RADON-2008: DAE-BRNS THEME MEETING:
A REPORT

The Health, Safety and Environment Group (HS&EG) organized a DAE-BRNS sponsored theme meeting entitled: “RADON-2008: Advances in the methods of assessment of exposure due to radon, thoron and their decay products” during March 11-13, 2008, in CT&CRS auditorium, Anushaktinagar, Mumbai. The objective of the meeting was to enhance and share the knowledge on advanced measurement techniques and theoretical models for assessing radon, thoron and progeny exposures. This was attended by 44 non-DAE participants from 25 national universities and institutions and 30 DAE participants nominated from different divisions in BARC.

The meeting was inaugurated by Dr. S. Banerjee, Director, Bhabha Atomic Research Centre, Mumbai. Mr. H. S. Kushwaha, Director HS&E; Prof. S. Tokonami, National Institute of Radiological Sciences (NIRS), Japan and Dr. K.S. V. Nambi, Former Head EAD were also present on this occasion. Dr. Banerjee emphasized the need for multi-parametric research and the importance of theoretical research along with the coordinated experiments. Dr. Nambi stressed on the fact, that the new developments in the Environmental Assessment Division are a major step forward which need to be communicated and shared with other Indian researchers, working in the field.

Prof. Tokonami in his key-note address, emphasized the need to measure thoron, which has always been underestimated and as a consequence of which sparse epidemiological data for thoron is available. He discussed the radon/thoron discriminator detector (RADUET) and calibration chamber at NIRS, Japan and CR-39 based deposition monitors and the related epidemiological studies carried out by their group. Dr. Y.S. Mayya, Head AMSS and convener RADON-2008, explained the need for an integrated approach (covering both theoretical modeling and experiments) towards assessment of radon, thoron and their progeny. He defined the self-compensating theory, stressing the need for deposition based sensors which can be efficiently used to mimic lung deposition.

The lectures delivered in the technical sessions were compiled into a proceedings volume. The following topics were discussed.

Mr. H. S. Kushwaha, Director HS&E Group giving the Welcome address and Dr. S. Banerjee, Director, BARC presenting the Inaugural address
Dr. M. Seshadri, RB&HSD, BARC discussed the biological effects of radiation exposures and the complexities in estimation of response at low doses.

Dr. P. M. B. Pillai, EAD, BARC, elaborated on thoron and its progeny exposures at the front-end of Nuclear Fuel Cycle activities with special reference to radioactive minerals, thorium and rare earths processing.

Mr. B. K. Sahoo, EAD, mentioned about the theory of radon emanation and methods of source term estimation by the newly developed flux measurement techniques.

Dr. B. K. Sapra, EAD, discussed the dynamics of progeny-aerosol interaction and the methods estimation of activity size distribution of the aerosol attached radon/thoron progeny.

Dr. Rosaline Mishra, EAD, discussed the recently developed direct progeny sensors based on monitoring of deposition velocity.

Dr. K. P. Eappen, EAD, elaborated on the Radon monitoring and real-time continuous radon/thoron monitor for environmental applications.

Dr. G. K. Srivastava, EAD, discussed the measurement of radon and daughter products in U-mines and environment.

Dr. I. S. Singh, IDD, gave a detailed depiction on the current status of lung dosimetry.

Dr. R. C. Ramola, HNB, Garhwal University discussed the studies on prediction of earthquakes based on radon/thoron measurements.

Dr. T. V. Ramachandran, EAD, presented the results of the last country-wide CRP and gave a brief picture on the status of radon-thoron distribution in India.

Other speakers from various national institutes, presented the status of radon and thoron in different regions of India, facilities and advances in radon, thoron and decay product monitoring at other national
different environments, using new instruments developed in the Environmental Assessment Division, through a BRNS sponsored, national radon project involving Indian Universities. Dr. Y.S. Mayya presented the proposal giving the need for progeny measurements and the importance of parametric measurements. Suggestions on this project were invited from Mr. Markandeya, Head, Planning and Co-ordination Division, BARC, Dr. K.S.V. Nambi (Former Head, EAD) and other participants for evolving a target oriented project of about 2 years duration, involving about 10 institutions.

On the 2nd day of the meeting, hands-on demonstration of the instruments developed in Environmental Assessment Division was held. The working principle and operation of the various samplers and instruments such as Progeny Deposition monitors (DTPS and DRPS), Unattached/Attached fraction Progeny sampler, Real time Radon and thoron monitor, dynamic Radon-Thoron flux monitor and Particle Aerodynamic Size Separators (PASS) was demonstrated.

A brainstorming interactive session was also held, to initiate a multi-parametric study programme to validate the deposition dosimetry technique in departments, geology of radon and related tectonics, influence of trace element geochemistry, exhalation rate from various sources, gamma levels and the exposure levels measured in high background radiation areas.

The concluding session of the theme meeting was held on 13th March 2008. Dr. D. N. Sharma, Head, Radiation Safety Systems Division (RSSD); Dr. Pendharkar, Head, Internal Dosimetry Division (IDD) and Dr. K.S.V. Nambi, Former Head, EAD, graced the occasion.