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Deepwater Horizon Oil Spill: A Case Study

Introduction:

The explosion of the Deepwater Horizon oil rig in 2010 led to the largest oil spill in the history of marine oil drilling operations. It is known as the Deepwater Horizon oil spill (DHOS), the Gulf of Mexico oil spill, and the BP oil spill. There were 11 deaths, multiple injuries, and the well remained open and leaking for over 87 days. The full scale of the environmental, health, and economic implications remain unknown.⁴

Facts of the Case:

During the evening hours on April 20, 2010, the Deepwater Horizon oil drilling rig exploded about 65 km (41 miles) off the coast of Louisiana in the Macondo Prospect in the Gulf of Mexico.¹³ Eleven workers on the rig were initially reported missing but after a three-day search-and-rescue operation by the U.S. Coast Guard (USCG), they were later determined dead.¹⁴ Lifeboats and helicopters rescued 94 crew members; 17 were treated for injuries.¹⁴ On April 22nd, the oil rig sunk. For the next 87 days, the wellhead gushed 4-5 million barrels of oil, equivalent to approximately 210 million U.S. gallons, into the Gulf.¹³

The scale of the DHOS was not directly obvious. Four days after the explosion, BP Exploration & Production determined that the wellhead was leaking oil. Initial reports from BP greatly underestimated the amount of oil that was spewing, and the deep underwater location of the well made it difficult to close.^{8,14} BP made several unsuccessful attempts to stop the flow, but it was not until September 2010 that the well was filled with cement and declared “effectively dead.” In 2012, however, reports surfaced that the well was still leaking.¹⁷

Over 100 civil and criminal lawsuits were filed against BP and several of the defendants (e.g., Transocean, Cameron International Corporation, and Halliburton Energy Services) responsible for the DHOS. All of these lawsuits were settled for approximately \$9.2 billion dollars.³ BP and the defendants paid a record-setting settlement of \$5.5 billion Clean Water Act penalty and nearly \$8.8 billion in natural resource damages after the U.S. Department of Justice sued them.¹³ As of 2018, BP has paid more than \$65 billion in cleanup costs, charges, and penalties.¹

Epidemiological aspects of the event:

Epidemiologic data demonstrated health consequences in humans. The Louisiana Department of Health and Hospitals received 143 spill-exposure cases by June 2010, 108 of which involved cleanup workers.⁶ The GuLFSTUDY (a longitudinal cohort study) began that same month and was run by the National Institute of Environmental Health Sciences to determine long-term health consequences from exposure to oil and other toxic compounds.⁹ Since its implementation, two follow-up studies have been carried out with the second ending in 2021.⁹

Additional surveys revealed workers suffered from several health effects including “eye, nose, and throat irritation; respiratory problems; blood in the urine; vomit and rectal bleeding; seizures; nausea and violent vomiting episodes that last for hours; skin irritation; hypertension; miscarriages; etc.”² Other studies have reported mental health issues such as anxiety, depression, and PTSD, headaches, breathing issues, coughing, and skin problems.^{2,4} Another cohort study of 2,126 Louisiana women used Odds Ratios and 95% Confidence Intervals to determine significant associations between the DHOS and burning of the nose, throat, or lungs, sore throat, dizziness, and wheezing.¹⁰

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Management of the event:

Dispersants, which are commonly used in oil spill cleanup efforts, proved controversial during the DHOS.¹⁴ Although they are known to be effective on the surface of the water, the DHOS was the first time they were injected underwater after receiving approval from the U.S. Environmental Protection Agency.¹⁴ It appeared that the underwater use of dispersants failed to contain the spread, and evidence suggests that it made the oil 52 times more toxic causing major devastation to the ecosystem and to over 8,000 species of marine wildlife and birds, including the Gulf's fish supply.¹⁴

In addition to dispersants, other cleanup methods used were containment through the use of booms, and removal using combustion, offshore filtration, and collection for future processing. It took four years for BP to announce the cleanup complete. Although the federal cleanup response and effort were slow, federal costs amounted to \$850 million, most of which was reimbursed by BP.

BP requested the National Institute for Occupational Safety and Health (NIOSH) conduct a Health Hazard Evaluation in cleanup workers after several were hospitalized.⁷ Chemical exposure tests were negative leading to the assumption that the hospitalizations were caused by heat, fatigue, and terpenes.⁷ Reports claim that while the Occupational Safety and Health Administration (OSHA) directed BP to provide protective clothing for the cleanup workers, they failed to do so.⁵ BP also did not provide safety training or the legally required safety manual for the use of dispersant.⁵ OSHA advised cleanup workers that they did not require respirators.¹²

Communications of the event:

U.S. Public opinion polls revealed that Americans were critical of the response from both BP and President Barack Obama. BP's reaction was slow, and the company failed to properly communicate the magnitude of the DHOS.¹¹ Company executives downplayed the severity of the disaster, and criminal lawsuits later allege that a BP engineer obstructed justice by deleting messages that showed BP was aware of how much oil was truly leaking (i.e., three times more than they originally reported) and that an original "Top Kill" approach to stop the leak would not work.⁸ BP's former VP was charged with obstructing Congress by also lying about the flow rate from the well, and a Halliburton manager was charged with instructing two employees to delete data surrounding the company's work cementing the wellhead.⁸

President Obama did not order the federal government to the Gulf Coast to investigate until April 30.¹⁶ He also instilled anger among United Kingdom residents after incorrectly using the term "British Petroleum" instead of the rebranded BP after the company merged with the American company, Amoco.^{15,16} The British people felt President Obama was placing the blame on them.¹⁵

Summary:

Oil spills will continue to occur so long as the world relies on petroleum, but the DHOS provided a few lessons for future accidents. Response time from the oil company and federal government must be swift. PPE, including respirators, must be provided to cleanup personnel. PPE wearing must also be enforced, and workers should receive proper safety training. The use of dispersants should be used with caution to mitigate the toxic chemical effects to humans, animals, and the environment. To create effective public health policies, baseline epidemiologic data must be established in populations, including both cleanup workers and residents living near the spill, prior to the cleanup, during, and after.

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References:

- 1) Bousso, R. (2018). BP Deepwater Horizon costs balloon to \$65 billion. Reuters. Retrieved on February 20, 2022 from <https://www.reuters.com/article/uk-bp-deepwaterhorizon/bp-deepwater-horizon-costs-balloon-to-65-billion-idUKKBN1F50O6?edition-redirect=uk>
- 2) Curwood, S. (2013). *Research Update on the Impact of BP Oil Spill*. Living on earth. Retrieved on February 20, 2022 from <http://www.loe.org/shows/segments.html?programID=13-P13-00004&segmentID=6>
- 3) Dobuzinskis, A. and Young, S. (2014). *BP appeal to stop 'fictitious' U.S. oil spill claims fails*. Reuters. Retrieved on February 21, 2022 from https://finance.yahoo.com/news/u-appeals-court-affirms-bp-033211520.html?guccounter=1&guce_referrer=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnLw&guce_referrer_sig=AQAAAA59feOKqPS-t2ol7mrPc2yyZW-SZ-U7TgUDLt7IOh5TiLAQfR-QFj9NmsdjrbqwDNmUXCmhlvOROs7LDyAhXjZ9JXH7x4z5sEz22KNZnvq61m88exDpeWkNbb0kRkg9Jf7thyJtG8qILXxHBIUVKktLsrXaODMAb6e6Z1Laa19q
- 4) Goldstein, B. D., et al. (2011). "The Gulf Oil Spill." New England Journal of Medicine 364(14): 1334-1348. DOI: 10.1056/NEJMra1007197
- 5) Hertsgaard, M. (2013). *What BP Doesn't Want You to Know About the 2010 Gulf Spill*. Newsweek. Retrieved on February 19, 2022 from <https://www.newsweek.com/what-bp-doesnt-want-you-know-about-2010-gulf-spill-63015>
- 6) Juhasz, A. (2012). *Investigation: Two Years After the BP Spill, A Hidden Health Crisis Festers*. The Nation. Retrieved on February 21, 2022 from <https://www.thenation.com/article/archive/investigation-two-years-after-bp-spill-hidden-health-crisis-festers/>
- 7) King, B., and Gibbins, J. (2011). Health Hazard Evaluation of Deepwater Horizon Response Workers. National Institute for Occupational Safety and Health. HETA 2010-0115 & 2010-0129-3138. <https://www.cdc.gov/niosh/hhe/reports/pdfs/2010-0115-0129-3138.pdf>
- 8) Lustgarten, A. (2012). *Feds File First Criminal Charges Related to BP Gulf Spill*. ProPublica. Retrieved on February 19, 2022 from <https://www.propublica.org/article/feds-file-first-criminal-charges-related-to-bp-gulf-spill>
- 9) National Institutes of Health. (n.d.) GuLFSTUDY: A long-term health study for oil spill clean-up workers. NIH. Retrieved on February 21, 2022 from <https://gulfstudy.nih.gov/en/index.html>
- 10) Peres L., Trapido E., Rung, A., Harrington, D., Oral, E., Fang, Z., Fonham, E., Peters, E. (2016). The *Deepwater Horizon* Oil Spill and Physical Health among Adult Women in Southern Louisiana: The Women and Their Children's Health (WaTCH) Study *Environmental Health Perspectives* 124:8 CID: <https://doi.org/10.1289/ehp.1510348>

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- 11) Robertson, C. and Lipton, E. (2010). *BP Is Criticized Over Oil Spill, but U.S. Missed Chances to Act*. The New York Times. Retrieved on February 18, 2022 from <https://www.nytimes.com/2010/05/01/us/01gulf.html#:~:text=See%20how%20this%20article%20appeared,originally%20published%20on%20NYTimes.com.&text=BP%20officials%20said%20they%20did,blame%20on%20the%20oil%20company>.
- 12) Trottman, M. (2010). *OSHA Says Cleanup Workers Don't Need Respirators*. Wall Street Journal. Retrieved on February 20, 2022 from <https://www.wsj.com/articles/SB10001424052748704764404575286180491707288>
- 13) United States Environmental Protection Agency. (n.d.). *Deepwater Horizon – BP Gulf of Mexico Oil Spill*. Retrieved on February 20, 2022 from <https://www.epa.gov/enforcement/deepwater-horizon-bp-gulf-mexico-oil-spill>
- 14) Viglione, G. (2020). *What did we learn from the Deepwater Horizon disaster?* Chemical & Engineering News (C&EN). Retrieved on February 20, 2022 from <https://cen.acs.org/safety/industrial-safety/learn-Deepwater-Horizon-disaster/98/i35>
- 15) Armitstead, L. and Butterworth, M. (2010). *Barack Obama's attacks on BP hurting British pensioners*. The Telegraph. Retrieved on February 21, 2022 from <https://www.telegraph.co.uk/news/worldnews/barackobama/7815713/Barack-Obamas-attacks-on-BP-hurting-British-pensioners.html>
- 16) Office of the Press Secretary. (2010). *Statement by the President on the Economy and the Oil Spill in the Gulf of Mexico*. The White House. Retrieved on February 22, 2022 from <https://obamawhitehouse.archives.gov/the-press-office/statement-president-economy-and-oil-spill-gulf-mexico>
- 17) Oceana Admin. (2012). *Oil Still Leaking From Deepwater Horizon Site*. Oceana. Retrieved on February 22, 2022 from <https://usa.oceana.org/blog/oil-still-leaking-deepwater-horizon-site/>