Application of pre-stack migration techniques in SSB/SSPC to improve seismic imaging and reduce exploration uncertainties

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A crucial step in seismic processing is the application of migration techniques. An optimum migration ensures proper imaging and positioning of seismic events. In conventional processing post-stack time migration is the most commonly applied migration technique. For geological settings with mild velocity variations this technique gives satisfactory results. However, for more complicated structures with strong velocity variations post-stack time migration results are sub-optimum and more advanced migration methods such as pre-stack time migration and pre-stack depth migration should be applied.

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These pre-stack migration methods are generally CPU and labour intensive, especially in pre-stack depth migration which requires velocity model building. Although the turnaround time is relatively long and costs are generally high for processing projects with pre-stack migration, the improvement in imaging and positioning of seismic events can significantly reduce exploration and production risks, thus leading to large cost savings and improved financial performance of an E&P company.

This paper describes the successful application of 2D and 3D pre-stack migration techniques in the in-house processing centre in SSB/SSPC.