

Wellbore Imaging: A Key to Managing the Asset Life Cycle

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Wellbore image data has been demonstrated to be the single most valuable source of logging data to assess reservoir geomechanics. High resolution image data allow direct observation of stress induced wellbore failures from which a geomechanical model of the reservoir can be derived. These tools also reveal the lithologic and structural detail required to characterize and map hydrocarbon-bearing rocks. Advanced LWD imaging technologies provide operators with immediate information to continuously update geologic and geomechanical data for real time integrated well planning.

Geomechanical analysis plays a crucial role over the entire life cycle of an asset. A geomechanical model serves as a platform for dramatically reducing drilling costs and production losses through field-wide well planning and completion designs that enable production optimization and reduce exploration risk. Geomechanics provides the basis for evaluating the potential for wellbore instability during drilling, enhancing production from fractured reservoirs, the assessment fault trap integrity and hydrocarbon column height, and the mitigation of environmental damage due to the injection of water or steam in close proximity to faults during enhanced recovery operations.

The essential contribution of wellbore image technologies to these exploration and production challenges will be illustrated through recent case studies world-wide that apply both conventional and advanced imaging technologies to the detection and recovery of hydrocarbons. The oil industry faces unprecedented technical and economic challenges for oil recovery. Incorporating wellbore imaging technologies as standard reservoir development and management practice will help to ensure successful production in risky environments, reduce drilling costs, and increase the economic life of mature reservoirs.