

# 31 Museums

## Scope

1. This chapter is applicable to MOD units and establishments with responsibilities for museums and those who provide equipment or articles containing radioactive material or generators producing ionising radiation to these museums. This Chapter also outlines radiation protection requirements for museums that are sited on the Defence estate, or are funded by MOD, or to whom the MOD provide all or some of the workforce. In these circumstances the MOD is likely to have retained health and safety responsibilities for the museum, its employees, visitors or other persons.

## Introduction

2. The term 'museum' in this chapter is taken to include trusts and similar voluntary bodies who preserve or renovate historic artefacts or equipment for display.

3. Museums on the Defence estate or to which MOD has loaned, sold, gifted or donated items, often include in their catalogue items that contain radioactive material or have the potential to emit ionising radiation. Unless specifically advised, museum personnel may not be aware of the hazards posed by such equipment. MOD has a duty of care in these circumstances to provide such information to the museum in accordance with the Secretary of State's Health and Safety Policy Statement and national legislation.

## Statutory Requirements

4. In addition to the general requirements of the Health and Safety at Work etc Act 1974 and the Management of Health and Safety at Work Regulations 1999, the following specific legislation applies directly or is applied indirectly through parallel arrangements designed to achieve equivalent standards:

- a. Ionising Radiations Regulations 2017 (IRR17) (apply directly);
- b. The Environmental Permitting (England & Wales) Regulations 2016 (EPR16) (as amended) (parallel arrangements);
- c. Environmental Authorisations (Scotland) Regulations 2018 (EASR18) (parallel arrangements);
- d. Radioactive Substances Act (Northern Ireland) 1993 (RSA93) (as amended) and associated Exemption Orders; and
- e. Carriage of Dangerous Goods and Transportable Pressure Equipment Regulations 2009 (CDG09) (apply directly).

## Duties

5. Duties as detailed in Chapter 39 apply. In addition, the following duties also apply.

### **Commanding Officer / Head of Establishment (CO/HoE)**

6. At the discretion of the CO / HoE, the museum may be staffed by volunteers. Where a CO / HoE allows a voluntary group or individuals to operate on a MOD site, they are

personally liable for ensuring that the operations of volunteers do not adversely affect the health and safety of staff on the site or result in a breach of legislation. CO / HoE are advised to have a written agreement with the group or individuals confirming that a condition of their continued presence is that health and safety, environmental and other relevant legislation is applied to their operations.

7. If a museum sited on the Defence estate is physically separated from, and totally independent of, Ministry of Defence units on the same site, the primary responsibility for radiation health and safety rests entirely with the management of the museum.

### **Voluntary Groups and Individuals**

8. Volunteers who are permitted onto MOD premises to work in the museum do so at the discretion of the CO / HoE and are required to comply with all local, MOD mandatory and statutory requirements for health, safety and the environment.

## **Radiation Protection Arrangements for Museums**

### **Radiation hazard from museum exhibits**

9. Because of the wide variety of exhibits found in museums and local displays within the MOD it is not realistic to detail the precise nature of the radiation hazard for all circumstances. Annex A lists typical museum exhibits that may contain radioactive material.

10. One of the most common sources of radioactivity found on military museum artefacts is luminised paint containing radium-226 (Ra-226). It should be noted that due to the age of these radium luminised articles, they no longer glow due to the phosphor having been 'burnt out' – however they still contain almost the same level of radioactivity as when they were originally painted. Therefore, luminosity should not be used as a primary indicator to establish whether a museum article is radioactive.

11. JSP 392 contains Chapters written specifically to address the radiation protection matters associated with many of these items. Once the type of radioactive material or radiation emitted has been identified (e.g. radium luminised item, thorium alloy, X-ray generator, GTLS), then an appropriate Chapter from JSP 392 should be consulted if available. Where no specific Chapter is appropriate advice should be sought from the appointed RPA.

### **Radiation Protection Advice and Visits**

12. Museums holding items described in Annex A, or who suspect that they hold other radioactive items that are not listed, are to request an advisory visit from a radiation protection adviser (RPA) through the appropriate Service focal point for radiation safety. The objective of such a visit will be to identify equipment, articles and exhibits containing radioactive material and provide radiation protection advice to the museum to enable it to comply with its legal obligations. The RPA, usually the DRPS RPA Body, can also undertake regular subsequent visits - the frequency of which will be determined by the degree of radiation hazard and the level of support requested. Where MOD is not the employer, advice should be sought from their appointed RPA.

13. Advice can be sought from DRPS via telephone: 02392 768130) or email: [DRPSenquiries@awe.co.uk](mailto:DRPSenquiries@awe.co.uk).

## **Receipt of Articles Containing Radioactive Material from MOD Units**

14. Before articles containing radioactive material are accepted (including from MOD ships, units or establishments) museums are to request Safety Data Sheet(s) or radiation risk assessments from the providers. Where the museum's policy for accepting radioactive materials permits the receipt of such items, the information from Safety Data Sheets can be used to determine whether they can meet statutory and MOD requirements and safely handle, store, display and, if necessary, work on and dispose of these articles. Such datasheets will form part of the basis of decision making when accepting or declining these items.

## **Arrangements for Articles Gifted or Loaned by Members of the Public**

15. Museums are to put in place arrangements for dealing with articles that are gifted or loaned by members of the public. As a general rule no item should be formally accepted until its radioactive content has been determined. Items that are suspected of containing radioactive material should, as a minimum, be quarantined by sealing them in a polythene bag if practicable, and locking them in a cabinet or store (not containing other hazardous materials) until they can be investigated - RPA advice is to be sought early on. Such arrangements are to be included in Radiation Safety Orders.

## **Environmental Regulators' Approvals (formerly Noting Letters, Letters of Approval or Authorisations) and Charges**

16. Museums for which MOD has responsibilities and which hold radioactive material are required to have an approval issued by the appropriate environmental regulator as detailed in Chapter 3, unless covered by an exemption under the EPR16 / EASR18 / RSA93. These approvals stipulate limits on the quantities of radioactive material that can be held by the museum and conditions for the keeping and use of the radioactive material. Similarly, approvals are required to accumulate for disposal, and to dispose of radioactive waste (unwanted articles containing radioactive material declared as radioactive waste). Charges will be levied by the environmental regulator. Funds to pay these charges are to be provided by the TLB or the museum, dependent on circumstance. Advice on the need for an approval, their provision and payment of fees will be provided by the RPA/Radioactive Waste Adviser (RWA), usually DRPS, during their visit or through the focal point for radiation safety.

17. For most circumstances (subject to the minimum quantities of radioactive material being exceeded) this can be summarised in the following statements (to be applied independently):

- a. an EA Permit or SEPA Registration/Authorisation is required if a museum is operated by an independent organisation and either the employees of that organisation are paid, or an entrance fee is charged. In all other cases MOD are required to submit an environmental regulator's approval; and
- b. an Annual Holdings Return (AHR) is required for a museum operated by MOD personnel or on a MOD site (irrespective of who operates the museum).

## **Risk Assessments and Contingency Plans**

18. Risk assessments are to be carried out by the museum for each type of article or equipment containing radioactive material, and for each radiation emitting equipment that is received or held. Although less common as museum exhibits, equipment capable of

generating radiation, such as X-ray sets and some high voltage equipment should also be subject to risk assessment. A single generic risk assessment would be appropriate to cover work with equipment of a similar nature, e.g. luminised instruments, provided that it covers all requirements (including identification, storage, use and repair) for each article. Records of these assessments are to be kept by the museum. Requirements for risk assessments are set out in Chapter 2 and further assistance can be sought from the appointed RPA.

19. As an outcome of any Risk Assessments, Contingency Plans for radioactive items will be required to mitigate against any risks identified e.g. in the event of a breakage and a fire. Details for contingency planning are in Chapter 40 and advice is available from the RPA.

## **Local Orders for Radiation Protection**

20. The Head of Establishment for the Museum is to ensure that Radiation Safety Orders have been drafted, which set out the responsibilities and arrangements for radiation protection within the museum. Chapter 16 sets out the requirements for this documentation which should contain procedures to limit staff and public exposure to ionising radiation. Contact the RPA for further advice.

## **Appointments and Training**

21. A suitable person should be appointed as an RSO, WPS or RPS (as required) and trained to manage the items containing radioactive material. The requirements for appointments and training are set out in Chapter 15. Guidance should be sought from the appropriate Service focal point or the appointed RPA if necessary.

22. RSO / WPS training for MOD supported museum personnel is carried out by the DRPS RPA and organised by the National Army Museum.

23. Local training is also required for museum staff / volunteers that may come into contact with radioactive material. In conjunction with the local training, these museum staff / volunteers should also sign and date the Radiation Safety Orders as evidence that they have been read and understood.

## **Display and Storage of Exhibits**

24. Exhibits that contain radioactive material are to be displayed so they cannot be handled by visitors and should be arranged so that radiation doses to visitors are as low as reasonably practicable (ALARP). The dose rate in areas that visitors have access to, wherever reasonably practicable, should not exceed 1  $\mu\text{Sv/hr}$ . Any trefoils on exhibits should, where practicable, be discreetly positioned away from public view.

25. Articles held in store are to be segregated and kept in a dedicated, secure store marked with a radiation warning sign. Dose rates on the outside of the store are not to exceed 7.5  $\mu\text{Sv/hr}$  and wherever reasonably practicable are to be less than 1  $\mu\text{Sv/hr}$  (although up to 2.5 $\mu\text{Sv/hr}$  might be permissible for an existing facility). Chapter 9 provides further guidance on the storage of radioactive items.

26. Where the radiation dose rate in areas that can be accessed by the public or outside storage areas cannot be reduced below 2.5  $\mu\text{Sv/h}$  then the advice of the appointed RPA should be sought.

## **Radiation Monitoring Surveys**

27. It may be necessary to undertake radiation monitoring surveys of display and storage areas. The RPA will advise if this is necessary and recommend suitable monitoring instruments.

## **Accounting for Articles Containing Radioactive Material**

28. A record must be kept of all articles containing radioactive material as detailed in Chapter 9. This record should include a description of the item, serial number, date received, location held, type of radioactive material, activity if known, date removed and transfer or disposal route. Sources should be mustered as detailed in Chapter 9. Annually, an audit of the source list is to be undertaken to verify the accuracy of the records. A record of this audit is to be kept by the museum. The holdings are also to be recorded on the AHR.

## **Leak Testing of Radioactive Sources**

29. Any article containing or embodying radioactive material, with the exception of those containing gaseous tritium, should be tested for leakage. The purpose of a leak test is to show that the mechanisms for preventing dispersal of radioactive substances are functioning as intended. Museums should ensure that all radioactive sources, except those containing gaseous tritium, are leak tested at least every two years as detailed in Chapter 9.

## **Work on Articles Containing Radioactive Material or Generating Ionising Radiation**

30. Safety Data Sheets and/or radiation risk assessments are to be made available to all persons coming into contact with an article containing radioactive material. Before any work is undertaken on items containing radioactive material advice should be sought from the RPA as strict conditions (including the need for a radiation risk assessment) are applied to working with radioactive material to avoid unnecessary radiation contamination and exposure.

## **Return of Exhibits Loaned by the MOD**

31. All equipment loaned by the MOD to a museum is to be returned to the unit or establishment from which the museum obtained the equipment when it is no longer required. If this is not possible, the equipment is to be returned to an appropriate MOD unit or establishment. Further information can be obtained from the focal point for radiation safety or RPA.

## **Return of Exhibits Loaned by a Member of the Public**

32. If an item containing radioactive material is returned to a member of the public, information about the hazards associated with the item must be provided to the owner. Contact the RPA for advice.

## **Sale, Gifting and Disposal of Exhibits**

33. The sale and gifting of items containing radioactive material is detailed in Chapter 11 and disposal of same in Chapter 12. In brief, it is MOD policy not to sell or gift items that contain radium, but to send these items for authorised disposal. Strict conditions apply to the disposal of radioactive material and advice should be sought from the RPA.

## **Transport of Articles Containing Radioactive Material**

34. Articles containing radioactive material that are to be transported on public roads have to be packaged and transported in accordance with the requirements of The Dangerous Goods Manual. Advice on the transport of radioactive material should be sought from a Dangerous Goods Safety Adviser and, where appropriate, the RPA.

## **Incident Reporting**

35. Actions to be taken in the event of an incident related to radioactive items is detailed in Chapter 14 and includes reporting of suspected radiation over-exposure, skin contamination, intake by inhalation or ingestion as well as loss, theft or spillage of an item.

## **Records**

36. Records are to be kept in accordance with MOD record retention policy (see JSP 441 and JSP 392 Part 1 Chapter 3).

## **TYPES OF ITEMS CONTAINING RADIOACTIVE MATERIAL OR PRODUCING IONISING RADIATION**

1. A listing of items that may contain radioactive material is as follows. This list is intended as a guide only and is not exhaustive. Museums should note that items from other countries can also contain radioactive components.

- a. compasses (including escape compasses sometimes incorporated into uniforms etc).
- b. radios.
- c. gun sights.
- d. camera lenses and filters.
- e. aircraft instruments and gauges.
- f. vehicle instruments and gauges.
- g. ship instruments.
- h. wrist watches.
- i. thermal imaging equipment.
- j. clocks.
- k. aircraft engines.
- l. radars.
- m. electronic valves.
- n. smoke detectors.
- o. Aldis lamps.
- p. telephones and switchboards.
- q. other articles painted with luminous paint.
- r. X-ray equipment.
- s. monitoring instruments containing a check source or luminised dial.

2. Further information on articles containing radioactive material referenced by NATO stock number or Section and Reference Number should be sought from JSP 515

(Hazardous Stores Information System) in the first instance, and additional information is held by DRPS including some non-UK sourced items. Details can be obtained through Service focal points.