

Information Note

Radon

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Who Should Read this: Defence Estates Personnel who have responsibility for workplaces, housing and other relevant premises where the presence of radon may affect the safety, health and welfare of occupants whether they are employees, residents or visitors.

When it takes effect: Immediately

When it is due to expire: ~~09 July 08~~
This date has been extended to 04 Feb 2014

Document Aim: The aim of this document is to clarify the relevant requirements and measures to be taken to effectively manage radon exposure. The overall intent is to ensure that radon levels in premises remain below Action Levels; thus providing a suitable and sufficient environment whilst avoiding more stringent requirements in complying with Ionising Radiation Regulations.

Radon

Arrangement for the implementation of MOD policy for the management and minimisation of Radon gas in the Workplace and in Families accommodation on the MOD Estate.

Introduction

1. Radon is a radioactive gas that occurs naturally below ground in rock and soil. In some parts of the UK, the presence of radon is significant and permeates through subsoil into the air and can be found in high concentrations within some buildings; if inhaled and retained within the lung, it may pose a risk to health.
2. The process of radon management commences with an indicative assessment of radon presence (desktop survey); using data published within Health Protection Agency (HPA) Radon Maps to indicate presence and likely concentrations of radon (refer to JSP 392 Leaflet 32 & the UKradon website <http://ukradon.org>). This information is then used to inform an overall monitoring and management strategy to confirm the extent of radon concentrations and 'trigger' follow-up action and priority as necessary. This forms the basis of general radon risk assessment required by the Management of Health and Safety at Work Regulations.
3. In many cases, these preliminary investigations may be sufficient to determine that elevated radon levels are unlikely and no further immediate action is necessary. However, it needs to be noted that the data is not conclusive; giving only indicative likelihood of radon levels and measurements can vary considerably across all areas (even from building to building on the same site). Likewise, changes can occur over time and some review will be necessary.
4. The type of construction, ventilation and size of the premises can all have an impact on the potential for radon presence and these factors should be taken into account when deciding where to install monitors. Typical buildings with elevated radon levels have confined areas such as small rooms with low ventilation rates at ground level and in basements. As such, if these factors make elevated levels likely, measurement of radon concentrations in air within specific premises is the only way to achieve confidence and reliability when completing assessments. The results of monitoring will determine whether there is a problem and if action is required.
5. Accurate records are fundamental to maintaining effective radon management across the estate and documentation needs to demonstrate how decisions have been made e.g. if a site is not within or near a Radon Affected Area (RAA) there will be no need for immediate action, but this reasoning needs to be recorded. Conversely, where records of high radon levels exist within parts of a site, monitoring will be needed to confirm levels for neighbouring areas and to determine what (if any) further action is needed.

Overall Applicability and Responsibility for Radiation Safety

6. JSP 375 refers directly to JSP 392 for detailed guidance on MOD's policy with regard to Radon. It places responsibility for radiation safety on the Commanding Officer/Head of Establishment (CO/HoE) to take account of radon alongside other site hazards and risks; however there is the ability to delegate management arrangements to appropriate personnel.
7. Where a DE manager has been appointed HoE, or has been delegated the role of Duty Holder for relevant premises and maintenance management, they are to ensure that these duties are effectively discharged through their Senior Management representatives and Regional Prime Contracting, other partnering arrangements, 'provider' organisations etc as appropriate.
8. Relevant premises managed by DE include:
 - Offices and other occupied workplace accommodation.

- Housing/married quarters and other residential premises.
 - Transient accommodation and temporary accommodation including that used to accommodate trainees.
 - Tenanted residential and workplace premises – including farms and leased buildings (although tenants operating businesses may have further duties to discharge as employers).
 - Premises used for storage of radioactive sources such as Radium-226 and Radium luminised articles are to be treated separately following RPA advice. These may be defined as Radiation Areas and subject to a more stringent management regime and requirements (possibly demarcated as ‘controlled’ or ‘supervised’ areas where access is restricted and other safety requirements are necessary).
9. Where DE and/or its contractors are occupying premises of another TLB, radon management will be in accordance with the host TLB organisations requirements. In such cases, if an establishment is in a region which has been identified on the HPA maps as being at risk, details are to be obtained from the host/HoE. The details should include results of any Radon surveys and monitoring carried out and dates when this was last undertaken, relevant to the buildings occupied by DE staff/contractors or under DE control (as Area Custodian).
10. In all cases, whether the HoE role is taken by DE or another TLB, a Radon Co-ordinator¹ is to be appointed to act as a delegated focus for the collation of all relevant radon data, on behalf of the appropriate Director/Deputy Director. Duty Holders (or their delegated representatives) are to co-ordinate all radon-related activities, and receive reports from each Estate Management area relating to programmes, categories and progress to ensure their overall duty is discharged within their area of responsibility. Where there are no records, this is to be reported to DE CHSA thru’ the Radon Co-ordinator/Duty Holder.

Radiation Protection Adviser (RPA)

11. DE has appointed Dstl to undertake Radiation Protection Adviser duties through a CSA. Requests for the use of the services are to be channelled through the relevant DE Operations Senior Health & Safety Adviser.

Site-level Radon Management

12. Duty Holders are to ensure that all appropriate measures are in place i.e. a Radon Management Plan and Register documenting relevant details for all establishments and sites within their area of responsibility and for maintaining currency and accuracy. This will include the details of desktop surveys used to indicate presence of radon in concentrations requiring action, and allocation of priorities in accordance with Radon Likelihood Categories (Annex B); records of monitoring requirements, programmes, actions, results and any planned subsequent action.
13. Where the site is located within a Radon Affected Area (RAA), and/or where there are records of high radon concentrations, awareness details will need to be communicated to all staff and others likely to be affected and details are to be included within the induction process for all site visitors/users. In workplaces where it is necessary to take action to reduce radon levels, staff could also be exposed to significant concentrations at home. In such cases, Senior Managers should recommend staff to have radon concentrations monitored in their homes and consider the potential for additional exposure within any actions needed.
14. Should radon monitors be required to measure radon concentrations, the detectors are to be installed in accordance with HPA guidance; taking account of the building configuration, number of floors, size, layout and number of rooms per floor. For typical two-storey residential properties, two radon detectors are to be positioned within each property; one on the ground floor and one on the first floor.

¹ This role should be undertaken by the Senior Health and Safety Adviser from each Operations or Project area of responsibility.

15. If monitoring confirms that concentrations are elevated (above the relevant Action Level), remediation measures will need to be considered; this will require specialist design and construction advice. Pending remediation, a radiological risk assessment will be required – in such a case refer to JSP 392 and seek RPA advice immediately as there may be a need to implement immediate access restrictions or other controls to ensure exposure remains below the tolerable concentrations. Although the appointment of a Radiation Protection Supervisor may not be required in accordance with JSP 392, a Workplace Supervisor (Radon) is to be appointed to ensure that actions identified are carried out in accordance with other relevant requirements.
16. Where premises are not already subject to radon monitoring and/or there is insufficient documentary evidence and records, there is a need to ensure that radon does not represent a significant risk to occupants, visitors or users. In such cases, there is a need to conduct a desktop survey of all sites within the area of responsibility to indicate whether the site is within a RAA i.e. is the site within an area where, according to HPA Radon Maps, at least 1% of homes surveyed have radon levels above the specified action level. For sites not covered by the HPA Radon Maps seek RPA advice.
 - If a desktop survey indicates that the site is within a RAA, assess the location to determine which HPA zone is broadly applicable and the action/priority. Further and more detailed work will be required by the Radon Co-ordinator in conjunction with the RPC (or equivalent) to assess the sizes and types of use for all premises and for each site; a schedule will need to be created to record initial findings and to inform future monitoring, action and progress; these records will need to be updated accordingly as monitoring data is collected and actions are taken. Radon monitoring surveys will then need to be implemented in accordance with the priorities to determine if levels are 'elevated' in accordance with the Radon Likelihood Categories.
 - If a desktop survey indicates that the site is not within a RAA, then generally, there is no immediate action required as levels are presumed to be such that a significant risk is not present. However, some less immediate investigation should be implemented to verify the continuing assumption that radon levels represent a minimal hazard; by a programme of annual 20% targeted sample² monitoring and annual 5% random sample³ monitoring.
17. In all cases refer to the Radon Likelihood Categories at Annex B to complete a desktop survey to indicate assumed radon levels, priority for monitoring requirements and subsequent action in accordance with the protocol (Priority, Secondary or Ongoing Action; together with details of programmed 20% targeted and 5% sampled monitoring to confirm suitability of the indicative assessment). Types/buildings are to be selected for sampled monitoring by the Radon Co-ordinator in conjunction with the RPC (or equivalent). On completion of the monitoring and on receipt of the results, appropriate action is to be taken in accordance with the Table at Annex A – this gives actions dependent on actual concentrations recorded and is relevant to both workplaces and residential premises.
18. Outline details of the action required for the management of radon exposure at DE controlled sites is included at Annex B.

Recording and Reporting

19. Senior Managers are to ensure that all relevant details for their area of responsibility are recorded and updated to reflect progress, with details reported to the nominated Radon Co-ordinator. The Radon Co-ordinator is to monitor the suitability and sufficiency of

² When a site is located within an area where the likelihood level is considered to be 'Low' – see Annex B (i.e. where less than 10% of homes exceed the Action Level), but is adjacent to a 5km grid where the likelihood exceeds that level (i.e. more than 10% of homes exceed the Action Level), 20% of occupied buildings are to be monitored each year so that all are monitored within 5 years. The requirement for action/future monitoring will depend on the results.

³ When a site is located outside a RAA where the likelihood level is considered to be 'Negligible' – see Annex B (i.e. less than 1% of homes exceed the Action Level), 5% of occupied buildings are to be monitored each year to confirm continuing suitability of the indicative assessment. The requirement for action/future monitoring will depend on the results.

records and action and maintain an overview of all sites and areas, noting in particular that some sites may span more than one HPA 5km map 'grid'. Details are to be collated from each area and progress reported to DE ES&P Chief Health and Safety Adviser on a quarterly basis.

Audit Systems, Review and Feedback

20. The status of radon management across DE will be informed through system audit, review and feedback. This will take place as a part of the established DE ES&P Audit Programme either as part of the SHEP Compliance Programme and/or the Target Risk Audits. Any recommendations for policy, system or implementation improvement are to be included within the recommendations of the Audit Reports.

21. DE Senior Managers are to ensure that the contents of this document are brought to the attention of their staff in particular those staff that live in radon affected areas. Further information can be obtained by going to the Health Protection Agency website. <http://www.hpa.org.uk/radiation>

TABLE 1: ACTIONS REQUIRED FOLLOWING RADON MONITORING RESULTS

Survey	Reading type	Residential Concentration level (Bq.m ⁻³)	Workplace Concentration level (Bq.m ⁻³)	Action required
Initial (any month)	Actual	≥ 200	≥ 400	Ionising Radiations Regulations 1999 apply (for workplaces); notify HSE; consult RPA. Restrict exposure. Investigate and implement remediation measures and follow-up as appropriate*.
Initial (any month)	Actual	≥ 150, but < 200	≥ 300, but < 400	Consult RPA. Re-monitor during winter months (Nov-Feb). Consider immediate action to reduce exposure, i.e. review occupancy, simple ventilation.
Initial (any month)	Actual	≥ 100, < 150	≥ 200, but < 300	Consult RPA. Re-monitor during winter months (Nov-Feb). No action required. Review assessment
Initial (any month)	Actual	< 100	< 200	No immediate action; keep radon risk assessment under review
Repeat (winter months)	Actual	≥ 200	≥ 400	Ionising Radiations Regulations 1999 apply (for workplaces); notify HSE; consult RPA. Restrict exposure. Investigate and implement remediation measures and follow-up as appropriate*.
Repeat (winter months)	Actual	≥ 150, but <200	≥ 300, but <400	Consult RPA. Keep situation under review to ensure that if working use or conditions alter the radon concentrations are re-monitored.
Repeat (winter months)	Actual	< 150	< 300	No immediate action; keep radon risk assessment under review

*Where remediation is required, the premises are to be monitored for concentrations of radon immediately afterwards to confirm that the measures are successful. Subsequent action is to be in accordance with the radon concentration result and relevant action above.

Where remediation includes installation of forced ventilation of any sort, fans or other mechanical equipment are to be fitted with failure alarms/indicators to ensure continued operation, be subject to routine checks and annual (or other period based on risk assessment) formal inspection and service regime. Subject to RPA advice, maintenance operations are to be conducted only by competent personnel. Mechanical equipment used with under-floor sumps is to be treated as Local Exhaust Ventilation.

Table 1 includes details extracted from JSP 392 Radiation Safety Handbook (2007 edition) Leaflet 32 relating to workplaces. Also included are additions to reflect requirements for residential premises; these details have been combined into a single table to identify consistent actions at appropriate comparable concentration level thresholds.

PROCESS MAP - RADON MANAGEMENT AT DE-CONTROLLED SITES

Note 1: Radon Likelihood High. Exposure to elevated concentrations is highly likely due to location (more than 30% of homes exceed the HPA Action Level) or premises type (all underground facilities and radium storage areas).
Note 2: Radon Likelihood Medium. Exposure to elevated concentrations is likely due to location (between 10% and 30% of homes exceed the HPA Action Level) or for other ground-level (and above) occupied premises where no radon records exist.
Note 3: Radon Likelihood Low. Exposure to elevated concentrations is less likely due to location (between 1% and 10% of homes exceed the HPA Action Level) or for other ground-level (and above) occupied premises where no radon records exist.
Note 4: Radon Likelihood Negligible. Exposure to elevated concentrations is unlikely due to location (below 1% of homes exceed the HPA Action Level – sites in these locations are not considered as 'radon affected areas').
Note 5: When deciding on which premises need to be monitored, account should be taken of location (whether within, or immediately adjacent to, a RAA), the building/room size and types of use, type of ventilation etc. Smaller, poorly ventilated and confined areas are more likely to have significant radon levels e.g. offices or other smaller rooms rather than workshops and other larger buildings where ventilation (either natural or mechanical/forced) is greater. Rooms at 1st floor level and above are less likely to have significant radon levels.
Note 6: Noting that analysis and production of results takes a further 3 months.
Note 7: Appropriate action is outlined in Table 1 Annex A. For more specific requirements refer directly to JSP 392 Leaflet 32 (which further refers to other Leaflets for relevant action).



