Workshop on 'New and Emerging Technologies', at Navi Mumbai

SPG, Mumbai chapter organized a one day workshop on "NEW AND EMERGING TECHNOLOGIES" at Hotel Tunga Regency, Vashi, Navi Mumbai, on 3rd June 2007 (SUN DAY), from 1000 hrs to 1730 hrs. The following technical presentations were held:

l   Wide Azimuth & Multi Azimuth Seismic Surveys by Mr. Chris Koninger, M/S WesternGeco

Implications of Full Waveform Seismic Inversion in delineation of Petrophysical Properties by Dr Inderjit G. Roy, Onshore Energy and Mineral Division, Geoscience, Australia

Neural Network and its application for Exploration of Hydrocarbons - Dr C. H. Mehta, M/S Paradigm Geophysical, Mumbai

Towed Streamer Multi Azimuth Acquisition & Processing - Dr Maz Farouki, M/S PGS

HP in Oil and Gas - E & P by T. Kamalakannan, M/S HP

New Sonic Technology as an aid in Formation Evaluation, Completion Optimization and Geophysical Prospecting - Dr Theodore Klimentos, M/S Schlumberger

Delivering on the promise of CSEM - Dr James Tomilson, M/S OHM

The towed-streamer 3D seismic method has historically been limited to single-azimuth source-receiver geometries. In regions of complex overburdens, the single-

azimuth approach does not always provide the illumination needed to characterize the reservoirs and geohazards that lie beneath. Irregular illumination creates artifacts in processing and imaging that degrade the clarity, quality and resolution of the final results. Survey designs that provide a richer suite of azimuths can solve this problem. The challenges involved with proper design, acquisition, processing, and final exploitation of these data are considerable.

WesternGeco claims to have successfully executed all of these phases in several rich-azimuth Q-Marine programs.

PGS has pioneered the Multi-Azimuth seismic method as a robust solution to poor target illumination during 'conventional' 3D seismic surveys. Data is acquired in two or more directions over the same survey location. Different shooting directions illuminate different parts of the target. The datasets are then collectively processed to output a single 3D seismic cube.

For severe cases of poor target illumination, such as sub-salt targets in the Gulf of Mexico, Wide-Azimuth acquisition may provide better results. Wide-Azimuth Seismic uses additional source vessels to acquire very large cross-line aperture and offsets, complemented by a much larger range of source-receiver azimuths than can be acquired using single-vessel 3D acquisition.

Full waveform inversion of P-wave Pre-stack seismic data can estimate P-, S-velocity field and density variation of the medium. It is possible to determine petrophysical parameters through full waveform seismic inversion.

The Neural Networks can be used for predicting

target logs in 3-D, using 3-D seismic data & training logs in drilled wells and also for classification of seismic facies using unsupervised or supervised networks (SOM).

Controlled Source Electro-Magnetic (CSEM) imaging can be an effective tool for Sub-basalt imaging. Basalt is a low electrical attenuation medium, through which EM signals can pass and provide information about underlying geology.

There is a large resistivity contrast between the basalt and surrounding sediments, and the sub-basalt sediments and the basement. This provides a significant target for EM methods.

The day long workshop was very interesting and provided good food for thoughts.

Solutions to Geophuzzle - III