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Measurement of Radon Concentration in Workplaces at Thailand Institute of Nuclear Technology (TINT), Khlong 5, Pathumthani, Thailand prior and during Decommissioning

Rare Earth Research and Development Center (REDC) has been set up at Thailand Institute of Nuclear Technology (TINT), Khlong 5, Pathumthani, Thailand for separation and extraction of rare earth elements from monazite ore in 1995. This facility had been shut down since 2005 and TINT recently is carrying out decommissioning. The aim of this research is the determination of radon concentration in the buildings of the REDC prior and during decommissioning. The radon concentrations in various buildings including the monazite ore-U/Th processing (building no.8), the rare earth separation (building no.9), the boiling operation (building no.10), the laboratory (building no.12), the old monazite ore-U/Th storage (building no.14), the office (building no.1), and the institute's accommodation were measured using ionization chamber ATMOS 12 DPX detector for 3 h. The results showed that the radon concentrations varied from 16.00 ± 3.00 to 739.00 ± 27.00 Bq/m³ with an average of 149.00 ± 8.75 Bq/m³ for prior decommissioning, and 8.00 ± 1.00 to 1008.00 ± 28.00 Bq/m³ with an average of 189.23 ± 7.54 Bq/m³ for during decommissioning, respectively. The mean value of radon concentration was found to be lower than the action level of 1000 Bq/m³ for radon in the workplace recommended by the International Atomic Energy Agency (IAEA), except for the building no.8. The annual effective dose values were ranging from 0.12 ± 0.02 to 5.32 ± 0.19 mSv/y with an average of 1.07 ± 0.06 mSv/y for prior decommissioning, and 0.06 ± 0.01 to 7.26 ± 0.20 mSv/y with an average of 1.33 ± 0.05 mSv/y for during decommissioning, respectively. The mean value of annual effective dose was found to be less than the dose limited of 20 mSv/y for occupational radon exposure recommended by IAEA.

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