The “Hands-Off” Approach to Seismic for the 21st Century: A Case Study in the Use of Very High Channel Recording Systems

*Mohammed R. Rajab[1], Ibrahim Al-Hakim[1], **P. Van Baaren**[2], A. Smart[3], and John Garrity[4]. (1) Joint Operations Exploration Department, Joint Operations, Wafra, Wafra, Kuwait, phone: +965-3983639, RAJM@chevron.com, (2) Reservoir Services, WesternGeco, P.O.Box 9261, Dubai, United Arab Emirates, (3) Land Acquisition, WesternGeco, P.O. Box 1106 (Salmiya), Kuwait, Kuwait, (4) Joint Operations, Wafra, Wafra, Kuwait*

Very high channel count seismic recording systems open new avenues in the search and exploitation of hydrocarbons in the Middle East. Vast leaps in hardware and software development since the 1980's allow manufacture of electronics capable of recording over 20 000 channels in an cost efficient manner. In addition, these advances in technology have allowed the use of higher fidelity processing algorithms and techniques such as pre-stack time migration in routine processing which previously were only possible in theory or in research using the largest computers available at that time. However, the general philosophy used to record seismic data is still based on the 2D paradigms of the 1980's where recording systems were able to record 96 to 480 channels for each shot. Even the highly successful 3D seismic technique, is still based on the paradigms developed for 2D recording and limited channel counts.

As the demands for the information provided by seismic data have increased from providing a structural picture to detailed reservoir information in the inter-well space, fold of the 3D seismic surveys has increased to very high levels to try and deliver the hi-fidelity seismic data sets required for such analysis. Especially in the Middle East, where strong coherent surface generated noise is prevalent, a plateau has been reached to how much information the seismic data can provide. This case study shows how changing the paradigms used for 3D seismic acquisition and processing, made possible by very high channel count systems, can extend the usefulness of 3D surface seismic acquisition further than with conventional acquisition and processing techniques.