



OTC 19534

Analyses and Measurement of Conductor Response for Jack-up Drilled Wells in 110 m Water Depth in Harsh Environment

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This paper was prepared for presentation at the 2008 Offshore Technology Conference held in Houston, Texas, U.S.A., 5–8 May 2008.

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Abstract

The analysis of conductor systems for wells drilled by jack-ups is often limited to analysis of the conductor alone as a free standing unit. This paper discuss the various aspects of the analysis of the whole conductor system and shows that the limitations in strength may be in the conductor itself, but in other parts of the system

Introduction

This paper deals with top tensioned drilling conductors that are drilled from jack-up platforms. The conductor system consists of an outer drilling conductor cemented to the sea bed and kept in tension by a tension system on the jack-up. The conductor is guided horizontally at the Texas deck. The conductor system also includes equipment connected to the conductor such as BOP, wellhead, packer and overshot system. The paper describes a conductor system typical for the jack-up rig used for the deep water drilling. Other jack-ups may have different systems, but the main message of this paper on total system analysis is still valid.

Conclusion

It is important to model all elements of the conductor system for deep water jack-up drilled wells. There are strength limitations in various parts of the system, and changing the strength or stiffness of one part may have negative effects on other parts of the system.

Analyses of the drilling conductor

The analysis of the drilling conductor need to include all components in the system. Typical components included in the analysis are:

- Seabed fixation (soil-pipe interaction modelled with springs)
- Conductor pipe with internal pipes (pipe to pipe contact modelled)
- Texas deck support
- Tension system
- Adjustable landing ring
- Wellhead
- BOP
- Mandrel
- Packer / overshot
- Diverter

In addition, the jack-up movements must be input to the analyses.