Comparisons of Post-Stack Migration and Pre-Stack Depth Migration Results at Elk Hills, California

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A PSDM re-processing project was undertaken in 2001- 2003 to improve the subsurface imaging of the structurally complex, ~150-mi^2 Elk Hills 3-D seismic survey. During the course of this project, a new methodology was developed by the processing contractor, GX Technology, which allowed the selective refinement of the migration velocity field.

The project interpreters were able through several iterations to make improvements in the imaging of the subsurface. These results were best in areas of robust data quality. When compared to the original time migration, the PSDM added value to the interpretation. In some cases, these PSDM data changed the way geological correlations were done. The imaging of various faults was also enhanced.

In order to make the PSDM final migration easier to correlate, a post-stack (Tau-P) signal enhancement was applied to the data. The results were remarkable in areas of good data quality, but the results were questionable in areas of poorer data quality.

Examples are shown demonstrating these improvements and difficulties.