Deepwater Horizon Disaster:
Blowout, Oil Spill, Litigation, and Changes in the Industry

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Deepwater Horizon

- Mobile offshore drilling unit or “MODU”
- Self-propelled, dynamically-positioned, semi-submersible
- Entered service in 2001
- Capable of drilling up to 35,000 feet deep at a water depth of 10,000 feet
- Successfully drilled 50 wells in the Gulf of Mexico
Deepwater Horizon Parties

- **BP** – Leaseholder/Operator who contracted with Transocean to drill the Macondo well
- **Transocean** – Owner of Deepwater Horizon and employed the crew
- **Halliburton** – Contracted with BP to provide cementing and mudlogging
- **Cameron** – Manufactured the BOP
Deepwater Horizon Parties (cont’d)

- M-I, LLC – Service provider
- MOEX – Co-Lessee with BP
- Anadarko – Co-Lessee with BP
- Weatherford – Service provider
- Dril-Quip, Inc. – Service provider
Location of Deepwater Horizon

Deepwater Horizon Rig Location: 28°44′12″N 088°23′14″W
Drilling the Macondo Well

- The “Well from Hell”
- Increasingly fragile sandstone
- Drilling with narrow or non-existent margin
- Multiple kicks and shut-in
- Multiple lost returns incidents
- Drilled extra 100 feet with no margin and called total depth at 18,360 feet, leaving the wellbore in an extremely fragile condition
Drilling the Macondo Well (cont’d)

- Large amount of debris in the well when production casing was set
- Debris compromised the production casing, leading to incorrect placement of cement and in turn permitting hydrocarbons to enter the well on April 20, 2010
- The decision to drill the final 100 feet was the initial link in a chain that concluded with the blowout, explosion, and oil spill
Production Casing Issues

- Plan to set production casing, then temporarily abandon the well
- Selected long string production casing for the well (extends continuously from wellhead at seafloor to bottom of the well)
- Did not cause or contribute to the blowout
Production Casing Issues (cont’d)

- Due to fragile wellbore, significant amount of debris in the well when production casing was run
- Debris flow up inside the casing
- Bottom of the production casing was set into debris at bottom of the well
- Substantial compressive force caused it to buckle
Failed Float Collar Conversion

- A valve used to prevent unset cement from “u-tubing” and flowing back into the casing
- Float collar also serves as a landing profile for plugs as a part of cementing
- Float collar was run in unconverted mode
- Debris blocked the flow path
Failed Float Collar Conversion (cont’d)

- Nine attempts over the course of two hours to clear the blockage and convert float collar
- Rapid depressurization on the ninth attempt; circulating pressure was significantly lower than predicted
- Float collar did not fully and properly convert on April 19, 2010 or anytime thereafter
Failed Float Collar Conversion
Shoe Track Breach

- Breach or opening in the casing during ninth attempted conversion
- Cement pumped through the breach in the casing
- Hydrocarbons entered well casing through the breach
- Cement bond log (CBL) was not performed
Shoe Track Breach (cont’d)

- CBL would have given a clear indication that the cement was placed improperly and would not provide a barrier to flow.
- CBL would have shown that the top of cement was not where it should have been.
- The decision not to run CBL was a substantial cause of the blowout, explosion and oil spill.
Shoe Track Breach (cont’d)
Misinterpretation of Negative Pressure Tests

- The most safety-critical test run prior to removing the BOP
- Simulates hydrostatic condition on the well
- Confirms integrity of the entire system
- “Pass-Fail” test
Misinterpretation of Negative Pressure Tests (cont’d)

- Initially conducted on the kill line, rather than the drill pipe
- Declared a success despite pressure on drill pipe
- If the two tests had been correctly interpreted, the incident would have been averted
- Substantial cause of the incident
April 20, 2010 9:00 pm to 9:51 pm

- Final displacement
- Anomalies
- Pressure spike
- Blowout, ignition, explosion
- Failure to timely shut in the well
- Diversion to the mud-gas separator
- Well monitoring hindered by simultaneous operations
Blowout Preventer (BOP)

- Functions and Configuration
- Improper maintenance effect on AMF: BSRs not closed
- Had AMF functioned, BSRs would have sealed the well
- Failure of subsequent attempts to operate the BOP with ROVs
Source Control Methods

- BOP – numerous attempts to close shearing rams using ROVs
- LMRP – numerous attempts to close using ROVs
- Cofferdam
- Top kill/junk shot/momentum kill
- Top hat
- Riser insertion tube tool
Capping the Well

WHAT DID WORK
The Capping Stack:
A second blowout preventer was outfitted and lowered in place atop the faulty blowout preventer.

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Spill of National Significance
Unprecedented in Size and Complexity
Lawsuits

- Largest lawsuit in history
- 3,000 cases in federal and state courts across the nation
- 100,000 named claimants
- MDL in New Orleans Federal Court
- Wide array of claims asserted
  - Wrongful death
  - Personal injury
  - Damage to property and natural resources
  - Economic losses
Phase One Trial

- Trial between February 25, 2013 and April 17, 2013
- Addressed everything from the beginning of the well to the blowout
- Fault determinations
Each defendant’s conduct found negligent and a legal cause of the incident

In addition, BP’s conduct found grossly negligent

Transocean and Halliburton conduct found negligent

Percentage of total liability:

- BP: 67%
- Transocean: 30%
- Halliburton: 3%
Phase Two Trial

- Trial from September 30, 2013 to October 18, 2013
- Source Control
  - Issue: acts/omissions relative to stopping discharge
  - BP found not grossly negligent in source control planning and preparation
  - BP’s flow rate misrepresentations did not delay source control
  - No alteration to Phase One decision
Phase Two Trial (cont’d)

- Quantification
  - Issue: amount of oil actually released
  - Found 4 million barrels of oil released from reservoir
  - For purposes of calculating maximum possible civil penalty under the CWA, found discharge of 3.19 million barrels of oil
Penalty Phase Trial

- Trial held between January 20, 2015 and February 2, 2015
- Issue: amount of Civil Penalties to be paid by Anadarko under the CWA (BP settled)
BP’s Total Liability

- Over $62 billion – $62,000,000,000.00
- Includes civil penalty of $5.5 billion under the CWA
- Includes $7.1 billion to the United States and the five Gulf Coast states for natural resource damages
- Includes $4.9 billion to settle economic and other claims by the five Gulf Coast states
- Includes civil settlement with Gulf Coast residents and businesses of $10.3 billion
Changes in the Industry

- Moratorium
- New U.S. Well Control Rule (81 FR 25887)
  - Enacts recommendations of Deepwater Horizon Commission
  - Makes mandatory certain practices recommended by the American Petroleum Institute
  - Most provisions effective July 28, 2016, but some phased in over several years
Changes in the Industry (cont’d)

- Major provisions in new rule (81 FR 25887)
  - BOP systems equipped with both drill pipe-centering technologies and dual shear rams
  - Rigorous third-party certification of shearing capability
  - Sets expectations for safe drilling margin
  - Additional requirements for using ROVs to function certain components on BOP
  - Reporting of safety equipment failures to address potential systemic problems in early stages
  - Adequate centralization of casing during cementing
Changes in the Industry (cont’d)

- Marine Well Containment Company (MWCC)
- July 2010, Shell, Chevron, ConocoPhillips, and ExxonMobil committed to providing a new containment response capability for Gulf of Mexico
- Containment System includes two Modular Capture Vessels (MCVs), enhanced Subsea Umbilical, Risers, and Flowlines (SURF) equipment, three capping stacks, and additional ancillary equipment
Changes in the Industry (cont’d)

- Includes capping stack as MWCC centerpiece
- Built for use in deepwater Gulf of Mexico in water depths from 500 feet to 10,000 feet, temperatures up to 350 degrees Fahrenheit, and pressures up to 15,000 psi
- Capacity to contain up to 100,000 barrels of liquid per day and handle up to 200 million standard cubic feet of gas per day
- Ready-to-deploy state
Takeaways

- Indemnity
- Understanding technology
- Witness preparation
- Email discipline
- Preserving evidence/spoliation
Deepwater Horizon