiction in the Gulf of Mexico,<sup>127</sup> but there are only fifty-five inspectors.<sup>128</sup> This means there are fifty-four facilities for every one inspector,<sup>129</sup> which seems wholly inadequate when one considers the technical complexity associated with deepwater drilling and production, and their inherent risks.

The lack of inspection personnel may explain, in part, why even after instances of noncompliance are found, few follow-up inspections result. In 2009 there were 2298 so-called instances of noncompliance; however, “only 50 follow-up inspections were conducted to ensure compliance.”<sup>130</sup>

The penalties violators may face for noncompliance are another problem for BOEMRE. The maximum penalty for violations is \$35,000 per day, per violation.<sup>131</sup> At first blush this may not seem an inconsequential sum, and is in line with the penalty amounts proscribed by other environmental statutes.<sup>132</sup> As the Safety Oversight Board pointed out, however, even BOEMRE employees question whether, given the fact that “many operators pay between \$500,000 and \$1 million daily to run a facility, . . . a potential fine of no more than \$35,000 per violation per day is an effective tool to deter violations.”<sup>133</sup>

Data considered by MMS supports the view that past enforcement against the offshore industry has not resulted in improved compliance.

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<sup>126</sup> *Id.* at 11.

<sup>127</sup> *Id.* at 13.

<sup>128</sup> *Id.*

<sup>129</sup> *Id.*

<sup>130</sup> SAFETY OVERSIGHT BOARD REPORT, *supra* note 116, at 18.

<sup>131</sup> See 43 U.S.C. § 1350(b) (2006); Outer Continental Shelf Civil Penalties, 75 Fed. Reg. 1076, 1076 (Jan. 8, 2010) (summarizing review of the maximum daily civil penalty assessment). The statutory civil penalty authorized for violating the Outer Continental Shelf Act has increased over time to \$35,000 per day, per violation, pursuant to the Federal Civil Penalties Inflation Adjustment Act of 1990. See 28 U.S.C. § 2461 (2006).

<sup>132</sup> See, e.g., Clean Water Act, 33 U.S.C. § 1319(d) (2006) (civil penalty provision imposing up to \$25,000 per day, per violation).

<sup>133</sup> SAFETY OVERSIGHT BOARD REPORT, *supra* note 116, at 18.

In discussing the need to consider adoption of SEMS as a regulatory standard, MMS noted that from 2001 to 2007 it had issued approximately 150 instances of noncompliance to oil drilling operators per year.<sup>134</sup> MMS concluded that such enforcement activity had little, if any, deterrent effect, because it led to “no discernable trend of improvement by industry over the past 7 years.”<sup>135</sup>

## V. ADDITIONAL MEASURES TO CONSIDER

One lesson learned from the Deepwater Horizon oil spill is the regulations in place governing deepwater drilling are insufficient. Additional measures are required to ensure that deepwater drilling is performed as safely as is humanly possible, and in a manner that minimizes adverse environmental impacts. The actions taken by BOEMRE to date are a step in the right direction. Alone, however, they are not enough to prevent the next Deepwater Horizon-magnitude oil spill from recurring.

### A. Increased Penalties

One way to incentivize the oil and gas industry to engage in deepwater drilling as safely as humanly possible is to substantially bolster the sanctions that are available in the event that a spill does occur. To achieve this goal, in part, Congress should eliminate the liability cap associated with oil spills, which is now \$75 million,<sup>136</sup> unless gross negligence or willful misconduct is found.<sup>137</sup> The current limit on liability, even with no limit on removal costs, is woefully inadequate for the harm that a massive spill like the Deepwater Horizon can cause.

Closely related to the liability cap is whether the per day, per violation, civil penalty that operators face for noncompliance is sufficient. The Safety Oversight Board concluded that the current amount, up to \$35,000 per day, per violation, provides insufficient deterrent effect.<sup>138</sup> Therefore, it is clear that the amount should be dramatically increased.

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<sup>134</sup> See Safety and Environmental Management Systems for Outer Continental Shelf Oil and Gas Operations, 74 Fed. Reg. 28,639, 28,642 (proposed June 17, 2009) (codified at 30 C.F.R. pt. 250).

<sup>135</sup> *Id.*

<sup>136</sup> 33 U.S.C. § 2704(a)(3) (2006).

<sup>137</sup> *Id.* § 2704(c).

<sup>138</sup> SAFETY OVERSIGHT BOARD REPORT, *supra* note 116, at 17–18 (“The current level of civil penalty fines . . . do not make them an effective deterrent to violations of OCS regulations.”).

A related financial deterrence mechanism that Congress can put in place is to greatly enhance the civil liability of responsible parties when gross negligence or willful misconduct is found. In order to deter and punish such conduct, it is not sufficient to rely on the common law punitive damages remedy. As the Exxon Valdez oil spill litigation vividly demonstrated, even if awarded, punitive damages are subject to dramatic reductions by the courts. There, the trial court imposed a \$5 billion punitive damages award against Exxon for the massive Prince William Sound spill.<sup>139</sup> Following multiple appeals, the Ninth Circuit reduced the punitive damages award to \$2.5 billion,<sup>140</sup> and later the Supreme Court further reduced it to just \$500 million, a one-to-one ratio based on the compensatory damages.<sup>141</sup>

To avoid the morass of punitive damages resulting from recent Supreme Court decisions,<sup>142</sup> Congress can look to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and its treatment of recalcitrant Potentially Responsible Parties (PRPs) who fail to comply with section 106 orders.<sup>143</sup> CERCLA section 106 authorizes the Environmental Protection Agency (EPA) to order PRPs to investigate and remediate a site contaminated with hazardous substances if an imminent and substantial endangerment to human health, welfare, or the environment exists.<sup>144</sup> What makes the issuance of a section 106 order such a potent EPA enforcement tool is that the failure to comply can result not only in large per day, per violation fines,<sup>145</sup> but additional liability up to treble the amount incurred by the government in responding to the release of hazardous substances.<sup>146</sup> A similar approach could be adopted by amending the Oil Pollution Act to impose, in addition to removal costs and natural resource damages,<sup>147</sup> an express treble

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<sup>139</sup> *In re The Exxon Valdez*, 296 F. Supp. 2d 1071, 1082 (D. Alaska 2004), *vacated* 490 F.3d 1066 (9th Cir. 2006), *vacated sub nom.* *Exxon Shipping Co. v. Baker*, 554 U.S. 471 (2008).

<sup>140</sup> *In re The Exxon Valdez*, 490 F.3d at 1073.

<sup>141</sup> *Exxon Shipping Co.*, 554 U.S. at 514.

<sup>142</sup> See Shawn LaTourette, *Run Aground Again: The Exxon Valdez's Collision with the Supreme Court's Punitive Damages Jurisprudence*, 39 *Envtl. L. Rep. (Envtl. Law Inst.)* 11,097, 11,097 (2009) ("Nearly 20 years after the spill, those who sought punitive damages for their resulting injuries were met by a Supreme Court still hostile toward punitives, and poised to limit them in a new and unique way.").

<sup>143</sup> See Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. § 9606(a)–(b) (2006).

<sup>144</sup> See *id.* § 9606(a).

<sup>145</sup> *Id.* § 9606(b)(1) (imposing a penalty of \$25,000 for each day a section 106 order is not complied with).

<sup>146</sup> *Id.* § 9607(c)(3).

<sup>147</sup> See Oil Pollution Act, 33 U.S.C. § 2702(b) (2006).

damages award based upon the total economic harm resulting from the oil spill<sup>148</sup> where instances of gross negligence or willful misconduct are found.

### B. Increased Financial Assurances

Yet another financial mechanism that could become a routine condition of issuing drill permits for deepwater exploration and production is to require the ultimate parent to sign as a guarantor for any damages that result from one of its subsidiary's drilling activities.<sup>149</sup> One of the designated responsible parties for the Deepwater Horizon oil spill is BP Exploration and Production, Inc.,<sup>150</sup> a subsidiary of BP North America, which is a wholly owned subsidiary of the London-headquartered BP PLC.<sup>151</sup> It remains to be seen whether BP Exploration and Production, Inc. has the financial wherewithal to compensate for all the damages associated with the spill. It also remains to be seen whether the protection of the bankruptcy courts may be sought by BP Exploration and Production, Inc. as its total financial liability evolves.<sup>152</sup>

In the event the responsible party is unable to fully compensate for damages, the ultimate parent guarantee of BP PLC would serve as an alternative funding source to make certain that all corporate assets are available for compensation, and not hidden behind the shield of limited shareholder liability.<sup>153</sup> Without such an ultimate parent guarantee, the maximum extent of the assets available is confined to those of the subsidiary and not the parent.<sup>154</sup>

<sup>148</sup> See, e.g., 42 U.S.C. § 9607(c)(3) (CERCLA's treble damages provision).

<sup>149</sup> See 33 U.S.C. § 2716(e). The Oil Pollution Act requires parties engaged in offshore drilling to provide financial assurances. *Id.* § 2716(c). The mechanisms for providing financial assurances vary but an ultimate parent guarantee is not mandated. See *id.* § 2716(e).

<sup>150</sup> U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-11-90R, DEEPWATER HORIZON OIL SPILL: PRELIMINARY ASSESSMENT OF FEDERAL FINANCIAL RISKS AND COST REIMBURSEMENT AND NOTIFICATION POLICIES AND PROCEDURES 1 (2010).

<sup>151</sup> *BP Exploration & Production Inc.*, BLOOMBERG BUSINESSWEEK, <http://investing.businessweek.com/research/stocks/private/snapshot.asp?privcapId=10006787> (last visited Apr. 15, 2010).

<sup>152</sup> See Clients and Friends Memorandum from Cadwalader, Wickersham & Taft LLP, BP in the Wake of the Deepwater Horizon Incident and the Bankruptcy Implications of Mounting Environmental Liabilities 6 (July 7, 2010), available at [http://www.cadwalader.com/assets/client\\_friend/070710\\_BPIntheWakeofDeepwater.pdf](http://www.cadwalader.com/assets/client_friend/070710_BPIntheWakeofDeepwater.pdf).

<sup>153</sup> See 33 U.S.C. § 2716(e); *United States v. Bestfoods*, 524 U.S. 51, 61–62 (1998) (“Thus it is hornbook law that the exercise of the control which stock ownership gives to the stockholders . . . will not create liability beyond the assets of the subsidiary.” (citation and internal quotation marks omitted)).

<sup>154</sup> See *Bestfoods*, 524 U.S. at 61–62.

On a related issue, currently under the Oil Pollution Act parties engaged in offshore drilling activities have to provide financial assurances of up to \$35,000,000.<sup>155</sup> The current amount of financial assurances is inadequate considering the damages wrought by the Deepwater Horizon spill and should be dramatically increased by Congress.<sup>156</sup>

### C. Increased Criminal Sanctions

To truly maximize deterrence and improve operator compliance, Congress could also increase the criminal sanctions associated with oil spills.<sup>157</sup> In addition, the Department of Justice could aggressively use the responsible corporate officer doctrine in prosecuting major oil spill cases.<sup>158</sup> If corporate officers faced the threat of prison as one of the consequences of an oil spill, they are much more likely to manage with a heightened concern for compliance, safety, and environmental protection.

### D. Improving the Regulatory Structure

Other necessary steps include addressing the structural deficiencies at BOEMRE. We cannot reasonably expect the agency, even in its restructured form, to effectively regulate the complexities associated with deepwater exploration and production without enough engineers to conduct even basic permit reviews.<sup>159</sup> Similarly, we are asking too much of regulators to closely monitor offshore activities, including deepwater drilling, if personnel are not adequately trained and lack clear written guidelines. Further, we cannot expect effective agency regulation without a random and unannounced inspection regime.

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<sup>155</sup> 33 U.S.C. § 2716(c)(1)(B).

<sup>156</sup> The National Commission on the BP Deepwater Horizon Oil Spill estimated that it could cost anywhere from \$15 to \$20 billion to restore the Gulf. BP COMMISSION REPORT, *supra* note 12, at 210–11. Civil penalties under the Clean Water Act could be between \$4.5 to \$20 billion depending on findings of negligence and the amount of oil that was discharged. *Id.* According to the complaint filed on December 15, 2010 by the Justice Department, “[t]he amount of damages and the extent of injuries sustained by the United States as a result of the Deepwater Horizon Spill are not yet fully known, but far exceed \$75,000,000.” Complaint of the United States of America at 19, *United States v. BP Exploration & Prod. Inc.*, No. 2:10-cv-04536-CJB-SS (E.D. La. Dec. 15, 2010).

<sup>157</sup> See, e.g., Clean Water Act, 33 U.S.C. § 1319(c)(1) (2006) (criminal sanctions provisions under Clean Water Act).

<sup>158</sup> See, e.g., *id.* § 1319(c)(6) (defining a “person” under the Clean Water Act to include “any responsible corporate officer”).

<sup>159</sup> See SAFETY OVERSIGHT BOARD REPORT, *supra* note 116, at 6.



Thus, steps must immediately be taken to address these and other deficiencies discussed in the Safety Oversight Board's report. Without addressing these fundamental regulatory agency issues, no matter what new statutory or regulatory measures are enacted and regardless of what agency restructuring takes place, the actions of regulators and policymakers will not succeed in preventing another massive oil spill from future deepwater drilling activities.

#### E. *Improved Technology and Oil Spill Response*

Lastly, since policymakers and industry continue to support deepwater exploration and production activities, we must strive to have in place the best technology humanly possible. If we do not, future massive oil spills will result. One possible course of action is for BOEMRE to establish a special commission involving experts from the agency, law, academia, the engineering profession and, yes, the oil and gas industry, that would then collaborate on further evaluating and improving existing deepwater technology. Such an expert commission can also consider how other countries regulate deepwater drilling to see if there are indeed better regulatory regimes in place.

A particular focus of these experts should rest on the fundamentals of well pressure control—the use of drilling mud and cement—as the primary methods of avoiding another Deepwater Horizon disaster.<sup>160</sup> Another focus of the experts must be on blowout preventers, given their critical function as a last resort fail-safe mechanism in the event pressure control is lost at a well.

This expert panel must also reassess the worst case scenario in the event well control is lost and the blowout preventer fails to stop the well from flowing. This would involve examining current oil spill response technologies and methods to seek improvements in the actions needed to combat an oil spill. To its credit, the oil and gas industry has already headed down this path by forming a joint industry task force to “identify best practices in offshore drilling operations and equipment.”<sup>161</sup>

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<sup>160</sup> See *supra* Part I.B.

<sup>161</sup> See JOINT INDUS. TASK FORCE TO ADDRESS OFFSHORE OPERATING PROCEDURES & EQUIP., WHITE PAPER: RECOMMENDATIONS FOR IMPROVING OFFSHORE SAFETY 1 (2010), available at <http://online.wsj.com/public/resources/documents/DRAFTJITFRRecommendations1.pdf>.

## CONCLUSION

Even after the several-months-long Deepwater Horizon oil spill, obtaining recoverable oil from deep beneath the ocean floor, in thousands of feet of water, remains an important part of our nation's energy policy. Among the confluence of factors that contributed to the Deepwater Horizon human tragedy and environmental disaster was a failure to adequately regulate the risks associated with deepwater drilling technology. Admittedly, the federal government has taken certain actions in response to this unparalleled disaster, including revamping the regulatory agency responsible for permitting and oversight of deepwater drilling activities and adopting new regulations targeting oil and gas activities in the Gulf of Mexico.

There are legitimate reasons to doubt, however, whether the actions taken by the federal government are sufficient to dramatically reduce the risks of another catastrophic oil spill that will result in loss of life and untoward harm to the marine ecosystem. One reason to question whether the federal government's actions are adequate to reduce the risks inherent in deepwater drilling is because of the incredible complexity of the technology used in deepwater oil production. This is particularly troublesome when one contemplates the extraordinarily harsh conditions that the technology faces in deepwater. Further, dismantling MMS and creating BOEMRE, as its replacement agency, appears to have done little to address the lack of resources that are critical for any agency to serve in a robust regulatory capacity. A final reason to be less than sanguine about the future effectiveness of the response to the Deepwater Horizon oil spill is the reliance on blowout preventers as the fail-safe mechanism of last resort in the event pressure control is lost at a well in thousands of feet of water. As amply demonstrated by the Deepwater Horizon, blowout preventers fail at an alarmingly high rate; yet presently by regulation they are the technological fail-safe device of last resort for the industry.

The Deepwater Horizon vividly illustrated to regulators, industry representatives, and members of the public a tragic lesson about the terrible consequences associated with deepwater oil drilling. Nevertheless, despite this tragic lesson, we still remain only one well away from another unfortunate disaster in the deep unless additional steps are taken by regulators and industry.

