Please fill in the name of the event you are preparing this abstract for.	International Petroleum Technology Conference
Please fill in your 5-digit IPTC manuscript number and IPTC Control number.	IPTC-19541-MS 19IPTC-P-2827-IPTC
Please fill in your abstract title.	Application of Seismic Amplitude Confidence Maps to Mitigate Noise and Reduce 3D Modelling Uncertainty

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Abstract

Objectives/Scope: To mitigate the effect of noise, a rigorous and in-depth analysis was implemented. The process combined well and seismic information to scrutinize the level of validity of the input data. We analyzed over 700 well synthetics calibrated to the seismic data to produce laterally varying confidence estimates to supplement the various seismic products e.g. seismic inversion. Development of seismic confidence maps for areas with high multiple contamination helped reduce geological model uncertainty to a large degree.

Methods, Procedures, Process: Initially, synthetic seismograms were generated using edited sonic and density logs. Out of the 700 selected wells, only 500 produced high correlation coefficients. The target carbonate reservoir is a thick interval, composed of a succession of layers, denoted by A, B & C. Sonic logs were used for time depth conversion. In other wells, spurious density values were removed and missing density sections were computed using rock physics principals. Noise Percentage Maps were computed based on comparison between seismic and synthetic amplitudes. All wells were ranked into three categories, Good (0-30%), Moderate (30-70%) and Noise (70-100%). Finally, confidence maps were generated for key reservoir intervals using wells ranked as 'Good'.

Results, Observations, Conclusions: Noise and confidence maps were beneficial in understanding how seismic noise varies spatially and within the reservoir interval. Based on these maps and the categorical well ranking, a 60% noise level was taken as a threshold. 45% of Layer-B in the carbonate reservoir has more than 60% noise, the highest among all the three reservoir layers. Layer-C had a 32% noise level and Layer-A had 20%.

Novel/Additive Information: Seismic Integrated geological models are the most robust models for field development programs. However, poor seismic data quality can hinder such integration. We propose a unique methodology, where noise and confidence maps are generated, merged with different DHI seismic products to understand areas of poor data quality and quantify its impact when used in geocellular models.