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| ONR Technical Assessment Guide  Management of Radioactive Waste on Nuclear Licensed Sites |



ONR Technical Assessment Guide (TAG)

Management of Radioactive Waste on Nuclear Licensed Sites

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Revision commentary

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| Issue | Description of update(s) |
| 8 | Restructuring to separate guidance on radioactive waste and radioactive materials. This document, NS-TAST-GD-024, now focusses on radioactive waste only and guidance relating to the management of radioactive materials will be integrated into NS-TAST-GD-023. |

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# Introduction

1. ONR has established its [Safety Assessment Principles](http://www.onr.org.uk/saps/saps2014.pdf) (SAPs) [1] which apply to the assessment by ONR specialist inspectors of safety cases for nuclear facilities that may be operated by potential licensees, existing licensees, or other dutyholders. The principles presented in the SAPs are supported by a suite of guides to further assist ONR’s inspectors in their technical assessment work in support of making regulatory judgements and decisions. This technical assessment guide (TAG) is one of these guides.

# Purpose and scope

1. This TAG contains guidance to advise and inform ONR inspectors in exercising their regulatory judgement on the management of solid, liquid and gaseous radioactive waste on nuclear licensed sites. The TAG is not written for dutyholders and, although it may be used by dutyholders as a source of guidance or relevant good practice (RGP), it should not be interpreted as a set of prescriptive legal requirements.
2. This guidance relates to the management of radioactive waste that is currently being, or may be accumulated or stored on nuclear licensed sites. In this guidance, the meaning of these terms is as defined in ONR’s Licence Condition Handbook [2] and in sections 3(14) and 4(7) of the Nuclear Installations Act 1965 (NIA1965) [3], all of which refer to the relevant environmental legislation. Radioactive waste is also an example of nuclear matter, as defined in section 26(1) of NIA1965.
3. This guidance is applicable to the management of radioactive waste on nuclear licensed sites prior to disposal (predisposal management). The management of radioactive waste is closely linked with the decommissioning of nuclear facilities, therefore these activities require an integrated approach. It covers through-life management of radioactive waste from creation through generation, processing, storage and up to, but not including, disposal or discharge.
4. Key terms pertinent to the management of radioactive waste used in this TAG are defined as follows:

* Accumulation: The gathering or amassing of radioactive waste in any form;
* Processing: Any operation that changes the characteristics of the waste, including pre-treatment, treatment and conditioning;
* Storage: Emplacement of radioactive waste in an appropriate engineered facility with the intention and ability to retrieve;
* Disposal: Emplacement of solid radioactive waste in an appropriate engineered facility without the intention of retrieval; and,
* Discharge: Release of liquid or gaseous radioactive waste to the environment.

1. The term “radioactive waste” covers a wide range of material, and so it is classified in terms of the nature and quantity of the radioactivity it contains and its heat-generating capacity. The guidance in this TAG is applicable to all of the following classifications of radioactive waste:

* High Level Waste (HLW) – waste in which the temperature may rise significantly as a result of its radioactivity, so this factor has to be taken into account in the design of storage or disposal facilities.
* Intermediate Level Waste (ILW) – waste exceeding the upper boundaries for LLW, but which does not require heat generation to be taken into account in the design of storage or disposal facilities.
* Low Level Waste (LLW) – waste having a radioactive content not exceeding 4 GBq/te of total alpha activity or 12 GBq/te of total beta/gamma activity.
* Higher Activity Radioactive Waste (HAW) – comprises HLW, ILW and LLW that is not currently suitable for disposal in existing facilities.
* Within the LLW definition are additional sub-categories for low volume and high volume very low level waste (VLLW)
  + Low volume VLLW – radioactive waste which can be safely disposed of to an unspecified destination with municipal, commercial or industrial waste (“dustbin” disposal):
    - each 0.1 m3 of waste contains less than 400 kBq of total activity or single items contain less than 40 kBq of total activity
    - For wastes containing carbon-14 or tritium:
      * in each 0.1 m3, the activity limit is 4,000 kBq for carbon-14 and tritium taken together; and
      * for any single item, the activity limit is 400 kBq for carbon-14 and tritium taken together.

Controls on disposal of this waste, after removal from the premises where the wastes arose, are not necessary.

* + High volume VLLW – radioactive waste with maximum concentrations of 4 MBq/te of total activity which can be disposed of in specified landfill sites. For waste containing tritium, the concentration limit for tritium is 40 MBq/te.

Controls on disposal of this waste, after removal from the premises where the waste arose, will be necessary.

* Exempt and out of scope waste – waste that can be exempted from some requirements of the environmental legislation (such as permitting) if the preconditions specified in that legislation can be satisfied, or are out of scope of the environmental legislation. Guidance is available on exemptions from environmental legislation in England and Wales [4], and on the authorisation framework, including General Binding Rules, for Scotland [5].

1. For further background on the context of radioactive waste management, including what radioactive waste is and the different roles involved in the management of radioactive waste, inspectors should refer to the joint guidance document [Basic Principles of Radioactive Waste Management](https://dev-office-for-nuclear-regulation.uksouth01.umbraco.io/media/4yznxreg/basic-principles.pdf) [6].

# Relationship to licence and other relevant legislation

## Nuclear Site Licence Conditions

1. All of the licence conditions (LCs) apply and are relevant to activities involving the management of radioactive waste. However, there are a number of LCs that are of particular relevance to the guidance provided in this TAG:

* **LC4 Restrictions on nuclear matter on the site**

The definition of nuclear matter in NIA1965 encompasses radioactive waste, so the requirements of LC4 for the licensee to ensure that nuclear matter is not brought onto, or stored, on the site except in accordance with adequate arrangements apply to the management of radioactive waste. This TAG provides guidance on expectations for the safe management of radioactive waste, which inspectors may find useful in judging the adequacy of arrangements for compliance with LC4.

* **LC6 Documents, records, authorities and certificates**

**LC25 Operational records**

LC6 requires the licensee to make adequate records to demonstrate compliance with the licence conditions, while LC25 requires the licensee to make adequate records of the operation, inspection and maintenance of any plant which may affect safety, where “operation” includes the treatment, processing, keeping, storing, accumulating or carriage of radioactive waste. LC25 also requires records of the amount and location of all radioactive waste processed, stored or accumulated upon the site at any time. This TAG provides an overview of RGP for records for radioactive waste, reflecting that the management of radioactive waste may involve multiple facilities and organisations at different points in the waste lifecycle from generation to disposal, potentially over significant timescales. Inspectors may find this useful in judging the adequacy of compliance with LCs 6 and 25.

* **LC15 Periodic review**

LC15 requires the licensee to make and implement adequate arrangements for the periodic review and reassessment of safety cases. This TAG provides guidance on safety cases for radioactive waste management activities, which inspectors may find useful in judging whether a licensee has conducted an adequate review against RGP. As facilities for the management of radioactive waste, particularly stores for HAW, may be required to operate safely over long periods, this TAG also highlights specific aspects that should be addressed by licensees in the periodic safety review of radioactive waste facilities.

* **LC17 Management systems**

LC17 requires the licensee to make and implement adequate quality management arrangements in respect of all matters that may affect safety. In respect of radioactive waste, adequate control over the quality of radioactive waste products and containers is required to ensure that the waste can be managed safely and in a way that is consistent with the safety cases for its management over the full lifecycle. This TAG includes guidance on quality control and quality assurance of radioactive waste management activities, which inspectors may find useful in judging the adequacy of quality arrangements related to radioactive waste management for compliance with LC17.

* **LC23 Operating rules**

For operations that may affect safety, LC23 requires the licensee to produce an adequate safety case and to identify the conditions and limits necessary in the interests of safety. This TAG provides guidance on specific aspects important to safety that should be addressed in safety cases for radioactive waste management activities, including associated limits and conditions.

* **LC28 Examination, inspection, maintenance and testing**

For all plant that may affect safety, LC28 requires the licensee to make and implement adequate arrangements for examination, inspection, maintenance and testing. This TAG provides guidance on specific considerations for the condition, monitoring and inspection programmes for stored radioactive waste, reflecting that the storage system may need to provide safety functions over significant periods and that waste form and / or packages may also contribute to achieving those safety functions.

* **LC32 Accumulation of radioactive waste**

LC32 requires adequate arrangements for minimising, so far as is reasonably practicable, the rate of production and total quantity of radioactive waste accumulated on the site. This TAG provides an overview of RGP for preventing and minimising the generation of radioactive waste, which inspectors may find useful in judging the adequacy of the arrangements for compliance with LC32.

* **LC34 Leakage and escape of radioactive material and radioactive waste**

LC34 requires the licensee to ensure, so far as is reasonably practicable, that radioactive waste on the site is at all times adequately controlled or contained so that it cannot leak or otherwise escape from such control or containment, without being detected. This TAG provides an overview of RGP for control and containment of stored radioactive waste and for detection of leakage via an adequate condition, monitoring and inspection programme.

* **LC35 Decommissioning**

LC35 requires the licensee to make and implement adequate arrangements for the decommissioning of any plant or process that may affect safety. Decommissioning is likely to result in the production of significant quantities of radioactive waste, which then need to be managed to the point of disposal. Inspectors should note that the guidance in this TAG is applicable to management of any radioactive waste expected to be generated during decommissioning.

1. LC5 and LC33 also include specific requirements relating to radioactive waste (LC5 requires records to be kept of all nuclear matter consigned from the nuclear licensed site, including radioactive waste, while LC33 gives ONR a primary power to direct a licensee to dispose of accumulated radioactive waste in accordance with an environmental permit), but the guidance in this TAG has not been written with these two LCs explicitly in mind. Inspectors should refer to the Technical Inspection Guides NS-INSP-GD-005 [7] and NS-INSP-GD-033 [8] for guidance on the arrangements for compliance with LC5 and LC33 respectively.

## Ionising Radiation Regulations 2017

1. The Ionising Radiations Regulations 2017 (IRR2017) control the use of ionising radiation in the workplace with the intent of restricting exposure and limiting dose to the workforce and the public [9]. Where radioactive waste is a source of ionising radiation, the requirements of IRR2017 should be considered during radioactive waste management activities. Further guidance on radiological protection, including aspects relevant to the management of radioactive waste, is given in NS-TAST-GD-038 [10].

## The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009

1. Legislation governing intra-national and international transport of radioactive materials is based on the International Atomic Energy Agency (IAEA) Regulations for the Safe Transport of Radioactive Materials, Specific Safety Requirements SSR-6 [11]. It should be noted that the definition of radioactive material in SSR-6 does not align with the definitions in the licence conditions [2]. Nevertheless, as SSR-6 defines radioactive material as any material containing radionuclides where a certain activity concentration and total activity are exceeded, radioactive waste would fall within the scope of this definition.
2. SSR-6 is translated into European modal regulations, including the Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) and the Regulations concerning the International Carriage of Dangerous Goods by Rail (RID), within which radioactive materials are referred to as Class 7 Dangerous Goods. The modal regulations are given legal effect in Great Britain via the Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (CDG) [12].
3. Specific paragraphs within the regulations prescribe the different safety requirements for transport of radioactive material, packaging and packages. These requirements may affect the processing of radioactive waste where transport to off-site facilities is required, and are of particular relevance where the waste packages are also intended to be the transport packages. NS-TAST-GD-99 [13] provides further details and inspectors should also seek advice from the ONR Transport Competent Authority.

## Environmental Regulations

1. Environmental protection is a devolved matter and different environmental legislation is applicable to the management of radioactive substances, including radioactive waste, in England and Wales, and Scotland. The environmental legislation recognises the implementation of the nuclear site licensing regime by ONR under NIA1965 provides for equivalent, or greater, regulatory control for onsite activities. More specifically, and as relevant to onsite radioactive waste management activities:

* **England and Wales**: The Environment Agency and Natural Resources Wales (NRW) are responsible for regulating the receipt and disposal of radioactive waste on and from nuclear licensed sites in England and Wales, respectively, under the Environmental Permitting (England and Wales) Regulations 2016 (EPR2016) [14]. “Disposals” of radioactive waste include discharges into the atmosphere, discharges into the sea, rivers, drains or groundwater, disposals to land, and disposals by transfer to another site. Schedule 23 “Radioactive substances activities” of EPR2016, paragraph 13, disapplies the environmental permitting requirements for keeping and use of radioactive material and accumulations of radioactive waste on a nuclear licensed site.
* **Scotland**: The Scottish Environmental Protection Agency (SEPA) regulates the management and disposal of radioactive waste on nuclear licensed sites under the Environmental Authorisations (Scotland) Regulations 2018 (EASR2018) in Scotland [15]. SEPA has legal responsibilities for the management of radioactive waste on site, including the long term storage of radioactive waste prior to disposal, and disposal on and from the nuclear licensed site (EASR2018 Schedule 8). This is in addition to the requirements of the nuclear site licence and the licence conditions, so joint working in this area is encouraged to minimise the regulatory burden on licensees. “Disposals” of radioactive waste include discharges to the environment, sewer or drain, abandonment, burial or deposit. SEPA has published guidance on its standard conditions for authorisations for radioactive substances activities including specific guidance for nuclear sites [16].

1. Consistent with the Memoranda of Understanding (MoU) [17] and their associated guidance [18], [19] and [20], it is an expectation for ONR to work with the environmental regulators on topics which have a bearing on the creation, accumulation, pre-disposal management or disposal of radioactive waste.
2. A key principle of the environmental legislation is the expectation for Best Available Techniques (BAT) in England and Wales, or Best Practicable Means (BPM) in Scotland, to be used to prevent or minimise the impact of radioactive waste on the environment [21]. Inspectors should note that what constitutes BAT/BPM for a particular activity depends on a range of factors, taking into account the specifics of the situation, including ONR’s judgement on what it is reasonably practicable to safely implement. However, regulators may have conflicting opinions on the operations licensees should/should not be undertaking to maintain compliance with our respective pieces of legislation. Consistent with the MoU and associated guidance these should be discussed jointly prior to engagement with the licensee to avoid conflicting advice being given.

# Government policy

1. Policy on managing radioactive waste is a devolved matter. The UK Policy Framework for Managing Radioactive Substances and Nuclear Decommissioning [21] (‘the Policy Framework’) includes the UK Government’s policy on managing radioactive waste both on and off nuclear licensed sites. The policy is guidance that should be applied where possible without undermining legal requirements.
2. The Policy Framework was published in 2024 and replaces previous UK-wide policies on the management of radioactive waste, as well as highlighting where the devolved administrations have different policies. We were consulted on the Policy Framework, including the key policy principles and expectations in relation to the management of radioactive waste. These are largely reflected in existing regulatory requirements and expectations, including the ONR SAPs and guidance to inspectors in section ‎6 of this TAG.
3. The UK Government and devolved administrations have specific policies for management of different classifications of radioactive waste, which are summarised in the following sub-sections.

## Policy for HAW (England and Wales)

1. There are currently no disposal facilities for HAW. The policy in England and Wales is for safe and secure storage of this radioactive waste on the nuclear licensed site until a geological disposal facility (GDF) becomes available. Further guidance to inspectors on aspects relating to design and operation of a GDF is given in NS-TAST-GD-101 [22]. Less-hazardous ILW, and LLW that cannot be disposed of in current facilities, may be disposed of in a near-surface facility where it is safe to do so.
2. The UK Government and Welsh Government policies for working with communities to implement geological disposal are contained within the Policy Framework, as is the policy around design, siting and planning for near-surface disposal facilities.

## Policy for HAW (Scotland)

1. Scotland's policy for HAW [23] is that long-term management of HAW should be in near-surface facilities which should be located as near to the site where the waste is produced as possible so that the need to transport the waste over long distances is minimal. The policy also states the need to demonstrate how facilities will be monitored and how waste packages, or waste, could be retrieved. The policy is supported by the Implementation Strategy for Scotland’s Policy on Higher Activity Radioactive Waste [24].

## Policy for LLW (UK)

1. The Policy Framework sets out the policy for the management of solid LLW, and a complementary UK Strategy on solid LLW was published in 2016 [25].
2. Concerning disposal of solid LLW, the Policy Framework identifies that there is a large variation in types of LLW. LLW that requires the protection offered by an engineered near surface facility should be disposed of at facilities such as the Low Level Waste Repository (LLWR). For VLLW and low-activity LLW, the UK Government’s and devolved administrations’ preference is that commercial operators, alongside the NDA’s own permitted landfill sites, are used for disposal.

# Relationship to Safety Assessment Principles, WENRA Reference Levels, and IAEA Safety Standards and Guides

## Safety Assessment Principles

1. The SAPs [1] provide nuclear inspectors with a framework for making consistent regulatory judgements on the safety of activities on nuclear installations, and also recognise the legal duty on licensees to reduce risk so far as is reasonably practicable. The SAPs are split into sections relating to different aspects of nuclear safety. One section of the SAPs is dedicated to radioactive waste and those principles are embedded in the guidance in Section ‎6 of this TAG. However, all of the SAPs provide guidance to ONR inspectors in assessing the adequacy of safety cases in support of regulatory judgements, where deemed to be relevant. The SAPs should therefore be viewed as RGP in the broadest sense.
2. The SAPs on radioactive waste management (RW.1 to RW.7) recognise that minimisation and control of radioactive waste should be taken into account at all stages of a facility’s lifecycle. RW.1 reflects that a strategy is an essential prerequisite for the safe and timely management of radioactive waste on a site. RW.2 and RW.3 then cover minimisation of the generation and accumulation of radioactive waste. RW.4 covers the application of characterisation and segregation to facilitate the safe management, including disposal, of radioactive waste, while RW.5 and RW.6 address passive safety and how the waste form and storage facility contribute to this. Finally, RW.7 concerns the records needed to manage radioactive waste in the present and the information to manage, and eventually dispose of, waste safely in the future. The principles on control of nuclear matter (ENM.1 to ENM.8) are also applicable to radioactive waste.
3. There are several other SAPs of relevance to the management of radioactive waste. The following list is not exhaustive but highlights key principles for which guidance relevant to radioactive waste is provided in this TAG:

* Decommissioning principles concerned with planning and strategies for decommissioning (DC.1 to DC.4);
* Key engineering principles (EKP.1 to EKP.5);
* Engineering principles on maintenance, inspection and testing (EMT.1, EMT.2 and EMT.6);
* Engineering principles relating to the management of ageing and degradation (EAD.1 to EAD.5);
* Engineering principles on containment and ventilation (ECV.1 to ECV.3 and ECV.7); and,
* Engineering principles on criticality safety (ECR.1 and ECR.2).

## Technical Assessment Guides

1. There are a number of other TAGs that may be of relevance to the management of radioactive waste:

* NS-TAST-GD-005 ONR guidance on the demonstration of ALARP;
* NS-TAST-GD-023 Control of processes involving nuclear matter;
* NS-TAST-GD-026 Decommissioning on nuclear licensed sites;
* NS-TAST-GD-033 Dutyholder management of records; and,
* NS-TAST-GD-101 Geological disposal.

## IAEA Requirements and WENRA Safety Reference Levels

1. In addition to the SAPs, the IAEA Safety Standards and the Safety Reference Levels (SRLs) developed by the Western European Nuclear Regulators Association (WENRA) are considered to be UK RGP.
2. The following are the most relevant IAEA documents and the guidance within these documents has been explicitly considered and reflected in this TAG:

* General Safety Requirements: Predisposal Management of Radioactive Waste (GSR Part 5) [26];
* Safety Specific Guide: Predisposal Management of Radioactive Waste from Nuclear Power Plants and Research Reactors (SSG-40) [27];
* Safety Specific Guide: Predisposal Management of Radioactive Waste from Nuclear Fuel Cycle Facilities (SSG-41) [28];
* The Safety Case and Safety Assessment for the Predisposal Management of Radioactive Waste (GSG-3) [29]; and
* Leadership, Management and Culture for Safety in Radioactive Waste Management (GSG-16) [30].

1. The most relevant WENRA SRLs for the management of radioactive waste are:

* Waste and spent fuel storage [31];
* Treatment and conditioning of radioactive waste [32];

1. This TAG has been produced with the guidance in the SRLs highlighted above in mind, to ensure our expectations are consistent with international standards. Where the guidance in section ‎6 aligns with specific SRLs, a cross-reference to the SRL number is recorded in the text, with storage SRLs being identified by a ‘S’ prefix, and treatment and conditioning SRLs by a ‘P’ prefix. However, it should be noted that the guidance in this TAG does not provide explicit reference to all SRL numbers: some aspects can be found in wider ONR guidance, for example SRLs S37-S39 on emergency preparedness are integrated into ONR’s expectations for compliance with LC11 (Emergency Arrangements) [33], and are not repeated in this TAG.

# Advice to inspectors

## Fundamental expectations

1. There are four fundamental expectations that licensees should meet so far as is reasonably practicable, and which should form a common thread through any assessment relating to the management of radioactive waste. These expectations are as follows:

* Generation of radioactive waste should be avoided, or where radioactive waste is unavoidable, generation should be minimised according to the waste hierarchy;
* Radioactive waste should be managed safely throughout its lifecycle in a manner that is consistent with the RGP and modern standards highlighted in the guidance below;
* Predisposal management of radioactive waste should take account of the anticipated disposal route and full use should be made of existing routes; and,
* Where a disposal route is not yet available, radioactive waste should be put into a passively safe state as soon as reasonably practicable for storage pending future disposal.

## Joint Guidance on the Management of Higher Activity Radioactive Waste on Nuclear Licensed Sites

1. While ONR regulates the management of radioactive waste on nuclear licensed sites and the environment agencies regulate disposals, the regulators work together on decisions concerning permissioning of activities relating to HAW [34]. This ensures the appropriate environment agency’s regulatory requirements are considered alongside the nuclear safety considerations. This is necessary to ensure the HAW is managed and stored in a way that, so far as is reasonably practicable, avoids deterioration and enables safe implementation of future phases of the management strategy, including retrieval, processing, transport and compatibility with disposal.
2. To this end, the environment agencies and ONR have published joint guidance on the management of HAW on nuclear licensed sites [35] (‘the Joint Guidance’). Inspectors should consider the Joint Guidance to be RGP when assessing licensees’ proposals relating to the management of HAW. Where licensees have applied the RGP in the Joint Guidance in an appropriate manner, this should be considered sufficient to demonstrate that HAW will be managed and stored in a way that is safe and provides protection of people and the environment. The principles in the Joint Guidance may also be relevant to the management of other radioactive wastes.

## Strategies for the management of radioactive waste

1. In line with the expectations of government policy, a strategy should be produced and implemented for the management of radioactive waste on a site. The strategy should include a description of:

* The licensee’s overarching radioactive waste management objectives, which could include, for example, implementation of passive safety to minimise, so far as is reasonably practicable, dependence on active systems, and avoiding the generation of problematic wastes.
* The licensee’s policy principles that underpin delivery of the radioactive waste management objectives, such as application of the waste management hierarchy, continuous improvement, knowledge management and record keeping.

1. The licensee should demonstrate that the strategy is consistent with government policy (SRL P-03, S-05) and ONR’s fundamental expectations for radioactive waste management (see Section ‎6.1). SAP RW.1 (paragraph 793) [1] provides further guidance on aspects that should be included in the strategy.
2. If a licensee or dutyholder is responsible for a number of sites, it may be appropriate to have a corporate strategy supported by a series of site-specific strategies. The corporate strategy should set out a consistent set of overarching objectives and policy principles to be applied in the site-specific strategies.
3. In selecting a preferred strategy, licensees should demonstrate a full range of management options has been examined, taking account of technical factors, social factors, government policies, international agreements and its radioactive waste management objectives. The reasons for reaching the preferred strategy should be recorded, including an adequate demonstration that this risks from operations are reduced ALARP, and BAT / BPM have been considered for disposability aspects. Major assumptions and uncertainties should be identified, along with an assessment of their potential impact (for example, sensitivity analysis) and the approach for their resolution.
4. The strategy should identify the current and future inventory of radioactive waste and describe how each waste stream will be managed from generation to disposal by practical and cost-effective methods. This should include overarching programme timescales for different management steps and identification of the proposed disposal route. The strategy should take account of interdependencies between waste streams and processes, including both on- and off-site facilities, to demonstrate that an optimum management process is delivered (SRL P-03).
5. The strategy should be linked to, or integrated with, strategies for management of secondary wastes generated from the management of spent fuel and nuclear material. The strategy should also be integrated with the strategies for decommissioning and for management of radioactively contaminated land, to identify how radioactive waste arising from those activities will be safely managed through to disposal.
6. The strategy should describe the approach to ensuring that radioactive waste is managed safely. This should include how the balance between passive safety and foreclosure of disposal options has been addressed. Where relevant, the strategy should demonstrate that hazards posed by legacy wastes are being adequately controlled and progressively reduced. The strategy should also describe the arrangements to ensure that radioactive waste will be managed safely until its ultimate disposal, including the provision of an appropriate organisational structure, resources and infrastructure (SRL P-11, P-15, S-09).
7. The strategy should demonstrate how the objectives of The Convention for the Protection of the Marine Environment of the North-East Atlantic (the OSPAR Convention) have been taken into account. As a signatory to the OSPAR Convention, the UK is required take all possible steps to prevent and eliminate pollution and to protect the OSPAR maritime area against the adverse effects of human activities. The UK Strategy for Radioactive Discharges [36] supports the UK’s OSPAR obligations through progressive and substantial reductions of radioactive discharges, emissions and losses of radioactive substances. Licensees should describe how their radioactive waste management strategies address the objectives of the OSPAR Convention, as well as any corresponding implications for the volume and total activity of on-site arisings of solid waste, options for storage and ultimate disposal, and for compliance with the ALARP principle.
8. The strategy should contain sufficient detail to be standalone, but may be supported by a number of other documents, including individual documents describing waste stream lifecycle management, site lifetime plan, site decommissioning strategy and site strategy for end states. In some cases, the strategy may be encompassed by existing documents.
9. Further guidance on the production of radioactive waste strategies for HAW can be found in the Joint Guidance [35]. Licensees may choose to present their strategy in the form of an Integrated Waste Strategy (IWS) or within an Integrated Waste Implementation Plan (IWIP). The NDA has produced guidance on the form and content IWIPs [37].
10. The strategy should be reviewed at appropriate intervals, taking into account operational experience, the outcomes from condition monitoring and inspection (CM&I), and any relevant advances in standards, science and technology (SRL P-04).
11. LC15 requires licensees to make and implement adequate arrangements for the periodic and systematic review and reassessment of safety cases. Further guidance on Periodic Safety Reviews (PSRs) can be found in NS-TAST-GD-050 [38]. The PSR should review and justify the continuing adequacy of the licensee’s strategy for management of radioactive waste.

## Application of ALARP across the waste lifecycle

1. In line with the expectations of government policy, those responsible for creating and managing radioactive waste (including owners), should take a risk-informed approach to decision-making throughout the full waste-management lifecycle based on understanding the properties of the waste and the hazards they pose to people and the environment.
2. Radioactive waste should be managed in a way that is compatible with ultimate disposal, or other long-term solution. Unless appropriately justified, licensees should not unnecessarily foreclose any reasonably foreseeable management options. The risks associated with radioactive waste management should be assessed in a holistic manner and not restricted to part of the overall waste lifecycle. Inspectors should consider this when reaching judgments on whether risks have been reduced ALARP.
3. The nature of radioactive waste management means that multiple facilities are likely to be involved in the different aspects of the waste lifecycle from generation through to processing, storage, transport and disposal. For HAW, these activities are expected to take place over a significant period of time due to the absence of an operational disposal facility.
4. The safety case for management of waste streams across their whole lifecycle needs to be considered, taking account of relevant factors, to ensure that an appropriate balance is achieved. These factors include requirements imposed by the environmental permit (including optimisation, BAT and disposability) and any waste acceptance criteria for the final disposal facility. The licensee should also consider the uncertainty associated with future disposal options and the risks that could arise. Licensees should consider the risk that rework of waste packages may become necessary as a result of deterioration or accidental damage.
5. For HAW, licensees should seek appropriate disposability advice from NWS to provide confidence that proposed or ongoing waste processing and storage operations will result in disposable waste products. The advice may be used by the licensee as part of the safety case for management of the waste across the lifecycle, but onsite safety remains the responsibility of the licensee.
6. Long-term safety and environmental performance aspects relevant to the lifecycle ALARP demonstration may not be addressed in the individual facility safety cases or environmental documentation. Where waste is transferred between multiple facilities or sites, it is good practice to produce a radioactive waste management case (RWMC) case to capture the overall management early in the waste stream lifecycle, enabling its maintenance and update upon subsequent transfer(s). Further guidance on the form and content of RWMCs can be found in the Joint Guidance [35].

## Predisposal management of radioactive waste

1. Radioactive waste should be managed in a manner that minimises the need for future processing and that it is compatible with anticipated facilities for ultimate disposal or long-term solution. The term predisposal management describes all the steps required for the safe management of radioactive waste from generation to disposal, as identified in GSR Part 5 [26]. The key steps, for which further guidance on RGP is provided in this TAG, relate to :

* Generation (prevention, minimisation, characterisation and segregation);
* Processing (timing, passive safety, processing operations such as pretreatment, treatment and conditioning);
* Storage (design, safety case requirements, and CM&I); and,
* Conditions for acceptance (for storage and disposal).

1. Further guidance on the predisposal management of HAW can be found in the Joint Guidance [35].

### Generation

1. The generation of radioactive waste should be prevented or, where this is not reasonably practicable, minimised in terms of quantity and activity, and the total quantity of radioactive waste accumulated on site at any time should be minimised so far as is reasonably practicable. LC32 requires licensees to make and implement adequate arrangements for minimising, so far as is reasonably practicable, the rate of production and total quantity of radioactive waste accumulated on site. LC4 requires licensees to ensure that no nuclear matter, which includes radioactive waste, is stored or brought onto site, except in accordance with adequate arrangements for this purpose.

#### Prevention and minimisation

1. The licensee should demonstrate that adequate steps have been taken to avoid the creation of radioactive waste, and then to minimise the amount generated in terms of both volume and activity. This should be based on application of the waste hierarchy (also referred to as the waste management hierarchy), which is a step wise approach that should lead to the avoidance or minimisation of the production of radioactive waste, including secondary waste. Inspectors should note that government policy expects the waste hierarchy to be used as a framework for decision-making for all radioactive waste across the UK.
2. The licensee’s approach to minimising the generation of radioactive waste should also include the following aspects:

* Selection of appropriate process and facility design features, for example appropriate material selection to minimise the generation and release of activation products, or the use of reliable and effective techniques and equipment to minimise the generation of waste from repair/replacement;
* Selection of operational procedures that facilitate waste minimisation, including minimisation of secondary waste, for example by keeping non-radioactive material out of controlled areas to avoid contamination, segregating waste streams to minimise the volume of waste to be managed, and clearance of waste that is exempt from environmental permitting;
* Preventing the spread of contamination and decontamination of zones and equipment;
* Recycling and reusing material and equipment; and
* Appropriate use of pre-treatment, such as decontamination (see section ‎6.5.2.3 for further guidance on pre-treatment operations).

1. Inspectors should note that licensees are also required by the environment agencies to demonstrate that waste disposal has been optimised through the use of BAT/BPM. This should be balanced with our requirement for risks to be reduced ALARP (see NS-TAST-GD-005 on the demonstration of ALARP [39]).
2. The generation of wastes that may be difficult to convert into a passive form for storage, or for which there is no obvious disposal route, should be avoided. These wastes may be classed by licensees as ‘problematic’ or ‘orphan’ wastes. Where these wastes exist, licensees should demonstrate adequate arrangements for their management, which should include a research and development plan to develop a lifecycle management solution for the waste. Further arisings of problematic wastes should be minimised.
3. Noting that LC4(1) concerns the arrangements for nuclear matter brought onto the site, inspectors should note that generation is also considered to encompass the transfer of radioactive waste from other national and international sites. Where this occurs, ownership of the waste should be clear and unequivocal and the respective responsibilities of the different organisations should be agreed (SRL P-01, P-06, S-04, S-06).

#### Characterisation and segregation

1. Radioactive waste should be characterised and segregated to facilitate its subsequent safe and effective management, including subsequent application of the waste hierarchy, so far as is reasonably practicable. The waste should be characterised in terms of its source or origin and its physical, mechanical, chemical, radiological, fissile and biological properties.
2. Licensees should develop a systematic approach to characterisation that enables safe and effective management of the waste, taking into account the intended approach to processing, storage and disposal and the extent of characterisation required to enable informed decisions about the subsequent management of the waste. The characterisation methods should be justified, and may include destructive and non-destructive measurements, sampling and analysis, as well as indirect methods based on process control and process knowledge. Characterisation should be done as soon as practicable in the waste lifecycle to inform onward management, but further characterisation may be required at any of the subsequent steps.
3. Some radioactive waste may also be identified as Qualifying Nuclear Material (QNM) under the Nuclear Safeguards (EU Exit) Regulations 2019 (NSR19) [40]. Licensees should also consider any characterisation requirements for Nuclear Material Accountancy and Control (NMAC) purposes when developing the objectives for characterisation.
4. Segregation involves accumulating those materials with similar characteristics, and separating or avoiding mixing those with different characteristics, including consideration of the radioactive classification of the waste and other hazardous properties.
5. Where practicable, radioactive waste should be segregated as close to the point of generation as possible, taking account of the intended approach to processing, storage and disposal. Segregation is most effective if it is considered at the process design stage and can contribute significantly to the safe and effective management of radioactive waste at subsequent stages of the lifecycle. Some legacy wastes have arisen because incompatible wastes have been mixed inappropriately, without due consideration of subsequent management steps.

### Processing

1. Radioactive waste should be processed as close to the point of generation as practicable, with the ultimate goal of producing a waste product that is suitable for subsequent waste management steps including storage and disposal (SRL P-27).

#### Timing of processing

1. Radioactive waste should be processed into a passively safe state as soon as is reasonably practicable, and the timing should be justified based on an appropriate balance of relevant factors. SAP RW.6 (paragraph 820) [1] provides guidance on factors that could influence the timing of processing radioactive waste into a passively safe state.
2. Where there are significant uncertainties around disposability, there is a risk that processing the waste may unduly foreclose options for future disposal. In such cases, it may still be appropriate for ONR to permission the processing of the waste but inspectors should engage with the relevant environmental agency to understand the risk of generating a waste for which no disposal routes would be available. The absence of a disposal route is inconsistent with LC32 requirements on minimising accumulations of radioactive waste onsite.

#### Achieving passive safety

1. Passive safety is most appropriately achieved by:

* Processing the waste such that the waste form and its container are physically and chemically stable, energy is removed from the waste form so far as is reasonably practicable, and the radioactivity is immobilised (noting that for some wastes the radioactivity may be inherently immobile, such as activated uncontaminated metals); and,
* Placing the waste in a storage facility where the safety functions are provided by passive systems and the conditions have been optimised to support the long-term physical and chemical stability of the waste form and its container.

SAP RW.5 (paragraphs 812 – 813) [1] provides further guidance on the characteristics of the waste package and storage facility that contribute to achieving passive safety.

1. There should be multiple physical barriers to the release of radioactivity to both the store and the wider environment, to minimise the risk of spreading contamination. These barriers may include the waste form, the waste container and/or the storage facility itself.
2. Where it is proposed to defer the processing of radioactive waste into a passively safe state, it should be contained in a manner that avoids deterioration and allows retrieval for future processing and eventual disposal, while maintaining standards of safety and environmental protection that are as close as is reasonably practicable to those for waste that has been processed into a passively safe form. In particular, the need for active safety systems, monitoring, maintenance and human intervention to ensure safety should be minimised so far as is reasonably practicable.
3. The term ‘passive safety’ is commonly associated with processing of wastes for long-term storage, pending disposal. However, passive safety should be provided at all stages in predisposal management and licensees should consider proportionate application of the principles of passive safety in all radioactive waste management operations, for example passive means of containment to minimise the spread of contamination and therefore minimise the rate of production of secondary waste.

#### Processing operations

1. Processing of radioactive waste can include pre-treatment, treatment and conditioning:

* **Pre-treatment** includes operations to minimise the amount of radioactive waste needing subsequent processing, storage and/or disposal. The approach to pre-treatment should be justified and the associated risks reduced so far as is reasonably practicable, to underpin the overall strategy for management of the waste stream. Examples of pre-treatment operations include:
  + Decontamination, which may remove surface contamination to allow reclassification of the waste to a lower level, or be cleared from regulatory control, although the amount and characteristics of secondary waste generated during the decontamination process should be considered; and,
  + Decay storage of wastes that are borderline in terms of classification, where a period of decay storage may allow reclassification of the waste to a lower level.
* **Treatment** includes operations intended to provide a benefit by changing the characteristics of the waste, including volume reduction, removal of radionuclides and changing the composition of radioactive wastes. Examples of treatment operations include filtration, ion exchange, incineration, cutting and compaction (including supercompaction).
* **Conditioning** consists of operations that produce a waste package suitable for safe handling, storage, transport and disposal, taking account of the timescales expected for these activities. Examples of conditioning operations include packaging of the waste in a container, encapsulation of the wastes in a suitable matrix, for example cementitious grout, vitrification and drying.

1. A waste package comprises a waste form and waste container:

* The waste form is the waste in its physical and chemical form after treatment and conditioning; and,
* The waste container is the vessel into which the waste form is placed for handling, storage, transport and disposal. Inspectors should be aware that the term “packaging” is sometimes used to refer to a waste container, while the term “waste canister” is considered to be a specific term for the waste container used for vitrified waste.
* Both the waste form and the waste container contribute to the overall performance of the waste package.

1. The processing techniques should be selected on the basis of the characteristics (including non-radiological) of the waste concerned, as these may affect safety during processing and the suitability of the product for onward management to disposal (SRL P-28). Other factors that should be considered in selecting a processing technique include discharges, secondary waste and the ability to apply quality assurance (SRL P-29). The risks associated with processing technologies, including their installation, operation, maintenance and decommissioning should be reduced ALARP. Licensees may choose to employ mobile waste processing equipment. In this case, there should be clearly defined, safe interfaces to the hosting facility (SRL P-63, P-64).
2. The licensee should describe the expected properties of the intended waste product and ensure that adequate controls are applied to processes and activities to achieve consistent, safe outcomes (SRL P-30, P-33). There should be suitable arrangements for managing secondary waste created during processing (SRL P-45).
3. For conditioned wastes, the waste container should be selected such that it contributes to passive safety over the expected timescales. Depending on the nature of the waste and the hazard it presents, in addition to containment the waste container may need to provide shielding and may also need to take account of criticality safety, gas generation, wasteform expansion and heat generation. The choice of materials and surface finish of the waste container should consider ease of decontamination.
4. The overall design of the waste package should take into account the predicted evolution over the lifecycle of the waste and should be compatible with the long-term management strategy for the waste, which may include handling, retrieval, storage, further processing and disposal (SRL P-31). The design of the waste package should also consider the need for on- and off-site transport, including compatibility with suitable transport containers, constraints of the transport system and compliance with relevant transport legislation. For waste packages that will ultimately be disposed, there design of the waste package may also need to take into account the interface with the disposal facility’s safety case.
5. Waste products should be uniquely identifiable via appropriate labelling, which should be designed to ensure identification over the expected storage period (SRL P-25, S-16). Labelling of waste packages for disposal should comply with the requirements set out by the disposal facility. Where radioactive waste is QNM, licensees should also consider any identification requirements for NMAC purposes (see ONR Nuclear Material Accountancy, Control, and Safeguards Assessment Principles, [41]).
6. LC17 requires licensees to make and implement adequate quality management arrangements in respect of all matters which may affect safety. With respect to the predisposal management of radioactive waste, licensees are expected to make and implement adequate quality control arrangements and quality assurance procedures for the processing and packaging of radioactive waste. These arrangements should ensure that the waste products comply with relevant specifications, including those of the storage facility, the final disposal facility, or discharge routes for liquid and gaseous wastes. These should also include appropriate provisions for managing waste products that do not meet the relevant specifications (SRL P-44, P-61). The quality management arrangements should also cover the procurement of the packaging and any raw materials used in processing, the quality of the final product and all necessary records.
7. For liquid and gaseous wastes which are not solidified, the environmental permit will require the treatment to apply BAT/BPM in order to minimise and control discharges.

### Storage

1. Storage of radioactive waste is an interim measure and can occur at, or between, any steps in predisposal management from generation to disposal, including decay storage as a step on the way to disposal. Licensees should, so far as is reasonably practicable, store radioactive waste in a passively safe state and in accordance with good engineering practice, such that it can be inspected, monitored, retrieved and preserved in a condition suitable for its subsequent management.
2. LC4 requires licensees to ensure that nuclear matter, including radioactive waste, is stored in accordance with adequate arrangements made for this purpose. LC34 requires the licensee to ensure, so far as is reasonably practicable, that and radioactive waste (and radioactive material) is adequately controlled or contained so that it cannot leak or otherwise escape without detection.
3. The following sub-sections provide guidance to inspectors on aspects of the design and safety case for radioactive waste storage facilities, including expectations for CM&I. SAP RW.5 (paragraphs 809 – 812 and 817 – 818) [1] provide further guidance on good engineering practice for the storage of radioactive waste. The NDA has also published specific industry guidance on the storage of HAW, which should be considered by its operating companies and may also be followed by the wider nuclear industry as industrial practice, and should be considered by inspectors to be an interpretative standard [42].

#### Design of radioactive waste storage facilities

1. The storage vessel, for example tanks containing raw wastes or waste containers for conditioned waste, and the storage facility form part of the multi-barrier system and should be designed to provide effective containment, prevent leakage and minimise the spread of contamination. In some cases, the role of the storage facility or structure may be limited to providing weather protection, radiation shielding and presenting a secure boundary against unauthorised intrusion or interference from personnel or wildlife.
2. The licensee should demonstrate that the design of the facility is fit for purpose, taking account of the hazards posed by the stored radioactive waste, under normal and fault conditions, and the expected timescales for storage, which could extend beyond 100 years in some cases (SRL S-19, S-20, S-23). This should include selection of appropriate design and construction standards, and should include allowance for potential aging and degradation (SRL S-22). The need for active safety systems should be minimised. There should be no need for prompt intervention to maintain the facility in a safe condition, and there should be access to allow for response to reasonably foreseeable events.
3. If raw waste is to be stored, there should be particular consideration of whether the design of the storage system (container and facility) provides adequate containment of the waste to prevent and detect leakage and to minimise the spread of contamination. SAPs ECV.3 and ECV.4 (paragraphs 525 and 526) [1] provide further guidance on relevant aspects of containment design.
4. The design of the storage facility should facilitate retrieval within an appropriate timeframe for inspection, for subsequent management or to intervene in the event of unexpected faults (SRL S-32, S-33). Provisions for transfer of waste out of the storage facility should be considered in the design, and there should be appropriate contingency arrangements for waste packages that show signs of degradation or are not retrievable by normal means (SRL S-50).
5. There should be sufficient storage capacity for waste generated during normal operations, and consideration given to spare/buffer capacity to maintain operations in case of issues with upstream operations or downstream management steps (for example, transport links being disrupted), or to enable lifetime extensions of operational facilities that generate waste. There should also be consideration of reserve capacity in case of incidents or abnormal events (SRL S-34 and ONR SAP ENM.2). For storage of liquid wastes, this should include an adequate provision of secondary containment.
6. Licensees may wish to carry out short term temporary storage of radioactive waste to support other processes, for example decommissioning, retrieval of radioactive waste for disposal or storage, or pending construction of other facilities. In these cases, licensees should demonstrate that the temporary storage areas are fit for purpose and that any risks associated with the presence or usage of temporary storage areas are reduced to ALARP. This should include, where relevant, consideration of access and egress to the temporary storage area, trip hazards, handling of the waste (for example, risks associated with movement of forklift trucks), provision of adequate weather protection, provision of secondary containment and arrangements for custodianship of the temporary storage area.

#### Safety case for radioactive waste storage facilities (including the PSR interface)

1. LC23 requires the licensee to identify the conditions and limits necessary in the interests of safety (referred to as operating rules). This should include limits and conditions in the interest of maintaining passively safe (physically and chemically stable) storage over extended periods. The operating rules needed for safe storage may include limits and conditions relating to the environmental conditions within the storage facility, the hazards associated with the waste (such as heat generation, gas generation, radiological and criticality hazards) and the monitoring, examination, inspection, maintenance and testing arrangements for the facility and its stored wastes (SRL S-26, S-27).
2. There are a number of important issues that are particularly relevant to radioactive waste storage facilities that need to be addressed in the safety cases. More specifically, it should be acknowledged that there is currently no disposal facility for HAW, resulting in extended (multigenerational) storage of radioactive waste. In some instances, these facilities may be new, but in many other cases the facilities are repurposed, and built to non-modern standards. Some remain in a good condition, but others may be deteriorating.

* For older facilities, built to earlier standards, the licensee should maintain a justification that risks are reduced to ALARP, taking account of new knowledge and experience, comparison with modern standards and considering the age of the facility and the anticipated remaining lifetime.
* For new facilities, the safety case should demonstrate that the design and operation of the facility meets modern standards. Safe operations should be justified throughout the projected life of the facility.

1. A safety case comprises a suite of safety documentation which, when taken together, provide this justification. In addition to the guidance provided in NS-TAST-GD-051 [43], the following elements are considered particularly relevant for the safety case for radioactive waste storage facilities:

* Descriptions of the storage facility and the expected environmental conditions within the store;
* The scope of radioactive waste inventories to be stored, how the waste is expected to be processed prior to entry into the store, and conditions for acceptance (see section ‎6.5.4);
* Demonstration that the storage facility supports management of the waste in line with the radioactive waste management and decommissioning strategies;
* Identification and substantiation of any safety functions to be provided by the waste packages; and,
* Demonstration that the ageing and obsolescence of structures, systems and components, plant and waste packages is adequately considered and managed over the potentially extended durations.

1. As noted above, LC15 requires licensees to make and implement adequate arrangements for the periodic and systematic review and reassessment of safety cases. For radioactive waste storage facilities, the PSR should include adequate consideration of any whether the waste in storage has evolved in a way that is inconsistent with the controls put in place by the conditions for acceptance (SRL S-60).
2. Where the storage facility provides a safety function that cannot be provided by an alternative means, the PSR should include consideration of the time needed to design, construct and commission, or to procure, a replacement facility or equipment, should the original be found to be unserviceable at some point in the future. This is a particular consideration for radioactive waste stores, and for other facilities in which the hazard cannot be simply removed by shutting them down. For stores containing significant quantities of radioactive waste, the review needs to consider the entire period until retrieval. This is particularly important if the waste is not passively safe, degrading or could leak from its primary or secondary containment.

#### Condition monitoring and inspection

1. LC28 requires the licensee to make and implement adequate arrangements for the regular and systematic examination, inspection, maintenance and testing of all plant which may affect safety. Inspectors should refer to the guidance on Examination, Inspection, Maintenance and Testing of Items Important to Safety, NS-TAST-GD-009 [44]. Key aspects for the storage of radioactive waste, where safety functions may be provided by both the storage facility and its systems, structures and / or components (SSCs) and the waste packages, are the containment barriers, criticality controls, shielding, and systems controlling the environmental conditions within the storage facility. Where waste is to be placed in long-term storage, monitoring and inspection may be infrequent, with long gaps, potentially years, between inspections, so the operating rules should provide robust margins of safety.
2. Licensees should develop a strategy for CM&I of stored radioactive waste, which should be reviewed at appropriate intervals to incorporate lessons learned and take account of monitoring and inspection results (SRL S-25). The fundamental objective of CM&I is to confirm that the waste, container, and storage facility are in an acceptable condition for continuing safe storage, retrieval, processing and final disposal, and will remain so for the relevant timescales (SRL S-48).
3. The CM&I strategy should include criteria against which the condition of the radioactive waste and waste packages are to be assessed and an appropriate justification for the method and frequency of inspections. Where strategies are based on predicted rates of degradation, inspections should be undertaken at appropriate time intervals to confirm that the waste is not evolving to an unexpected degree. The CM&I should also include consideration of the environmental conditions within the storage facility to ensure it remains consistent with the safety case requirements.

### Conditions for acceptance

1. Licensees should establish acceptance criteria for radioactive waste and waste packages that are to be accepted for processing, storage, transport and disposal (SRL P-26, P-57, S-52). The acceptance criteria are typically referred to as Conditions for Acceptance (CfA) for waste processing and storage facilities and as Waste Acceptance Criteria (WAC) for disposal facilities, although inspectors should be aware that two terms may be used interchangeably.
2. The CfA should specify the radiological, physical, chemical and biological characteristics of the waste or waste packages that may be accepted. The CfA should be consistent with the safety case, including limits and conditions defined in the interests of safety, and should also take into account compatibility with future management steps (SRL S-53). Appropriate arrangements, which may include the need for characterisation, should be made to assess waste or waste packages for compliance with the CfA (SRL P-28, S-54).
3. Licensees should also make adequate provisions for the safe management of radioactive waste or waste packages that do not meet the CfA (SRL P-58, S-49). This may include the provision of a quarantine area to store the waste while investigations are carried out, suitable governance arrangements for granting concessions against the CfA where justified, consideration of remedial work required to meet the CfA, and any specification of additional CM&I for any non-conforming waste packages accepted into storage.

## Data and information recording

1. Licensees should make adequate provision for recording and preserving all the data and information that may be required for the current and future safe management of radioactive waste. These records should be maintained in a secure and accessible form for as long as such information may be required.
2. LC 6 requires licensees to make adequate records to demonstrate compliance with each condition of the site licence, and to ensure that such records are preserved for 30 years. LC25 requires licensees to ensure that adequate records are made of the operation[[1]](#footnote-2), inspection and maintenance of any plant which may affect safety including records relating to the amount and location of all radioactive waste. LC32 requires licensees to make adequate arrangements for the recording the amount of radioactive waste accumulated on site.
3. The record preservation period of 30 years referred to in LC6 reflects the requirements of NIA1965 with respect to third party liability. However, records required to support the safe management of radioactive waste during long-term storage and final disposal will need to be managed by the licensee over a significant period of time prior to disposal, and subsequently by the operator of the disposal facility. As a result, the records may be required for periods in excess of 100 years and consideration needs to be given to the content of such records, and the form in which they are kept. Records should be held by the licensee until the responsibility for the waste has been passed to another body such as the operator of a disposal facility, although some information will need to be retained to comply with NIA1965 requirements. Further guidance on regulatory expectations for the management of records is provided in NS-TAST-GD-033 [45].
4. The Joint Guidance (Section 7 paragraphs 325 – 413) [35] provides RGP for managing information and records relating to radioactive waste, including systems and procedures for generating, maintaining and managing records, and guidance on managing records for the long-term. While the Joint Guidance is written for HAW, the guidance provided on managing information and records should be applied proportionately to other radioactive waste. Further guidance on the types of information that should be recorded is provided in SAP RW.7 (paragraph 823) [1].
5. In addition to the licensee and the regulators, records will be of value to other organisations or persons in the future, for example any successor licensee, the operator of a disposal facility, planning authorities, members of the public and international organisations such as the IAEA (including for IAEA safeguards purposes).

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# Glossary and abbreviations

ALARP As Low As Reasonably Practicable

BAT Best Available Techniques

BPM Best Practicable Means

CDG Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations

CfA Conditions for Acceptance

CM&I Condition Monitoring and Inspection

EASR2018 Environmental Authorisations (Scotland) Regulations 2018

EPR2016 Environmental Permitting (England and Wales) Regulations 2016

GDF Geological Disposal Facility

HAW Higher Activity Waste

HLW High Level Waste

IAEA International Atomic Energy Agency

ILW Intermediate Level Waste

IRR2017 Ionising Radiation Regulations 2017

IWIP Integrated Waste Implementation Plan

IWS Integrated Waste Strategy

LC Licence Condition

LLW Low Level Waste

LLWR Low Level Waste Repository

MoU Memorandum of Understanding

NDA Nuclear Decommissioning Authority

NIA1965 Nuclear Installations Act 1965

NMAC Nuclear Material Accountancy and Control

NRW Natural Resources Wales

NWS Nuclear Waste Services

PSR Periodic Safety Review

QNM Qualifying Nuclear Material

RGP Relevant Good Practice

RWMC Radioactive Waste Management Case

SAP Safety Assessment Principle(s)

SEPA Scottish Environmental Protection Agency

SRL Safety Reference Level

TAG Technical Assessment Guide(s)

VLLW Very Low Level Waste

WAC Waste Acceptance Criteria

WENRA Western European Nuclear Regulators’ Association

1. The definition of operations includes the treatment, processing, keeping, storing, accumulating or carriage of radioactive waste. [↑](#footnote-ref-2)