

Geophysical Challenges facing Santos

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This presentation covers some of the key geophysical technical challenges facing Santos in the Cooper Basin, Otway Basin, and NW Shelf of Australia.

In the Cooper Basin, Santos' immediate need is to develop exploration tools for new play trends, with the highest potential new play being Permian stratigraphic traps. AVO and inversion are critical to the Permian strat play. Successful AVO and inversion require improvements to our data quality, with the biggest data quality problem being aliased ground roll on the inner source-receiver offsets. Some examples are presented where this ground roll is successfully removed pre-stack, which gives significant improvements in the stack as well as the ability to do AVO and inversion on the near offset traces.

In the Australian southern margins, Santos has solved some traditional exploration problems by using 3D in the onshore Otway Basin, but the average field size there is small. We are going offshore in that area to find bigger structures, but are challenged by multiples and extracting far offset reflections (for AVO) that are masked by direct arrivals. We think we have solved these processing problems, as shown by recent drilling successes.

For the NW Shelf of Australia, the key challenges facing Santos are multiple suppression and time-depth conversion. For time-depth conversion, PSTM and PSDM appear to be helping, but the imaging velocity may not be the depth conversion velocity, probably because of anisotropy. The multiple problem in the NW Shelf is one of the most difficult challenges we face. Some help has come from tau-p deconv and radon transforms, but this problem is not solved.