

## ENDNOTES

The Commission has reviewed thousands of pages of documents from dozens of government agencies, private companies, and other entities, and interviewed hundreds of witnesses from these same agencies, companies, and entities. When possible, we include all pertinent details in the following endnote citations for those documents and interviews that have contributed to this report. Many documents and interviews, however, were disclosed or given to the Commission on a confidential basis. For these “non-public” sources, our citations include only as much detail as we can comfortably disclose while still respecting the privacy concerns of the source (e.g., “non-public BP document,” “interview with government official,” “interview with Coast Guard official”).

The vast majority of non-public material that we cite in the endnotes below comes from documents and interviews provided by four government agencies—the Chemical Safety Board, the Coast Guard, the Department of Energy, and the Department of the Interior—and ten companies—BP, Cameron, Chevron, Dril-Quip, ExxonMobil, Halliburton, Schlumberger, Shell, Transocean, and Weatherford. In addition, the Commission participated in the Coast Guard’s Incident Specific Preparedness Review of the BP Deepwater Horizon spill, through which dozens of officials from a variety of federal and state agencies, federal, state, and local elected officials, and executives and personnel from private companies and other spill response-related entities have been interviewed. All Coast Guard Incident Specific Preparedness Review interviews are also cited as non-public. Finally, the Commission has interviewed many Gulf Coast residents who wish to remain anonymous. These interviews are cited as non-public as well.

### Chapter One

- <sup>1</sup> Internal Halliburton document (HAL\_0011208); Testimony of Nathaniel Chaisson, Hearing before the Deepwater Horizon Joint Investigation Team, August 24, 2010, 423. This report cites many “Internal documents” that the Commission received from companies, including BP, Halliburton, and Transocean. Those internal documents are identified by their document production serial numbers when available, which were assigned by the entity that provided them.
- <sup>2</sup> Internal BP document (BP, presentation to Commission, August 9, 2010, slides 5 & 12).
- <sup>3</sup> Testimony of Nathaniel Chaisson, 411; U.S. Department of Energy, *Well Configuration* (BP document made public by the Department of Energy), [http://www.energy.gov/open/documents/3.1\\_Item\\_2\\_Macondo\\_Well\\_07\\_Jun\\_1900.pdf](http://www.energy.gov/open/documents/3.1_Item_2_Macondo_Well_07_Jun_1900.pdf); Testimony of Natalie Roshto, Hearing before the Deepwater Horizon Joint Investigation Team, July 22, 2010, 15.
- <sup>4</sup> Testimony of Michael Williams, Hearing before the Deepwater Horizon Joint Investigation Team, July 23, 2010, 35–36.
- <sup>5</sup> Testimony of John Guide, Hearing before the Deepwater Horizon Joint Investigation Team, July 22, 2010, 260–266; Testimony of James Wilson, Hearing before the Deepwater Horizon Joint Investigation Team, October 6, 2010, 176.
- <sup>6</sup> Brian Morel, e-mail message to Richard Miller and Mark Hafle, April 14, 2010, 13:31, <http://energycommerce.house.gov/documents/20100614/BP-April14.Email.calling.Macondo.a.nightmare.well.pdf>.
- <sup>7</sup> BP, “GoM Exploration Wells: MC 252 #1—Macondo Prospect Well Information,” September 2009, <http://bpoilresponse.markimooore.com/blog/bp-media/docs/Macondo.Prospect.Well.Information.pdf>.
- <sup>8</sup> Testimony of Richard Tink, Hearing before the Deepwater Horizon Joint Investigation Team, May 26, 2010, 392; Deepwater Horizon Joint Investigation Team, *APE Summary for the Macondo Well*, October 7, 2010, <http://www.deepwaterinvestigation.com/external/content/document/3043/914919/1/APE%20Summary%20for%20the%20Macondo%20Well.pdf>.
- <sup>9</sup> BP, Deepwater Horizon *Accident Investigation Report* (September 8, 2010), 17.
- <sup>10</sup> Transocean, *Our Company*, <http://www.deepwater.com/fw/main/Our-Company-2.html>.
- <sup>11</sup> Press Release, Transocean, Transocean Ltd. Reports Fourth Quarter and Full-Year 2009 Results, February 24, 2010.
- <sup>12</sup> Press Release, Transocean, Transocean Inc. and GlobalSantaFe Corporation Agree to Combine, July 23, 2007.
- <sup>13</sup> “Contractors ordering offshore rigs on speculation,” *Drilling Contractor*, May/June 2002.
- <sup>14</sup> “Global 500,” CNNMoney.com, July 26, 2010, [http://money.cnn.com/magazines/fortune/global500/2010/full\\_list/index.html](http://money.cnn.com/magazines/fortune/global500/2010/full_list/index.html).
- <sup>15</sup> Internal Transocean documents (TRN-HCJ 93526, 93528).
- <sup>16</sup> Internal BP document (BP-HZN-MBI 126338); Internal BP document (BP-HZN-OSC 5378).
- <sup>17</sup> “Brazil Pins Hopes on Massive, untapped Oil Fields,” NPR, December 1, 2009, <http://www.npr.org/templates/story/story.php?storyId=120966523>.
- <sup>18</sup> Bureau of Ocean Energy Management, Regulation, and Enforcement, *Installations, Removals, and Cumulative Totals of Offshore Production Facilities in Federal Waters; 1959–2010*, February 2010, <http://www.boemre.gov/stats/PDFs/OCSPlatformActivity.pdf>; Bureau of Ocean Energy Management, Regulation and Enforcement, *OCS Incidents/Spills by Category: 1996–2005*, October 19, 2007, <http://www.boemre.gov/incidents/Incidents1996-2005.htm>; Bureau of Ocean Energy Management, Regulation, and Enforcement, *OCS Incidents/Spills by Category: 2006–2010*, July 10, 2010, <http://www.boemre.gov/incidents/IncidentStatisticsSummaries.htm>.

- 19 Testimony of Ronald Sepulvado, Hearing before the Deepwater Horizon Joint Investigation Team, July 23, 2010, 7, 14, 34.
- 20 Testimony of John Guide, 23.
- 21 *Ibid.*, 43–44 and 189; Schlumberger, “Oilfield Glossary: cement bond log,” accessed November 19, 2010, <http://www.glossary.oilfield.slb.com/Display.cfm?Term=cement%20bond%20log>.
- 22 Testimony of John Guide, 43–44, 189–191.
- 23 Testimony of Douglas Brown, Hearing before the Deepwater Horizon Joint Investigation Team, May 26, 2010, 88, 91.
- 24 Testimony of Jimmy Harrell, Hearing before the Deepwater Horizon Joint Investigation Team, May 27, 2010, 77; Internal Transocean document (TRN-HCDC 92).
- 25 Internal Transocean document (TRN-HCDC 92); BP, Deepwater Horizon *Accident Investigation Report*, 82.
- 26 Testimony of Ross Skidmore, Hearing before the Deepwater Horizon Joint Investigation Team, July 20, 2010, 264.
- 27 BP, Deepwater Horizon *Accident Investigation Report*, 24.
- 28 Testimony of Jimmy Harrell, 38, 113; Testimony of Curt Kuchta, Hearing before the Deepwater Horizon Joint Investigation Team, May 27, 2010, 166, 183, 184.
- 29 Testimony of Daun Winslow, Hearing before the Deepwater Horizon Joint Investigation Team, August 24, 2010, 188 and 191.
- 30 Testimony of Jimmy Harrell, 113; Testimony of Curt Kuchta, 184.
- 31 Testimony of David Sims, Hearing before the Deepwater Horizon Joint Investigation Team, August 26, 2010, 119.
- 32 Testimony of Daun Winslow, Hearing before the Deepwater Horizon Joint Investigation Team, August 23, 2010, 442.
- 33 Testimony of Stephen Bertone, Hearing before the Deepwater Horizon Joint Investigation Team, July 19, 2010, 29, 33; Testimony of Randy Ezell, Hearing before the Deepwater Horizon Joint Investigation Team, May 28, 2010, 279.
- 34 Testimony of Randy Ezell, 275.
- 35 BP, Deepwater Horizon *Accident Investigation Report*, 24.
- 36 Testimony of Stephen Bertone, 33.
- 37 *Ibid.*; Testimony of Randy Ezell, 280.
- 38 Testimony of Daun Winslow, August 23, 2010, 443.
- 39 Testimony of Stephen Bertone, 33–34; Testimony of Daun Winslow, August 23, 2010, 443.
- 40 Testimony of Randy Ezell, 281.
- 41 *Ibid.*
- 42 *Ibid.*
- 43 *Ibid.*
- 44 Testimony of Chris Pleasant, Hearing before the Deepwater Horizon Joint Investigation Team, May 28, 2010, 115, 281.
- 45 *Ibid.*, 116–118; Testimony of Jimmy Harrell, 117.
- 46 John R. Smith, *Review of Operational Data Preceding Explosion on Deepwater Horizon in MC252*, July 1, 2010, 11–12.
- 47 Testimony of Lee Lambert, Hearing before the Deepwater Horizon Joint Investigation Team, July 20, 2010, 291; Internal BP documents (BP-HZN-CEC 20347, 20178).
- 48 Internal BP documents (BP-HZN-CEC 20347, 20178).
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- 50 Testimony of Patrick O’Bryan, Hearing before the Deepwater Horizon Joint Investigation Team, August 26, 2010, 364–365, 393.
- 51 Brian Morel, e-mail message to Richard Miller and Mark Hafle.
- 52 Testimony of Jimmy Harrell, 13.
- 53 BP, Deepwater Horizon *Follow Up Rig Audit, Marine Assurance Audit and Out of Service Period*, September 2009, 2, 18–48; Internal BP document (BP-HZN-MBI 136211).
- 54 Testimony of Patrick O’Bryan, 364.
- 55 Testimony of David Sims, Hearing before the Deepwater Horizon Joint Investigation Team, May 29, 2010, 172, 313.
- 56 BP, Deepwater Horizon *Accident Investigation Report*, 25; Internal BP document (BP-HZN-CEC 17621).

- <sup>57</sup> BP, *Deepwater Horizon Accident Investigation Report*, 33.
- <sup>58</sup> *Ibid.*, 25; Testimony of Chris Pleasant, 118–119.
- <sup>59</sup> Testimony of John Gisclair, Hearing before the Deepwater Horizon Joint Investigation Team, October 8, 2010, 131–132.
- <sup>60</sup> Testimony of Curt Kuchta, 185–186; Testimony of Jimmy Harrell, 12.
- <sup>61</sup> Testimony of Yancy Keplinger, Hearing before the Deepwater Horizon Joint Investigation Team, October 5, 2010, 128–129.
- <sup>62</sup> *Ibid.*; Testimony of Andrea Fleytas, Hearing before the Deepwater Horizon Joint Investigation Team, October 5, 2010, 16; Testimony of Daun Winslow, August 23, 2010, 296.
- <sup>63</sup> Testimony of Daun Winslow, August 23, 2010, 295; Testimony of Pat O’Bryan, 366.
- <sup>64</sup> Testimony of Daun Winslow, August 23, 2010, 295–296.
- <sup>65</sup> Testimony of Randy Ezell, 281, 282, 294.
- <sup>66</sup> *Ibid.*, 282.
- <sup>67</sup> *Ibid.*, 281–282, 311.
- <sup>68</sup> Testimony of Patrick O’Bryan, 219–220.
- <sup>69</sup> Testimony of David Sims, August 26, 2010, 163.
- <sup>70</sup> *Ibid.*, 317; Testimony of Patrick O’Bryan, 367.
- <sup>71</sup> Testimony of David Sims, August 26, 2010, 174.
- <sup>72</sup> *Ibid.*, 367.
- <sup>73</sup> Testimony of Patrick O’Bryan, 367.
- <sup>74</sup> Internal BP documents (BP-HZN-MBI 21418, 21420); BP, *Deepwater Horizon Accident Investigation Report*, 150.
- <sup>75</sup> Testimony of Randy Ezell, 282, 283.
- <sup>76</sup> *Ibid.*, 283.
- <sup>77</sup> *Ibid.*, 283–284.
- <sup>78</sup> Testimony of Micah Sandell, Hearing before the Deepwater Horizon Joint Investigation Team, May 29, 2010, 8, 10, 12.
- <sup>79</sup> *Ibid.*, 11.
- <sup>80</sup> Internal BP documents (*Deepwater Horizon Schematic*; BP August 9, 2010 presentation to Oil Spill Commission, slide 5 ).
- <sup>81</sup> Testimony of Douglas Brown, 88–89, 92–93.
- <sup>82</sup> Testimony of Paul Meinhart, Hearing before the Deepwater Horizon Joint Investigation Team, May 29, 2010, 28
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- <sup>85</sup> Testimony of Steve Bertone, Hearing before the Deepwater Horizon Joint Investigation Team, July 19, 2010, 28, 34.
- <sup>86</sup> Testimony of James Nicholas Wilson, Hearing before the Deepwater Horizon Joint Investigation Team, October 13, 2010, 10; Testimony of Steve Bertone, 35.
- <sup>87</sup> Testimony of Steve Bertone, 35.
- <sup>88</sup> Testimony of Gregory Meche, Hearing before the Deepwater Horizon Joint Investigation Team, May 28, 2010, 198.
- <sup>89</sup> Testimony of Steve Bertone, 35–36.
- <sup>90</sup> *Ibid.*
- <sup>91</sup> Testimony of Andrea Fleytas, 14.
- <sup>92</sup> Testimony of Gregory Meche, 235.
- <sup>93</sup> Testimony of Andrea Fleytas, 14.
- <sup>94</sup> Complaint at 2, *Shivers v. BP Plc.*, No. 10-cv-381 (S.D. Ala. July 20, 2010).
- <sup>95</sup> *Ibid.*
- <sup>96</sup> *Ibid.*
- <sup>97</sup> *Ibid.*

- <sup>98</sup> *Ibid.*; Tracey Dalzell Walsh, "Forced To Become Emergency Workers, Fishermen Say BP Never Even Said Thanks," *Courthouse News Service*, July 22, 2010.
- <sup>99</sup> Testimony of Steve Bertone, 37.
- <sup>100</sup> *Ibid.*, 37–38.
- <sup>101</sup> *Ibid.*, 38.
- <sup>102</sup> *Ibid.*, 38–39.
- <sup>103</sup> Testimony of Randy Ezell, 284–285.
- <sup>104</sup> *Ibid.*, 285.
- <sup>105</sup> Testimony of Yancy Keplinger, 165.
- <sup>106</sup> Testimony of Randy Ezell, 285–286.
- <sup>107</sup> *Ibid.*, 286.
- <sup>108</sup> *Ibid.*
- <sup>109</sup> *Ibid.*, 286–287.
- <sup>110</sup> *Ibid.*, 287.
- <sup>111</sup> Testimony of Yancy Keplinger, 152; Testimony of Tyrone Benton, Hearing before the Deepwater Horizon Joint Investigation Team, July 23, 2010, 250.
- <sup>112</sup> Testimony of Gregory Meche, 209; Testimony of David Young, Hearing before the Deepwater Horizon Joint Investigation Team, May 27, 2010, 327; Testimony of Randy Ezell, 283; Testimony of Jimmy Harrell, 65; Testimony of Yancy Keplinger, 153.
- <sup>113</sup> Testimony of Micah Sandell, 11–13.
- <sup>114</sup> Testimony of Capt. Alwin Landry, Hearing before the Deepwater Horizon Joint Investigation Team, May 11, 2010, 98–100.
- <sup>115</sup> Testimony of Paul Erickson, Hearing before the Deepwater Horizon Joint Investigation Team, May 11, 2010, 231–232.
- <sup>116</sup> Testimony of Capt. Alwin Landry, 101–102.
- <sup>117</sup> *Ibid.*, 104–105.
- <sup>118</sup> Testimony of Gregory Meche, 202, 211, 223.
- <sup>119</sup> Testimony of Anthony Gervasio, Hearing before the Deepwater Horizon Joint Investigation Team, May 11, 2010, 173, 187–188.
- <sup>120</sup> *Ibid.*, 187; Testimony of Kevin Robb, Hearing before the Deepwater Horizon Joint Investigation Team, May 11, 2010, 42.
- <sup>121</sup> Testimony of Anthony Gervasio, 189.
- <sup>122</sup> *Ibid.*, 105, 190; Testimony of Gergory Meche, 223.
- <sup>123</sup> Testimony of Daun Winslow, August 23, 2010, 447–448.
- <sup>124</sup> *Ibid.*, 448–449, 452.
- <sup>125</sup> Testimony of Mark Hay, Hearing before the Deepwater Horizon Joint Investigation Team, May 28, 2010, 225.
- <sup>126</sup> Testimony of Daun Winslow, August 23, 2010, 452; Testimony of Randy Ezell, 287.
- <sup>127</sup> Testimony of Daun Winslow, August 23, 2010, 452.
- <sup>128</sup> *Ibid.*, 449–450, 452; Testimony of Randy Ezell, 289; Testimony of Anthony Gervasio, 190, 199.
- <sup>129</sup> Testimony of Daun Winslow, August 23, 2010, 450; BP, Deepwater Horizon *Accident Investigation Report*, 123.
- <sup>130</sup> Testimony of Daun Winslow, August 23, 2010, 450; Testimony of Steve Bertone, 39.
- <sup>131</sup> Testimony of Steve Bertone, 39.
- <sup>132</sup> *Ibid.*
- <sup>133</sup> *Ibid.*
- <sup>134</sup> Testimony of Daun Winslow, August 23, 2010, 451; Testimony of Steve Bertone, 39.
- <sup>135</sup> Testimony of Steve Bertone, 39.
- <sup>136</sup> *Ibid.*
- <sup>137</sup> Testimony of Patrick O'Bryan, 368, 396.
- <sup>138</sup> Testimony of Daun Winslow, August 23, 2010, 452.

- <sup>139</sup> Internal BP Document (BP-HZN-MBI 21277).
- <sup>140</sup> Testimony of Daun Winslow, August 23, 2010, 451–452.
- <sup>141</sup> Internal BP Document (BP August 9, 2010 presentation to Oil Spill Commission, slide 13).
- <sup>142</sup> Testimony of Daun Winslow, August 23, 2010, 454.
- <sup>143</sup> *Ibid.*, 454–455.
- <sup>144</sup> Testimony of Yancy Keplinger, October 5, 2010, 157.
- <sup>145</sup> Associated Press, “‘The Real Deal’: Survivors recall the Deepwater Horizon explosion,” *Press-Register*, May 9, 2010.
- <sup>146</sup> *Ibid.*; BP, Deepwater Horizon *Accident Investigation Report*, 103.
- <sup>147</sup> Testimony of Steve Bertone, 39–40.
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- <sup>149</sup> *Ibid.*, 40–41.
- <sup>150</sup> *Ibid.*, 41–43.
- <sup>151</sup> *Ibid.*, 43.
- <sup>152</sup> *Ibid.*
- <sup>153</sup> Testimony of Randy Ezell, 288.
- <sup>154</sup> Testimony of Steve Bertone, 44.
- <sup>155</sup> *Ibid.*, 44–46.
- <sup>156</sup> *Ibid.*, 45–46.
- <sup>157</sup> *Ibid.*, 46–47.
- <sup>158</sup> *Ibid.*, 47–48.
- <sup>159</sup> Testimony of Michael Williams, 26.
- <sup>160</sup> Testimony of Steve Bertone, 48.
- <sup>161</sup> Testimony of Andrea Fleytas, 15.
- <sup>162</sup> Testimony of Steve Bertone, 48.
- <sup>163</sup> *Ibid.*
- <sup>164</sup> *Ibid.*, 48–49.
- <sup>165</sup> *Ibid.*, 48.
- <sup>166</sup> Testimony of Curt Kuchta, 219.
- <sup>167</sup> Testimony of Daun Winslow, August 28, 2010, 467.
- <sup>168</sup> Testimony of Steve Bertone, 50.
- <sup>169</sup> *Ibid.*
- <sup>170</sup> Testimony of Anthony Gervasio, 197.
- <sup>171</sup> Testimony of Steve Bertone, 49.
- <sup>172</sup> Internal Transocean document (TRN-USCG\_MMS 30428).
- <sup>173</sup> Testimony of Anthony Gervasio, 224.
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- <sup>175</sup> Testimony of Capt. Alwin Landry, 112.
- <sup>176</sup> Testimony of Steve Bertone, 51.
- <sup>177</sup> Testimony of Kevin Robb, Hearing before the Deepwater Horizon Joint Investigation Team, May 11, 2010, 44.
- <sup>178</sup> Ian Urbina and Justin Gillis, “Workers On Oil Rig Recall a Terrible Night of Blasts,” *New York Times*, May 7, 2010.
- <sup>179</sup> Internal BP Document (BP-HZN-MBI 143366).
- <sup>180</sup> Testimony of Alwin Landry, 115.
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- <sup>182</sup> Walsh, “Forced to Become Emergency Workers, Fishermen Say BP Never Even Said Thanks.”
- <sup>183</sup> Testimony of Steve Bertone, 52; *Ibid.*, 48–53.
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<sup>185</sup> Testimony of Alwin Landry, 120–121.

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<sup>187</sup> Testimony of Capt. Alwin Landry, 121–122.

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## Chapter Two

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<sup>2</sup> Quoted in Tom Zoellner, “Oil and Water: The Adventure of Getting One from Deep Beneath the Other,” *Invention and Technology* (Fall 2000): 48.

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<sup>4</sup> Pratt, Priest, and Castaneda, *Offshore Pioneers*, 15–52, 137–157.

<sup>5</sup> *Ibid.*, 21–25.

<sup>6</sup> Tyler Priest, “Extraction Not Creation: The History of Offshore Petroleum in the Gulf of Mexico,” *Enterprise & Society* 8, no. 2 (June 2007): 240.

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<sup>8</sup> James W. Calvert, “Gulf Offshore Activity Booming,” *World Petroleum* (January 1957): 48.

<sup>9</sup> Ben C. Belt, “Louisiana and Texas Offshore Prospects,” *Drilling* (March 1956): 119.

<sup>10</sup> “Special Offshore Report,” *World Oil* (May 1957): 118; Calvert, “Gulf Offshore Activity Booming,” 48.

<sup>11</sup> Pratt, Priest, and Castaneda, *Offshore Pioneers*, 36–48.

<sup>12</sup> Tyler Priest, *The Offshore Imperative: Shell Oil’s Search for Petroleum in Postwar America* (College Station: Texas A&M Press, 2007), 81–91.

<sup>13</sup> *Ibid.*, 95–98.

<sup>14</sup> Tyler Priest, “Auctioning the Ocean: The Creation of the Federal Offshore Leasing Program, 1954–1962,” *History of the Offshore Oil and Gas Industry in Southern Louisiana: Vol. 1: Papers on the Evolving Offshore Industry* (Minerals Management Service OCS Study 2004-049, 2008).

<sup>15</sup> U.S. Department of Interior, “Petroleum and Sulfur on the U.S. Continental Shelf,” internal study, August 1969, box 134, Central Classified Files, 1969–1972, Record Group 48, Records of the Secretary of Interior, National Archives and Records Administration (NARA), College Park, MD.

<sup>16</sup> Priest, “Auctioning the Ocean,” 113.

<sup>17</sup> On Project Mohole and JOIDES, see David K. van Keuren, “Breaking New Ground: The Origins of Scientific Ocean Drilling,” in *The Machine in Neptune’s Garden: Historical Perspectives on Technology and the Marine Environment*, eds. Helen M. Rozwadowski and David K. van Keuren (Sagamore Beach, MA: Science History Publications, 2004), 183–210. On Shell’s *Eureka* project, see Priest, *The Offshore Imperative*, 97, 218.

<sup>18</sup> F. P. Dunn, “Deepwater Production: 1950–2000” (Offshore Technology Conference [OTC] Paper 7627, Houston, TX, May 1994).

<sup>19</sup> Priest, *The Offshore Imperative*, 127–130.

<sup>20</sup> *Ibid.*

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<sup>24</sup> U.S. Geological Survey, *Monthly Engineering Reports* Vol. 128 (December 1958) and *Monthly Engineering Reports* Vol. 144 (February 1960), RG 57, Records of the U.S. Geological Survey, NARA.

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<sup>26</sup> Neil R. Etson to President Nixon, March 18, 1970, Central Classified Files, 1968–1974, Box 71, RG 57, Records of the

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- <sup>31</sup> M.D. Reifel, “Offshore Blowouts and Fires,” in *The Technology of Offshore Drilling, Completion and Production*, ETA Offshore Seminars, Inc. (Tulsa: The Petroleum Publishing Company, 1976), 239–257; “The Wicked Witch is Dead,” *Shell News* no. 2 (1978): 2–8; and R.C. Visser, “Offshore Platform Accidents, Regulations, and Industry Standards” (OTC Paper 7118, Houston, TX, May 1993).
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- <sup>33</sup> K. E. Arnold, P. S. Koszela, and J. C. Viles, “Improving Safety of Production Operations in the U.S. OCS” (OTC Paper 6079, Houston, TX, May 1989).
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- <sup>35</sup> Dunn, “Deepwater Production.”
- <sup>36</sup> See data in National Academy of Sciences, Committee on Assessment of Safety of OCS Activities, *Safety and Offshore Oil* (Washington D.C.: National Academy Press, 1981).
- <sup>37</sup> E. P. Danenberger, “Outer Continental Shelf Drilling Blowouts, 1971–1991” (OTC Paper 7248, Houston, TX, May 1993).
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## Chapter Three

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- <sup>81</sup> T.A.F. Powell, "US Voluntary SEMP Initiative: Holy Grail or Poisoned Chalice?" (Offshore Technology Conference [OTC] Paper 8111, May 1996): 828.
- <sup>82</sup> E.O. Redd, Jean Chevallier, and Ian Paterson, "Preparing a Safety Case: A Drilling Contractor's Experience" (Society of Petroleum Engineers [SPE] Paper 27293, January 1994): 799.
- <sup>83</sup> L.D. Easley, J.E. Stark, and R.A. Bradford, "Implementing API RP 75 'Recommended Practice for Development of a Safety and Environmental Program for Outer Continental Shelf (OCS) Operations and Facilities'" (Offshore Technology Conference [OTC] Paper 7384, May 1994): 130.
- <sup>84</sup> American Petroleum Institute, *Recommended Practices for Development of a Safety and Environmental Management Program for Outer Continental Shelf (OCS) Operations and Facilities, Recommended Practice 75*, 1st ed. (Dallas, TX: May 15, 1993).
- <sup>85</sup> Oil and Gas and Sulphur Operations in the Outer Continental Shelf, 59 Fed. Reg. 33,779 (June 30, 1994).

- <sup>86</sup> Safety and Environmental Management Program (SEMP) on the Outer Continental Shelf (OCS), 61 Fed. Reg. 37,493 (July 18, 1996).
- <sup>87</sup> *Ibid.*
- <sup>88</sup> Patrick Crow, "New slant on safety," *Oil & Gas Journal* (July 22, 1996): 23.
- <sup>89</sup> T.A.F. Powell, "US Voluntary SEMP Initiative: Holy Grail or Poisoned Chalice?" (Offshore Technology Conference [OTC] Paper 8111, 1996).
- <sup>90</sup> E.P. Danenberger, interview with Commission staff, September 2, 2010; E.P. Danenberger, e-mail message to Commission staff, October 25, 2010.
- <sup>91</sup> Oil and Gas and Sulphur Operations in the Outer Continental Shelf—Incident Reporting Requirements, 68 Fed. Reg. 40,585 (July 8, 2003).
- <sup>92</sup> E.P. Danenberger, interview with Commission staff, September 2, 2010; E.P. Danenberger, e-mail message to Commission staff, October 25, 2010.
- <sup>93</sup> Oil and Gas and Sulphur Operations in the Outer Continental Shelf—Incident Reporting Requirements, 71 Fed. Reg. 19,640 (April 17, 2006).
- <sup>94</sup> Commission staff analysis of Bureau of Ocean Energy Management, Regulation and Enforcement data. See <http://www.boemre.gov/adm/budget.html>.
- <sup>95</sup> Jim Morris, "Lost at Sea/OFFSHORE RISKS/Safety concerns return with rise of oil, gas boom," *Houston Chronicle*, December 22, 1996, [http://www.chron.com/CDA/archives/archive.mpl?id=1996\\_1384981](http://www.chron.com/CDA/archives/archive.mpl?id=1996_1384981).
- <sup>96</sup> Commission staff analysis of Bureau of Ocean Energy Management, Regulation and Enforcement data. See <http://www.gomr.boemre.gov/homepg/fastfacts/WaterDepth/wdmaster.asp>.
- <sup>97</sup> Commission staff analysis of Bureau of Ocean Energy Management, Regulation and Enforcement data; Minerals Management Service, *U.S. Offshore Milestones* (as of August 2006): 5. See <http://www.boemre.gov/stats/PDFs/milestonesAUG2006.pdf>.
- <sup>98</sup> Commission staff analysis of Bureau of Ocean Energy Management, Regulation and Enforcement and U.S. Energy Information Administration data. See <http://www.gomr.boemre.gov/PDFs/2009/2009-016.pdf>, 71–72; <http://www.eia.gov/oog/info/twip/twiparch/100526/twipprint.html>.
- <sup>99</sup> Commission staff analysis of MMS yearly budget request and enactments, by nominal and real (2005) dollars.
- <sup>100</sup> Tetrahedron, Inc., *Reliability of Blowout Preventers Tested Under Fourteen and Seven Days Time Interval: Study Report, Submitted to Minerals Management Service, Department of the Interior*, MMS Technology Assessment & Research Project 253, "Blowout Preventer Study" (December 20, 1996), <http://www.boemre.gov/tarprojects/253/AA.PDF>; Blowout Preventer (BOP) Testing Requirements for Drilling and Completion Operations, 63 Fed. Reg. 29,604 (June 1, 1998).
- <sup>101</sup> Per Holand, *Reliability of Subsea BOP Systems for Deepwater Application, Phase II DW, SINTEF Report STF38 A99426* (November 7, 1999); Per Holand, *Deepwater Kicks and BOP Performance*, SINTEF Report STF38 A01419 (July 24, 2001); WEST Engineering Services, Inc., *Mini Shear Study for U.S. Minerals Management Service*, Requisition No. 2–1011–1003 (December 2002); WEST Engineering Services, Inc., *Shear Ram Capabilities Study for U.S. Minerals Management Service*, Requisition No. 3–4025–1001 (September 2004).
- <sup>102</sup> WEST Engineering Services, Inc., "Comments by WEST Engineering Services, Houston, Texas, to The National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling" (November 12, 2010): 3.
- <sup>103</sup> David Barstow and others, "Regulators Failed to Address Risks in Oil Rig Fail-Safe Device," *New York Times*, June 20, 2010, [www.nytimes.com/2010/06/21/us/21blowout.html](http://www.nytimes.com/2010/06/21/us/21blowout.html).
- <sup>104</sup> U.S. Department of the Interior, Outer Continental Shelf Safety Oversight Board, *Report to the Secretary of the Interior* (September 1, 2010), 6.
- <sup>105</sup> *Ibid.*
- <sup>106</sup> *Ibid.*
- <sup>107</sup> U.S. Department of the Interior, Office of Inspector General, *Survey Report: Offshore Civil Penalties Program, Minerals Management Service* (March 30, 1999), <http://www.doi.gov/images/stories/reports/pdf/99-I-374.pdf>.
- <sup>108</sup> Commission staff analysis of Bureau of Ocean Energy Management, Regulation and Enforcement data provided to the Commission by the Department of the Interior of unannounced MMS inspections of MODUs/drilling rigs, 1990 (1,985 inspections) to 2009 (85 inspections). The pivotal change occurs in 1998–1999, as the numbers drop from 864 to 41 in the span of one year.
- <sup>109</sup> Yearly MMS Incident Summary Reports are available at <http://www.boemre.gov/incidents/IncidentStatisticsSummaries.htm>.
- <sup>110</sup> "Deepwater Gulf of Mexico production rising," *Oil & Gas Journal* (November 1, 1999): 34 ("In 1999, 11 more deepwater development production projects in the gulf have already begun producing or are on the verge of doing so"); Michael Davis, "LEARNING THE DRILL/The oil patch rebound brought with it a need for drilling companies to find, train and keep people to work the rigs," *Houston Chronicle* (February 1, 1998): 1 ("A shortage of qualified personnel has been a nagging problem since the oil patch has come back in the past year. But over the next two years some 50 new offshore jack-up rigs, semi-submersibles and drill ships currently being built or converted will

go into operation. Finding qualified crews to operate these increasingly high tech drilling rigs is a major worry for drilling companies.”).

<sup>111</sup> 33 C.F.R. § 140.1.

<sup>112</sup> 46 C.F.R. pt. 2.

<sup>113</sup> Curry L. Hagerty and Jonathan L. Ramseur, *Deepwater Horizon Oil Spill: Selected Issues for Congress*, (Washington, D.C.: Congressional Research Service, July 15, 2010): 37. The Coast Guard proposed new safety rules in 1999, which triggered significant industry opposition, and has not since made those rules final. Outer Continental Shelf Activities, Notice of Proposed Rulemaking, 64 Fed. Reg. 68,416 (December 7, 1999).

<sup>114</sup> Inspection Under, and Enforcement of, Coast Guard Regulations for Fixed Facilities on the Outer Continental Shelf by the Minerals Management Service, 67 Fed. Reg. 5912 (February 7, 2002).

<sup>115</sup> The MMS and the United States Coast Guard have signed three governing Memoranda of Understanding (in 1989, 1999, and 2004, with supporting Memoranda of Agreement) in order to clarify roles and responsibilities related to workplace safety and the approval of technical systems and equipment that are applicable to both drilling and marine systems on offshore oil and gas facilities. See <http://www.boemre.gov/regcompliance/MOU/MOUindex.htm>.

<sup>116</sup> S. Elizabeth Birnbaum, interview with Commission staff, August 2010; Randall B. Luthi, interview with Commission staff, August 2010; Thomas R. Kitsos, interview with Commission staff, August 2010.

<sup>117</sup> Deepwater Royalty Relief Act of 1995, Pub. L. 104–58, 109 Stat. 563 (1995).

<sup>118</sup> Press Release, U.S. Department of the Interior, Secretary Salazar Launches Ethics Reform Initiative in Meeting with Minerals Management Service Employees, January 29, 2009, [http://www.doi.gov/news/pressreleases/2009\\_01\\_29\\_release.cfm](http://www.doi.gov/news/pressreleases/2009_01_29_release.cfm).

<sup>119</sup> For example, in 2006, Congress responded to Gulf state demands for greater revenues by enacting the Gulf of Mexico Energy Security Act, which provides that Alabama, Louisiana, Mississippi, and Texas and the coastal political subdivisions will receive 37.5 percent of all revenue (bonus bids, rentals, and royalty production) for new leases in the 5 million acres in the Eastern Gulf and the 5.8 million acres in the Central Gulf. See <http://www.boemre.gov/ooc/press/2008/FactSheet-MMSGOMSecurityActMARCH202008.htm>. The Fiscal Year 2010 allocation to the four Gulf States and their political subdivisions was approximately \$866 million. See <http://www.boemre.gov/offshore/PDFs/GOMESAFY2010Final.pdf>.

<sup>120</sup> U.S. Department of the Interior, Outer Continental Shelf Safety Oversight Board, *Report to the Secretary of the Interior* (September 1, 2010), 11.

<sup>121</sup> U.S. Department of the Interior, Office of the Inspector General, *MMS Oil Marketing Group–Lakewood*, September 10, 2008.

<sup>122</sup> U.S. Department of the Interior, Office of the Inspector General, *MMS Oil Marketing Group–Lakewood*, Report Transmittal Letter, September 9, 2008, 3, <http://www.doiig.gov/images/stories/reports/pdf/RIKInvestigation.pdf>.

<sup>123</sup> Department of the Interior Office of the Inspector General, Minerals Management Service, *Island Operating Company, et al.*, (May 25, 2010), 7, <http://www.doiig.gov/images/stories/reports/pdf/IslandOperatingCo.pdf>.

<sup>124</sup> *Ibid.*

<sup>125</sup> Press Release, U.S. Department of the Interior, Secretary Salazar Launches Ethics Reform Initiative in Meeting with Minerals Management Service Employees, January 29, 2009, [http://www.doi.gov/news/pressreleases/2009\\_01\\_29\\_release.cfm](http://www.doi.gov/news/pressreleases/2009_01_29_release.cfm).

<sup>126</sup> U.S. Department of the Interior, Outer Continental Shelf Safety Oversight Board, *Report to the Secretary of the Interior* (September 1, 2010), 8.

<sup>127</sup> *Ibid.*, 13.

<sup>128</sup> *Ibid.*, 8, 13.

<sup>129</sup> *Ibid.*, 13.

<sup>130</sup> *Ibid.*, 6.

<sup>131</sup> Don E. Kash, *Lease Management Activities in the Geological Survey*, Commission on Fiscal Accountability of the Nation’s Energy Resources: Technical Reports, 1981–1982, RG 48, Entry 998, Box 10, File 239, National Archives and Records Administration, 27.

<sup>132</sup> U.S. Department of the Interior, Outer Continental Shelf Safety Oversight Board, *Report to the Secretary of the Interior* (September 1, 2010), 11–12.

<sup>133</sup> *Ibid.*, 11.

<sup>134</sup> 43 U.S.C. § 1344.

<sup>135</sup> 43 U.S.C. § 1344.

<sup>136</sup> 43 U.S.C. § 1344(a)(3).

<sup>137</sup> 42 U.S.C. § 4332.

<sup>138</sup> 40 C.F.R. § 1508.8 (“Effects includes ecological . . . , aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative”).



- <sup>139</sup> 16 U.S.C. §§ 1801-1891d.
- <sup>140</sup> 16 U.S.C. §§ 1531-1544.
- <sup>141</sup> 16 U.S.C. §§ 1361-1423h.
- <sup>142</sup> 16 U.S.C. §§ 1431-1445c-1.
- <sup>143</sup> 33 U.S.C. §§ 1251-1387.
- <sup>144</sup> 33 U.S.C. §§ 2701-2762.
- <sup>145</sup> Exec. Order No. 12,777, 56 Fed. Reg. 54,757 (October 22, 1991).
- <sup>146</sup> 43 U.S.C. §1344.
- <sup>147</sup> 43 U.S.C. §1340(c)(1).
- <sup>148</sup> It appears to be understood that the meaning of this language is that an environmental impact statement is not required for the Gulf of Mexico, but it should be pointed out that is not the compelled or obvious reading of the language. The provision can also be fairly read to say no more than at least one impact statement has to be prepared for areas outside the Gulf and not address the issue, one way or another, concerning the application of NEPA within the Gulf. That potentially significant nuance, however, is beyond the scope of this report's inquiry.
- <sup>149</sup> National Environmental Policy Act; Revised Implementing Procedures, 45 Fed. Reg. 75336 (proposed Nov. 14, 1980) (proposed NEPA rules); National Environmental Policy Act; Revised Implementing Procedures, 46 Fed. Reg. 7485 (Jan. 23, 1981) (final NEPA rules); see 516 Departmental Manual, 2.3.A(2) (1980).
- <sup>150</sup> 43 C.F.R. § 46.215
- <sup>151</sup> U.S. Department of the Interior, Outer Continental Shelf Safety Oversight Board, *Report to the Secretary of the Interior* (September 1, 2010), 20.
- <sup>152</sup> *Ibid.*
- <sup>153</sup> 516 Departmental Manual 15.4.C (providing for exceptions from categorical exclusion in certain "extraordinary circumstances," including when there are highly uncertain and potentially significant environmental effects).
- <sup>154</sup> 51 Fed. Reg. 15,624 (1986).
- <sup>155</sup> NOAA Fisheries Service, Southeast Regional Office, letter to MMS dated July 1, 1999 (subsequently updated in 2006, 2007, and 2008).
- <sup>156</sup> *Essential Fish Habitat Assessment for the Minerals Management Service Programmatic Consultation for Gulf of Mexico Outer Continental Shelf (OCS) Oil and Gas Activities* (June 4, 1999).
- <sup>157</sup> NOAA Fisheries Service, Southeast Regional Office, letter to MMS dated July 1, 1999 (subsequently updated in 2006, 2007, and 2008).
- <sup>158</sup> 30 C.F.R. § 254.21.
- <sup>159</sup> 30 C.F.R. § 254.23.
- <sup>160</sup> The Response Group on behalf of ExxonMobil, *Gulf of Mexico Regional Oil Spill Response Plan* (August 2009), Rev. 5; The Response Group on behalf of ConocoPhillips, *Gulf of Mexico Regional Oil Spill Response Plan* (April 2010), Rev. 6; The Response Group on behalf of Chevron, *Gulf of Mexico Regional Oil Spill Response Plan* (February 2010), Version 3; The Response Group on behalf of Shell Offshore Inc., *Gulf of Mexico Regional Oil Spill Response Plan*, (June 2010), Rev. 6.1.
- <sup>161</sup> The Response Group on behalf of BP, *Regional Oil Spill Response Plan-Gulf of Mexico* (June 30, 2009), App. H: 5, 17, and 32.

## Chapter Four

- <sup>1</sup> John Guide (BP), interview with Commission staff, September 17, 2010.
- <sup>2</sup> Internal Transocean document (TRN-HEC 90686). Internal documents are identified by their document production serial numbers when available, which were assigned by the entity that provided them.
- <sup>3</sup> Internal BP document (BP-HZN-MBI 126338).
- <sup>4</sup> Internal Transocean document (TRN-USCG-MMS 11597).
- <sup>5</sup> Internal BP document (BP-HZN-MBI 126338).
- <sup>6</sup> *Ibid.*
- <sup>7</sup> *Ibid.* Three companies own the Macondo well. BP has a 65 percent share, Anadarko Petroleum Corporation has a 25 percent share, and MOEX Offshore has a 10 percent share. BP maintained regular contact with Anadarko and MOEX throughout the drilling of the well.



- <sup>8</sup> Internal Transocean documents (TRN-USCG-MMS 11600, 11605, 11609, 11613, 11617, 11621, 11625).
- <sup>9</sup> Brett Clanton, "New tactic might seal leaking well sooner, BP CEO says," *Houston Chronicle*, May 5, 2010.
- <sup>10</sup> Gregory Walz (BP), interview with Commission staff, October 6, 2010.
- <sup>11</sup> Testimony of Gregory Walz, Hearing before the Deepwater Horizon Joint Investigation Team, October 7, 2010, 157–59.
- <sup>12</sup> Internal BP document (BP-HZN-MBI 143300) (emphasis added).
- <sup>13</sup> Internal BP documents (BP-HZN-MBI 136937, 136941).
- <sup>14</sup> Internal BP document (BP-HZN-CEC 8848-58).
- <sup>15</sup> Internal BP document (BP-HZN-MBI 129238-39).
- <sup>16</sup> Guide, interview. Indeed, just days before the running of the long string at Macondo, another well drilled by Transocean's DD3 suffered just such a complication. *Ibid.*
- <sup>17</sup> Testimony of Jesse Gagliano, Hearing before the Deepwater Horizon Joint Investigation Team, August 24, 2010, 320.
- <sup>18</sup> Internal BP document (BP-HZN-CEC 22433). Walz also noted that the flight carrying centralizers would not increase costs. *Ibid.*
- <sup>19</sup> Guide, interview. BP had special one-piece bolt-on centralizers made for the Thunder Horse project. *Ibid.*
- <sup>20</sup> Internal BP document (BP-HZN-MBI 128379).
- <sup>21</sup> Internal BP document (BP-HZN-CEC 22669).
- <sup>22</sup> Internal BP document (BP-HZN-CEC 22433).
- <sup>23</sup> Testimony of Steve Lewis, Hearing before the National Commission, November 9, 2010, 93–94; Internal BP document (BP-HZN-MBI 129226). Prior to conversion, a small ball drops from the top of the float valves to block the main path through the auto-fill tube, leaving only two small holes on the side of the tube through which mud can flow. *Ibid.*
- <sup>24</sup> The Well Site Leaders—Bob Kaluza and Don Vidrine—would normally have been on the rig. Morel, a relatively junior BP engineer, had flown to the rig out of a professional interest in learning more about the cementing process. Guide, interview.
- <sup>25</sup> Bryan Clawson (Weatherford), interview with Commission staff, October 28, 2010; BP Deepwater Horizon *Accident Investigation Report* (September 8, 2010), 70.
- <sup>26</sup> Testimony of Steve Lewis, 96; Internal Transocean document (TRN-USCG\_MMS 11638).
- <sup>27</sup> Internal BP document (BP-HZN-MBI 137367).
- <sup>28</sup> *Ibid.*; Testimony of Nathaniel Chaisson, Hearing before the Deepwater Horizon Joint Investigation Team, August 24, 2010, 432.
- <sup>29</sup> Internal BP documents (BP-HZN-MBI 137367, 21304). Since the incident, BP has argued that the M-I SWACO models predicted an erroneously high circulation pressure, and that the readings the crew observed were proper. This may ultimately explain the readings, but it does not explain why the BP Macondo team dismissed them as the result of a broken pressure gauge.
- <sup>30</sup> David Izon, E.P. Danenberger, and Melinda Mayes, "Absence of fatalities in blowouts encouraging in MMS study of OCS incidents 1992–2006," *Well Control* July/August (2007), 84.
- <sup>31</sup> Testimony of John Guide, Hearing before the Deepwater Horizon Joint Investigation Team, July 22, 2010, 87.
- <sup>32</sup> John Gisclair, Sperry Sun data, April 20, 2010 (annotations, September 20, 2010). Commission calculation based on internal Halliburton document (HAL\_10994).
- <sup>33</sup> Internal BP document (BP-HZN-MBI 127537-39); Internal Halliburton document (HAL\_11196).
- <sup>34</sup> 30 C.F.R. § 250.421.
- <sup>35</sup> Internal BP document (BP-HZN-MBI 193549). BP's internal guidelines further specify that centralization should extend 100 feet above any such hydrocarbon-bearing zones. If either the top of cement or centralization requirements are not met, the guidelines require that the actual top of cement should be confirmed by a "proven cement evaluation technique." *Ibid.*
- <sup>36</sup> Internal BP documents (BP-HZN-MBI 143295, BP-HZN-CEC 22663); BP Deepwater Horizon *Accident Investigation Report*, 34.
- <sup>37</sup> Document provided to the Commission by Halliburton entitled "Halliburton GoM Foam Jobs 2002–2010."
- <sup>38</sup> S.L. Pickett and S.W. Cole, "Foamed Cementing Technique for Liners Yields Cost-Effective Results" (Society of Petroleum Engineers SPE Paper #27679, Midland, Texas, March 1994), 523–24.
- <sup>39</sup> Halliburton had delivered the slurry blend to the *Deepwater Horizon* several months earlier. It had developed the blend to match the temperature and pressure profile of the well that *Deepwater Horizon* had drilled immediately prior to Macondo—another BP well called Kodiak. Jesse Gagliano (Halliburton), interview with Commission staff, September 10, 2010.

- <sup>40</sup> At this point, it appears that lab personnel replicated the dry blend recipe that was on the rig using off-the-shelf materials from their lab. For later tests, Halliburton sent samples of the cement that was actually on the *Horizon* back to the lab and directly tested those materials.
- <sup>41</sup> Internal BP document (BP-HZN-MBI 109218).
- <sup>42</sup> Internal Halliburton document (HAL\_DOJ 68).
- <sup>43</sup> Internal Halliburton document (HAL\_DOJ 36).
- <sup>44</sup> Internal Halliburton document (HAL\_DOJ 43).
- <sup>45</sup> *Ibid.*
- <sup>46</sup> Internal BP document (BP-HZN-MBI 136946-47).
- <sup>47</sup> Internal BP document (BP-HZN-MBI 171151).
- <sup>48</sup> Internal BP document (BP-HZN-MBI 136946-47).
- <sup>49</sup> Internal BP document (BP-HZN-CEC 20234).
- <sup>50</sup> *Ibid.*
- <sup>51</sup> Testimony of Vincent Tabler, Hearing before the Deepwater Horizon Joint Investigation Team, August 25, 2010, 22-23, 36.
- <sup>52</sup> Internal Halliburton document (HAL\_0011208).
- <sup>53</sup> Internal BP document (BP-HZN-MBI 137370).
- <sup>54</sup> Internal BP document (BP-HZN-MBI 129141).
- <sup>55</sup> Internal Transocean document (TRN-USCG\_MMS 30422); Internal Schlumberger document (SLB-EC-2).
- <sup>56</sup> Testimony of John Guide, 44-45.
- <sup>57</sup> Internal BP document (BP-HZN-MBI 143304).
- <sup>58</sup> Testimony of John Guide, 298 (the cement plug was “deeper than normal”); Testimony of Ronald Sepulvado, Hearing before the Deepwater Horizon Joint Investigation Team, July 20, 2010, 145 (“the top of the surface plug is normally at 500 feet below the wellhead”).
- <sup>59</sup> Internal BP document (BP-HZN-CEC 8574).
- <sup>60</sup> Testimony of Jimmy Harrell, Hearing before the Deepwater Horizon Joint Investigation Team, May 27, 2010, 118.
- <sup>61</sup> Internal BP document (BP-HZN-CEC 8574).
- <sup>62</sup> Internal BP document (BP-HZN-CEC 21260-279).
- <sup>63</sup> Internal BP document (BP-HZN-MBI 126928).
- <sup>64</sup> Internal BP document (BP-HZN-OSC 1438).
- <sup>65</sup> 30 C.F.R. § 250.423.
- <sup>66</sup> The blind shear rams closed and sealed as expected during the positive-pressure test. This fact suggests that the rams were capable of sealing the well when the blowout occurred. But the evidence is inconclusive on its own; during the positive-pressure test the crew closed the blind shear rams using a low pressure hydraulic system, rather than the high pressure hydraulic system that would have activated the rams in the event of a blowout.
- <sup>67</sup> Internal Transocean document (TRN-HCEC 90).
- <sup>68</sup> Testimony of Patrick O’Bryan, Hearing before the Deepwater Horizon Joint Investigation Team, August 26, 2010, 360.
- <sup>69</sup> Testimony of David Sims, Hearing before the Deepwater Horizon Joint Investigation Team, August 26, 2010, 204. There were no regulations or industry standards guiding the conduct or interpretation of negative-pressure tests at the time of the Macondo blowout. The absence of any such guidance may have contributed to the failure to conduct and interpret the test correctly here.
- <sup>70</sup> This calculation is based on approximate values of the depths and mud weights involved.
- <sup>71</sup> Testimony of Leo Lindner, Hearing before the Deepwater Horizon Joint Investigation Team, July 19, 2010, 297; BP, Deepwater Horizon *Accident Investigation Report*, app. Q, 1.
- <sup>72</sup> BP, Deepwater Horizon *Accident Investigation Report*, 83.
- <sup>73</sup> Testimony of Leo Lindner, 308-11. The exclusion for “[d]rilling fluids, produced waters, and other wastes associated with the exploration, development, or production of crude oil, natural gas or geothermal energy” is found at 40 C.F.R. § 261.4.
- <sup>74</sup> Testimony of Leo Lindner, 276-79, 297, 359-60; Internal BP document (BP-HZN-BLY 47100).
- <sup>75</sup> Testimony of Randy Ezell, Hearing before the Deepwater Horizon Joint Investigation Team, May 28, 2010, 279-81.
- <sup>76</sup> Testimony of Daun Winslow, Hearing before the Deepwater Horizon Joint Investigation Team, August 24, 2010, 219;

- Testimony of Randy Ezell, 279.
- <sup>77</sup> Testimony of Randy Ezell, 279.
- <sup>78</sup> Testimony of Lee Lambert, Hearing before the Deepwater Horizon Joint Investigation Team, July 20, 2010, 292. Transocean disputes these accounts. It points out that the only individuals who have stated that Anderson advanced the “bladder effect” theory are BP employees.
- <sup>79</sup> Testimony of Lee Lambert, 292.
- <sup>80</sup> Testimony of Jimmy Harrell, 117; Internal BP documents (BP-HZN-MBI 127909, BP-HZN-CEC 20189-90). While that may have been Mr. Vidrine’s stated reason for running the test on the kill line, the Commission notes that the negative-pressure test performed at Macondo—whether on the drill pipe or kill line—was different from the negative-pressure test described in the Application for Permit to Modify. Testimony of Mark Bly, Hearing before the National Commission, November 8, 2010, 293–95.
- <sup>81</sup> BP, *Deepwater Horizon Accident Investigation Report*, 86.
- <sup>82</sup> There are several possible explanations for the inconsistent readings on the drill pipe and kill line. One possibility is that the viscous spacer that had leaked through the annular preventer migrated into and clogged the kill line. John Smith, *Review of Operational Data Preceding Explosion on Deepwater Horizon in MC252* (July 1, 2010), 20–21. Another possibility is that a valve was inadvertently closed that should have been open. BP, *Deepwater Horizon Accident Investigation Report*, 87. A third, more remote, possibility is that hydrocarbons coming up the well formed solid hydrates when they hit the cold seawater and those hydrates clogged the kill line. Guide, interview.
- <sup>83</sup> Testimony of Christopher Haire, Hearing before the Deepwater Horizon Joint Investigation Team, May 28, 2010, 247.
- <sup>84</sup> For example, a bubble of gas, under ideal conditions, would expand approximately 166-fold. This number differs under actual conditions based on fluid properties and flow.
- <sup>85</sup> Mudloggers operate systems that collect and transmit real-time data from sensors on the rig. BP employed mudloggers from Sperry Drilling (a Halliburton subsidiary) on the Deepwater Horizon.
- <sup>86</sup> The driller first sent mud to pits 9 and 10, then switched to pit 7, and then switched to pit 6. Sperry Sun data, April 20, 2010, 20:10–21:18.
- <sup>87</sup> *Ibid.*, 20:28–20:36, 20:58–21:06.
- <sup>88</sup> *Ibid.*, 20:20–21:01.
- <sup>89</sup> *Ibid.*, 21:01.
- <sup>90</sup> *Ibid.*, 21:01–21:08.
- <sup>91</sup> The Commission believes, based on interviews of the mudloggers on the *Horizon*, that the Hitec system may have shown a more obvious trend because it displays numeric values as opposed to trend lines such as those seen in the Sperry data shown in the text. Joseph Keith (Sperry), interview with Commission staff, October 6, 2010; Cathleen Willis (Sperry), interview with Commission staff, October 21, 2010.
- <sup>92</sup> Testimony of Greg Meche, Hearing before the Deepwater Horizon Joint Investigation Team, May 28, 2010, 207–09.
- <sup>93</sup> 40 C.F.R. §§ 261.4, 435.11.
- <sup>94</sup> Testimony of Greg Meche, 207–09, 219.
- <sup>95</sup> Keith, interview.
- <sup>96</sup> Internal BP document (BP-HZN-MBI 21415).
- <sup>97</sup> Keith, interview. Given what we now know, it is all but impossible that the well was not flowing as of 9:08 p.m. BP, *Deepwater Horizon Accident Investigation Report*, 25; Smith, *Review of Operational Data Preceding Explosion on Deepwater Horizon*, 22–23. Other than faulty memory, the only apparent explanations for Mr. Keith’s statement are that the crew had already closed off the portion of the flow line Mr. Keith was watching or that Mr. Keith watched for an inadequate period of time. Keith, interview; Darryl Bourgoyne (LSU), interview with Commission staff, November 23, 2010.
- <sup>98</sup> Testimony of Greg Meche, 207–09.
- <sup>99</sup> *Ibid.*
- <sup>100</sup> Internal BP document (BP-HZN-MBI 21415).
- <sup>101</sup> Sperry Sun data, April 20, 2010, 21:08–21:14.
- <sup>102</sup> *Ibid.*, 21:14–21:15.
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- <sup>104</sup> Testimony of Chad Murray, Hearing before the Deepwater Horizon Joint Investigation Team, May 27, 2010, 335–36.
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- <sup>107</sup> Testimony of Bill Ambrose, Hearing before the National Commission, November 8, 2010, 381.

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- <sup>116</sup> Testimony of Randy Ezell, 283; Young, interview.
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- <sup>118</sup> Testimony of Christopher Pleasant, Hearing before the Deepwater Horizon Joint Investigation Team, May 28, 2010, 173.
- <sup>119</sup> Testimony of Randy Ezell, 283.
- <sup>120</sup> Testimony of Bill Ambrose, 244.
- <sup>121</sup> Smith, *Review of Operational Data Preceding Explosion on Deepwater Horizon*, 14; Testimony of Bill Ambrose, 252–53; BP, *Deepwater Horizon Accident Investigation Report*, 28.
- <sup>122</sup> Testimony of Christopher Pleasant, 165.
- <sup>123</sup> *Ibid.*, 123.
- <sup>124</sup> *Ibid.*
- <sup>125</sup> Various parties have suggested other causes for the deadman’s failure, including leaks, overdue equipment certification, and improper modifications.
- <sup>126</sup> Interview with industry expert, September 24, 2010.
- <sup>127</sup> After the blowout, some industry CEOs testified they would never have used a long string production casing, suggesting there was a causal connection between BP’s choice of the long string and the blowout. Hearing Before the Subcomm. on Energy and Environment, 111th Cong. 104 (June 15, 2010) (statements of John Watson, Chairman and Chief Executive Officer, Chevron Corporation; and Rex Tillerson, Chairman and Chief Executive Officer, Exxon-Mobil).
- <sup>128</sup> First, the long string required the cement to travel through a longer stretch of steel casing—roughly 12,000 feet longer—before reaching its final destination, potentially increasing the risk of cement contamination. Second, because it can require higher cement pumping pressure, a long string design can lead to the selection of lower cement volumes, lower densities, and lower pump rates. Third, the cement job at the bottom of a long string is more difficult to remediate than one at the bottom of a liner.
- <sup>129</sup> Internal BP document (BP-HZN-MBI 128489); BP, *Deepwater Horizon Accident Investigation Report*, 64 (“the BP Macondo well team did not ask for the OptiCem model to be re-run”). This may have been because of Mr. Guide’s distrust of the OptiCem model. Testimony of John Guide, 275 (“it’s wrong a lot”). When Halliburton rig personnel eventually informed Gagliano of BP’s decision themselves, he responded by e-mailing BP modeling data suggesting again that more centralizers would be needed to prevent channeling. Internal BP document (BP-HZN-MBI 128708).
- <sup>130</sup> Testimony of Jesse Gagliano, 259; Testimony of Nathaniel Chaisson, 415.
- <sup>131</sup> BP, *Deepwater Horizon Accident Investigation Report*, 35. Mr. Guide disagreed with the BP report’s conclusion in an interview with Commission staff. Guide, interview.
- <sup>132</sup> Internal BP document (BP-HZN-CEC 22670).
- <sup>133</sup> Ronald Sepulvado (BP), interview with Commission staff, September 1, 2010.
- <sup>134</sup> BP, *Deepwater Horizon Accident Investigation Report*, 66.
- <sup>135</sup> Fred Bartlit, letter to the National Commission, October 28, 2010 (reporting the results of cement testing).
- <sup>136</sup> If BP were looking, the one February test actually reported to BP could have prompted BP to question the design as well. BP argues that its failure to do so here is understandable given that it had hired one of the world’s leading cementers specifically for purposes of designing and testing the cement slurry.
- <sup>137</sup> To the contrary, Halliburton’s selection of conditioning time appears to have been haphazard at best. Lab personnel used different conditioning times (ranging from zero conditioning time to three hours) in each of the four foam stability tests that they conducted.
- <sup>138</sup> Internal Halliburton document (HAL\_DOJ 43).
- <sup>139</sup> Testimony of Daun Winslow, 209; Guide, interview.
- <sup>140</sup> Moreover, once the BP Well Site Leaders and crew realized that the annular preventer was leaking, they should have circulated out any spacer that had migrated below the annular preventer prior to continuing with the test. Testi-

mony of John Smith, Hearing before the National Commission, November 9, 2010, 140–41.

- <sup>141</sup> The Commission agrees with others that there is no such thing as a “bladder effect” that could account for the pressures the rig crew was observing. There was no apparent explanation for the 1400 psi on the drill pipe other than that the well was flowing.
- <sup>142</sup> Transocean asserts that its personnel, including the driller and toolpusher, were not “in any way responsible for interpreting the negative pressure test or making the decision that the well was secure and work could properly proceed.” Rachel Clingman, letter to Commission staff, November 16, 2010, 1. As the Commission’s staff made clear at the November 8, 2010 hearing, the Commission is not tasked with deciding legal responsibility. Based on available evidence, however, Revette and Anderson agreed the negative-pressure test was a success and did not stop the job before moving on to the remaining temporary abandonment procedures. Testimony of Lee Lambert, 291; Internal BP documents (BP-HZN-CEC 20347, 20178).
- <sup>143</sup> Guide, interview.
- <sup>144</sup> Benjamin Powell, “BP Response to Presidential Commission’s Preliminary Technical Conclusions,” letter to Commission staff, November 22, 2010, att. 1, 3 (citing Hearing Before the Senate Comm. on Energy and Natural Resources, 111th Cong. (May 11, 2010) (statement of Testimony of Tim Probert, Halliburton President, Global Business Lines, Chief Health, Safety and Environmental Officer)).
- <sup>145</sup> Testimony of Mark Bly, 213; Testimony of Charlie Williams, Hearing before the National Commission, November 9, 2010, 45.
- <sup>146</sup> Testimony of Steve Lewis, 54, 124. BP argues that “[t]he use of additional mechanical plugs would have brought its own additional risks.” Powell, letter, att. 1, 6 (citing API, *Recommended Practice 65—Part 2* (May 2010), § 3.1); Guide, interview. However, BP does not present any evidence that the Macondo team in fact evaluated those risks or compared them with the risks of setting a single surface cement plug in seawater 3,300 feet below the mud line.
- <sup>147</sup> Merrick Kelley (BP), interview with Commission staff, October 22, 2010; Industry expert, interview.
- <sup>148</sup> BP asserts that “[u]sing drill collars would have required unranking the drill pipe on the rig and then locating and re-racking drill collars—a set of additional operations with attendant risks.” Powell, letter, att. 1, 5. BP does not provide any evidence to substantiate the extent of such “attendant risks” or whether they outweighed the risks of the procedure BP chose. Most significantly, BP offers no evidence that its Macondo team ever considered such risks or performed a rigorous comparative risk analysis.
- <sup>149</sup> Internal BP document (BP-HZN-CEC 8574).
- <sup>150</sup> Testimony of Mark Bly, 308. BP has suggested that the float valves provided an additional barrier to flow. BP, Deepwater Horizon Accident Investigation Report, 68. The Commission does not agree that float valves, even when converted, constitute a distinct physical barrier to flow, but instead reinforce the cement in the shoe track. Clawson, interview (indicating that Weatherford does not consider the float collar to be a barrier to hydrocarbons); API, *Recommended Practice 65—Part 2* (May 2010), §§ 3.4, 4.4.3 (float valves not included in the list of subsurface mechanical barriers; float equipment used to prevent cement from flowing back into the casing).
- <sup>151</sup> Testimony of Darryl Bourgoyne, Hearing before the National Commission, November 9, 2010, 133.
- <sup>152</sup> Testimony of Charlie Williams, 46–53.
- <sup>153</sup> Testimony of Bill Ambrose, 380–84.
- <sup>154</sup> Between 8:00 and 9:49 p.m., the crew was performing a number of other activities that may have further confounded the data or at least distracted the driller. The crew was emptying various tanks on the rig into the active pit system, including “trip tanks” and “sand traps,” which may have masked increased flow out of the well into the active pit system. At 9:18 p.m., a valve on one of the pumps blew, and a number of crew members from the rig floor went to fix it. Finally, the crew was operating one or both of the cranes on the main deck, which could have affected flow-out and volume readings.
- <sup>155</sup> Internal BP document (BP-HZN-OSC 5420).
- <sup>156</sup> Guide, interview.
- <sup>157</sup> *Ibid.*; Internal BP document (BP-HZN-MBI 193529–39).
- <sup>158</sup> It appears that the chain of command and responsibilities at BP during the execute phase were not well-understood by the Macondo Engineering Team Leader. When asked during an interview who was responsible for designing or amending the temporary abandonment procedures, the Macondo Engineering Team Leader said he would need to look at the company’s chart of roles and responsibilities. Walz, interview.
- <sup>159</sup> Internal BP document (BP-HZN-MBI 117603).
- <sup>160</sup> Internal BP document (BP-HZN-MBI 128542).
- <sup>161</sup> Internal BP document (BP-HZN-OSC 6224).
- <sup>162</sup> There is a dispute as to whether BP personnel called back to shore that evening to discuss the data observed during the negative-pressure test. The Commission staff has to date seen no direct evidence of such a call. The staff’s investigation is ongoing.
- <sup>163</sup> Internal BP document (BP-HZN-BLY 38354).
- <sup>164</sup> Internal BP document (BP-HZN-BLY 38355).

- <sup>165</sup> Internal BP document (BP-HZN-BLY 38354).
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- <sup>167</sup> *Ibid.*
- <sup>168</sup> Internal BP document (BP-HZN-BLY 38362).
- <sup>169</sup> Internal Transocean document (TRN-PC 3227).
- <sup>170</sup> Transocean states that on April 5, 2010, it posted a short, two-page version of this advisory to an internal electronic document platform, which supervisors on the *Deepwater Horizon* had access to. But the advisory was limited to completion operations, and, as of this writing, Transocean has not offered any evidence that anyone on the rig actually saw or reviewed the advisory.
- <sup>171</sup> The industry and the international community also failed to adequately communicate lessons learned from the Montara blowout, which for ten weeks beginning on August 21, 2009 spewed between 400 and 1500 barrels per day of oil and gas into the Timor Sea approximately 150 miles off the northwest coast of Australia. David Borthwick, *Report of the Montara Commission of Inquiry* (The Montara Commission of Inquiry, Australia, June 2010), 5, 26. According to the *Report of the Montara Commission of Inquiry*, released on November 24, 2010, many of the technical and managerial causes of the Montara blowout track those at Macondo. For instance, the Commission of Inquiry concluded that the cement job in the “9 5/8” casing shoe failed, that there were numerous risk factors surrounding the cement job that went unheeded, and that the cement job was not properly pressure tested. *Ibid.*, 7. According to the Commission of Inquiry:
- The multiple problems in undertaking the cement job—such as the failure of the top and bottom plugs to create a seal after “bumping,” the failure of the float valves and an unexpected rush of fluid—should have raised alarm bells. Those problems necessitated a careful evaluation of what happened, the instigation of pressure testing and, most likely, remedial action. No such careful evaluation was undertaken. The problems were not complicated or unsolvable, and the potential remedies were well known and not costly. This was a failure of “sensible oilfield practice 101.”
- Ibid.* The Commission of Inquiry went on to conclude that while the “absence of tested barriers was a proximate cause of the Blowout,” the deeper failure was a systemic failure of management on the part of the operator, PTTEP Australasia. *Ibid.*, 9.
- <sup>172</sup> Testimony of Rex Tillerson, Hearing before the National Commission, November 9, 2010, 250–52; Testimony of Marvin Odum, Hearing before the National Commission, November 9, 2010, 278–79.
- <sup>173</sup> 30 C.F.R. § 250.1721(d).
- <sup>174</sup> 30 C.F.R. § 250.141(a).
- <sup>175</sup> Internal BP document (BP-HZN-OSC 1436).
- <sup>176</sup> Internal BP document (BP-HZN-MBI 127906). MMS approved a number of other requests by BP for deviations on the Macondo well. None of those other approvals appear to have contributed to the blowout. However, they do suggest that the MMS staff did not spend much time deciding whether to grant the requests, which may have been due to the severe funding and staffing shortages in the New Orleans office.

## Chapter Five

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## Chapter Eight

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- <sup>188</sup> Graeme Wearden, “BP oil spill costs to hit \$40bn,” *The Guardian*, November 2, 2010 (\$39.9 billion estimated costs); 33 U.S.C. §2716 (maximum required financial responsibility for offshore facilities is \$150 million).
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## Chapter Nine

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- <sup>2</sup> See 43 U.S.C. § 1337(b)(6) (“An oil and gas lease issued pursuant to this section shall . . . contain such rental and other provisions as the Secretary may prescribe at the time of offering the area for lease.”).
- <sup>3</sup> These terms are taken directly from the Council on Environmental Quality (CEQ) NEPA implementing regulations. 40 C.F.R. § 1508.28.
- <sup>4</sup> 40 C.F.R. §1508.4.
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- <sup>15</sup> 30 C.F.R. § 254.2(a).
- <sup>16</sup> 30 C.F.R. § 254.126
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- <sup>20</sup> Department of the Interior, National Notice to Lessees and Operators of Federal Oil and Gas Leases, Outer Continental Shelf No. 2010-N10 (November 8, 2010), <http://www.gomr.boemre.gov/homepg/regulate/regs/ntls/2010NTLs/10-n10.pdf>.

- <sup>21</sup> 30 C.F.R. §§ 250.410–418.
- <sup>22</sup> 30 C.F.R. § 250.418(j).
- <sup>23</sup> Transcript, Deepwater Blowout Containment Conference (September 22, 2010), <http://www.doi.gov/news/video/Deepwater-Blowout-Containment-Conference.cfm>.
- <sup>24</sup> Doug Suttles, interview with Commission staff, October 13, 2010.
- <sup>25</sup> Response workers generally must be trained pursuant to the Hazardous Waste Operations and Emergency Response (“HAZWOPER”) regulation administered by the Occupational Safety and Health Administration. 29 C.F.R. § 1910.120. This regulation requires specific training and medical surveillance and monitoring for workers dealing with hazardous materials. While this regulation presumably applied to formal response contractors after the Deepwater Horizon spill, it was not applied consistently to citizen responders who also require its protections.
- <sup>26</sup> Public information should further be provided in languages and formats that are understandable to individuals with limited English proficiency and individuals with disabilities. ESF #8—Public Health and Medical Services Annex at 7.
- <sup>27</sup> Indeed, the Public Health and Medical Services Annex provides for long-term monitoring of potentially exposed individuals, requiring the Department of Health and Human Services to “assist[] State, tribal, and local officials in establishing a registry of potentially exposed individuals . . . and conducting long-term monitoring of this population for potential long-term health effects.” ESF #8 – Public Health and Medical Services Annex at 9–10; Rebecca Bratspies, et al., *From Ship to Shore: Reforming the National Contingency Plan to Improve Protections for Oil Spill Cleanup Workers* (Center for Progressive Reform, September 2010).
- <sup>28</sup> Whether or not respirators should be required for cleanup workers emerged as a major controversy in the response.
- <sup>29</sup> Ray Mabus, *America’s Gulf Coast: A Long Term Recovery Plan after the Deepwater Horizon Oil Spill* (September 2010); Exec. Order No. 13554, 75 Fed. Reg. 62313–62317 (October 8, 2010).
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## Chapter Ten

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  - <sup>8</sup> Energy Information Administration, *Annual Energy Review 2009*, Tables 4.2, 5.1, 101, 129 (calculated from tables) <http://www.eia.doe.gov/aer/pdf/aer.pdf>.
  - <sup>9</sup> *Ibid.*, Table 11.5, 315.
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  - <sup>33</sup> The Arctic Council is a multinational and intergovernmental group. Members include the governments of Canada,

Denmark (including the Faroe Islands and Greenland), Finland, Iceland, Norway, the Russian Federation, Sweden, and the United States of America. The Permanent Participants of the Arctic Council are: Aleut International Association (AIA), Arctic Athabaskan Council (AAC), Gwich'in Council International (GCI), Inuit Circumpolar Council (ICC), Russian Association of Indigenous Peoples of the North (RAIPON), and the Saami Council.

## Appendix A

### Commission Members



SENATOR BOB GRAHAM, Co-Chair, is the former two-term governor of Florida and served for 18 years in the United States Senate. After retiring from public life in January 2005, Senator Graham served for a year as a senior fellow at the Harvard Kennedy School of Government. There he commenced writing *America, the Owner's Manual*, published in 2009 as a guide to participatory citizenship. From May 2008 to February 2010, he served as chairman of the Commission on the Prevention of Weapons of Mass Destruction Proliferation and Terrorism, and currently serves as a member of the Financial Crisis Inquiry Commission and the CIA's Executive Advisory Board.



WILLIAM K. REILLY, Co-Chair, is a founding partner of Aqua International Partners, LP, a private equity fund dedicated to investing in companies engaged in water and renewable energy, and a senior advisor to TPG Capital, LP, an international investment partnership. He co-chaired the National Commission on Energy Policy. Mr. Reilly served as Administrator of the U.S. Environmental Protection Agency (1989-1993) and president of World Wildlife Fund (1985-1989). He also served as the head of the U.S. delegation to the United Nations Earth Summit at Rio in 1992.

Mandel Ngan/AFP/Getty Images



FRANCES G. BEINECKE, Member, is the President of the Natural Resources Defense Council (NRDC), a non-profit corporation that works to advance environmental policy in the United States and across the world. In addition, Ms. Beinecke currently serves on the Board of the World Resources Institute and the steering committees of the U.S. Climate Action Partnership. She is a member of the Aspen Institute's Commission on Arctic Climate Change, and on the advisory boards of the Yale School of Management and the Yale School of Forestry and Environmental Science.





DONALD F. BOESCH, Member, is President of the University of Maryland Center for Environmental Science, where he is also a Professor of Marine Science and Vice Chancellor for Environmental Sustainability for the University System of Maryland. He is a biological oceanographer who has conducted research on coastal ecosystems along the Atlantic Coast, the Gulf of Mexico, Australia and the East China Sea. A native of Louisiana, he has assessed the long-term environmental effects of offshore oil and gas development and multiple environmental problems of the Gulf Coast.



TERRY D. GARCIA, Member, is currently Executive Vice President for Mission Programs for the National Geographic Society, responsible for the Society's core programs that manage more than 400 scientific field research, conservation and exploration projects annually. From 1994 to 1996, he was General Counsel at NOAA and led the implementation of the Exxon Valdez Oil Spill Restoration Plan for Prince William Sound and the Gulf of Alaska. From 1997 to 1999, he was Assistant Secretary of Commerce for Oceans and Atmosphere and Deputy Administrator of NOAA.



CHERRY A. MURRAY, Member, is Dean of the Harvard School of Engineering and Applied Sciences and John A. and Elizabeth S. Armstrong Professor of Engineering and Applied Sciences. She is currently the Past President of the American Physical Society. She was formerly Senior Vice President of Physical Science & Wireless Research at Bell Labs and past Principal Associate Director for Science & Technology at Lawrence Livermore National Laboratory. A member of the National Academy of Engineering and the National Academy of Sciences, she has served on more than 80 national and international scientific advisory committees, governing boards, and National Research Council panels, including chairing the Council's Division of Engineering and Physical Science.



FRAN ULMER, Member, is Chancellor of the University of Alaska Anchorage, Alaska's largest public university. Ms. Ulmer has served as Mayor of Juneau and Lieutenant Governor of Alaska. As a state legislator, she served on the Special Committee on the Exxon Valdez Oil Spill Claims Settlement. She has been a member of the North Pacific Anadromous Fish Commission, the Alaska Coastal Policy Council, the Alaska Nature Conservancy, the National Parks Conservation Association, the Aspen Institute's Commission on Arctic Climate Change, among many others.

## Appendix B

### List of Acronyms

API	American Petroleum Institute
BOEMRE	Bureau of Ocean Energy Management, Regulation and Enforcement
CWA	Clean Water Act
DOI	Department of the Interior
EA	Environmental Assessment
EIS	Environmental Impact Statement
FDA	Food and Drug Administration
HPSA	Health Professional Shortage Area
IADC	International Association of Drilling Contractors
INPO	Institute of Nuclear Power Operations
MMS	Minerals Management Service
NASA	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
NRC	Nuclear Regulatory Commission
NRDA	Natural Resource Damage Assessment
OPA	Oil Pollution Act of 1990
OPEC	Organization of Petroleum Exporting Countries
OCS	Outer Continental Shelf
OCSLA	Outer Continental Shelf Lands Act
SEMP	Safety and Environmental Management Program
SEMS	Safety and Environmental Management Systems

## Appendix C

### **Executive Order-- National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling**

By the authority vested in me as President by the Constitution and the laws of the United States of America, it is hereby ordered as follows:

**Section 1. Establishment.** There is established the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling (the "Commission").

**Sec. 2. Membership.** (a) The Commission shall be composed of not more than 7 members who shall be appointed by the President. The members shall be drawn from among distinguished individuals, and may include those with experience in or representing the scientific, engineering, and environmental communities, the oil and gas industry, or any other area determined by the President to be of value to the Commission in carrying out its duties.

(b) The President shall designate from among the Commission members two members to serve as Co Chairs.

**Sec. 3. Mission.** The Commission shall:

- (a) examine the relevant facts and circumstances concerning the root causes of the Deepwater Horizon oil disaster;
- (b) develop options for guarding against, and mitigating the impact of, oil spills associated with offshore drilling, taking into consideration the environmental, public health, and economic effects of such options, including options involving:
  - (1) improvements to Federal laws, regulations, and industry practices applicable to offshore drilling that would ensure effective oversight, monitoring, and response capabilities; protect public health and safety, occupational health and safety, and the environment and natural resources; and address affected communities; and
  - (2) organizational or other reforms of Federal agencies or processes necessary to ensure such improvements are implemented and maintained.
- (c) submit a final public report to the President with its findings and options for consideration within 6 months of the date of the Commission's first meeting.

**Sec. 4. Administration.** (a) The Commission shall hold public hearings and shall request information including relevant documents from Federal, State, and local officials, nongovernmental organizations, private entities, scientific institutions, industry and

workforce representatives, communities, and others affected by the Deepwater Horizon oil disaster, as necessary to carry out its mission.

- (b) The heads of executive departments and agencies, to the extent permitted by law and consistent with their ongoing activities in response to the oil spill, shall provide the Commission such information and cooperation as it may require for purposes of carrying out its mission.
- (c) In carrying out its mission, the Commission shall be informed by, and shall strive to avoid duplicating, the analyses and investigations undertaken by other governmental, nongovernmental, and independent entities.
- (d) The Commission shall ensure that it does not interfere with or disrupt any ongoing or anticipated civil or criminal investigation or law enforcement activities or any effort to recover response costs or damages arising out of the Deepwater Horizon explosion, fire, and oil spill. The Commission shall consult with the Department of Justice concerning the Commission's activities to avoid any risk of such interference or disruption.
- (e) The Commission shall have a staff, headed by an Executive Director.
- (f) The Commission shall terminate 60 days after submitting its final report.

**Sec. 5. General Provisions.** (a) To the extent permitted by law, and subject to the availability of appropriations, the Secretary of Energy shall provide the Commission with such administrative services, funds, facilities, staff, and other support services as may be necessary to carry out its mission.

- (b) Insofar as the Federal Advisory Committee Act, as amended (5 U.S.C. App.) (the "Act"), may apply to the Commission, any functions of the President under that Act, except for those in section 6 of the Act, shall be performed by the Secretary of Energy in accordance with guidelines issued by the Administrator of General Services.
- (c) Members of the Commission shall serve without any additional compensation for their work on the Commission, but shall be allowed travel expenses, including per diem in lieu of subsistence, to the extent permitted by law for persons serving intermittently in the Government service (5 U.S.C. 5701-5707).
- (d) Nothing in this order shall be construed to impair or otherwise affect:
  - (1) authority granted by law to a department, agency, or the head thereof; or
  - (2) functions of the Director of the Office of Management and Budget relating to budgetary, administrative, or legislative proposals.

(e) This order is not intended to, and does not, create any right or benefit, substantive or procedural, enforceable at law or in equity by any party against the United States, its departments, agencies, or entities, its officers, employees, or agents, or any other person.

BARACK OBAMA

THE WHITE HOUSE,  
May 21, 2010.

## Appendix D

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## Appendix E

### List of Commission Meetings

1st Meeting: New Orleans, LA

July 12-13, 2010: Gulf Region Perspectives

2nd Meeting: Washington, DC

August 25, 2010: Regulatory Oversight of Offshore Drilling

3rd Meeting: Washington, DC

September 27-28, 2010: Response & Restoration

4th Meeting: Washington, DC

October 13, 2010: Commission Deliberations

5th Meeting: Washington, DC

November 8-9, 2010: Causes of Macondo Well Blowout & Drilling Safety

6th Meeting: Washington, DC

December 2-3, 2010: Commission Deliberations

## Appendix F

### List of Staff Working Papers

Over the past several months, Commission staff prepared a number of working papers for use by Commission members to inform their work and deliberations. Listed below are all of the staff working papers completed as of the date of this report. The Staff Working Papers can be found at [www.oilspillcommission.gov](http://www.oilspillcommission.gov).

A Brief History of Offshore Drilling (No. 1)

Decision-Making Within the Unified Command (No. 2)

The Amount and Fate of the Oil (No. 3)

The Use of Surface and Subsea Dispersants During the BP Deepwater Horizon Oil Spill (No. 4)

The Challenges of Oil Spill Response in the Arctic (No. 5)

Stopping the Spill: The Five- Month Effort to Kill the Macondo Well (No. 6)

Response/Clean-Up Technology Research & Development and the BP Deepwater Horizon Oil Spill (No. 7)

The Story of the Louisiana Berms Project (No. 8)

Industry's Role in Supporting Health, Safety, and Environmental Standards: Options and Models for the Offshore Oil and Gas Sector (No. 9)

Liability and Compensation Requirements under the Oil Pollution Act (No. 10)

Scientific Research to Support Oil and Gas Decision Making: Evolution of the Department of the Interior's Environmental Studies Program (No. 11)

The National Environmental Policy Act and Outer Continental Shelf Oil and Gas Activities (No. 12)

Offshore Drilling in the Arctic: Background and Issues for the Future Consideration of Oil and Gas Activities (No. 13)

Unlawful Discharges of Oil: Legal Authorities for Civil and Criminal Enforcement and Damage Recovery (No. 14)

Long-Term Regional Restoration in the Gulf: Funding Sources and Governance Structures (No. 15)

Rebuilding an Appetite for Gulf Seafood after Deepwater Horizon (No. 16)

Natural Resource Damage Assessment: Evolution, Current Practice, and Preliminary Findings Related to the Deepwater Horizon Oil Spill (No. 17)

Continuous Improvement Is Essential: Leveraging Global Data and Consistent Standards for Safe Offshore Operations (No. 18)

A Competent and Nimble Regulator: A New Approach to Risk Assessment and Management (No. 19)

Demonstrating a Comprehensive, Rigorous Management Approach for Deepwater Drilling (No. 20)

Federal Environmental Review of Oil and Gas Activities in the Gulf of Mexico: Environmental Consultations, Permits, and Authorizations (No. 21)

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On April 20, 2010, the Macondo well blew out, costing the lives of 11 men, and beginning a catastrophe that sank the *Deepwater Horizon* drilling rig and spilled over 4 million barrels of crude oil into the Gulf of Mexico. The spill disrupted an entire region's economy, damaged fisheries and critical habitats, and brought vividly to light the risks of deepwater drilling for oil and gas—the latest frontier in the national energy supply. Soon after, President Barack Obama appointed a seven-member Commission to investigate the disaster, analyze its causes and effects, and recommend the actions necessary to minimize such risks in the future.

The Commission's report offers the American public and policymakers alike the fullest account available of what happened in the Gulf and why, and proposes actions—changes in company behavior, reform of government oversight, and investments in research and technology—required as industry moves forward to meet the nation's energy needs.

Complementary reports, staff background papers, hearing records, and other materials produced by the Commission are available at [www.oilspillcommission.gov](http://www.oilspillcommission.gov).