



# The management of higher activity radioactive waste on nuclear licensed sites

## Part 3d

### Managing information and records 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

February 2010

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## 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.

Dutyholders on nuclear licensed sites who follow this guidance will normally be doing enough to comply with the relevant law as interpreted by the regulators at the time of writing, and the regulators may refer to this guidance as illustrating relevant good practice. However, duty holders are not required to follow this guidance and compliance with it 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. The guidance provides information to other parties who may be stakeholders in how radioactive waste is managed on a nuclear licensed site.

Policies for the disposal of higher activity waste differ in Scotland and in England/Wales. We consider that packages conditioned in anticipation of 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Waste Management Directorate (RWMD) under review and if any developments mean that this assertion for Scottish waste is no longer valid, we will provide further guidance.

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.

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 knowledge and records associated with waste is an important aspect of radioactive waste management. It is essential to ensure that licensees both now and in the future, are equipped with the knowledge and records they need to manage radioactive waste safely, 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 managing information and records about higher activity radioactive wastes on licensed nuclear sites.

# Scope

1 This document is part of a suite of guidance documents covering management of higher activity radioactive waste on nuclear licensed sites.

2 This document provides guidance for all licensees. It complements the guidance provided in:

- *The management of higher activity radioactive waste on nuclear licensed sites: Part I The regulatory process;*<sup>1</sup> and companion modules in the 'Joint Guidance' series;<sup>2-5</sup>
- *Guidance for inspectors on the management of radioactive materials and radioactive waste on nuclear licensed sites;*<sup>6</sup> and
- *Near-Surface Disposal Facilities on Land for Solid Radioactive Wastes, Guidance on Requirements for Authorisation;*<sup>7</sup>
- *Geological Disposal Facilities on Land for Solid Radioactive: Guidance on Requirements for Authorisation.*<sup>8</sup>

3 In the context of this guidance:

- 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 HLW, ILW, and such LLW as cannot be disposed of at present. If there is doubt over how to regard a particular waste stream, the owner of that waste stream should consult the regulators.

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.

4 Policies for the disposal of higher activity waste differ in Scotland and in England/Wales. We consider that packages conditioned in anticipation of 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 Directorate (RWMD) under review and if any developments mean that this assertion for Scottish waste is no longer valid, we will provide further guidance.

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

## Objectives

6 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 licensees collect and appropriately manage the information necessary for safely managing the waste;
- describing regulatory expectations in relation to the management of knowledge and records relating to radioactive waste in the United Kingdom; and
- providing links to specifications for use by licensees for the management of knowledge and records relating to radioactive wastes and other documentation that give general guidance on managing information.

## Applicable legislation and government policy

7 Key applicable legislation with respect to radioactive waste is as follows:

- Nuclear Installations Act 1965 (as amended);<sup>9</sup>
- standard conditions applied to nuclear site licences;<sup>10</sup>
- Health and Safety at Work etc Act 1974;<sup>11</sup>
- Radioactive Substances Act 1993 (RSA93);<sup>12</sup>
- conditions attached to authorisations under RSA93.

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

8 In England and Wales, it is anticipated that radioactive substances regulation will be incorporated into the Environmental Permitting Regulations (EPR) from April 2010. This legislative change will not affect the applicability of this guidance and references to RSA93 can be taken to include the EPR.

9 Government maintains and continues to develop a policy<sup>13</sup> and regulatory framework which ensures that:

- radioactive wastes are not unnecessarily created;
- such wastes as are created are safely and appropriately managed and treated;
- they are then safely disposed of at appropriate times and in appropriate ways.

10 The fundamental aim is to ensure that radioactive waste is managed in a way that protects the health and interests of people and the integrity of the environment, both now and in the future, inspires public confidence and takes account of costs.

# Introduction

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

11 The safe management and disposal of solid radioactive waste both now and in the future requires the maintenance of knowledge and adequate records. At any point in time the records should be sufficient to address the needs all stakeholders, which include the waste owners/producers, waste management facility operators, regulators, government, the public and future generations. All stakeholders need to work together to ensure that this is achieved.

12 The necessary records must be available to accompany consignments of waste through their whole lifecycle, and ultimately to an archive facility. Managing the records, such that they are maintained and transferred appropriately with no loss of authenticity, integrity, availability or confidentiality will be a long term process involving a number of organisations.

13 Traditional records management approaches are unlikely to be sufficiently robust or sustainable to meet the demands over the long timescales. This guidance 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 licensees 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. Licensees 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 2001.*

'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. Environment Agency September 2009.*<sup>14</sup>

## **Nuclear site licensees should establish and implement a system to create, maintain and manage comprehensive, accurate and reliable records**

14 Every organisation responsible for managing radioactive waste, through all stages of the lifecycle, should establish and implement a system to create, maintain and manage comprehensive, accurate and reliable records. We would encourage licensees to work together to establish, as far as possible, common systems and approaches.

15 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 knowledge and records from one licensee to another. Sometimes this transfer process will span many tens or hundreds of years. Knowledge and records must both be managed and transferred in such a way that future licensees are properly equipped to ensure that waste continues to be managed in such a way that prevents or minimises threats to human health and the environment.

16 Knowledge management and transfer are of crucial importance to the interpretation of records. Licence Conditions 14 and 36 require a licensee to demonstrate continued organisational capability, which includes production of an integrated management prospectus that sets out how management of knowledge is maintained and transferred. The present document hereafter

concentrates on information and records management and does not discuss knowledge management further.

## 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 2001.*

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

**The current generation should not impose an approach that might foreclose future opportunities for the effective transfer of knowledge and records**

17 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 potentially to be retained indefinitely. It is impossible to predict 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 should not impose an approach that might foreclose future opportunities for the effective transfer of knowledge and records.

18 The processes applied to manage and store records will vary depending on usage and long-term value. Some records may be used in the short term up to the point that they are placed in a store and again in the longer term when they are transferred to another store or sent for disposal. It is important that these records are managed for the longer term and can be accessed at any time.

19 The licensee should implement a procedure for keeping records under review. This review will take into account the continuing relevance of the information, the suitability of the medium on which it is stored and the needs and expectations of stakeholders.

20 Records produced before the implementation of this guidance should be reviewed and their continuing relevance determined. This may require significant resource, and take 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 (Nuclear Directorate) 2001*

'During the period of authorisation [of a disposal facility], the records will be needed by the organisation exercising control and, potentially, by the regulators. We shall expect the operator to make arrangements at the end of the period of authorisation for the records to be included in the public archive.'

*Geological Disposal Facilities on Land for Solid Radioactive Wastes: Guidance on Requirements for Authorisation* Environment Agency & Northern Ireland Environment Agency, February 2009  
*Near-surface Disposal Facilities on Land for Solid Radioactive Wastes: Guidance on Requirements for Authorisation* Environment Agency, Northern Ireland Environment Agency & Scottish Environment Protection Agency, February 2009

**The transfer of waste items from one licensee to another should be accompanied by the transfer of suitable knowledge and records.**

21 Procedures for the physical transfer of a waste item from one licensee to another are well documented. These procedures define the various controls (physical and administrative) to be employed for ensuring the safe transfer of the waste item. Transfer of the associated waste item record should be equally well documented and controlled. The dispatching and receiving organisations should work closely together to ensure that suitable knowledge and records are transferred, and that the handover is properly controlled and recorded. The transfer of the waste item record represents the formal transfer of responsibility for the continuing management of the information.

22 Transfer of knowledge and records must precede transfer of the wastes. Duplicate records will also need to be retained by the dispatching organisation at least until the receiving organisation receives the waste and is satisfied that the records are suitable.

# Information and records 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*<sup>15</sup>

'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 2001

'The developer/operator will need to set up and maintain a comprehensive system for recording information on all aspects of the project affecting the environmental safety case. The information to be recorded should include: decisions taken and the reasons for them, data and results from the site investigation and characterisation programme; design documents, drawings and engineering details of the facility as constructed; records of waste form and characterisation; records of waste emplacements and their location in the facility; other operational information; details of facility closure; and results of monitoring and assessment at all stages of the project. Duplicates of the records will need to be kept at diverse locations and in durable form.'  
*Disposal Facilities on Land for Solid Radioactive Wastes: Guidance on Requirements for Authorisation* Environment Agency & Northern Ireland Environment Agency, February 2009  
*Near-surface Disposal Facilities on Land for Solid Radioactive Wastes: Guidance on Requirements for Authorisation* Environment Agency, Northern Ireland Environment Agency & Scottish Environment Protection Agency, February 2009

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

23 Organisations should establish and implement a comprehensive policy for managing radioactive waste records, endorsed at the highest management level. BS ISO 15489-1:2001<sup>19</sup> is the principal international standard for records management, 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 15489-1:2001<sup>16</sup>

24 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.

25 Having established the policy, the organisation should develop and implement an appropriate strategy that should be endorsed at senior management level. The strategy will identify measures to protect information and records relating to radioactive waste over the long term. PD ISO/TR 15489-2:2001<sup>17</sup> and IAEA Tecdoc-1097<sup>18</sup> provide guidance.

# Information and records 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 2007

## Information and records management should be regarded as an integral part of the organisation's culture

### Systems

26 Organisations in the nuclear industry will have in place management systems that recognise the importance of maintaining information and records 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, information and 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 should receive an appropriate level of training, depending on their specific responsibilities for the management of the information and records.

27 Resources (financial and material) for managing information and records should be secured and protected, particularly during times when they may be at risk, such as times of national emergency, financial constraint or organisational change.

28 The information and records management system should provide the tools, processes and people that will enable information and records to be created, managed and transferred from one party to another. Success will be largely measured by the organisation's ability to transfer information and records with no loss of authenticity, integrity, availability or confidentiality.

## Managing information requires specific actions beyond just managing records to ensure that the information can be accessed, interpreted and understood by an authorised user

29 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, rather than simply preserving the recording medium. These actions may involve, for example, frequent sampling and review of the records, provision of technical glossaries and information providing context, together with indicators of the significance of the information for the safe management of radioactive waste.

30 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

### **Working practices should follow documented procedures to provide appropriate quality management**

31 Working practices should follow documented procedures to provide appropriate quality management. The above section on 'information and records 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,<sup>19</sup> 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 information and records management.

### **Staff should understand their responsibilities and the rationale of the organisation's information management policy**

32 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 should be allocated time to carry out information and record management tasks. Working-level procedures will be needed for key stages of the information management process. Documented procedures should be an integral part of the organisation's quality management system. Documented procedures should be provided for such processes as:

- planning – determining that a record should be made and kept;
- creation – production of the record;
- registration – providing evidence of the record in the document management system;
- access and security – assigning rights or restrictions to access;
- content control – preserving the technical content of the record and preventing unauthorised alterations;
- record status – determining where and in what form the record is held ;
- identifying and documenting the record currency – determining the appropriate retention and review periods;
- storage and archiving – short- and long-term conditions to ensure that records are protected, accessible and managed;
- use and tracking – identifying when a record was used and /or amended;
- record destruction – defining the processes for destruction and the need to create a record of any destruction carried out.

### **The transfer of information and records from one licensee to another should be planned and controlled. Given the timescales, such a transfer is not just likely, it is inevitable**

33 The transfer of information and records from one licensee to another should be planned and controlled. Given the timescales, such a transfer is not just likely, it is inevitable. From the outset, a licensee 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 information on context. Licensees should also ensure that information generated on their behalf (for example, by contractors) is produced in accordance with predefined specifications and that transfer of such information is also planned and controlled.

34 The dispatching organisation is responsible for ensuring the record is complete, in accordance with the requirements determined at the outset through dialogue with the recipient and other stakeholders. Records containing supporting information will accompany the primary record. The record should be in good order, legible, and in a format agreed with the recipient. The inclusion of a glossary of terms might be necessary to explain specialist or unusual terminology.

35 Digital records will, in addition, require a degree of preparation prior to transfer to ensure the information is retrievable in a form that can be 'translated' and understood. Non-proprietary formats should be used, wherever possible. The dispatcher will have to liaise closely with the recipient on preferred medium and format.

36 In the context of this document, a record is the means used to transfer information. A record can exist in a number of forms, for example:

- text, numerical data, maps, drawings on paper or microfilm;
- photographic images on film;
- digital information on magnetic media (eg tapes, floppy discs) or on optical storage devices (eg CDs, DVDs);
- physical material (such as samples of materials and rock cores).

37 Some records (for example, a photograph) allow direct access to the information, while others (for example, a computer file) require some type of processing. 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

38 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.

39 Licensees should establish a risk register which identifies the threats over time, their likelihood of occurring and the potential consequences. The loss of a record may be regarded at the time as merely inconvenient, but some losses may have significant health and safety or environmental relevance and an associated cost for any future attempt to regenerate the record.

### **A risk management strategy relating to information and records should be established and actively maintained**

40 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.

## Back-up procedures

41 A risk management strategy relating to important information and records should be established and actively maintained. A common process employed to reduce the risk of loss is to copy it on to a second (or back-up) recording medium 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 back-up is performed on a frequent basis and if the recording medium used is different from that of the primary record.

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

## Records handling

43 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 storage regime should be established that minimises handling

44 Materials that are often filed with paper records (such as staples, paper clips, treasury tags, PVC covers) should be removed during preparation for long-term storage as they can cause or accelerate degradation, and an alternative means of ensuring the records are kept in order may need to be considered.

45 A storage regime should be established that minimises handling. Clear procedures must be applied to ensure that protective gloves are used to handle records, (gloves should protect records from harmful substances on the hands but should not introduce chemicals that may have a deleterious effect on the record medium). Environmental conditions are likely to affect record longevity. Environmental conditions for information and record storage 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 6

'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 2

46 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,<sup>20</sup> and two others of relevance are BS 1153<sup>21</sup> and BS 5699.<sup>22</sup> 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 storage is available'.<sup>23</sup>  
*Guidance for inspectors on the management of radioactive materials and radioactive waste on nuclear licensed sites* HSE (Nuclear Directorate) 2001

47 There is no optimum recording medium. Many records linked to the management of radioactive waste are likely to be required for the long-term (>100 years) and will ultimately be transferred to a public archive to be maintained indefinitely. Licensees should consider the short and

long-term role of records under their control and discuss the requirements of the next waste custodian and other stakeholders, in order to select the most appropriate recording medium.

### **Information contained in a record should be accessible in a form that can be used and understood**

48 Information contained in a record should 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. All records have 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 should first be considered individually then as a whole:

- the recording medium – the selected medium should be readily available at reasonable cost and not require sophisticated preservation techniques that rely on unusual technologies or challenging storage environments;
- the primary data – this should 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 should comply with the Government Standard<sup>24</sup> and is essential for the long-term preservation and access requirements;
- information providing context – the opportunity should be taken to add explicit links to other sources of information to aid interpretation and consistency.

49 It is government policy to place permanent records for public archive on to digital or electronic media.<sup>25</sup> This may present a challenge to preserving radioactive waste information for a very long time. The NDA should establish standards, procedures and guidance for the National Nuclear Archive so that early steps can be taken to produce records to the required standard, where practicable. In the meantime licensees should discuss the requirements of the next waste custodian and other stakeholders, in order to select the most appropriate recording media.

### **Paper records**

50 There is a lot of experience in preserving paper-based records and clear guidelines are provided in BS EN ISO 9706,<sup>26</sup> BS ISO 11798<sup>27</sup> and BS ISO 11108.<sup>28</sup> Barring extraordinary events such as fire, paper records tend to deteriorate quite gradually, providing adequate time for the licensee to migrate the information on to alternative media in a controlled way. To cater for extraordinary events, licensees should give consideration to back-up procedures as described earlier. 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 should consider the need to migrate the information on to archive-grade paper (see BS ISO 11108), or 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 should accommodate these needs;
- laser printing and photocopying are the most practical and common techniques for transferring text on to paper. BS ISO 11798 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.

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

## Digital records

52 Licensees across the UK nuclear industry should 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. 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.

53 The integrity of reports containing text, diagrams, drawings and images created using a number of file formats will be difficult to protect against changes in technology. Where such records are to be preserved in electronic form, they should 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 19005<sup>29</sup> provides guidance on the application of the PDF/A-1 format, which has been specifically developed to address the long-term challenge.

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

## Microform records

55 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.

56 Procedures should 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 handling, packaging, and storing microform records.

57 Further information on the use of microforms can be found in ISO 18901:2002.<sup>30</sup>

# Records storage facilities

## General

‘documents and records should be securely stored and maintained in such a way that they are readily retrievable in facilities that provide a suitable environment to minimise deterioration or damage and to prevent loss.’  
HSE Technical Assessment Guide T/AST/033 2009

58 Records that are needed for current day-to-day operations and in the long-term 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. The ‘master’ should be moved to an archive, and managed appropriately thereafter.

59 Records with long-term value should be prepared for long-term management as soon as possible after making the last entry. They should be reviewed to ensure they are complete, for example, that they include information providing context, links to other information sources and

explanations of specialist terminology and abbreviations. The record should be moved to an archive, and managed appropriately thereafter.

60 Records having short-term value only should be transferred to an appropriate store and managed appropriately thereafter. The need to separate 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.

61 It is important that for analogue records (such as paper or microform), the 'original' can be distinguished from any copies that are made. It is clearly preferable to mark the copy as such. It is good record management practice to review the copies against the original periodically, to ensure consistency.

62 Licensees should ensure an 'audit trail' is established and maintained to ensure the record can be traced at all times and its history determined, including, in particular, whether and when it was copied and when it was last reviewed.

### Local records management facilities

63 Most organisations will require facilities to store operational records. In many cases, records will be kept initially on sites close to waste management operations. Licensees should 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.

64 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 the building and records;
- controlled heat, light and humidity (consistent with the needs of the range of record media being stored);
- appropriate fire protection and fire fighting equipment;
- low risk of flood, damage from inclement weather, subsidence or other natural phenomena;
- appropriate levels of safety for permanent or visiting staff.

67 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;
- HSE T/AST/033 Section 4.6;
- BS 5454.

68 Licensees should use these references to judge the suitability of present and proposed storage and archive facilities.

69 Records that are stored on site should be routinely reviewed to ensure:

- the case for preserving the record remains valid;
- the recording medium is still in common use;
- the information contained in the record remains accessible; and
- security arrangements remain consistent with the record's security marking.

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

71 The nature and importance 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 'information and records management policy and strategy').

## Off-site records management facilities

### Organisations may choose to transfer records to an off-site archive operated by a third party but cannot transfer responsibility for the records

72 Licensees may choose to transfer records to an off-site archive operated by a third party. Where this approach is used, the licensee should ensure that the records are managed to a standard appropriate for their long-term preservation and accessibility. The case for using any off-site archive should include an assessment of the ability of the archive to meet the minimum requirements set out in standards such as ISO 15489 and BS 5454. Similarly, the security arrangements should satisfy minimum requirements for the information stored. These arrangements should be regularly checked and assessed.

73 Licensees should review records that are stored off-site and subject to infrequent handling routinely to ensure:

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

74 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 'Information and records management policy and strategy').

75 The licensee remains responsible for the records relating to wastes for which they are responsible (even if the records are physically located with a third party) until such a time that they transfer the wastes and associated information and records to another custodian (for example, to the operator of a disposal facility).

## National records management facilities

### The National Nuclear Archive

### Long-term records should be prepared and maintained such that they can, in the future, be transferred to the National Nuclear Archive with minimal further processing

'We shall expect the operator [of a disposal facility] to make arrangements at the end of the period of authorisation for the records to be included in the public archive.'

*Disposal Facilities on Land for Solid Radioactive Wastes: Guidance on Requirements for Authorisation* Environment Agency & Northern Ireland Environment Agency February 2009

*Near-surface Disposal Facilities on Land for Solid Radioactive Wastes: Guidance on Requirements for Authorisation* Environment Agency, Northern Ireland Environment Agency & Scottish Environment Protection Agency February 2009

76 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. The role of the NNA in radioactive waste information management will become clearer as the project progresses.

77 In the long term (once wastes are disposed of and a disposal facility is no longer subject to licensing) there will be a national need to maintain knowledge, information and records relating to the facilities and the wastes they contain. It is currently understood that the NNA will accept records relating to wastes from NDA-controlled sites (including records relating to disposals to the Low Level Waste Repository (LLWR) and the geological disposal facility (GDF), or transfers to interim stores). Records relating to wastes from non-NDA sites destined for disposal to the LLWR and to the geological disposal facility will also, in due course, be transferred to the NNA. The 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 regulators will pursue this issue with the NDA with respect to developing the strategy for the NNA.

78 Long-term records should be prepared and maintained such that they can, in the future, be transferred to the NNA with minimal further processing.

79 Records relating to wastes generated from non-NDA nuclear sites and any relevant records from non-nuclear sites will be transferred to the next waste custodian, eg when wastes are sent for conditioning, storage or disposal. To this end we recommend early dialogue between all organisations generating and managing radioactive waste to ensure appropriate information is collected and that suitable information management systems and procedures are agreed and implemented.

## Nature of the information and records 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 2007

80 Information about radioactive waste is created at all stages of the lifecycle from its generation, through processing and storage, to disposal and beyond. Licensees are responsible for collecting and managing all necessary information and records pertaining to the waste for which it is responsible for the past and current stages in its lifecycle, and for ensuring the information and records are comprehensive and in a format such that the next waste custodian can continue to manage them. Licensees need to identify their own and other stakeholder information requirements to ensure these are met and to ensure that knowledge about the wastes can be transferred to and understood by future custodians and generations. This results in a very large amount of information and records, not all of which will be needed in the long term. An appropriate strategy for managing information and records should ensure that only appropriate and selective information and records are retained. The success of any review or filtering process relies on clear understanding of the information requirements and the significance of the information at every stage of the lifecycle.

81 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 Parts 3a and 3b of the Joint Guidance. In general terms the information is likely to address:

- nature of the wastes: description and origin,
- packaging records:

- the waste forms, including formulation and chemical constituents
  - the containers in which the waste is placed;
  - the conditioning and packaging processes;
  - waste package radionuclide and physical /chemical inventory
  - conditioned waste package properties, including reference to the Waste Product Specification and waste package unique identifier;
  - waste package history, including the storage conditions the waste has encountered;
- specific safety and other data criteria such as imposed for example by criticality compliance, international safeguards and hazardous waste regulations;
  - Disposal Records:
    - records of authorisation for final disposal;
    - records of decisions taken and the reasons for them;
    - data and results from site investigation and characterisation;
    - design documents, drawings and engineering details of the facility;
    - records of waste emplacement and their location in a disposal facility;
    - details of facility closure;
    - results of monitoring and assessment throughout all stages of authorisation).

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

### **A waste record should not be managed in isolation but as a component of a much larger information set**

83 The record of an individual waste item or package should not be managed in isolation but as a component of a much larger information set that includes information providing context. Individual waste records should include references (links) to 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
- information required to demonstrate compliance with management (eg quality) and regulatory requirements.

84 Generic information and some batch-specific data records may not be physically located with the record of an individual waste item or package, because the data may be common for a large number of items. In these cases the record of the individual item should provide explicit, robust and documented links to the more general data.

## **Metadata and information providing context**

### **All records should include metadata and information providing context**

85 Metadata are 'data about data'. Metadata enable a resource to be found by indicating what the resource is about and how it can be accessed with a series of structured descriptions.

86 Record management systems should contain metadata to enable the system and the records to be understood and to be operated efficiently. Records required for long-term waste management should contain comprehensive and high-quality metadata and information providing context to ensure they are accessible and can be properly interpreted in the future.

87 The scope for defining information providing context 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. Information providing context will enable the licensee to understand and identify the importance and value of the record. There is no legal requirement to include information providing context but in the interests of the long-term management of radioactive waste, it is strongly advised.

88 Used together, metadata and information providing context will create a valuable resource providing evidence of provenance (origin), relevance, accuracy and trustworthiness of the information and records.

## Record review

**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 long term preservation.**

89 The licensee should establish a written procedure for closing waste records, which should set out the criteria to be fulfilled before a record can be closed. 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 long-term preservation.<sup>33</sup> This should take into account factors such as, whether there will potentially be further processing of the waste or whether it has been consigned for disposal. The licensee should also establish a written procedure for destroying waste records, which should set out the criteria to be fulfilled before a record can be destroyed. Any decision to destroy a record should be properly documented and this documentation maintained as part of the continuing records. The licensee should establish a written procedure for reviewing waste records. The review of a waste record will confirm the following:

- the information contained in the record remains relevant;
- the information is accessible to the reader. This means it should be:
  - readable (the data can be recovered from the medium);
  - intelligible (the data are meaningful to the reader); and
  - usable (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;
- the record medium remains fit for purpose (ie it is not obsolescent and has not been subject to chemical, physical or biological degradation);
- information sources referenced in the record and necessary for its interpretation remain accessible;
- security and protective markings are correct (or are amended as appropriate as a result of the review) – see section below on 'Security and the protection of sensitive information'.

# Security and the protection of sensitive information and records

## Information and records relating to civil nuclear activities

### Information and records relating to radioactive waste may contain sensitive information and need to be protected accordingly

90 Information and records relating to radioactive waste may contain sensitive information and need to be protected accordingly. Licensees should be aware of potential sensitivities and ensure appropriate security arrangements are implemented and followed.

91 Waste records and information providing context may attract differing security classifications. This potential conflict should be highlighted and suitable measures instigated to ensure that necessary linkages between information and records are maintained

92 Information that needs to be protected in the interests of national security requires a protective marking in accordance with the protective security and classification manual. This does not extend to information that has previously been made available to the public anywhere in the world. OCNS should be consulted for further guidance.

93 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)<sup>34</sup>

94 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 2003<sup>35</sup> (NISR03), as amended by the Nuclear Industries Security (Amendment) Regulations 2006<sup>36</sup> 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 should be borne in mind if it is intended to place records under the day-to-day management of a third party.

95 NISR03 does not apply to nuclear premises operated primarily or exclusively by the Ministry of Defence (MoD) or its contractors, or to those holding Category IV nuclear material or radioactive sources outside civil nuclear licensed sites.

## Classification of civil nuclear information

96 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.

97 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 of the information and any time-dependence this may have, in making decisions to downgrade.

### Information and records relating to MoD nuclear activities

98 Information and records relating to MoD nuclear activities, which need to be protected in the interests of national security, require a protective marking in accordance with the security and classification policy issued on behalf of the Secretary of State for Defence.

### Disclosure of information

99 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. In *Finding a balance*,<sup>37</sup> OCNS provides general guidance 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

100 The National Archives have provided guidance<sup>38</sup> 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.<sup>39</sup>

101 We recommend that licensees evaluate their systems in line with this guidance to determine where further work needs to be undertaken and to assess compliance.

102 We will capture experience gained from working with this guidance and will review the document a year after it is issued.

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

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