2. Introduction

The natural background radiation had been out of the framework of radiological protection because of its natural occurrence. Some of technologically enhanced naturally occurring radioactive material (TENORM), such as radon and monazite sand, gradually became a target for radiological protection. In ICRP publ.60[1], the following four natural sources were listed as part of occupational exposure:

- operations in workplaces where the radon concentration is high,
- operations with materials that contain significant traces of natural radionuclides,
- operation of jet craft, and
- space flight.

All of the above were considered to be controlled from the viewpoint of amenability to control.

The United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) has accumulated a large amount of data on NORM/TENORM issues in a world-wide scale over a long period of time. It was reported in UNSCEAR 2000[2] that the public exposure could be enhanced by NORM, such as treatment or production of phosphoric acid, mineral ore, uranium mining, zircon sand, titanium pigment, fossil fuel, oil and its extraction, building material and so on.

On the other hand, the IAEA published the Basic Safety Standard (BSS)[3] in 1996 incorporated with the radiological protection principle of ICRP publ.60. In the BSS, the exemption levels for each radionuclide were proposed including natural radionuclides. Discussion for the introduction of BSS exemption levels into the regulatory system has commenced mainly in Europe and Japan. In the European discussion, the new concept of "work activity" was introduced and the 300 μSv/yr of dose criteria was set instead of 10 μSv/yr for "practice". In the Japanese discussions, the direct application of the BSS exemption level to NORM is not appropriate and it is better to use the intervention exemption concept, which was introduced in ICRP publ.82[4].

In international movements related to NORM/TENORM situations, the Radioactive Waste Management group in FNCA (Forum for Nuclear Cooperation in Asia) organized a TENORM subgroup for discussion/survey of NORM/TENORM problems. The TENORM discussion meetings were held at Australia in February 2003, at Malaysia and Viet Nam in August 2003, and at China and Thailand in August 2004. This report summarized the results of NORM/TENORM discussion/survey meetings in the FNCA activity, including the international concepts of radiation protection on TENORM and the present status of each voluntary country.