Tectonics and Trap Development in the Ulleung (Tsushima) Back-Arc Shelf Basin, East Sea, Korea

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Most prospects in the Ulleung shelf basin, Korea occurred with NE-SW and N-S trending folds. NE-SW trending folds developed together with thrust faults at about 12.5 Ma when the Izu-Bonin arc collided against the Japan Island, while N-S trending folds formed in Pliocene under the compressional stress regime. Structures in the less deformed platformal area are anticlines associated with N-S trending folds. Their reservoirs are delta front sandstones with an average porosity of 15% and permeability of more than 10 md, and sealing was provided by shale-filled channels. Structures in the southeastern faulted and folded area resulted mainly from the 12.5 Ma tectonic event. Their reservoirs are deep water turbiditic sandstones formed early in basin development. Their porosity ranges between 20% and 29%, and permeability averages at 12 md. Twenty three wells were drilled for 13 structures. One discovery was made and is producing, 6 showed substantial gas and/or condensate flows, and the rest indicated gas shows. Still many structures remain untested, and numerous geophysical anomalies are observed especially in deep sections. The basin is considered to be frontier, and deep drilling to test large structures in depth would open new plays promising huge reserves close to a consumer market.