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ADVANCEMENTS IN POSITIONING FOR MARINE SEISMIC 3D

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Market demands for highly accurate means of positioning seismic cables and sources in marine seismic 3D surveys have led to many new developments. The process of formulating and implementing concepts utilizing radio navigation and acoustic ranging techniques for in sea positioning has involved several generations of equipment and software. 1988 has been an important year in this process as advanced in sea positioning has become a standard in marine 3D surveying.

In sea positioning in the past has been based on range and bearing computations utilizing nominal offsets from a vessel antenna and bearings from streamer mounted magnetic compasses. Methods now in place include utilization of acoustic responders and hydrophones, attached to seismic sources and streamers, coupled with radio navigation on vessels and towed buoys. The deployed systems must be capable of handling the harsh marine environment and the demand for 24 hour operation with minimum downtime.

The acoustics and radio-navigation must be integrated into a single solution for determination of seismic source and receiver locations. The integrated systems must have flexible hardware and software to handle constantly varying data quality and configuration in sea equipment. In many cases there must be telemetry, interface capabilities and software options for utilizing data from more than one vessel at a time. There must be quality control in the form of inter and intra system statistics as well as graphic display for optimum steering for subsurface coverage. In addition there must be recording capacity for large amounts of nav sensor data recorded for post mission analysis.

This paper shall give an overview of the hardware and software systems presently available for in sea positioning on marine seismic 3D surveys.