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First attempt to drill down hydrate mound and gas chimney by BGS Rockdrill 2

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A series of shallow piston coring (PC) has identified dense accumulation of massive gas hydrates in the upper part of hydrate mounds and gas chimneys in Japan Sea since 2004, however, because of limited penetration of PC, distribution and resource potential of gas hydrate below ˜10 mbsf have not been clearly answered as yet. On the other hand, 3D seismic profiles have revealed significant pull-up structure, a characteristic velocity pseudo-structure, in gas chimneys, suggesting an accumulation of significant amount, probably 20 to 30 vol.%, of gas hydrates in gas chimneys. In the summer 2013, Meiji University and British Geological Survey deployed BGS benthic drilling machine, Rockdrill 2, on hydrate mounds in Joetsu basin, Japan Sea, and successfully drilled through inhomogeneous, gas hydrate- and carbonate-bearing hard sediments and occasional soft and gassy sediments down to 32 mbsf. Core recovery was unfortunately low throughout the coring due to extensive dissociation of gas hydrate and gas expansion during and after coring. However, we could recover massive gas hydrate samples, 5 to 12 cm long, from a number of horizons down to 32 mbsf. Several 2 to 7 m thick zones of gas hydrate accumulation have been inferred from integrated profiles of drill logs, video-monitor observation, and discontinuous sediment core record. Shallow drilling of Rockdrill 2 is likely to have proved a dense distribution of gas hydrates in deeper part of hydrate mounds and gas chimneys.

Keywords: gas hydrate, Japan Sea, hydrate mound, gas chimney, Rockdrill 2