Bulgarian gas hydrates: assessment from pBSR

Atanas VASSILEV

Institute of Oceanology- BAS, PO Box 152, Varna 9000, Bulgaria

gasberg@mail.bg

In the Black Sea BSRs are discovered in 17 areas and 4 fields are outlined. This article is a first attempt at gas hydrate (GH) study from probable bottom simulating reflectors (pBSRs) for the Bulgarian part of the Black Sea.

Procedures

Look for crossing reflections (BSR), starting from the upper part of continental slope and continue in direction to the abyssal, if there are continuous transparent zones. Potential BSRs and GH spreading are visually identified with the Landmark's ProMAX software on seismic records of Halliburton G.S. from 1992.

Results

Eleven probable areas with GHs are found in the northern deepwater part of the Bulgarian economical zone. Only one area is located outside the GHSZ determined from the model. The reason could be an error, a relict or H_2S-hydrate deposit.

The three closest to the coast areas are "reached to" the South-Moesian Fault which is a Northern and Western boundary of the Kamchian Trough. Thus they outline this main obstacle for HCs' migration. Gaseous flares in the water body, registered from expeditions of the IO-BAS are situated on the boundaries of these areas.

The largest area is with a complex shape and a "peninsula of instability" in the central part. Multiple BSRs are registered in 2 sub-areas. The most of relief of the probable BSR is close to the relief of the model GHSZ base, but is shifted to the shallow waters and more wide. This could be result from lack of geothermal station data.

Four areas are longer than 10 km and one reached 60 km. The total area for which could be assumed existence of GHs is 2,600 км^2. The determined min, average and max thickness of the sediments with GHs are 8, 240 and 580 m and their total volume - 620 км^3.

The result for potential reserves of GHs is ~50 км^3 and for trapped in them Methane – 7,500 км^3 in the GHSZ. Assuming the existence of a zone with thickness of 100±5 м with free gas content of 1±0.1%, the total Methane reserves increase to ~7,800 км^3 with an accuracy of ±25% (4±1 Gt or 4±1×10^{-3} Tt Carbon).

Conclusions

This quantity exceeds 6-times the assessment of Lüdmann for the area of paleo-Dnepr and is 18% from the Black Sea reserves or 0.04% of the world total - 10 Tt.

The 3 areas connected with seeps could become a key for the global warming study.

Results suggest a high oil and gas potential of the area and complex paths and processes of HC distribution.