Geophysical Research Abstracts
Vol. 16, EGU2014-3816, 2014
EGU General Assembly 2014

Implementing remediation measures against radon for houses located in Baita-Stei uraniferous region

Constantin Cosma (1), Alexandra Cucos (Dinu) (1), Botond Papp (1), Andra-Rada Iurian (1), Mircea Moldovan (1), Bety Burghele (1), Oana Dumitru (Rusu) (1), Robert Begy (1), Tiberius Dicu (1), Dan Fulea (1), Ciprian Cindea (1), Dan Nita (1), Liviu Suciu (2), Gheorghe Banciu (1), and Carlos Sainz (3)

(1) Interdisciplinary Research Institute on Bio-Nano-Science of Babeş-Bolyai University, Treboniu Laurean 42, Cluj-Napoca, Romania , (2) Research and Design Institute for Electrical Engineering (ICPE) Bistriţa S.A., Parcului 7C, Bistriţa, Romania, (3) Department of Medical Physics, Faculty of Medicine, University of Cantabria, Herrera Oria, Santander, Spain

Radon is the second cause after smoking, inducing lung cancer. Twenty one houses from the area of Băiţa-Ştei Old Uranium Mine (Romania) have been selected for remediation against radon, in the frame of the IRART project (2010-2013). The selection was performed from a batch of 303 houses (representing 58% of the total houses from Băita, Campani, Fînate and Nucet localities), following two campaigns of indoor radon measurements. Analysis of the preliminary data identified the targeted houses having initial indoor radon values between 800 – 2500 Bq m-3.
The remediation techniques have been particularly selected for each house after detailed diagnostic measurements of indoor and outdoor radon, including subsoil, water supply and building materials, to identify the major radon source in each location. The different mitigation methods (e.g. pressurization, depressurization, aeolian extraction, antiradon membranes, isolation) were firstly tested for a representative pilot-house. The efficiency of the remediation strategy was estimated in each case based on the coefficient of remediation (R) through both continuous and integrated measurements:

R=(Ci-Cf)/Cix100

where Ci and Cf are the radon concentrations before and after the remediation.
The final results of the project showed that the applied mitigation techniques were appropriate for our purpose, leading to values of the coefficient of remediation/house in a range of 65.2-95.1%, with a medium value of 80.9%. Our results are comparable with the ones obtained in the RADPAR European Project (2009-2012), which involved 14 countries.
The medium radon concentration (992 Bq m-3) of the 21 targeted houses was reduced to a value of 160 Bq m-3. Based on the TF-TR model for the estimation of radon exposure risk, the project implementation will reduce to half the lung cancer cases for the habitants of theses houses.

Acknowledgements: The survey was supported by the Sectorial Operational Programme “Increase of Economic Competitiveness” co-financed by the European Regional Development Fund under the project IRART 586-12487, Contract No. 160/15.06.2010.