SPG Mumbai Chapter organizes technical presentation
on 7th Feb, 2018 at Panvel

SPG, Mumbai chapter organized a technical session. After the welcome address and brief introduction an ex-ONGCian Mr. S.P. Singh, President Global Geoscience Services in Emerson-Paradigm started presentation on “Orthorhombic Earth Modelling and Imaging the Need” on 7th Feb, 2018 at ONGC Panvel.

Mr. Singh talked about accounting anisotropy in data processing is now recognized as an important step in improving the quality of seismic data. In isotropic seismic data processing we consider a single velocity at a depth point and try to flat the gather to the maximum offset to depth ratio. But in reality the model is anisotropic, means we have different velocities at a depth point for different directions. When we try to fit this model with a single velocity, it generates well mis-ties as well as lateral mis-positioning in the migrated image. The anisotropy solution was first successfully tested in ONGC by speaker himself.

Commonly, two forms of anisotropy are considered. The first and most common is ‘Vertical Transverse Isotropy’ (VTI), or the closely associated ‘Tilted Transverse Isotropy’ (TTI). This anisotropy is often caused by fine layering of sediments, with the layering smaller in scale than the seismic wavelength. In the case of VTI the bedding planes are horizontal, while in TTI they are dipping.

The second form of anisotropy considered in P-wave processing is ‘Horizontal Transverse Isotropy’ (HTI). The most commonly considered mechanism for this type of anisotropy is vertical aligned fractures embedded in an isotropic background medium. In reality, the subsurface is likely to contain both types of anisotropy, either combined or in separate layers. An earth model with vertical aligned fractures embedded in a finely layered background is termed as Orthorhombic earth model.

These type of anisotropy causes azimuthal travel-time variations which can become apparent at near-to-mid offsets (offset-to-depth ratios of 0.5 and beyond). Study of azimuthal travel-time variations is important for delineation of fracture orientations.

Mr. S.P. Singh introduced the concepts of ES360 imaging of M/S Emerson-Paradigm. He also introduced the concept of anisotropy and its need. He has explained how ES 360 Reflection gather preserves the azimuthal information which is helpful in inversion of the elastic modulus parameters needed for Orthorhombic Earth Modelling.

This knowledge sharing platform was also shared by some representatives of Regional Laboratories, Logging services, Panvel and a few superannuated ONGC personals.

This technical session was attended by more than 60 geoscientists. It was a very interactive presentation. There was a good strength of young executives amongst the audience who took keen interest and participated in interaction. The presentation concluded with a very informative question-answer session.

This technical session is also attended by Shri U.S.D. Pandey, ED-CGS President, Mumbai Chapter, Shri K. V. Krishnan, GGM-HGS and Shri C.I.S. Rana, GM-I/C SPIC.

About speaker: Mr. Shiv Pujan Singh is Director Global Technology of Geophysical Services at Paradigm Houston. His main interests are modelling anisotropic velocity, including HTI/orthorhombic anisotropy for identifying fractures using P-wave seismic data and full azimuth image gathers, and AAV inversion for fracture mapping using full-azimuth gatherers. He has more than 32 years of experience in the field of data processing.