Seismic Exploration: Broadband and Beyond
A.K. Dwivedi, Basin Manager, Western Offshore Basin, ONGC, Mumbai, India

As the hydrocarbon E&P industry is venturing into ever deeper and more complex areas, the challenge of exploration and exploitation of oil and gas in such settings is growing all the time. Innovative, alternative approaches are needed to deal with ever increasing needs of better imaging, interpretation and understanding of subsurface. In this context there has been more and more expectations and deliverability from the development in seismic API. The main driver to these expectations being seismic resolution improvement through enhanced low and high frequencies. In the recent past advancement in marine seismic acquisition has evolved around improving the bandwidth of seismic signal by enhancing low and high frequencies information under the Broadband API. Structural imaging though was/is the main objective, reservoir characterization improvements has been the key requirement/expectations from broadband seismic applications. Broad band may prove to be very effective and vital, not only in exploring the frontier areas but it could be vital to maximize recovery from existing fields and also to devote attention to the vast potential of unconventional hydrocarbon resources like shale gas. In general, it is evident that success comes from an integrated effort between acquisition and processing innovations.

The industry expectations from broad band seismic would largely focus on capturing the full value of surveys through

- Reduced turnaround time in data acquisition, processing & interpretation
- Better understanding and better utilization of full seismic wave-field.
- Improved reservoir characterization all the way from velocity accuracy to facies and fluid predictions, key for sedimentary information which can be directly read from seismic. Continued emphasis on current trend in seismic data acquisition i.e., more azimuths, more offsets, more frequencies.
- Quantitative seismic reservoir monitoring through 4D.