

Environmental **Radon** Newsletter

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Identification of a house in Ireland with extreme indoor radon concentrations

Catherine Organo and David Fenton, Radiological Protection Institute of Ireland (RPII)

In July 2003, a radon measurement carried out over a 3-month period in a house near Castleisland (County Kerry, southwest Ireland) gave a seasonally adjusted whole house average radon concentration of approximately 49,000 Bq m⁻³. This is the highest radon concentration ever recorded in a house in Ireland. It is almost 250 times above the national Reference Level of 200 Bq m⁻³. It gives rise to a dose that is more than 500 times the average radiation dose from radon received by a member of the public in Ireland.

Prior to the discovery of this house, the highest domestic radon concentration measured in Ireland was approximately 16,500 Bq m⁻³ in County Wicklow. Radon concentrations up to 6,000 Bq m⁻³ have previously been reported for both homes and workplaces in the neighbouring town of Tralee, and based on the results of the National Radon Survey*, two of the 10-km grid squares surrounding Castleisland are classified as High Radon Areas (where the predicted percentage of dwellings exceeding the national Reference Level is 10% or greater).

The householder in question was immediately notified of the high radon levels and urged to carry out remediation as soon as possible. He advised that although he had never smoked, he had been diagnosed with lung cancer in March 2003 and that his wife had died aged 41 of the same illness in 1998 after giving up smoking some 20 years previously. In fact, clinical concern that environmental exposure to radon might have been a causative or contributory factor had prompted his medical consultant to recommend that radon levels in the house be checked**.

On first surveying the house the remediation company found a room with no access (the original doorway had been closed off to facilitate



Room used as a 'radon sump', showing concrete lintels installed across the width of the room to create a false floor

a new downstairs bathroom). This room was the only one in the house with a suspended timber floor laid directly over the bare soil and was suspected as being the main pathway through which radon entered the house. The room was modified to install a sump over its entire floor area (see photo). Work was completed by September 2003. The results of 3-month post-remediation measurements indicated a dramatic reduction in the average radon concentration to less than 600 Bq m⁻³. Consideration of ways of achieving a further reduction in the radon levels has been recommended.

A thorough investigation of the possible causes of the high radon concentrations in the house was not possible as it was considered more urgent to carry out immediate remediation work to reduce the radon levels. However, it seems clear that the potential exists for the occurrence of high radon concentrations in buildings in and around the Castleisland area. The local geology in particular would appear to be conducive to the production

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POINTS OF CONTACT

Building Research Establishment (BRE)
Garston, Watford, WD2 7JR
BRE Radon Hot Line:
Tel: 01923 664707 Fax: 01923 664010
www.bre.co.uk

National Radiological Protection Board
Radon Survey
Chilton, Didcot, OX11 0RQ
Radon Freephone: 0800 614529
Fax: 01235 833891
www.nrp.org

Department for Environment,
Food and Rural Affairs
Zone 4-F7, Ashdown House
123 Victoria Street, London SW1 6DE
Tel: 020 7082 8497/8498 Fax: 020 7082 8474
www.defra.gov.uk

National Assembly for Wales
Housing Division
Cathays Park, Cardiff, CF1 3NQ
Tel: 01222 825219 Fax: 01222 825391

Environment and Heritage Service
Department of the Environment for
Northern Ireland
Calvert House, 23 Castle Place
Belfast, BT1 1FY
Tel: 01232 254754 Fax: 01232 254700

Scottish Executive Development Department
Housing Division 1
First Floor East, Victoria Quay
Edinburgh, EH6 6QQ
Tel: 0131 244 5575 Fax: 0131 244 5596

Health and Safety Executive
Health Directorate B6
Rose Court, 2 Southwark Bridge
London, SE1 9HF
Tel: 020 7717 6854 Fax: 020 7717 6717

Northern Radon Liaison Group
c/o Environmental Health Department
South Lakeland District Council
South Lakeland House, Lowther Street
Kendal, Cumbria, LA9 4UD

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Secretary: Gerald Hudd
46 Parkfield Drive, Taunton
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Steering Group on Radon
(Northamptonshire and elsewhere)
Environmental Health Department,
Daventry District Council
Lodge Road, Daventry
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Derbyshire Radon Steering Group
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Derbyshire Dales District Council
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Derbyshire, DE4 3NN

The Radon Council Limited
PO Box 39, Shepperton
Middlesex, TW17 8AD
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High radon houses found in Cornwall

Record Levels of Radon in Homes

Western Morning News

Soon after the extremely high radon house was found in Ireland, two houses with very high radon levels were discovered in Cornwall. The National Radiological Protection Board (NRPB) issued the following statement:

Two houses with high radon levels have been found in the Kerrier District of Cornwall; one with 17,000 Bq m⁻³ (becquerels per cubic metre of air) of radon, the other with 12,000 Bq m⁻³. The highest value previously found in the UK is 10,000 Bq m⁻³. These concentrations are well above the UK Radon Action Level of 200 Bq m⁻³.

NRPB has advised that action should be taken to reduce all radon concentrations which exceed the Action Level. The higher the concentration, the greater the risk to health and the earlier the remedial action should be taken. When the concentrations are very high, as in these two cases, NRPB strongly advises that effective action is taken as soon as practicable and certainly within a few months.

The householders in the two properties have been informed and advised of the health risks. One property is a rented flat; the other is a house occupied by the owner. The householder and the landlord of the flat are being given advice on remediation. Steps are in hand to renew the offer of radon tests to neighbouring householders.

These measurements were made as part of the Radon Roll-out Programme run by the Department for Environment, Food and Rural Affairs (DEFRA). The Local Authority, in this case Kerrier District Council, is a key part of the Programme that also involves the Building Research

Establishment as well as NRPB.

These organisations, together with the Health Protection Agency and the local medical authorities in Cornwall, are liaising to minimise the risk to the occupants of these and any other houses found with high radon levels.

Anyone concerned about the radon levels in their home can obtain a free information pack about radon (including details of how to obtain a test kit) by leaving their name, address and postcode on the free telephone number 0800 614529. Further information is also available on the NRPB website (www.nrp.org/radon/index.htm).

Test kits are available free of charge to householders in the highest risk areas of councils participating in the DEFRA Roll-Out programme. Householders should contact their local councils.

Silent killer back to haunt families

Western Daily Press

RISP - a new support package for employers

Tracy Gooding, National Radiological Protection Board

Most of the attention on radon in workplaces is geared at encouraging employers to undertake initial measurements, and rightly so. But we at the National Radiological Protection Board (NRPB) have been aware for some time that support has been lacking for those private sector employers who have found high radon levels in their workplaces.

The Ionising Radiations Regulations 1999 (IRR99) make several administrative demands upon the employer once a high result has been found, such as the need to consult a Radiation Protection adviser (RPA). However, in most cases, work to reduce radon levels will mean that the IRR99 no longer apply, which makes the routine RPA service unsuitable for all but the largest employers. A shorter-term solution is required, therefore, which is why we have developed the Radon Interim Surveillance Package (RISP). RISP is offered to employers with high radon levels along with their results, as the IRR99 apply immediately and some kind of action will be required.

Most employers with high radon levels are encountering legislation concerning radiation for the first time, so RISP summarises the main points

of the IRR99 which relate to radon. Clear information is needed for employers and employees alike, so an advice sheet, leaflets and other literature are provided, written in straightforward language.

Regular radiation measurements are standard in high radiation areas, and radon is no exception to this rule. NRPB advises that, in those locations where radon is known to exceed 400 Bq m^{-3} , radon measurements should be continuous until the radon levels are successfully reduced or the exposure to employees is controlled in some other way, for instance by restricting access.

RISP provides pairs of monitors for three two-monthly periods, therefore covering a total of six months, during which time it is intended that remedial work is planned and implemented. Of course, more monitors can be added as necessary, for instance if more detailed monitoring of a particular area is desired. If work is likely to take longer than six months, the monitoring can continue, although the additional monitoring costs this will incur should provide an incentive to speed it along. At some point, however, more

formal RPA arrangements might have to be considered.

Of course, the final part of the story is the remedial work, and we are aware that employers often find it difficult to find access to reliable builders for its installation. They may not be aware, for instance, that local councils often hold information on builders with experience in this area. RISP therefore provides a list of useful contacts and addresses, along with information on the types of remedial work available, its suitability in various situations and likelihood of success.

Over the past year, NRPB has developed a package that brings together the various strands required not only to comply with the IRR99 but also provides information on organising radon remedial work. Although we shall continue to improve it as further information becomes available, and with feedback from employers, we are confident that RISP is a valuable tool in helping employers to protect their employees from excessive levels of radon.

**For further information, contact Tracy Gooding on
Tel: 01235-822787 or
email: tracy.gooding@nrpb.org**

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and accumulation of radon, there being close proximity with an extended caving system and outcrops of Namurian Shale.

The RPII initiated a survey of the Castleisland area where 2,500 householders were invited to have their house tested for radon. To date measurements have been carried out in 377 homes and the results are

currently being interpreted. The RPII will continue to highlight the health issue of radon nationally and encourage householders, particularly those in High Radon Areas, to have radon measurements carried out in their homes.

* *Radon in dwellings - The Irish National Radon Survey*. Fennell, SG, et al. RPII Report 02/1,

Radiological Protection Institute of Ireland, 2002.

** *High radon concentrations in a house near Castleisland, County Kerry (Ireland) - Identification, remediation and post-remediation*. Organo, C, et al. *Journal of Radiological Protection*, 24, 107-120 (2004).

Providing clear information on radon

Daryl Dixon, National Radiological Protection Board

The fact that NRPB receives up to 10,000 enquiries a year about radon demonstrates a substantial interest in the subject among the general public. These enquiries come mainly to the NRPB Freephone number, 0800 614529, and usually request a radon information pack.

Information about radon may lead householders to request a measurement: currently around 1,500 requests for measurement are received from householders each year. If the information packs were the sole source of information, this would imply that 15% of the packs prompt a request for a measurement. In reality there are other stimulants, so the effect of the information pack is less than this.

NRPB has long recognised that the content of public information materials is critical in conveying the radon message effectively. It is important that leaflets provide key information, but too much or over-complicated material may lose people's interest. NRPB has recently, therefore, produced a pair of simple, direct and visually striking leaflets in an attempt to communicate more effectively. One encourages people to have a radon measurement, and the other encourages them to take action to

reduce high radon levels. The first of these is now included in radon information packs.

When the leaflets were presented to a regional radon steering group, the members of the group suggested that they could also be used as inserts in local newspapers and newsletters, be displayed in public places such as council offices, and distributed to workforces.

NRPB is keen to continue to stimulate increasing awareness about radon and will respond positively to requests to use this leaflet and other such material in local initiatives.

For copies of the leaflets, ring 01235 822622 or email daryl.dixon@nrpb.org

RADON: Don't ignore the risk *Measure it!*

Prolonged exposure to high radon is a health risk. NRPB advice is to reduce levels to below the Action Level of 200 Bq m⁻³ and ideally lower still.

- A measurement shows the risk from radon in your home
- A low result provides reassurance

RADON: Don't live with the risk *Reduce it!*

Prolonged exposure to high radon is a health risk. NRPB advice is to reduce levels to below the Action Level of 200 Bq m⁻³ and ideally lower still.

- Lower radon reduces your risk of lung cancer
- A large and rapid fall in radon level can be achieved
- Standard mitigation guides are available for builders

Reduce it:

Many builders have attended training events on radon under the Government radon roll-out programme. Information on this is held by the Environmental Health Department of the Councils listed overleaf. Other Councils may also be able to advise you. Specialist advice on remedies is available from the Building Research Establishment on 01923 664707.

- At around £700, cost is less than many home projects
- It can be done by a local builder, or even as DIY
- Reduced price re-test is available to check the work

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