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An Introduction to Deepwater Drilling

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This presentation is an introduction to deepwater drilling, some of the nomenclature, processes, and “how things work,” including illustrations of several of the more complex and technically challenging operational situations encountered in deepwater drilling operations. Drilling and well construction activities are carried out in water depths from just a few feet, to over 10,000 feet. Subsurface pressures encountered may be as high as 35,000 psi, with temperatures over 500 degrees F. Some of the technical aspects of deep water drilling include: 1) locating the well 2) rig types 3) well types 4) rig components 5) drill bits, drill string assemblies, bottom-hole assemblies 6) inclined and horizontal well trajectories 7) anisotropic in-situ earth stresses and operationally induced stresses 8) anisotropic, non-linear, hysteretic, and time-dependent rock behavior 9) steady-state and transient fluid flow and formation pressures 10) complex static and dynamic temperature distributions 11) eccentric wellbore geometries 12) wellbore stability 13) lost circulation 14) formation pressure control 15) sea floor completions 16) robotic operations