

# Environmental **Radon** Newsletter

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## Radon and the Housing Health and Safety Rating System

*Tim Braund, Derbyshire Dales District Council*

One of the main planks of the Housing Bill currently making its way through Parliament is a fundamental change to the way in which housing conditions are assessed and enforced by local authorities. The new system is known as the Housing Health and Safety Rating System (HHSRS) and it will replace the fitness standard, a change that has been the subject of some heated debate amongst practitioners.

The basis of the HHSRS is that it requires a local authority inspector to consider a wide range of matters that give rise to hazards within dwellings and to give these a numerical score based on risk, enabling the direct comparison of different categories of hazard. The HHSRS then links the assessment of these hazards to a range of enforcement tools aimed at correcting the hazards. Since one of the listed hazards is radiation, the HHSRS gives local authorities enforcing housing standards a legal basis to deal with radon in dwellings, both in air and in water, for the first time.

In order to explain how the HHSRS will work in practice Government has published formal Guidance. Version 1 of this Guidance\* contained some basic information about radon and some of the matters to be taken into account when assessing the hazard it presents, but the draft of Version 2 of the Guidance produced in December 2003 provides much more detail about how radon should be assessed in practice. A simple measure of this progress can be gained from considering that the annex on radiation has expanded from three pages to eight!

The Guidance is clear that the level of risk relates to the measured radon level. Version 2 does not try to directly relate the hazard presented by radon to dwelling types or age ranges, as it accepts that these are much less relevant to the risk than the geology of the ground on which the dwelling is

built. Instead a number of matters are listed that may affect the likelihood of the hazard and of the harm outcome, such as whether the property is in a radon Affected Area, the type of floor, sealing around the floor, ventilation methods and whether a private water supply is in use (for radon in water). The Guidance states that the single most important consideration as to whether or not radon presents a risk is whether the property is in an Affected Area and that the only way to be sure of the level of risk would be to measure the radon level.

So where does this leave us? There are basically three scenarios to consider:

- The dwelling is not in a radon Affected Area - no action is likely to be necessary.
- The dwelling is in a radon-affected area but no measurement has been made - should enforcement action be used to require measurement?
- The dwelling has a high level of radon confirmed by measurement - should enforcement action be used to require remedial works?

The Housing Bill proposes a system of improvement and prohibition notices to require action on housing conditions. This system can be seen as analogous to the approach used under health and safety at work legislation. The use of improvement notices to require measurement in workplaces has previously been argued in the Environmental Radon Newsletter 33, by our neighbours High Peak Borough Council and it may be that a similar approach could be justified for dwellings under the HHSRS.

*\* Housing Health and Safety Rating System: Guidance (Version 1), ISBN 1 85112 405 5, price £20. Office of the Deputy Prime Minister.*

This newsletter and previous editions can be seen at [www.nrpb.org](http://www.nrpb.org) - search for radon newsletter

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# Radon questions in Parliament

**In March this year there were six questions about radon asked in Parliament. The questions and answers below were taken from Hansard ([www.hansard-westminster.co.uk](http://www.hansard-westminster.co.uk))**

**Mr Jim Cunningham (Coventry South):**  
**To ask the Secretary of State for Environment, Food and Rural Affairs:**

- 1. What proportion of UK housing stock has been tested for radon gas**
- 2. How many houses have been tested for radon gas in each of the last seven years**
- 3. What plans she has to encourage the testing of the remainder of UK housing stock for radon gas**
- 4. What plans she has to include radon testing in CON29 within the proposed Housing Investment Programme**

## Answer (1,2,3):

Since 1987 successive Governments have run a radon measurement programme to identify the extent of the radon problem in the UK. During that time 450,000 of the 25 million UK homes have been tested. Over the last eight years Government-funded measurement programmes have mainly focused on homes likely to be at most risk. In England and Northern Ireland, for example, that has meant every home with a greater than 5 per cent probability of radon levels being at or above the National Radiological Protection Board's (NRPB) recommended radon "Action Level" (200 becquerels per cubic metre of air) has been offered a free radon test.

In accordance with NRPB's recommendation, we advise that remedial action is taken to reduce radon levels in any home at or above the Action Level. It is estimated that over 100,000 homes in the UK are

likely to be at or above the Action Level and, of those, around 43,000 have been found. Approximately 90 per cent of the homes above the Action Level are likely to be in England.

The following table sets out the number of homes tested by NRPB for radon gas in the UK since 1996 up to the present date. The figures from 1998 onwards include radon tests that have been offered to householders as part of pilot studies and a wider on-going programme where the Government are working in partnership with nearly 30 local authorities in England to help householders in radon Affected Areas to take action to cut levels of radon in their homes. This supports the Government's policy of encouraging more radon remediation amongst householders in order to reduce the risk that high radon levels pose to their health.

The pilot studies run between 1998 and 2000 showed that working at a local level worked well and could double the amount of radon remediation. This success led to the rolling out of the current programme based on the experiences and lessons learned from the pilot studies. We shall be reviewing the initiative before it ends in March 2005 to allow us to determine how successful it has been. We will then make a judgement on the future direction of the Government's radon programme.

In Northern Ireland, the Department of the Environment is continuing to make free radon tests available to householders in areas where radon concentrations in homes have a 1 per cent or greater probability of being at or above the Action Level. In addition,

radon awareness campaigns will be conducted in selected areas of Northern Ireland in partnership with local authorities. These will target areas where there is a greater than 10 per cent probability of radon levels in a home exceeding the Action Level.

Plans to encourage the testing of dwellings for radon in Scotland and Wales rest with the Scottish Executive and National Assembly for Wales respectively.

Year	Number of Tests
1996	70,500
1997	54,000
1998	25,800
1999	9,600
2000	6,800
2001	8,000
2002	10,000
2003 <sup>(1)</sup>	11,100
2004 <sup>(1)</sup>	14,100

<sup>(1)</sup> All the Government-funded tests have used detectors that need to be in place for 3 months. Some tests in 2003 and all those so far commenced in the first two months of 2004 are therefore still to be completed.

Note: Totals rounded to three significant figures.

**Answer (4):**

There are no such plans. Under our proposals for home information packs, the pack is likely to include information on whether the property is located within a radon Affected Area. Issues of practicality and cost suggest that it would not be appropriate to require radon testing as part of a statutory home information pack scheme. However, this will be considered further by specialist working groups that are being set up to consider the contents of the pack before any final decisions are taken.

**Mr Jim Cunningham (Coventry South):  
To ask the Secretary of State for Health how many deaths were attributable to radon gas exposure in each of the last five years**

**Answer:**

From the known radiation risks, the National Radiological Protection Board has calculated that exposure to radon gas in the home and work place causes approximately 2,500 lung cancer deaths per year in the United Kingdom.

**Mr Jeffrey M. Donaldson**

(Lagan Valley):

**To ask the Deputy Prime Minister if he will make legislative provision for**

- a) radon tests to be carried out on (i) old and (ii) new homes and**
- b) to require a radon test certificate to be furnished at the time of conveyancing.**

**Answer:**

- a)** There are no plans for legislation to require radon testing of homes.
- i)** In the case of homes built without radon protection, successive governments have run a radon measurement programme to identify the extent of the radon problem. In the last eight years it has mainly focused on homes likely to be at most risk. In England, where the problem is estimated to be greatest, and in Northern Ireland, that has meant every home with a greater than 5 per cent probability of having radon concentrations at or above the National Radiological Protection Board recommended level of 200 becquerels per cubic metre of air, has been offered a free radon test. The Government's current programme continues to offer free tests to the homes at most at risk. This targeting has

encouraged the more at risk householders to undertake radon remediation. This is an approach that has been tested and shown that it can double the amount of remediation in homes where there is greatest risk from this naturally occurring radioactive gas.

Under the Office of the Deputy Prime Minister's proposals for home information packs, the pack is likely to include information on whether the property is located within a radon Affected Area. Issues of practicality and cost suggest that it would not be appropriate to require radon testing as part of a statutory home information pack scheme. However, this will be considered further by specialist working groups that are being set up to consider the contents of the pack before any final decisions are taken.

- ii)** Post completion tests of houses that include radon measures had demonstrated that the level of protection is adequate and it would be uneconomic to test every house. Of the few houses where the radon levels have risen after occupation all but one were due to alterations to the house and the increase level in the remaining house was due to the use of a method of protection that is not recommended in official guidance.
- b)** The revised questions in the searches form used in conveyancing are much more pointed in relation to radon and ask about radon tests and radon proofing. As the standardised procedures relating to house purchases address radon much more effectively than was the case in the past, there is no case to require test certificates through legislation.

# Long-term effectiveness of radon remedial actions

Chris Howarth, National Radiological Protection Board

**M**ethods of reducing high concentrations of radon in UK homes are well understood\*. However, in order to achieve the aim of reducing people's lifetime exposure to radon, it is essential that any remedial measure used continues to function effectively for many years.

In 1993 NRPB began a research programme of making repeat annual measurements of radon concentration in a group of volunteers' homes. A total of 57 homes were recruited to the study in 1993-1995. These homes were selected to provide coverage of the five counties designated as radon Affected Areas at the time, as well as including representatives of each of the common methods of remediation. The purpose of the study was to try and shed light on some fundamental questions about what was then still a relatively new technology:

- How long do remedial measures remain effective?
- Do some measures remain effective longer than others?
- How long do the electric fans in sumps last?

Remedial measures can be divided into two types: active systems using an electric fan, such as sumps or positive ventilation systems, and passive systems such as sealing cracks or improving underfloor ventilation.

## Active systems

As far as long-term effectiveness is concerned, the primary disadvantage of active systems is that the fans must inevitably fail at some point, due to mechanical wear. The most common type of fan used in the homes in this study is a 75 watt centrifugal type. Out of 23 fans of this type in the study, 12 have failed. On the other hand, some of the fans have been running continuously for more than 12 years, compared to a typical manufacturer's quoted lifetime of 5 years or less.

Two fans failed in their first year due to excessive moisture in the sump system, so the failure must be put down to the design of the sump rather than mechanical failure. The information available to installers is better today than it was 10 years ago, and addresses the issue of condensation in pipework.

Four sump systems suffered partial failure: measurements showed that radon concentrations had risen above the Action Level but were still well below the original, unremediated result. Measurements in subsequent years showed radon concentrations below the Action Level, without the householder carrying out any additional work. These partial failures were seen in older systems, and suggest that they may become less reliable with age, although the number in the sample is too small to draw any definite conclusions.

Most failures of active systems were noticed by the householders, for instance because the fan had stopped or a pipe was broken. This allows the householders to repair the system without needing a repeat radon measurement. About 55% of active systems failed during the 11 years of the study, some systems failing more than once.

## Passive systems

Passive systems are generally much less effective in reducing radon levels than active systems, and they have the disadvantage that it is not possible to tell whether they remain effective without re-measuring the radon concentration. But they are attractive to householders because they have zero running costs. The overall failure rate was similar to that of the active systems, but in only one case was the failure noticed by the householder (airbricks had become overgrown with vegetation).

## Choosing remedial measures

The choice of remedial measure will depend on the radon level and details of the house construction, as well as cost. This study suggests that the durability of active and passive systems is similar, though failure is easier to detect in active systems.

Overall the picture on durability of remedial measures is encouraging, especially with regard to sump fans, which have lasted better than expected. It is also encouraging to note that all types of remedial measure can, in some cases, remain effective for more than 10 years. On the other hand, all types of measure have recorded a failure in the first 5 years. This suggests that quality of work when the remedial measure is installed is extremely important.

Houses in the study		Failure found by	
Type of measure	Number	Measurement	Householder
Passive	13	7	1
Active	44	12	16

\* Chris Howarth and Chris Scivyer, *The effectiveness of remedial measures in houses*, Environmental Radon Newsletter 19.

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