

Cenozoic interaction processes of forearc, strike-slip and foreland basins along the NE Japan and Kuril arc junction

TAKANO, Osamu^{1*} ; ITOH, Yasuto² ; KUSUMOTO, Shigekazu³

¹Japan Petroleum Exploration, ²Osaka Prefectural University, ³University of Toyama

The N-S trending zone from the forearc side of the northern NE Japan arc to central Hokkaido, which corresponds to the Sorachi-Yezo belt or Ishikari-Teshio belt, demonstrates a complex tectonic history during the Cenozoic, since forearc, strike-slip and foreland settings had been interacted as the junction zone between the NE Japan and Kuril arcs. This study investigated the Paleogene to early Neogene sedimentary basin history along this zone to reveal the temporal and spatial interaction processes between the three tectonic settings, mainly based on 2D and 3D seismic survey, exploration well and outcrop survey data sets.

During the Paleogene, the northern part of this zone was situated in a territory of a strike-slip setting between the Okhotsk block and Eurasia Plate, whereas the southern part was situated in a forearc setting along the Pacific Plate subduction zone. Sedimentary basins created along the northern strike-slip part were characterized by an echelon-arranged small basins, whereas those along the southern forearc part were characterized by an uplifted trench slope break (TSB) on the subduction zone side of the forearc basins and by a bay to fluvial depositional system in the basin infilling sediments. The transition point between the strike-slip and forearc settings was originally located in central Hokkaido in early Paleogene, but it gradually shifted toward the south through the Paleogene. In addition, even in the southern forearc zone, strike-slip tectonics affected the forearc basins to be segmented into subbasins. When the strike-slip motion was the maximum at around mid Oligocene, transpressional uplift occurred along the trench slope break, and regional unconformity was created (Ounc: Oligocene Unconformity). After the formation of Ounc, the southern forearc part started to subside, forming a slope type deep marine forearc basins. During the Early Miocene, the Miocene unconformity (Munc) was created again due to Japan Sea opening-related NE Japan arc uplift, which was induced by eastward migration of the NE Japan arc. After this event, westward migration of the forearc sliver of the Kuril arc induced the collision of the Hidaka block, resulting in the formation of foreland basins along this zone in central Hokkaido, in which strike-slip faults were converted to a thrust belt. The thrust block on the Hidaka side provided a large amount of clastics into the basin to form a thick pile of turbidite successions in the foreland basins. Geohistory diagrams showing basin subsidence history after this collision event demonstrate a completely different pattern between the forearc and foreland territories.

Keywords: Sanriku-oki, central Hokkaido, Early Cenozoic, forearc basin, strike-slip basin, foreland basin