Honorary Lecturer-SEG, Sri D.P. Sinha delivers lecture at Dehradun on 3rd April 2013 on- Estimation of Earth Velocity Model - Bridging the Gap between Geology and Geophysics

3D depth migration has created many opportunities for exploration and production. At the same time, it has brought many challenges. An essential prerequisite for accurate imaging in depth is, of course, an accurate estimation of the velocity earth model. Depth imaging essentially consists of two processes travel time computation and downward extrapolation of the observed wave field through a suitable algorithm. For computing travel times, we need to start with an accurate depth-velocity interval model, which in turn, requires accurate reflection geometries in depth with layer interval velocities. During the process, one can check the various geological hypotheses which match the observed data (i.e., whether the horizons and velocities used in the depth model make geologic sense). For this purpose, we combine the pre-stack velocity analysis and model building tools to obtain the accurate initial velocity model.

Either layered or non-layered velocity models or a combination of two can yield the best possible earth velocity model which may bridge the gap between geology and geophysics. In many geologically complex areas, especially in hilly terrain, we do not get velocity semblance that is adequate to obtain a good velocity earth model for the area. In such areas, estimation of the earth velocity model has a certain amount of uncertainty regarding layer velocity and layer geometries. This can be quantified with interpretation efforts and prior geologic information.

He showed many case histories from the world over and discussed different aspects of depth imaging, computational capabilities needed to meet the rigorous computing with different depth imaging packages, the scenario of present computational capabilities at the world level vis-a vis India. He emphatically elaborated to improve upon the present status with increasing of computing capabilities. Mr Sinha demonstrated how depth imaging with focussed approach can altogether change the seismic picture, which in turn leads to change of exploration and exploitation strategies. The exhaustive interaction of the participants with Mr Sinha was quite educative for all, particularly the young processers and interpreters who listened the talks with rapt attention.

Vice President SPG-India Sri C M Vardarajan, presented memento to Sri D P Sinha. Sri N S Dangwal Secretary SPG-India presented vote of thanks.

Interactive session after lecture.