Centre for Advanced Research in Environmental Radioactivity (CARER)
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With technical support from

Bhabha Atomic Research Centre (BARC)
Trombay, Mumbai-400085, India

International Intercomparison Exercise on

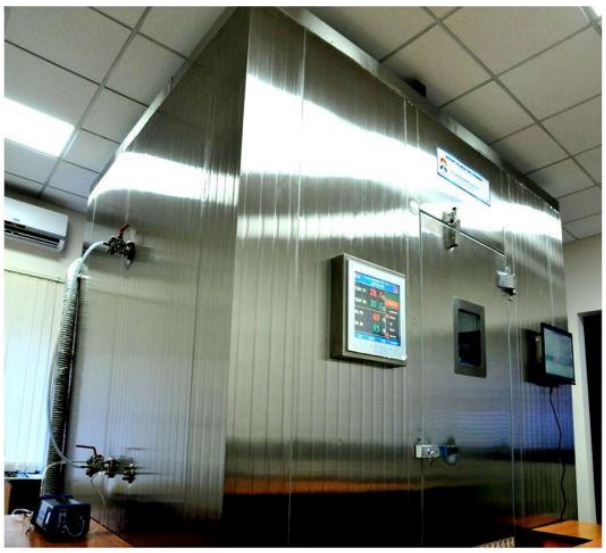
Radon Measuring Devices

Aug - September 2022

Need of Intercomparison Exercises

Increasing efforts have been made for monitoring ^{222}Rn, ^{220}Rn, and their progeny concentrations in dwellings due to their accountability for nearly 50% of the total dose to the general population. Measurements of ^{222}Rn, ^{220}Rn, and progeny are carried out using a host of cumulative passive detectors and real-time active monitors. The existing and newly developed measurement techniques are tested periodically for their performance. Also, harmonization of ^{222}Rn and ^{220}Rn measurements is prioritized worldwide, and the necessity of periodic intercomparison exercises has been emphasized. In this context, intercomparison studies play a crucial role in the quality control and assurance of ^{222}Rn measuring devices. Hence, an international intercomparison of ^{222}Rn measuring devices is being organized by the Center for Advanced Research in Environmental Radioactivity (CARER), Mangalore University, with technical support from Bhabha Atomic Research Centre (BARC), India.

Radon chamber at CARER for calibration of ^{222}Rn measuring devices



^{222}Rn Chamber at CARER, Mangalore University

The walk-in type ^{222}Rn calibration chamber of volume 22.7 m^3 at CARER, Mangalore University, is designed to perform the calibration and intercomparison exercises of various active and passive ^{222}Rn and progeny measuring devices. For more details about the calibration chamber, please refer to the below publications:

DOI: 10.1093/rpd/ncz188
https://www.nature.com/articles/s41598-020-73320-9
https://www.nature.com/articles/s41598-020-71872-4
DOI: 0.1016/j.jenvrad.2020.106298

Exposure Conditions

The proposed intercomparison exercise will be performed in the ^{222}Rn chamber at CARER, Mangalore University. Both active and passive radon detectors are expected from the participants for the intercomparison. Laboratories from about 10 countries have confirmed participation in the experiments. Two sets of exposures are planned, and the details are:

Parameter	Concentration (range)	Duration of exposure	Environmental conditions
Radon gas concentration	Low concentration exposure : (500 – 1000 Bq m^3)	15 days	Temperature (T) @ 25°C Humidity (RH) @ 80%
	Medium concentration exposure: (4000 – 8000 Bq m^{-3})	7 days	Temperature (T) @ 25°C Humidity (RH) @ 50%

Scheduled Timeline

Task	Date
Delivery of detectors at CARER	Before August 5, 2022
Exposure of the devices	Before September 5, 2022
Return of detectors	To reach the respective laboratories before August 5, 2022
Processing of the detectors and analysis of the data	Respective laboratories should send the data to CARER before October 31, 2022
Final report	December 31, 2022

Reference Monitors

The reference monitors used in the ^{222}Rn chamber at the CARER are AlphaGuard systems and Smart RnDuo. They are calibrated using a pylon source at BARC, Mumbai.

Those who are interested in participating in the intercomparison may contact:

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