Geological Disposal:
Supplementary Specification for Requirements Based on the 2016 Generic Disposal System Safety Case (gDSSC)
August 2018
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WASTE PACKAGE SPECIFICATION AND GUIDANCE DOCUMENTATION
SUPPLEMENTARY SPECIFICATION FOR REQUIREMENTS BASED ON THE 2016
GENERIC DISPOSAL SYSTEM SAFETY CASE (gDSSC)

This document forms part of the Waste Package Specification and Guidance Documentation (WPSGD), a suite of documents prepared and issued by Radioactive Waste Management Limited (RWM). The WPSGD is intended to provide a ‘user-level’ interpretation of the RWM packaging specifications, and other aspects of geological disposal, to assist UK waste packagers in the development of plans for the packaging of higher activity waste in a manner suitable for geological disposal.

Key documents in the WPSGD are the Waste Package Specifications (WPS), which define the requirements for the transport and geological disposal of waste packages manufactured using standardised designs of waste container. The WPS are based on the high level requirements for all waste packages, as defined by the generic Disposal System Specification (DSS), and are derived from the bounding requirements for waste packages containing a specific category of waste, as defined by the relevant Generic Specification.

The purpose of this Supplementary Specification is to provide an analysis of the changes to the WPSGD that would be introduced by alignment to the 2016 gDSSC and provide guidance on how these should be implemented. This document supplements the packaging specifications for all categories of Higher Activity Wastes (HAW) included in the WPSGD.

The combination of the existing WPSGD and this Supplementary Specification provides a de facto alignment of the WPSGD with the 2016 gDSSC.

The Supplementary Specification is a temporary document that will be withdrawn upon completion of the revision and restructuring of the relevant components of the WPSGD. The arrangements for this withdrawal are described herein.

<table>
<thead>
<tr>
<th>WPSGD DOCUMENT NUMBER WPS/999 - VERSION HISTORY</th>
</tr>
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<tbody>
<tr>
<td>VERSION</td>
</tr>
<tr>
<td>WPS/999/01</td>
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</table>
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1 Introduction

The Nuclear Decommissioning Authority (NDA) has established Radioactive Waste Management Limited (RWM) as the body responsible for implementing UK Government policy for the management of higher activity radioactive wastes (HAW), as set out in the 2014 Implementing Geological Disposal White Paper [1]. The White Paper outlines a framework for managing those wastes in the long-term through geological disposal, which will be implemented alongside the ongoing interim storage of waste packages and supporting research.

As implementer of a geological disposal facility (GDF), and therefore as the ultimate receiver of wastes for disposal, RWM will be responsible for establishing waste acceptance criteria (WAC) for such a facility. The plans for the construction of a GDF are at an early stage and the information necessary to define final WAC is not available. In the meantime, and as a precursor to WAC, RWM produces packaging specifications, the primary purpose of which is to enable the holders of radioactive wastes to condition those wastes into a form that will be compatible with the anticipated needs of transport to and disposal in a GDF.

The packaging specifications, together with a wide range of explanatory material and guidance that users will find helpful in the development of proposals to package waste, make up a suite of documentation known as the Waste Package Specification and Guidance Documentation (WPSGD). For further information on the extent and role of the WPSGD, all of which can be accessed via the RWM website, reference should be made to the Introduction to the RWM Waste Package Specification and Guidance Documentation [2].

The current published suite of documents in the WPSGD is based on the Disposal System Specification (DSS), illustrative design concepts and generic Disposal System Safety Case published by RWM in 2010 (collectively the 2010 gDSSC). Subsequently, RWM has produced an updated version of the gDSSC (the 2016 gDSSC) and it is planned that the WPSGD will be revised to align with the 2016 gDSSC. In addition to this planned revision, the overall structure and approach of the WPSGD is under review. This restructuring will not be complete until at least the end of 2018/19.

RWM has determined that alignment of the WPSGD with the 2016 gDSSC will be delayed to coincide with the planned restructuring. Recognising that this pragmatic approach to the timing of the revision introduces an apparent inconsistency between RWM controlling documentation, and in particular potentially invalidates the cited basis for disposability assessment, this Supplementary Specification has been produced.

The Supplementary Specification provides an analysis of the changes that would need to be made in the WPSGD in order to align to the 2016 gDSSC and provides guidance on how these should be implemented. The Supplementary Specification supplements the packaging specifications for all categories of Higher Activity Wastes (HAW) included in the WPSGD. The combination of the existing WPSGD and this Supplementary Specification provides a de facto alignment of the WPSGD with the 2016 gDSSC.

The Supplementary Specification is a temporary document that will be withdrawn upon completion of the revision and restructuring of the relevant components of the WPSGD. The arrangements for this withdrawal are described herein.

To avoid duplication, this document does not provide detailed background on geological disposal, the role of waste packages or the range of materials covered by the WPSGD. Information on these matters may be found in the relevant Generic Specifications [3,4,5].

The remainder of this document is structured in the following manner:

- Section 2 summarises the role of the existing RWM packaging specifications and the relationship of this Supplementary Specification to these documents.
• Section 3 outlines the conclusions of a review of the changes introduced by aligning with the 2016 gDSSC.
• Section 4 describes how this Supplementary Specification will be managed and, ultimately, retired.

2 Specifications for Packaged Waste

Packaging specifications define the standard properties and performance requirements for waste packages that are compatible with the anticipated systems and safety cases for their transport to and disposal in a GDF.

As discussed above, in the absence of the necessary information to permit the production of WAC for a GDF, RWM produces generic packaging specifications, their principal purpose being to expedite the conversion of unconditioned wastes into passively safe and disposable forms. The packaging specifications therefore play an important role in determining the disposability of waste packages and, in this sense, may be considered to act as the 'preliminary' WAC for a future GDF. This approach is consistent with that outlined in guidance produced by the International Atomic Energy Agency (IAEA) [6] and with that adopted in a number of countries worldwide (for example Sweden, France and the USA).

The packaging specifications are also produced with a number of other key purposes in mind, notably:
• to support the development of RWM's plans for the implementation of geological disposal for higher activity radioactive waste
• to provide the UK nuclear industry and regulators with a clear definition of the requirements for packaged waste in advance of the construction of a GDF
• to permit scrutiny of this aspect of RWM's plans to implement geological disposal for HAW in the UK.

2.1 The form of the RWM packaging specifications

In order to ensure that the packaging specifications satisfy the needs of all users, RWM has devised a hierarchical structure as illustrated in Figure 1. The hierarchy comprises three levels of specification in which each successive level represents an increasing degree of specificity, both to the nature of the waste and the design of the waste package. Each of the levels in the hierarchy satisfies a specific function and is produced for a particular audience:

• The DSS [7,8], which defines high-level requirements for all waste packages destined for disposal in a GDF. It is aimed at industry regulators and stakeholders who are not directly involved with the packaging of waste.
• Generic Specifications, which define the requirements for all waste packages that will be disposed of in accordance with a specified range of concepts, and which will contain wastes with similar radiological characteristics. They are produced for use by RWM's Technical Programme, industry regulators, and waste packagers involved in the development of new or innovative approaches to the packaging of waste.
• Waste Package Specifications (WPS), which define, where applicable, quantitative requirements for waste packages containing a specific type of waste and manufactured using a standardised design of waste container\(^1\). They are produced

\(^1\) These are designs which have been shown to be suitable for the manufacture of waste packages that are compatible with the anticipated needs of transport and disposal.
for use by waste packagers intending to use such a waste container for the packaging of waste.

Figure 1  Hierarchy of the RWM packaging specifications

2.2 Basis for the definition of the packaging requirements

Much of the waste destined for geological disposal does not arise in a form that is immediately suitable for such disposal. It must therefore be conditioned and packaged in such a way as to render it:

- passively safe, such that it can be managed safely with the minimum need for active safety systems, monitoring or prompt human intervention
- capable of safe handling during interim storage\(^2\), transport to and emplacement in a GDF
- ‘disposable’, in that it can be shown to be compliant with all the relevant regulations and safety cases for transport to and disposal in a GDF

The Generic Specifications are founded on the requirements for geological disposal, as defined by the DSS [7,8]. Waste packages should be capable of being safely transported to a GDF in accordance with the systems defined by the Generic Transport System Designs (GTSD) [9] and, following receipt at a GDF, of being safely handled by way of the processes and equipment defined in the Generic Disposal Facility Designs (GDFD) [10]. Also included is a consideration of the required performance of waste packages in the GDF post-closure period, as defined in terms of environmental safety functions.

No explicit consideration of the needs of interim storage has been included in the definition of the packaging requirements, as interim storage facilities will be designed by the site operator to ensure compatibility with a need to preserve the properties of waste packages. Industry guidance on the interim storage of Higher Activity Waste (HAW) packages is provided by NDA [11].

\(^2\) It is expected that many waste packages will need to be stored for an extended period (that is several decades), either at their site of manufacture or elsewhere, pending the availability of a GDF.
Further details on the derivation of the existing packaging requirements are provided in the relevant Generic Specifications and are not repeated herein.

2.3 Generic Specifications

For the purposes of GDF design, the DSS splits the full range of HAW into a number of different groups [7,8]:

- Low Level Waste (LLW)
- Shielded Intermediate Level Waste (SILW)
- Unshielded Intermediate Level Waste (UILW)
- Depleted, Natural and Low-Enriched Uranium (DNLEU)
- Vitrified High Level Wastes (HLW)
- Spent Fuel (SF)
- Plutonium
- Highly Enriched Uranium (HEU)
- Mixed OXide (MOX) spent fuel

Different approaches to packaging and disposal may be required for different categories of waste. In order that the packaging specifications are applicable to the full range of HAW, whilst ensuring that a proportionate approach to the packaging and disposal of each category of waste is adopted, a suite of Generic Specifications is required. As a means of identifying the extent of such a suite, RWM has used two properties of radioactive waste, namely radiogenic heat output and fissile nuclide content, to divide the whole range of HAW into groups of wastes for which distinct approaches to packaging and/or disposal may be required. The current suite of Generic Specifications comprises:

- Generic Specification for waste packages containing low heat generating waste, WPS/220/01 [3]
- Generic Specification for waste packages containing high heat generating waste, WPS/240/02 [4]
- Generic Specification for waste packages containing depleted, natural and low enriched uranium (DNLEU), WPS/230/02 [5]

It should be noted that heat output and fissile nuclide content are not the only two discriminators for waste types that could be used in this way. Other properties, such as the specific activity of long-lived radionuclides or the timescales required for the containment of radionuclides by a GDF, could also be used.

2.4 Relationship to the Supplementary Specification

The current published suite of documents in the WPSGD is based on the Disposal System Specification, illustrative design concepts and generic Disposal System Safety Case published by RWM in 2010 (collectively the 2010 gDSSC). Subsequently, RWM has produced an updated version of the gDSSC (the 2016 gDSSC) and it is planned that the WPSGD will be revised to align with the 2016 gDSSC. Furthermore, the 2016 gDSSC has

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3 These sub-categories of ILW are differentiated by the manner in which they are expected to be packaged.

4 The Generic Specification for waste packages containing DNLEU applies only to wastes with uranium-235 enrichments of up to 1%w/w. DNLEU with higher uranium-235 enrichments will be managed as ILW and this Generic Specification applies to waste packages containing such material.
been adopted as the basis for disposability assessment and the relevant assessment methodologies revised to reflect those reported in the 2016 gDSSC.

In addition to the planned revision of the WPSGD to align with the 2016 gDSSC, the overall structure and approach of the WPSGD is under review. It is anticipated that this restructuring will not be complete until at least the end of 2018/19. RWM has determined that formal alignment of the full suite of documents with the 2016 gDSSC should be delayed to coincide with the planned restructuring.

It is recognised that this pragmatic approach to the timing of the revision of the WPSGD will introduce an inconsistency between the stated basis for disposability assessment (the 2016 gDSSC) and the WPSGD. As a result, this Supplementary Specification has been produced to provide consistency between the assessment basis and the WPSGD. The Supplementary Specification provides an analysis of the changes to the WPSGD that would be introduced by alignment to the 2016 gDSSC, and provides guidance on how these should be implemented. In practice, the combination of the existing WPSGD and this Supplementary Specification provides a de facto alignment of the WPSGD with the 2016 gDSSC.

The Supplementary Specification primarily addresses those components of the WPSGD considered to be packaging specifications. The RWM packaging specifications are presented as a hierarchy intended to satisfy the needs of all users. Of these, the Supplementary Specification applies to the second tier, namely the Generic Specifications, and the third tier, namely the Waste Package Specifications for specific designs of waste package. The first tier of the packaging specification has been incorporated into the Disposal System Specification and is directly included in the 2016 gDSSC [7,8]. Further details on the current structure of the WPSGD are provided in reference 2.

In common with the gDSSC and existing WPSGD, this Supplementary Specification makes no assumptions regarding the geographical location of a GDF, the geological environment in which it will be constructed, or specific concepts that could be adopted for the disposal of waste packages. Accordingly, the packaging requirements continue to be defined so as to be bounding of a number of illustrative disposal concepts that could be implemented in a range of geological environments that exist at a number of locations throughout the UK.

3 Review of changes arising from adoption of 2016 gDSSC

3.1 Scope and approach to review

The review encompassed the principal documents in the 2016 gDSSC and associated underpinning documents, as follows:

- the Disposal System Safety Case main reports [12,13,14] and associated assessments
- the Disposal System Specification [7,8]
- the knowledge base underpinning the 2016 gDSSC, as reported in the suite of eight status reports
- reporting of the periodic update performed through the Disposal System Change Management system, through which the overall changes to the full suite of generic DSSC documents was managed

In addition to the review of this documentation, the relevant document owners were interviewed informally to gain further insight into the nature of the changes introduced that might influence packaging specifications.
3.2 Assessment of changes to the gDSSC

The outcome of the review is presented in Table 1, including the following:

- recognition of the primary document in the 2016 gDSSC document suite where the change is reported
- statement of the relevant positions in the equivalent documents in the 2010 and 2016 gDSSC (noting that in some cases a new position has been recognised that is not recorded in the 2010 gDSSC)
- identification of the necessary changes that ultimately should be implemented in updating the WPSGD, including areas where further development may be required before a final position can be specified
- identification of interim measures that may be adopted prior to the publication of the updated WPSGD, with particular emphasis on maintaining continuity in the disposability assessment process

A total of 17 significant changes are identified in Table 1. In all cases, interim measures have been identified that will allow disposability assessment to be undertaken in alignment with the 2016 gDSSC.

3.3 Changes necessitating further development

Four of the identified changes represent newly-recognised legal or regulatory expectations applicable to a GDF that are now noted in the 2016 gDSSC, typically relating to non-radiological matters. Although these expectations have been identified, it is understood that further development will be necessary to establish any explicit requirements before they could be codified in the gDSSC and embodied in the WPSGD.

This position applies to items 8, 10, 11 and 12 identified in Table 1. Item 7 represents a change (recognition of the Pressure System Safety Regulations (PSSR)), for which the necessary development has been completed.

In these circumstances, any requirements relating to these matters would not have been available for incorporation into an immediate update to the WPSGD (and may not be resolved by the time an update is finally published). Consequently, Table 1 does not identify any specific interim measures to be deployed in advance of a formal update to the WPSGD. It is noted that some emerging issues will continue to require assessment on a case by case basis. Where such issues arise in disposability assessments, we will work with the affected waste producer and ensure learning is shared with other waste producers. Learning will be used to help inform requirements that are later formally incorporated into the WPSGD.

4 Management of the Supplementary Specification

The Supplementary Specification is a temporary document that will be withdrawn once all relevant elements of the WPSGD suite have been updated (or, in some cases, have been subsumed into a different document within the suite). The relevant updated documents may not be published as a single event. Where this is the case, the Supplementary Specification should be deemed to be no longer applicable in the case(s) of the published updated documents.

For clarity, the initial list of WPSGD documents to which the Supplementary Specification is considered to be applicable is recorded below.

In addition to specifications, Table 1 also indicates that a small number of published or draft guidance documents, providing detailed guidance relating to packaging requirements, would need to be updated to align with the 2016 gDSSC. These documents are also listed below.
### Generic Specifications

<table>
<thead>
<tr>
<th>WPS/220/01</th>
<th>Generic specification for waste packages containing low heat generating wastes</th>
</tr>
</thead>
<tbody>
<tr>
<td>WPS/230/01</td>
<td>Generic specification for waste packages containing DNLEU</td>
</tr>
<tr>
<td>WPS/240/01</td>
<td>Generic specification for waste packages containing high heat generating wastes</td>
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</tbody>
</table>

### Waste Package Specifications (WPS)

<table>
<thead>
<tr>
<th>WPS/300/03</th>
<th>Waste package specification for 500 litre drum waste packages</th>
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</thead>
<tbody>
<tr>
<td>WPS/310/04</td>
<td>Waste package specification for side lifting variants of the 3 cubic metre box waste packages</td>
</tr>
<tr>
<td>WPS/315/04</td>
<td>Waste package specification for corner lifting variants of the 3 cubic metre box waste packages</td>
</tr>
<tr>
<td>WPS/320/04</td>
<td>Waste package specification for 3 cubic metre drum waste packages</td>
</tr>
<tr>
<td>WPS/330/03</td>
<td>Waste package specification for 4 metre box waste packages</td>
</tr>
<tr>
<td>WPS/340/01</td>
<td>Waste package specification for MBGWS box waste packages</td>
</tr>
<tr>
<td>WPS/350/03</td>
<td>Waste package specification for 2 metre box waste packages</td>
</tr>
<tr>
<td>WPS/360/03</td>
<td>Waste package specification for 6 cubic metre concrete box waste packages</td>
</tr>
<tr>
<td>WPS/361/01</td>
<td>Waste package specification for 500 litre concrete drum waste packages</td>
</tr>
<tr>
<td>WPS/362/01</td>
<td>Waste package specification for 1 cubic metre concrete drum waste packages</td>
</tr>
<tr>
<td>WPS/380/01</td>
<td>Waste package specification for 500 litre robust shielded drum waste packages to be transported in a SWTC-150</td>
</tr>
<tr>
<td>WPS/381/01</td>
<td>Waste package specification for 3 cubic metres robust shielded box waste packages for transport as part of an IP-2 package</td>
</tr>
</tbody>
</table>

### Guidance documents (selected)

<table>
<thead>
<tr>
<th>WPS/911/02</th>
<th>Guidance on the application of the criticality safety requirements of the 2012 IAEA Transport Regulations</th>
</tr>
</thead>
<tbody>
<tr>
<td>WPS/916/01</td>
<td>Guidance on the control of fissile material in waste packages</td>
</tr>
<tr>
<td>WPS/917</td>
<td>Unpublished draft guidance on the determination of safe fissile mass</td>
</tr>
<tr>
<td>WPS/924</td>
<td>Unpublished draft guidance on the packaging of non-aqueous phase liquids (NAPLs)</td>
</tr>
</tbody>
</table>

### Summary

This Supplementary Specification provides an analysis of the changes introduced by implementing the 2016 gDSSC that would need to be included in the WPSGD for it to be fully aligned and provides guidance on how these changes should be implemented. It supplements the packaging specifications for all categories of HAW included in the WPSGD.
The combination of the existing WPSGD and the Supplementary Specification provides a *de facto* temporary alignment of the WPSGD with the 2016 gDSSC and a basis for disposability assessment against the 2016 gDSSC.

A total of 17 significant changes resulting from the adoption of the 2016 gDSSC have been identified. Several of the identified changes represent newly-recognised legal or regulatory expectations for which further development will be necessary to establish any explicit requirements before they could be embodied in an updated WPSGD. In all cases, interim measures have been identified that will allow disposability assessment to be undertaken in alignment with the 2016 gDSSC.

6 References

Table 1  Changes to the 2016 generic DSSC that affect the WPSGD (items highlighted in amber cannot be addressed immediately).

<table>
<thead>
<tr>
<th>2016 gDSSC document</th>
<th>2010 gDSSC position</th>
<th>2016 gDSSC position</th>
<th>Required change to WPSGD</th>
<th>Immediate action and/or current position (to maintain disposability assessment capability)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Generic Operational Safety Case (DSSC/202)</td>
<td>Not included in 2010</td>
<td>Requirement to consider the lifecycle impact of a packaging proposal and the use of optioneering, including justification for ALARP (As Low As Reasonably Practicable) and the consideration of BAT (Best Available Techniques).</td>
<td>WPSGD should emphasise the need for ‘full lifecycle’ justification and the need for ‘balanced decision-making’ in developing packaging proposals. Further consideration may be necessary to determine how and where this needs to be incorporated into the WPSGD. It is not yet clear whether explicit criteria for assessment could or should be specified. Equivalent requirements are already implicit in disposability assessment process and are recognised in the Disposability Assessment Aim and Principles (DAAPs).</td>
<td>No immediate action required. Equivalent requirements are already implicit in disposability assessment process and are recognised in the DAAPs.</td>
</tr>
<tr>
<td>2 Generic Transport Safety Assessment (DSSC/301)</td>
<td>Transport system design and safety assessment based on 2009 IAEA Transport Regulations (as incorporated into UK law).</td>
<td>Transport system design and safety assessment based on 2012 IAEA Transport Regulations (as incorporated into UK law).</td>
<td>Revise statements and paragraph citations relating to criticality and fissile exceptions, as reported in the WPSGD, to reflect 2012 IAEA Transport Regulations. No other topics are directly cited from regulations in the WPSGD.</td>
<td>No immediate action required. The requirements for managing criticality safety in transport have been recognised and are routinely employed in disposability assessment. Guidance documents are in place (WPS/911 and WPS/916) or are under development (WPS/917) and will be published immediately when completed.</td>
</tr>
<tr>
<td>3 Generic Transport Safety Assessment (DSSC/301)</td>
<td>Transport system design assumes non-exclusive use. Fissile excepted transport packages would be limited to 15 g of fissile material Under non-exclusive use, the 2012 IAEA Transport Regulations (adopted subsequent to publication of 2010 gDSSC) would have resulted in fissile excepted transport packages being limited to 2 g of fissile material.</td>
<td>Transport system design allows exclusive use (note that this is not explicitly stated in transport design report DSSC/411). Fissile excepted transport packages limited to 45 g of fissile material. Other fissile exceptions also recognised or under development.</td>
<td>Add revised fissile exceptions to the Generic Specifications. Update requirements applicable to specific package types to the WPS as appropriate. Guidance on compliance with fissile exceptions (WPS/911) is published but will be updated. Guidance on control of fissile content published (WPS/916). Additional fissile exceptions will be introduced through change management and implemented in WPSGD as appropriate.</td>
<td>No immediate action required. The application of fissile exceptions under exclusive use has been recognised and is routinely employed in disposability assessment. Guidance document is in place (WPS/911). Update will be published immediately when completed.</td>
</tr>
<tr>
<td>4 Generic Transport Safety Assessment (DSSC/301)</td>
<td>Transport system design assumes non-exclusive use. Shielding limits pertaining to non-exclusive are assumed • 2 mSv/hr on the package surface • 0.1 mSv/hr at any point 1m from the package • 0.1 mSv/hr at any point 2m from the vertical planes represented by the outer lateral sides of the vehicle</td>
<td>Transport system design allows exclusive use (note that this is not explicitly stated in transport design report DSSC/411). Shielding limits pertaining to exclusive use are assumed as follows: • 10 mSv/hr on the package surface • 2 mSv/hr on the outer surface of the vehicle • 0.1 mSv/hr at any point 2m from the vertical planes represented by the outer lateral sides of the vehicle</td>
<td>Add revised dose-rate limits to the Generic Specifications. Update limits applicable to specific package types to the WPS as appropriate.</td>
<td>No immediate action required. The dose-rate requirements for exclusive use have been recognised and are routinely employed in disposability assessment. The position should be made explicit in the revision of RWPR60-WI13 as part of aligning the basis for disposability assessments with the 2016 gDSSC.</td>
</tr>
<tr>
<td>2016 gDSSC document</td>
<td>2010 gDSSC position</td>
<td>2016 gDSSC position</td>
<td>Required change to WPSGD</td>
<td>Immediate action and/or current position (to maintain disposability assessment capability)</td>
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<td>---------------------------------------------------------</td>
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<td>--------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>5 Generic Transport Safety Assessment (DSSC/301)</td>
<td>Transport system design assumes non-exclusive use.</td>
<td>Transport system design allows exclusive use (note that this is not explicitly stated in transport design report DSSC/411). The maximum surface temperature of a transport package is limited to 50°C for Type B packages only (this is not a limit applied to IP packages).</td>
<td>Add revised temperature limit to the relevant Generic Specifications (noting that this applies to the Type B transport package, such as the SWTC, rather than the waste packages within). WPS for relevant packages specify limits on heat output. May need to check whether existing limits are overly conservative for an increased temperature limit.</td>
<td>No immediate action required. Application of existing heat output limits will provide a conservative test against increased temperature limit. Relaxation of heat output limit would be assessed on a case-by-case basis and conclusions shared with waste producers through the WPLG.</td>
</tr>
<tr>
<td>6 Disposal System Specification, Part B (DSSC/402)</td>
<td>Not included in 2010</td>
<td>Inclusion of additional waste package types:</td>
<td>Required Waste Package Specifications (WPS) already introduced through change management process. <strong>No further action required.</strong></td>
<td>No immediate action required. Disposability assessments continue to be based on the existing WPS.</td>
</tr>
</tbody>
</table>
| 7 Disposal System Specification, Part B (DSSC/402)      | Not included in 2010                                                                | Recognition of the Pressure System Safety Regulations 2000 (PSSR)                     | Add limits and requirements from the PSSR to the Generic Specifications and cascade to WPS as appropriate. Consider production of accompanying guidance based on existing exemplar disposability assessments. | For packaging proposals that include items liable to pressurise in waste packages, then waste packagers will need to:  
  1) identify whether every such item is a "pressure system" to which PSSR applies (regs. 3 and 2); and  
  2) where any such item is identified as a "pressure system", provide RWM with sufficient evidence that every person involved in the design, manufacture, importation and/or supply of each pressure system has discharged the duties imposed on them by regs. 4 and 5 of PSSR, such that RWM can be satisfied that the waste package containing the "pressure system" can be disposed of to a GDF without there being reasonably foreseeable danger to persons from the unintentional release of stored energy from the pressure system (but not danger from the hazardous properties of its contents). Assessments and advice may be based on existing interpretation of legal requirements as developed and agreed through previous exemplar assessments. |
<table>
<thead>
<tr>
<th>2016 gDSSC document</th>
<th>2010 gDSSC position</th>
<th>2016 gDSSC position</th>
<th>Required change to WPSGD</th>
<th>Immediate action and/or current position (to maintain disposability assessment capability)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 Disposal System Specification, Part B (DSSC/402)</td>
<td>Not included in 2010</td>
<td>Recognition of the Groundwater Daughter Directive in EPR-2010 (now EPR-2016)</td>
<td>Add any requirements from EPR-2016 to the Generic Specifications and cascade to WPS as appropriate. Further development and regulatory engagement is underway to establish the requirements before this can be implemented.</td>
<td>No immediate action possible. Further development and (potentially) regulatory engagement may be necessary to establish the requirements before this can be fully implemented. This may not be completed before planned WPSGD update. Assessments and advice may be based on existing interpretation of requirements. It is recognised that these requirements are not yet fully understood. Current RWM policy excludes disposal of lead as a structural component of waste packages.</td>
</tr>
<tr>
<td>9 Disposal System Specification, Part B (DSSC/402)</td>
<td>Not included in 2010</td>
<td>Recognition of the Lifting Operations and Lifting Equipment Regulations (LOLER) 1998 (noting that waste packages are ‘loads’ under LOLER). Requires ‘employers’ to ensure that: • lifting equipment is of adequate strength and stability for each load, having regard in particular to the stress induced at its mounting or fixing point – suggests maximum weight of packages required • every part of a load and anything attached to it and used in lifting it is of adequate strength – suggests waste packages and stillages must be designed with sufficient strength to be lifted</td>
<td>WPSGD includes requirements regarding the mass and lifting of waste packages. LOLER introduces another driver for the same or similar requirements. Review existing requirements to ensure that they also fulfill LOLER. Modify as necessary, noting that it may be appropriate to specify GDF systems to accommodate packages as they have been manufactured. Generic Operational Safety Assessment (DSSC/311) does not define explicit requirements for compliance of waste packages with LOLER. Development may be required to confirm requirements in the WPSGD.</td>
<td>No immediate action required. It may be assumed that current requirements for waste packages are sufficient to ensure consistency with LOLER.</td>
</tr>
<tr>
<td>10 Disposal System Specification, Part B (DSSC/402)</td>
<td>Not included in 2010</td>
<td>Recognition of the Provision and Use of Work Equipment Regulations (PUWER) 1998. Waste containers, stillages and (possibly) waste packages are likely to be ‘work equipment’ under PUWER. The principal requirement under PUWER is that employers must ‘ensure that work equipment is so constructed or adapted as to be suitable for the purpose for which it is used or provided’.</td>
<td>Add any limits and requirements from PUWER to the Generic Specifications and cascade to WPS as appropriate. Consider production of accompanying guidance or include in existing guidance. Further development and (potentially) regulatory engagement may be necessary to establish the requirements before this can be fully implemented. This may not be completed before planned WPSGD update. Generic Operational Safety Assessment (DSSC/311) does not define explicit requirements for compliance of waste packages with PUWER. Development may be required to inform WPSGD.</td>
<td>No immediate action possible. Further development and (potentially) regulatory engagement may be necessary to establish the requirements before this can be fully implemented. This may not be completed before planned WPSGD update. Implications may be considered through disposability assessment and would be assessed on a case-by-case basis. Conclusions would be shared with other waste producers through the WPLG.</td>
</tr>
<tr>
<td>11 Disposal System Specification, Part B (DSSC/402)</td>
<td>Not included in 2010</td>
<td>Recognition of the Control of Substances Hazardous to Health Regulations (CoSHH) 2002. Waste packages containing ‘substances hazardous to health’ are likely to be subject to CoSHH. The principal requirements under CoSHH are that employers ‘ensure that the exposure of his employees to substances hazardous to health is either prevented or, where this is not reasonably practicable, adequately controlled’, and a series of prioritised controls must be applied (starting at the source of the hazardous substance).</td>
<td>Add any limits and requirements from CoSHH to the Generic Specifications and cascade to WPS as appropriate. Consider production of accompanying guidance or include in existing guidance. Further development and (potentially) regulatory engagement may be necessary to establish the requirements before this can be fully implemented. This may not be completed before planned WPSGD update. Generic Operational Safety Assessment (DSSC/311) does not define explicit requirements for compliance of waste packages with CoSHH. Development may be required to inform WPSGD.</td>
<td>No immediate action possible. Further development and (potentially) regulatory engagement may be necessary to establish the requirements before this can be fully implemented. This may not be completed before planned WPSGD update. Implications may be considered through disposability assessment and would be assessed on a case-by-case basis. Conclusions would be shared with other waste producers through the WPLG.</td>
</tr>
<tr>
<td>2016 gDSSC document</td>
<td>2010 gDSSC position</td>
<td>2016 gDSSC position</td>
<td>Required change to WPSGD</td>
<td>Immediate action and/or current position (to maintain disposability assessment capability)</td>
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<tr>
<td>12 Disposal System Specification, Part B (DSSC/402)</td>
<td>Not included in 2010</td>
<td>Recognition of the Dangerous Substances and Explosive Atmospheres Regulations (DSEAR) 2002. Waste packages containing ‘dangerous substances’ (flammable, explosive, pressurised gasses, aerosols, etc.) are likely to be subject to DSEAR. The principal requirements under DSEAR are that employers ‘ensure that risk is either eliminated or reduced so far as is reasonably practicable’ and a series of prioritised controls must be applied (starting at the source of the dangerous substance).</td>
<td>Add any limits and requirements from DSEAR to the Generic Specifications and cascade to WPS as appropriate. Consider production of accompanying guidance or include in existing guidance. Further development and (potentially) regulatory engagement may be necessary to establish the requirements before this can be fully implemented. This may not be completed before planned WPSGD update. Implications may be considered through disposability assessment on an ad hoc basis.</td>
<td>No immediate action possible. Further development and (potentially) regulatory engagement may be necessary to establish the requirements before this can be fully implemented. This may not be completed before planned WPSGD update. Implications may be considered through disposability assessment on an ad hoc basis.</td>
</tr>
<tr>
<td>13 Derived Inventory Report (DSSC/403)</td>
<td>Wastes covered by Scottish Government Policy on radioactive waste included in assumed inventory for disposal.</td>
<td>Wastes covered by Scottish Government Policy on radioactive waste not included in assumed inventory for disposal.</td>
<td>Change recorded for completeness. WPSGD not directly influenced by the inventory for disposal. No issues specific to Scottish wastes are cited in the WPSGD. <strong>No further action required.</strong> Regulatory position remains that assessment for geological disposal provides current best analogy for management under Scottish Government Policy.</td>
<td>No immediate action required. The position on Scottish Government Policy is recognised and is routinely employed in disposability assessment based on existing interpretation and practice.</td>
</tr>
<tr>
<td>14 Engineered Barrier System Status Report (DSSC/452)</td>
<td>Not included in 2010</td>
<td>Recognition that significant quantities of non-aqueous phase liquids (NAPLs) will not escape from waste packages. NAPLs that do escape are unlikely to accumulate in such a manner that could result in them being transported into the geosphere.</td>
<td>Revise statements in the WPSGD relating to NAPLs to align with the modified position. This may reduce conservatism. Confirm that existing draft guidance on packaging of NAPLs (WPS/924) represents current position.</td>
<td>No immediate action required. The position on NAPLs is recognised and is routinely employed in disposability assessment based on existing interpretation and practice. The position should be made explicit in the revision of RWPR60-W103 as part of aligning the basis for disposability assessments with the 2016 gDSSC.</td>
</tr>
<tr>
<td>15 Waste Package Accident Performance Status Report (DSSC/457)</td>
<td>Impact accident scenarios specified</td>
<td>Revised impact accident scenarios specified (modification to assumed drop heights, emphasis on aggressive feature impacts and reduction in assumed respirable particle size to 10 μm).</td>
<td>Details of the assumed scenarios are not included in the WPSGD (reference is made to credible accident scenarios). <strong>No further action required.</strong> Consideration could be given to stating explicitly the impact accident scenarios in relevant documents. Details of the assumed scenarios are not included in the WPSGD (reference is made to credible accident scenarios). <strong>No further action required.</strong> Consideration could be given to stating explicitly the impact accident scenarios in relevant documents.</td>
<td>The relevant impact accident scenarios will be included in the revision of RWPR60-W106 as part of aligning the basis for disposability assessments with the 2016 gDSSC.</td>
</tr>
<tr>
<td>16 Waste Package Accident Performance Status Report (DSSC/457)</td>
<td>Fire accident scenarios specified</td>
<td>Revised fire accident scenarios specified. Note that fire accidents are not explicitly considered in the documented Operational Safety assessments.</td>
<td>Details of the assumed scenarios are not included in the WPSGD (reference is made to credible accident scenarios). <strong>No further action required.</strong> Some changes to scenarios already introduced through change management process. Consideration could be given to stating explicitly the fire accident scenarios in relevant documents. Any such change would need to recognise the position of the Operational Safety assessments and, potentially, the planned (but not yet proven) elimination of fire accidents as a design basis.</td>
<td>The relevant fire accident scenarios should be included in the revision of RWPR60-W107 as part of aligning the basis for disposability assessments with the 2016 gDSSC.</td>
</tr>
<tr>
<td>17 Criticality Status Report (DSSC/45B)</td>
<td>Criticality safety fissile material limits specified, based on generic Criticality Safety Assessments (CSA)</td>
<td>Revised and extended range of safety fissile material limits, including additional package types.</td>
<td>Add revised fissile material limits to the Generic Specifications and cascade to WPS as appropriate. Guidance on control of fissile content published (WPS/916). Further guidance on determining safe fissile mass expected (allocated WPS/917).</td>
<td>No immediate action required. The relevant CSAs are available and are routinely employed in disposability assessment. WPS/916 is under development and will be published immediately when completed.</td>
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