Noble Corporation

Deep Water Technology
A Focus on Drilling

US-China Oil & Gas Industry Forum

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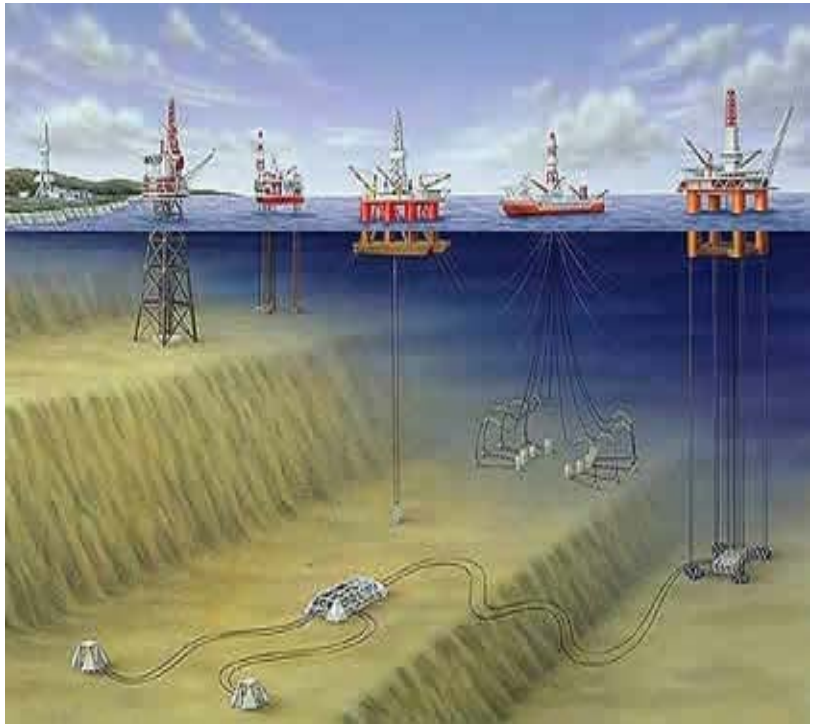
NYSE: NE

"Deep" Water is Being Redefined Each Year

- **1992** – 1,000' was considered deep water in the GoM; DeepStar was formed and 2,000' was considered a major challenge
- **2000** – DeepStar and Industry saw 6,000' as achievable and 7,000' seemed possible
- **2004** – wells were being drilled to 10,000' and production facilities were installed at 6,500'



Deepwater Technology Challenges?

- **Seafloor Production Systems**
  - Extend offset tieback distance
  - Solve the flow assurance challenges – prediction, prevention & management
  - Seafloor processing (pressure boosting, separation, disposal)
  - Subsea component reliability

- **Connecting Seafloor to Surface**
  - Mooring system materials & modeling
  - Deploy innovative (lighter weight) risers

- **Floating Production Systems**
  - Refinery on a Stamp (weight reduction)
  - Fit for purpose design - Global motion (VIV / current)

- **Drilling & Completions**
  - Up to 50% of project CAPEX can be drilling & completing wells

- **Organizational Capability / Competency**
  - Develop the required knowledge and expertise

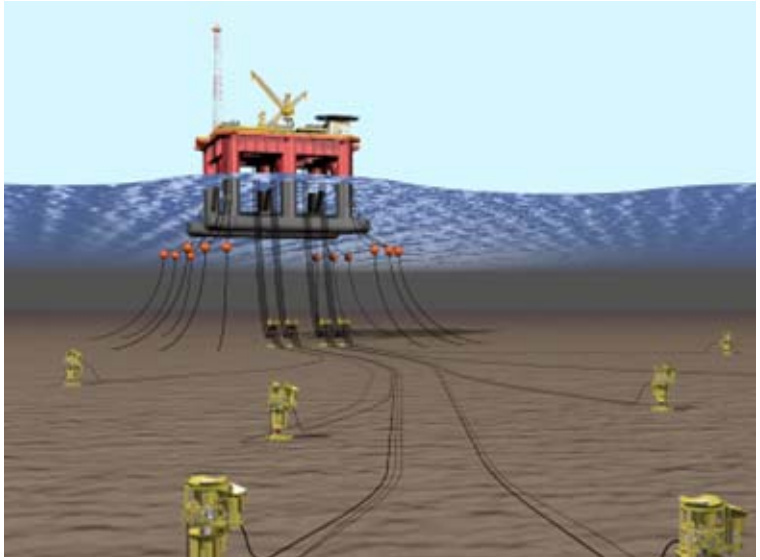
DeepStar Consortium

DeepStar is industry's preeminent deepwater technology development forum. DeepStar is a collaborative effort between oil companies, vendors, regulators and academic & research institutes focused on creating value in the development of deepwater assets.

- **The Challenge –** extreme high cost & risk of first deployment of deepwater technologies
- **Develops technologies to meet common business needs –** focus is 4,000 to 10,000 ft water depths
- **Collaborates where the competitive advantage is low**
  Provides a 10:1 investment leverage opportunity
- **Engages the Vendor Community**
  Bring vendors along with the process so they are able to deliver on operators' business needs (inform, educate, disseminate)
  Provides vendors guidance on the operators' needs to steer their investment
  Provides a forum for generation of new ideas

Deepwater Challenges Differ Worldwide

- ✓ Currents
- ✓ Water Temperature
- ✓ Seas/Weather
- ✓ Regulations
- ✓ Geology/Salt
- ✓ Bottom Topography
- ✓ Location/Logistics
- ✓ Rig Availability



Deeply Buried–
Deepwater Reservoirs

As wells are drilled deeper and deeper in increasing water depths, new technologies will be needed to allow wells to be drilled and produced.

In our ongoing study for DeepStar, DOE and the MMS, we are identifying the state of the art and gaps that exist for High-Pressure/High-Temperature wells in deep water.

"Dumb Iron" is Not as Dumb as it Used to Be

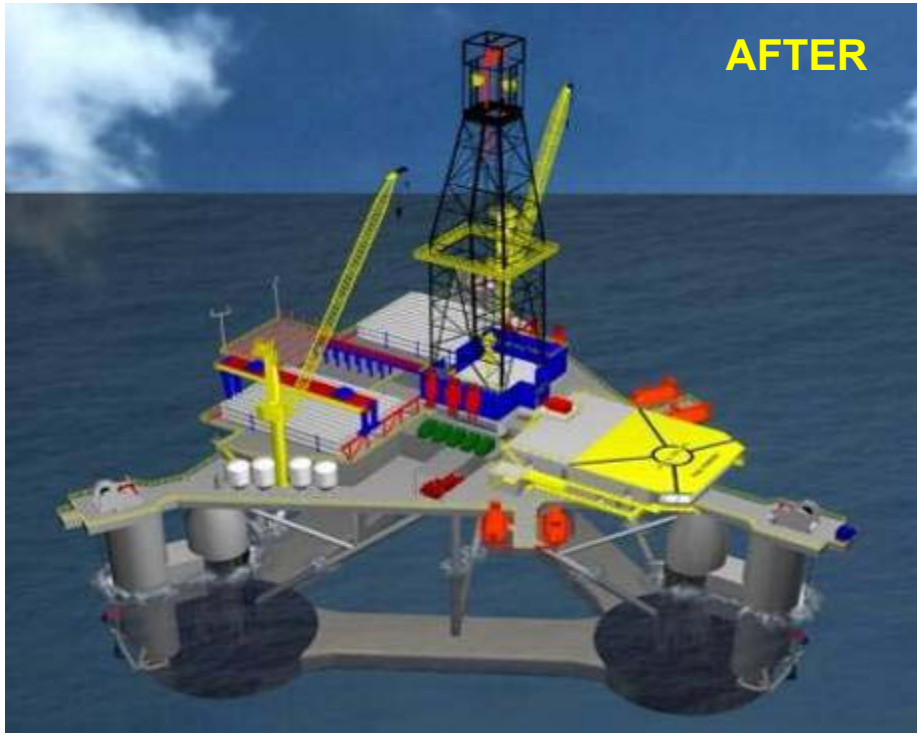
New innovations and technology are improving rig capabilities and drilling performance

Noble's Aluminum Alloy Drilling Riser


Video of Noble's New-Generation Deepwater Rig
(Click to Start)

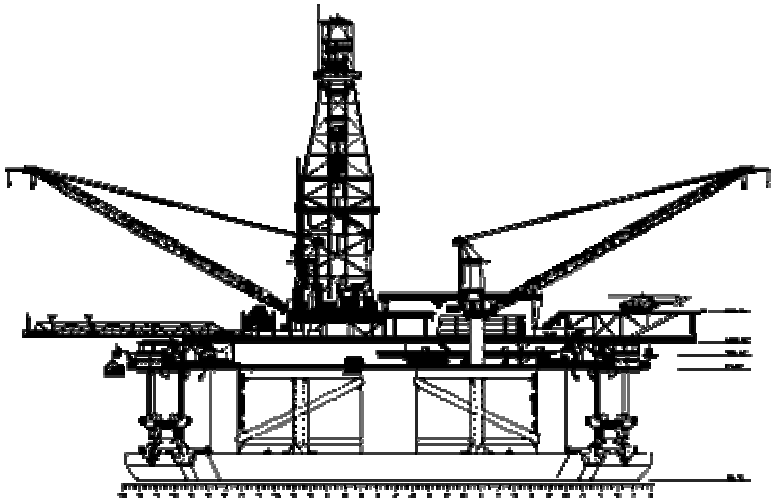
Rig Conversions

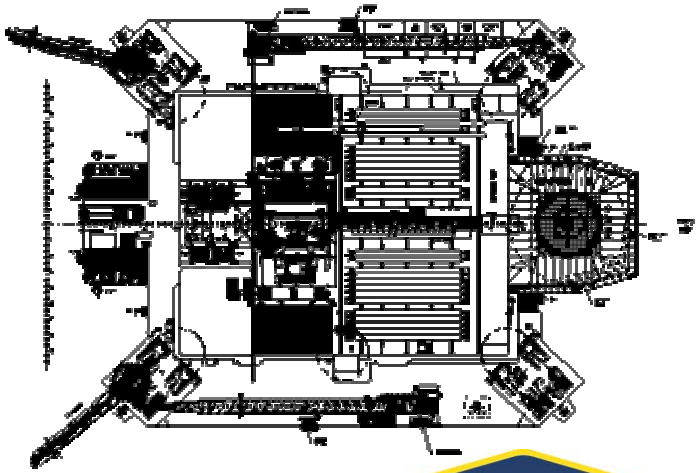
- Increase Water Depth
- Increase Load Capacity
- Increase Strength & Service Life
- Increase Stability
- Upgrade Equipment
- Improve Motion Performance



Ongoing Project: Noble Dave Beard

- Will be Converted to a DW DP Semisubmersible





Located in Dalian, China

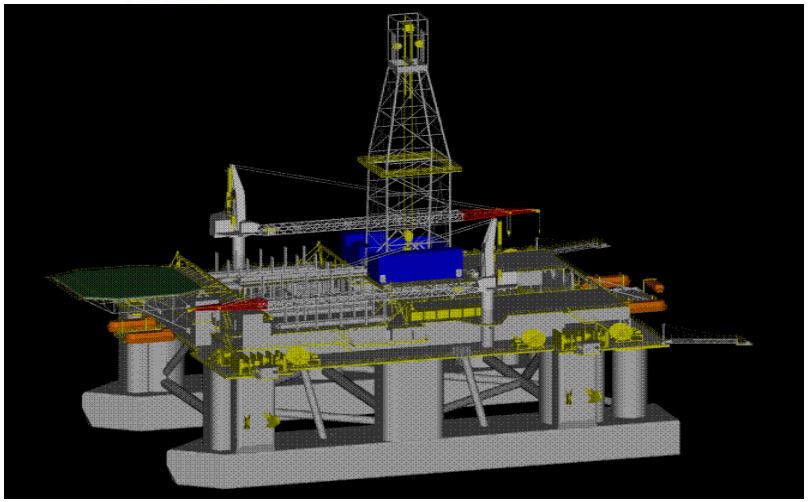
New Designs: Noble Bingo 9003 and Bingo 9004
– Ready to be Converted to 5th Gen Semisubmersibles

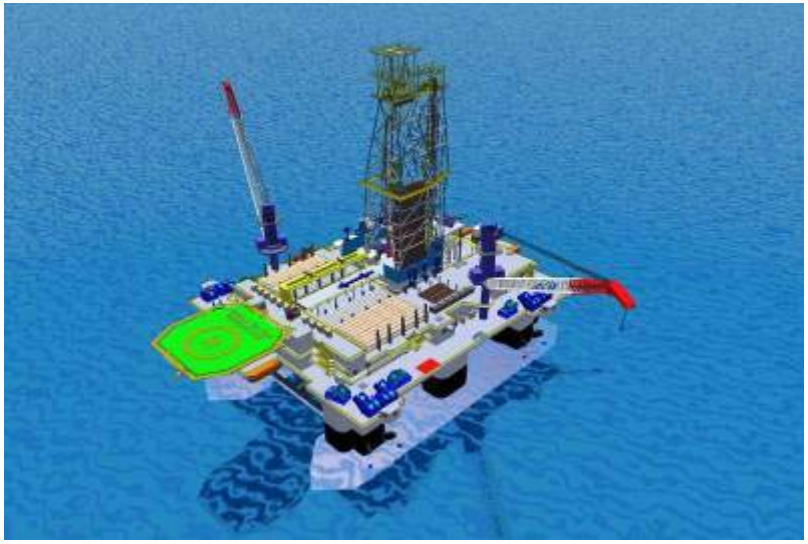
- A State-of-the-Art Hull Design
- Water Depth = 10,000 ft +
- Aluminum Alloy Drilling Risers

Located in Dalian, China

Ongoing Project: Noble Clyde Boudreaux

- Will be Converted to a 10,000 ft Deepwater Moored Semisubmersible





Sister Rig of NDB & NHF Located in GOM

Biggest Drilling Challenge– *Controlling Costs*

- Manage Risks
  - Proper Planning and Execution
- Most Offshore Drilling Problems are Related to Pressure*
- Improve Drilling Performance
  - Knowledge-Based Analysis/Lessons Learned*
  - Applying Enhanced Technology – (Rotary Steerable Drilling, Bit Performance, LWD, Drilling Dynamics Data)
- Reduce Casing Strings
  - Good Well Planning and Pore Pressure Prediction
  - Application of Dual Gradient Drilling, Managed Pressure Drilling and/or ECD Management
  - Expandable Tubulars

**** 2005 OTC Paper 17119 (Anadarko Petroleum Corporation)***

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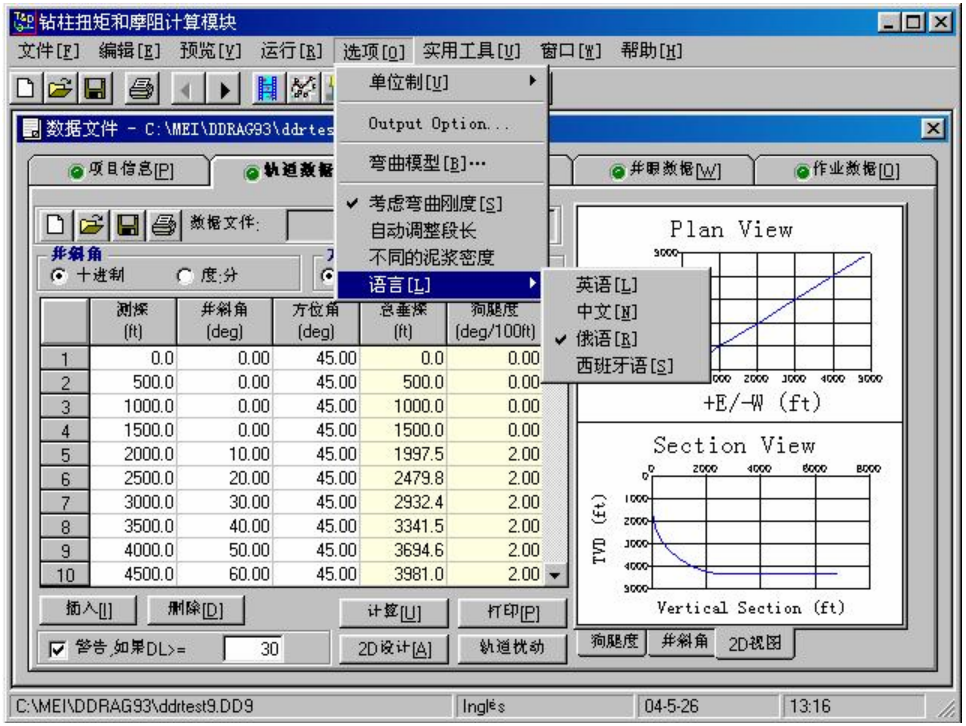
Well Construction Schematic

Evaluation and Planning

Engineering

Operations

Assessment and Benchmarking



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