



3D Seismic Analysis of Geometry and Spatial Distribution of Seismic Chimney in the Ulleung Basin, East sea of Korea

Nyeon Keon Kang (1), Dong-Geun Yoo (1), Bo Yeon Yi (2), and Byong-Jae Ryu (1)

(1) Petroleum & Marine Research Division, Korea Institute of Geoscience and Mineral Resources, 92 Gwahang-no, Yuseong-gu, Daejeon, 305-350 Korea (nkkang@kigam.re.kr), (2) Department of Energy Resources Engineerig, Pukyong National University, Busan 608-737, Korea

Analysis of seismic data acquired in the Ulleung Basin, East Sea of Korea reveals a number of seismic chimneys characterized by velocity pull-up and reduced reflectivity. These seismic chimneys probably result from fluid-gas upwelling into the gas hydrate stability zone. Based on the geometry and distribution patterns, seismic chimneys in the study are can be divided into two groups. Group1 is characterized by seismic chimneys vertically grown to near surface with sub-circular geometry, whereas Group 2 is characterized by seismic chimneys buried within subsurface with elliptical geometry. According to their distribution pattern, Group1 is dominant in SE part of the study area, where fault system is rarely developed, while Group2 is dominant in NW part of the study area, characterized by vertically faulted system within the strata. Group1 shows a large dimension and low frequency of occurrence, whereas Group2 shows relatively small dimension and high frequency of occurrence. These results suggest that Group1 is interpreted as high flux seismic chimney, while Group2 is interpreted as low flux seismic chimney associated with vertically faulted system.