

RADON IN THE WORKPLACE

A guide for building owners and managers

SECOND EDITION

Chris Scivyer



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Second edition

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Cover images:

Main: Externally excavated sumps manifolded to a single fan and exhaust

Top right: Externally excavated mini-sump system

Middle right: Positive-ventilation system

Bottom right: Fan to an externally excavated sump system

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1 INTRODUCTION

This guide has been prepared by BRE, with assistance from the Health Protection Agency (HPA), Cornwall Council, the Health and Safety Executive (HSE) and contractors installing radon remedial measures. Following the guidance is not compulsory and you are free to take other action. However, if you do follow the guidance you will normally be doing enough to comply with the law. Health and safety inspectors seek to secure compliance with key aspects of the law and may refer to this guidance as illustrating good practice.

Historically, concern about the exposure of employees to radon was largely centred on people working in mines. Over the last 20 years, with increased knowledge and mapping of radon levels, attention has increasingly turned to radon exposure in buildings used for general work purposes. There is a considerable fund of information to show that employees in some buildings can receive very significant radiation doses from radon. Surveys show that levels of radon tend to be higher in buildings with small rooms, such as offices and schools, rather than larger factory and warehouse buildings. Unfortunately the nature of the work process gives no clue as to the radon hazard that may exist, and the employer may be unaware of its presence and how to deal with it.

This guide is aimed principally at employers who control buildings used for work purposes, or their representatives. It offers guidance on practical measures for reducing radon levels in workplaces. The guidance should also be of interest and assistance to those, such as surveyors and builders, concerned with specifying and carrying out the necessary remedial measures.

Advice is provided for the majority of building types and construction situations likely to be encountered in larger non-domestic buildings. For buildings where construction is similar to that found in dwellings, the guidance published by BRE and HPA on remedial measures for dwellings should be used (see Section 7, 'Further reading'). Inevitably there will be situations where no obvious solution applies. In such cases you are advised to contact BRE for further advice.

1.1 RADON AND ITS HEALTH EFFECTS

1.1.1 What is radon?

Radon is a colourless, odourless, radioactive gas. It comes from the radioactive decay of radium, which in turn comes from the radioactive decay of uranium. Uranium acts as a permanent source of radon and is found in small quantities in all soils and rocks, although the amount varies from place to place. It is particularly prevalent in granite areas, but not exclusively so. Radon levels vary not only between different parts of the country but even between neighbouring buildings.

Radon in the soil and rocks mixes with air and rises to the surface where it is quickly diluted in the atmosphere. Concentrations in the open air are very low. However, radon that enters enclosed spaces, such as buildings, can reach relatively high concentrations in some circumstances.

When radon decays it forms tiny radioactive particles that may be breathed into the lungs. Radiation from these particles can cause lung cancer, which may take many years to develop. In addition, smoking and exposure to radon are known to work together to greatly increase the risk of developing lung cancer.



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This guide provides advice on reducing the risk of exposure to radon in the workplace. It has been thoroughly updated to include lessons learned and changes in legislation since the mid-1990s. This 2011 edition replaces earlier guidance published in 1995.

This guide is intended to help employers comply with radon requirements contained in the Ionising Radiations Regulations 1999, which were made under the Health and Safety at Work etc. Act 1974. It is specifically aimed at managers, maintenance staff and building contractors who may be asked to determine whether a building has a radon problem or to reduce known elevated radon levels. Step by step, the guide describes the process of dealing with radon in workplace buildings.

The solutions that are described are intended to be straightforward to implement, and can often be carried out by the employer's own maintenance team. The guide describes how to identify common construction types and their impact on radon, and explains in simple terms the way in which buildings work and how different ventilation regimes can have a positive or negative effect on radon levels. To conclude, a series of case study scenarios describes a range of different building types together with appropriate solutions.

BRE prepared this guide with assistance from the Health Protection Agency, Cornwall Council, the Health and Safety Executive and contractors installing radon remedial measures.

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