

Radon Emissions

Risks to human Health and proposed regulation

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Scope of presentation

- Source of emissions
- Incidence
- Hazards & Risks
- Epidemiology
- Proposed Regulation & Controls

Source of Emissions

- Naturally occurring
- Decay of natural uranium in geological strata
- Inert gas
- Alpha radiation - short range damage
- Most badly affected areas identified in the Radar Atlas of England & Wales
- Devon, Cornwall, Somerset, Derbyshire, parts of North & central Wales, parts of the North & Midlands

Incidence of hazard

- Mines – non coal > coal
- Homes – emissions from the ground beneath the house
- Schools
- All other occupied buildings

Risk to Human Health

- Radon from the ground is the largest & most widespread single radiation source in our environment
- Lung cancer can be caused by inhalation of radon in our residential & occupational environment
- There is an estimated > 1,000 deaths per annum attributed to radon in the UK

Epidemiological Studies

- Results confirm that high levels of radon can pose significant hazard in the home
- Risks are significantly increased for smokers
- Demonstrates a detectable risk for smokers & non smokers at levels below the current action levels used in most EU countries including the UK
- Radon is a non threshold toxic material

Exposure

- Average exposure in UK domestic situation 20 Bq/m³
- High levels recorded - 2,000 Bq/m³
- Current action level – 200 Bq/m³

Incidence of radon Induced lung cancer

- Highest risk in high emission areas
- But highest incidence in areas of relatively low emission levels of 10-30 Bq/m³

HPA Radon Assessment Services

- HPA/BGS – Radon Mapping identifies areas of greatest potential risk
- HPA – see UKRadon.org
- Radon measurement service for home assessment
- Advice on reducing radon levels in existing buildings
- Recommendations on Radon protection measures in new buildings

HPA Recommendations for Radon protective measures in new Buildings

- “the distribution of radon exposure in buildings across the UK indicates that most lung cancers attributable to radon are due to exposures in buildings below the UK action level. Reducing the average level will reduce the number of deaths. This can be done by changes to the Building Regulations.”
- Part C revision proposals:- Installation of a protective membrane within the concrete floor of all new buildings with passive ventilation of an underfloor void. Where a higher level exists as indicated by elevated post construction measurements a positive ventilation system incorporating a radon sump and an extraction fan.
- Reduction of the action level to 100Bq/m³ is also being considered

Costing and cost benefit

- Original estimate for the Part C recommended measures suggested a cost of £100 per dwelling and that a considerable level of cost benefit would be achieved by the introduction of these measures.
- Experience however suggests that is a significant underestimate and that the realistic cost to ensure an effective performance would require effective supervision and quality control system of all installations would be £400 – 500.

Timescale for revision of Part C and its introduction

- The BRAC committee was convened by DCLG in November 2008 to consider various revisions to part C & A. It met several times and a draft for consultation was prepared and agreed in June 2009
- The Part C amendments included the recommendations from the HPA on Radon measures and a more relevant section on dealing with contamination with reference to more recent best practice guidance and risk assessment
- Publication was anticipated for April 2010 but the process was suspended and a new plan for all necessary revisions of the Building Regulations was published which delays the Part C publication till sometime in 2013
- No satisfactory explanation for this delay has been made known!

Protective Measures for existing Buildings

- There are many initiatives involving the HPA/ HSE and local authorities dealing with reducing the risks from radon especially in high risk areas covering schools, public buildings, residential care homes and commercial buildings.
- They are generally in situations where the measured Radon levels approach or exceed the current action level