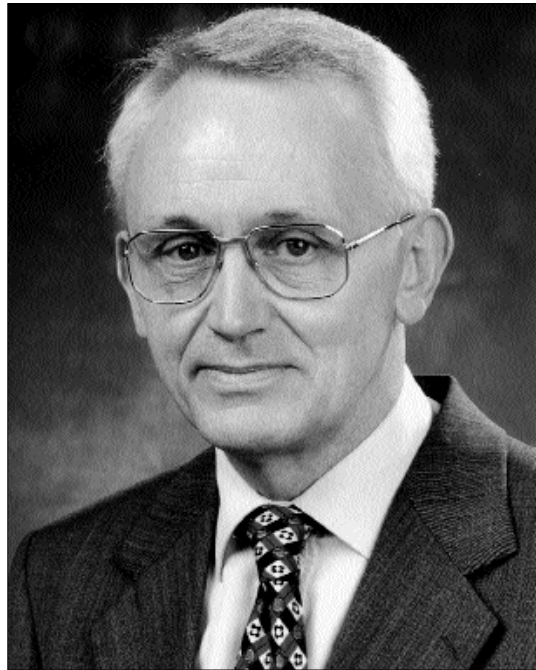


# Environmental **Radon** Newsletter

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Mike O'Riordan

## Mike O'Riordan Retires from NRPB

**M**any people will remember Mike O'Riordan with affection as the main driving force behind the UK radon programme for many years. Without his energy and commitment, the UK would not have the strong and effective radon programme that it has (or this newsletter).

He recognised early on that radon was by far the largest contributor to the radiation exposure of the general public, and pointed out in the journal *Nature* in 1983 that 'the public and professional interest in natural and artificial radiation is in inverse proportion to the radiation dose received from them'. This irrational attitude (which became known in NRPB as O'Riordan's Law) he set about changing. He gathered support from government departments and agencies, EHOs and the European Union as well as within NRPB. The radon programme which resulted has a radon Action Level for homes of 200 Bq m<sup>-3</sup>, mapping of radon prone areas in progress or completed over the whole of the UK, and continuing work to identify and fix workplaces and homes with high radon levels (see later in this issue).

He maintained his interest in the subject despite being elevated four years ago to Secretary of the Board, with wider responsibilities. Mike O'Riordan retired from NRPB in September this year.

## Pylons and Radon (again)

**L**ast year Professor Denis Henshaw of Bristol University suggested that electromagnetic fields could affect radon decay products in the air in such a way as to increase doses to people out of doors under power lines. Recent research\* gives the results of measurements of radon decay product concentrations in high electric fields under power lines and nearby in much lower electric fields. The measurements showed that decay product concentrations changed markedly with time, but no difference with electric field could be detected. This does not prove, of course, that electric fields have no effect, but it does suggest that any such effect is very small.

\* Measurements of radon decay product concentrations under power lines. JCH Miles and RA Algar, *Radiation Protection Dosimetry*, Volume 74, Number 2, 1997.

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# House Fitness Standard - Unfit Without Radon!

Alan Blythe, *Consultant/Lecturer (retired Director of Environmental Services)*

At a time when the Legal Research Institute of Warwick University are carrying out a DOE-sponsored review of controls on minimum standards for the existing housing stock, it seems appropriate - yet again - to restate the overwhelming case for including radon in the housing fitness standard.

That the UK hasn't, as yet, seen fit to include it is like the ostrich burying its head in the sand. Already in Europe compulsory housing radon limits apply in Sweden (400 Bq m<sup>-3</sup> - twice their Action Level), Switzerland (1000 Bq m<sup>-3</sup> - two and a half times their Action Level) and more recently, the Czech Republic (400 Bq m<sup>-3</sup>). When Norway and France are also actively considering the possibility too, where does this leave the poor old unprotected UK citizen?

As usual, the UK leads the world in the formulation of innovative ideas but sadly we seem to lack the commitment to carry them through to a practical, meaningful conclusion. Take for example Frank Whittle's jet engine or Arthur C Clarke's earth orbiting satellite inventions. Radon is no different - radon in this country seems to be following in the slow lane of progress, whilst other countries' radon programmes accelerate past us in the fast lane. We may well lead the world in radon measurement - and the DOE-funded NRPB national radon survey is arguably a sparkling achievement, with one third of a million results obtained so far. But, without significant levels of remediation - the only worthwhile yardstick of success - we have failed abysmally to translate this high level of awareness into meaningful protection.

EHOs like me have been chasing the Holy Grail of wholesale remediation by means of mandatory grants for the past 10 years. It now seems that the missing key to the grants problem could be inclusion of radon in the house fitness standard. By placing radon alongside other prima facie unfitness indicators like instability, dampness, inadequate lighting, heating and ventilation, we might prise open the door to mandatory grant-aided improvement. And it's no good the legislators claiming that radon is "too difficult to measure" or "too reliant

on occupant's habits and comfort perceptions". All these difficulties and false objections can easily be overcome - just as they already have been in the case of occupational exposure, where the equivalent of >400 Bq m<sup>-3</sup> radon gas concentration makes a workplace subject to the restrictions of the Ionising Radiations Regulations.

Surely, like Sweden, the Czech Republic and Switzerland, we should also place an upper limit on the tolerable level of radon in our homes and twice the current action level, ie. 400 Bq m<sup>-3</sup> would seem a reasonable limit.

In other words, house owners should correct this unacceptable radon concentration within their homes within a few years, hopefully taking advantage of financial assistance available through a new non-means tested mandatory grant (just like householders in Sweden, Finland, the Czech Republic and now Ireland can claim!) or the house will be classed as unfit and statutory action taken to either improve or condemn it.

This might sound a bit harsh on elderly owner-occupiers who don't want to be bothered by radon in the twilight of their years, but what happens if a house is later sold to new owners with a young family? They may not be told of the problem (revelation of previous radon testing is another must - hopefully in the much vaunted property 'Log Book'). Or what protection is available now to a tenant who has no redress against his landlord for letting a home at whatever huge concentration of radon might prevail? In the absence of a realistic UK regulatory limit none of these situations can be properly resolved.

As a learned colleague in the radon field said to me recently, "perhaps compulsory radon limitation is an idea whose time has come". I do hope so - the new Labour Government should grasp this nettle firmly without delay. It's long overdue and the DOE needs to get cracking on it sooner rather than later!

We seem to be successfully shedding our erstwhile tag as "the dirty man of Europe", so why not go the whole hog while you're at it, Mr. Meacher, and catch up on RADON too?

# Radon in the Workplace

David M Smith, *Specialist Inspector (Radiation), FOD Midlands Region, HSE*

**R**adon is a potential hazard in the workplace, as well as in the home. Employers have a duty under the "Management of Health & Safety at Work Regulations 1992" (MHSWR) to assess the risks to the health and safety of their employees and others who may be affected by their work. Radon needs to be considered in this risk assessment for premises in areas where radon is a known problem.

The Health and Safety Executive (HSE) has enforcement responsibilities under the Health & Safety at Work etc. Act 1974 at about 450,000 premises in Great Britain, some of which are in "radon affected areas". For example, there are about 12,000 HSE registered premises in Northamptonshire and Derbyshire.

HSE Inspectors have found that employer's awareness of the risk to health from radon in premises in radon affected areas varies tremendously. Some employers have initiated a programme to monitor and review radon exposure in the workplace, and have taken remedial action where radon levels have been found to be above  $400 \text{ Bq m}^{-3}$  (see footnote). However, many employers seem unaware of the risk, and their responsibilities under the MHSWR to assess the risk and take action, where appropriate.

HSE has participated in activities at regional level designed to raise the awareness of radon in the workplace (e.g. radon workshops, radon training courses, media coverage). However, there is a need to assess compliance with the MHSWR with respect to radon.

The resources available to HSE to assess compliance are precious. Visits to employers aimed solely at radon would not be an efficient use of these resources. Radon is discussed with employers in radon affected areas during routine visits, but some premises may not be visited for considerable periods of time, depending upon the known risks at the premises. Other ways to supplement the inspection resource are needed on such important issues.

HSE therefore decided to use and evaluate a "mailshot" approach to employers in radon affected areas in the Midlands, but which employers to target? There is plenty of information on the distribution of radon in homes, based on 5 km grid square

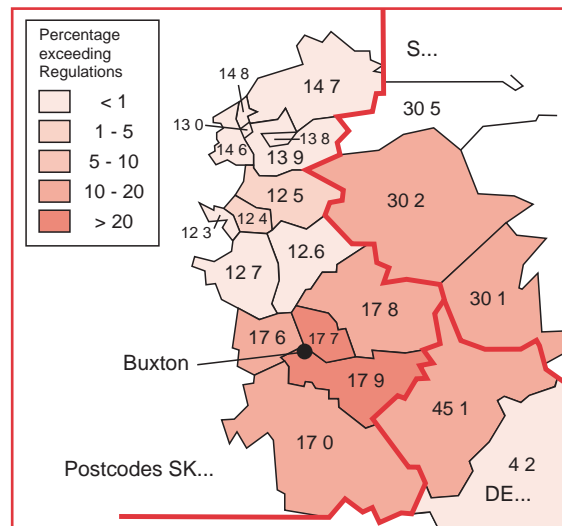
information. There is much less information based on workplace radon levels. HSE has addresses of employer's premises (including postcode), but not usually grid reference. We therefore decided to have the radon in homes data, plus the limited workplace data, transcribed to a postcode sector format. This work was carried out by NRPB under an HSE research contract. The result was a map indicating the probability of significant levels of radon in a workplace, such that the Ionising Radiations Regulations 1985 may apply (see footnote). The maps were coded in different bands according to probability. Part of such a map is reproduced in the figure.

Selecting premises at risk by postcode sector produced a list of about 700 registered premises in Northamptonshire and about 300 in Derbyshire. This much shorter list was further reduced by removing certain lower radon risk premises (for example, farms) and premises where employers were thought to have a high awareness of radon (for example local authorities, who themselves enforce the IRR85 in commercial premises!). This enabled our resources to be targeted even more effectively.

Information packs were put together, notifying the employers

of their duties under the MHSWR to assess the risks from radon. We also included information leaflets on *Radon in the workplace* and *Radon: building remedies for your workplace*, and a list of known suppliers of radon monitors.

We are now about to embark upon an exercise to evaluate the effectiveness of the mailshot approach. A cross section of employers originally targeted will be telephoned by a member of HSE staff to establish what action they have taken to comply with the MHSWR (and the IRR85, if levels of radon are sufficiently high). The results will be evaluated, and a decision reached as to whether to target other parts of known radon affected areas in the same way.



Part of map of radon in Derbyshire workplaces

**Footnote:** The Ionising Radiations Regulations 1985 apply to premises if radon daughter concentrations exceed 0.03 WL (Working Level) over any 8 hour working period. Under normal circumstances, this level would be reached where the long-term average radon gas concentration is  $400 \text{ Bq m}^{-3}$ . The radiation detriment associated with a workplace level of  $400 \text{ Bq m}^{-3}$  is approximately equivalent to the housing Action Level of  $200 \text{ Bq m}^{-3}$ , when occupancy and other factors are taken into account.

# Progress on Radon Surveys

Martyn Green and Jon Miles, *National Radiological Protection Board*

If we are to prevent excessive exposures to radon in houses, then our aim is simple: find the high houses, and fix them. Achieving this simple aim is much more difficult, however. First we need to identify the areas where such houses are likely to be found, then we need to make long-term radon measurements in the houses. Finally we need to persuade those living in high houses to take effective action.

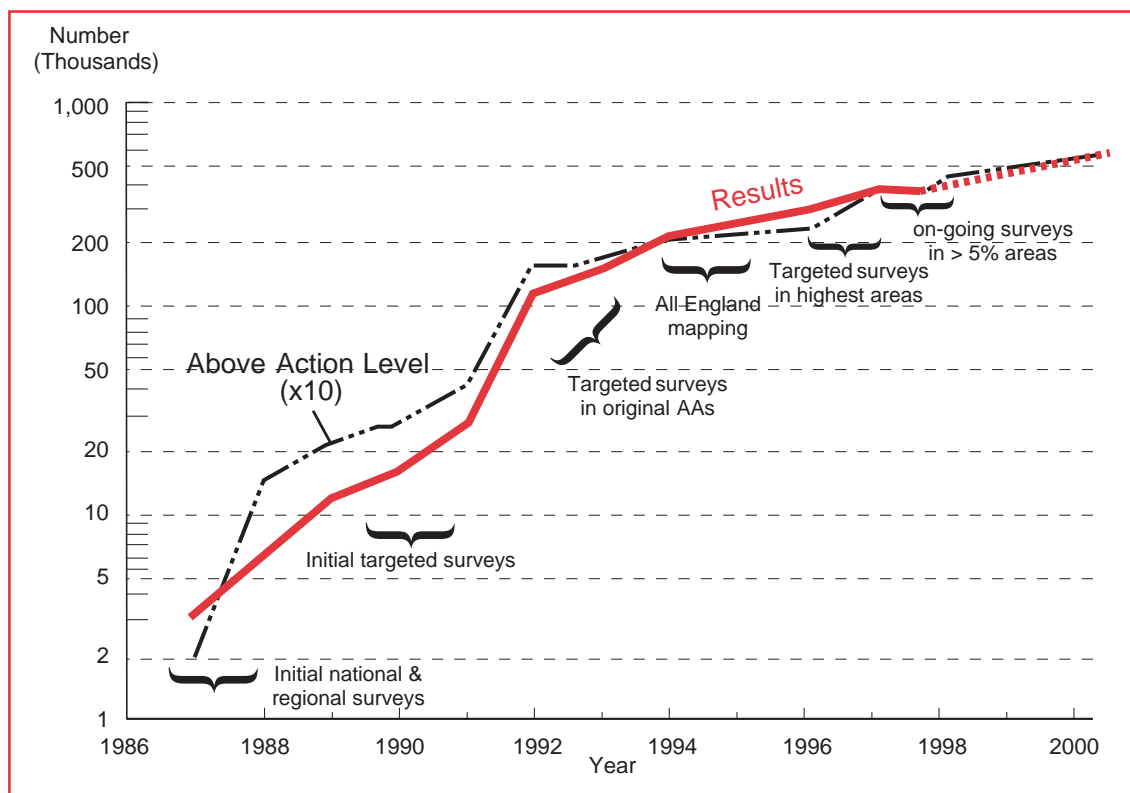
The first two steps in this process depend on making large numbers of measurements in houses. NRPB has been carrying out measurements of radon in houses for central and local government for many years, and has used these results to map the radon problem in the UK. Local authorities, both individually and in the groups listed under 'Points of contact' on page 2 have played an important role in disseminating information, persuading householders to test for radon, and taking effective action where appropriate.

The numbers of measurements made so far are shown in the table and the graph. In September the Department of the Environment, Transport and the Regions announced that it is continuing its programme of radon measurements by issuing 127,000 invitations for tests to houses in the highest radon areas of the southwest.

## Radon measurements in homes

Country	Number of results available	Number above Action Level
England	336,000	34,200
Northern Ireland	12,300	410
Scotland	6,000	210
Wales	5,000	2000
<b>United Kingdom</b>	<b>360,000</b>	<b>35,000</b>

Figure: Increasing numbers of results.



The Scottish Office, Welsh Office, and Department of Environment for Northern Ireland also have continuing programmes of measurements in homes.

This newsletter is prepared for the Chartered Institute of Environmental Health by the National Radiological Protection Board. It is published quarterly as an insert in Environmental Health and distributed by the Royal Environmental Health Institute for Scotland. Any suggestions for topics for

future issues should be sent to Jon Miles at NRPB (see address on page 2). The views expressed in the contributions here are not necessarily those of the Chartered Institute of Environmental Health, the Royal Environmental Health Institute for Scotland or the National Radiological Protection Board.