ADVICE ON SETTING A REFERENCE LEVEL FOR RADON CONCENTRATIONS IN LONG-STAY INSTITUTIONS

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Environmental Protection Agency
McCumiskey House
Richview
Clonskeagh
Dublin 14
D14 YR62

Tel: +353 1 268 0100
Email: radon@epa.ie
Web: www.radon.ie

1. Radon is a radioactive gas. Radon is formed in the ground by the radioactive decay of uranium, which is present in small quantities in all rocks and soils. Radon which surfaces in the open air is quickly diluted to harmless concentrations but when it enters an enclosed space, such as a building, it can sometimes build up to unacceptably high concentrations. Long term exposure to high radon concentrations increases the risk of lung cancer.

2. In 1990 the Government set a national reference level of 200 becquerels per cubic metre (Bq/m^3)[1] for radon exposure in the home. The reference level for homes is advisory. It represents a level of risk similar to other everyday risks such as fatal accidents on the road or deaths from accidental falls.

3. Article 65 of the Radiological Protection Act 1991 (Ionising Radiation) Regulations of 2019 places a general duty on employers in high radon areas to test for radon. If radon concentrations above 300 Bq/m^3 are found employers are required to take remedial action or implement an on-going system of radiation protection relevant for Existing Exposure Situations. Implementing such a system is onerous and is only needed when remedial work has failed to reduce the radon concentrations and therefore the risk must be managed.

   Radon remediation is usually straightforward therefore this is the preferred and simplest course of action to demonstrate compliance with the regulations.

   Further information about the requirements of Article 65 is available from the EPA's website: www.radon.ie.

4. The Health and Safety Authority has stated that, to comply with health and safety legislation, all indoor workplaces in High Radon Areas[2] must be measured for radon[3].

5. While most radon exposure situations are covered by the reference levels for homes and workplaces, there are some instances where much higher occupancy rates may apply. These include, but are not limited to, potentially long-stay institutions such as prisons, nursing homes and live-in training centres. Such institutions are effectively workplaces for staff and homes for those who reside there.

6. Radon exposure in long-stay institutions has been considered by international organisations such as the International Commission on

[1] The becquerel is the unit of radioactivity, equivalent to one radioactive disintegration per second
[2] High Radon Areas are those areas where the EPA has predicted that more than 10% of homes will have radon concentrations above 200 Bq/m^3. See the EPA's radon risk map on www.radon.ie
[3] http://www.hsa.ie/eng/Topics/Radon/

Radiological Protection (ICRP)[4] and the International Atomic Energy Agency (IAEA)[5]. Both the ICRP and the IAEA recommend that, in the interest of controlling radon exposures of the public, the reference level for homes should be applied.

7. A similar issue has previously arisen regarding radon exposure in schools. Schools are workplaces for teachers but not for pupils. The Department of Education and Skills has taken the view that the same level of protection should be afforded to children in school as in the home and has advised that the 200 Bq/m^3 reference level for homes should apply to radon exposure in schools.

8. Taking all factors into account, the EPA advises that the 200 Bq/m^3 reference level for homes should apply to those areas within long-stay institutions that are clearly used for residential purposes. In areas that are clearly workplaces and generally reserved for staff, the workplace reference level of 300 Bq/m^3 is applicable. Where there is a doubt as to whether the area is residential or a workplace, it is recommended that the lower reference level of 200 Bq/m^3 be applied.

9. This approach is consistent with international recommendations and with advice previously offered by the EPA in the case of radon exposure in schools.

12. While the reference level of 200 Bq/m^3 is advisory in nature, it is important that full account be taken of this advice in undertaking radon surveys[6] and when considering the need for remedial measures to reduce radon concentrations.

13. It should be noted that the results of radon measurements for long stay institutions should be seasonally adjusted, but should not be averaged. Worked examples of the use of seasonal correction factors are set out in the EPAs Protocol for the Measurement of Radon in Homes and Workplaces on www.radon.ie.

[4] Protection against Radon-222 at Home and at Work (ICRP Publication 65)
[5] Radiation Protection against Radon in Workplaces other than Mines (Safety Report Series No. 33)
[6] EPA Protocol for the Measurement of Radon in Homes and Workplaces. www.radon.ie