

# **What It Is Inside The Diaper----The Application of Multi-Component Seismic In YGH Basin**

HE HANYI, Exploration & Development Research Center of CNOOC, Gaobeidian City, China

YGH Basin is located in northern part of South China Sea, west to Hainan Island. It's a Tertiary basin with over 10,000 meters sedimentation. The huge volume of shale is a hydrocarbon kitchen. High temperature and over-pressured section is characterized by a series of diapers, which are hydrocarbon vertical migration pathways, and formed a series of anticlines with large area (200-300km<sup>2</sup>). On conventional seismic sections the diaper represent as a blurry-zone (absent reflections or very low S/N).

The problem is that what it's inside the blurry-zones? There are two geological models: model A: Mud-diaper or igneous, The plasticity shale was drove up by over-pressure, and pierced anticlines in deep sections, transported hydrocarbons to both shallow and deep structures. The shale inside diapers sealed the deep anticlines after penetration actions. In this case, hydrocarbon would be accumulated in the deep structures. Model B: Flowing-diaper, The mixed water, oil and gas flowed up through fractured sections to the shallow anticlines, but can not seal the pieced structures.

CNOOC shot several multi-component lines on the diaper anticlines to identify what it's inside the blurry-zones. The work is successful. The converted section removed the P wave's blurry-zone on anticline L3, indicate that the blurry-zone is a flowing-diaper because converted wave isn't influenced by flowing (especially by gas). The thing is just opposite on the anticline L1, both P wane section and converted section didn't received reflections in the blurry-zone. It's proved that the blurry-zone is caused by lithology changing.

Conclusion: The multi-component seismic can get more information than conventional. It not only can indicate hydrocarbon directly, but also can resolve difficult geological problems.