SEISMIC AMPLITUDE ANALYSIS OF THE LOWER CRUSE SANDS SOUTHWEST SOLDADO, TRINIDAD

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ABSTRACT

The extent to which seismic amplitudes can be used to determine gross sand or net pay thickness was investigated in the Lower Cruse sands in Southwest Soldado Field. A seismic stratigraphic interpretation of the Lower Cruse section revealed two channel-like systems, one containing all oil-bearing sands and the other all water-bearing sands. By using various methods of amplitude extraction (including max. positive, negative and absolute, average absolute and RMS), amplitudes were extracted from the oil-bearing channel interval and plotted against gross sand, NOS and NOS/interval thickness. Of the different types of amplitudes used, the RMS vs NOS/interval thickness had the best linear relationship after removing the effect of tuning. This plot showed two trends (or populations) which corresponded to two lobes identified in the oil-bearing channel.

The investigation concluded that: (i) detailed seismic stratigraphic analysis must be performed to restrict amplitude analysis to the same sand unit - this ensures that other factors affecting amplitudes (e.g. velocity, density, lithology and porosity) remain constant; (ii) different trends (or populations) may indicate different sand bodies or differences in dip; (iii) final NOS maps must incorporate amplitude vs NOS relationships, well data and isochron thickness derived from seismic analysis.