

## Partitioned Zone Onshore 3D Seismic Survey Challenges and Best Practices

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### ABSTRACT

Wafra Joint Operations (WJO), a joint venture of Kuwait Gulf Oil Company (KGOC) of the State of Kuwait, and Saudi Arabian Chevron (SAC) of the Kingdom of Saudi Arabia recently completed one of the world's largest on-shore 3D seismic surveys, covering 4612 km<sup>2</sup> within 660 days. To complete the seismic acquisition program in an area, inundated with various challenges, WJO dedicated extensive efforts to mitigate the challenges while strictly abiding by governmental regulations, maintaining productive relationships with the locals and maintaining stringent safety norms and data quality. A series of "Best Practices" were adopted in the successful completion of the project. Since the operational area, particularly the north, is affected by the presence of mine fields, UXO and other ERW objects. It was main priority of operations to detect and remove those deadly objects from the potential seismic profiles before any seismic data acquisition took place. Specially designed armored vehicles and trained dog squad were deployed in detecting and removing of any mines or UXO's. WJO which was situated in the heart of an oil field had to maintain mandatory restraint on all the activities of service providers and contractors so as not to compromise the safety and production modes. In that, a robust SIMOPS plan was successfully executed. Vibrators were mostly used as an energy source, while explosives were used in the wet sabkha. Since these sources generate significant amounts of energy which may cause damage to the man-made features, the peak particle velocity (PPV) studies, a total of 276 PPV surveys, were conducted to maintain an optimal safe distance during deployment of energy sources in the survey area. Southeastern part of the area was inundated with wet sabkhas, tidal water and deceptive near surface features which demanded special rig types and vehicles to opt for safe operations. These vehicles were specially designed for this project and were deployed for shot hole drilling, shifting of personnel and materials. An intensive community engagement program was also pursued using posters, banners, live demo and pamphlets targeting local community/commercial areas. With the commitment to maintain "best practices" many innovative approaches were implemented in a proactive manner to mitigate the challenging environment while attaining the goal without any recordable unfortunate incidence. This establishes a benchmark for any future seismic campaign in the region.