



Forming factors of gas hydrate chimney in the Ulleung Basin, East Sea

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Seismic chimneys ranging in width from 200 m to 1,000 m are observed in the seismic sections obtained in the Ulleung Basin, East Sea. In consequence of Ulleung Basin Gas Hydrate Expedition 1 and 2, concentrations of gas hydrates were identified. Especially, 6 chimney sites were drilled and the occurrence of gas hydrate was identified at all wells. Through the interpreting seismic section, three factors affect the formation of gas hydrate chimney; mass transport deposit, fault, igneous intrusion. These three factors result in three case of forming gas hydrate chimney. Firstly, gas hydrate chimney appears predominantly in the fault zone. Deep-rooted fault reach to mass transport deposit and gas hydrate chimney which is mostly rooted in mass transport deposit is formed. Secondly, Gas hydrate chimney appears linked to igneous intrusion. Igneous intrusion result in forming fault in overlying strata. Similar to first case, this fault traverses mass transport deposit and gas hydrate chimney rooted in mass transport deposit is created. Thirdly, gas hydrate chimney is formed at thick mass transport deposit without fault. In this case, chimney is not reach to seabed in contrast with first and second case. The thickness of mass transport deposit is 0.2 second in two-way travel times. Overburden load cause to pressure at the upper part of mass transport deposit. This leads to fracture in overlying sediments and form gas hydrate chimney.