Land Based S-Wave Reflection Seismology with P Sources

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ABSTRACT

If S-wave technology remains as it has been practiced for the past 20-plus years, S-wave data will continue to be used by only a small segment of the geophysical community. Causing S-wave reflection seismology to be accepted by a larger number of seismic users has been a principal research objective of the Exploration Geophysics Laboratory at the Bureau of Economic Geology (BEG) since 2009. To set the strategy for this research, the speaker was influenced by the fact that during the past 3 decades, he has seen repeated evidence in land-based VSP data that an SV mode is generated directly at vertical-vibrator and vertical-impact baseplates, and at the subsurface coordinates of a buried explosive, even though these sources have, by tradition, been used only as P-wave sources, not as S-wave sources. These observations led to the decision to implement research that would lead to a better understanding of the physics of the direct-SV modes that all common, commercial, land-based, P sources generate. Some of the research findings amassed in this 8-year study that have caused the speaker to promote the option of practicing Swave seismology with P sources will be described in this presentation.