
Variable Depth Streamer Acquisition— Benefits of Truly Broadband Marine Seismic

Robert Soubaras and Peter Whiting

CGGVeritas

ABSTRACT

The importance of recording the full range of frequencies (low as well as high) is widely accepted. Broader bandwidths produce sharper wavelets and this is crucial for high-resolution imaging of thin beds and stratigraphic traps. We describe here an innovative technique to achieve broadband marine streamer data. The proposed solution is a new combination of streamer equipment, novel streamer towing techniques, and a new de-ghosting and imaging technology. The method creates an exceptionally sharp and clean wavelet for interpretation. It can be tuned for different water depths, target depths, and desired output spectra. This approach to towed streamer broadband seismic is particularly efficient, flexible, and customizable for a range of environments and applications. This flexibility means that the technique can be tuned to provide the maximum possible bandwidth for a given geological setting and water depth. The increase in penetration from the extension of the bandwidth at the low end will benefit the imaging of deep targets and those below complex overburdens (e.g., salt domains). Shallow targets (such as shallow hazards) will benefit from the total bandwidth available and recordable. Recent trials have achieved usable bandwidths between 2.5 and 150 Hz. As we see more examples of such seismic data that we have acquired and processed from around the world, the benefits have become increasingly apparent. Enhancements in data quality are observed in ranges of geological settings.