Draft Safety Guide: DS546 Ageing Management and Maintenance of Packages for Transport of Radioactive Material

Step 9 Member States' comments resolution table (input for STEP 10)

MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
F-02	1.1	IAEA Safety Standards Series No. SSR-6 ~~(Rev. 1)~~, Regulations for the Safe Transport of Radioactive Material~~, 2018 Edition [1]~~ (hereinafter referred to as the 'Transport Regulations'), **have** introduced**-, since the 2018 Edition of these regulations,** important requirements to take into account the ageing of transport packages including, as relevant, their radioactive contents. The design of such packages is required to be based on evidence that these requirements have been met (see para**s. 604A,** 613A **and 809(f)** of the Transport Regulations). This includes packages used for shipment after storage (see para. ~~809(f) and~~ 809(k) of the Transport Regulations).	As a result of the SSR-6 revision process, some ageing-related requirements are about to be modified (Para 809(f)) or introduced (Para 604A) according to the draft as per SPESS STEP 11 (Second review of the draft publication by the Review Committees). In this context, it seems beneficial to synchronise the publication of DS546 with SSR-6 (Rev. 2). Therefore, it is proposed to modify the text not only to focus on SSR-6 (Rev. 1) and to reflect the changes in the Rev. 2. It is important to notice that guidance is to be developed within the guide to address ageing mechanisms for special form radioactive material subsequently to the new para 604A.		IAEA Safety Standards Series No. SSR-6 (Rev.2), Regulations for the Safe Transport of Radioactive Material (hereinafter referred to as the 'Transport Regulations'), includes important requirements to take into account the ageing of transport packages including, as relevant, their radioactive contents. The design of such packages, inlcuding those used for shipment after storage, is required to be based on evidence that these requirements have been met (see paras. 613A and 809(f) of the Transport Regulations).		It was recognized that addressing ageing of special form radioactive material is currently out of the scope of this guide, based on the approved DPP. However, this issue could be included in next review of the guide. It is also believed, that general approaches to ageing provided in this guide could serve well for special form radioactive material.
WNTI-01	1.3	1.3. The Transport Regulations also include requirements for maintenance of transport packages. SSG-66 [3] recommends ~~that evidence of~~ maintenance ~~is used when preparing~~ **specifications are included in** the package design safety report. SSG-26 (Rev.1) [2] also addresses maintenance of transport packages with respect to lifting attachments and ageing management of transport packages.	Clarification. The package design safety report provides the specification of the maintenance (see Sections about Maintenance in Appendices II, III, IV, V and VI). It does not provide evidence of the actual maintenance on individual packagings.		1.3. The Transport Regulations also include requirements for maintenance of transport packages. SSG-66 [3] recommends **that** maintenance **specifications are included in** the package design safety report. ...		Agree with the comment with editorial modification.
JPN-05	1.4	The objective of this Safety Guide is to provide recommendations on ageing[2] **management** and maintenance[3] of transport packages in order to ensure compliance with the Transport Regulations	Consistency	x			
WNTI-02	1.4	1.4 The objective of this Safety Guide is to provide recommendations on ageing[2] and maintenance[3] of transport packages in order to ensure compliance with the Transport Regulations. **The recommendations in this safety guide are complementary to those published in SSG-26 [2] and SSG-66 [3].**	Clarification			x	IAEA guides are complementory to each other and supporting the Transport Regulations.
CDN-06	1.5	The recommendations in this Safety Guide are aimed at: designers of packages; manufacturers; owners and…	Typo	x			
F-03	1.5	The recommendations in this Safety Guide are aimed at: designers of packages; manufacturers; owners and the maintenance organizations of the packagings;	Editorial. It should be "manufacturers" instead of "manufactures".	x			

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ITA-01	1.5	1.5. The recommendations in this Safety Guide are aimed at: designers of packages; manufactures; owners and the maintenance organizations of the packagings; owners of the radioactive content of the package; **consignors and** users of the package; ….	The proposal is to keep consistency with para. 306 of the SSR-6, stating that "[…] The manufacturer, consignor or user shall be prepared: (a) To provide facilities for inspection during manufacture and use; (b) To demonstrate compliance with these Regulations to the competent authority.			x	It was considered to prioritize the user as the audience, taking into account the description of an user of the package being usually the consignor of the package as is stated in Annex III.
CDN-01	1.6	This Safety Guide covers Type IP-2, Type IP-3, Type A, Type B(U) or B(M), Type C ~~all~~ packages containing radioactive material ~~(i.e. Excepted, Type IP, Type A, Type B(U) or B(M), Type C packages~~, including packages containing fissile material or uranium hexafluoride~~)~~, as defined in the Transport Regulations.	The scope of packages is too broad and should exclude excepted and Type IP-1 packages, as there is really no safety benefit including them in this document. Although the graded approach is stated in section 1.8 it is difficult at times to determine if the requirement would apply to an excepted or industrial package. Including excepted packages is not useful, as consignors of excepted packages will likely be unaware of this document or apply the guidance provided and no requirements are specified in Table 1.1 of the draft guide.			x	Scope of the safety guide approved in the DPP included all types of packages and more over, para 613A is applicable to all type too. Application of graded approach was further clarified throught the text where possible.
CDN-07	1.6	"…containing radioactive material (i.e. Excepted, Type IP-1, Type IP-2, Type IP-3, Type A, Type B(U) or B(M), and Type C packages…"	For readability.	x			
WNTI-03	1.6	1.6. This Safety Guide covers all packages containing radioactive material (i.e. Excepted **packages**, Type IP-1, Type IP-2, Type IP-3, Type A **packages**, Type B(U) or B(M) **packages** , Type C packages, including packages containing fissile material or uranium hexafluoride), as defined in the Transport Regulations.	Editorial. Consistency with the wording in para. 231 in SSR-6 (Rev. 1).	x			
F-04	1.8	~~A graded approach is applied to the recommendations provided in this Safety Guide, commensurate with the type of package and its intended use (i.e. single transport, repeated use, shipment after storage).~~ **This Safety Guide also covers the intended use of the package (i.e. single transport, repeated use, shipment after storage), for which a graded approach commensurate to the package operational conditions throughout its service life should be applied for the implementation of the recommendations of this Safety Guide.**	For consistency with paras 1.6 and 1.7, it is proposed to rephrase the para 1.8			x	
CDN-09	1.9	~~Recommendations~~ Sections 7 and 8 provide recommendations on the role of the competent authority in relation to ageing management and maintenance of transport packages, and related administrative matters ~~are provided in Sections 7 and 8, respectively~~.	For consistency with other section descriptions (i.e. other sentences of this paragraph).	x			
CDN-08	1.9 1.10	Combine sections 1.9 and 1.10 into one paragraph.	1.10 should be merged with 1.9, for which the heading covers the sections and the appendices.	x			

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F-05	1.10	Appendix I provides examples of approaches for consideration of ageing mechanisms in package design. Appendix II provides an example structure of an ageing management programme. Appendix III describes roles and responsibilities of **some of** the relevant interested parties[5] considered in ageing management and maintenance of transport packages.	Not of all the 'relevant interested parties' (as listed in the footnote 5) are considered in the Appendix III.	x			
D-02	1.10 2nd sentence	"Appendix II provides an example structure of an ageing management programme for transport packages."	To be more specific with regard to the content, and to be consistent with the title of Appendix II.	x			
US-03	2.1	Remove "curing" from Footnote 6	Curing is not an aging mechanism; it is an expected reaction process that is used to develop specific materials properties.			x	To keep consistency with IAEA glossary definition
US-04	2.1	Move first 3 lines of text to previous page	Page break after section title	x			
US-05	2.1	Comment: Revisions needed to SSG-26 including the following: 1. The guidance in SSG-26 should be corrected. Specifically, the last sentence of paragraph 613.A.3 should be moved to be the last sentence of 613.A.4. Note that the order of the references [12] and [13] in SSG-26 will need to be revised as well. 2. The first sentence of SSG-26 Paragraph 613A.5. should read: With regard to package design, the consideration of the impact of ageing on the package as described in 613A.1 should be supported by an inspection and maintenance program or an ageing management programme.	Consistency with aging management requirements.			X	The proposal is not related with development of this guide, but with review/revision of SSG-26. The comment will be forwarded to technical officer responsible for development of SSG-26.
WNTI-04	2.1	2.1. The effects of ageing mechanisms on packaging components, radioactive contents and package safety functions depend on the environmental and operational conditions to which they are exposed. A graded approach should be applied to the consideration of the ageing mechanisms to packages commensurate to the package operational conditions throughout its service life as described in paras 613A.1–613A.6 of SSG-26 (Rev.1) [2]. Considerations for ageing management are divided into three types of use of packaging; packagings intended to be used for a single transport, repeated use, and shipment after storage (see paras 613A.2–613A.4 of SSG-26 (Rev.1) [2]), as described in paras 2.3–2.9 of this Safety Guide. **A graded approach should also be applied when considering the type of package, in accordance with SSG-66 [3]. Ageing considerations are not necessary to be included in the package design safety report neither for an excepted package design (Appendix I in SSG-66 [3]), nor for a Type IP-1 (which is essentially similar to an excepted package). A very limited application of this Safety Guide should be necessary for Type IP-2 and Type IP-3, for which the consequences of a failure are restricted by the characteristics of the radioactive content.**	In para. 1.8, it is stated that "A graded approach is applied to the recommendations provided in this Safety Guide, commensurate with the type of package…". However, currently, the draft Safety Guide does not provide guidance on the application of the graded approach, as regards the type of package. It is proposed to add wording to para. 2.1 to deal with that subject.		A graded approach should also be applied when considering the type of package, in accordance with SSG-66 [3]. Ageing considerations may not need to be included in the package design safety report for an excepted package design (See Appendix I in SSG-66 [3]).		Modification to the text was proposed to clarify further on application of graded approach, adding the type of the package as a another criterion.

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BRA-01	2.1	...safety functions depend on the environmental and operational conditions, including transport incidents/accidents to which they can be exposed	Incidents and/or accidents can affect the ageing mechanisms and their effects.			x	It is considered that the incidents/accidents as defined in SSR-6 are included already in the operational conditions and furthermore in the evalutation of the safety functions of the package.
AUS-02	2.1	Commensurate with ~~to~~	editorial	x			
D-03	2.1 3rd sentence	"Considerations for ageing management are divided into three types of use of packaging; packagings intended to be used for a single transport, repeated use, and shipment after storage (…), as described in paras 2.3–2.8 ~~2.9~~ of this Safety Guide."	Wrong paragraph number is referred to in the text. Paragraph 2.9 does not exist in this Safety Guide.	x			
CDN-10	2.2	For packagings that will be loaded after prolonged storage ~~since their manufacture~~, the effects of ageing mechanisms should be considered whether they are intended to be used for a single transport or for repeated use	Applies to packagings loaded after prolonged storate in general, not just since their manufacture.			x	The intention of this para is to capture the time between manufacturing and commissioning of the packaging. See also WNTI-05.
JPN-07	2.2	For packagings that will be loaded after prolonged storage since their manufacture, the effects of ageing mechanisms **during the storage period** should be considered whether they are intended to be used for a single transport or for repeated use	Clarification			x	It is considered that the intention of this comment was similar to WNTI-05, which was accepted.
CH-01	2.2	For packagings that will be loaded after prolonged storage since their manufacture, the effects of ageing mechanisms should be considered ~~whether they are intended to be used for a single transport or for repeated use~~.	It does not matter how the package issue. Ageing has to be considered in any case. If ageing should be considered differently for the two cases, this might be reflected in the text. It could be clarified that the packaging is empty.			x	It is considered necessary to keep the text, as it provides additional information. See also WNTI-05
WNTI-05	2.2	2.2. For packagings that will be loaded after prolonged storage since their manufacture, the effects of ageing mechanisms should be considered **from completion of manufacturing, and** whether they are intended to be used for a single transport or for repeated use.	Clarification for packagings which are stored during a significant period of time before first loading.	x	..from the completion of manufacture, regardless of whether they are..		
CDN-11	2.3	For packagings used once for a single transport and not intended for shipment after prolonged storage.	To align with section 2.2. All packagings are stored for a short period of time before use.			x	To keep consistency of 'shipment after storage' concept with SSG-26 and SSR-6
CDN-12	2.3	Add paragraph moved from Section 2.4: The effect of the ageing mechanisms on its radioactive contents should not normally need to be considered because the duration of a single transport is relatively short (i.e. equal to or less than one year)	This paragraph belongs to section 2.3, not section 2.4, since it applies to single transport packagings.		2.3bis The effect of the ageing mechanisms does not normally need to be considered because the duration of a single transport is relatively short (i.e. one year or less).		New para was created. Para 2.4 was not modified by resolution of this comment. See also F-06 and CDN-13.
F-06	2.3	-	There is no recommendation in this para. It is therefore unclear what is recommended for packagings intended to be used for a single transport.		2.3bis The effect of the ageing mechanisms does not normally need to be considered because the duration of a single transport is relatively short (i.e. one year or less).		New para was created. See also CDN-12 and CDN-13

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CDN-13	2.4	Remove paragraph: ~~The effect of the ageing mechanisms on its radioactive contents should not normally need to be considered because the duration of a single transport is relatively short (i.e. equal to or less than one year)~~	This paragraph belongs to section 2.3, not section 2.4, since it applies to single transport packagings.		The effect of the ageing mechanisms does not normally need to be considered because the duration of a single transport is relatively short (i.e. one year or less).		See also CDN-12 and F-06
F-07	2.4	… Based on an evaluation, measures should be defined as part of the inspection and maintenance programme on the packaging to monitor and control ageing effects7 to ensure that the safety functions of the packaging do not deteriorate over its service life. **To reduce exposure of personnel to radiation,** ~~T~~the inspection and maintenance might be conducted when the packaging is empty (i.e. without radioactive contents) between shipments of the loaded package (see Section 5).	To make a link with the optimization principle (ALARA) of radiation protection.			x	There are more reasons to conduct the inspection when the packaging is empty (i. e. operational activities) and also principles of radiation protection applies to all activities in general. It was considered not neccessary to introduce the principle particularly for this para only.
AUS-35(01)	2.4	Omit "The effect of the ageing mechanisms on its radioactive contents should not normally need to be considered because the duration of a **single transport** is relatively short (i.e. equal to or less than one year).	Contents of this paragraph relates to "Single Transport" packages, and is included under the heading "Repeated Use".		The effect of the ageing mechanisms does not normally need to be considered because the duration of a single transport is relatively short (i.e. one year or less).		see also CDN-13 and CDN-12 and F-6
AUS-03	2.4	i.e. less than or equal to		x	(i.e. one year or less)		
WNTI-06	2.4 Footnote 7	[7] In the context of this Safety Guide, the phrase 'ageing effects' is intended to mean effects **produced by ageing** on the ability of package components ~~produced by ageing~~ **to perform safety critical functions**. In case the ability to function within its acceptance criteria is impaired, they may be called as ageing degradation.	Clarification. It is necessary to be more precise about the kind of "ability" that is expected		7 In the context of this Safety Guide, the phrase 'ageing effects' is intended to mean effects produced by ageing that impair the ability of package components to perform safety functions. If the package's ability to function within its acceptance criteria is impaired, these effects may be reffered to as 'ageing degradation'.		Modification was introduced to keep the consistency of using the term 'safety functions' throughout the document.
BRA-02	2.4 Footnote 7	In the context of this Safety Guide, the phrase 'ageing effects' is intended to mean process where the ageing mechanism reduces the safety margin of the package design. In case the ability to function within its acceptance criteria is impaired, they may be called as ageing degradation.	Better and clear wording.		7 In the context of this Safety Guide, the phrase 'ageing effects' is intended to mean effects produced by ageing that impair the ability of package components to perform safety functions. If the package's ability to function within its acceptance criteria is impaired, these effects may be reffered to as 'ageing degradation'.		see WNTI-6
D-04	2.6 1st sentence	"Paragraph 106.2 of ~~the~~ SSG-26 (Rev.1) [2] states that …"	Editorial correction.	x			
D-05	2.6 3rd sentence	"In some cases, packages are loaded and stored at the same facility for a long time, then shipped to ~~an outside~~ another facility."	More appropriate wording: replace "an outside facility" by "another facility".	x	.. to another storage facility.		

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
CDN-05	2.6 title	~~PACKAGINGS~~PACKAGES INTENDED TO BE USED FOR SHIPMENT AFTER STORAGE	The subsequent sections discuss packages intended to be shipped after storage, not packagings.	x			
CDN-14	2.7	(a) The transportability of a package intended for ~~use~~ shipment after storage…	"shipment" is more precise and appropriate than "use" in this sentence.	x			see WNTI-07
ITA-02	2.7	… The ageing effects due to the storage conditions (e.g., temperature variations and humidity) on the empty packaging would be representative of the ageing effects on the loaded package. **Furthermore, also analytical simulations of phenomena affecting the contents of the transport package (e.g. gas generation) can be used to estimate the possible effects of ageing on the packaging.**	The proposal is to add analytical simulations as potential solution for inspection and maintenance of package that cannot be directly inspected and maintained.			x	It was not considered connected with the intention of this para. Alternative means for inspection (such as simulations) are mentioned further in the guide.
WNTI-07	2.7 (a)	(a) ~~The transportability of a package intended for use after storage should be maintained during storage.~~ The ageing management programme and the gap analysis programme[9] should ensure that the package complies with the requirements of the Transport Regulations at the time of shipment after storage.	Simplification and subsequent clarification. "Transportability" is a loose word that could mean many things. In the meantime, the intent of the first sentence seems to be covered by the second sentence. Consequently, it is appropriate to delete the first sentence and just to keep the second one.		(a) The ageing management programme and the gap analysis programme[9] should ensure that the package complies with the requirements of the Transport Regulations at the time of shipment after storage **(i.e. the transportability of the package should be maintained).**		Modification was introduced to keep the idea of 'transportability' in the para, as it is used furher in the document.
AUS-36(02)	2.7 (b)	Omit "It should be recognized that the"	Duplication with "take into account"	x			
F-08	2.7 (d)	[…] ~~The ageing effects due to the storage conditions (e.g., temperature variations and humidity) on the empty packaging would be representative of the ageing effects on the loaded package.~~	This is disputable for some ageing mechanisms while an empty packaging is not representative for a loaded one. For instance, the temperature variation is also depending on the temperature induced by the contents. In addition, consistency with Para 3.5 ("The possible effects of heat generation due to radioactive decay and the possible effects of irradiation on package components should also be considered.") is to be checked.			x	Addressed by WNTI-08 resolution.

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JPN-08	2.7 (d)	Inspection and maintenance during storage should be designed so that they can be conducted on the loaded packages. Where it is not possible to directly inspect and maintain the loaded package during storage (e.g., if the primary container of the package is enclosed within a shielded overpack or shielded vault during the storage period) alternative means could be used to assess aging effects. For example, ~~an empty packaging of the same design could be placed in the same storage conditions and at the same starting time as the loaded package. The empty packaging could be periodically retrieved, disassembled, and inspected. The ageing effects due to the storage conditions (e.g., temperature variations and humidity) on the empty packaging would be representative of the ageing effects on the loaded package.~~ **literature research on ageing or experiments to simulate ageing effects by using specimen should be considered if necessary.**	Using empty package without stressor (radiation and heat source) to simulate ageing effects is not practical because the stressor from the contents are essential for ageing of packaging components. The conditions of the empty package are largely different from actual ones of the loaded package even if the environmental conditions are same. Literature research or (accelerated) experiments by using coupons or small samples (para.6.26 (j)) can be appropriate instead of an empty packaging.			x	Addressed by WNTI-08 resolution.
WNTI-08	2.7 (d)	(d) Inspection and maintenance during storage should be designed so that they can be conducted on the loaded packages. Where it is not possible to directly inspect and maintain the loaded package during storage (e.g., if the primary container of the package is enclosed within a shielded overpack or shielded vault during the storage period) alternative means could be used to assess aging effects. For example, an empty packaging of the same design could be placed in the same storage conditions and at the same starting time as the loaded package. The empty packaging could be periodically retrieved, disassembled, and inspected. The ageing effects due to the storage conditions (e.g., temperature variations and humidity) on the empty packaging would be representative of the ageing effects on the loaded package. **Note – The ageing effects due to phenomena others than the storage conditions, such as radiation and heat loads would not be simulated on the empty packaging and would have to be considered with a different method.**	An empty package does not have radiation and heat loads and they cannot simulate such ageing effects practically even if the environmental conditions are same. It is important to give information about the limitations associated with the use of an empty packaging to simulate some phenomena.		However, the ageing effects due to phenomena other than the storage conditions (e.g. radiation, heat load) would not be simulated on the empty packaging, so would have to be assessed using a different method.		Modification is related with deletion of word "Note -"
AUS-37(03)	2.7 (d)	Replace "Inspection and maintenance during storage should be designed so that they can be conducted on the loaded packages." with "Packages should be designed so that inspection and maintenance can be conducted on loaded packages during storage."	Original paragraph is ambiguous as to what is being designed (Storage? Package? Inspection and maintenance?) The proposed replacement assumes it is the package to be designed to allow, for example, access for maintenance while in storage. This paragraph is in keeping with Section 5.12.		Inspection and maintenance during storage should be **such** that they can be conducted on the loaded packagings.		The issue regarding the design allowing to conduct the inspection and maintenance is addressed in 5.12. However, the modification to the text was introduced to clarify the intention (designed vs defined).
D-06	2.7 (d) 2nd sentence	"… alternative means could be used to assess ~~aging~~ ageing effects."	Spelling correction: 'ageing' instead of 'aging'. Elsewhere in this publication, the British English spelling of the term is consistently used.	x			

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F-09	2.8	Consideration of ageing mechanisms, with appropriate justifications, should be included in the package design safety report. For the ~~package design~~ approval **of Type B(U), Type B(M) and Type C**, ~~this evidence and~~ a gap analysis programme is required to be submitted to the competent authority (see para~~s~~ 809~~(f) and~~ (k) of the Transport Regulations).	As a result of the SSR-6 revision process, the proposed text of the para 809(f) according to the draft as per SPESS STEP 11 (Second review of the draft publication by the Review Committees) is no longer solely applicable to packages which are to be used for shipment after storage.		2.8 For the approval of packages intended to be used for shipment after storage, a gap analysis programme is required to be submitted to the competent authority (see para. 809(k) of the Transport Regulations). 2.2bis For package designs requiring competent authority approval, justification of considerations to ageing mechanisms ~~consideration of ageing mechanisms, with appropriate justifications~~, is required to be included in the package design safety report (see para. 809 (f) of the Transport Regulations).		The changes resulting from revision of SSR-6 (Rev.2) were taken into considerations and text was modified accordingly and placed in appropriate parts of the guide.

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F-10	2.9	Add a new paragraph between 2.8 and 2.9: **When storage of spent fuel or radioactive waste in a transport package (for example in a dual purpose cask) occurs at a nuclear power plant, the periodic safety review to be performed should include such storage, as recommended in SSG-25 (paragraph 5.17 and 5.29). This would lead to a review of the actual condition of package and their ageing management.**	Make a link with the periodic safety review process (see SSG-25) when dry storage of spent fuel relying on dual purpose cask occurs at nuclear power plants. Para 5.29 of SSG-25 states that "The review of the actual condition of the SSCs important to the safety of the nuclear power plant should include examination of the following aspects for each SSC: Existing or anticipated ageing processes; Operational limits and conditions; Current state of the SSC with regard to its obsolescence; Implications of changes to design requirements and standards on the actual condition of the SSC since the plant was designed or since the last PSR (for example, changes to standards on material properties); Plant programmes that support ongoing confidence in the condition of the SSC; Significant findings from tests of the functional capability of the SSC; Results of inspections and/or walkdowns of the SSC; Maintenance and validity of records; Evaluation of the operating history of the SSC; Dependence on obsolescent equipment for			x	The scope of the SSG-25 already considers the storage facilities in the NPP. Furthermore it is not considered as general practice for some member states.
CDN-15	3.1	ageing mechanisms for transport packages might ~~be~~ follow the fundamental principles	Typo		Ageing might be addressed by following the general principles used for nuclear power plant components, taking into account the application of the graded approach to the type of package.		The text was modified to take the comment into consideration. See also F-11, CH-02, WNTI-09, JPN-09
F-11	3.1	For some types of packages, the ageing management approach applied to the consideration of ageing mechanisms for transport packages might be **to** follow the fundamental principles used for nuclear power plant components.	Editorial – missing word		Ageing might be addressed by following the general principles used for nuclear power plant components, taking into account the application of the graded approach to the type of package.		The text was modified to take the comment into consideration. See also CDN-15, CH-02, WNTI-09, JPN-09
D-07	3.1	"The interim storage of spent nuclear fuel and the use of dual purpose casks ~~has~~ have strengthened the focus on the consideration of ageing mechanisms for storage packages (~~e.g.~~ see e.g. Refs [11–14])."	Grammatical corrections.	x	..(see e.g. Refs..)		

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
JPN-09	3.1	Paragraph 3.1 should be moved to 4.2bis (after the title "APPROACHES TO AGEIGN MANAGEMENT FOR TRANSPORT PACKAGES" ~~3.1~~.**4.3.** ~~For some types of packages, t~~The ageing management approach applied to the consideration of ageing mechanisms for transport packages **basically**~~might be~~ follow**s** the fundamental principles used for nuclear power plant components. Recommendations on ageing management for nuclear power plants are provided in IAEA Safety Standards Series No. SSG-48, … The interim storage of spent nuclear fuel and the use of dual purpose casks has strengthened the focus on the consideration of ageing mechanisms for storage packages (e.g. see Refs [11–14]).	As the current paragraph 3.1 is more related to Section IV, it is recommended replace para. 4.3, which is proposed to be deleted with the proposal JPN-17. The current first sentence is unclear and should be clearly state the ageing management of packages can follow that of NPP. Consequential change of para. numbers and ref. numbers shall be undertaken.		Ageing might be addressed by following the general principles used for nuclear power plant components, taking into account the application of the graded approach to the type of package.		The text was modified to take the comment into consideration. See also F-11, CDN-15, CH-02, WNTI-09
CH-02	3.1	For some types of packages, the ageing management approach ~~applied to the consideration of ageing mechanisms~~ for transport packages might be follow the fundamental principles used for nuclear power plant components.	For clarity		Ageing might be addressed by following the general principles used for nuclear power plant components, taking into account the application of the graded approach to the type of package.		The text was modified to take the comment into consideration. See also F-11, CDN-15, WNTI-09, JPN-09
WNTI-09	3.1	3.1. For some types of packages, the ageing management approach applied to the consideration of ageing mechanisms for transport packages might ~~be~~ follow the fundamental principles used for nuclear power plant components.	Editorial		Ageing might be addressed by following the general principles used for nuclear power plant components, taking into account the application of the graded approach to the type of package.		The text was modified to take the comment into consideration. See also JPN-09, CH-02.
CDN-16	3.2	the ageing mechanisms that might occur in the course of ~~an~~the expected service life of the package	Typo			x	
CH-03	3.2	Ageing is a time-dependent phenomenon and therefore may depends on the service life of the package. Although it is usually difficult in practice to establish a priori a specific service life for a package design as it often **may** ~~might~~ depend on some unpredictable factors, the designer should consider the ageing mechanisms that might occur in the course of an expected service life of the package.	Seems to be a typo due to the may in the first sentence			x	The sentence was deleted from the draft. See WNTI-10.
UK-02	3.2	Ageing is a time-dependent phenomenon and therefore may ~~depends~~ depend on the service life of the package.	Grammatical change	x			See WNTI-10
BRA-03	3.2	Ageing is <u>mostly</u> a time-dependent phenomenon	Because some ageing mechanism are not time dependent (fatigue, overpressure, overheat, etc).		3.2. Ageing is dependent on time and use and therefore may depend on the service life of the package. The designer should consider the ageing mechanisms that might occur during the service life of the package, while it is both in service (i.e. with the packaging subjected to the loads caused by the radioactive contents and transport operations) and out of service (i.e. subjected to the storage environment).		The text was modified to address both time and use dependent phenomenon, in line with IAEA glossary.

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Step 9 Member States' comments resolution table (input for STEP 10)

MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
WNTI-10	3.2, 3.3, 3.4	~~SERVICE LIFE OF TRANSPORT PACKAGES~~ 3.2. Ageing is a time-dependent phenomenon and therefore may depend~~s~~ on the service life of the package. ~~Although it is usually difficult in practice to establish a priori a specific service life for a package design as it often might depend on some unpredictable factors, t~~The designer should consider the ageing mechanisms that might occur in the course of ~~an expected~~ **the** service life of the package. 3.3. ~~The expected service life might be expressed in terms of the number of years of use or the number of shipments.~~ To consider ageing mechanisms, both the in-service ~~duration~~ **period** (i.e. with the packaging subjected to the loads caused by the radioactive contents and transport operations) and the out-of-service ~~duration~~ **period** (subjected to the storage environment) should be considered. 3.4. ~~Nevertheless, if it is not practicable to set a limit on the duration or on the number of shipments, the performance of the packaging should be ensured by a~~An appropriate maintenance **should be part of the ageing management and contribute ensuring the performance of the packaging**. **3.4 bis.** If the transport period is short, then there should be no need to consider the effects of ageing mechanisms on the radioactive contents, provided this is adequately justified in the package design safety report. 3.5. Additionally, for the packagings intended to be used for shipment after storage, the service life should consider the storage period of the package and phases before and after storage, including operations such as loading, movement and transport. The radioactive contents may be stored for a period	The definition of service life in footnote 4 ('service life' is intended to mean the period from initial operation to final withdrawal of the transport package from its service) is sufficient. There is no need to establish an end-of-life date which these sections are doing. It is unreasonable and unnecessary to establish an end-of-life date for a package. It is recognized in para. 3.2 that "*it is usually difficult in practice to establish a priori a specific service life for a package design as it often might depend on some unpredictable factors*" . The ageing process depends on the components, contents, and operational conditions. Defining a priori an end of life date would require being excessively conservative, resulting in transport packages being retired far too early compared to their historical statistical mean life. Instead, with a sound ageing management program that leverages the advancements in ageing monitoring technology, transport packages can achieve maximum useful life without safety risks to		~~SERVICE LIFE OF TRANSPORT PACKAGES~~ 3.2. Ageing is dependent on time and use and therefore may depend on the service life of the package. The designer should consider the ageing mechanisms that might occur during the service life of the package, while it is both in service (i.e. with the packaging subjected to the loads caused by the radioactive contents and transport operations) and out of service (i.e. subjected to the storage environment). 3.3 For some packages it might be appropriate for the package designer to define an expected service life in terms of number of years of use or number of shipments.		The text was modified to take into account the comment and further clarify the concept of service life for the package.

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Step 9 Member States' comments resolution table (input for STEP 10)

MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
CDN-02	3.2, 3.3, 3.4	SERVICE LIFE OF TRANSPORT PACKAGES 3.2. Ageing is a time-dependent phenomenon and therefore may depend~~s~~ on the service life of the package. ~~Although it is usually difficult in practice to establish a priori a specific service life for a package design as it often might depend on some unpredictable factors, t~~The designer should consider the ageing mechanisms that might occur in the course of an expected service life of the package. 3.3. ~~The expected service life might be expressed in terms of the number of years of use or the number of shipments.~~ To consider ageing mechanisms, both the in-service duration (i.e. with the packaging subjected to the loads caused by the radioactive contents and transport operations) and the out-of-service duration (subjected to the storage environment) should be considered. 3.4. ~~Nevertheless, if it is not practicable to set a limit on the duration or on the number of shipments,~~ The performance of the packaging should be ensured by an appropriate maintenance. If the transport period is short, then there should be no need to consider the effects of ageing mechanisms on the radioactive contents, provided this is adequately justified in the package design safety report. 3.5. Additionally, for the packagings intended to be used for shipment after storage, the service life should consider the storage period of the package and phases before and after storage, including operations such as loading, movement and transport. The radioactive contents may be stored for a period of time in the package, thus the effect of ageing mechanisms on the radioactive contents should be considered taking into account any changes that might affect the integrity of the contents, loads to which packaging components are subjected to, and the retrievability of the contents. The	The definition of service life in footnote 4, ('service life' is intended to mean the period from initial operation to final withdrawal of the transport package from its service) is sufficient. There is no need to establish and end of life date which these sections are doing. Although this section was rewritten, it remains unreasonable and unnecessary to establish a service life (end of life date) for a package. The ageing process depends on the components, contents, and operational conditions. Requiring the establishment of a service life (end of life date) would require being excessively conservative, resulting in transport packages being retired far to early compared to their historical statistical mean life. Instead, with a sound ageing management program that leverages the advancements in ageing monitoring technology, Transport Packages can achieve maximum useful life without safety risks to the public. It is costly and adds no safety benefit to retire a package that is still in good condition because it exceeded it's estimated service life (arbitrarily set end of life date).		~~SERVICE LIFE OF TRANSPORT PACKAGES~~ 3.2. Ageing is dependent on time and use and therefore may depend on the service life of the package. The designer should consider the ageing mechanisms that might occur during the service life of the package, while it is both in service (i.e. with the packaging subjected to the loads caused by the radioactive contents and transport operations) and out of service (i.e. subjected to the storage environment). 3.3. For some packages it might be appropriate for the package designer to define an expected service life in terms of number of years of use or number of shipments.		The text was modified to take into account the comment and further clarify the concept of service life for the package. See also WNTI-10.
JPN-10	3.3	The expected service life might be expressed in terms of the number of years of use or the number of shipments. To consider ageing mechanisms, both the in-service duration (i.e. with the packaging subjected to the loads caused by the radioactive contents and transport operations) and the out-of-service duration (subjected to the storage environment) should be considered. **The expected service life is generally estimated in the design phase based on conservative assumptions including activities and heat loads of contents and annual transport periods. However, especially for spent nuclear fuels or radioactive waste the actual conditions may be largely different from the design conditions. Therefore, the service life may be re-evaluated after certain operation experiences based on the experienced conditions and maintenance results as appropriate.**	It's important to clarify that "service life" which is established at the design stage can be extended practically by the conditions during the operations and maintenance.			x	The establishment of service life is recognized as one of the options in the reviewed draft, not as a recommendation. See CDN-02 and WNTI-10.
CDN-17	3.4	If the ~~transport period~~expected service life is short, then there should be no need to consider the effects of ageing mechanisms on the ~~radioactive contents~~packagings, provided this is adequately justified in the package design safety report.	It is the service life that should be considered and not the duration of the transport, as well it is the effects on the packagings that should be considered and not the radioactive material only		the sentence is deleted.		The sentence was deleted from the draft in para 3.4 as it is covered in paras 2.4 and 2.5.

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MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
JPN-11	3.4	Nevertheless, if it is not practicable to set a**n expected service life** ~~limit on the duration~~ or on the number of shipments, the performance of the packaging should be ensured by an appropriate maintenance.	Consistent with the term		~~SERVICE LIFE OF TRANSPORT PACKAGES~~ 3.2. Ageing is dependent on time and use and therefore may depend on the service life of the package. The designer should consider the ageing mechanisms that might occur during the service life of the package, while it is both in service (i.e. with the packaging subjected to the loads caused by the radioactive contents and transport operations) and out of service (i.e. subjected to the storage environment). 3.3 For some packages it might be appropriate for the package designer to define an expected service life in terms of number of years of use or number of shipments.		See WNTI-10 and CDN-02.
CDN-18	3.5	The radioactive contents may be stored for a period of time in the ~~package~~packaging, thus the effect of ageing mechanisms on the ~~radioactive contents~~package should be considered…	For clarity of terms.		The radioactive contents may be stored for a period of time in the packaging, thus the effect of ageing mechanisms on the radioactive contents should be considered…		It is considered that in the case of shipment after storage it is necessary to include effects of ageing on the radioactive content too.
ITA-03	3.5		To be clarified the meaning of "movement" and "transport" and keep consistency with para 106 of the SSR-6 stating that "Transport comprises all operations and conditions associated with, and involved in, the movement of radioactive material; these include the design, manufacture, maintenance and repair of packaging, and the preparation, consigning, loading, carriage including in-transit storage, shipment after storage, unloading and receipt at the final destination of loads of radioactive material and packages".		.. loading, **handling** and transport.		the use of the word 'movement' was to include movement in the facility in consideration for the service life. To avoid confusion, the text was modified to use the word 'handling' instead.
JPN-12	3.5	…The possible effects of **irradiation and** heat generation due to radioactive decay ~~and the possible effects of irradiation~~ on package components should also be considered	Effects of "heat generation due to irradiation" is considered negligible. But effects of "irradiation" itself should be considered	x			
AUS-38(04)	3.6	Replace "define restrictions of" With "limitations".. and delete "to' at the end of the sentence	Design limit is a parameter that relates to the functional capability and the performance levels of the package.	x			
AUS-04	3.6	Delete ~~to~~ after subjected	editorial	x			

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MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
CDN-19	3.6 (a)	The internal atmosphere of the package cavity (e.g. air or a filling gas, such as helium and nitrogen) should be defined to evaluate the ageing effects on the ~~radioactive contents~~package. Leaktightness criteria … should be considered. The storage configuration (i.e., vertical or horizontal position, on a concrete pad or a floor, storage frame requirements, outdoors or~~,and~~ in a building) should also be considered~~, if they affect the ambient conditions~~.	For clarity of terms.The storage configuration affects things other than the ambient conditions as noted in the list in parentheses.		(iii)Internal atmosphere of the package cavity (e.g. air or a filling gas, such as helium and nitrogen), to evaluate the ageing effects on the radioactive contents and internal components of the packaging; (iv)Leaktightness criteria; (v)Dry storage needs, including specifications for drying; (vi)For packagings intended to be used for shipment after storage, the expected environmental conditions during storage, which might be defined in or derived from the storage facility design specifications; (vii)Storage configuration (e.g. vertical or horizontal position, on a concrete pad or a floor, storage frame).		It was considered to highlight the effects of the internal atmosphere on the radioactive content and internal components of the packaging. Package in this case would have broader meaning (include outer part of the packaging). 'Storage frame' is considered clear, adding 'requirements' could create confusion.
ITA-04	3.6 (a)		The proposal is to replace the term “ambient” with “environmental” in all Para. 3.6/(a). Ambient conditions refer to standard temperature and pressure.	x			
JPN-13	3.6 (a)	The internal atmosphere of the package cavity (e.g. air or a filling gas, such as helium and nitrogen) should be defined to evaluate the ageing effects on the radioactive contents and internal components. Leaktightness criteria need to be specified **in the package design safety report**. Dry storage needs special specifications for drying. For packagings intended to be used for shipment after storage, the expected ambient conditions during storage, which might be defined in or derived from the storage facility design specifications should be considered.	Clarification ~~It is important to consider the storage facility location (e.g. inland or costal site) for the ambient condition.~~			x	It is intended to recommend establishing the criteria, not to specify where they need to be stated.
WNTI-11	3.6 (b)	(b) Mechanical loadings: For all transport packages, the mechanical loadings acting on the packaging components during routine conditions of transport (including those caused by acceleration, vibration, and resonance) should be considered. For lifting attachments, such as trunnions, the cumulative number of liftings ~~may~~ **should** also be considered.(…).	Lifting is a safety critical process. Hence, “should” is more appropriate than “may”.	x	changed structure for bullet points (ii)For lifting attachments, such as trunnions, the cumulative number of liftings;		
WNTI-12	3.6 (b)	(b) Mechanical loadings: (…). For packagings intended to be used for shipment after storage, the mechanical loadings, as defined by the package designer for the conditions of storage, should also be considered.	Editorial. A comma is missing in the last sentence just before “should also be considered”.	x			
AUS-05	3.6 (b)	..number of liftings should (replace ~~may~~) also be considered	grammar/editorial	x	changed structure for bullet points (ii)For lifting attachments, such as trunnions, the cumulative number of liftings;		see also WNTI-11

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MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
WNTI-13	3.6 (c)	(c) Thermal loadings: For repeated use packagings, all thermal loadings that increase the temperature of package components should be considered. These include the decay heat of the radioactive contents and the solar insolation data specified in Table 12 of the Transport Regulations. The daily fluctuation of the insolation might have an effect on the ageing mechanisms. For packagings intended to be used for shipment after storage, the thermal loadings, as defined by the package designer for the conditions of storage should be considered. These loadings are the decay heat of the radioactive contents~~, and~~ the insolation in the case of outdoor storage **and the ambient temperature**.	Clarification. Variability in ambient temperature should be considered. Long term storage might see large fluctuations in temperature between summer and winter storage conditions.		.. (ii) For packagings intended to be used for shipment after storage, the thermal loadings defined by the package designer for the conditions of storage (i.e. decay heat of the radioactive contents, insolation in the case of outdoor storage and the environmental temperatures).		Modification to the text was proposed to keep consistency in using term 'environmental' rather then ambient throught the document.
WNTI-14	3.6 (c)	(c) Thermal loadings: (…). For packagings intended to be used for shipment after storage, the thermal loadings, as defined by the package designer for the conditions of storage, should be considered. These loadings are the decay heat of the radioactive contents and the insolation in the case of outdoor storage.	Editorial. A comma is missing just before "should be considered".	x			
CDN-20	3.6 (e)	(e) The ~~increase~~fluctuation in the internal pressure of the package should be considered, if applicable in accordance with the package design	Increase and decrease of pressure should be considered		[..] (e) Internal pressure: Changes in the internal..		See AUS-39
AUS-39(05)	3.6 (e)	Replace "increase" with "change"	Internal pressure could also decrease, for example, as package contents cools over time.		[..] (e) Internal pressure: Changes in the internal..		It was considered appropriate to use plural. See CDN-20
CDN-03	3.7	3.7. ~~The most~~ Common ageing mechanisms that may be relevant ~~specific~~ to transport packagings ~~that should be considered~~, ~~depending on the package design~~, are as follows [14]:	Although para 1.8 mentions the graded approach a user of an Excepted Package or Industrial Package is expected to comply with this section. Adding "may" to this section allows for a graded approach. It is well recognized that users of Excepted packages (cardboard box) will be able to consider the ageing mechanism of boron depletion or crevice corrosion.		3.7. Ageing mechanisms that might be relevant to transport packages, depending on the package design, are as follows [14]:		See WNTI-15

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MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
CDN-21	3.7	(a) Boron depletion: degradation of the neutron-absorbing capacity of the neutron ~~poison and~~shielding materials when exposed to neutron fluence. (b) Corrosion: electrochemical reaction of a metal or a metal alloy ~~in an environment~~, which results in material oxidation or loss. (b)(iv) …can produce corrosive metabolites, and ~~W~~wood corrosion bacteria… (c) are likely to undergo this type of corrosion only when exposed to certain chemicals ~~environment~~. (f) Creep: ~~for a metallic material,~~ thermally activated and time-dependent continuous deformation process for a metallic material under constant stress. It is ~~a thermally activated process and~~ generally a concern at temperatures greater than 40% of the absolute melting temperature of the material. (h)… resistance of metal and polymer to cracking… (i) For example, when water exists in ~~the~~a package cavity, hydrogen is generated... Polymers might change in composition, due to the decomposition~~decomposing~~ of crosslinks by irradiation. (j) Thermal ageing: development of undesirable properties due to continuous exposure to elevated temperatures~~continued exposure to elevated temperatures during operation can sometimes result in undesirable properties~~. (k) …Wear can occurs ~~in parts that experience intermittent relative motion or~~ because of frequent manipulations	Typos and improved readability.		(a) Boron depletion: degradation of the neutron-absorbing capacity of the neutron poison and shielding materials when exposed to neutron fluence. (b) Corrosion: electrochemical reaction of a metal or a metal alloy in an environment, which results in material oxidation or loss. (b)(iv) …can produce corrosive metabolites.~~, and wood corrosion bacteria…~~ (c) are likely to undergo this type of corrosion only when exposed to certain chemicals environments. (f) Creep: thermally activated and time-dependent continuous deformation process for a metallic material under constant stress. It is generally a concern at temperatures greater than 40% of the absolute melting temperature of the material. (h)… resistance of **a** metal and **a** polymer to cracking… (i) For example, when water is present in a package cavity, hydrogen is generated... Polymers might change in composition, due to the decomposition of crosslinks by irradiation. (j) Thermal ageing: microstructural or chemical changes to a material exposed continuously to elevated		a) capacity of both neutron poison and shielding materials needs to be considered b) to follow the definitions of corrosion and ref [14] b)iv) rejected as the sentence was deleted from the draft. See WNTI-17 c) chemical environments are considered more general. f) accepted h) accepted and modified (AUS-07) i) modified j) modified in considerations with US-08 k) modified to singular
ITA-05	3.7	(j) Thermal ageing: continued exposure to elevated temperatures during operation can sometimes result in undesirable properties. **(k) Pyrolysis: gases produced by exposure to elevated temperatures during unexpected event. For example, in case of fire, gases could be generated by pyrolysis of package content, causing an internal pressure buildup.**	The proposal is to keep consistency with para. 614.1 of SSG-26 stating that "Consideration of the chemical compatibility of the radioactive contents with packaging materials and between different materials of the components of the packagings should take into account such effects as corrosion, embrittlement, accelerated ageing and dissolution of elastomers and elastics, contamination with dissolved material, initiation of polymerization, gases produced by pyrolysis and alterations of a chemical nature." This comment is related to comments 07 e 10.			x	Unexpexted events and accidental conditions are not considered relating with ageing, therefore out of the scope of this guide.

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
WNTI-15	3.7	3.7. ~~The most common a~~Ageing mechanisms ~~specific~~ **that may be relevant** to transport packagings ~~that should be considered~~, depending on the package design, are as follows [14]:	The introductory sentence in para. 3.7 is very general and seems to consider that all the phenomenon described in this paragraph might apply to any type of package, or most types of package (e.g. "*The most common ageing mechanisms…* "). It is proposed to modify the introductory sentence, to make easier the differentiation between different package designs.		3.7. Ageing mechanisms that might be relevant to transport packages, depending on the package design, are as follows [14]:		The proposal was modified in consideration with CND-03.
AUS-06	3.7	Incorporation of information about physical ageing and non-physical ageing of components related to components related safety	It would be useful to provide some guidance on physical and non-physical ageing management due to technological changes including obsolescence of safety related components noting that Section 5 of Ref [4] provide detailed about these aspects.			x	Considering non-physical ageing is out of the scope of this guide. See Footnote 2.
D-08	3.7 (a)	"Boron depletion~~,~~: degradation of …"	Removal of a superfluous comma before the colon.	x			
CH-04	3.7 (a)	Boron depletion~~,~~: degradation of the neutron-absorbing capacity of the neutron poison and shielding materials when exposed to neutron fluence.	Typo. The comma after boron depletion is too much.	x			
WNTI-17	3.7 (b)	(b) Corrosion: electrochemical reaction of a metal or a metal alloy in an environment, which results in material oxidation or loss. The following are typical forms of corrosion: (…) ~~(iv) Microbiologically influenced corrosion: any form of corrosion influenced by the activity of microorganisms, such as bacteria, fungi and algae, and/or the products of their metabolism. For example, anaerobic bacteria can establish an electrochemical galvanic reaction or disrupt a passive protective film, acid-producing bacteria can produce corrosive metabolites. Wood corrosion bacteria might degrade the wood used as a shock absorber.~~ (…)	The phenomenon described in (iv) is related to ageing of wood, but this is not corrosion, whereas the sub-paragraph (b) is about corrosion. Hence, (iv) should be removed from sub-paragraph (b).		(iv) Microbiologically influenced corrosion: any form of corrosion influenced by the activity of microorganisms, such as bacteria, fungi and algae, and/or the products of their metabolism. For example, anaerobic bacteria can establish an electrochemical galvanic reaction or disrupt a passive protective film, acid-producing bacteria can produce corrosive metabolites. ~~Wood corrosion bacteria might degrade the wood used as a shock absorber.~~		It is considered necessary to keep the microbiologically influenced corrosion in the list. The part regarding the wood degradation was deleted as it is not related with corrosion.
WNTI-16	3.7 (b)(ii)	(ii) Galvanic corrosion: accelerated corrosion of a metal when **it** is in electrical contact with a more noble metal or a non-metallic conductor in a corrosive electrolyte.	Editorial	x			
US-06	3.7 (e)	Wet corrosion and blistering: degradation mechanism for some types of neutron poison plates with open porosity	This type of degradation is limited to a specific type of neutron absorber material.	x			
JPN-14	3.7 (f)	Creep: …It is a thermally activated process and generally a concern at temperatures greater than 40% of the absolute melting temperature of the material **[14]**.	Technical reference for each specific value (criterion) should be provided. The value is provided in [14] (NUREG-2214).			x	referece [14] is included in the opening para 3.7.
D-09	3.7 (g)	"Fatigue ~~c~~(also called 'cyclic loading' or 'thermal/mechanical fatigue'): …"	Removal of an artefact before the phrase in brackets.	x			
JPN-15	3.7 (g)	Fatigue ~~c~~(also called 'cyclic loading'	typo	x			

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MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
CH-05	3.7 (g)	Fatigue ~~e~~(also called 'cyclic loading' or 'thermal/mechanical fatigue'): phenomena leading to fracture under repeated or fluctuating stresses with a maximum value less than the tensile strength of the material.	Typo. The "c" after fatigue is too much.	x			
US-07	3.7 (g)	Delete typo letter "c" before "(also…"	Typo	x			
WNTI-18	3.7 (g)	(g) Fatigue ~~e~~(also called 'cyclic loading' or 'thermal/mechanical fatigue'): phenomena leading to fracture under repeated or fluctuating stresses with a maximum value less than the tensile strength of the material.	Typo	x			
AUS-07	3.7 (h)	.. metals and polymers to..			.. a metal and a polymer to..		see CDN-21
JPN-16	3.7 (j)	Re-Propose adding text. Rejected STEP7 WNTI-32 Para3.7 (j) Thermal ageing: continued exposure to elevated temperatures during operation can sometimes result in undesirable properties. **For example, at operating temperatures of 300–400°C, austenitic stainless steel welds containing ferrite exhibit a spinodal decomposition of the ferrite phase into ferrite and chromium-rich phases. This could lead to embrittlement (reduction in the fracture toughness) depending on the amount, morphology, and distribution of the ferrite phase and the stainless-steel composition. This phenomenon is called 'thermal ageing embrittlement' or 'thermal embrittlement'. For some alloys, where the material strength is increased by adding specific elements and heat treated when needed, a long thermal history might cancel the enhanced mechanisms and reduce the strength**.	Since thermal ageing is a phenomenon that should be considered in stainless steel that is generally used at high temperatures, there should be a specific example. The reason for ageing is unclear from the remaining text alone.			x	It is considered that the level of details provided is too high for the guide. More information is to be find in the provided reference [14] and other sources.
JPN-17	3.7 (j)	Re-Propose adding text.Rejected STEP7 US-15 Para3.7 (j) **For example, thermal embrittlement of ~~Type 17-4~~ precipitation hardened martensitic stainless-steel components; reduction in yield and tensile strength for precipitation hardened aluminium alloys, etc. These types of thermal aging effects are known to occur during long-term exposure to sufficiently high temperatures, which can occur for structural components located near stored and/or transported spent nuclear fuel.** **Also, thermal aging of polymers and inorganic compounds could be an aging mechanism that needs evaluation for packagings designed for repeated use and for packagings used for shipping after storage.**	In addition to the thermal aging of duplex stainless steels mentioned in the previous section, consideration should be given to the change in mechanical properties due to thermal aging of precipitation hardened alloys. This is a guide, and specific examples of expected transport containers should be included. [12] does not provide specific examples, so this will increase the convenience of users of the guide.			x	It is considered that the level of details provided is too high for the guide. More information is to be find in the provided reference [14] and other sources.
US-08	3.7 (j)	Change definition to Thermal aging to describe the material changes that occur and the effects of the changes. Suggest: Microstructural or chemical changes to materials exposed to elevated temperatures that affect material or mechanical properties.	clarity		Microstructural or chemical changes to **a material** exposed **continuously** to elevated temperatures that affect material or mechanical properties.		Modified to keep the consistency (singular). See CDN-12

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Step 9 Member States' comments resolution table (input for STEP 10)

MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
US-09	3.8	Unclear how this list of ageing mechanisms specific to nuclear fuel was developed. The section references the NRC MAPS report (NUREG-2214) but the listing here only contains 3 of the 11 aging mechanisms identified in NUREG-2214 for fuel cladding (See Table 3-6 in NUREG-2214). Only 2 of the 11 aging mechanisms, hydride reorientation and thermal creep, for fuel cladding were determined to be credible for storage of spent fuel in the MAPS report. For transportation, thermal creep and fatigue may be relevant/credible. Note that the aging considerations in paragraph 4.12(c) which has the general ageing management considerations in relation to the storage of spent fuel are different from those listed in paragraph 3.8 Appendix I, Table I.1 also lists General corrosion for the cladding. It is not clear in this document if this is synonymous with oxidation that is listed in paragraph 4.12(c).	The aging of fuel and cladding has been extensively reviewed. The aging mechanisms and effects presented in this document are not consistent with previous assessments and are different in paragraphs 3.8 and 4.12(c) and Appendix I Table I.1 in this document.		3.8 Ageing mechanisms that might be **relevant to** nuclear fuel, especially spent fuel, include the following ~~[14]~~: (c)… (d) Fatigue: phenomenon leading to fracture under repeated or fluctuating stresses with a maximum value less than the tensile strength of the material. (e) Creep: thermally activated and time-dependent continuous deformation process for a metallic material under constant stress. For fuel cladding, this is caused by internal overpressure. High burn-up fuel is more affected because of the higher fission gas release. See Ref. [14], Table 3-6 for a comprehensive list of nuclear fuel related ageing mechanisms. 4.12 (c) … (…~~oxidation~~,..)		Text of para 3.8 and 4.12 (c) was modified to take into consideration the comment. To avoid confusion, the word "oxidation"was deleted in the set of examples.
CDN-22	3.8 (a)	(a) Delayed hydride cracking: crack propagation in zirconium-based cladding materials resulting from the hydrogen diffusion ~~to~~ahead of a crack tip, ~~and~~the embrittlement of the near-tip region due to hydride precipitation, and ~~. The operability of the delayed hydride cracking mechanism in fuel cladding depends on~~ the stress imposed on the cladding	Typos and improved readability.	x	(a)Delayed hydride cracking: crack propagation in zirconium-based cladding materials resulting from the hydrogen diffusion to a crack tip, the embrittlement of the near-tip region due to hydride precipitation, and the stress imposed on the cladding.		
CH-06	3.8 (b)	Hydride reorientation and **hydrogen-induced** ~~hydride-induced~~ embrittlement	Hydrogen-induced might be correct.			x	To follow the term as used in Ref [14]
CH-07	3.8 (d)	**d) Cladding creep: creep out of fuel cladding caused by internal overpressure. This phenomenon especially takes place at the begin of dry storage, i. e. when the fuel temperatures are high. High burn-up fuel is more affected because of the higher fission gas release.**	Besides the three mentioned mechanisms, cladding creep is an important ageing mechanism.		(e) Creep: thermally activated and time-dependent continuous deformation process for a metallic material under constant stress. For fuel cladding, this is caused by internal overpressure. High burn-up fuel is more affected because of the higher fission gas release.		See US-09
AUS-08	3.9 general	Some guidance on qualification of component and equipment will be useful	There is no information on qualification of components and equipment, which is an important aspect of ageing management.			x	It is considered that the guidance is provided in para 3.9 and with bases in SSG-48, which is reffered in the draft too.

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Step 9 Member States' comments resolution table (input for STEP 10)

MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
JPN-18	3.10	(b) Other components whose failure might prevent the components important to safety from fulfilling their intended functions. Examples are shock absorbers, ~~trunnions and lifting lugs~~ **rupture disks**. (c) Other components credited in the safety analyses as performing the function of coping with certain types of event, consistent with the Transport Regulations and national requirements. Examples are **trunnions and lifting lugs,** barriers to prevent access or persons touching the package (mesh plates)~~,~~ ~~seals to detect opening of packages and name plates~~.	"trunnions and lifting lugs" are routinely used and they should be included in (c). And instead of them "rapture disk" should be included in (b). Seals and name plates should be deleted because seals are used for security and name plates are not directly related to safety		(b) Other components whose failure might prevent the components important to safety from fulfilling their intended functions. Examples are shock absorbers, **rupture discs**, trunnions and lifting lugs. (c) Other components credited in the safety analyses as performing the function of withstanding certain types of event, consistent with the Transport Regulations and national requirements. Examples are ~~**trunnions and lifting lugs,**~~ protective covers, barriers to prevent access or persons touching the package (e.g. mesh plates) or silicone for protection of trunnions.~~, seals to detect opening of packages and name plates~~.		It is considered that the failure of trunnions and lifting lugs might compromise the safety function of the components, therefore they are included in b). More examples were added to c).
UK-03	3.10	The following components should be included by the package designer in the scope of ageing considerations in the package design safety report ~~(See Fig. 1) [4]~~ (See Fig. 1 and [4]).	As [4] is straight after (See Fig. 1). Gives the impression Fig 1 is in reference 4 but Fig. 1 is actually on the next page.		3.10. A systematic scope setting process (Ssee Fig. 1) should be used for identifying components subject to the ageing consideration; all package components, including radioactive contents, where relevant, should be listed. The following components should be included by the package designer in the scope of ageing considerations in the package design safety report [4].		see also WNTI-20
WNTI-19	3.10	3.10. A systematic scope setting process should be used for identifying components subject to the ageing consideration; all package components, including radioactive contents, where relevant, should be listed. The following components should be included by the package designer in the scope of ageing considerations in the package design safety report (See Fig. 1) [4]. (a) (…) (b) (…) (c) (…) **The graded approach outlined in para. A.6. (2) and Table 2 in the Appendix to IAEA Safety Standards Series No. TS-G-1.4, The Management System for the Safe Transport of Radioactive Material [25], provides additional useful guidance.**	The quality grading process described in the Appendix in TS-G-1.4 could be considered as well.			x	It is considered that introducing other categorization based on TSG-1.4 could create confusion. Additionaly, TSG-1.4 is in the revision process.

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MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
WNTI-20	3.10	3.10. A systematic scope setting process should be used for identifying components subject to the ageing consideration; all package components, including radioactive contents, where relevant, should be listed. The following components should be included by the package designer in the scope of ageing considerations in the package design safety report (Ssee Fig. 1) [4].	Typo		3.10. A systematic scope setting process (see Fig. 1) should be used for identifying components subject to the ageing consideration; all package components, including radioactive contents, where relevant, should be listed. The following components should be included by the package designer in the scope of ageing considerations in the package design safety report [4].		see also UK-03
AUS-09	3.10	Editorial, incorrect reference [4], it should be [3]				x	Correct reference is SSG-48 [4]
CDN-23	3.10 (a)	(a) Components important to safety and necessary to fulfil one or more of the safety functions of the package listed in section 3.9.	To reference where the safety functions for the package to be considered are listed, and to avoid confusion with the safety functions specified in SSG-48 (para. 5.16) which are altogether different (see resolution/disposition of CDN-14 for Step 7).		(a) Components important to safety and necessary to fulfil one or more of the **four** safety functions of the package.		It is considered that para 3.9 is just few lines above, and cross references should be limited.
AUS-10	3.10 Fig.1	Heading of bottom right box of the flow diagram- Components in scope for (of) ageing management	Editorial	x			
CDN-04	3.11	3.11. The materials of safety relevant components in a transport package, should be listed to complete the scope setting process for ageing management described in para. 3.10. Examples of typical materials used for components of packaging may include the following [14]:	Similar to the comment provided for section 3.7, users of excepted packages or industrial packages do not deal with any of these materials. Graded approach not considered. This section should be revised to prevent confusion. Adding "may" to this section allows for a graded approach.		Materials used for components of packaging **might** include the following [14]:		editorial modification See WNTI-21
WNTI-21	3.11	3.11. The materials of safety relevant components in a transport package should be listed to complete the scope setting process for ageing management described in para. 3.10. ~~Examples of typical m~~Materials used for components of packaging **may** include the following [14]:	The introductory sentence in para. 3.11 is very general and seems to consider that all the materials described in this paragraph might apply to any type of package, or most types of package (e.g. "E*xamples of typical materials used …*"). It is proposed to modify the introductory sentence, to make easier the differentiation between different package designs.		Materials used for components of packaging **might** include the following [14]:		editorial modification See CDN-04
US-10	3.11 (d)	Concrete use in a transportation package as a structural material is questionable.	Delete the reference to concrete if this material in not actually used.			x	It is considered to keep the concrete in the list, as there are many examples of its use in packages among member states.

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MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
WNTI-23	3.11 (g)	(g) Ductile cast iron: used as a structural member **and/**or as shielding material.	Clarification. Both functions are possible at the same time.		..a structural material or as a shielding material;.		modified "member" for "material"
D-10	3.11 (k)	"… boron or B_4C may be used to absorb neutrons and suppress secondary gamma ray, and ~~also for~~ for subcriticality control ~~purpose~~."	More appropriate wording In the Safety Guide SSG-15 (Rev. 1), Storage of Spent Nuclear Fuel, the phrase "for criticality control" is used instead in the context of boron usage.	x			See AUS-11
AUS-11	3.11 (k)	.. gamma rays, and for subcriticality purposes	Editorial		.. gamma rays and for subcriticality control.		See D-10
WNTI-22	3.11 (m) - (r)	(…). ~~(m) Tungsten: used as a shielding material.~~ (~~n~~**m**) Silicone resin: used as a filling or sealing material for gaps, notches or holes to prevent the aggregation or ingress of moisture. (~~o~~**n**) Silver: used as a cladding of the metallic gasket for lid seals. (~~p~~**o**) Stainless steel (austenitic, ferritic, duplex or martensitic): used as a structural member, shielding material, corrosion-resistant lid gasket seating surface and nuclear fuel cladding tube (older designs). (~~q~~**p**) Steel (i.e. carbon, alloy, high-strength and low-alloy steels): used as structural member or as shielding material. (~~r~~**q**) Synthetic rubber: used as an elastomer O-ring for the closure seal. **(r) Tungsten: used as a shielding material.** (…).	Typo. The materials are listed in alphabetical order. Consequently, "tungsten" should be listed after "synthetic rubber" and not before "silicone resin".	x			
AUS-12	3.11 (n)	Replace aggregation with accumulation	Editorial	x			
AUS-13	3.11 (s)	Woods (delete 's')	Editorial	x			
F-12	4.1	The package design should be documented in a package design safety report by the package designer to provide evidence of its compliance with the applicable Transport Regulations. For package designs that require approval by a competent authority, the package design safety report should be the basis for the application to the competent authority.	The drafted recommendation is not applicable to all types of package design and is inconsistent with the recommendations in the Safety guide SSG-66 'Format and Content of the Package Design Safety Report for the Transport of Radioactive Material' which states: 1.2. Packages intended for the transport of radioactive material are required to be designed to meet the applicable national and international regulations, and, as such, documentary evidence of compliance of a package design with the applicable regulations is required.		The package design should be documented by the package designer in accordance with SSG-66 [3] to provide evidence of its compliance with the applicable Transport Regulations. [..]		Modification to the text was introduced in consideration of the comment.
CDN-24	4.2 (a)	(a) Identification of ~~intended~~anticipated conditions during service life that might influence ageing	"anticipated" is more appropriate here than "intended".	x			
AUS-14	4.2 (b)	The components to be considered and their materials should be listed (see paras 3.10-3.11), along with the potential ageing mechanisms, based on the possible conditions faced during their service life. Then the components….	Better clarity of information	x			

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MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
WNTI-24	4.2 (c)	(c) Analysis of the influence of ageing on the design assumptions for demonstration of compliance with the Transport Regulations and measures to be taken: The materials and ageing mechanisms identified in (b) should be evaluated. If such effects have the potential to adversely affect the safety functions of the package (i.e. as assumed in the package design), preventive measures should be incorporated in the design and/or in operation. **Another option is the use of reasoned argument to demonstrate that ageing effects may be minor and certain levels of safety are not undercut during the service life.** Appendix I includes typical methods to evaluate ageing effects and measures considered in the design of packages to prevent adverse effects due to ageing.	It is currently missing that reasoned argument can be used to allow these ageing effects during the service life of the package when the effects are minor and certain levels of safety are not undercut. It is important to have this option in the main body of the Safety Guide, and not only in an Appendix, as the status of the main body of the Safety Guide and of an Appendix are different, first, and some readers may read preferably the main body of the document and have a limited reading of an appendix, second.			x	see WNTI-28 that resolved this comment.
D-11	4.2 (d)	"… should be stated (see Sections 5 and 6)."	Grammatical correction.	x			
WNTI-25	4.2 (d)	(d) Compilation of operational measures: The operational measures for detecting ageing effects and preventing adverse effects on the safety of packages (e.g. maintenance, inspections, monitoring and restrictions on conditions of use) should be stated (see Sections 5 and 6).	Typo	x			
JPN-19	4.3 Table 1	~~4.3. A general approach to considering ageing mechanisms for transport packages is shown in Table 1.~~ **Para. 4.3 should be replaced by para. 3.1,See JPN-09.** ~~TABLE 1: AGEING MANAGEMENT CONSIDERATIONS FOR TRANSPORT PACKAGES~~ Or move to new APPENDIX (or ANNEX) IV.	Under JPN-09, para. 4.3 should be replaced with par. 3.1. Table I is not explained specifically in this guide. The contents of Table I are not related to ageing directly and it doesn't seem necessary. If it is considered as useful, retain it in an new appendix.		4.3. The considerations of ageing mechanisms and their effects on the package should be included in the package design safety report (i.e. in the section on 'AGEING CONSIDERATIONS') [3]. For each combination of packaging component material and ageing mechanism (see para. 4.2(c)), the package designer should evaluate the effects of ageing on the functions of components and the safety functions of the package, and should define limitations on the environmental conditions and safety criteria of components including relevant inspections to control them. The evaluation of ageing should be based on the package design and its operational conditions and service life. 4.4. A general approach to ageing management considerations for transport packages is shown in Table 1.		Table 1 is considered useful for the user of the guide. It was decided also to move the original para 4.3 after original para 4.4.
CDN-25	4.3 Table 1 first row, 2nd and 3rd	2nd column: ~~Packages~~Packagings intended to be used for a single transport 3rd column: ~~Packages~~Packagings intended for repeated use	These columns should refer to packagings and not packages	x			
WNTI-26	4.3 Table 1	Package ~~O~~operation	Typo	x			

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MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	**Para/Line No.**	**Proposed new text**	**Reason**	**Accepted**	**Accepted, but modified as follows**	**Rejected**	**Reason for modification/rejection**
WNTI-27	4.3 Table 1 fourth column Fourth line	Manufacturing confirmation for packaging conformity with the design, in accordance with para.501 of the Transport Regulations Shipment confirmation for package content and design, in accordance with paras 502 and 503 of the Transport Regulations Periodic maintenance during storage, in accordance with a maintenance programme**, including p**~~P~~eriodic monitoring of ageing effects in accordance with the ageing management programme **Periodic monitoring of environmental and operational conditions in accordance with the ageing management programme** Periodic monitoring of gaps in terms of compliance with new regulations and technologies, in accordance with a gap analysis programme	The "periodic monitoring of ageing effects in accordance with the ageing management programme" is a component of the periodic maintenance, and should be merged with the periodic maintenance in a single item. It is proposed to add an item "Periodic monitoring of environmental and operational conditions in accordance with the ageing management programme", because, in some instances, monitoring certain environmental and operational conditions, or facility parameters (temperature, humidity, etc.), could eliminate the need to monitor each individual package.	x			
F-14	4.3 Table 1 last row 'Package Operation'	Text to be added in third column (duplication of the text in 4th column): **Periodic monitoring of ageing effects in accordance with the ageing management programme**	As a result of the SSR-6 revision process, the proposed text of the para 809(f) according to the draft as per SPESS STEP 11 (Second review of the draft publication by the Review Committees) is no longer solely applicable to packages which are to be used for shipment after storage. Thus, in consistency with the previous comment, the monitoring in accordance with the ageing management programme, as		Maintenance in accordance with a maintenance programme with periodic and pre-shipment inspections, **including periodic monitoring of ageing effects.**		Text was modified to follow similar structure of WNTI-27
F-13	4.3 Table 1 third row 'Package Design'	Text to be added in third column (duplication of the text in 4th column): **Ageing management programme to control and confirm that ageing effects are within an acceptable range as defined by the package design (see para. 809(f) of the Transport Regulations)**	As a result of the SSR-6 revision process, the proposed text of the para 809(f) according to the draft as per SPESS STEP 11 (Second review of the draft publication by the Review Committees) is no longer solely applicable to packages which are to be used for shipment after storage. Thus, the ageing management programme as recommended in the last column for 'Packages intended for shipment after storage' should be duplicated in the third column for 'Packages intended for repeated use'. Please also note that Para 809(f) of SSR-6 only applies to Type B(U) and Type (C) package designs (and by derivation to Type B(M)). This is not reflected in table 1.		For packages requiring approval, ageing management programme to control and confirm that ageing effects are within an acceptable range as defined by the package design (see para. 809(f) of the Transport Regulations)		Refining of the text to take the comment into account.

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MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
D-12	4.4	"… including relevant inspections to control them. ~~.~~The evaluation of ageing …"	Removal of an artefact after the end of the sentence.	x			
CH-08	4.4	… and should define restrictions of environmental conditions and safety criteria of components including relevant inspections to control them. ~~.~~ The evaluation of ageing should be based on the package design and its operational conditions and service life.	Dot to be deleted in front of last sentence.	x			
US-11	4.4	Delete extra period after second sentence	Typo	x			
WNTI-28	4.5bis New	**4.5 bis Based on the results obtained from the first step of evaluation (e.g. quantitative changes in material properties, material strength), the consequences on the safety functions of the package due to ageing mechanisms should be assessed by the package designer in the package design safety report (i.e. in the section dealing with 'AGEING CONSIDERATIONS'). If the consequences are negligible (or within an allowable range), no measures to control the ageing mechanism need to be taken.**	This text is copied from Appendix I, para. I.5. It is important to have a kind of conclusion after the description which is made in paras 4.3 to 4.5. The last sentence is fundamental for the entire ageing management and, thus, should be implemented as a new para. 4.5bis in the text of the guide, and not only in the Appendix. It is important to have this option in the main body of the Safety Guide, and not only in an Appendix, as the status of the main body of the Safety Guide and of an Appendix are different, first, and some readers may read preferably the main body of the document and have a limited reading of an appendix, second.		4.4 (new, after new 4.3) Based on the results obtained from the initial evaluation (e.g. quantitative changes in material properties, material strength), the consequences of ageing mechanisms on the safety functions of the package should be assessed. If the consequences are negligible or within an allowable range, no measures to control the ageing mechanism need to be taken.		see connection with WNTI-24
US-12	4.6	Either change Reference 15 to reference 14 in the second sentence or add reference 14 to the callouts at the end of the sentence Recommendations relevant to an ageing management programme are provided in SSG-48 [4], and further information is available in Refs [11, 14, 15].	Additional information on aging mechanisms and effects in NRC storage systems is included in NUREG-2214 which is Reference 14 in the DS546	x			
CH-09	4.7	An ageing management programme might also be defined for a package containing radioactive material other than spent nuclear fuel based on the information included **in** Refs [11, 15] and in Appendix I and Appendix II.	"in" missing before "Refs [11, 15]"	x			
US-13	4.7	Suggest adding Reference 14 to the second sentence An ageing management programme might also be defined for a package containing radioactive material other than spent nuclear fuel based on the information included Refs [11, 14, 15] and in Appendix I and Appendix II.	Additional information on aging mechanisms and effects in NRC storage systems is included in NUREG-2214 which is Reference 14 in the DS546	x			

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MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
WNTI-29	4.7	4.7. The ageing management programme for dual purpose casks containing spent nuclear fuel should be defined by following the approach in Appendix II or as described in Ref. [11]. An ageing management programme might also be defined for a package containing radioactive material other than spent nuclear fuel based on the information included **in** Refs [11, 15] and in Appendix I and Appendix II. (…).	Editorial	x			
JPN-20	4.9	… For packagings stored for a prolonged period of time (typically more than a year) before transport, any deformation, rust, corrosion, or other defect in the packaging should be detected by ~~pre-shipment inspections~~ **inspections prior to use** [10bis]. In such case, the packaging should be repaired or replaced. [10bis] **"Inspections prior to use" include both pre-loading inspections for packaging before loading of radioactive contents and pre-shipment inspections for package (i.e. radioactive contents loaded) before commencement of shipment.**	The modified text is consistent to para. 613A.2 of SSG-26 Rev.1. The integrity of packaging should be checked before loading radioactive contents (i.e., the contents should be loaded to an intact packaging), and the compliance of package loaded with radioactive contents to the Transport Regulations should be checked before commencement of shipment. The footnote proposed clarifies this.		… For packagings stored for a prolonged period of time (typically more than a year) before transport, any deformation, rust, corrosion, or other defect on the packaging should be detected prior to shipment and assessed. When necessary, the packaging should be repaired or replaced.		It was considered to highlight the inspection for packaging itself before commencement of shipment, as this para is related with packaging intended for single use after being stored for prolonged time. See WNTI-30, AUS-40
WNTI-30	4.9	4.9. A wide range of packagings are designed to be used for a single transport. For packagings stored for a prolonged period of time (typically more than a year) before transport, any deformation, rust, corrosion, or other defect in the packaging should be detected by ~~pre-shipment inspections~~ **inspection prior to use**. In such case, the packaging should be repaired or replaced.	The integrity of packaging should be checked before loading radioactive contents (prior to use). The modified text is consistent with para. 613A.2 of SSG-26 Rev.1.		… For packagings stored for a prolonged period of time (typically more than a year) before transport, any deformation, rust, corrosion, or other defect on the packaging should be detected prior to shipment and assessed. When necessary, the packaging should be repaired or replaced.		It was considered to highlight the inspection for packaging itself before commencment of shipment, as this para is related with packaging intended for single use after being stored for prolonged time. See JPN-20, AUS-40
AUS-40(06)	4.9	Replace "In such case, the packaging should be repaired or replaced." With "Where a defect is identified, the performance of the package should be reassessed and where requirements are not satisfied the defect be repaired or the package replaced to satisfy requirements."	A defect may have no material impact on the serviceability of the package. For example, corrosion of a non-structural shielding layer that has served its role and become obsolete. In this case, the defect doesn't establish a need to repair or replace.		… For packagings stored for a prolonged period of time (typically more than a year) before transport, any deformation, rust, corrosion, or other defect on the packaging should be detected prior to shipment and assessed. When necessary, the packaging should be repaired or replaced.		See WNTI-30 and JPN-20
D-13	4.10 (a)(ii)	"Any deformation, rust, corrosion, or other defects in the packaging should be detected by the maintenance programme, including pre-shipment inspections (see Section 6 ~~5~~)."	Wrong section number is referred to in the text. The maintenance programme for transport packages, including pre-shipment inspections, is dealt with in Section 6 of this Safety Guide.	x			
JPN-21	4.10 (a)(ii)	Any deformation, rust, corrosion, or other defects in the packaging should be detected by the maintenance programme~~, including pre-shipment inspections~~ (see Section 5). Where such effects are detected, the packaging should be repaired or replaced	As shown in para. 5.4 pre-shipment inspection is not a part of maintenance program though the results of the pre-shipment inspection may be used for maintenance. The pre-shipment inspection is conducted to demonstrate the conformity to the transport regulations.		Any deformation, rust, corrosion, or other defects in the packaging should be detected by the maintenance programme~~, including pre-shipment inspections~~ (see Section 6)**, and during pre-shipment inspections**. If such ageing effects are detected, the packaging should be repaired or replaced.		see WNTI-31

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MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
WNTI-31	4.10 (a)(ii)	Any deformation, rust, corrosion, or other defects in the packaging should be detected by the maintenance programme~~, including pre-shipment inspections~~ (see Section 5)**, and during pre-shipment inspections**. Where such effects are detected, the packaging should be repaired or replaced.	As shown in para. 5.4 pre-shipment inspections are not part of the maintenance program. Nevertheless, the results of the pre-shipment inspections have to be considered when assessing the state of the packaging.	x	..(see Section 6), and during pre-shipment inspections. If such ageing effects are detected, the packaging should be repaired or replaced.		
BRA-04	4.10 (a)(ii)	….detected by the maintenance and or surveillance (tests) programme, including ……	Surveillance Programme also gives inputs on ageing concerns.			x	It is considered that surveillance is part of maintenance programme. See also WNTI-31 and JPN-21
F-15	4.10 (b)	(i) Ageing management issues that can be taken into account include the following: – Embrittlement of stainless steel, carbon steel or low-alloy steel should only be considered for very high neutron irradiation levels [16]. ~~Normally, the embrittlement of these materials need not be considered.~~ – Changes in the mechanical properties of aluminium and copper alloys should only be considered for very high neutron irradiation levels [17, 18]. ~~Normally, these changes need not be considered.~~ […]	For those two bullets, as the first sentence established the only case for which the ageing management issue should be considered, the second sentence is unnecessary.		– Embrittlement of stainless steel, carbon steel or low-alloy steel should be considered for very high neutron irradiation levels [16]. – Changes in the mechanical properties of aluminium and copper alloys should be considered for very high neutron irradiation levels [17, 18]. […]		Word 'only' was omitted from the proposed text.
F-16	4.10 (b)(i)	[…] – The ageing effects on lead used as shielding **do not** need ~~not~~**to** be considered~~.~~ because no clear change in the properties of lead due to irradiation has been reported.– The radiation resistance of resins (**e.g.** epoxy, silicone) should only be considered for very high neutron and gamma irradiation levels [19]. – In structural design and construction codes (e.g. Ref. [20]), the mechanical integrity of carbon steel and low alloy steel is up to 350°C, and up to 425°C for stainless steel. The temperature of these material used for a shell, a bottom plate, a lid, lid bolts, and trunnions during transport is less than 170°C; thus, creep in these components **do not** need ~~not~~**to** be considered. The temperature of the stainless steel basket for spent nuclear fuel is less than 180°C for a wet type package and less than 390°C for a dry type package; thus, creep and dimensional change in the basket **do not** need ~~not~~**to** be considered. – Irradiation and thermal degradation of elastomer O-rings (e.g. for lid seals) ~~need to~~**should** be considered. – Corrosion of the external surfaces of packaging made of carbon steel or low alloy steel should be considered. Sea salt particles and road chemicals during transport or storage environment might cause the initiation of pitting, crevice corrosion, and/or stress corrosion cracking on stainless steel surfaces. In case of internal storage, the monitoring of storage conditions, i.~~-~~e. humidity and temperatures, to exclude any condensation on the package surfaces (Dew point) ~~can~~**should** be used to exclude all ageing mechanisms that require an electrolyte to take place.– The fatigue of trunnions should be considered and the need to replace the trunnions should be determined when the number of lifting operations exceeds a calculated limit times to avoid a fatigue failure. – Corrosion by bacteria and/or humidity on the wood used as a shock absorbing material should be considered. The concern is that wood corrosion	Editorial: ~~-~~Change of “need not be considered” to “do not need to be considered” ~~-~~Add of “e.g.” while addressing the types of resins as the types are not limited to epoxy and silicone. ~~-~~Use of “should” instead of “need to” and “can” for consistency within the safety guide.		[…] – The ageing effects on lead used as shielding **do not** need ~~not~~**to** be considered~~.~~ because no clear change in the properties of lead due to irradiation has been reported.– The radiation resistance of resins (**e.g.** epoxy, silicone) should only be considered for very high neutron and gamma irradiation levels [19]. – In accordance with structural design and construction codes (e.g. Ref. [19]), creep does not need to be considered for carbon steel and low alloy steel for temperatures up to 350°C, and for stainless steel for temperatures up to 425°C. As the temperature of these materials used for a shell, a bottom plate, a lid, lid bolts, and trunnions during transport is generally less than 170°C, creep is not expected in these components. As the temperature of the stainless steel basket for spent fuel is generally less than 180°C for a wet type package and less than 390°C for a dry type package, creep and dimensional change in the basket do not need to be considered. – Irradiation and thermal degradation of elastomer O-rings (e.g. for lid seals) ~~need to~~**should** be considered. – Corrosion of the external surfaces of packaging made of carbon steel or low alloy steel should be considered. Sea salt particles and road chemicals during transport or the storage environment might cause the initiation of pitting, crevice corrosion, and/or stress corrosion cracking on stainless steel surfaces. In case of storage		For bullet point on 'Corrosion of the external surfaces..' a change from proposed using of 'should' was done to 'might'.

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Step 9 Member States' comments resolution table (input for STEP 10)

MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
F-17	4.10 (b)(i)	[…] – In structural design and construction codes (e.g. Ref. [20]), the mechanical integrity of carbon steel and low alloy steel is up to 350°C, and up to 425°C for stainless steel. The temperature of these material used for a shell, a bottom plate, a lid, lid bolts, and trunnions during transport is less than 170°C; thus, creep in these components need not be considered. The temperature of the stainless steel basket for spent nuclear fuel is less than 180°C for a wet type package and less than 390°C for a dry type package; thus, creep and dimensional change in the basket need not be considered.	The highlighted sentence is too affirmative and incorrect as temperatures higher that 170°C could be observed in NCT for some of those components. It is unclear whether the intent of the authors was 'When temperature of these material used for a shell, a bottom plate, a lid, lid bolts, and trunnions during transport is less than 170°C, creep in these components do not need to be considered.' or 'As the temperature of these material used for a shell, a bottom plate, a lid, lid bolts, and trunnions during transport is generally less than 170°C, creep in these components are not expected.' Clarification is needed.		In accordance with structural design and construction codes (e.g. Ref. [20]), creep does not need to be considered for carbon steel and low alloy steel for temperatures up to 350°C, and for stainless steel for temperatures up to 425°C. As the temperature of these materials used for a shell, a bottom plate, a lid, lid bolts, and trunnions during transport is generally less than 170°C; creep is not expected in these components. As the temperature of the stainless steel basket for spent fuel is generally less than 180°C for a wet type package and less than 390°C for a dry type package, creep and dimensional change in the basket do not need to be considered.		It was considered that the second option was the intention. See also WNTI-33 and JPN-23.
US-14	4.10 (b)(i)	In several sub bullets the text states that Changes in the mechanical properties of a material should only be considered for very high neutron (and gamma) irradiation levels. Clarification oof what constitutes high gamma and neutron irradiation would be helpful	The definition of very high doses will depend on the type of radiation and the material.			x	It is considered that for the cases where high doses are mentioned the reference is provided in the draft.
WNTI-32	4.10 (b)(i)	(i) Ageing management issues that ~~can~~ **may** be ~~taken into account include the~~ **relevant to transport packages, depending on the package design, are as** follow~~ing~~s:	The introductory sentence in para. 4.10 (b) (i) is very general and seems to consider that all the issues described in this paragraph might apply to any type of package. It is proposed to modify the introductory sentence, to make easier the differentiation between different package designs.		(i) Ageing management issues that- **might** be **relevant to such transport packages, depending on the package design, are as** follow**s**:		Refining of the text to take the comment into account.
AUS-15	4.10 (b)(i) 10th bullet point	Less than or equal to ~~(equal or less than one year)~~	Editorial		(one year or less)		STEP 10 modification
CH-11	4.10 (b)(i) 3rd bullet point	…need not be considered., because…	Typo: should be comma instead of dot	x			
JPN-22	4.10 (b)(i) 4th bullet point	– The radiation resistance of resins (epoxy, silicone) should only be considered for very high neutron and gamma irradiation levels [19]. **Thermal degradation may need to be considered**.	Thermal degradation should be mentioned to be consist to Table I.1 and I.4 (h) in Appendix I ((h) Depletion of the hydrogen content of neutron shielding material due to temperature;).		..gamma irradiation levels [19]. The thermal degradation might need to be considered.		Changed may to might.
CDN-26	4.10 (b)(i) 5th bullet point	…the mechanical integrity of carbon steel and low alloy steel is maintained up to 350°C…	For clarity.		… steel for temperatures up to 350°C..		see F-17, JPN-23 and WNTI-33

MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
JPN-23	4.10 (b)(i) 5th bullet point	– In structural design and construction codes (e.g. Ref. [18]), the mechanical integrity of carbon steel and low alloy steel is up to 350°C, and up to 425°C for stainless steel. The temperature of these material used for a shell, a bottom plate, a lid, lid bolts, and trunnions during transport is **designed to be much lower** ~~less~~ than ~~170°C~~ **above temperatures in order to comply with the package surface temperature limitations**; thus, creep in these components need not be considered. The temperature of the stainless steel basket for spent nuclear fuel is less than ~~180°C for a wet type package and less than 390°C for a dry type package~~ **above temperature due to the fuel cladding temperature limitation**; thus, creep and dimensional change in the basket need not be considered.	It's not appropriate to provide the specific value because temperature of each cask is different. Thus, by indicating the factors to limit the temperature of components, the reasons not to exceeding the temperature limit of material are explained.		In accordance with structural design and construction codes (e.g. Ref. [20]), creep does not need to be considered for carbon steel and low alloy steel for temperatures up to 350°C, and for stainless steel for temperatures up to 425°C. As the temperature of these materials used for a shell, a bottom plate, a lid, lid bolts, and trunnions during transport is generally less than 170°C; creep is not expected in these components. As the temperature of the stainless steel basket for spent fuel is generally less than 180°C for a wet type package and less than 390°C for a dry type package, creep and dimensional change in the basket do not need to be considered.		see F-17 and WNTI-33
CH-12	4.10 (b)(i) 5th bullet point	…The temperature of these material**s**…	Typo: should be "materials" instead of "material"	x			
WNTI-33	4.10 (b)(i) 5th bullet point	- **Based on the information in** ~~In~~ structural design and construction codes (e.g. Ref. [20]), ~~the mechanical integrity of~~ **creep does not need to be considered for** carbon steel and low alloy steel ~~is~~ **for temperatures** up to 350°C, and ~~up to 425°C~~ for stainless steel **for temperatures up to 425°C**. The temperature of these material**s** used for a shell, a bottom plate, a lid, lid bolts, and trunnions during transport is **typically** less than 170°C; thus, **if this is confirmed,** creep in these components need not be considered. The temperature of the stainless steel basket for spent nuclear fuel is **typically** less than 180°C for a wet type package and less than 390°C for a dry type package; thus, **if this is confirmed,** creep and dimensional change in the basket need not be considered.	The first sentence is clarified (what is meant by "mechanical integrity?). The second part is very specific and precise, and seems to be considered as granted for any package design. The values that are announced need to be confirmed on a case-by-case basis.		In accordance with structural design and construction codes (e.g. Ref. [20]), creep does not need to be considered for carbon steel and low alloy steel for temperatures up to 350°C, and for stainless steel for temperatures up to 425°C. As the temperature of these materials used for a shell, a bottom plate, a lid, lid bolts, and trunnions during transport is generally less than 170°C; creep is not expected in these components. As the temperature of the stainless steel basket for spent fuel is generally less than 180°C for a wet type package and less than 390°C for a dry type package, creep and dimensional change in the basket do not need to be considered.		Additional editorial changes were added to the proposal.

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MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
WNTI-34	4.10 (b)(i) 7th bullet point	- Corrosion of the external surfaces of packaging made of carbon steel or low alloy steel should be considered. Sea salt particles and road chemicals during transport or storage environment might cause the initiation of pitting, crevice corrosion, and/or stress corrosion cracking on stainless steel surfaces. In case of internal storage, the monitoring of storage conditions, i. e. humidity and temperatures, to exclude any condensation on the package surfaces (~~Ð~~dew point) can be used to exclude all ageing mechanisms that require an electrolyte to take place.	Editorial	x			
CH-13	4.10 (b)(i) 8th bullet point	…a calculated limit ~~times~~ to…	"times" should be deleted	x			
WNTI-35	4.10 (b)(i) 8th bullet point	- The fatigue of trunnions should be considered and the ~~need to replace the~~ trunnions should be ~~determined~~ **replaced** when the number of lifting operations exceeds a calculated limit ~~times~~ to avoid a fatigue failure**, or other measures should be implemented when it is not possible to replace the trunnions (e.g. when the trunnions are an integrated part of the packaging)**.	Editorial. It is proposed to streamline the first part sentence, for clarification. It is also proposed to consider the case where the trunnions cannot be replaced because they are an integrated part of the packaging.		The fatigue of trunnions should be considered and the ~~need to replace the~~ trunnions should be ~~determined~~ **replaced** when the number of lifting operations exceeds a calculated limit ~~times~~ to avoid a fatigue failure. **When replacement of the trunnions is not possible due to the design (e.g. when the trunnions are an integrated part of the packaging) other measures should be implemented to take into account their fatigue.**		Additional editorial changes were added to the proposal.
CH-14	4.10 (b)(i) 9th bullet point	… Normally, this ~~need~~ **does** not **need to** be considered, …	Grammar	x			
WNTI-36	4.10 (b)(i) 9th bullet point	- ~~Corrosion~~**Degradation** by bacteria and/or humidity on the wood used as a shock absorbing material should be considered. The concern is that wood ~~corrosion~~ **degradation** will lead to dry rot or wet rot and result in a loss of strength and/or degradation of mechanical properties. Normally, this need not be considered, providing the wood is sealed tightly in a metallic casing ~~and its surface~~ **that** is confirmed to be leaktight during maintenance and/or periodic inspection. The temperature and irradiation of the wood is low enough such that ageing effects (e.g. a change of mechanical property or decomposition of adhesive to form a plywood) need not be considered.	Editorial. - In the two first sentences, the phenomenon that is described is not "corrosion". It is suggested to use a more simple and general word such as "degradation". - In the third sentence, it is suggested to simplify, and consequently to clarify, the wording.	x	Degradation by bacteria and/or humidity of the wood used as a shock absorbing material should be considered. Wood degradation might lead to dry rot or wet rot and result in a loss of strength and/or degradation of mechanical properties. Normally, this does not need to be considered, providing the wood is sealed tightly in a metallic casing that is confirmed to be leaktight during maintenance and/or periodic inspection. The temperature and irradiation of the wood is low enough that such ageing effects (e.g. a change in mechanical properties, decomposition of the adhesive used to form a plywood) do not need to be considered.		
CH-10	4.10 (b)(i), (ii)	-	Strange sign for dotted list	x			
CDN-27	4.10 (b)(ii) 3rd bullet point	For transport packages containing spent fuel, the evaluation of thermal ageing for components made of ~~precipitation~~ hardened stainless steels…	Applicable to all hardened steels.	x			

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Step 9 Member States' comments resolution table (input for STEP 10)

MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
ITA-06	4.11	(c)... **(d) a gap analysis program is needed to describe a systematic procedure for periodic evaluation of changes of regulations, changes in technical knowledge and changes in the state of the package design during storage [3].**	The proposal is to add the bullet point (d) in accordance with para. 2.7 and [3].			x	It is not considered correct to add gap analysys in this para, as gap analysis is more general requirement than a considerations of ageing effects intended to be listed in this para.
AUS-16	4.11	… different from (~~to~~) those	Editorial	x			
CDN-28	4.11 title	~~Packagings~~Packages intended to be used for shipment after storage	The subsequent sections discuss packages used for shipment after storage.	x			
F-18	4.12	After 4.12, add a paragraph: **4.xx When storage of spent fuel in transport packages (for example dual purpose casks) occurs at a nuclear power plant (or at another type of nuclear installation), the operator of the storage facility may be required to perform a periodic safety review which scope includes the storage facility. SSG-25 provides recommendations on the preparation and performance of such review, including on factors related to ageing management and maintenance.**	Make a link with the periodic safety review process (see SSG-25) when dry storage of spent fuel relying on dual purpose cask occurs at nuclear power plants.		9.2bis When a facility is designed for the storage of dual purpose casks, any change of the storage conditions that may result from the periodic safety review of the facility [XX] should be considered in the gap analysis programme of the package designs. [xx] INTERNATIONAL ATOMIC ENERGY AGENCY, Safety Assessment for Facilities and Activities, IAEA Safety Standards Series No. GSR Part 4 (Rev.1), IAEA, Vienna (2016).		It was considered to cover the interface between periodic safety review of a facility and the gap analysis programme of the package desing in the section 9.
CDN-29	4.12 (a)	The metal gasket should be demonstrated (through testing and analysis) to be able to maintain its leak rate within the design limits over a~~n~~ defined storage period.	For clarity	x			
CH-15	4.12 (a)	The containment function of the package during storage needs to be maintained. The metal gasket should be demonstrated (through testing and analysis) to be able to maintain its leak rate within the design limits over ~~an~~ **a** storage period.	Typo: might be "a" instead of "an"		over a defined storage period.		see CDN-29
WNTI-37	4.12 (b)	(b) For fuel baskets, the ageing effects of an elevated temperature environment for long term storage should be considered. For example, age-hardening aluminium alloy with a higher mechanical strength ~~is~~ **may be** used as the basket material; however, this alloy can eventually lose its enhanced strength in an elevated temperature environment.	Clarification		..strength might be used ..		Changed may to might.
AUS-17	4.12 (b)	… For example, age-hardened (~~hardening~~)	Use of correct wording	x			
D-14	4.12 (c)	"The ageing effects associated with changes in the behaviour of the radioactive contents, especially for spent fuel, should be considered (i.e. creep, hydride reorientation, embrittlement, oxidation, reconfiguration of fissile material)."	Several ageing effects might occur during storage of spent nuclear fuel, as indicated by the list enclosed in brackets. Therefore, the plural form should be used.	x			
JPN-24	4.12 (c)	The ageing effect associated with changes in the behaviour of the radioactive contents, especially for spent fuel, should be considered (i.e. creep, hydride reorientation, embrittlement, oxidation, **loss of irradiation hardening,** reconfiguration of fissile material)	"loss of irradiation hardening" (or "softening") may need to be considered.			x	Adding loss of irradiation hardening was considered not relevant to be included as example in this bullet point.
ITA-07	5.2	Maintenance of packaging should be performed before and/or after each shipment**, at planned intervals or after unexpected events that could affect the packaging.**	The proposal is to include maintenance after unexpected events, to ensure that the package design specifications were not affected.			x	Unplanned maintenance is considered covered in later paras, e.g. 5.5 and 5.6.

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
ITA-08	5.2	… to comply with the Transport Regulations. **Maintenance of tools not part of the packaging, but necessary for its proper operation, should be performed (e.g. gammagraphic devices).**	The proposal is to integrate the para.5.2 because, for example, in the case of gammagraphic devices most of the accidents is due to a lack of maintenance of tools like cladding and channels.			x	It is considered that the tools that are not part of the packaging are out of the scope of this guide.
WNTI-38	5.2	5.2. Maintenance of packaging should be performed before and/or after each shipment or at planned intervals. ~~It should be indicated on the packagings when maintenance was previously undertaken or (preferably) when the next maintenance is due.~~ The aim of this, in conjunction with appropriate maintenance records, should be to demonstrate that the packaging continues to comply with the Transport Regulations.	It is not a general practice to indicate on the packagings the dates of the maintenance operations. It is recognized that dates of the pressure test (for pressure vessels) or of the control of conformity according to the CSC (for freight containers) are indicated on these packagings. But this is based on requirements from other regulations, and – more importantly – these are regulatory controls, not maintenance operations.		5.2 [..at planned intervals.] **Information should be readily available on when maintenance was previously undertaken or when the next maintenance is due.** [The aim of this..]		The comment was taken into considerations, however, it was considered necessary to keep the recommendation on availability of information on when the maintenance (previous and/or next) is due.
JPN-25	5.3	For shipment of radioactive material c~~C~~onsignors should select packagings properly maintained to be able to comply with the Transport Regulations ~~plan transport operations in order to ensure that each packaging will be available for maintenance on schedule~~	Consignors are not responsible for maintenance schedule, but to use the packaging properly maintained.		5.3. When planning transport, consignors should take into account the maintenance intervals to ensure the packaging will be available for its next maintenance.		The concern of responsibility for maintenance schedule was addressed and text of the para changed accordingly.
CDN-30	5.4	~~Typically, p~~Planned (periodic) maintenance might include the following	"Typically" is redundant here because of the "might".	x			
JPN-26	5.4	Typically, planned (periodic) maintenance might include the following (See para 6.24):	Para. 6.24 provides some guidance for the intervals of periodic inspections..			x	It was not considered correct to cross-reference general maintenance recommendations on period basis with para 6.24 that is specific for periodic inspection of packagings intended for repeat use.

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
F-19	5.4 5.5	5.4. ~~Typically, planned (periodic) maintenance might include the following:~~ ~~(a) Routine maintenance (e.g. before loading of radioactive contents, and before and after each shipment);~~ ~~(b) Short term (e.g. annually);~~ ~~(c) Medium term (e.g. every 3–5 years);~~ ~~(d) Long term (e.g. every 10 years);~~ ~~(e) Maintenance after a specified number of shipments.~~ ~~5.5.~~ Planned maintenance is performed on a periodic basis that should be established by the designer in the package design safety report [3] and/or specified in the certificate of approval. This maintenance usually consists of a series of inspections and tests to demonstrate that the packaging retains the capability specified in the package design safety report for safely transporting the radioactive contents. Planned maintenance often includes the systematic replacement of some components (e.g. gaskets, seals, screws) .**5.5. Typically, the periodic basis for planned maintenance might include the following:** **(a) Routine maintenance (e.g. before loading of radioactive contents, and before and after each shipment);** **(b) Short term (e.g. annually);** **(c) Medium term (e.g. every 3–5 years);** **(d) Long term (e.g. every 10 years);** **(e) Maintenance after a specified number of shipments.**	It is proposed to change the order of the Paras 5.4 and 5.5 and to rephrase the sentence which introduces the bullet points.		5.4 Preventive maintenance should be performed with a periodicity established by the designer and stated in the package design safety report and/or specified in the certificate of approval. This maintenance usually consists of: **a) a series of inspections and tests to demonstrate that the packaging retains the capability specified in the package design safety report for safely transporting the radioactive contents.** **b) the scheduled replacement of some components (e.g. gaskets, seals, screws).** 5.5 Preventive maintenance might be performed with the following periodicity: (a) Routine (e.g. before loading of radioactive contents, and before and after each shipment); (b) Short term (e.g. annually); (c) Medium term (e.g. every 3–5 years); (d) Long term (e.g. every 10 years); (e) After a specified number of shipments.		Editorial changes were added to the proposal (creating bullet point list).
CDN-31	5.5	Planned maintenance is performed on a periodic basis that should be established by the designer and stated in the package design safety report	For clarity.	x			
F-20	5.7	A non-compliant package cannot be transported to another location if it is not in compliance with the Transport Regulations, except under special arrangement according to para. 238 of the~~se~~ **Transport** Regulations [1]. […]	For consistency with Para 1.1 which states that the SSR-6 is referred as the 'Transport Regulations'.	x			

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
D-15	5.7	"A non-compliant package cannot be transported to another location if it is not in compliance with the Transport Regulations, except under special arrangement ~~according to para. 238~~ in accordance with para. 310 of these Regulations [1]."	1.) While para. 238 of SSR-6 (Rev. 1) comprises the definition of the term "special arrangement", the general provisions for transport of consignments under special arrangement are established in para. 310. This is the relevant paragraph to be cited in the context of this sentence. 2.) The phrases "according to" and "in accordance with" do not have the same meaning; thus, they should not be used interchangeably. The phrase "in accordance with" means "in compliance with" and refers to laws, rules and regulations. The phrase "according to" means "as stated by" and works if someone were providing an opinion.	x			
JPN-27	5.7	A non-compliant package cannot be transported to another location if it is not in compliance with the Transport Regulations, except under special arrangement according to para. 238 of ~~these~~ **Transport** Regulations [1]. In addition, depending on the degree of non-compliance, it might not be advisable to even move the package at all until it has been repaired	"these Regulations" is only used in SSR-6.	x			
F-21	5.8	The owner or user[11] of the package should implement or arrange for the maintenance of packaging. ~~The designer should provide maintenance instructions to the owner or user.~~	The sentence proposed to be deleted is an unnecessary duplication of the recommendation in para. 5.9.		5.8 not changed 5.9 The package designer should state the necessary maintenance arrangements within the package design safety report ~~and provide the maintenance instructions to the owner and user of the package~~.		Duplication was removed from para 5.9, rather then 5.8.
JPN-28	5.8	The owner or user[11] of the ~~package~~ **packaging** should implement or arrange for the maintenance of packaging. The designer should provide maintenance instructions to the owner or user	"package" should be replaced by "packaging" because this para. mentions only packaging.	x			
WNTI-39	5.8	5.8. The owner or user[11] of the ~~package~~ **packaging** should implement or arrange for the maintenance of packaging. The designer should provide maintenance instructions to the owner or user.	Clarification (and consistency with footnote 11).	x			
WNTI-40	5.8 Footnote 11	[11] See Appendix III. In the context of this Safety Guide, the phrase 'owner or user' is intended to mean the organization or person responsible for ensuring that transport packagings are maintained throughout their service life. Depending on the specific circumstances, this may be the owner of the packaging or the user (consignor). Where packages are in ~~extended~~ storage (dual purpose casks) this may also include the operating organization responsible for the storage facility.	"Extended storage" is not defined in the Safety Guide, and the wording "storage" is sufficient. The wording "storage" is sufficient, because the footnote 11 remains valid, whether it is "extended" storage or "normal" storage.		[11] In the context of this Safety Guide, the phrase 'owner or user' is intended to mean the organization or person responsible for ensuring that transport packagings are maintained throughout their service life. Depending on the specific circumstances, this may be the owner of the packaging or the user (consignor). If packages are in ~~extended~~ storage (e.g. dual purpose casks) 'owner or user' may also include the operating organization responsible for the storage facility. The roles and responsibilities of owners and users are summarized in Appendix III.		Introduction of DPC as an example was added to the the text in brackects.

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MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
JPN-29	5.9	The package designer should address the necessary maintenance arrangements within the package design safety report and provide the maintenance instructions to the owner and user of the ~~package~~ **packaging**	"package" should be replaced by "packaging" because packaging is appropriate in this context.			x	second part of the sentence was deleted in resolution for F-21
WNTI-41	5.9	5.9. The package designer should ~~address~~ **state** the necessary maintenance arrangements within the package design safety report and provide the maintenance instructions to the owner and user of the ~~package~~ **packaging**.	Clarification	x			note - second part of the sentence was deleted in resolution for F-21
ITA-09	5.11		To be clarified the meaning of "package analysis" (it could be "package design safety report" in SSG-66).		When identifying maintenance needs, regulatory requirements, codes and standards, the conclusions of the package **design** analysis, the properties or performance of the package materials and components, …		see JPN-30
JPN-30	5.11	When identifying maintenance needs, regulatory requirements, codes and standards, the conclusions of the package **design** analysis, the properties or performance of the package materials and components, …	Proper term	x			
WNTI-42	5.12	5.12. The package design should facilitate access to components to perform maintenance operations, **as far as practicable**.	This statement is in contrast with some design features. For instance, a resin has to be protected from water ingress, thus it is in leak tight chambers which cannot be opened to perform a visual check. The statement should be changed.	x			

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Step 9 Member States' comments resolution table (input for STEP 10)

MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	**Para/Line No.**	**Proposed new text**	**Reason**	**Accepted**	**Accepted, but modified as follows**	**Rejected**	**Reason for modification/rejection**
WNTI-43	5.13	5.13. Maintenance activities should be defined in operating and maintenance instructions, and also set out in the package design safety report [3]~~., which~~ **Operating and maintenance instructions** should be made available to all relevant parties. These instructions should include all activities relevant to operation, inspection and repair of the packaging**, and they should be the basis for the organisations in charge of operation and maintenance for establishing their relevant procedures**.	Clarifications 1. The operating and maintenance instructions have to be made available to all relevant parties, not the package design safety report. If an organization needs a specific information from the PDSR, only this information has to be transmitted to this organization (and specific agreements, including contractual arrangements are needed for this purpose). The full PDSR includes information that does not need to be disclosed to some other parties (e.g. the safety assessment or the properties of some materials) and should be protected as intellectual property. The proposal is consistent with the guidance provided in para. 5.9. 2. It is necessary to distinguish the instructions as provided in the package design safety report and the procedures that are prepared and implemntes by the organisations in charge of operation and maintenance.	x	5.13. Maintenance activities should be defined in the operating and maintenance instructions, and also set out in the package design safety report. Operating and maintenance instructions should be made available to all relevant parties. These instructions should include all activities relevant to operation, inspection and repair of the packaging, and they should be used by the organizations in charge of operation and maintenance as a basis for establishing their relevant procedures.		
WNTI-44	5.15	5.15. During the service life of the packaging, the owner and user should maintain sufficient records on the maintenance to demonstrate that the requirements **of the maintenance programme, and subsequently** of the package design safety report **and of** the Transport Regulations have been met. Documentation of the maintenance should be retained for the service life of the packaging. For multiple packagings of the same design, records should indicate the serial number of each individual packaging.	Editorial. The current text does not seem grammatically correct, and some words seem missing. See also the resolution table with the comments provided at the previous step of the process.	x	5.15. During the service life of the packaging, both the owner and the user should maintain sufficient records on the maintenance undertaken to demonstrate that the requirements of the maintenance programme, and of the package design safety report and of the Transport Regulations, have been met. Documentation on the maintenance undertaken should be retained for the service life of the packaging. For multiple packagings of the same design, records should indicate the serial number of each individual packaging		STEP 10 modification
AUS-18	5.15	.. report and the	Editorial	x			
CDN-32	5.16	These modifications could affect the safety ~~analyses~~ of the package design…	It is the safety of the package that is first affected.		.. affect the safety of the package and..		Modification was added to consider safety of the package. (design deleted).

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MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
JPN-31	5.16	…If the result of the verification is that the modifications are not covered by the original package design safety report, an application for revision of the approval of the package design should be considered**, if applicable**.	Not all the package design is required to be approved by the competent.		5.16. (…). If the result of the verification is that the modifications are not covered by the original package design safety report, the package design safety report should be updated and, if applicable, an application should be made for approval of the revised package design.		see WNTI-45
WNTI-45	5.16	5.16. (…). If the result of the verification is that the modifications are not covered by the original package design safety report, **the package design safety report should be updated and, for the package designs requiring competent authority approval,** an application for revision of the approval of the package design should be considered.	Package design approval by the competent authority is not necessary for all package types.		5.16. (…). If the result of the verification is that the modifications are not covered by the original package design safety report, the package design safety report should be updated and, if applicable, an application should be made for approval of the revised package design.		see JPN-31
WNTI-46	5.22	5.22. Inspection and periodic testing should be conducted in accordance with the maintenance instructions ~~in the package design safety report~~ provided by the package designer **in the package design safety report**.	Clarification about what is "provided".	x			
CDN-33	5.23	(c) The condition of liners, other internal parts, O-rings and gaskets ~~for damage~~; (d) The condition of the ~~S~~sealing surfaces ~~for~~ (e.g., damage, corrosion ~~and~~or residual material such as ~~(e.g.~~ burrs); (e) The condition of the ~~W~~wooden parts ~~for~~ (e.g., drying, shrinkage, crushing ~~when possible,~~ or cracks, ~~and~~or damage~~s~~ on the casing of shock absorbers);	To align with format of other bullets.		(c) The condition of liners, other internal parts, O-rings and gaskets ~~for damage~~; (d) The condition of the ~~S~~sealing surfaces ~~for~~ (e.g. damage, corrosion ~~and~~or residual material such as ~~(e.g.~~ burrs); (e) The condition of the ~~W~~wooden parts ~~for~~ (e.g. drying, shrinkage, crushing ~~when possible,~~ cracks or **other damage** on the casing of shock absorbers);		see also AUS-19
JPN-32	5.23 (a)	(a) The condition of the exterior of the ~~package~~ **packaging**,	"packaging" seems more appropriate for usual maintenance.	x			see WNTI-47
WNTI-47	5.23 (a)	(a) The condition of the exterior of the ~~package~~ **packaging**;	Clarification and consistency with the introductory sentence of para. 5.23.	x			see JPN-32
AUS-19	5.23 (e)	..cracks and other damage~~s~~	Editorial	x			
AUS-20	5.23 (h)	The condition of nuts, ~~and~~ bolts and fasteners	Better clarity	x			
WNTI-48	5.26	Trunnions should be visually inspected prior to each shipment for permanent deformation, ~~galling~~ **wear, abrasion**, or cracking. (…).	"galling" is not a common word and might be difficult to understand for those who English is not the mother tongue. It is suggested to use another wording.	x			
WNTI-49	5.26	5.26. (…). Trunnions should also be subjected to periodic tests. Critical areas~~, including basic bearing welded joints,~~ should be subject to inspection for defects. (…).	Simplification and subsequent clarification. It is unclear what a 'basic bearing welded joint' is. And it is not sure that this example is very useful. Consequently, it is proposed to remove this example.	x			
CDN-34	5.28	Gas leakage ~~is~~may be monitored by several methods, such as the helium leakage test, which can give more high sensitivity.	Edits to give less specificity to the helium leak test.	x	Gas leakage may be monitored by several methods (e.g. a helium leakage test can be used for greater sensitivity).		
CH-16	5.28	Gas leakage is monitored by several methods.~~, helium leakage test can give more high sensitivity.~~ **As an example, a helium leakage test can give higher sensitivity.**	Wording should be improved. At least "more high" could be replaced by "higher".		Gas leakage may be monitored by several methods (e.g. a helium leakage test can be used for greater sensitivity).		See CDN-34, WNTI-50, AUS-21

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MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
WNTI-50	5.28	5.28. For some package designs, a leaktightness test~~s~~ should be conducted periodically and/or after seal parts replacement, prior to loading and after loading of the content. Gas leakage ~~is~~ **can be** monitored by several methods, helium leakage test can give more ~~high~~ sensitivity. Additional information is available in Ref. [24].	Improvement of the wording and subsequent clarification.		5.27. For some package designs, a leaktightness test should be conducted periodically and/or after the replacement of seal parts, both before and after loading of the contents. Gas leakage may be monitored by several methods (e.g. a helium leakage test can be used for greater sensitivity). ...		See CDN-34, CH-16, AUS-21
AUS-21	5.28	… designs, ~~a~~ leaktightness (delete 'a) .. can give ~~more high~~ greater	Editorial; better clarity		(e.g. a helium leakage test can be used for greater sensitivity). ...		See WNTI-50, CDN-34, CH-16
CDN-35	5.29	For some package designs, ~~a~~ thermal performance tests should be conducted, if applicable, during periodic maintenance ~~used~~ to verify the heat transfer…These~~is~~ test~~s~~ should be performed…	Typos			x	see WNTI-53
JPN-34	5.29	…Thermal performance can be evaluated by using the temperature measurement data obtained during transport**, and storage if applicable**.	Consistency to para. 5.30. The data can be obtained during not only transport but also storage as appropriate.		5.29. (…). Thermal performance can be evaluated by using the temperature measurement data obtained during transport **or, if applicable, during storage.** (…).		see WNTI-52
WNTI-51	5.29	5.29. For some package designs, a thermal performance test~~s~~ should be conducted, if applicable during periodic maintenance used to verify the heat transfer capability over the service life of the packaging. (…).	typo			x	see WNTI-53
WNTI-52	5.29	5.29. (…). Thermal performance can be evaluated by using the temperature measurement data obtained during transport **or storage**. (…).	Consistency with para. 5.30. The data can be obtained not only during transport, but also during storage as appropriate.		5.29. (…). Thermal performance can be evaluated by using the temperature measurement data obtained during transport **or, if applicable, during storage.** (…).		See JPN-34
WNTI-53	5.29	5.29. For some package designs, a thermal performance ~~tests~~ **assessment** should be conducted~~, if applicable, during periodic maintenance used~~ to verify the heat transfer capability **of the packaging** over ~~the~~ **its** service life ~~of the packaging~~. Thermal performance can be evaluated by using the temperature measurement data obtained during transport. ~~If possible, it may be conducted by using simulated heating sources, such as electrical heating devices, a system commonly used in thermal tests prior to the first shipment. Test should be performed in a homogeneous and stable thermal environment, allowing enough time to establish a constant temperature.~~	The first sentence is streamlined for simplification and subsequent clarification. As regards the tests using simulated heating sources, once the packaging is used, the packaging may be contaminated, and it is difficult to conduct the tests by using simulated heating sources. Such tests can be done only prior to the first shipment. The conditions of application are too vague to be useful. Wordings such as "if possible" and "it may" limit the value of the guidance as the conditions of application are not identified.	x			
JPN-35	5.30	…Shielding performance can be evaluated by using the dose rate measurement data obtained during transport**, and** ~~or~~ storage **if applicable**, ….	Editorial		[…] Shielding performance can be evaluated by using the dose rate measurement data obtained during transport or, if applicable,during storage. […]		To keep consistancy with the style in para 5.29. See WNTI-52

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MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
WNTI-54	6. Section	No additional text is proposed at this stage. Paras to be updated include – inter alia – paras 6.4, 6.5, 6.6, 6.7, 6.10, 6.19, and 6.20 (and new paragraph to develop the additional information in 6.20).	Section 6 "Maintenance programme for transport packages" is focused on inspections. It does not address another aspect of maintenance which is the systematic replacement of some components at pre-defined intervals, for instance the change of elastomer O-rings every X years (X to be defined and depending of the type of O-ring and the characteristics of the packaging and package) (see also I.9.(a) and (c) where this is considered).		6.1 .. (b) Type and description of maintenance operations including inspection methods, **scheduled replacement of components (i.e. after a specified amount of time or number of transport operations),** tools needed and justification for spot checks;		Text added to address the comment on replacement of some components.
JPN-33	6. Section page 23	[Comment] Especially in Section 6, it should be carefully distinguished between pre-loading inspection of packaging (as part of maintenance, conducted on packagings before the loading of radioactive contents) and pre-shipment inspection of package (as part of shipment to confirm compliance of loaded package with the Transport Regulations).	Packaging owner is responsible for the pre-loading inspections demonstrating that the packaging is properly maintained and suitable for loading and transport of radioactive contents. Consignor, i.e., packaging user, is responsible for pre-shipment inspections demonstrating that the loaded package complies with the Transport Regulations			x	It is considered that the pre-shipment inspection is a part of the maintenance in general. Responsibilities of relevant parties are addressed in Appendix III and also in Section 5.
D-16	6.1	"… provided by the package designer.~~.~~ The maintenance programme …"	Correction of a typo: Full stop is inadvertently duplicated.	x			
JPN-36	6.1	The package design safety report [3] should include a description of the maintenance programme for transport packages as part of the maintenance instructions provided by the package designer.~~.~~ The maintenance programme should address the following elements:	Typo (delete full-stop)	x			
UK-04	6.1	The package design safety report [3] should include a description of the maintenance programme for transport packages as part of the maintenance instructions provided by the package designer.~~.~~	Remove additional fullstop	x			
US-15	6.1	Delete the extra period at the end of the first sentence	typo	x			
WNTI-55	6.1	6.1. The package design safety report [3] should include a description of the maintenance programme for transport packages as part of the maintenance instructions ~~provided by the package designer~~.~~.~~ The maintenance programme should address the following elements: (…).	Simplification and subsequent clarification. It is well established that the PDSR is prepared and, consequently, provided by the package designer. Typo (one stop after "designer" is sufficient).	x	The package design safety report should include a description of the maintenance programme for transport packages as part of the maintenance instructions. The maintenance programme should address the following elements:		STEP 10 modification
CDN-36	6.1 (b)	(b) Type and description of maintenance operations including inspection methods and tools, and ~~also~~ reasoned argument for spot checks	"also" not required because of "including".	x			

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Step 9 Member States' comments resolution table (input for STEP 10)

MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
F-22	6.1 (d)	(c) The frequency of maintenance operations~~;~~ ~~(d) The qualifications for personnel who will perform maintenance operations and quality control checks~~.	The Para 6.1 deals with the maintenance programme as part of the PDSR. Thus, the qualifications for personnel who will perform maintenance operations and quality control checks appears to be inappropriate here as this is more relevant for a management system. Therefore bullet (d) is proposed to be deleted.	x			covered in 5.14
JPN-37	6.1 (d)	The qualifications for personnel who will perform maintenance operations and quality **management** ~~control~~ checks.	IAEA terminology.			x	Bullet point d) was deleted. Issue is covered in 5.14. See F-22
CH-17	6.1 (d)	The qualifications for personnel ~~who will~~ perform**ing** maintenance operations and quality control checks.	Wording could be improved			x	Bullet point d) was deleted. Issue is covered in 5.14. See F-22
ITA-10	6.2	… (c) Maintenance requirements during periods of non-use; **(d) Maintenance after unexpected events that could affect the packaging.**	The proposal is to include maintenance after unexpected events, to ensure that the package design specifications were not affected – see comment 07 –.			x	see ITA-07 (rejected) bullet a) Maintenance after each shipment is considered to include the general idea of unplanned maintenace actions to be adressed in the maitenance programme.
D-17	6.4	"The maintenance programme should include a scheme that systematically addresses the content of para 6.1 (b), (c) and (d) for each component considered in the scope, …"	Grammatical correction.	x			
WNTI-56	6.4	6.4. The maintenance programme should include a scheme that systematically address the content of paras 6.1 (b), (c) and (d) for each component considered in the scope, **and for each activity described in para. 6.2,** including a description of planned inspections and the organisational procedures for implementing unplanned inspections, and instructions for the maintenance of the packaging.	Clarification		6.4. The description of the maintenance programme should include a scheme that systematically addresses the content of paras 6.1 (b) **and (c)** for each component that undergoes maintenace, **and for each activity described in para. 6.2,** including a description of planned inspections and the organizational procedures for implementing unplanned inspections, and instructions for the maintenance of the packaging.		Text was modified as (d) was deleted from the draft based on resolution of F-22.
AUS-22	6.4	Systematically addresses	Editorial	x			
AUS-23	6.5 (b)	To record the completion of each inspection or test, and the results…..	Better clarity	x			
UK-05	6.7 (b)	~~The packaging identification such as model/design and serial number or identification reference.~~ The packaging identification such as model/design and unique identification reference i.e. serial number.	Consistency between different paragraphs asking for the same information. See UK/6	x	The packaging identification, such as model or design, and a unique identification reference (i.e. serial number).		STEP 10 modification
WNTI-57	6.7 (e)	(e) **Statement of** ~~C~~compliance with the acceptance criteria **and associated evidence**. In some cases, this may be a simple pass/fail indication for the verification of each component of packaging. In other cases, practical acceptance criteria should be established. The acceptance criteria should be as defined in the relevant procedure.	Clarification. It is a statement of compliance that is needed in the records.	x			
JPN-38	6.7 (g)	The name and signature of a qualified person responsible for quality **management** ~~control~~ in steps involving instrumentation (such as pressure gauges and leak detectors).	IAEA terminology.			x	see also JPN-37 In this specific case the intention is to highlight the quality control as part of management (per TSG-1.4)

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MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
ITA-11	6.8		To be clarified the meaning of the term "shelf life" as it is not used in IAEA SSR-6 nor in SSG-26 or SSG-66.			x	it is considered that shelf life is commonly used as the period of time during which a material may be stored.
WNTI-58	6.9	6.9. Additionally to the maintenance records, it is recommended also to provide an individual record (in the form of an electronic log or logbook) compiled for each packaging, in the case of complex designs (e. g. Type B(U), Type B(M) and Type C **package** designs, packages containing fissile material), or for each package design in use for other cases, which will provide the following [23]:	Editorial. Consistency with the wording used in the Transport Regulations.	x			
WNTI-59	6.10	6.10. The individual packaging records should contain the following information, as appropriate: (a) Package design reference and unique serial number; (b) A list of applicable references to the operating quality plans; (c) Certificate number(s); (d) Records of inspections and tests performed before first use; (e) Maintenance records; (f) Quality control records (e.g. modification certificates, repair certificates); (g) List of non-compliances and corrective actions taken; (h) Records of shipments~~.~~**;** **(j) Records of inspections and tests performed of spot checks with the same design which have an impact on the individual package.**	"Spot checks" have been introduced in para. 6.1(b). By performing spot checks of an individual package, an evaluation of an ageing mechanism regarding the package design could be performed. This result could be helpful for other packages of the same design and thus should be added to this record as well.		**(i)** Records of inspections and spot checks performed on packaging of the same design, **if available.**		editorial modifications added.
UK-06	6.10 (a)	~~Package design reference and unique serial number;~~ The packaging identification such as model/design and unique identification reference i.e. serial number;	Consistency between different paragraphs asking for the same information. See UK/5	x	The packaging identification, such as model or design and a unique identification reference (i.e. serial number);		STEP 10 modification
BRA-05	6.10 (e)	Maintenance, and inspections and tests records along the service life	The records of inspections and tests is important to control the periodicity of them.			x	Records of inspections and test are included in maintenance record, as it was established in 6.7 d)
JPN-39	6.10 (h)	Records of shipments **(both cases with loaded and empty)**	Records of empty shipments should be also recorded to estimate ageing effects.		h) Number of shipments (loaded and empty)		The intention was to have a record of number of shipments, for instances where maintenance is based on this criteria.
AUS-24	6.12	The maintenance program, in accordance with the management system, may establish procedures for managing tools, equipment, and spare parts used for maintenance, and ensure that appropriate records are kept.	The current sentence is confusing and needs clarity.		In accordance with the management system, procedures for managing the tools, equipment and spare parts used for maintenance, and for keeping the appropriate records may be established in the maintenance programme.		Editorial changes were made.
AUS-25	6.14	.. maintenance program is changed …..	Editorial	x			
CDN-37	6.17	For ~~packages~~packagings intended for repeated use or for packages intended to be used for shipment after storage,…	It is the packagings that are used repeatedly, not the packages. And it is packages that are used for shipment after storage.	x			

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MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
CDN-38	6.18	For ~~packages~~packagings intended for repeated use or for packages intended to be used for shipment after storage,…	It is the packagings that are used repeatedly, not the packages. And it is packages that are used for shipment after storage.	x			
JPN-40	6.20	The maintenance of packagings intended for repeated use should consist of ~~pre-shipment and~~ periodic inspections **and unplanned inspection** to confirm that the safety functions of the package continue to be fulfilled **(See para. 5.4 - 5.6)**.	According to paras. 5.4 to 5.6 maintenance consist of planned (periodic) and unplanned inspections. Pre-shipment inspection is not a part of maintenance program.		6.20. The maintenance of packagings intended for repeated use should consist of periodic inspections and scheduled replacement of some components (e.g. O-rings, movable components such as valves), which, in conjunction with pre-shipment inspections, should ensure that the safety functions of the package continue to be fulfilled.		Para 5.4 a) stated that inspection before each shipment is included in routine maintenance - in planned maintenance. See WNTI-60. Unplanned maintenance is connected with non-compliances found during inspection, use or following an incident/event as stated in para 5.6.
WNTI-60	6.20	6.20. The maintenance of packagings intended for repeated use should consist of ~~pre-shipment and~~ periodic inspections **which, in conjunction with pre-shipment inspections, ~~to~~ should** confirm that the safety functions of the package continue to be fulfilled.	Pre-shipment inspections are not formally part of the maintenance program. Nevertheless it is recognized that the results of the pre-shipment inspections have to be considered when assessing the state of the packaging.	x			
AUS-26	6.21	The pre-shipment (This) inspection …. and is ready …	Better clarity in sentence	x			
WNTI-61	6.22	6.22. The pre-shipment inspection should be defined in the package design safety report (i.e. the sections dealing with 'PACKAGE OPERATIONS' or 'MAINTENANCE', as applicable). The pre-shipment inspection results should be **maintained throughout the service life of the packaging and** retained by the consignor of the package (with copies provided to other responsible parties, as appropriate) in accordance with its management system. These records should be used as part of the evaluation of ageing effects	Clarification about the duration for the maintenance of the inspection results.		6.22. The pre-shipment inspection should be defined in the package design safety report (i.e. in the sections entitled 'PACKAGE OPERATIONS' and 'MAINTENANCE', as applicable — see SSG-66 [3]). ~~The pre-shipment inspection results should be retained by the consignor of the package (with copies provided to other responsible parties, as appropriate) in accordance with its management system. These records should be made available to the owner of the packaging and used as part of the evaluation of ageing effects.~~ 8.7 [..] as applicable, throughout the service life of the packaging, [..]		It is considered that the pre-shipment records are to be retained by relevant parties now covered by modified para 8.7.

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MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
WNTI-85	6.22, 6.25, 6.35, 6.39 and 6.41ter	*No specific text is proposed at this stage.*	Paras. 6.22, 6.25, 6.35, 6.39 and 6.41ter are about how the results of inspection should be retained. The wording of these paragraphs presents some differences. It should be assured that these differences are justified and/or the wording of these paragraphs should be aligned as far as possible.		x		It is considered that since there was no specific text proposal, the comment was adressed in WNTI-61.
F-23	6.23	Pre-shipment inspections ~~for detecting ageing effects~~ may include the following **considerations for detecting ageing effects**:	The proposed change aims at clarifying that the pre-shipment inspections are not exclusively used for the detection of ageing effects	x			
CDN-39	6.23 (b)	(b) Leaktightness checks: Where appropriate, the containment boundary should be checked ~~and~~including the lid seal (O-ring) ~~replaced, if necessary~~.	Replacing the seal is a corrective action beyond the pre-shipment inspection.	x			
F-24	6.23 (c)	~~Dose rate measurements: To detect ageing effects on the shielding performance.~~	This is not helpful guidance. Furthermore, as the radioactive contents vary from one shipment to another, such effect could not easily be detected.		Dose rate measurements: The results may indicate potential ageing effects on the shielding performance.		Text was modified to provide better guidance.
CDN-40	6.23 (d)	(d) Checks for subcriticality: For fresh or spent fuel packages, ageing effects on the components to ~~remain the~~ensure subcriticality (e.g., absence of deformation, ~~occurrence of a~~ cracking, corrosion, or peeling off of neutron absorber)	Fuel could be spent or fresh.Changes for readability		(d) Checks for subcriticality: For some packages containing fissile material, ageing effects on the components relied on to maintain subcriticality might be detected through a visual check before loading (e.g. deformation, cracks, corrosion, peeling off of neutron absorber).		The changes were introduced to include all types of fissile material (as para 6.31 is also refering to this para). Considerations were taken in conjuction with D-18 and WNTI-62.
D-18	6.23 (d)	"Checks for subcriticality: For fresh fuel packages, ageing effects on the components to maintain ~~remain the~~ subcriticality (deformation, …) can be detected …"	More appropriate wording: replace the phrase "to remain the subcriticality" by "to maintain subcriticality", for ensuring consistency with the wording in the Safety Guide SSG-15 (Rev. 1), Storage of Spent Nuclear Fuel.	x			
CH-18	6.23 (d)	… remain the subcriticality (deformation, …	Missing blank after subcriticality	x			
US-16	6.23 (d)	Add space between "subcriticality" and (deformation,	typo	x			
WNTI-62	6.23 (d)	(d) Checks for subcriticality: For fresh fuel packages, ageing effects on the components **relied on** to ~~remain~~ **maintain** ~~the~~ subcriticality (deformation, occurrence of a crack, corrosion, peeling off of neutron absorber) can be detected through a visual check before loading of the radioactive contents.	Editorial. The current text does not seem grammatically correct, and some words seem missing.	x			

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Step 9 Member States' comments resolution table (input for STEP 10)

MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
WNTI-63	6.23 (f)	(f) Lifting attachments inspections (e.g. visual inspection, loading test)~~: Potential ageing effects on lifting attachments may be detected when the package is lifted~~.	Clarification. As written, the text suggest that any failure would be detected during a lifting operation. Obviously, this would not be an acceptable moment to detect a failure. The first part of the subparagraph (f) is clear enough.	x			
WNTI-64	6.23 (f)	Lifting attachments inspections (e.g. visual inspection, loading test): ~~P~~potential ageing effects on lifting attachments may be detected when the package is lifted.	typo			x	Sentence was deleted in addressing WNTI-63.
WNTI-71	6.23 Heading before	*Receipt inspection of package at the storage facility* ~~:~~	Typo	x			Note - it is the heading before para 6.32, not para 6.23
JPN-41	6.24	Depending on the type of the package, the inspection activities and inspection intervals may be determined through a systematic analysis, such as ~~f~~Failure ~~m~~Modes and ~~e~~Effects ~~a~~Analysis **(FMEA) [xx]**. **[xx] Atomic Energy Society of Japan, Standards for Periodic Inspection and Maintenance of Shipping Casks for Spent Fuel, Fresh Mixed-Oxide Fuel, High Level Radioactive Waste and Low Level Radioactive Waste: 2008, AESJ-SC-F001:2008**	Adding a reference to provide specific guidance of Failure Modes and Effects Analysis (FMEA) is informative for readers.	x	new Ref was added.		FMEA proposal was not changes in accordance with IAEA terminology.
WNTI-65	6.25	6.25. Periodic inspections should be performed by the organization in charge of maintenance, on behalf of the owner or the user of the packaging. These inspections should include the items identified in the package design safety report (i.e. in the section dealing with 'MAINTENANCE'). **The periodic inspection results should be maintained throughout the service life of the packaging and retained by the organization in charge of maintenance, on behalf of the owner or the user of the packaging, and the packaging owner (with copies provided to other responsible parties, as appropriate) in accordance with the relevant management systems. These records should be used as part of the evaluation of ageing effects.**	Clarification. How the results of the inspection should be maintained and retained is defined in para. 6.22 for pre-shipment inspection, and the same should be defined for periodic inspection. It is proposed to include in para. 6.25 a text similar to the current text in paras 6.22 and 6.35.			x	It is considered that the periodic inspection records are to be retained by relevant parties now covered by modified para 8.7.
CDN-41	6.26 (b)	(b) Non-destructive testing (other than visual inspection~~testing~~), to detect	There is no visual testing.	x			

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MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
CDN-42	6.26 (c)	(c) Leaktightness checks…where appropriate. ~~Seals and O-rings should be replaced, if necessary, after a given duration or given number of transport operations (i.e. preventive maintenance), including transport as an empty package, depending on the temperature conditions, to avoid ageing effects on the leaktightness of the package.~~	Replacing seals is a corrective action beyond inspection.	x			see WNTI-54 and CDN-39. 6.26 e) was modified, partially moved to 6.20
WNTI-66	6.26 (e)	(e) Operational checks, to detect ageing effects **on movable components, where appropriate.** ~~based on the scheduled replacement of m~~Movable components**,** such as valves**, should be replaced if necessary, after a given number of transport operations (i.e. preventive maintenance), including transport as an empty package**.	Clarification. The current wording is not very clear. It is suggested to use a wording similar to the wording in para. 6.26 (c).		6.26 e) Operational checks, to detect ageing effects of movable components.		see CDN-42
WNTI-67	6.26 (f)	(f) Lifting attachment inspection (e.g. visual inspection, loading test~~)~~, non-destructive testing**)** ~~may be performed~~ **to detect ageing effects** on the attachments, including weld joints, when necessary.	Editorial. To align the style of (f) with the style of the other items in para. 6.26.	x			
WNTI-68	6.26 (j)	(j) Inspection and/or destructive testing of analogues~~,~~. ~~w~~**W**here it is undesirable or impractical to examine a package component it may be possible to use an analogue (an equivalent or representative component) for periodic inspection and/or non-destructive and/or destructive testing. The condition of the analogue should be representative of the condition of the package component because the analogue should be subjected to the same transport conditions (e.g., impacts, vibrations, and temperature variations) as the package component during shipments. (…).	Editorial. The current wording does not seem grammatically correct. The proposal is consistent with the original proposal CAD-40.	x			
JPN-42	6.26 (j) +general	"impact limiter(s)" should be replace by "shock absorber(s)"	For consistency because "shock absorber" is more used than "impact limiter" in this draft. Apply to the whole document.	x			part was deleted in STEP 10
CDN-49	6.27	These inspections should not be limited to the detection of the ageing effects but should also confirm transportability after storage (i.e. ~~conformance to these inspections during storage demonstrates the~~ compliance with the Transport Regulations should also be assessed to ensure that the safety functions of the package have been maintained, ~~(i.e.~~ without any adverse ageing effects~~,)~~ and the package is ready for transport).	Improved readability.	x	These inspections should not be limited to the detection of ageing effects but should also confirm transportability after storage (i.e. compliance with the Transport Regulations should also be assessed to ensure that the safety functions of the package have been maintained without any adverse ageing effects, and that the package is ready for shipment).		STEP 10 modification

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MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
WNTI-70	6.27	6.27. (…) These inspections should not be limited to the detection of the ageing effects but should also confirm transportability after storage (i.e. conformance to these inspections during storage demonstrates the compliance with the Transport Regulations to ensure that the safety functions of the package have been maintained (i.e. without any adverse ageing effects) and the package is ready for transport **or, if a non-conformance is detected, can be made ready for transport when the non-conformance is detected or, in any case, before shipment**).	For shipment after storage, it should be possible to refurbish the package and make it ready for transport. It is important to make this explicit, i.e. to recognize that a non-compliance can be corrected, first, and that the correction can be done at any time before shipment, second. The safety functions, for transport, do not need to be maintained at any time during storage; it is just needed to have assurance that they will be available at the time of transport.			x	It is considered that the text does not imply that the package need to be ready for transport at any point of time of storage, therefore additional text is not needed.
CDN-44	6.27 (a) - (d)	~~(a)Pre-shipment inspection of package before the first shipment (or first loading) before storage;~~ ~~(b)Reception inspection at the storage facility;~~ ~~(c)Monitoring programme during storage;~~ ~~(d)Pre-shipment inspection before the shipment after storage.~~ (a)Package inspection before shipment for storage or before storage; (b)Package inspection on receipt for storage; (c)Package monitoring programme during storage; (d)Package inspection before shipment after storage.	Improved consistency and clarity of what items are required. For item (a) "first loading" implies that the packaging is inspected before loading (which may be the case but is not the focus of this section) and not the package before storage.			x	Consideration was given to other comments related with this para and connecting titles.
WNTI-69	6.27 (a) Heading before 6.29	6.27. The ageing management programme for packages intended to be used for shipment after storage should be used to determine the associated maintenance programme, and the operating and maintenance instructions, which should include the following: (a) Pre-shipment inspection of package before ~~the first~~ shipment**(s)** ~~(or first loading)~~ before storage; (…). 6.28. (…). *Pre-shipment inspection of package before ~~the first~~ shipment **(s)** ~~(or first loading)~~ before storage* 6.29. (…)	Clarification. A packaging may be used for several shipments before being stored. It is necessary to consider the case of those packages that perform several shipments before being used for storage.	x	(a)Pre-shipment inspection of the package before loading for storage or before shipment to the storage facility title before 6.29: Pre-shipment inspection of the package before loading for storage or before shipment to the storage facility		STEP 10 modification
AUS-27	6.27 (b)	Receipt (~~Reception~~) inspection ..		x	Receiving inspection..		STEP 10 modification
AUS-28	6.27 (d)	Pre-shipment inspection of package intended for shipment after storage	Better clarity as the current sentence is confusing	x	..of the package..		STEP 10 modification
CDN-43	6.27 title	~~Packagings~~Packages intended to be used for shipment after storage	The subsequent sections discuss packages used for shipment after storage.	x			
UK-07	6.28	The recommendations provided in paras ~~6.29–6.44~~ 6.29-6.43 mostly relate to packages loaded with spent fuel.	States "paras 6.29-6.44". There is no 6.44.	x			The sentence was deleted, see WNTI-83

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MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
WNTI-83	6.28	~~6.28. The recommendations provided in paras 6.29–6.44 mostly relate to packages loaded with spent fuel.~~	When looking at paragraphs 6.29-6.44, it seems that these paragraphs are general and not related to spent fuel. There is one exception, which is para. 6.41bi, and this is explicitly stated in this para. 6.41bis. Consequently, it is proposed to delete para. 6.28 as this paragraph is not necessary, and even misleading.	x			
CDN-45	6.29 title	~~*Pre-shipment inspection of package before the first shipment (or first loading) before storage*~~ *Package inspection before shipment for storage or before storage*	Improved consistency and clarity. "first loading" implies that the packaging is inspected before loading (which may be the case, but is not the focus of this section) and not the package before storage.			x	see CDN-44 and WNTI-69
F-25	6.30	(deleted)	As DS546 is a new Safety Guide, to mention a para as deleted makes no sense. It is suggested to renumber the following paras and references to those paras accordingly.	x			
CDN-50	6.31	…the purpose is not to identify ageing effects but to record the ~~initial~~ package condition at the time it is shipped for storage.	Typo and improved clarity.	x			
D-19	6.31	"Typical pre-shipment inspection activities are listed in para. 6.23; however, in this case the purpose is ~~not to identify ageing effect but~~ to record the initial package condition rather than to identify ageing effects."	For linguistic reasons, the wording should be changed as proposed.			x	see CDN-50
CH-19	6.31	…ageing effects…	Should be plural	x			
F-26	6.32	The primary purposes of this inspection are (i) to verify that the package**, in its transport configuration,** has been transported without being subject to any event that would affect its safety functions and (ii) that ~~it~~**the loaded packaging, in its storage configuration,** complies with the storage specifications. This inspection should provide a record of the initial conditions of the **loaded packaging**~~package~~ to be stored. The results should be compared with the results of the pre-shipment inspections.	Attention should be paid to distinguish the different configurations, i.e. the package in its transport configuration and and the loaded packaging in its storage configuration (e.g. without shock absorbers and sometimes without secondary lid). The proposed modification is thus consistent with para 6.36 which states that "Monitoring activities of the package during storage might cover activities described in paras 6.32-6.35 for the receipt inspection of package at the storage facility and it is not necessary for them to be two completely independent processes.". Indeed, the monitoring during storage applies to the package in its storage configuration.			x	It is considered too specific for this guide, partially covered in paras related with interfaces between transport and storage. See WNTI-72

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MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
D-20	6.32	"The primary purposes of this inspection are ~~(i)~~ to verify (i) that the package has been transported without being subject to any event that would affect its safety functions and (ii) that the package ~~it~~ complies with the storage specifications."	In this sentence, the verb "to verify" applies to both items (i) and (ii). Consequently, the item '(i)' needs to be moved after the verb. In the text of item (ii), the pronoun 'it' should be replaced by the respective noun, for the sake of clarity.	x	..are to verify (a) that the package has been transported without being subject to any event that affected its safety functions; and (b) that the package complies with the storage specifications. ..		STEP 10 modification
WNTI-72	6.32	6.32. The primary purposes of this inspection are (i) to verify that the package has been transported without being subject to any event that would affect its safety functions and (ii) that it complies with the storage specifications. This inspection should provide a record of the initial conditions of the package to be stored. **If there is no off-site transport before storage, the pre-shipment inspection before loading may cover the receipt inspection at the storage facility, and it is not necessary for them to be two completely independent process.** The results should be compared with the results of the pre-shipment inspections.	Clarification to cover the case where the package is directly stored, without off-site transport before. It is proposed to adopt a similar wording to the wording in para. 6.36.			x	It is considered too specific for this guide, partially covered in paras related with interfaces between transport and storage. Additionaly, on-site transport is out of the scope of this guide as well as the Transport Regulations. See F-26
AUS-29	6.32	The primary purposes of this inspection are ~~(i)~~ to verify (i) that … safety functions, and (ii) …		x	.. are to verify (a) that the package has been transported without being subject to any event that affected its safety functions; and (b) that the package complies with the storage specifications. ..		STEP 10 modification
CDN-46	6.32 title	~~*Receipt inspection of package at the storage facility:*~~ *Package inspection on receipt for storage*	Improved consistency and clarity.			x	see CDN-44 and WNTI-69
WNTI-73	6.34	6.34. The receipt inspection should be ~~included~~ **specified** in the relevant parts of the package design safety report (i.e. the sections dealing with 'PACKAGE OPERATIONS' or 'MAINTENANCE', as applicable).	Clarification	x			
WNTI-74	6.34	6.34. The receipt inspection **programme** should be included in the relevant parts of the package design safety report (i.e. the sections dealing with 'PACKAGE OPERATIONS' or 'MAINTENANCE', as applicable).	Clarification			x	See WNTI-73
F-27	6.35	The receipt inspection results should be retained by the operating organization of the storage facility and the packaging owner and the owner of the radioactive contents, in accordance with regulatory requirements and the management systems. The results should be made available to other relevant interested parties.	This Para could be moved to Section 8 after or combined with Para 8.7.			x	Based on the specific concept of shipment after storage it is considered better to keep this recommendation in para 6.35, as para 8.7 is more general.
WNTI-75	6.35	6.35. The receipt inspection results should be **maintained throughout the service life of the packaging and** retained by the operating organization of the storage facility and the packaging owner and the owner of the radioactive contents, in accordance with regulatory requirements and the management systems. The results should be made available to other relevant interested parties.	Clarification about the duration for the maintenance of the inspection results.	x	.. Retained throughout the service life of the packaging and..		STEP 10 modification

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
WNTI-76	6.36	6.36. Monitoring activities of the package during storage might cover activities described in paras 6.32-6.35 for the receipt inspection of package at the storage facility and it is not necessary for them to be two completely independent processes. Monitoring during storage may be conducted continuously, or periodically at intervals that are commensurate with the importance to safety. On the basis of an appropriate justification, monitoring may be conducted on a representative sample of packages of the same design, stored at the same location **or in different locations**. The practicability of monitoring (e.g. in high dose rate areas or areas that are otherwise difficult to access) should also be considered.	Casks of the same design might be stored at different locations and the sample size can also be determined across several storage facility sites. It is recognized that packages, even if of the same design, may be affected differently depending on the different environmental conditions at different locations. But, subject to appropriate justifications, including for instance the demonstration that the environmental conditions are similar enough, or an additional assessment is provided to take into account the different environmental conditions, the sample of packages can come from different locations.		..On the basis of an appropriate justification, monitoring may be conducted on a representative sample of packages of the same design. [..]		The modification was introduced for simplification.
CDN-47	6.36 title	~~*Monitoring programme during storage*~~ *Package monitoring programme during storage*	Improved consistency and clarity.			x	see CDN-44 and WNTI-69
CH-20	6.37	… (or by another organization of behalf **on** ~~of~~ the operating organization) …	Typo: might be "on" instead of "of"		..on behalf of..		typo
F-28	6.39	~~The results of the receipt inspection, if applicable, should be retained by the operating organization of the storage facility, the packaging owner and the owner of the radioactive contents, in accordance with regulatory requirements and the relevant management systems. The results should be made available to other relevant interested parties.~~	This Para is an unnecessary duplication of Para 6.35 which was furthermore proposed to be moved in section 8 (see previous comment F-27).			x	see F-27
WNTI-77	6.39	6.39. The results of the ~~receipt inspection~~ **monitoring activities during storage**, if applicable, should be retained by the operating organization of the storage facility, the packaging owner and the owner of the radioactive contents, in accordance with regulatory requirements and the relevant management systems. The results should be made available to other relevant interested parties.	Correction of typo. In accordance with the heading before paras 6.36 to 6.40, para. 6.39 is related to the "monitoring programme during storage", not about receipt inspection. The information related to the management of the results of the receipt inspection is already covered appropriately in para. 6.35.		6.39. The results **of monitoring** activities during storage, if ..		editorial change
WNTI-78	6.39	6.39. The results of the receipt inspection, if applicable, should be **maintained throughout the service life of the packaging and** retained by the operating organization of the storage facility, the packaging owner and the owner of the radioactive contents, in accordance with regulatory requirements and the relevant management systems. The results should be made available to other relevant interested parties.	Clarification about the duration for the maintenance of the inspection results.	x	..should be retained throughout the service life of the packaging and..		STEP 10 modification
AUS-30	6.39 (c)	.. may substitute for (~~substitutes~~)…	6.40 c)	x	..may substitute the ..		

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
WNTI-79	6.40	6.40. **Depending on the package design,** ~~T~~the programme of monitoring during storage may include the following: (a) Visual inspection, to detect ageing effects on the accessible packaging component surfaces **(e.g. corrosion, coating defects)**. (b) Non-destructive testing (other than visual inspection), to detect the existence, initiation or propagation of cracks in packaging components, or **a** reduction in thickness of component due to ageing. (c) Inter-lid pressure monitoring, which is conducted continuously or intermittently, and may substitutes the leaktightness inspection of lid seals**, to detect ageing effects on the lid seals**. If no anomaly is detected, this demonstrates that the leaktightness of lid seals has been maintained, and consequently the atmosphere of the cavity has been maintained. Pressure transducers or pressure switches ~~are~~ **may be** used for monitoring the pressure between the lids or the metal seals. Transducers should be periodically calibrated. (d) Dose rate measurements on the surface of the package or around the package, which may be performed continuously or intermittently**, to detect ageing effects on shielding components, from history of the dose rates change and the radioactive decay of the radioactive contents**. (e) Checks for subcriticality, which are normally undertaken through a combination of visual inspections and temperature measurements**, to detect ageing effects on components relied on to maintain subcriticality**. If there is no evidence of excessive mechanical impact to the package, identified during the visual inspection, there should be no change of the packaging configuration, including the fuel basket. If there is no abnormal change in package temperature, this indicates that the heat dissipation performance of the package is maintained as designed and there should be no change of the packaging configuration, including the fuel basket.	Editorial. To assure consistency of style and contents within para. 6.40 and also with para. 6.26.		Depending on the package design, the programme of monitoring during storage may include the following: (a) Visual inspection, to detect ageing effects **and evidence of excessive mechanical impact** on the accessible packaging component surfaces (e.g. corrosion, coating defects). (b) Non-destructive testing (other than visual inspection), to detect the existence, initiation or propagation of cracks in packaging components, or a reduction in thickness of component due to ageing. (c) Inter-lid **or inter-seal** pressure monitoring, which is conducted continuously or intermittently, and may substitute for the leaktightness inspection of lid seals, to detect ageing effects on the lid seals . If no anomaly is detected, this demonstrates that the leaktightness of lid seals has been maintained, and consequently the atmosphere of the cavity has been maintained. Pressure transducers or pressure switches may be used for monitoring the pressure between the lids or the metal seals. Transducers should be periodically calibrated. (d) Dose rate measurements on the surface of the package or around the package, which may be performed continuously or intermittently, to detect ageing effects on shielding components. (e) Checks for subcriticality, which are normally undertaken through a combination of visual inspections and temperature measurements, to detect ageing		a) modified in conjuction with JPN-43 b) accepted c) modified in conjuction with F-29, AUS-30 d) accepted e) accepted f) accepted
JPN-43	6.40 (a)	Visual inspection, to detect ageing effects **and evidence of excessive mechanical impact** to the package on the accessible packaging component surfaces.	6.40 (e) mentions the visual inspection and add text to be consistent.	x			see WNTI-79
F-29	6.40 (c)	Inter-lid **(or inter-seal in case the packaging is stored without its secondary lid)** pressure monitoring, which is conducted continuously or intermittently, and may substitutes the leaktightness inspection of lid seals.	For some package design, the operating instructions allow the loaded packaging to be stored without its secondary lid. In that case, the pressure is monitored between the two seals of the primary lid.		(c) Inter-lid or inter-seal pressure monitoring, which is conducted continuously or intermittently, and may substitute for the leaktightness inspection of lid seals, t**o detect ageing effects on the lid seals**. If no anomaly is detected, this demonstrates that the leaktightness of lid seals has been maintained, and consequently the atmosphere of the cavity has been maintained. Pressure transducers or pressure switches **may b**e used for monitoring the pressure between the lids or the metal seals. Transducers should be periodically calibrated.		see WNTI-79

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
F-30	6.40 (d) and (f)		Dose rate measurements and temperature measurements may be affected by the presence of other package in the storage. It would be helpful to add a sentence or a footnote to mention this explicitly.		(d) Dose rate measurements on the surface of the package or around the package, which may be performed continuously or intermittently, to detect ageing effects on shielding components.	x	It was considered obvious that temperature measurements may be affected by the presence of packages and no more text is needed in the para.
F-31	6.40 (g)	[…] In addition, indirect monitoring from other inspections may be used for early detection of a potential problem with radioactive contents, whenever possible. ~~If no significant event affecting the package occurs or is detected during storage, changes in the condition of the contents that could affect the safety of the package are not to be expected.~~	This is a too affirmative statement.		[…] In addition, indirect monitoring from other inspections may be used for early detection of a potential problem with the radioactive contents, whenever possible. If no significant event affecting the package occurs or is detected during storage, changes in the condition of the contents that could affect the safety of the package **can be reasonably expected not to arise, on the basis of an appropriate justification**.		see WNTI-80
WNTI-80	6.40 (g)	(g) Depending on the type of radioactive content stored, the monitoring programme could rely on the inspection prior to storage, use of test or research results and safety analyses to demonstrate that the radioactive content is maintained during storage. In addition, indirect monitoring from other inspections may be used for early detection of a potential problem with radioactive contents, whenever possible. If no significant event affecting the package occurs or is detected during storage, changes in the condition of the contents that could affect the safety of the package ~~are not to~~ **can** be **reasonably** expected **not to arise**.	The final statement is an 'absolute' that cannot be made without reference to a package.		[…] In addition, indirect monitoring from other inspections may be used for early detection of a potential problem with the radioactive contents, whenever possible. If no significant event affecting the package occurs or is detected during storage, changes in the condition of the contents that could affect the safety of the package **can be reasonably expected not to arise, on the basis of an appropriate justification**.		see F-31
WNTI-81	6.41	The same inspection methods as described in paras 6.29–6.31 should be conducted. Some types of inspection can be conducted directly, while others (e.g. cavity pressure, subcriticality and radioactive contents) should be substituted by records of visual inspection, inter-lid pressure monitoring, and temperature measurement during storage. Such substitutions should be carefully justified **in the section dealing with "Ageing Considerations" of the package design safety report**.	The revised statement gives the reader clear guidance on where to present a justification.		1.1. The recommendations provided in paras 6.28—6.29 on pre-shipment inspection of the package before loading for storage or before shipment to the storage facility should apply for this pre-shipment inspection. Some types of inspection can be conducted directly, while others (e.g. checks of cavity pressure, subcriticality and radioactive contents) should be substituted by records of visual inspection, inter-lid pressure monitoring, and temperature measurement during storage. Such substitutions should be justified on the basis of the package design safety report.		Simplification of reference to PDSR.
US-17	6.41 - 6.43	Correct numbering in this section. There is a 6.41 followed by a 6.41bis. Renumber 6.42 and 6.43 accordingly.	typo	x	WNTI-81 modified		
CDN-48	6.41 title	~~*Pre-shipment inspection of package intended for shipment after storage*~~ *Package inspection before shipment after storage*	Improved consistency and clarity.		ok	x	see CDN-44 and WNTI-69

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MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
WNTI-82	6.41bis	6.41bis. Specifically, if the following points are confirmed, it can be judged that no abnormal change in the condition of spent fuel occur~~s~~**ed** [11]: (a) Moisture is removed and inert gas is filled in a way that satisfies the design condition during preparation of the ~~dual purpose cask~~ packages in the power plant. (b) ~~Dual purpose cask p~~**P**ackages pass the inspection of contents for transport~~ation~~ from the power plant to the storage facility, and there are no abnormal external forces added during transport~~ation~~. (c) There have been no incidents that may damage the integrity of the spent fuel during storage. (d) The inert atmosphere of the ~~dual purpose cask~~ **packaging** has been maintained during storage. Consequently, when the ~~dual purpose cask~~ packages are shipped from the storage facilities, especially if there is no fuel reloading equipment, the inspection of the contents during the pre-shipment inspection can be substituted by the documents that confirm the **above** listed items.	Editorial. The wording "dual purpose cask package" seems inappropriate. It should be "dual purpose cask" or "package". It is suggested to use the term "package", which is more general.		6.40. If the following points are confirmed, it can be concluded that there have been no abnormal changes in the condition of the spent fuel [12]: (a) During preparation of the package at the nuclear power plant, moisture was removed and the package was filled with inert gas in a way that satisfies the design conditions; (b) The package passed the inspection of contents for shipment from the nuclear power plant to the storage facility, and no abnormal external forces were exerted during transport; (c) There were no incidents that might have damaged the integrity of the spent fuel during storage; (d) The inert atmosphere inside the package has been maintained during storage. Consequently, when the package is shipped from the storage facility, especially if there is no fuel reloading equipment, the inspection of the contents during the pre-shipment inspection can be substituted by the documents that confirm the listed items.		more general term 'package' was used instead of 'dual purpose casks'.
D-21	6.41bis (a)	"Moisture is removed and inert gas is filled in a way that satisfies the design condition during preparation of the dual purpose cask packages in the nuclear power plant."	Ensuring consistency with the terminology used in other IAEA safety standards as well as in the IAEA Nuclear Safety and Security Glossary, 2022 (Interim) Edition. The original text has been taken from IAEA-TECDOC-1938, (see Section 1.7.4.2 therein), which was not subject to a rigorous review process by Standards Specialists with regard to terminology.	x			
D-22	6.41bis (b)	"Dual purpose cask packages pass the inspection of contents for transportation from the nuclear power plant to the storage facility, and …"	Ensuring consistency with the terminology used in other IAEA safety standards as well as in the IAEA Nuclear Safety and Security Glossary, 2022 (Interim) Edition.	x			
JPN-44	6.41bis (b)	(b)Dual purpose cask packages pass the inspection of contents for **transport** ~~transportation~~ from the power plant to the storage facility, and there are no abnormal external forces added during **transport** ~~transportation~~.	IAEA terminology.		(b) Package passes the inspection of contents for **shipment** from the nuclear power plant to the storage facility, and there are no abnormal external forces added during transport.		Use of 'shipment' was considered more precise.
D-23	6.41bis (d)	"The inert atmosphere inside ~~of~~ the dual purpose cask has been maintained during storage."	The inert atmosphere is inside the cask containing the spent nuclear fuel.	x			

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Step 9 Member States' comments resolution table (input for STEP 10)

MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
WNTI-84	6.41ter (new)	**6.41ter. The results of the pre-shipment inspection of packages for shipment after storage should be maintained throughout the service life of the packaging and retained by the operating organization of the storage facility, the packaging owner and the owner of the radioactive contents (with copies provided to other responsible parties, as appropriate) in accordance with regulatory requirements and the relevant management systems. These records should be used as part of the evaluation of ageing effects.**	Clarification. How the results of the inspection should be maintained and retained is defined in para. 6.39 for the receipt inspection, and the same should be defined for pre-shipment inspection for shipment after storage. It is proposed to include, in a new para. 6.41ter, a text similar to the current text in para. 6.39.		6.41ter. The results of the pre-shipment inspection of **package intended** for shipment after storage are expected to be recorded in accordance with regulatory requirements and the relevant management systems throughout the service life of the packaging and should be retained by the **organization responsible for storage**, the packaging owner and the owner of the radioactive contents. The results should be made available to other interested parties and should be used as part of the evaluation of ageing effects. 6.39 [..] retained by the **organization responsible for the storage**, [..]parties a**nd should be used as part of evaluation of ageing effects**. 6.35 [..] retained by the **organization responsible for the storage,** the packaging owner and the owner of the radioactive contents, in accordance with regulatory requirements and the management system. The results should be made available to other relevant interested parties an**d should be used as part of the evaluation of ageing effects.**		Similar changes were introduced in paras 6.41ter, 6.39 and 6.35. 'organisation responsible for storage' - modified throuhgout the whole document (instead of operation organization or any other wording)
F-32	7.1	The owner and user of the packaging is subject to the supervision of the competent authority. When necessary, the competent authority may make specific arrangements for the supervision of ageing management and maintenance programmes for transport packages — in accordance with the characteristics and conditions of use of the packages — and organize compliance inspection accordingly, including on-site. **In addition, when the package (for example a dual cask) is used as storage container, the operator if the storage facility is likely to be regulated as a nuclear facility by a regulatory body which may be different from the competent authority (see para 9.1 and 9.2). In such situation, cooperation between both regulators should be encouraged**	Not fully true. When a cask is used for dry spent fuel storage at a nuclear installation, the regulatory body is not anymore the transport regulator but the nuclear regulator…		9.1bis When a package is used for storage, the storage facility might be regulated by a regulatory body different from the competent authority for transport. In such a case, cooperation between both should be encouraged.		It was considered more appropriate to add new para to section 9 focusing on interfaces between transport and storage.
JPN-45	7.1	The owner and user of the packaging **may be** ~~is~~ subject to the supervision of the competent authority.	The supervision of the competent authority is not always required for all types of packages.		Both the owner and the user of the packaging **should be** ~~may be is~~ subject to supervision by the competent authority.		It is considered as appropriate guidance.
WNTI-86	7.1	7.1. The owner and user of the packaging is subject to the supervision of the competent authority**, within the compliance assurance activities of the competent authority**. When necessary, the competent authority may make specific arrangements for the supervision of ageing management and maintenance programmes for transport packages — in accordance with the characteristics and conditions of use of the packages — and organize compliance inspection accordingly, including on-site.	To clarify that the supervision of the competent authority is not necessarily a 100% supervision.			x	SSG-78 is introduced in 7.2, moreover it is considered that supervision might have a broader scope than activities under compliance assurance programme.

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MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
D-24	7.2	"These can be used as examples to develop specific ageing management and maintenance ~~management~~ checklists."	The sentence relates to two different checklists – one on ageing management, and another one on maintenance. The modified wording is consistent with the title of Section 7 as well as with the wording in other paras of that Section.	x			
JPN-46	7.3	The manufacture of transport **packagings** ~~packages~~ (including the production of spare parts) **may** ~~should~~ also be subject to surveillance by the competent authority.	Graded approach is important. (All types of package don't need the supervision of the competent authority.)		The manufacture of **packagings** (including the production of spare parts) should also be subject to surveillance by the competent authority.		see WNTI-87
WNTI-87	7.3	7.3. The manufacture of transport packag~~es~~**ings** (including the production of spare parts) should also be subject to surveillance by the competent authority**, within the compliance assurance activities of the competent authority**.	Clarification. The supervision of the competent authority is not necessarily a 100% supervision.		The manufacture of **packagings** (including the production of spare parts) should also be subject to surveillance by the competent authority.		The intention of this section is not to describe the activities of the competent authorities, but to 'inform' other stakeholders where they should expect the involvement of the authority regarding ageing management and maintenance.
CH-21	8.2	that a *competent authority* issue**s** a certificate	Typo: might be "issues" instead of "issue"			x	Citation of SSR-6
D-25	8.3	"~~Para.~~ Paragraph 613A of the Transport Regulations requires the consideration of …"	In IAEA safety standards, the term 'paragraph' is generally shortened to 'para.' (Singular) or 'paras' (Plural), except at the very beginning of a sentence (first word), where it is always written in full. See the related provision in the IAEA Style Manual for Publications and Documents in English, 2005 Edition. Compare also with the wording in paras 8.1, 8.2 and 8.5 of this Safety Guide.	x			
JPN-47	8.3	**Paragraph** Para. 613A of the Transport Regulations requires …	IAEA grammar to type out the first word of sentence.	x			
D-26	8.3	"These considerations should be included in the package design safety report as ~~stated~~ recommended in SSG-66 [3]."	More appropriate wording: replace the verb "stated" by "recommended".	x			
F-33	8.4	For the package design approvals for Type B(U), Type B(M) and Type C packages ~~that are to be used for shipment after storage~~, ageing mechanisms are required to be considered in the safety analysis and the operating and maintenance instructions (see para. 809(f) of the Transport Regulations). In addition, ~~for~~ **if** such packages **are to be used for shipment after storage**, a gap analysis programme is also required (see para. 809(k) of the Transport Regulations).	As a result of the SSR-6 revision process, the proposed text of the para 809(f) according to the draft as per SPESS STEP 11 (Second review of the draft publication by the Review Committees) is no longer solely applicable to packages which are to be used for shipment after storage.		For package designs requiring competent authority approval for Type B(U), Type B(M) and Type C packages ~~that are to be used for shipment after storage~~, ageing mechanisms are required to be considered in the safety analysis and the operating and maintenance instructions (see para. 809(f) of the Transport Regulations). In addition, ~~for~~ **if** such packages **are to be used for shipment after storage**, a gap analysis programme is also required (see para. 809(k) of the Transport Regulations).		For a package design requiring competent authority approval, justification of considerations to ageing mechanisms, and operating and maintenance instructions are required to be included in the application for approval (see paras 809 (d) and 809 (f) of the Transport Regulations). In addition, if such a package is to be used for shipment after storage, a gap analysis programme is also required (see para. 809(k) of the Transport Regulations).

MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
JPN-48	8.5	The package ~~-~~**manufacturer** ~~designer~~ should supply the necessary manufacturing documentation of the packaging to the owner of the packaging.	It is a manufacturer who submits the documents related to manufacture.		The package designer (or the manufacturer, when it is the supplier of the packaging) should supply to the owner of the packaging the manufacturing documentation of the packaging, confirming its compliance with the package design. This may include written certification that the packaging complies with all manufacturing and testing requirements, as well as copies of quality records, results of manufacturing inspections, 'as built' drawings and certificates. The		see CH-22
CH-22	8.5	The owner of the packaging should ~~supply further~~ **forward** that documentation to the user of the packaging.	Wording could be improved.		The package designer (or the manufacturer, when it is the supplier of the packaging) should supply to the owner of the packaging the manufacturing documentation of the packaging, confirming its compliance with the package design. This may include written certification that the packaging complies with all manufacturing and testing requirements, as well as copies of quality records, results of manufacturing inspections, 'as built' drawings and certificates. The owner should forward the documentation confirming its compliance with the package design to the user of the packaging.		see JPN-48
WNTI-88	8.5	8.5. (…). The ~~package designer~~ **packaging manufacturer** should supply the necessary manufacturing documentation of the packaging to the owner of the packaging.	The package designer may not be responsible for the manufacture of the packaging		The package designer (or the manufacturer, when it is the supplier of the packaging) should supply to the owner of the packaging the manufacturing documentation of the packaging, confirming its compliance with the package design. This may include written certification that the packaging complies with all manufacturing and testing requirements, as well as copies of quality records, results of manufacturing inspections, 'as built' drawings and certificates. The owner should forward the documentation confirming its compliance with the package design to the user of the packaging.		See JPN-48 and CH-22

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
WNTI-89	8.5	8.5. (…). The package designer should supply the necessary manufacturing documentation of the packaging to the owner of the packaging. The owner of the packaging should supply ~~further~~ that documentation to the user of the packaging **as is necessary for the user to fulfil their responsibilities**. This may include a written certification that the packaging complies with all manufacturing and test requirements, as specified by the owner (or its delegate), and the copies of quality records, results of manufacturing inspections, 'as built' drawings and certifications.	Remove "further", it is confusing. Only necessary information should be shared. There is no need to share all information.		The package designer (or the manufacturer, when it is the supplier of the packaging) should supply to the owner of the packaging the manufacturing documentation of the packaging, confirming its compliance with the package design. This may include written certification that the packaging complies with all manufacturing and testing requirements, as well as copies of quality records, results of manufacturing inspections, 'as built' drawings and certificates. The owner should forward the documentation confirming its compliance with the package design to the user of the packaging.		See WNTI-88, CH-22 and JPN-48
D-27	8.6	"To fulfil para. 502 and para. 503 of the Transport Regulations, a pre-shipment inspection (see Section 6 of this Safety Guide) ~~is required to~~ should be conducted to demonstrate compliance with the applicable requirements."	In contrast to IAEA Safety Requirements publications, IAEA Safety Guides do not establish any requirements.	x			
JPN-49	8.7	Results of manufacturing inspections, pre-shipment inspections and inspections during maintenance should be kept by ~~the designer,~~ owner or user of the **packaging** ~~package, and the packaging manufacturer~~, as applicable, to demonstrate that the safety functions are maintained.	In general, the owner or user of the packaging should be responsible to demonstrate that the safety functions are maintained.		Results of manufacturing inspections, pre-shipment inspections and inspections during maintenance should be kept, in accordance with the relevant management systems, by the package designer, the owner or user of the packaging, the packaging manufacturer, and the organization in charge of maintenance or storage, as applicable, throughout the service life of the packaging, to demonstrate that the safety functions are maintained.		see WNTI-90
WNTI-90	8.7	8.7. Results of manufacturing inspections, pre-shipment inspections and inspections during maintenance should be kept by ~~the designer,~~ owner or user of the ~~package~~ **packaging**, and the packaging manufacturer, as applicable, to demonstrate that the safety functions are maintained.	In general, the owner or user of the packaging should be responsible to demonstrate that the safety functions are maintained, and the designer is responsible only for its design		Results of manufacturing inspections, pre-shipment inspections and inspections during maintenance should be kept, in accordance with the relevant management systems, by the package designer, the owner or user of the packaging, the packaging manufacturer, and the organization in charge of maintenance or storage, as applicable, throughout the service life of the packaging, to demonstrate that the safety functions are maintained.		See JPN-49
WNTI-91	8.8	8.8. In preparation for the pre-shipment inspections after ~~extended~~ storage, all results of the previous inspections and monitoring should be maintained by the organization responsible for the storage of the package, and delivered to the user of the package responsible for the shipment after storage.	"Extended storage" is not defined in the Safety Guide, and the wording "storage" is sufficient. The wording "storage" is sufficient, because para. 8.8 remains valid, whether it is "extended" storage or "normal" storage.	x			

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MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
D-28	8.9	"If necessary, an ageing management review should be completed by the package designer for the affected components."	Grammatical correction.	x			
JPN-50	8.9	…If necessary, an ageing management review should be completed by package designer for the affected components **(see para. 5.16 – 18)**.	Relevant paras are referred.		(see paras 5.16 – 5.18).		typo correction
US-18	8.10	This paragraph identifies the information that should be considered in package renewals. This paragraph should include a specific consideration for changes described in Paragraph 8.9.	The changes to the package described in paragraph 8.9 need to be considered in renewals.		8.9 … affected components. **Depending on the result of this review, the package design safety report should be updated and, if applicable, an application for revision of the approval of the package design should be considered.**		Proposal was adressed in para 8.9 instead 8.10.
AUS-31	9. title	INTERFACES BETWEEN TRANSPORT AND STORAGE, AND BETWEEN COUNTRIES OF ORIGIN, STORAGE, AND USE OF A PACKAGE	Current heading is confusing and inconsistent with the contents of the section.			x	It was considered adequate.
US-19	9.1	Change last sentence as follows: In most cases, the approach to ageing management may be common; however, evaluations may differ between transport and storage, because the environment, duration, and loading conditions are different.	The typical time in service in transportation and storage operations can be significantly different.	x			
F-34	9.2	The operating organization of the storage facility should take into account both the ageing management and maintenance programme included in the package design safety report (i.e. in the sections on 'AGEING CONSIDERATIONS' and 'MAINTENANCE') **and the requirements on ageing management and maintenance applicable to SSC installed at the storage facility**, in the development of its own ageing management programme.	The storage facility, if a nuclear installation e.g. a NPP), will also have requirements on ageing management and maintenance of safety (related) structures and components…			x	It is not considered necessary to specify further the requirements applicable to SSC, as it is covered by the later part of the sentence already.
JPN-51	9.4	The applicant for package design approval in the country of storage should obtain ~~as much of the relevant~~ **necessary** information**, including that on the safety assessment,** ~~as possible~~ from the package designer and/or the competent authority of the country of origin to fully understand the contents and background of the original application.	"as much as possible" seems insufficient. Information in para, 9,5 is included.		9.4. The applicant for package design approval in the country of storage should obtain the necessary information from the package designer and/or the competent authority of the country of origin that helps to fully understand the contents and background of the original application. This should include information on ageing considerations, maintenance (e.g. monitoring during storage), requirements for shipment after storage and the gap analysis programme. 9.5 as original (not changed)		See WNTI-92
WNTI-92	9.4	9.4. The applicant for package design approval in the country of storage should obtain as much of the ~~relevant~~ **necessary** information, as ~~possible~~ **permitted by appropriate agreements,** from the package designer and/or the competent authority of the country of origin**. This is to help** to fully understand the contents and background of the original application. This should include information on ageing considerations, maintenance (e.g. monitoring during storage), requirements for shipment after storage and the gap analysis programme.	Clarifications. 1. Precision about what is meant by "relevant". 2. Precision about what is meant by "possible".		The applicant for package design approval in the country of storage should obtain the necessary information from the package designer and/or the competent authority of the country of origin that helps to fully understand the contents and background of the original application. This should include information on ageing considerations, maintenance (e.g. monitoring during storage), requirements for shipment after storage and the gap analysis programme.		See JPN-51

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
JPN-52	9.5	~~Before issuing the package design approval, the competent authority of the country of storage should obtain information on the safety assessment from the competent authority of the country of origin of the design.~~	Inclusion in para. 9.4 is proposed.			x	see WNTI-92 and JPN-51
WNTI-93	9.6	9.6. Irrespective of the status of the original package design approval, the following should be considered. **If the following is not implemented, alternative ageing management programme and maintenance programme should be submitted to the competent authority in the country of storage for assessment.**	The requirement to 'consider' the following is passive and not mandatory. If a user is going to consider the requirements and reject or change the maintenance requirements, then the local competent authority should have the chance to review the arrangements		9.6. Irrespective of the status of the original package design approval, the following should be considered: (a) The packaging owner, the user of the package and the operator of the storage facility in the country of storage should implement, as relevant, the provisions of the ageing management programme and maintenance programme included in, **or based on,** the package design safety report that supports the package design approval issued by the competent authority in the country of origin.		Proposal was adressed by adding 'or based on'
F-36	Appendix I	General comment regarding Appendix I The structure of the Safety Guide is questionable as, although it is mentioned in the para 1.10 that "Appendix I provides examples of approaches for consideration of ageing mechanisms in package design", this Appendix is not limited to examples but also provides important recommendations to be considered. It should be decided whether the appendix should remain as it is drafted (in that case, the use of the term example should be avoided when referring to this appendix) or part of it should be incorporated in the body text of the Safety Guide in a dedicated section (in that case the appendix could be kept only with some examples such as the table I.1).			Table I.1 of Appendix I was transformed to Annex I Appendix I was redrafed to avoid word 'example'		Appendix I and Appendix II contain valuable information for this guide. However, it was recognized that the wording ''Example'' needs to be removed from both appendices. The text of both appendices will be reviewed to distinguish between recommendations and examples. Table I.1 was moved to Annex I as providing an example on scope setting table. See F-35.
F-35	Appendix I Appendix II	Transform appendices I and II into annexes	Examples only.		Table I.1 of Appendix I was transformed to Annex I Appendix I was redrafed to avoid word 'example'		Appendix I and Appendix II contain valuable information for this guide. However, it was recognized that the wording ''Example'' needs to be removed from both appendices. The text of both appendices will be reviewed to distinguish between recommendations and examples. Table I.1 was moved to Annex I as providing an example on scope setting table. See F-36.

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
F-37	Appendix I I.1	~~Based on the service life of the package and the environmental and loading conditions (see paras 3.2–3.6), the potential ageing mechanisms for each packaging component and material should be selected.~~**As recommended in paras 4.1 and 4.2, the identification of potential ageing mechanisms that are relevant to the package design, taking into account the environmental and loading conditions during the service life of the package should be addressed by the package designer and documented in the package design safety report.** […]	ppendix I is supposed only to contain example of the process recommended in Para 4.2 of the body text. Therefore, it is proposed to rephrase the Para I.1 to refer to the existing recommendations in paras 4.1 and 4.2.			x	It was considered not necessary to repeat paras 4.1 and 4.2 in the appendix. Additionaly, the approach to appendix I was change and no longer provide only examples, but additional information.
D-29	Appendix I I.2	"Table I.1 shows examples of a variety of packages and possible ageing mechanisms, in which the letter "Y" (yes) ~~(Y)~~ indicates that the mechanism should be considered."	Editorial correction for ensuring consistency with the wording in the subsequent para. I.3, item (a), 1st sentence.	x			Move table I.1 to Annex (I)
UK-10	Appendix I I.3 (a)	"Y" (yes) is used to indicate all ageing mechanisms that are possible. If a mechanism can be excluded through subsequent evaluation, the reason for this should be stated in the package design safety report (i.e. in the section on 'AGEING CONSIDERATIONS'). Any mechanisms excluded for the material ~~can be~~ have been left blank ~~or marked as "N" (no)~~.	The text is describing the table contents – "N" is not used in the table and adds confusion.	x			Move I.3 to Annex (I)
JPN-54	Appendix I I.4 (i)	(i) Depletion of the ^{10}B content of neutron **absorbing** ~~shielding~~ material due to neutron irradiation;	Neutron absorbing material (e.g basket) seems appropriate to be consistent to I.5(c).	x			

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
WNTI-95	Appendix I I.4 (i)	(i) Depletion of the ^{10}B content of neutron ~~shielding~~ **absorbing** material due to neutron irradiation;	Neutron absorbing material (e.g. basket) seems appropriate to be consistent with para. I.5 (c).	x			
JPN-55	Appendix I I.4 (j)	(j) Initiation of the hydride reorientation due to stress and temperature **during** loading **and storage**.	Temperature histories during both loading (drying process) and storage are important.		(j) Initiation of hydride reorientation due to stress and temperature **during** loading **of spent fuel assemblies;**		see WNTI-96
WNTI-96	Appendix I I.4 (j)	(j) Initiation of the hydride reorientation due to stress and temperature **during** loading **of spent nuclear fuel assemblies**.	Clarification.		(j) Initiation of hydride reorientation due to stress and temperature **during** loading **of spent fuel assemblies;**		see JPN-55
F-39	Appendix I I.5	**As recommended in para 4.2, b**~~B~~ased on the results obtained from the first step of evaluation (e.g. quantitative changes in material properties, material strength), the consequences on the safety functions of the package due to ageing mechanisms should be assessed by the package designer in the package design safety report (i.e. in the section on 'AGEING CONSIDERATIONS'). […]	Appendix I is supposed only to contain example of the process recommended in Para 4.2 of the body text. Therefore, it is proposed to introduce a reference to the existing recommendation in para 4.2.			x	It was considered not necessary to repeat para 4.2 in the appendix. Additionaly, the approach to appendix I was change and no longer provide only examples, but additional information.
US-20	Appendix I.5 (a)	Generally, irradiation damage does not result in a decrease in the yield strength of engineering alloys used as structural components in a transportation package. Embrittlement and a decrease in ductility are a concern but as noted in Paragraph 4.10, this typically only occurs after very high neutron irradiation levels. Consider revising to address the decrease in ductility	Revise to be consistent with expected response of materials exposed to high neutron irradiation levels.		a) For structural components, changes in materials caused by high irradiation might lead to embrittlement of the components..		Text of para I.5 (a) was modified in consideration of the comment.
JPN-56	Appendix I I.5 (b)	The breakage of thermal conductor (copper plates) in the neutron shielding layer **exterior the packaging shell, or among the basket plates in the cavity**, disrupting heat conduction through the plate, and thereby degrading heat dissipation and inducing a potential increase of the temperature of the **packaging components or radioactive contents (e.g. fuel pins)** ~~fuel basket~~ and consequently a decrease in mechanical properties.	It should not limit only to basket and more general wording should be used.			x	It was considered too specific as this para is giving only typical examples of consequences of ageing mechanisms.

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
US-21	Appendix I.5 (d) and I.12 (d)	In addition to loss of hydrogen contained in neutron shielding due to heat, the polymeric materials may also shrink and crack leading to streaming paths	Revise to be consistent with expected response of materials exposed to elevated temperature.		d) The loss of hydrogen and the shrinking and cracking of polymeric material used in neutron shielding due to irradiation and heat might lead to a degradation of the shielding capability and increase in the external dose rate around the package.		
AUS-32	Appendix I I.6 (a)	.. do not exceed thresholds….	This may raise the question of whether the materials/components conform to the standard.			x	It was considered that the sentence implies that the materials must meet specific standards regarding their ageing properties. Also, it emphasizes the importance of selecting materials that comply with the ageing thresholds set by the standards.
AUS-33	Appendix I I.9	….before their performance is degraded to the extent that it reaches or exceeds predetermined thresholds.	Current sentence is confusing		Components should be replaced, as appropriate, before their performance is degraded to the extent that predetermined ageing thresholds would be reached.		See WNTI-97
CH-24	Appendix I I.9	Components should be replaced, as appropriate, before their performance is degraded to the extent that predetermined ageing thresholds **are violated**.	Something seems to be missing.		Components should be replaced, as appropriate, before their performance is degraded to the extent that predetermined ageing thresholds would be reached.		See WNTI-97
WNTI-97	Appendix I I.9	Components should be replaced, as appropriate, before their performance is degraded to the extent that predetermined ageing thresholds **would be reached**. This approach is applicable to a component designed to be replaced or refurbished during either operation or maintenance of empty packaging. The thresholds should be set at levels at which the safety functions of the package might be affected, or else at a detectable value determined by the evaluation of ageing effects. The package designer should provide instructions that are reflected in maintenance programmes, for detecting ageing prior to thresholds being exceeded, and for replacing or repairing components, for example as follows: (…)	Correction of an omission	x			
JPN-57	Appendix I I.9 (b)	Replacing a metallic gasket for the second lid of a package intended to be used for transport after storage of spent fuel, after a**n unacceptable** drop of the inter-lid pressure is detected, and the integrity of metallic gasket for the primary lid is proven;	For clarification. The pressure will drop gradually even if the lid is intact.	x			
JPN-58	Appendix I I.9 (d)	Refurbishment actions (e.g. repainting) **from the findings of maintenance activities.**	For clarification.	x	..) on the basis of the findings of maintenance activities.		
WNTI-98	Appendix I I.9 (d)	(d) Refurbishment actions (e.g. repainting) **from the findings of maintenance activities**.	Clarification	x	..) on the basis of the findings of maintenance activities.		

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Step 9 Member States' comments resolution table (input for STEP 10)

MEMBER STATES' COMMENTS				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
JPN-59	Appendix I I.11 (b)	(b) ~~In designing the heat dissipation performance of the package, it can be ensured that related parameters (e.g. temperature and stress of the component of concern) do not result in excessive creep in the component material during operation. This should be achieved by restrictions on the radioactive content, to ensure that the heat dissipation rate is in accordance with the maximum value stated in the package design safety report (i.e. in the section on 'SPECIFICATION OF THE CONTENTS').~~ ~~(c)~~ In designing the heat dissipation performance of the package, it can be ensured that related parameters (e.g. temperature of the component of concern) do not result in exceeding the predetermined temperature limit of the component material, to prevent the initiation of ageing (e.g. **creep,** annealing of embrittlement and hydride reorientation) during operation. This should be achieved by restrictions on the radioactive content, to ensure that the heat dissipation rate is in accordance with the maximum value stated in the package design safety report (i.e. in the section on 'SPECIFICATION OF THE CONTENTS').	(b) can be combined with (c) noting "creep" included, as (b) and (c) are almost same sentences.		(b) In designing the heat dissipation performance of the package, it can be ensured that related parameters (e.g. temperature **and stress** of the component of concern) do not result in exceeding the predetermined temperature limit of the component material, to prevent the initiation of ageing (e.g. annealing of embrittlement and hydride reorientation, or creep) during operation. ...		see WNTI-99
WNTI-99	Appendix I I.11 (b)	(b) ~~In designing the heat dissipation performance of the package, it can be ensured that related parameters (e.g. temperature and stress of the component of concern) do not result in excessive creep in the component material during operation. This should be achieved by restrictions on the radioactive content, to ensure that the heat dissipation rate is in accordance with the maximum value stated in the package design safety report (i.e. in the section on 'SPECIFICATION OF THE CONTENTS'). (c)~~ In designing the heat dissipation performance of the package, it can be ensured that related parameters (e.g. temperature **and stress** of the component of concern) do not result in exceeding the predetermined temperature limit of the component material, to prevent the initiation of ageing (e.g. annealing of embrittlement and hydride reorientation**, or creep**) during operation. This should be achieved by restrictions on the radioactive content, to ensure that the heat dissipation rate is in accordance with the maximum value stated in the package design safety report (i.e. in the section on 'SPECIFICATION OF THE CONTENTS').	(b) and (c) are almost same and (b) can be deleted.	x			
WNTI-100	Appendix I I.12	A package design may be based on the properties of aged component materials; however, caution should be taken when considering these properties. Such properties are often estimated by exposing materials to very severe environments to accelerate the ageing mechanism and shorten the time of the experiment. Hence, the acceleration method and the extrapolation of the obtained data should be fully justified, **including uncertainty quantification,** to ensure that they are representative of appropriate (and not unduly conservative) properties. Some examples of this approach include the following: (…).	Quantifying uncertainty in these analyses can help inform the decision of the assessor	x			
US-22	Appendix I.12(c)	Unclear how the increased leak rate of an aged metallic gasket in the evaluation of a radioactive Release would be estimated or verified.	Guidance is not clear	x			Bullet point c) was deleted to avoid confusion.

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
F-38	Appendix I Table I.1		For consistency with para 3.7, the table I.1 of the Appendix I could be expanded to consider all the relevant ageing mechanisms specific to transport packagings listed in para 3.7.			x	Table I.1 is considered as only an example.
JPN-53	Appendix I Table I.1	Fresh Fuel (Type AF, Type IPF~~, B(U)F~~)	Fresh Fuel is seldom transported by Type B(U)F.			x	Table I.1 is considered as only an example.
CH-23	Appendix I Table I.1		Layout of Table should be improved: - 1st row to be repeated on each page. - Information for one package type should be kept together on same page.	x			
WNTI-94	Appendix I Table I.1 First Column	(…) UO_2 (Type AF, Type I~~P~~F) Fresh ~~F~~fuel (Type AF, Type I~~P~~F, B(U)F) Dual purpose cask Spent ~~F~~fuel (Type B(U)F, Type B(M)F, Type CF)	Editorial	x			
UK-09	Appendix I Table I.1 UO2 Lid	No proposed new text, however table I. 1 could be considered to be providing technical information about materials identified. Should the materials be more generic? Also note there are inconsistencies between similar materials and the aging mechanisms identified in the table. For example: Differences between pitting corrosion and stress corrosion cracking on two lines.	Add clarity to the reader so that they do not think this table is giving technical advice and make it clear that it is an example for reference only.		Table 1 of Appendix 1 and paras I.2-I.3 were moved to Annex I		Table 1 of Appendix 1 paras I.2-I.3 were moved to Annex I and is providing an example only.
WNTI-101	Appendix II II.1	II.1. The ageing management programme for transport packages should be developed using a structured methodology to ensure a consistent approach in implementing ageing management. The programme should be developed considering all safety relevant components of the package. In practice, ageing mechanisms and effects are studied and managed at the component level. However, the ageing management programme for individual components ~~may~~ **should** be integrated into an ageing management programme at the package level.				x	It was considered that both options are possible.

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
WNTI-103	Appendix II II.2	II.2. There are generally four types of activity that should be considered in an ageing management programme: (a) Prevention activities, which prevent ageing effects from occurring (e.g. coating measures to prevent external corrosion of carbon steel overpack components or adequate drying to prevent hydride reorientation in high-burnup cladding alloys). ~~(b) Mitigation activities, which attempt to slow or reduce the effects of ageing.~~ (~~c~~**b**) Condition monitoring activities to identify the presence and extent of ageing effects (e.g. visual inspection of package surfaces for cracking and sensors that monitor package surface temperatures, inter-lid pressure, or fission gases such as 85Kr). (~~d~~**c**) Performance monitoring activities, which verify the ability of the components to perform their intended safety functions (e.g. periodic radiation monitoring and temperature monitoring). **(d) Mitigation activities, which attempt to slow or reduce the effects of ageing.**	The four items contained in (a), (b), (c) and (d) should be ordered in order to follow the orders of the next paragraphs: it is understood that the current (a) correspond to para. II.5, the current (b) correspond to paras II.9 and II.10, the current (c) corresponds to para. II.6 and the current (d) to paras II.7 and II.8. Consequently, it should be better to move up the current (c) and (d), and to have the current (b) in the last position.	x			
CH-25	Appendix II II.2 (a)		"… adequate drying to prevent hydride reorientation in high-burnup cladding alloys…" Not obvious: correlation between drying process and hydride reorientation. Maybe an explanation should be given.			x	It was considered that there is a clear correlation between drying process and hydride reorientation, and no further text to be added in the guide (might be too technical level).
WNTI-102	Appendix II II.2 (c)	(c) Condition monitoring activities to identify the presence and extent of ageing effects (e.g. visual inspection of package surfaces for cracking and sensors that monitor package surface temperatures, inter-lid pressure~~, or fission gases such as ^{85}Kr~~).	It is difficult to find ageing by monitoring fission gasses practically. There is no specific information related to fission gas in this guide.	x			
WNTI-104	Appendix II II.7	II.7. The parameters related to the condition and safety performance of the package should be identified, providing a clear link to the ageing mechanisms listed in the scope of ageing management programme and descriptions of the capability and means of identifying ageing effects or potential degradation before a loss of the safety function (~~S~~see Section 3). The parameters should be used as part of the following: (...)	Typo	x			
AUS-34	Appendix II II.9	.. data and an analysis which (~~that~~) demonstrate..	grammatical	x	..an analysis demostrating that..		
F-41	Appendix III	Transfer Appendix III into the main text	Valuable information on assignement of responsibilities			x	See F-42 and para 1.9.
F-42	Appendix III	General comment regarding Appendix III The objective of the Appendix III seems unclear as most of the recommendations included in this appendix are already in the body text. If the objective is to summarize of the roles and responsibilities of the relevant interested parties, it should be presented as such. The value of this appendix is to be evaluated.			New text added at the beginning of the Appendix III: The purpose of this appendix is to summarize the roles and responsibilities of some of the relevant interested parties involved in the ageing management and maintenance of transport packages. The list of relevant interested parties is provided in para. 1.5 and footnote 5.		New text added at the beginning of the Appendix III to clarify the objective of it.

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
JPN-60	Appendix III III.4	The package designer should interact with the relevant interested parties regarding manufacturing, use and maintenance and the operator of the storage facility, if applicable, in order to gather feedback. For transport packages containing spent fuel, the package designer should interact also with the fuel vendors **and the reactor operators** to gather the relevant information regarding the changes in the behaviour of the spent fuel assemblies.	The relevant information should be obtained from not only vendors, but also the reactor operators.		The package designer should interact with the relevant interested parties regarding manufacture, use and maintenance, and with the organization responsible for the storage, if applicable, in order to gather feedback. For transport packages containing spent fuel, the package designer should interact also with fuel vendors and reactor operators to gather the necessary information regarding changes in the behaviour of the spent fuel assemblies.		It was recognized that the full extend of information might not be needed to gather, only the necessary.
JPN-61	Appendix III III.5bis	**III.5bis. The package designer should supply the package design safety report to the owner of the packaging. When required, the designer should supply the report to the consignor who evaluate whether the design is applicable to planned consignment.**	Package design safety report should be supplied to the package owner, and if needed, to the consignor who plans to use the packaging to ship his/her radioactive contents.			x	See WNTI-106
WNTI-105	Appendix III III.7	II.7. Before starting the manufacturing, the manufacturer should ensure that the procedures to be applied are qualified to meet the provisions of the package designer, and are conducted in accordance with their management systems.	Clarification: at the end of the paragraph "management systems" should be plural. Both management systems, of the package of the manufacturer and of the package designer (as far as manufacturing is concerned by the management system of the package designer) should be considered.	x	.. systems of both the manufacturer and the designer.		STEP 10 modification
WNTI-106	Appendix III III.11	III.11. If the owner of the packaging is not the same as the user of the packaging, the owner should be responsible for supplying the **relevant information (e.g. the maintenance instructions) of the** package design safety report to the user.	It is not necessary to provide the whole package design safety report to the user. The maintenance instructions have to be made available to all relevant parties, not the package design safety report. If an organization needs a specific information from the PDSR, only this information has to transmitted to this organization. The full PDSR includes information that does not need to be disclosed to some other parties (e.g. the safety assessment or the properties of some materials) and should be protected as intellectual property. Our proposal is consistent with the guidance provided in para. 5.9.		III.11. If the owner of the packaging is not the same as the user of the packaging, the owner should be responsible for supplying the **necessary information from the** package design safety report to the user.		Text was modified to take into account the comment.
F-40	Appendix III title	ROLES AND RESPONSIBILITIES OF **SOME OF THE RELEVANT** INTERESTED PARTIES IN RELATION TO AGEING MANAGEMENT AND MAINTENANCE OF TRANSPORT PACKAGES	Not of all the 'relevant interested parties' (as listed in the footnote 5 in Para 1.10) are considered in the Appendix III.	x	..responsibilities of relevant interested..		

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
UK-08	Content Table	**APPENDIX I: EXAMPLES OF APPROACHES TO CONSIDER AGEING MECHANISMS IN PACKAGE DESIGN** **APPENDIX II: EXAMPLE STRUCTURE OF AN AGEING MANAGEMENT PROGRAMME FOR TRANSPORT PACKAGES** **APPENDIX III: ROLES AND RESPONSIBILITIES OF INTERESTED PARTIES IN RELATION TO AGEING MANAGEMENT AND MAINTENANCE OF TRANSPORT PACKAGES**	Insert Appendix description into content table for clarity.	x			To follow IAEA style
F-01	general	General comment regarding the inappropriate use of the term 'package' According to para 231 of the transport regulations (SSR-6), Package shall mean the complete product of the packing operation, consisting of the packaging and its contents prepared for transport. In the transport regulations, maintenance applies to packagings (see paras 104, 106, 680, 809, 837 of SSR-6). In the current draft of the Safety Guide, the term 'package' is inconsistently used when addressing maintenance. It is also the case when addressing all aspects related with storage because, especially for dual purpose casks, the stored object is the loaded packaging (i.e. without shock absorbers and sometimes without secondary lid) and not the package in its transport configuration. The current draft is to be revised to consider this inappropriate use of the term 'package'.		x			A specific look on the wording will be performed by inhouse review. Focus on maintenance section, especially on DPC and shipment after storage. Connected with D-01.
D-01	general	There are two options: either 1.) Use one of the terms 'spent fuel' or 'spent nuclear fuel' consistently throughout this publication. or 2.) Add a footnote, similar to Footnote 1 in Safety Guide SSG-15 (Rev. 1), Storage of Spent Nuclear Fuel, which says: "The terms 'spent fuel' and 'spent nuclear fuel' are used throughout this publication in the same meaning."	Throughout this Safety Guide, the terms 'spent fuel' and 'spent nuclear fuel' are used interchangeably.	x			It was decided to use spent fuel instead of spent nuclear fuel. Therefore, the wording will changed, accordingly. Connected with F-01
JPN-03	general	Carefully distinguish and use "package (radioactive contents inclusive)" and "packaging (without radioactive contents)" Eg., Footnote 8 "~~package~~ components" à "**packaging** components	Proper use of technical terms	X			A specific look on the wording will be performed by inhouse review. However, Footnote 8 remains unchanged as the description indicates that the concept of 'package component' includes the radioactive contents in addition to the packaging, which is consistent with the definition of 'package'.

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
US-02	general Clarification of basis for guidance	DS546 (and SSG-26 paragraphs supporting 613A) are improperly based on the principle of "graded approach"	"Graded approach" is defined in IAEA glossary as a **regulatory** process where **regulatory** provisions are drafted to address the different risk and safety hazards associated with a radioactive material or process. IAEA glossary does not include provisions or explanation for use of "graded approach" in guidance material. Tiering of regulations in guidance documents is inappropriate (regulating by guidance).			x	The "graded approach'' concept is used in several IAEA guides. The IAEA Safety Guides such as SSG-26 and SSG-66 use the concept of the "graded approach" based on the objective of para 104 of the Transport Regulations. The Safety Guides provide recommendations and guidance on how to comply with the safety requirements. As defined in the IAEA glossary, an example of a graded approach in general would be a structured method by means of which the stringency of application of requirements is varied in accordance with the circumstances, the regulatory systems used, the management systems used, etc., which can be more than just a regulatory process.
JPN-01	general Contents	(1) Titles of subsection should be written in non all-capital-letters. E.g., **Introduction**~~INTRODUCTION~~ (2) It will be user friendly if numbers of subsection contained in that subsection are added to the end of each subsection title. E.g., Background **(1.1 – 1.3)** (3) Title of each appendix should be added to the appendix number.E.g., APPENDIX I **EXAMPLE TO CONSIDER …**	Editorial (IAEA format)	x			To follow IAEA style
JPN-02	general Contents Appendix	APPENDIX I – III should be titled as ANNEX I – III.	To follow IAEA definition. Current appendices contain examples or good practices, but not supplemental guidance to the main text.			x	Table I.1 was moved to new Annex I as it is providing only an example. The rest of Appendix I and II was reviewed to avoid using word 'example'. See also F-35 and F-36
JPN-06	general Footnote 1	[1] In the context of this Safety Guide, the phrase 'package design safety report' is intended to mean all documentary evidence of compliance of a transport package design with **the** Transport Regulations.	Editorial	x			
JPN-04	general Footnotes	Eg.; 1 ~~In the context of this Safety Guide, the phrase~~ '~~p~~Package design safety report' ~~is intended to~~ mean**s** all documentary evidence of compliance of a transport package design with Transport Regulations.	Editorial Simplification not to be persistent. Applicable to other footnotes.			x	To follow IAEA style.

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
US-01	general SPESS clarification	Clarification needed that DS546 completed SPESS 7b, 7c and 7d	IAEA completed SPESS Step 7a by posting draft guidance document and providing proper time for Safety Standards Committees to provide comment. Clarification requested when IAEA completed SPESS Step 7b, 7c and 7d. These steps require committees to receive, review and approve comment resolution tables and redline copies of drafts.			X	STEP 7a: submitting the draft to review by the Review Committees, by posting it on 22. 3. 2024 along with notification email to TRANSSC (and all other RCs) sent by the Secretariat STEP 7b: took place before the Review Committee meetings, time to review of the draft by the Review Committees members from posting till set deadline (three weeks before first RC meeting) STEP 7c: took place at the meeting of RCs, TO presented draft publication and got the approvals from all RCs. STEP 7d: did not take place as there were no conflicting issues between RCs. See TRANSSC 49 report
AUS-01	general Section 8 or new section	A separate section on 'Management System' will be very useful. This section may include: (a) Management responsibility (b) Resource management – competencies for ageing management, personnel qualifications, training, managing suppliers (c) Process implementation (responsibility and accountability of designers, manufacturers, users etc., analysis of data on changes/failures of safety related components to identify causes of failures/changes, trend analysis etc., specification of scope and frequency of inspections, measures to ensure that ageing management activities are accomplished as specified in the procedures) (d) Assessment and improvement (independent assessment of the ageing management program, audits of adequacy and implementation of the ageing management program, actions for improvement) Or, alternatively Section 8 can be revised	An effective Management is essential for managing safety of a package throughout the lifecycle of the package and the associated activities. Paragraph 3.12 of IAEA Safety Fundamentals states: "Safety has to be achieved and maintained by means of an effective management system. This system has to integrate all elements of management so that requirements for safety are established and applied coherently with other requirements, including those for human performance, quality and security, and so that safety is not compromised by other requirements or demands. The management system also has to ensure the promotion of a safety culture, the regular assessment of safety performance and the application of lessons learned from experience." Paragraph 306 of SSR-6 (Rev.1) states: A management system based on international, national or other standards acceptable to the competent authority shall be established and			x	Management system is recognized as important part and therefore is partially adressed in section 6.13-6.16 with reference to TS-G-1.4 and also in Table 1 in para 4.7.
D-30	Reference [03]	"INTERNATIONAL ATOMIC ENERGY AGENCY, Format and Content of the Package Design Safety Report for the Transport of Radioactive Material, IAEA Safety Standards Series No. SSG-66, IAEA, Vienna (2022) ~~(2021)~~."	The Safety Guide SSG-66 was published in June 2022.	x			

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
UK-01	Reference [03]	INTERNATIONAL ATOMIC ENERGY AGENCY, Format and Content of the Package Design Safety Report for the Transport of Radioactive Material, IAEA Safety Standards Series No. SSG-66, IAEA, Vienna ~~(2021)~~ 2022.	Reference states "Vienna (2021) but standard quotes 2022.	x			
D-31	Reference [05]	"INTERNATIONAL ATOMIC ENERGY AGENCY, Guidebook on Spent Fuel Storage Options and Systems, Technical Reports Series No. 240 …"	This is the correct full designation of the relevant IAEA publication series – see TRS 240.	x			
WNTI-107	References	[5] INTERNATIONAL ATOMIC ENERGY AGENCY, Guidebook on Spent Fuel Storage Options and Systems, Technical Reports Series No. 240 (3rd ~~edn~~ Edition), IAEA, Vienna (2024)	Editorial.		[5] INTERNATIONAL ATOMIC ENERGY AGENCY, Guidebook on Spent Fuel Storage Options and Systems, Technical Reports Series No. 240, IAEA, Vienna (2024).		IAEA citation
D-32	Reference [16]	"T.L. Sanders, et al., "Considerations Applicable to the Transportability of a Transportable Storage cask at the End of the Storage Period", SAND 88-2481, TTC-0841, Sandia National Laboratory, Albuquerque, NM (1991)."	Completion of citation details for SAND 88-2481 – the place and year of publication are missing.	x			
US-23	References	Correct typos in references 17 and 24. Add web links to IAEA and NRC documents.	Reader use.	x			doi links where added where possible
WNTI-108	References	[24] INTERNATIONAL ORGANIZATION FOR STANDARDIZATION, Safe ~~T~~transport of ~~R~~radioactive ~~M~~material — Leakage ~~T~~testing on ~~P~~packages, ISO 12807:2018, ISO, Geneva (2018).	Editorial. Consistency with the formatting of ISO standard.	x			
407				**189**	**168**	**83**	