

BP's rig of the future aims for safety, efficiency

BP'S RIG OF the future is never going to be built but rather it is an engineering project to demonstrate how safety hazards can be engineered out and performance engineered in.

The company's aspiration is zero accidents. BP's upstream safety performance has been trending downward, with a 12 month average in the number of days away from work per 200,000 man hours well below one day.

In order to reach its goal of zero accidents the company believes it should be doing something more fundamental.

Consequently, BP initiated a project called "Rig of the Future", which is a safe and efficient workplace where safety hazards have been engineered out.

The project's objectives are to determine how better engineering and design

of the rig of the future at IADC's annual meeting, concentrating primarily on the pipe handling system.

"We culled an internal survey to determine what people think we should be focusing our attention on," Mr Greaves said.

"The three items that came out at the top of the list were remotely operated and automated pipe handling systems, safe and efficient land rig moves and cargo handling on mobile rigs."

"The safety benefits of (remotely operated automatic pipe handling systems) has not been fully realized and we believe these systems will be an important part of the future," he continued.

Beginning the project, BP defined the business need of remotely operated automated pipe handling systems and it

"The least we want is an improvement in safety."

BP's approach to the pipe handling study will be to perform a detailed analysis of the system from the design through to operation.

The company will bring in a range of skills and expertise to perform that analysis, including people with a combination of practical drilling experience with the systems as well as people with expertise in reliability management, risk phase design and human factoring.

Additionally, BP plans to bring in knowledge, experience and engineering from other industries to help benchmark the performance from the outside as well as inside the company.

"Externalizing this problem could shed some new ideas," Mr Greaves explained.

The team will gather evidence and build a model of a system performance that describes efficiencies and deficiencies in the way the remotely operated automatic pipe handling system operates.

This will enable BP to demonstrate the most likely areas for improvement.

BP will also conduct a study on engineering and operating practices to deliver the best possible performance to back up its conclusions.

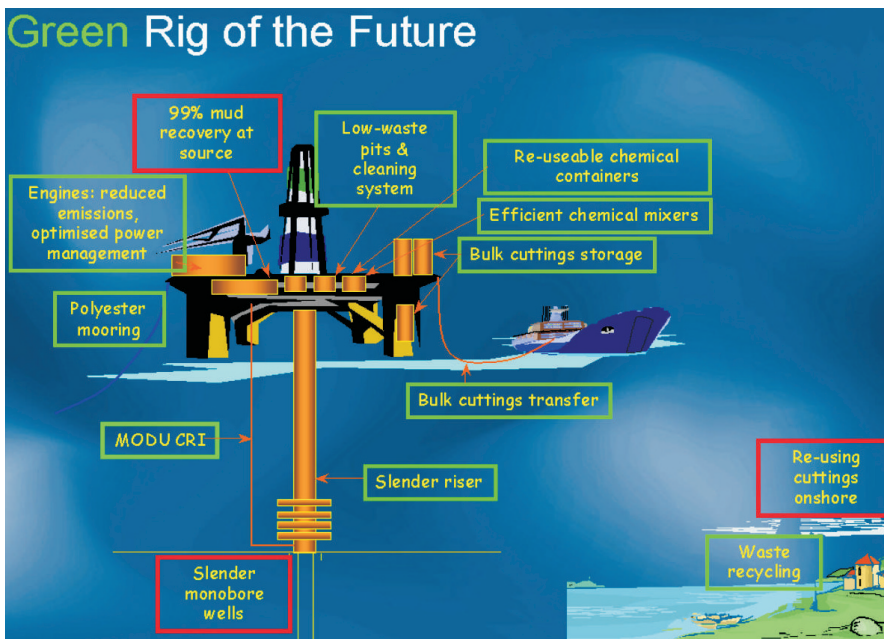
KEY ISSUES

Some of the key issues at the present stage of the study include:

- How reliability and safety requirements (e.g. availability, maintainability, safety risk levels) are identified for the specification for the rig.
- How the reliability and safety requirements are translated into the rig design requirements (e.g. back-up systems, drill floor layout, maintenance accessibility, line of sight, etc.)
- The effectiveness of the final rig reliability and safety testing (e.g. control systems testing.)

"We don't underestimate the complexity of this task," Mr Greaves said. "We think key activities go to model performance."

BP will be trying to determine what



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can improve safety and efficiency; determine how BP can take advantage of emerging technologies to improve safety and efficiency; and influence design of equipment and technology development.

Chris Greaves, Project Leader, Rig of the Future for BP, outlined just a portion

found that the systems provide consistently reliable performance and produce an overall improvement in safety performance.

"We don't want to just take away one hazard and create more in its place," Mr Greaves noted.

other significant activities should impact safety and performance as well.

"We will be quantifying that on the basis of data obtained in the systems review and the performance databases where we don't have the empirical data available," he explained.

Mr Greaves noted that human factor engineers are critical to the safety performance of the systems.

The company's idea of reliability is summarized by asking and answering the following question:

"Can this equipment with these components made to this level of quality perform these functions under this environment and with this level of maintenance to an acceptable level of reliability?"

The human factor can also be summarized by asking another question.

"Can this person with these characteristics and this training carry out these tasks to this specification under these conditions with this equipment?"

GOAL

Mr Greaves reiterated BP's approach to the Rig of the Future concept by again noting that it is not trying to build such a rig but rather the company is trying to assist in the development and ultimately test the technologies that can improve safety and performance in specific rig-based activities.

BP is currently in the process of researching what equipment and systems are available in order to identify their benefits.

"Our ultimate goal is to reach a position where we can field trial some of the technology and evaluate their performance."

GREEN RIG

BP also has a vision of a green rig of the future that includes reduced engine emissions, 99% mud recovery at the source, bulk cuttings transfer to a waste recycling center and using the cuttings onshore, and low waste mud pits and cleaning system.

BP's commitments regarding its green rig of the future include:

- Continuous improvement through

environmental management systems

- Reducing and eliminating discharges
- Energy efficiency
- Reducing waste
- Reducing resource use
- Reducing footprint

Mr Greaves is not suggesting that all of

the aspects of a green rig should be done at the same time. Rather, he said, they are the things that can make a rig more environmentally friendly

"We believe the industry needs to begin designing this capability into rigs today in order to meet expectations in the future," Mr Greaves said. 