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Oil Spill Causation and the Deepwater Horizon Spill

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Abstract

The April 20, 2010, BP Deepwater Horizon blowout riveted citizen and elected officials' attention on coastal oil spills in ways not seen since the ill-fated 1989 Exxon Valdez *crisis. A commonly voiced lament included why was the tragedy not prevented? Why the seemingly poor safety practices and who is to blame? Could a spill of such catastrophic proportion happen elsewhere in the future? Applying a spill prevention causation framework developed through the examination of other major near-shore incidents over a 23-year period, the author finds Deepwater Horizon exhibited a pattern of shortcomings evident in these other spills. These shortcomings are rooted in policy imperfections, a weak regulatory regime, organizational deviance in lieu of integrity, and interorganizational structure deficiencies.*

KEY WORDS: Deepwater Horizon, energy, environment, oil spill, pollution, regulation, disaster & risk management

Introduction

The April 20, 2010, Deepwater Horizon oil drilling rig blowout catapulted the issue of oil spill prevention and safety onto the U.S. national agenda. The BP-led operation failure resulted in eleven deaths and an estimated 4.9 million barrels of spilled oil. In the weeks and months following the spill, there was an avalanche of congressional hearings, investigations, and media inquiries. Questions included where to lay blame, why had the disaster not been prevented, and why had safety been so lax? Questions also included whether future environmental quality, the safety of citizens, and protection of publicly owned resources could be assured through the present prevention protocols.

This analysis draws upon the broader theoretical literature as applicable to the author's findings from seven major coastal spills occurring between 1989 and 2008. The analysis complements prior research in such matters as the roles high reliability, complex systems, redundancy, and organizational coordination decay play in disaster causation (Harrald, Marcus, & Wallace, 1990; Perrow, 1999; Roberts, 1990; Roberts & Moore, 1993).

The analysis is premised on a recognition that near-shore spill prevention and safety adherence is predominantly managed through an array of interorganizational public–private partnerships. The relationship of these partnerships—networks as they are typically referenced—is established through policy mandates. Mandate success may be inhibited through policy imperfections, a weak regulatory regime, failure to uphold the integrity of best safety practices, the deviant organizational behavior of some participants, and interorganizational networks structure deficiencies. What emerges is an opportunity to utilize the current theoretical literature in identifying an additional set of near-shore spill causal factors. These factors provide the foundation for the author's spill causation framework. This framework is then applied to the Deepwater Horizon incident to determine whether a similar pattern was evident.

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Findings from this analysis—suggesting alignment between Deepwater Horizon and the causal factors—will be of greatest interest to scholars engaged in practitioner applied research. Professional practitioners should also be interested in the analysis findings. Moreover, the findings provide a platform for future research through the application of discoveries in this analysis to additional spill incidents and networks within other industries.

Public–Private Partnerships

Writing in 2000, E.S. Savas declared a tectonic shift in governance processes had and was continuing to occur. This shift was premised upon a broadening reliance on private institutions, not government, to satisfy societal needs. Savas (2000) defined this shift as public–private partnerships, an arrangement between government and private sector organizations in which government-provided activities are shifted to the private sphere. This observation was not singular to Savas. He was tapping into a component of a broader trend: public–private interorganizational networks.

This trend has been described through a variety of names. New public management as it is commonly known in the United Kingdom, New Zealand, and Australia has had a companion movement in the United States referred to as reinventing government. Perhaps best represented in the United States through the popular 1993 Osborne and Gaebler (1993) publication *Reinventing Government*. The emerging movement challenged government agencies to be entrepreneurial, discover new ways of achieving greater efficiency, and provide improved customer service. Public–private partnerships are one important alternative method for delivering services in accordance with these stipulations. By the late 1990s, all levels of governments were increasingly entering into cooperative agreements, joined-up arrangements with other units of government and private sector partners in service delivery. Such arrangements extended beyond a desired end of greater efficiency. This was recognition that no single institution had the resources or capacity to accomplish many public sector tasks (Alford & Owens, 2008).

Reflecting on this, Agranoff and McGuire (2003) noted that public managers now worked in a world of networked organizations. This new world involves a process of governance defined through self-governing interorganizational networks. Such networks may involve public–private partnerships as well as vertical and horizontal multiagency alliances. These networks are linked together through interdependence in policy implementation and service delivery. They typically operate with significant autonomy from government officialdom red tape, relying upon trust-based interactions as the path to outcome achievement (Klijn, 2005; Rhodes, 1997).

The collaborative arrangements of interorganizational networks have created a number of operational challenges (Alford & Owens, 2008). For example, although emergency preparedness is often considered a discrete function limited to the internal operations of an organization, it is recognized that the operation of today's critical infrastructure is not under the control of a single entity. Consider waste and water supply management, telecommunications, the financial services industry, and electricity production. Much of the generation and supply of these critical operations occurs across organizations. Increasingly, we are obligated to speak of organizational networks as the landscape in which reliable performance must operate.

These networks are tasked with inculcating safety characteristics across organizations instead of within any one organization. Networks may vary from the complex and tightly coupled to the informal and loosely coupled (Chisholm, 1989; Kapucu & Van Wart, 2006; Perrow, 1999; Roe, Schulman, Van Eeten, & De Bruijne, 2005; Schulman, Roe, Van Eeten, & De Bruijne, 2004). Specific characteristics applicable to near shore oil spill prevention are discussed in the following section.

The Causal Factors

Public Policy

Public policy mandates resulting from federal statutes serve as the driving force behind coastal oil spill prevention and response in U.S. territorial waters. The first federal statute to address the issue of coastal oil spills was The Oil Pollution Act of 1924 (33 U.S.C. 431-437). Justification for the act was based in large part upon the earlier 1899 Rivers and Harbors Act (33 U.S.C. 401). Water pollution control specifications contained within the 1899 act authorized the Corps of Engineers to regulate the disposal of offshore refuse. The 1924 act made it unlawful to discharge oil into coastal, navigable waters of the United States. Navigable waters were defined as "the sea within the territorial jurisdiction of the U.S., and all inland waters, navigable in fact, where the tide ebbs and flows." Penalties for violation of the act included a fine of $500–$2,500, one year imprisonment, or both.

The 1924 act was primarily concerned with the hazards oil discharges posed to navigation. Any direct benefits resulting from this policy went primarily to the shipping industry. However, sections three and nine of the act did note the protection of commercial fisheries and human health that would result from statutory enforcement. It was not until 1966, with the passage of the Clean Water Restoration Act (Public Law 89-753) that steps were taken to amend the 1924 act. The 1966 act extended the earlier prohibitions on oil discharge to include all "inland" waterways navigable in fact rather than simply those waterways subject to tidal flow. In 1970, Congress repealed the 1924 Oil Pollution Act and chose instead to address the issue within the broader provisions of the 1970 Water Quality Improvement Act (Public Law 91-224). The new statute prohibited the discharge of harmful quantities of oil into navigable waters. It likewise established penalties for failure to report discharges and directed the executive to publish an oil discharge National Contingency Plan. Provisions of the 1972 Federal Water Pollution Control Act and its 1977 amended version superseded the 1970 statute. Civil discharge penalties of not more than $5,000 for each offense and civil action caps ranging from $50,000 to $250,000 for willful negligence or misconduct were established. A potential 1-year prison term and $10,000 fine faced individuals charged with criminal offenses.

Despite this statutory progress, a common theme of government and scholarly reports following the 11 million gallon 1989 *Exxon Valdez* oil spill was the realization that the spill prevention system for U.S. coastal waters was broken. The existing provisions as well as complementary statutes—Endangered Species Act, Comprehensive Environmental Response Compensation, and Liability Act—while important, did not contain the aggressive spill prevention and threat mitigation requirements advocates deemed essential (Alaska Oil Spill Commission, 1990; FOSC, 1993; Klijn, 2004; National Response Team, 1989; SIGCO, 2006). The solution—and policy component of this analysis—was passage of the 1990 Oil Pollution Act (OPA 90).

Although OPA 90 did not mention interorganizational networks, such characteristics permeated the legislation. The OPA 90 stipulated implementation of public–private networks designed to prevent and minimize the occurrence of near shore incidents (Public Law 101-480; U.S. Coast Guard, 2009). Provisions included an interorganizational directive for ongoing safety training tested through real-time simulations, periodic safety inspections, and integrated communication systems, all of which had the added value of building levels of trust between participants within the networks (Crichton, Lauche, & Flin, 2005). Prior to OPA 90, minimal enforcement of cooperative prevention, planning, and training requirements occurred (Alaska Oil Spill Commission, 1990; FOSC, 1993; National Response Team, 1989; SIGCO, 2006).

At this point, it is also important to clarify the applicability of OPA 90 to offshore oil drilling rigs. By regulatory definition, the Deepwater Horizon was a Class V (fifth generation) Mobile Offshore Drilling Unit (MODU). As such, it was considered an oceangoing vessel subject to all OPA 90 as well as other relevant regulatory provisions (FOSC, 2011; Murphy, 2012; SIGCO, 2012; U.S. Coast Guard, 2010).

Regulatory Authority

Through the policy mandates of OPA 90, the federal government has assumed the lead role of guarantor of adherence to best safety practices in spill prevention. Prior to the 1989 *Exxon Valdez* oil spill, the federal government assumed a limited regulatory role in oil transportation safety within the boundaries of U.S. territorial waters. The 11 million gallon tanker catastrophe demonstrated a need for government to step in and ensure the industry adherence to best safety practices. Numerous post-*Exxon Valdez* studies uncovered a definitive progression of lax safety adherence across the operational network. Compliance with best practices progressively gave way to cost-cutting and shoddy safety protocols, as partner contractors exemplified at the Port of Valdez and aboard Exxon tankers traversing Alaska's Prince William Sound (Alaska Oil Spill Commission, 1990; Birkland, 1997; FOSC, 1993; Harrald et al., 1990; Klijn, 2004; National Response Team, 1989; SIGCO, 2006).

This is not surprising. An abundance of scholarship, ranging from private sector economic self-interest to public choice theory, provides convincing evidence of the need and ability of government regulatory agencies to ensure ongoing interorganizational adherence to the integrity of safety. Commonly defined in terms of enforcement, agencies are charged with the implementation of specific compliance provisions outlined in the statutory mandate. Research demonstrates a propensity of private for-profit organizations to engage in actions—when given the opportunity—promoting their own interests. Self-interests, if exercised without appropriate oversight, may transgress toward deviant behavior and the erosion of integrity in lieu of profit seeking (Goodsell, 1994, 141–144; Heilbroner, 1986; Ostrom, 1989; Rhoads, 1985; Savas, 2000; Schwartz, 2008). Provisions of OPA 90, and complementary safety and environmental statutes, empowered the U.S. Coast Guard to ensure the integrity of best safety practices for vessels operating within U.S. territorial waters. With respect to offshore drilling rig operations, the U.S. Minerals Management Service (MMS) was delegated a leadership role.

Integrity

Integrity then, in this study, can be thought of as adherence to government safety mandates for oil extraction and transportation within U.S. territorial waters. Maintaining integrity requires steadfast adherence to a well-defined organizational code of ethical conduct. Prior research has also established an important linkage between integrity and image. By promoting an image of integrity, leadership can positively shape an organization's culture. Mid-level managers and supervisors come to understand that integrity reaches beyond minimal compliance with current government regulations.

An organization steeped in integrity fosters individual compliance and helps to establish trust within and between organizations (Verhezen, 2008). Trust implies a willingness to collaborate in an aboveboard manner—as honest brokers—with an expectation that other network participants will do the same. Maintaining an organization steeped in integrity, however, becomes difficult to achieve when diversity increases. This is particularly so in interorganizational networks. Many organizations operate on the basis of inconsistent and ill-defined value preferences. This inhibits effectiveness in building trust and cooperation. The catalyst of crisis episodes adds to the confusion and underlying organizational disarray inhibiting adherence to integrity (Cahn, 1995; Davies, 1963; Dull, 2010; LaPorte & Consolini, 1991; Stone, 2002).

Deviance

During an emergency situation—such as a major spill incident—this can be devastating. One particularly threatening version of this deterioration is the normalization of deviance that sometimes plagues organizations. Decisions viewed from the outside as inappropriate, ethically questionable, or risky are perceived as acceptable within the organization. Small deviations from normal operating procedures become embedded within an organization as a taken-for-granted component of the operational environment (Vaughan, 1996, 1999; Weick, 1987). Research on organizational misconduct and goal displacement suggests such deviant decision making is sometimes overt. Passed along from leadership to staff, it symbolizes an acceptable pattern for achieving desired ends (Bohte & Meier, 2000; Klijn, 2011a; Vaughan, 1999). These deviations often go unnoticed, ignored, or leadership encouraged during normal operational situations. During an emergency or crisis, the deviations become magnified contributing to disaster and organizational breakdown.

Organizational Structure

Preventing organizational breakdown is not limited to matters of integrity and deviance. In fashioning OPA 90, Congress acknowledged the need for an appropriate structure. This meant legitimizing a single unified command under the auspices of a Federal-On-Scene-Coordinator (FOSC). Within U.S. territorial waters, this is typically a Coast Guard official. Prior to 1989, the Coast Guard was empowered to serve as FOSC within U.S. navigable waters. Questions, however, over the FOSC's extent of authority to manage the 1989 spill compounded the initial command breakdown of the *Exxon Valdez* response (Alaska Oil Spill Commission, 1990; FOSC, 1993; National Response Team, 1989; SIGCO, 2006).

OPA 90 legitimization of FOSC leadership of the unified command structure did not signify the adoption of a rigid hierarchical structure. Rather the post-*Exxon Valdez* assessments recognized the value inherently gained through the interorganizational characteristics of a unified command. Typical participants in the unified command include the Responsible Party (spiller), stakeholder federal agencies, state and local agencies, as well as private spill response contractors. In spill prevention and planning, FOSC command leadership assures implementation of an overarching strategic direction. Planning and tactical operations involve all members of the unified command. Components of such planning typically focus on training in the coordination of spill containment, protection of resources at risk, safety, and effective cleanup operations (FOSC, 1993, 1995).

The 2010 Deepwater Horizon Spill—Incident Overview

The Network Participants

The Gulf of Mexico U.S. territorial waters overlay some of the most productive offshore oil reserves in the world. With over 4,000 active oil platforms, the region accounts for 30 percent of domestic production. While much of the drilling has occurred in shallow waters 500 feet or less in depth, a significantly increasing level of drilling is taking place in deeper waters. This includes ocean depths of 4,500 feet or greater (U.S. Bureau of Safety and Environmental Enforcement, 2012). It was in these deeper waters approximately 50 miles southeast of Venice, Louisiana—in the Mississippi Canyon—where oil giant BP and its partners attempted to finalize drilling operations in April 2010.

An overview of drilling operations at the site provides a picture of network complexity for offshore drilling operations. BP was the primary holder of the oil lease for the drilling site known as the Macondo well. Minority ownership partners included Anadarko Petroleum Corporation, a Texas-based independent, and Mitsui Oil Exploration Company. Mitsui is a subsidiary of MOECO Corporation, a multinational conglomerate with oil and gas operations throughout south Asia and the Middle East. Transocean, home based in Switzerland with 18,000 employees and the world's largest deep water drilling company, was the owner and operator of the drilling rig Deepwater Horizon. Responsibility for capping and sealing the well resided with Halliburton, an oil field services company with headquarters in Texas and Dubai. Other noteworthy network participants included Cameron—the Texas-based corporation that was the manufacturer of the well's blowout preventer—and Weatherford. The Swiss company manufactured the float collar used to support the cement sealing operation of the well casing (Joint Investigation Team, 2011;

National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, 2011; SIGCO, 2012).

The final significant prespill network participant was the U.S. Minerals Management Service (MMS). A U.S. Department of the Interior agency, MMS was established in 1982. Prespill tasks included oversight of drilling operations safety and spill prevention. MMS was also responsible for collecting federal royalty fees from operators drilling in Gulf of Mexico coastal waters. Some preincident critics considered these dual roles of MMS to be in conflict arguing the agency could not effectively fulfill both tasks (Blumenthal & Bolstad, 2010; Bolstad & Schoof, 2011; National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, 2011).

Calamity Sequence

In the critical days leading up to April 20th, BP operations management was frustrated with progress at the Macondo well site. Drilling operations had encountered a number of time consuming and costly delays. The complexity of site-drilling activities was the cause of most of these delays. The project was tens of millions of dollars over budget. Transocean and BP had anticipated being able to reposition the drilling rig Deepwater Horizon to another location before April. Each day of delay was costing BP hundreds of thousands of dollars (Efstathiou & Klimasinska, 2011; Joint Investigation Team, 2011; National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, 2011).

Given the high cost of drilling, BP decided to cap the Macondo well in a manner that would make it easily accessible for use in future oil extraction. The Macondo well was an exploratory site. Typically, such wells are permanently capped with new wells being drilled for the purpose of actual oil extraction. A temporary capping meant BP and Transocean would need to work closely with Halliburton to assure achieving intended outcomes. BP wanted the task completed in the most financially expedient and least time consuming method possible. This meant making critical decisions between employing the safest methods possible, and alternative lower cost more time efficient methods (Bolstad, 2010; Efstathiou & Klimasinska, 2011; Spear, 2010). Numerous government reports and analysis provide evidence of decisions favoring cost and time savings at each critical decision point in the well capping operational sequence. Cost and time savings from these decisions was significant measured in the tens of millions of dollars according to some estimates. The trade-off was a less rigorous safety protocol for preventing the unwanted flow of high pressure gas and oil up the well pipe at the Macondo well site (Joint Investigation Team, 2011; National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, 2011; U.S. Coast Guard, 2010).

During the evening hours of April 20th, the consequences of poor critical decision making at the Macondo well became apparent. The well experienced a significant "gas kick." Highly pressurized natural gas rapidly pushed its way up through the well, bypassing all of the containment mechanisms, including the backflow preventer. The preventer was the last line of defense. The 450-ton steel capping system, several stories tall, was designed to seal the well shut in the event of an emergency. Its failure meant extremely high pressure gas and oil gushed

Table 1. Relationship between Causal Factors and Spill Incidents

Incident Name	Policy Imperfection Evident	Regulatory Authority Enforced	Integrity Adherence Evident	Evidence of Org. Deviance	Org. Structure Breakdown Evident
Exxon Valdez	Yes	No	No	Yes	Yes
Posavina	Yes	Partial	No	Yes	No
Morris J. Berman	Partial	Partial	No	Yes	Partial
Selendang Ayu	Yes	No	No	Yes	Partial
Cosco Busan	Partial	Partial	No	No	No
Hebei Spirit	No	No	No	Yes	Yes
Tintomara	Partial	Partial	No	Yes	No
Deepwater Horizon	No	No	No	Yes	Yes

unimpeded onto the Deepwater Horizon drilling rig. The final outcome was devastating. A massive explosion and fire destroyed the rig causing it to burn and sink within 2 days. Eleven rig workers died. In the weeks following the blowout, an estimated 4.9 million barrels (205 million gallons) of oil spilled from the well inundating shorelines from Mississippi to Florida. Costs—still not finalized—are in the tens of billions of dollars (FOSC, 2011; Joint Investigation Team, 2011; National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, 2011). Legal litigation remains ongoing for a number of critical issues.

Discussion

The findings from a number of investigations provide strong evidence that the shortcomings resulting in the 2010 Deepwater Horizon catastrophe share a common set of characteristics the author has found in other major near-shore oil spills. Following is a compilation of these other incidents with brief descriptions. Limited space prevents an in-depth discussion concerning each incident. However, a detailed discussion of each of these incidents, their contributions, and robustness in developing the spill causation framework, is available via the respective citations.

The impact of each of the identified causal factors in Table 1 in contributing to spill incidents is judged using a simple forced ranking of Yes, No, or Partial. A "Yes" value indicates—based upon the theoretical criteria previously discussed—there was an identifiable relationship between the causal factor and the subsequent spill incident. A "No" value indicates there was not sufficient evidence to suggest the presence and negative influence of a causal factor in the spill incident. "Partial" implies the causal factor was a contributor on a limited basis or was indirect in contributing to the spill incident.

1 *TV Exxon Valdez*—Owned by Exxon Corporation's shipping division, now Exxon Mobil, the March 24, 1989, spill was and remains the largest tanker vessel incident in North American waters. The tanker ran aground on Bligh Reef, a well-known navigational hazard in Prince William Sound, Alaska. The tanker emptied 10.8 million gallons of crude oil into the Sound (Alaska Oil Spill Commission, 1990, 61–85; FOSC, 1993; Klijn, 2004). The incident,

coupled with a succession of five other coastal spills in U.S. waters, stimulated the push for a major policy change. The result was the OPA 90.

2 *TB Morris J. Berman*—The incident occurred in the early morning hours of January 7, 1994. A frayed towline connecting the tank barge to the tugboat *Emily S* snapped, causing the *Berman* to run aground on a reef near the San Juan, Puerto Rico, luxury hotel district. The 800,000-gallon IFO 380 bunker fuel spill is noteworthy as the first major incident in U.S. territorial waters following the passage of the OPA 90 (FOSC, 1995; Klijn, 2008a).

3 *MT Posavina*—The tanker was dockside at Chelsea Creek, a Boston Harbor tributary, on the morning of June 8, 2000. While maneuvering into position to move the tanker away from dockside and into the channel, the tugboat *Alex C* punctured a hole in the *Posavina* fuel tank. Some 6,000 gallons of heavy grade bunker fuel oil IFO 380 was spilled (NOAA, 2004; SIGCO, 2010; U.S. District Court, 2003).

4 *MT Selandang Ayu*—The December 8, 2004, incident occurred on a near-shore volcanic reef off the coast of Unalaska, an island in Alaska's southwest Aleutian chain. This 500,000 gallon spill of heavy grade bunker fuel was precipitated through an unsuccessful attempt to make at-sea engine repairs. Several crew members died during the rescue operation (Klijn, 2008b).

5 *MT Cosco Busan*—The freighter's captain and the OPA 90 mandated certified pilot agreed to set sail from San Francisco Bay in an extremely dense fog on the morning of November 7, 2007. The freighter sailed outside the designated channel and struck a glancing blow on a structural support pillar of the Bay Bridge resulting in a 58,000 gallon spill of IFO 380 (Klijn, 2011b).

6 *TV Hebei Spirit*—Just before 7:00 a.m. the morning of December 7, 2007, the single-hull tanker was anchoring at the Port of Daeson, South Korea, waiting for the off-loading of a cargo of Middle East crude oil. A breakaway barge transporting a large Samsung Heavy Industries crane struck the tanker puncturing holes into three of five cargo tanks. The resulting spill caused 2.8 million gallons of crude oil to discharge into the surrounding waters. The Korean government had a largely "on-paper" only spill prevention system—per the International Convention on Oil Pollution Preparedness, Response and Co-operation 1990—paralleling OPA 90 provisions (Republic of Korea, 2009; SIGCO, 2010).

7 *TV Tintomara*—In the early morning hours of July 23, 2008, the tanker—southbound on the Mississippi River—struck a fuel barge broadside, loaded with a cargo of IFO 380, spilling 400,000 gallons of heavy grade bunker fuel just north of the Port of New Orleans. Pushing the barge upriver at the time of impact was the towboat *Mel Oliver* (Klijn, 2011c; SIGCO, 2011).

Policy and Regulatory Oversight

The compilation above provides a suggestive pattern for predicting oil spill prevention failures. The negative influence of the causal factors is evident a majority of the time. Following is an application of each of these causal factors to the Deepwater Horizon incident beginning with the public policy regime.

First, the previously discussed OPA 90—in combination with other relevant federal statutes—did provide a robust general framework for interorganizational cooperation in spill prevention. The outcome of numerous investigations and hearings lend credence to this assertion. Aside from overly low—$75 million—responsible party liability caps, final postspill proposals have been fairly limited in modifying OPA 90 provisions. Industry advocates—such as oil transportation system operators, insurers, spill response contractors—argued successfully for a very limited scope of changes, if any, to the existing statute (SIGCO, 2012; U.S. Congress, 2010a, 2011). The same cannot be said for the regulatory regime responsible for implementing OPA 90 at the Deepwater Horizon rig.

For several years prior to Deepwater Horizon the MMS, as lead oversight agency, had been cited for a number of administrative infractions. Among these was accepting gifts from oil company representatives, ethical violations, shoddy safety enforcement, and inadequate record keeping. Such actions bordered on a pattern of organizational deviance. The shortcomings reached to the highest levels within the agency. J. Steven Griles, the number two person at MMS, was sentenced to 10 months in jail for a pre-Deepwater Horizon scandal (Campbell, 2011; Clayton, 2010; Scherer, 2010; Urbina, 2010).

A General Accountability Office (GAO) investigation and congressional hearings had already led decision makers down a decision path to dismantle MMS when the 2010 Macondo well blowout occurred. Postspill investigations reveal a pattern of MMS blanket agreement with the cost-cutting and faster—but oftentimes questionable—safety aspects BP proposed for well sealing in the days immediate prior to the blowout (Eilperin & Higham, 2010; National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, 2011; Urbina, 2010). Additional findings revealed MMS sign-off on an OPA 90 mandated spill prevention and response plan that was totally inadequate for situational needs. Many pages of the plan had been copied in whole from response plans for spills in Arctic waters. Thus, the inclusion of interorganizational action items for mitigating threats to walruses and other cold water marine mammals. MMS inspections aboard the Deepwater Horizon had similar inadequacies. MMS ignored a lengthy backlog of safety violations and equipment failures that should have triggered fines and temporary shutdown of drilling operations (Bolstad & Schoof, 2011; National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, 2011; Urbina, 2010; U.S. Coast Guard, 2010).

In its defense, MMS could rightfully claim its dual mission of serving as both industry regulator and collector of oil royalty payments for the federal government placed the agency in a difficult situation. As regulator, the agency was charged with assuring compliance with maintaining the integrity of best safety practices aboard offshore drilling rigs. This mandate if implemented aggressively could cause a stifling of oil extraction and a subsequent drop in royalty payments going directly to the U.S. treasury (Blumenthal & Bolstad, 2010; National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, 2011).

Weak Integrity and Organizational Deviance

Regardless of the cause weak MMS regulatory oversight provided opportunities for inadequate industry adherence to the integrity of best safety practices aboard the Deepwater Horizon drilling rig. Postspill investigations uncovered a pattern of failure to repair or replace inoperable warning alarms. Prior equipment testing had built up a backlog of hundreds of maintenance needs. Among these was the emergency backup operation system for the blowout preventer. Action on these safety repairs was delayed with priority specifically going to activities directly related to drilling (Joint Investigation Team, 2011; National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, 2011; U.S. Coast Guard, 2010).

An organization steeped in adherence to integrity would have placed a priority on safety repairs regardless of prodding from a government oversight agency. Such a visible image of failure to make safety repairs sent a clear message from management to field employees concerning what was important. Responding to congressional investigations, and during postspill congressional hearings, other major oil companies pointedly called out this distinction (U.S. Congress, 2010a, 2011; U.S. Congressional Research Service, 2010). BP leadership was described as an outlier not in keeping with the adherence to the integrity of putting safety first as practiced at other major companies.

Likewise, owners and operators of oil transportation networks made a point of distancing themselves from BP during postspill hearings (U.S. Congress, 2010a, 2011; U.S. Congressional Research Service, 2010). These operators pointed to the successes—verified through years of federal tracking data—achieved in reducing the number and severity of oil spills because of adherence to the OPA 90 mandated safety protocols. Amending OPA 90 to include larger fines and insurance requirements in effect would punish all oil extraction and transportation organizations because of the rogue actions of a single operator (U.S. Congress, 2010b; U.S. General Accountability Office, 2007).

Postspill investigations, mirroring the author's findings on other spill incidents, certainly suggest amending OPA 90 would not resolve many of the operational transgressions contributing to the Deepwater Horizon incident. Rather, the core problems in the sequence of ill-advised actions industry decision makers engaged in prior to the disaster was endemic of a pattern of organizational deviance. As the lead partner for the Macondo well project and Deepwater Horizon rig operations, BP was ultimately responsible. Prior research and investigations had revealed a pattern of deviant behavior within the BP leadership ranks. For example, investigations of the 2005 Texas City refinery explosion, and the 260,000 gallon Alaska North Slope pipeline spill in 2006, uncovered a BP pattern of leadership focus on short-term profits above all other considerations (U.S. Congress, 2006a, 2006b). Field employee concerns about safety and ensuring the performance quality of system infrastructure was ignored or suppressed. Leadership's overt actions crossed the line from simply being a nonchalant attitude concerning ensuring the integrity of best safety practices to one of overtly engaging in actions knowingly unsafe to save time and lower costs (Klijn, 2011a). This is not surprising given the propensity for profit-seeking behavior discussed in the literature review. The absence of aggressive agency oversight allowed for the continuation of such behavior.

Organizational Network and Structure

The blame for the Deepwater Horizon disaster cannot be placed only upon BP and the MMS. As previously discussed, drilling operations, transportation, spill prevention, and response is a networked system involving multiple participants. BP partners aboard the drilling rig, specifically Halliburton and Transocean managers, also had responsibilities for assuring the integrity of operational safety. For example, a U.S. Coast Guard (2010) investigation faulted Transocean rig management for exercising lax leadership in prespill safety and emergency training. This may have contributed to the loss of life when disaster struck.

Postspill investigations also reveal that at critical decision points, discussions concerning how to proceed—with sealing the Macondo well—ultimately followed the less expensive and less safe BP preferred alternative. Halliburton site managers, for example, made several initial recommendations for well cementing and sealing considered to provide greater safety assurance. Halliburton decision makers repeatedly acquiesced or abandoned these alternatives (Joint Investigation Team, 2011; National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, 2011; SIGCO, 2012). In some cases, it appears further input from partner experts not on the drill rig became muddled through communication breakdown. Email and other correspondences across the network went unread, sometimes misunderstood, or possibly never received. Follow up to assure clarity of communication and buy-in on key decisions was not aggressively pursued.

Postspill investigations further suggest the communication shortcomings and decision point frictions had a negative impact on the trust and cooperation necessary to launch a robust response to the disaster (U.S. Coast Guard, 2010). In the immediate days following the blowout, the leadership of BP and partner organizations launched campaigns to deflect and lay blame. BP leadership presented a public image of a conscientious corporate citizen accepting of its role as the responsible party for the spill, as defined through OPA 90. However, this was not an admission of guilt or legal culpability. BP leadership targeted Halliburton, Transocean, Cameron, Weatherford, and minority well owner partners for blame as contributors to the disaster (Blum & Fisk, 2010; Burdeau, 2011; Weber, 2011).

In taking such aggressive action, BP leadership was apparently attempting to insulate itself from carrying the full burden for legal liability, as well as shore up its sagging image. However, these actions contributed to a breakdown of the unity and trust necessary for implementing the OPA 90 mandated unified command structure necessary in a robust response. BP and partner organizations possessed the expertise the U.S. Coast Guard led unified command needed to help seal the runaway Macondo well. BP leaderships' unwillingness to fully cooperate as good faith partners inhibited the effectiveness of the organizational structure combating the spill.

Conclusion

The 2010 Deepwater Horizon disaster stands as the largest offshore spill incident in North American history. Final impact to the environment and other publicly owned resources, the economic losses and effects upon families caused through the 11 fatalities will not be known for several years. The question remains—what if anything can be done to further prevent future spill incidents?

Causal factors identified in this analysis build upon existing theoretical concepts other researchers have previously utilized to explain the occurrence of spill incidents. What emerges from this analysis is an expansion of the set of existing theoretical tools utilized to hypothesize about and test as future methods for improving spill prevention protocols. Thus, the benefit of this analysis is likely of greatest value to practitioner applied research. Also, it must be recognized that the scope of this analysis is fairly limited. The list of casual factors to test and apply to real-world situations can certainly be expanded. Finally, future research opportunities exist to apply casual factors from this analysis to additional spill incidents and networks within other industries.

About the Author

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