

FEA as a Prediction Tool for Bottomhole Assembly Design:

Mitigating Dangerous Vibrations

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The bottomhole assembly (BHA), which is the lower portion of the drillstring used in drilling, consists of a combination of very sophisticated (and expensive) equipment that is designed to stabilize and direct (navigate) the drill bit to a specific target depth and horizontal deviation (directional drilling) while simultaneously performing real time geophysical measurements (logging-while-drilling).

A typical BHA could range between 500-600 feet in length. Drilling forces and vibrations that occur during drilling operations have great impact not only on rate of drilling, but also on the survivability of the downhole equipment.

In this presentation, we will demonstrate how advanced FEA can be utilized to perform detailed analysis on every BHA system in order to predict critical dynamic behavior and minimize premature failures. We will also show how these prediction tools can assist in BHA design considerations before deployment.