

# Reservoir Modeling and Geosteering: A Synergistic Approach

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The importance of building a successful geological model of a reservoir not only serves as a basis for future development of the reservoir but it also holds the key to drilling of future development wells. The key to the successful placement of such wells is existence of geological model which can be continuously updated. Today with the advent of more sophisticated tools such as Petrel™, a 3-D geological model of the reservoir honouring channel geometry can be built. Horizontal wells can be planned with great precision in such a model. In addition, virtual wells can be simulated in such a model and property logs can be simulated along the proposed well paths. A curtain section can be extracted from the geological model. Such a curtain section is actually a vertical plane containing the well path with all the horizons.

This curtain section is transferred to RTGS™ (real time geosteering screen). Once the geology is properly in place, all one needs to do is square the logs from an offset well and propagate the section with the petrophysical properties. During the execution phase one needs to model the logs, and modify structure as encountered during drilling. The pre-job modeling ascertains the risk involved during the geosteering job. Since continuous updates are available during the drilling process the model is updated dynamically in realtime. This further minimizes the uncertainty and helps engineers and geoscientists take crucial decisions. Quite a few horizontal wells have been drilled in Kuwait using this technology