

# ENVIRONMENT

## Technologies for Better Quality of Life

### **PASSIVE MONITORING SYSTEM FOR ENVIRONMENTAL RADON-THORON DOSIMETRY**

Radon and Thoron are found ubiquitously in the environment. They are known to build up in indoor air, especially under poor ventilation conditions. These gases give rise to progeny species which constitutes the largest component of the natural radiation dose to humans.

Their large-scale monitoring is necessary for obtaining information on background radiation dose received by the members of the public.

Passive detection techniques are the best options available.

#### **RADON-THORON DISCRIMINATING TWIN-CUP DOSIMETER**

Radon, Thoron and their progenies are detected by solid-state-nuclear track detectors (SSNTDS), which record tracks when alpha particles pass through them.

For monitoring Radon and Thoron individually, the SSNTDS are placed in two separate compartments of a cylindrical plastic chamber.

The opening of one compartment is covered with a glass fibre filter paper, which allows both Radon and Thoron gases into the cup. The detector placed in this compartment records tracks due to Radon and Thoron.

The opening of the other compartment is covered with a low permeability membrane which allows only Radon to pass through. Thoron's entry is discriminated due to its short half-life. Hence SSNTD in this compartment registers tracks contributed by Radon only.

BARC has conducted countrywide Radon-Thoron survey, involving 10 universities. Nearly 6000 measurements have been carried out in about 2000 dwellings belonging to various regions (North-Eastern, Northern, Western, and Southern) of India.

The mean inhalation dose rate to the Indian population due to Radon, Thoron and their progenies is estimated to be  $0.97 \text{ msv.y}^{-1}$  (milli sievert per year).

Dosimetry in the high background radiation areas (Kerala) is being carried out. The dosimeters are being deployed for assessing inhalation doses to the populations living in various panchayats.