Drilling Technology

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Agenda

- Rig Types
- Rig Floor Mechanization
- Pressure Containment
- Directional Drilling
- Measurement While Drilling
- Subsea Tiebacks
- Onshore Infrastructure

The Deepwater Horizon, a dynamically positioned, semisubmersible drilling unit (photo courtesy of Transocean).
On November 16, 2003, a new record was set by drilling a well in 10,011 feet of water.

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Rig Floor Mechanization

- Pipe Handling Systems
- Iron Roughneck
- Vertical Alignment Tools
- Stabberless Systems
Blowout Preventers (BOP)

- Used to contain well in pressure situations
- The BOP consists of:
  - Annular
  - Pipe Rams
  - Blind/Blind Shear Rams
  - Choke and Kill lines
Subsea BOP Stack

- Control Line
- Drilling Riser
- Flex Riser Joint
- Lower Riser Package
- Annular BOP
- Ram BOP
- Hydraulic Connector
- Kill & Choke Lines
- Kill & Choke Valves

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Directional Well

- Allows drilling multiple wells from one surface location
- Allows penetration of multiple reservoirs from one well
- Contact more reservoir surface area
- Can drill under sensitive areas without surface disturbance
Vertical vs. Horizontal Well

**Vertical**
Completion: Easy to drill
Get minimum exposure to oil and gas part of sand

**Horizontal**
Completion: Hard to drill
Get lots of pay exposed to well ... thus higher flow rates
Directional Drilling

- Intentional deviation of a wellbore from the vertical
- Controlled directional drilling makes it possible to reach subsurface areas laterally remote from the point where the bit enters the earth
In GOM - this is the greatest offset well drilled to date.

Horizontal distance from surface location to the bottom hole location is about 26,000 feet.
Extended Reach
Measurement While Drilling (MWD)

- Directional Information
- Bottom Hole Pressure Data
- Bottom Hole Temperature
- Formation Properties
- Drill Bit and Pipe Torque
Subsea Tiebacks

• Longest gas well tieback is 77 miles
• Longest oil well tieback is 17 miles
Onshore Infrastructure

- Service Bases at Port Facilities / Helicopter Hubs
- Processing Facilities
  - refineries, gas processing plants
- Terminals
  - pipeline shore facilities, barge terminals, tanker port areas
- Construction Facilities
  - Fabrication yards, shipyards, pipecoating facilities and yards

Current MMS Study “Oil and Gas Infrastructure in the Mid-Atlantic (GM-09-08)” with final report due June 2010
Thank You

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