

Development and Use of Two Approaches for Evaluation of Future Volcanic Hazard

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Nuclear Waste Management Organization of Japan (NUMO) has developed technical basis for selection of suitable areas for a repository and conducted relevant researches since the publication of Siting Factors for the Selection of Preliminary Investigation Areas (Siting Factors). Two approaches, deterministic/empirical and probabilistic approaches, for evaluation of future volcanic hazard in NUMO are described in terms of development activities and their use.

Siting Factors are constructed based on the general consensus that future geological environment of Japan can be predicted deterministically/empirically for several tens of thousand years by extrapolating past geological information. After the publication, NUMO extracted remained issues on evaluation of future volcanic hazard and started researches, for example, on improvement of reliability in predicting occurrence of new volcanoes. NUMO, with the deterministic/empirical approach including results of these researches, basically thinks it is possible to make fully reliable evaluations on the literature surveys and preliminary investigations.

Since the same time, NUMO has annually organized International Tectonics Meeting which aims at acquiring international consensus on availability of evaluation of active tectonics in Japan, and at integrating state-of-the-art technologies and know-how's in the world into NUMO's evaluation methodologies. In the early stage, there was a consensus that a probabilistic approach should be applied to address issues involving occurrence of new volcanoes in areas between volcanic clusters and in areas of monogenetic volcanism. Subsequently, a working group which consists of international experts was organized and a study on comprehensive evaluation methodology employing several probabilistic methods in parallel has been conducted*. NUMO will take such a probabilistic approach to supplement the deterministic/empirical approach depending on the geological environment of volunteer areas.

Reference:

*Apted, M., Berryman, K., Chapman, N., Cloos, M., Connor, C., Kitayama, K., Sparks, S. and Tsuchi, H. (2004): Locating a Radioactive Waste Repository in the Ring of Fire, EOS, Vol. 85, No. 45, pp. 465 and 471.