

## **Anisotropic Imaging of Okubotin 3-D Seismic Survey**

**Adeboye A. Oni, Gislain Madiba, and Berti Ozumba**

*Geosolutions, Shell Petroleum Dev. Co. Nigeria, Port Harcourt, Nigeria.*

With the maturity of the Niger Delta region, having been producing hydrocarbons for the past fifty years, exploration has to look deeper to find more economic accumulations. Some of the consequences of looking deeper include the onset of overpressures and velocity anisotropy. One of the measures to counter these challenges in Shell Nigeria is the introduction of anisotropic prestack depth migration for all newly acquired long offset 3D seismic data.

The need to properly image the deep leads to acquisition of long offset data as in Okubotin 3D survey. The consequence is that Pre-Stack Depth Migration (PSDM) based on isotropic velocity model assumptions, though effective in imaging conventional reservoirs at shallower levels, is no longer adequate. The introduction of the long offset acquisition brings about a new challenge to derive an accurate velocity model to correct for the so-called 'hockey stick' effect at long offsets. Resolution of the velocity challenge helps in the better imaging of steep dips and corrects for non-hyperbolic moveout on Common Mid Point (CMP) gathers to give better image for the deep exploration plays in the field.

This paper presents a simple workflow for the use of anisotropic velocity model building in Okubotin area. It discusses the possible causes of anisotropy and the impact of anisotropic Pre-Stack Depth Migration processing of seismic data in Onshore Niger Delta. Results showed a much-improved imaging of the subsurface revealing new play potentials that were hitherto unknown in the area.