

Environmental risk of resource development in methane hydrate concentrated zones in Eastern Nankai Trough area

Koji Yamamoto[1]; Sadao Nagakubo[2]

[1] JOGMEC; [2] JOGMEC/JDC

<http://www.mh21japan.gr.jp/cgi-bin/dnet/dnet.cgi?>

The Research Consortium for Methane Hydrate Resources in Japan (MH21) was established to realize the National gas hydrate development program of Japan that was released in July 2001, and has investigated the abundance and distribution of gas hydrate in Eastern Nankai Trough area (Pacific off Sizuoka to Wakayama prefectures) as a model field. As the result, thick pore filling type deposits of gas hydrate in sand layers of turbidite sediments were found. Such state of the hydrate deposits is regarded as the most economically high potential prospect, and is named as *concentrated zones*.

On the other hand, laboratories and numerical modelling as well as field scale production tests in northern Canada have revealed the effectiveness of *depressurization method* as the most feasible gas production techniques in such *concentrated zones*.

According to such research results, MH21 Research Consortium has investigated the possible environmental risks of gas hydrate production using depressurization method.

If the production facilities were damaged by any reasons during operation, leakage of methane gas to ocean and atmosphere can happen, however, such risk should be small under the condition of depressurization, because once the production by artificial lift was stopped, pressure will recover by the intrusion of sea water to a wellbore and formation. Therefore, the pressure and temperature condition will move to more stable condition for gas hydrate. Pressurized conventional oil and gas resources may have higher risk.

Another possible risk is a leakage of produced gas through seafloor. If methane hydrate production makes high pressure or temperature zones in sediments, the risk should be considered. However, depressurization method makes opposite condition, low pressure.

Deformation and subsidence of the sea floor may be unavoidable but does not cause serious concern on the safety. Some have argued that hydrate dissociations in wide area may cause landslide due to weakened formation by dissociation. To manage the concern, the test site should be chosen carefully and formation property alternation should be well known.

As mentioned above, at present, risks of methane hydrate resource development in the concentrated zones by depressurization method is comparable or less serious than conventional oil and gas production, we concluded. this evaluation should be verified with offshore production tests that are planned in 2012 or later.