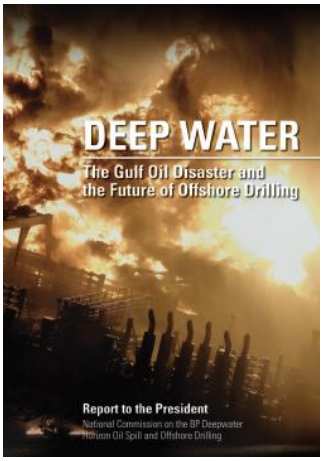
BP Deepwater Horizon – National Commission report summary



On the evening of 20 April 2010, a 'well control event' allowed hydrocarbons to escape from the *Macondo* well onto Transocean's *Deepwater Horizon* oil rig in the Gulf of Mexico.

Eleven people were killed and 17 were injured in the resulting explosions and fire.

The fire burned for 36 hours until the rig sank. Hydrocarbons continued to flow from the reservoir through the wellbore and the blowout preventer (BOP) for 87 days, causing a significant spill.

The following month, US President Barack Obama announced the creation of the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling: an independent, nonpartisan entity, directed to provide a thorough analysis and impartial judgment.

The Commission reported in January 2011.

Learning points for the wider rail industry

The National Commission's report contains learning points on:

- The dangers of complacency
- The pressure of the market
- Lack of government regulation
- Safety culture (whole-industry) and thinking beyond silos
- Risk assessment and management
- The link between management thinking and front line understanding
- The danger of losing R&D capability
- Benchmarking, best practice sharing and the public-private sector interface

Contents (click to navigate)

Mechanical causes

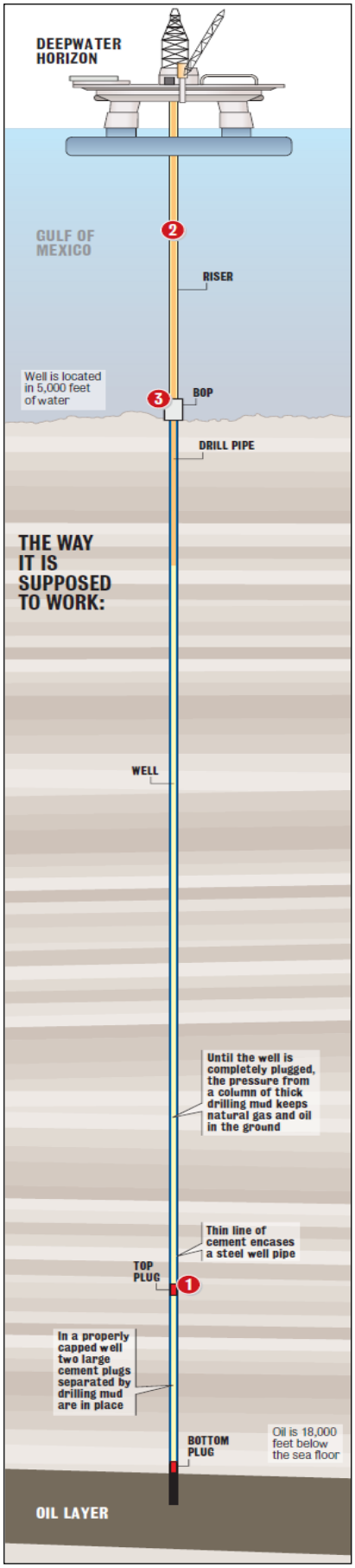
The Commission found the immediate cause of the blowout to be 'a failure to contain hydrocarbon pressures in the well'.

Three things could have contained the pressures: the cement at the bottom of the well, the mud in the well and in the riser, and the BOP.

However, 'mistakes and failures to appreciate risk' compromised each of these potential barriers, 'steadily depriving the rig crew of safeguards until the blowout was inevitable and, at the very end, uncontrollable'.

The diagram (right) shows the layout of the rig and well.

The Commission also viewed the accident from a wider perspective, assessing it in the context both of offshore drilling and the oil industry as a whole.



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The bigger picture

Complexity and complacency

'Though it is tempting to single out one crucial misstep or point the finger at one bad actor as the cause of the *Deepwater Horizon* explosion,' the Commission said, 'any such explanation provides a dangerously incomplete picture of what happened – encouraging the very kind of complacency that led to the accident in the first place.' Indeed, the accident 'exhibits the costs of a culture of complacency.'

The *Deepwater Horizon* was drilling the Macondo well under 5,000 feet of Gulf water, and then over 18,000 feet under the sea floor to the hydrocarbon reservoir below. 'It is a complex, even dazzling, enterprise,' but '[a]s the Board that investigated the loss of the *Columbia* space shuttle noted, "complex systems almost always fail in complex ways."' In fact, the immediate causes of the accident 'can be traced to a series of identifiable mistakes made by BP, Halliburton, and Transocean that reveal such systematic failures in risk management that they place in doubt the safety culture of the entire industry.'

The Commission added that the *Deepwater Horizon* had 'undermined public faith in the energy industry, government regulators, and even our own capability as a nation [ie, the USA] to respond to crises.'

'Investments in safety, containment, and response equipment and practices failed to keep pace with the rapid move into deepwater drilling. Absent major crises, and given the remarkable financial returns available from deepwater reserves, the business culture succumbed to a false sense of security.'

Learning for the rail industry?

'Absent major crises, the business culture succumbed to a false sense of security.'

Given industry pressures, the focus today is on cost reduction as well as avoiding accidents.

Market pressures

The Commission asked why a corporation was drilling for oil in mile-deep water 49 miles off the Louisiana coast. 'To begin,' it commented, 'Americans today consume vast amounts of petroleum products – some 18.7 million barrels per day – to fuel our economy. Unlike many other oil-producing countries, the United States relies on private industry – not a state-owned or [state]-controlled enterprise – to supply oil, natural gas, and indeed all of our energy resources. This basic trait of our private-enterprise system has major implications for how the U.S. government oversees and regulates offshore drilling. It also has advantages in fostering a vigorous and competitive industry, which has led worldwide in advancing the technology of finding and extracting oil and gas.'

Learning for the rail industry?

'Unlike many other oil-producing countries, the United States relies on private industry – not a state-owned or [state]-controlled enterprise – to supply oil.'

Industry is pursuing profit, and the balance and relationship between industry and government needs to be well-defined and stable.

'[T]he centrality of oil and gas exploration to the Gulf economy is not widely appreciated by many Americans, who enjoy the benefits of the energy essential to their transportation, but bear none of the direct risks of its production.'

'The notion of clashing interests – of energy extraction versus a natural-resource economy with bountiful fisheries and tourist amenities – misses the extent to which the energy industry is woven into the fabric of the Gulf culture and economy, providing thousands of jobs and essential public revenues.'

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Lack of government regulation

The Commission recorded 'the weaknesses and the inadequacies of the federal regulation and oversight, for 'without effective government oversight, the offshore oil and gas industry will not adequately reduce the risk of accidents, nor prepare effectively to respond in emergencies'.

However, 'government oversight must be accompanied by the oil and gas industry's internal reinvention [to accomplish] a fundamental transformation of its safety culture'.

'[E]ven in industries with strong self-policing, government also needs to be strongly present, providing oversight and/or additional regulatory control – responsibilities that cannot be abdicated if public safety, health, and welfare are to be protected.'

The idea of self-policing being a *supplement* to government regulation is key. The Commission cited the example of the US financial sector to illustrate why: 'the Securities and Exchange Commission's Consolidated Supervised Entities Program had, in 2004, delegated regulatory risk assessment of global investment bank conglomerates to the banks themselves. The program was designed to cover a regulatory gap left by Congress amid changes in global finance, but it was entirely voluntary'. Four years later, the Commission goes on, the Securities and Exchange Commission Chairman 'ended the program, declaring it a failure – indeed "fundamentally flawed" – after companies like Bear Sterns failed to adequately assess the risk of a sharp downturn in housing prices on their large, leveraged investments in mortgage-backed securities.'

Learning for the rail industry?

'The idea of self-policing being a 'supplement' to government regulation is key.'

'companies like Bear Sterns failed to adequately assess the risk'

How effective is industry risk management in anticipating potential major shocks?

Safety culture and thinking beyond company silos

'[T]he pervasive riskiness of exploring for and producing offshore oil and gas does not explain the extent to which approaches to safety differ among companies, nor why they differ within companies depending on where they are working.'

'From 2004 to 2009, fatalities in the offshore oil and gas industry were more than four times higher per person hours worked in U.S. waters than in European waters, even though many of the same companies work in both venues.

This striking statistical discrepancy reinforces the view that the problem is not an inherent trait of the business itself, but rather depends on the differing cultures and regulatory systems under which members of the industry operate.'

The Commission felt that the oil and gas industry could improve its safety culture by creating a cross-industry, 'self-policing entity like INPO [the Institute of Nuclear Power Operations] as a supplement to government oversight'.

Learning for the rail industry?

The Commission felt that the oil and gas industry could improve its safety culture by creating a cross-industry, 'self-policing entity like INPO [the Institute of Nuclear Power Operations] as a supplement to government oversight'.

Is there a read across to the VfM review?

'[A]ny successful oil and gas industry safety institute would require in the first instance strong board-level support from CEOs and boards of directors of member companies for a rigorous inspection and auditing function. Such audits would need to be aimed at assessing companies' safety cultures (from design, training, and operations through incident investigation and management of improvements) and encouraging learning about and implementation of enhanced practices.'

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Risk management

The number of 'disastrous or potentially disastrous workplace incidents' experienced by BP in the last decade 'suggest that its approach to managing safety has been on individual worker occupational safety but not on process safety'.

Furthermore, BP 'does not have consistent and reliable risk management processes'; this has prevented it from meeting its 'professed commitment to safety'.

'The risk-management challenges presented by nuclear power are in some respects analogous to those presented by deepwater drilling: the dependence on highly sophisticated and complex technologies, the low probability/catastrophic consequences nature of the risks generated, and the related tendency for a culture of complacency to develop over time in the absence of major accidents.'

'For the nuclear power industry, it took a crisis – the partial meltdown in 1979 of the radioactive core in Unit Two at the Three Mile Island Nuclear Generating Station – to prompt a transformation of its safety culture. But that is what industry accomplished and reportedly with significant, positive results. For that reason, the nuclear power industry's method of transforming business-as-usual practices offers a useful analogue as the oil and gas industry now seeks to do the same more than 30 years later.'

Learning for the rail industry?

'BP's approach to managing safety has been on individual worker occupational safety but not on process safety.'

'For the nuclear power industry, it took a crisis to prompt a transformation of its safety culture.'

System safety relies on a culture of system thinking.

Lack of link between management thinking and front line understanding

In the course of its investigation, the Commission reviewed a survey of Transocean crew re safety management and safety culture on the *Deepwater Horizon*. The survey, which was undertaken a few weeks before the accident, found that '[s]ome 46 percent of crew members surveyed felt that some of the workforce feared reprisals for reporting unsafe situations, and 15 percent felt that there were not always enough people available to carry out work safely'.

Learning for the rail industry?

'46 percent of crew members surveyed felt that some of the workforce feared reprisals for reporting unsafe situations'

Does this resonate in the rail sector?

Some Transocean crews complained that 'the safety manual was "unstructured," "hard to navigate," and "not written with the end user in mind"'; they also felt that there was '"poor distinction between what is required and how this should be achieved"'. This suggests a disconnection between the front line and management.

Conflicting interests

The American Petroleum Institute (API) 'has played a dominant role in developing safety standards for the oil and gas industry'. It 'produces standards, recommended practices, specifications, codes, technical publications, reports, and studies that cover the industry and are utilized around the world'.

'[T]he U.S. Department of the Interior has historically adopted those recommended practices and standards, developed by technical experts within API, as formal agency regulations.'

However, the Commission found that 'API's ability to serve as a reliable standard-setter for drilling safety is compromised by its role as the industry's principal lobbyist and public policy advocate.'

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'Because they would make oil and gas industry operations potentially more costly, API regularly resists agency rulemakings that government regulators believe would make those operations safer, and API favors rulemaking that promotes industry autonomy from government oversight.'

'Beginning early in the last decade, the trade organization steadfastly resisted […] efforts to require all companies to demonstrate that they have a complete safety and environmental management system in addition to meeting more traditional, prescriptive regulations – despite the fact that this is the direction taken in other countries in response to the *Piper Alpha* rig explosion in the late 1980s.'

'API also led the effort to persuade the Minerals Management Service not to adopt a new regulatory approach – the Safety and Environmental Management System (SEMS) – and instead has favored relying on voluntary, recommended safety practices.'

'As described by one representative, API-proposed safety standards have increasingly failed to reflect "best industry practices" and have instead expressed the "lowest common denominator" – in other words, a standard that almost all operators could readily achieve. Because, moreover, the Interior Department has in turn relied on API in developing its own regulatory safety standards, API's shortfalls have undermined the entire federal regulatory system.'

'As the *Deepwater Horizon* disaster made unambiguously clear, the entire industry's reputation, and perhaps its viability, ultimately turn on its lowest-performing members.'

Learning for the rail industry?

'the entire industry's reputation, and perhaps its viability, ultimately turn on its lowest-performing members'

How confident can we be in the reliability of all parts of the value chain?

Dangers of losing Research & Development capability

'Safely managing industrial hazards for oil and gas drilling requires experience and knowledge […], [which] enables correct decisions when unexpected events occur. Yet such knowledge and experience within the industry may be decreasing.'

'The chair of the University of Texas's Department of Petroleum and Geosystems Engineering, Tad Patzek, testified before Congress in 2010 that "the oil and gas industry has eliminated most of its research capabilities, which three decades ago allowed it to rapidly expand deepwater production." "Academic research has been important but small in scale and permanently starved of funding," Patzek continued. "The depletion of industry research capabilities and the starvation of academia that educates the new industry leaders have resulted in a scarcity of experienced personnel that can grasp the complexity of offshore operations and make quick and correct decisions." Nor, Patzek stressed, could industry depend upon contractors to fill the safety gap: "The individual contractors have different cultures and management structures, leading easily to conflicts of interest, confusion, lack of coordination, and severely slowed decision-making."'

Learning for the rail industry?

'knowledge and experience within the industry may be decreasing'

'the oil and gas industry has eliminated most of its research capabilities, which three decades ago allowed it to rapidly expand'

Is the industry planning for the development and retention of knowledge and experience?

Benchmarking, best practices and the public-private sector interface

'The industry needs to benchmark safety and environmental practice rules against recognized global best practices.'

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‘Industry’s responsibilities do not end with efforts to prevent blowouts like that at the *Macondo* well. They extend to efforts to contain any such incidents as quickly as possible and to mitigate the harm caused by spills through effective response efforts.’

‘[F]ederal efforts to regulate the offshore oil and gas industry have suffered for years from cross-cutting purposes, pressure from political and industry interests, a deepening deficit of technical expertise, and severely inadequate resources available to the government agencies tasked with the leasing function and regulation.’

‘[O]nce a spill occurs, the government must be capable of taking charge of those efforts. But government depends upon the resources and expertise of private industry to contain a blown-out well and to respond to a massive subsea oil spill.’

Government and industry ‘lacked adequate contingency planning, and neither government nor industry had invested sufficiently in research, development, and demonstration to improve containment or response technology. Notwithstanding its promises in the aftermath of *Exxon Valdez* that industry would commit significant funds to support more research and development in response technology – through the “Marine Spill Response Corporation,” for example – those commitments were soon forgotten as memories dimmed.’

Learning for the rail industry?

‘Government and industry ‘lacked adequate contingency planning, and neither government nor industry had invested sufficiently in research, development, and demonstration to improve containment or response technology’.

‘commitments were soon forgotten as memories dimmed’

How ready is industry and Government for a big accident?

Moving on

‘The oil and gas industry needs now to regain that trust, but doing so will require it to take bold action to make clear that business will no longer be conducted as usual in the Gulf.’

‘Industry must seize the opportunity to demonstrate that it is fully committed to subjecting its own internal operations to fundamental change and not merely because it is being forced to do so. Underscoring the sincerity and depth of their commitment to embracing a new safety culture, company leaders will need to lead the effort to guarantee that risk management improves throughout the industry to ensure that the mistakes made at the *Macondo* well are not repeated. And those leaders must also demonstrate an equal commitment to ensuring adequate containment and response technology and resources in case another spill happens.’

‘Only then will the oil and gas industry truly demonstrate that it is ready, willing, and able to engage in the kind of responsible offshore drilling practices upon which the nation’s basic energy supplies depend.’

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Further information

The full report may be found on the Commission’s official website: Deepwater Horizon Report

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