

Spatial Integrity of Seismic Data for Oil and Gas Exploration

Authors : Afiq Juazer Rizal, Siti Zaleha Misnan, M. Zairi M. Yusof

Abstract : Seismic data is the fundamental tool utilized by exploration companies to determine potential hydrocarbon. However, the importance of seismic trace data will be undermined unless the geo-spatial component of the data is understood. Deriving a proposed well to be drilled from data that has positional ambiguity will jeopardize business decision and millions of dollars' investment that every oil and gas company would like to avoid. Spatial integrity QC workflow has been introduced in PETRONAS to ensure positional errors within the seismic data are recognized throughout the exploration's lifecycle from acquisition, processing, and seismic interpretation. This includes, amongst other tests, quantifying that the data is referenced to the appropriate coordinate reference system, survey configuration validation, and geometry loading verification. The direct outcome of the workflow implementation helps improve reliability and integrity of sub-surface geological model produced by geoscientist and provide important input to potential hazard assessment where positional accuracy is crucial. This workflow's development initiative is part of a bigger geospatial integrity management effort, whereby nearly eighty percent of the oil and gas data are location-dependent.

Keywords : oil and gas exploration, PETRONAS, seismic data, spatial integrity QC workflow

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