Geo-hazards in Deep Water and Associated with Exploration around Salt

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ABSTRACT

Since the Macondo incident occurred in the Gulf of Mexico, the oil and gas industry has been very diligent in addressing various drilling hazards that may be encountered in deep water. This presentation focuses on examining the geologic origin of various hazards in deep water and around salt by reviewing the geologic origin, characteristics, and behaviors of hazards such as:

1. Sea-floor hazards including pockmarks, mud volcanoes, and mass sediment movement.
2. Sub-surface geologic hazards including shallow water flows, reactivated faults, and gas chimneys.

In addition, various potential drilling hazards may also be encountered when drilling massive salt and layered evaporates. These challenges may occur when:

1. Drilling into the top of an allochthonous salt canopy (cap rock issues),
2. Drilling through massive salt and layered evaporite complexes (including sediment inclusions, salt-to-salt sutures, and mobile layered evaporates), and
3. Emerging from salt or evaporites (including rubble zones, feeders, mobile bitumen, and basal touque) into sediments below. The talk concludes with a review of key exit strategy questions that should be asked before emerging from salt.