



The management of higher activity radioactive waste on nuclear licensed sites

Managing information relating to radioactive waste
in the United Kingdom

Joint guidance from the Health and Safety
Executive, the Environment Agency and the Scottish
Environment Protection Agency to nuclear licensees

November 2008

We are issuing this version of the guidance for
comment and trial use. We would welcome
comments by 30 January 2009.

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Explanatory note

This explanatory note will not form part of the guidance.

Trial use and comment

We are issuing this version of the guidance for comment and trial use. We would welcome comment on any other aspects of this document.

Please provide any comments by 30 January 2009. We will issue a revised version that takes account of all comments received, and after a further year we will review whether there should be further revision. We will also publish a summary of the responses received during the consultation period.

Responses are invited on the understanding that they may be made public by the regulators. Comments will be attributed, unless a respondent makes a specific request to the regulators for their comments to remain anonymous.

During this period there will be trial use of this document. Regulators will use it in discussions with licensees to test the practical implications of its use. Observations from such trial use will be fed back to inform the production of a final version.

Comments should be directed to: NDenquiries@hse.gsi.gov.uk referencing 'Joint Guidance' in the title of the message.

Health and Safety Executive
Environment Agency
Scottish Environment Protection Agency
November 2008

Foreword

The Health and Safety Executive (HSE), the Environment Agency and the Scottish Environment Protection Agency (SEPA) (together referred to as 'the regulators') have issued this guidance jointly.

You are not required to follow this guidance, and you are free to take other action. However, if you do follow this guidance, you will normally be doing enough to comply with the law as interpreted by the regulators at the time of writing, and the regulators may refer to this guidance as illustrating good practice. However, compliance with this guidance does not automatically mean that we will approve an application for a nuclear site licence, a consent or agreement under the licence or an authorisation.

Given the long timescales involved in radioactive waste management, you should be aware that standards, legislation and national policy might change. While this guidance forms the best advice that the regulators can give at present, nothing in this guidance overrides, or is intended to pre-empt, the ability of the regulators to discharge their statutory powers and duties in accordance with legislation, standards and policy applicable at any time.

Policies for the disposal of higher activity waste differ in Scotland and in England/Wales. We consider that packages conditioned in anticipation of deep geological disposal are also suitable for long-term storage, as required by Government policy in Scotland. On this basis the following guidance can be used equally in England,

Scotland and Wales, but any references to geological disposal will mean long-term storage when applied to Scotland. We will keep the packaging advice being developed by the Nuclear Decommissioning Authority's (NDA's) Radioactive Waste Management Division (RWMD) under review and if any developments mean that this assertion is no longer valid, we will provide further guidance.

We will review this guidance periodically to ensure that it continues to provide sound advice.

Freedom of information – disclosure of information

The regulators are public authorities for the purposes of the Freedom of Information Act 2000 (FOIA00) and the Environmental Information Regulations 2004 (EIR04) in England and Wales, and the Freedom of Information (Scotland) Act 2002 (FOISA02) and the Environmental Information (Scotland) Regulations 2004 (EISR04) in Scotland. If we receive a request for information that we hold, we will have to consider the request in accordance with this legislation.

This document is available on our websites, in accordance with our respective policies of openness and transparency.

Executive summary

Effective management of information about waste is an important aspect of radioactive waste management. It is essential to ensure that waste management organisations, both now and in the future, are equipped with the information they need to safely manage radioactive waste, over long timescales and through changes in the organisations responsible for the waste. This guidance covers existing national and international standards and practices for managing information. It also discusses some of the specific issues associated with managing information about radioactive waste over the long term.

This document provides an overview of the relevant policy drivers, regulatory requirements and expectations relating to the management of information about higher activity radioactive wastes on licensed nuclear sites. It identifies the relevant technical considerations that need to be addressed in the requisite radioactive waste management cases.

Scope

1 This document provides guidance for all waste management organisations (WMOs). It complements the guidance provided in:

- *The management of higher activity radioactive waste on nuclear licensed sites: Part I The regulatory process;*¹ and companion modules in the 'Joint Guidance' series;²⁻⁵
- *Guidance for inspectors on the management of radioactive materials and radioactive waste on nuclear licensed sites;*⁶ and
- *Disposal facilities on land for low and intermediate level radioactive wastes.*^{7*}

* The guidance on disposal is being revised. The final version of this document will refer to the relevant aspects of the finalised versions of the disposal guidance.

2 It is applicable in its broadest sense to all types of radioactive waste; however, the main focus of the Joint Guidance series is the management of higher activity radioactive wastes on licensed nuclear sites. In this context:

- **management of radioactive waste** means the whole process of managing waste from its generation to (but not including) its disposal;
- **higher activity radioactive waste** means all radioactive waste other than:
 - low-level radioactive waste which will be disposed of promptly at the Low Level Waste Repository near Drigg or to similar future facilities; and
 - very low-level radioactive waste which will be disposed of promptly at suitably authorised disposal facilities; and
 - radioactive wastes exempted under the provisions of any relevant exemption order;
- **promptly** means as soon as is reasonably practicable after waste generation without the need for any treatment other than basic segregation, sorting and inspection to make it suitable for its intended disposal route. Advice about the disposal of those categories of radioactive waste that are not covered in this guidance can be obtained from the Environment Agency or SEPA.

3 Licensees are reminded that the same general safety and environmental standards apply to all activities involving radioactive materials whether or not the material involved is declared as radioactive waste.

Objective

4 The objective of this document is to provide guidance on complying with the legislation below in accordance with current policy by:

- helping to ensure that waste management organisations collect and appropriately manage the information necessary for safely managing the waste;
- describing regulatory expectations in relation to the management of information relating to radioactive waste in the United Kingdom; and
- providing links to other guidance that gives useful information on managing information and how relevant aspects of the radioactive waste management case (RWMC)² may be produced.

Applicable legislation

5 Applicable legislation with respect to radioactive waste is as follows:

- Nuclear Installations Act 1965 (as amended);⁸
- standard conditions applied to nuclear site licences;⁹
- Health and Safety at Work etc Act 1974;¹⁰
- Radioactive Substances Act 1993 (RSA93);¹¹ and
- conditions attached to authorisations under RSA93.

Details of how each of the above apply are given in *Radioactive waste management cases*.²

Introduction

Traditional records management approaches are unlikely to be sufficiently robust or sustainable to meet the demands over the long timescales

6 Traditional records management approaches are unlikely to be sufficiently robust or sustainable to meet the demands over the long timescales. This guidance, therefore, highlights existing national and international standards and practices for managing information that can be tailored to address some of the specific issues associated with managing radioactive waste related information over the long term. The overall objective is to equip future WMOs with the information necessary to take on the responsibility of safely managing the waste. Obviously, over the long timescales involved, standards and practices will be subject to review and revision. Waste management organisations should be mindful of this through the application of their own procedures to ensure that new standards and practices are identified and implemented as appropriate.

‘NII requires licensees to make arrangements for recording and preserving all the information that may be required in the future to endure the safe management of radioactive material and radioactive waste, for as long as such information may be required.’

Guidance for inspectors on the management of radioactive materials and radioactive waste on nuclear licensed sites HSE 2001⁶

‘Sufficient records relating to radioactive substances and associated facilities shall be made and retained so as to: facilitate the subsequent management of those substances and facilities; demonstrate whether compliance with requirements and standards has been achieved; and to provide continuing assurance about the environmental impact and risks of the operations undertaken, including waste disposal.’

Radioactive Substances Regulation: Environmental Principles (Interim) Environment Agency 2005¹²

7 Every organisation responsible for managing radioactive waste must establish and implement a system to create, maintain and manage comprehensive, accurate and reliable information. The nature of the operations leading to the generation of radioactive waste and the subsequent disposal processes mean that it will be necessary to transfer information from one waste management organisation (WMO) to another. Sometimes this transfer process will span many tens or hundreds of years. Information must be managed and transferred in such a way that future WMOs have adequate and appropriate information, and confidence in its quality and provenance, to ensure that waste continues to be managed in such a way that prevents or minimises threats to human health and the environment.

WMOs must establish and implement a system to create, maintain and manage comprehensive, accurate and reliable information

Timeframes

‘Where radioactive waste management and decommissioning strategies last for significant periods of time, then responsibilities will be passed to future generations. In order to comply with the concept of sustainable development, it will be necessary to provide the future generations with all the information they need to manage the nuclear facilities safely. This can be achieved by making adequate records of the nuclear facilities, and maintaining them so that they can be accessed in the future.’

‘...the projected storage period for many records associated with radioactive waste management ... will be greater than 100 years’

Guidance for inspectors on the management of radioactive materials and radioactive waste on nuclear licensed sites HSE 2001⁶

An information management system should meet the demands likely to be inherent in the next generation of waste custodians

The current generation must not impose an approach that might foreclose opportunities for effective information transfer in the future

8 Information relating to radioactive waste management activities will remain valid over some hundreds of years. This includes wastes identified at early stages of new build; waste created during operations; waste undergoing treatment and conditioning for disposal; and wastes actively managed throughout storage and disposal including any post-closure management period. Thereafter, information about the waste will need to be retained in perpetuity. It is impossible to predict with any certainty the needs of, or the technology available to, society in 100 years. Attempting to create a record with the guarantee that the associated information will be accessible in 100 years is unrealistic. Therefore, an information management system should be designed and implemented to meet the demands likely to be inherent in the next generation of waste custodians (who will assume responsibility for the records over the next 30–40 years). Furthermore, the current generation must not impose an approach that might foreclose opportunities for effective information transfer in the future.

9 The processes applied to manage and store records will vary depending on usage and long-term value. For simplicity, three types of record are assumed:

- type 1 – a record that is expected to retain currency from its creation until its destruction, which could be many years in the future;
- type 2 – a record that will retain currency only in the near term (eg within two or three years of the last entry) is unlikely to be accessed in the medium term (3–30 years) but may have currency again in the long term (>30 years);
- type 3 – a record that has medium-term (3–30 years) currency only and unlikely to be required in the long-term (>30 years) future.

10 The record manager is responsible for implementing a procedure that clearly defines each record type, with the agreement of the relevant stakeholders, and for keeping record types under review.

11 Records produced before the implementation of this guidance should be reviewed and categorised as above, over time. It is recognised that this would be a manpower-intensive exercise that may take some considerable time to complete. However, it could be incorporated within the procedures for routine records reviews.

'Records should be held by the licensee until the responsibility for the wastes and materials has been passed to another body such as the operator of a disposal facility.'

Guidance for inspectors on the management of radioactive materials and radioactive waste on nuclear licensed sites HSE 2001⁶

'Up to withdrawal of control [of a disposal facility], the records will be needed by the organisation exercising control and, potentially, by the regulators. After that time, the records may be subject to public archive.'

Radioactive Substances Act 1993: Disposal facilities on land for low and intermediate level radioactive wastes: Guidance on requirements for authorisation Environment Agency, SEPA, Department of the Environment for Northern Ireland 1997⁷

Procedures for the physical transfer of a waste item from one WMO to another should ensure that complete and accurate records are created and transferred

12 Procedures for the physical transfer of a waste item from one WMO to another are well documented. These procedures will define the various controls (physical and administrative) to be employed for ensuring the safe transfer of the waste item. The procedure for the transfer of the associated waste item record must be equally well documented. The records managers in both the dispatching and receiving organisations must work closely together to ensure that complete and accurate records are created and transferred, and that the handover is properly controlled and recorded. The physical (or electronic) transfer of the waste information record will represent the formal transfer of responsibility for its continuing management.

Records and information management policy and strategy

'The records management function should be recognised as a specific corporate programme within an authority and should receive the necessary levels of organisational support to ensure effectiveness'

'An authority should have in place an overall policy statement, endorsed by top management and made readily available to staff at all levels of the organisation, on how it manages its records, including electronic records'
*Lord Chancellor's Code of Practice on the management of records under section 46 of the Freedom of Information Act 2000*¹³

'An approved quality assurance procedure should be adopted to ensure that such records are assembled and maintained in a secure form that is readily auditable and accessible to all those persons who may need to consult them. The records should be comprehensive and include information relating to the radioactive material/waste, plant, building and associated structures, including information from the design, construction and operating stages.'
Guidance for inspectors on the management of radioactive materials and radioactive waste on nuclear licensed sites HSE 2001⁶

'The developer shall set up and maintain a comprehensive system of records for the recording of detailed information on all aspects of the project affecting the safety case.'
Radioactive Substances Act 1993: Disposal facilities on land for low and intermediate level radioactive wastes: Guidance on requirements for authorisation Environment Agency, SEPA, Department of the Environment for Northern Ireland 1997⁷

Organisations should establish and implement a comprehensive policy for managing radioactive waste information records

13 Organisations should establish and implement a comprehensive policy for managing radioactive waste information records and it should be endorsed at the highest management level. BS ISO 15489-1:2001¹⁴ is the principal international standard for managing information and documentation, and includes an outline for such a policy.

'Organisations should define and document a policy for records management. The objective of the policy should be the creation and management of authentic, reliable and useable records, capable of supporting business functions and activities for as long as they are required'
BS ISO 15489-1:2001¹⁴

14 The policy should make reference to the procedures and standards applicable to the information and records management function, and to any related policies (eg the use of information technology within the organisation). An important function of the policy is to clearly define responsibilities.

15 Having established the policy, the organisation should develop and implement an appropriate strategy that must be endorsed at senior management level. The strategy will identify measures to protect records and information relating to radioactive waste over the long term. PD ISO/TR 15489-2:2001¹⁵ and IAEA Tecdoc-1097¹⁶ provide guidance.

Records and information management systems and procedures

'We will look for evidence that sufficient data on each package (and the component raw waste) are being recorded and stored so that future safety and environmental assessments can be carried out and so that the wastes can be accepted at any repository or long-term store.'

'We will also look for evidence that data are recorded in a way that allows them to be accessed and retrieved over the long time periods that may be associated with the storage of radioactive waste'

The management of higher activity waste on nuclear licensed sites: Part I The regulatory process HSE, Environment Agency, SEPA December 2007¹

Systems

Records management should be regarded as an integral part of the organisation's culture

16 Organisations in the nuclear industry will have in place management systems that recognise the importance of maintaining information for a wide range of purposes. These systems should be endorsed at the highest possible level in the organisation, based on policy, strategy, standards and clear procedures. Thus, records management should be regarded as an integral part of the organisation's culture, rather than an activity undertaken at the end of a project. All staff must receive an appropriate level of training, depending on their specific responsibilities for the management of the records. Resources (financial and material) for managing records should be secured and protected, particularly during times of financial constraint or organisational change.

'records management governs the practice both of records managers and any person who creates or uses records in the course of their business activities'

BS ISO 15489-1:2001¹⁴

17 The records management system must provide the tools, processes and people that will enable information to be created, managed and transferred from one party to another. Success will be largely measured by the organisation's ability to transfer information, in full, uncorrupted and interpretable in such a way that it can be assimilated by any recipient.

Managing information requires additional measures beyond just managing records to ensure that the information can always be interpreted in the way the creator intended

18 Managing information will require additional measures over and above those associated with managing records to ensure that the information can always be interpreted in the way the creator intended. These measures may involve, for example, frequent sampling of the information, provision of technical glossaries and contextual information, and including indicators of the significance of the information for the safe management of radioactive waste.

19 Elements of an information management system will include, for example:

- identifying the records to be included;
- how information is collected:
 - record form;
 - transmittal;
 - receipt;
 - acceptability of records;
- how information is managed:
 - record location;
 - record retrieval (indexing and inventory of records);
 - record review and retention schedules;
 - record and information transfer;

- measures to protect records (short and long-term considerations):
 - document storage and archive requirements;
 - access control;
 - security and confidentiality requirements;
 - control of modification of records;
 - reproduction or transfer to alternative storage format (eg in the event of record deterioration or redundancy of record format);
 - national archives requirements.

Procedures

The application of working practices that provide a level of quality assurance are particularly valuable

20 The application of working practices that provide a level of quality assurance are particularly valuable. The above section on 'records and information management policy and strategy' highlights the importance of documented procedures in the management of information and this is reaffirmed in BS EN ISO 9001: 2000,¹⁷ the international standard relating to the requirements for quality management systems. Section 4.2 of BS EN ISO 9001 refers to documentation requirements; the organisational quality policy may be an appropriate place to identify the procedures related to records and information management.

All staff should understand their responsibilities and the rationale of the organisation's information management policy

21 All staff will have some responsibility for creating, managing and using records effectively, in line with the information management policy and procedures. All staff should understand their responsibilities and the rationale of the organisation's information management policy. Staff will require specific training and guidance to discharge their responsibilities and to be allocated time to carry out record-keeping tasks. Working-level procedures will be needed for key stages of the management process. Documented procedures should be an integral part of the organisation's quality management system. Documented procedures should be considered for the following key processes:

- capture – the process of determining that a record should be made and kept;
- registration – to provide evidence that a record has been created or captured;
- classification – identifying the category or categories of business activity;
- access and security-related protective marking – assigning rights or restrictions to access;
- content control – preserving the text as recorded and preventing unauthorised alterations;
- record type – identifying and indicating the record currency and likely long-term needs;
- identification and disposition status – determining the physical status and location of the record and appropriate review and retention period;
- storage and archiving – short and long-term conditions to ensure that records are protected, accessible and managed;
- use and tracking – records management transactions that may affect disposition status and access;
- implementation of disposition – carrying out actions in line with the disposition strategy;
- record destruction – defining the processes for destruction and the need to create a record of any destruction carried out.

The transfer of records from one WMO to another must be planned and controlled. Given the timescales, such a transfer is not just likely, it is inevitable

22 The transfer of records from one WMO to another must be planned and controlled. Given the timescales, such a transfer is not just likely, it is inevitable. From the outset, a WMO creating a waste record should consider how the information it contains is to be transferred in the future. This consideration alone may influence things like the media, the language and the quality of the metadata and contextual information.

23 Where paper records are transferred, the dispatching WMO is responsible for ensuring the completeness of the record and the information. This will invariably mean that records containing supporting information will have to accompany the primary record. Every effort must be taken to ensure the record is in good order and legible – the inclusion of a glossary of terms might be necessary to explain specialist or unusual terminology.

24 Digital records will also require a degree of preparation prior to transfer to ensure the information is retrievable in a form that can be 'translated' and understood. If possible, non-proprietary formats should be used but the dispatcher will have to closely liaise with the receiver on preferred media and format. Otherwise, the requirements for supporting information will be the same as for paper records.

25 Of course, some information may be non-text based. In these cases, written records may need to be created to explain the relevance and use of the 'record'. In all cases, the dispatcher is responsible for preparing the record for transfer and should bear any reasonable costs. This is a critical activity that carries high risk and the importance of planning and liaison cannot be over-emphasised.

Risk management

26 There is an inherent threat that information contained in some records will become inaccessible over a period of time. This may be as a result of damage to or loss of the record, changes in the technology needed to read the record (particularly relevant to electronic records), or changes in terminology and language. The risks associated with some of these threats may be considered low today, but they will inevitably increase with time.

27 Records managers should establish a risk register which identifies the threats over time, their likelihood of occurring and the potential consequences. It may be regarded that the loss of a record is merely inconvenient but some may have significant health and safety or environmental relevance and an associated cost for any future recreation.

28 The risk register should be reviewed on a regular basis and action taken, as necessary, to reduce risks to an acceptable level within the restraints of time and cost.

Backup procedures

29 A risk management strategy relating to important records and information must be established and actively maintained. A common process employed to reduce the risk of information loss is to copy it onto a second (or backup) recording media and to transfer the record to another location. This process is equally valid for paper or photographic-based and electronic media. Increased assurance can be provided if information backup is performed on a frequent basis and that the recording media used is different to that of the primary record.

30 The procedures for backing up information should be documented and regularly reviewed for effectiveness and compliance.

Records handling

31 The type and amount of handling to which a record is subjected will have a significant effect on its life expectancy. The environment in which paper records are to be handled should be considered and potential sources of contamination controlled and, if possible, eliminated.

A risk management strategy relating to important records and information must be established and actively maintained

A storage regime should be established that minimises handling

32 Certain materials that are often filed along with paper records should be removed during preparation for long-term storage. The presence of some materials can accelerate degradation, create harmful gases or attack the media or print. Materials to be removed include metal objects such as pins, staples, paper clips and 'treasury tags' as their inevitable corrosion will damage and deface the paper. Plastic materials, especially PVC-type covers, should also be removed as chemicals contained in the plastic reduce the adhesion properties of carbon black toner.

33 A storage regime should be established that minimises handling. Where it is necessary, clear procedures are to be employed and the use of protective gloves encouraged (gloves should be carefully specified not only to protect records from harmful substances on the hands but also from chemicals in the gloves themselves). The environmental conditions in the archive store are likely to significantly affect record longevity. Environmental conditions for archive stores are considered further in the section 'Records storage facilities'.

Records management: specific issues relating to managing records for the long term

General

'adequate records are held for a suitable period to demonstrate compliance with licence conditions.'

Nuclear Site Licence Condition 6⁹

'adequate records are kept, inter alia, on the amount and location of all radioactive material, including nuclear fuel and radioactive waste.'

Nuclear Site Licence Condition 25⁹

34 The Lord Chancellor's Code of Practice¹³ on records management sets out the practices to be followed by public authorities in creating, keeping, managing and destroying records. A public authority is one that is subject to the Freedom of Information Act or Freedom of Information (Scotland) Act¹⁸ or the Public Records Act 1958.¹⁹

35 The following sections highlight some of the characteristics of different forms of records and the measures that can be applied to help manage them.

'There is no single recommended storage medium for archives. The Public Records Office, for example, keeps records on a variety of media including paper, electronic data, microfilm, microfiche etc. The most pertinent British Standard is BS 5454,²⁰ and two others of relevance are BS 1153²¹ and BS 5699.²² The licensee should demonstrate the adequacy of its chosen storage medium/media, including redundancy or duplicate records, and should describe how it will review those arrangements in the future. Specific guidance on record storage²³ is available.'

Guidance for inspectors on the management of radioactive materials and radioactive waste on nuclear licensed sites HSE 2001⁶

36 There is no optimum recording medium although the Government has stated that for public records, electronic media should be used. Many records linked to the management of radioactive waste are likely to become 'vital' records in time and this will mean that the Government's requirement to produce digital or

electronic records (see *Government Policy on Archives*²⁴) will apply if they are to be placed in a recognised 'place of deposit' (PoD). In the meantime, records managers must consider the short and long-term role of records under their control and the requirements of the next WMO, and select the most appropriate recording media.

Information contained in a record must be accessible in a form that can be used and understood

37 Information contained in a record must be accessible in a form that can be used and understood. Measures should be implemented to ensure that information is accessible, particularly where digital media are used. Each record type has different characteristics requiring different management approaches (described in the following sections). A sustainable and effective record can be regarded as a combination of four elements, each of which must first be considered individually then as a whole:

- the recording media – the selected medium must be readily available at reasonable cost and not require sophisticated preservation techniques that rely on unusual technologies or challenging storage environments;
- the primary information – this must be documented using a format that is 'fit for purpose', is of appropriate quality, can be recovered, shared and understood by contemporary and future users;
- the metadata – this must comply with the Government Standard²⁵ and is essential for the long-term preservation and access requirements;
- the contextual information – the opportunity should be taken to add explicit links to other sources of information to aid interpretation and consistency.

38 As stated, it is government policy to place all vital records onto electronic media – but the need to preserve radioactive waste information for a very long time may present a challenge to this policy. Until the position for these records is clarified, records managers should select the most appropriate medium that does not preclude the use of any known media in the future.

Paper records

39 There is a lot of experience in preserving paper-based records and clear guidelines are provided in BS EN ISO 9706,²⁶ BS ISO 11798²⁷ and BS ISO 11108.²⁸ Paper records tend to deteriorate quite gradually (unless subject to extraordinary events), providing adequate time for the records manager to migrate the information onto alternative media in a controlled way. The following should be considered when working with paper-based records:

- most of the paper in daily use contains lignin which attacks the wood fibres, and there is increasing use of recycled paper (which has unproven long-term performance). Organisations must consider the need to either migrate the information onto archive-grade paper (see BS ISO 11108²⁸), or to ensure that when lower-grade paper is used the record is monitored at suitable intervals to identify when migration is needed. The information management system must accommodate these needs;
- laser printing and photocopying are the most practical and common techniques for transferring text onto paper. The durability of the text depends on the adherence between the toner and the medium, and on the quality of the paper. BS ISO 11798²⁷ specifies requirements for permanence;
- paper records should be kept under conditions designed to minimise handling, in an environment where temperature and humidity are controlled and exposure to light, gaseous contamination, particulates, vermin and fungal growths are minimised.

40 Specific procedures should be considered and, where appropriate, adopted to maximise long-term performance and minimise potential damage of paper records.

Digital records

41 The UK nuclear industry must strive towards using compatible systems that can enable accurate transfer of digital information. The British Radioactive Waste Information Management System (BRIMS) provides a tool to compile radioactive waste information into a database that can meet many local and strategic needs. BRIMS is supported by the regulators and government departments. It is regularly updated to ensure the data remains accessible to authorised users, and it can be networked. Organisations should consider using BRIMS, or ensure that custom-built systems will interface with BRIMS such that key records can be transferred without the need to transcribe data.

42 'Online' storage is used for information that is in current use and usually employs a magnetic disk or solid-state memory on a computer or local area network. Because the information is in constant use, it is stored on devices physically located in the computer or very close to it.

43 'Near-online' storage of digital information is becoming increasingly common due to the ability to store large quantities of data. This method is used where information is less frequently accessed. The devices used (similar to those for online storage) do not require any physical transfer of media and are often used as a primary backup to the main computer or network system. Procedures must be in place to regularly backup important information stored on these devices.

44 Digital information can also be retained using 'offline' devices such as disks or tapes that are stored at a location remote from their source. This approach is often used by organisations to backup important data. It tends to be used for short-term storage, and data will be periodically overwritten. Remote storage means that the data is less likely to suffer from a serious accident at the source location, but there is more risk that the information will be inaccessible after a period of time unless it is reviewed regularly to ensure it is accessible.

45 The integrity of technical reports containing text, diagrams, drawings and images created using a number of file formats will be more difficult to protect against changes in technology. Where such records are to be preserved in electronic form, they must be converted into an appropriate file format. The Portable Document Format (PDF) is now regarded by records management experts to be the preferred format. BS ISO 19005²⁹ provides guidance on the application of the PDF/A-1 format, which has been specifically developed to address the long-term challenge.

46 Where off-site facilities are used for preserving records, the organisations responsible must consider the use of appropriate security measures to prevent unauthorised access to the information. Records management should involve experts in information security (eg OCNS).

Microform records

47 Microform (microfilm, microfiche and aperture cards) is popular for recording large volumes of information and data. There are a number of film types available but for long-term storage silver-halide film should be used as it is less prone to fading when exposed to light.

48 Procedures must be in place to protect the integrity of microform, such as minimising its exposure to dust, dirt, chemicals, fingerprints and light. These procedures need to be considered when packaging, storing and accessing microform records.

49 Procedures for the handling of microform media include:

- use of lint-free gloves when handling silver-halide film;
- silver-halide master films should not be used for routine reference purposes as equipment mechanisms can scratch and stretch the film;
- undertake regular surveys of the condition of the film;
- reference films should be stored in dark or low light conditions; and
- films should be stored in polyester envelopes.

50 Further information on the use of microforms can be found in BS ISO 18901:2002.³⁰

Records storage facilities

General

51 Records that are needed for current day-to-day operations and in the long-term (type 1) need to be retained in a form and location that will allow ongoing access. It may be preferable to make a duplicate copy of these records to ensure they are managed for the future. This duplicate or 'master' should be moved to an archive repository.

52 Records identified having long-term value (type 2) should be prepared for long-term management as soon as possible after making the last entry. They should be reviewed to ensure, for example, that appropriate contextual information, links to other information sources and explanations of specialist terminology and abbreviations are included, before passing to the records manager for formal closure. The record should be moved to an archive repository as soon as possible.

53 Records having short-term value only (type 3) will normally be subject to recognised international standards such as BS ISO 15489¹⁴ and the guidance of public bodies (such as The National Archive), regulators and stakeholders. Appropriate managed storage facilities should be provided and maintained, according to agreed standards. The need to segregate radioactive waste records from other short-term 'business' records should be considered, as the timescales for review may be different and they may require different security arrangements.

54 It is important that for any type of record, the 'original' can be distinguished from any copies that are made. It is clearly preferable to mark the copy as such. It is good records management practice to periodically review the copies against the original to ensure consistency.

55 Records managers should ensure an 'audit trail' is established and maintained to ensure the record can be traced at all times and its history determined.

Local records management facilities

56 Most organisations will require facilities to store short-term records over and above personal filing systems (hard copy records) or server space (digital records). In many cases, records will be kept initially on nuclear sites close to waste management operations. Site managers must implement arrangements to store records safely while they are on site and have in place procedures to prepare and transfer any records expected to be moved off site when operations are completed.

57 The minimum standards expected of a site-based records storage facility include:

- the use of appropriate recording media;
- the use of appropriate materials for the protection of the records;
- an appropriately designated building or buildings;
- controlled access to records;
- controlled heat, light and humidity (consistent with record media needs);
- appropriate fire protection and firefighting equipment;
- low risk of flood, damage from inclement weather, subsidence or other natural phenomena; and
- appropriate levels of safety and comfort for permanent or visiting staff.

58 There are a number of standards and guidance documents relating to minimum standards for storage facilities. These include:

- BS ISO 15489-1:2001 Section 4.3.7;¹⁴
- HSE T/AST/033 Section 4.6;²³ and
- BS 5454.²⁰

59 Records managers should use these references to judge the suitability of present and proposed storage and archive facilities.

60 Records that are stored on site must be routinely reviewed to ensure:

- the case for preserving the record remains valid;
- the recording media is still in existence;
- the information contained in the record remains accessible; and
- security arrangements remain commensurate with the record's security marking.

61 Guidance relating to the conduct of reviews should be contained in the records management strategy and detailed in associated procedures.

62 The nature and relevance of the information, its recording medium, storage conditions and handling will be factors in determining the review periodicity. This should be clearly defined in the information management strategy document (see section on 'records and information management policy and strategy').

Off-site records management facilities

Organisations may choose to transfer records to an off-site archives facility operated by a third party but cannot transfer responsibility for the records relating to waste which is under their jurisdiction

63 Organisations may choose to transfer records to an off-site archives facility operated by a third party. Where this approach is used, the waste custodian must ensure the records are managed to a standard that is appropriate for their long-term preservation and information accessibility. The case for using any off-site archive facility should include an assessment of that facility to meet the minimum requirements set out in standards such as BS ISO 15489¹⁴ and BS 5454.²⁰ Similarly, the security arrangements must satisfy minimum requirements for the information stored. These arrangements must be regularly checked and assessed.

64 Records that are stored off-site and subject to infrequent handling must be routinely reviewed to ensure:

- the case for preserving the record remains valid;
- the recording media is still in existence;
- the information contained in the record remains accessible; and
- security arrangements remain commensurate with the record's security marking.

65 The nature of the information, recording medium, storage conditions and handling will be factors in determining the review period, which should be defined in the information management strategy document (see section on 'records and information management policy and strategy').

66 The WMO cannot transfer responsibility for the records relating to waste which is under their jurisdiction, even if the records are physically located with a third party.

National records management facilities

Long-term records must be prepared and maintained to a standard such that they can, in the future, be transferred to NNA with minimal intervention

The National Nuclear Archive

67 The Nuclear Decommissioning Authority (NDA) is committed to establishing a National Nuclear Archive (NNA) for the long-term storage of records relating to the UK civil nuclear industry. This project will take several years to complete, but once it has, it is expected that selected records from NDA-controlled sites (including records relating to disposals to the Low Level Waste Repository (LLWR) and the deep geological facility, or transfers to interim stores) will be routinely transferred from the WMO to the national facility. Long-term records must be prepared and maintained to a standard such that they can, in the future, be transferred to NNA with minimal intervention.

68 Records relating to wastes generated from non-NDA sites and from non-nuclear sites will need to be transferred to the next waste custodian, eg when wastes are sent for conditioning, storage or disposal. In the case of disposals to the LLWR and to the deep geological facility this will mean that the records will ultimately transfer to NNA and must be prepared and maintained to a standard for efficient and effective transfer. To this end we recommend early dialogue between waste generators and WMOs to ensure appropriate information is collected and that suitable information management systems and procedures are agreed and implemented.

69 NNA is currently not responsible for information related to radioactive wastes from non-NDA nuclear sites or wastes from non-nuclear sites that are not disposed at NDA-controlled sites, eg controlled on-site burials at non-NDA nuclear sites.

The National Archives

70 The National Archives (TNA) is the central advisory body on the care of records and archives in all media from creation to long-term preservation. TNA supports the business of government by managing records and information effectively and securing the archives of government for future access. TNA has a very specific remit in terms of preserving public and vital records. TNA will not be responsible for any records that are not closed (this could include any radioactive waste records that might be accessed in the long-term future) or have a protective security marking. The future role of NNA is therefore critical for the preservation of many radioactive waste records.

Nature of the information related to radioactive waste

General

‘The regulators will look for evidence that sufficient data on each package (and the component raw waste) are recorded and stored in an appropriate manner to support the needs of future safety and environmental assessments and to enable the waste to be accepted at any repository’

The management of higher activity waste on nuclear licensed sites: Part I The regulatory process HSE, Environment Agency, SEPA 2007¹

71 Our regulatory guidance is not intended to prescribe the precise information to be recorded and managed. Waste characteristics, and therefore the information recorded, will vary significantly. We provide generic guidance on the type of information that should be recorded in *Conditioning and disposability*.³

72 Detailed guidance on the nature of information is provided in *Waste package data and information recording specification*³¹ and *Explanatory material and guidance*³² for waste packagers. The guidance also applies to information that is generated by a waste producer before the waste undergoes any form of conditioning or packaging (eg description and inventory, origin, storage information, hazardous materials).

The waste item record must not be managed in isolation but as a component of a much larger information set

73 The waste item record must not be managed in isolation but as a component of a much larger information set that includes contextual information. Individual waste item records must contain references (links) to complementary information such as:

- generic information – applies to the waste type as a whole, in particular that which defines the origin of the waste, storage and retrieval processes, treatment or conditioning process and the packaging process;
- batch specific information – relates to a common collection of waste packages, eg container manufacturing information, assay results, inspection results;
- package specific information – relates to an individual waste item or package; and
- administrative information – required to demonstrate compliance with management (eg quality) and regulatory requirements.

74 The generic information and some batch-specific data records may not be physically located with the waste item record, because the data may be common for a large number of physical items. In these cases the waste item record must provide explicit, robust and documented links to the source data.

Metadata and contextual information

All records must include metadata, as defined in the Government Standard

75 All records must include metadata, as defined in the Government Standard.²⁵ Records required for long-term waste management should contain comprehensive and high-quality metadata to ensure they are accessible in the future.

76 The definition of metadata, taken from the Government Standard, is ‘structured information about a resource’. Metadata enables an information resource to be found by indicating what the resource is about and how it can be accessed. According to the Government Standard, metadata includes the following mandatory and recommended elements:

Mandatory	Mandatory (if applicable)	Recommended
Creator	Accessibility	Coverage
Date	Identifier	Language
Subject	Publisher	
Title		

77 The scope for defining contextual information is enormous but can include the source of information, author, project, activity and version. The record's relationship with other information sources will evolve over time as information is created or destroyed. A contextual information record will enable the records manager to establish each record in the much larger information environment and to indicate its relevant importance and value. There is no legal requirement to include contextual information but in the interests of the long-term management of radioactive waste, it is strongly advised.

78 Used together, metadata and contextual information will create an extremely valuable source of information that will provide evidence of provenance (origin), relevance, accuracy and trustworthiness.

Every record should be reviewed, before it is formally closed, at appropriate points during its period of storage

Record review

79 Every record should be reviewed, before it is formally closed, at appropriate points during its period of storage and prior to destruction or transfer for permanent preservation. Any decision to destroy the record must be documented. The record will be thoroughly reviewed to confirm the following:

- the information must be relevant;
- the information is accessible to the reader. This means it must be:
 - readable (the data can be recovered from the medium);
 - intelligible (the data is meaningful to the reader); and
 - useable (the data can be correctly interpreted);
- unusual or specialist terminology, colloquialisms and abbreviations are explained;
- materials that can harm the medium or its content are removed at the earliest point possible;
- the record medium remains fit for purpose, has not been subject to attack by harmful materials or elements, pollution or vermin;
- information sources referenced in the record and necessary for its interpretation remain accessible; and
- the need to protect information must be reviewed and protective markings amended, where appropriate (see section on 'Security and the protection of sensitive information').

80 The record review process should be covered by clear written procedures.

Security and the protection of sensitive information

Information relating to civil nuclear activities

Information that needs to be protected in the interests of national security requires a protective marking in accordance with the protective security and classification policy

Information contained in a record must be accessible in a form that can be used and understood

81 Records relating to radioactive waste may contain sensitive information. Records creators, managers and users must be aware of potential sensitivities and ensure appropriate security arrangements are implemented and followed.

82 Information that needs to be protected in the interests of national security requires a protective marking. OCNS should be consulted for further guidance.

83 OCNS regulates security arrangements within the civil nuclear industry including the protection of sensitive nuclear information. The government's protective marking system applies throughout the civil nuclear industry. Companies operating in the civil nuclear industry are also required to comply with Government IT security policy, with OCNS as the accreditation authority.

Sensitive information includes 'Information relating to activities carried out on or in relation to nuclear sites or other nuclear premises which appears to the Secretary of State to be information which needs to be protected in the interest of national security'

Anti-terrorism, Crime and Security Act 2001 (as amended)³³

84 The unauthorised disclosure of sensitive nuclear information is covered by the Anti-terrorism, Crime and Security Act 2001, which applies across the UK. The Nuclear Industries Security Regulations 2003³⁴ (NISRO3), as amended by the Nuclear Industries Security (Amendment) Regulations 2006³⁵ specifically require any person involved in activities on or in relation to a nuclear site or nuclear premises, or who are proposing to become involved, who is in possession or in control of sensitive nuclear information to protect that information in an appropriate manner. These requirements must be borne in mind if it is intended to place records under the day-to-day management of a third party.

85 NISRO3 does not apply to nuclear premises operated primarily or exclusively by the Ministry of Defence (MoD) or its contractors (see section 11.3), or to those holding Category IV nuclear material or radioactive sources outside civil nuclear licensed sites.

Classification of civil nuclear information

86 Organisations subject to regulation by OCNS should ensure that their information classification policy is consistent with OCNS's requirements on the use of protective markings. This extends to those categories of sensitive nuclear information that require protection and the level of protective marking to be applied. It includes information held on computer systems relating to nuclear material, other radioactive material (including radioactive sources) and radioactive material designated as waste.

87 Planned reviews of records held should include consideration of the need to retain protectively marked material at its original level. Originators, other specialists and records reviewers should exercise a degree of judgement, according to the sensitivity or timeliness of the information, in making decisions to downgrade.

Information relating to MoD nuclear activities

88 Ministry of Defence (MoD) information relating to its nuclear activities, which needs to be protected in the interests of national security, requires a protective marking in accordance with the security and classification policy issued on behalf of the Secretary of State for Defence.

Disclosure of information

89 The policy relating to protective marking of sensitive nuclear information should not be confused with disclosure policy or the requirement to protect commercial or other official data. OCNS provides general guidance in *Finding a balance*³⁶ to a wider audience in relation to enquiries under the Freedom of Information Act 2000 or the Freedom of Information (Scotland) Act 2002. The OCNS guidance is intended to prevent the disclosure of information that could assist a person or group planning theft, blackmail, sabotage and other malevolent or illegal acts. It identifies categories of information that should not be disclosed, provides reasons for protecting this information and indicates the protective marking afforded to such information.

Complying with this guidance

90 The National Archives have provided guidance³⁷ for organisations to determine the quality and robustness of their records management system. TNA recommend:

‘Authorities* should identify performance indicators that reflect their information management needs and arrangements and the risks that non-compliance would present to the authority. They should then put in place the means by which performance can be measured. For example, if quantitative indicators such as statistics are to be used, the information from which they will be generated must be kept. Qualitative indicators, for example whether guidance is being followed, can be measured by spot checks of files or by interviews.’ Draft revised Code of Practice under FOIA section 46.³⁸

91 We recommend that organisations evaluate their systems in line with this guidance to determine where further work needs to be undertaken and to assess compliance against best practice standards.

* ‘Authority’ is a term used by TNA for any organisation subject to the Freedom of Information Act.

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Glossary

archives archives are those records which have been selected for permanent preservation due to their continuing administrative, informational, legal and historical value as evidence of the work of the creating organisation. Archives are normally a small subset of an organisation's records.

archives repository used in this guidance as a building that has been specifically identified, equipped and resourced to store archived records.

BRIMS British Radwaste Information Management System. This is a database and client application used to record data and information about unconditioned radioactive waste, waste packages and waste management facilities.

context the qualitative element of a record that enables a reader to accurately interpret and use 'raw' data. This qualitative element should not be confused with metadata (see below). In general terms, raw data when combined with relevant context, can be regarded as information.

contextual information this may be regarded as 'information about information'. The International Council on Archives defines contextual information as that which is used to document relationships between information sources (*Radioactive waste information*³⁹).

data a collection of numbers, text, symbols or images with little or no accompanying description. Data in their raw form are likely to have little value to uninformed recipients because their unique relevance to an event cannot be determined when viewed in isolation.

HSE Health and Safety Executive.

IAEA International Atomic Energy Agency

information this is defined in *Finding a balance: Guidance on the sensitivity of nuclear and related information and its disclosure*³⁶ as 'organised or manipulated data, which has theme and meaning but that is not necessarily evidence of an event or decision. Information includes published works, reference material, databases and other structured or indexed collections of information as well as records and archives'.

information management information management is an active process where specific actions (over and above those associated with records management) are undertaken to ensure information can be accessed, interpreted and understood by an authorised user. The principal objective is to ensure meaningful information is communicated, rather than simply preserving the recording media.

knowledge a 'human' characteristic which is developed through access to contextualised information and combined with personal insight, experience, judgement and logic. Current and future generations of custodians will have to acquire and develop their knowledge in order to safely manage radioactive waste.

LLWR Low Level Waste Repository.

metadata structured information about a resource. Often defined as 'data about data'. Metadata enables a resource to be found by indicating what the resource is about and how it can be accessed with a series of structured descriptions.

MoD Ministry of Defence.

NDA Nuclear Decommissioning Authority.

NII Nuclear Installations Inspectorate.

NISR03 Nuclear Industries Security Regulations 2003.

NNA National Nuclear Archive.

OCNS Office for Civil Nuclear Security.

PDF portable document format.

PoD place of deposit.

primary information this is used to describe the information for which the record was originally created. The need to retain the primary information is the purpose of the record's existence.

record in the context of this document, a record is the means used to transfer documented data or information. A record can exist in a number of forms, some of which allow direct access to the information (for example, a photograph), while for others some type of processing will be necessary (for example, a computer file). Defined as 'Recorded information, regardless of media or format, created or received in the course of individual or organisational activity, which provides reliable evidence of policy, actions and decisions' in *Finding a balance*.³⁶

records management the function of creating, organising and maintaining records to ensure they provide evidence of activity, decision-making and policy. It includes the establishment of links between related records, swift and accurate filing and accessibility when required and scheduled destruction or transfer to an archives repository as appropriate in a timely fashion. The term 'recordkeeping' is often used interchangeably with records management.

RWMD NDA's Radioactive Waste Management Division.

SEPA Scottish Environment Protection Agency.

TNA The National Archives.

type 1 record a record that is expected to retain currency from its creation until its destruction which could be many years in the future. It is likely to be used to support day-to-day operations long into the future (>30 years).

type 2 record a record that will retain currency in the near term (eg within two or three years of the last entry), is unlikely to be accessed in the medium term (3–30 years) but may have currency again in the long term (>30 years).

type 3 record a record that has medium-term (3–30 years) currency only and unlikely to be required in the long term (>30 years).

waste item this is a uniquely identified entity to which particular characteristics can be attributed. A waste item can include a quantity of untreated materials stored in a vault or an engineered package awaiting disposal.

waste item record the waste item record is a collection of contextualised information that can be directly associated with a waste item.

WMO waste management organisation. In the context of this guidance, a WMO is a body having a recognised responsibility for managing radioactive waste. WMOs include waste producers, waste treatment and disposal companies.

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