Comments on: Revision by amendment of Draft Safety Guide DS489 Storage of Spent Nuclear Fuel

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
1	General	The major limit of this exercise is that the Safety Requirement for Fuel Cycle Facilities (NS-R-5) is currently being under revision (DS478) at the step 10 of the SPESS process. This draft DS489 should not be published but should be used as an input for being revisited to get it fully in line with the coming NS-R-5 (FR/ENISS?)	Consistency among Safety Standards	Rejected ok	This isn't a full scale revision of the SSG-15. If the NS-R-5 will be published before this Guide, all contradictions will be managed. Fukushima Daïchi lessons are in the scope of this revision. To be taken into account in a full scale revision
2	General	Please check the terminology, in the guide the term safety case is used for the overall safety assessment. (FIN)	The use of term "safety case" is not well known in all of the MS.	Rejected ok	The term "safety case" is introduced in the IAEA Safety Glossary and used in the IAEA Safety Standards about 10 years.
3	General	Need to be reviewed by TRANSSC. (J)	There are over 26 times of "transport", especially, dual purposes transportations is mentioned in para. 6.2. (b) or somewhere.	Rejected	TRANSSC isn't indicated in the DPP The new project related to dual purpose casks will address this issue.

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No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
4	General		Experience feedback to IAEA secretariat: More detailed description of changes made to the document would facilitate committee members review (e.g. either a "tracked changes" version of original document or a table with new versus original texts). E.g. former paragraph 3.31 has in revised document been split into new paragraphs 3.31 (identical to first sentence of old 3.31). The remaining text from former 3.31 has been modified as new paragraph 3.32. E.g. former paragraph 6.5 has been deleted. E.g. former paragraphs 6.71 and 6.72 has in revised document been merged into new (renumbered) paragraph 6.70 E.g. New text has been introduced as paragraph 6.71	Accepted	

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No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
5	General	There are some small mistakes in the text. For example "body 3" (para 3.3.), "case3" (in the box, Req 3, page 8), "case6" (para 3.18), "vertically. or horizontally" (para 6.2. (b)), "the facility. operational limits" (para 6.103). In addition there are words in the text that are written in a different font than the normal text: "interdependences" (Para 3.2.), "provision" (para 4.8), "and the like" (para 5.1), etc.. (FIN)			
6	General	Spent fuel vs. spent nuclear fuel (CZ)	Use consistent terminology throughout the whole document in line with the IAEA Safety Glossary (spent fuel).	Spent nuclear fuel is consistent with the title and will be used through all the document	
7	General	Spent fuel (ARG)	Instead of "spent nuclear fuel" for consistency with the title, wording and definition of the Joint Convention	Spent nuclear fuel is consistent with the title and will be used through all the document	

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
8	General	Spent fuel (ARG)	Instead of "spent fuel is considered as waste" (and similar statements). For consistency with the definition of spent fuel from the Joint Convention	Spent nuclear fuel is consistent with the title and will be used through all the document	
9	General	The definition of double contingency shall the one of DS478 as approved by CSS (FR) Footnote 11 §6.33e		Consider changing to the IAEA glossary definition	Double contingency principle: a principle applied, for example, in the design of processes for NFCF: a criticality accident would not be possible unless at least two unlikely and independent changes in process conditions were to occur concurrently.
10	General	Reference document numbers should be corrected. (JP)	Ref. [6] has been deleted and Ref. [33] should be renumbered. Some new references may be added.	To be done before publishing	
11	General	Prevention impacts, explosion hazards, corrosion and other physical hazards of spent fuel assemblies and transport casks should be specified in adequate paragraphs. (TUR)	This subjects should be considered.	Rejected in this revision	These issues are addressed in the document. There are not specifically related to Fukushima Daïchi lessons. To be considered in the next full scale review.
12	**General comment**	Correct guide page numbering (PL)	Page numbering starts from "1. INTRODUCTION" section from 1st page number despite that it is 7th actual page.	To be managed	

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No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			Page numbering should start if not from title page of the document, than at least from "CONTENTS" (actual page 5). It should be noted, that in the comments below actual guide page number will be provided.		
13	**General comment** Entire document	Correct and unify text font size in the paragraphs. (PL)	Various size of fonts, i.e. 11 and 10,5 is used in one paragraph sentences for separate words without any order. This causes an impression of messy, irregular text. Some illustration of this issue, where usage of different size of fonts can be easily noticed is paragraphs 1.11 and 3.2, but this remark is valid for entire document. All the regular guide text, except titles of section, subsection, tables, etc. should be converted to 11 font size. Even if mismatch of font size is the result of conversion document to pdf format, other means of conversion should be applied and quality of final pdf format document should be checked and confirmed before	To be managed	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			issue of this document.		
14	**General comment**	1. Correct the font style of same level subchapters and include missing subchapters in the content list. 2. Correct direct access links to page number from content list to chapters and subchapters. (PL)	1. Different fonts (bold) are used for some same level separate subchapters. This affects the formation of Content list and results auto exclusion of these subchapters from content list. Such excluded from content list subchapters are: - "**RESPONSIBILITIES OF THE REGULATORY BODY",** - **"RESPONSIBILITIES OF THE SPENT FUEL OWNER"** Other same level subchapters "RESPONSIBILITIES OF THE GOVERNMENT", "RESPONSIBILITIES OF THE OPERATING ORGANIZATION" has different font style and are included in content list. 2. Direct access links to chapters and subchapters from content list are mismatched	To be managed	

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No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			starting from the link to "COMMISSIONING OF SPENT NUCLEAR FUEL STORAGE FACILITIES" subchapter, page 31. List of content should be updated and properly corrected.		
15	**General comment** Entire document	1. Add and use abbreviation SNF in guide text for better, harmonized and clear meaning of guide recommendations. 2. Clarify the meaning of currently used single term *"storage"* each time it is used in the guide, i.e. should it be understood as an action *"storage of SNF"* or as a facility *"SNF storage facility"*. (PL)	1. Entire guide text is written in such a way, that in most cases the object of consideration is missing. It is understandable, that writing each time *"spent nuclear fuel"* or *"spent fuel"* might not always be very comfortable, but inserting SNF abbreviation in such places as: *"SNF storage facility", "storage of SNF", "SNF cask", "SNF management"*, etc., at least once in the sentence or paragraph will make guide text more harmonized, more clear, smooth and better understandable. Otherwise, full terms *"storage of spent nuclear fuel"*, *"spent fuel storage facility", "spent fuel cask",* etc. should be used, as it must be clearly specified the object of consideration in	Spent nuclear fuel to be consistent with the title. The use of abbreviation is not recommended. To ask for WASSC recommendation: - storage as a process, - storage facility.	

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			each sentence. 2. Also it should be noted, that there are many places in the guide when single term *"storage"* is used. In most such cases it is unclear if it should be understand as *"storage of SNF"*, or as a *"SNF storage facility"*. The guide text should be screened for term *"storage"* and proper clarification should be provided as applicable.		
16	**General comment** Entire document	Add and use abbreviation SSC in the guide text instead of term "Items". (PL)	*"Items important to safety, including structures, systems and components"*, *"items important to safety, i.e. structures, systems and components"*, as well as simple *"items important to nuclear safety"* and *"safety related items"* are widely used in the guide text. According to IAEA Safety Glossary 2016 edition the term SSCs is equivalent to the term "items" and in the context of nuclear safety "items" should be understood as SSCs, i.e. writing *"Items important to safety, including structures, systems and components"* or *"items*	Rejected in this revision. To be considered in the next full scale revision	

Comments on: Revision by amendment of Draft Safety Guide DS489 Storage of Spent Nuclear Fuel

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No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			important to safety, i.e. structures, systems and components" is senseless and should be replaced by simple term *"SSCs important to safety"*. Taking into account that the same term "item" is also used in the guide to name other objects of consideration which are not SSCs, providing abbreviation "SSC" will make guide text more harmonized, more clear, smooth and better understandable. Affected paragraphs at which term "items" should be replaced by abbreviation SSCs are: 5.21(a), 6.8, 6.15, 6.20, 6.21, 6.46(d), 6.53(c), 6.61, 6.97(d), 6.101(b), 6.101(d), 6.101(e), 6.107, 6.108.		
17	**General comment** Entire document	Add the definition of the term *"safety"* in the context of this guide (PL)	The term *"safety"* is used in entire guide, but its meaning should be clarified and specified in the context of this guide. According to IAEA Safety Glossary 2016 edition *"Safety means nuclear safety unless otherwise stated"*. Meanwhile the radiological protection is	Rejected	Safety fundamentals define nuclear safety.

Comments on: Revision by amendment of Draft Safety Guide DS489 Storage of Spent Nuclear Fuel

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No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			defined as: *"The protection of people from harmful effects of exposure to ionizing radiation, and the means for achieving this"*. IAEA Safety Glossary 2016 edition also clarifies, that: "*Safety is primarily concerned with maintaining control over sources, whereas (radiation) protection is primarily concerned with controlling exposure to radiation and its effects*". It should be noted, that despite SNF is treated as radioactive waste, i.e. the source of ionizing radiation, due to specific material composition nuclear safety aspects of SNF such as prevention of criticality also must be applied. Due to said above, term *"safety"* should be replaced by term *"nuclear safety and radiological protection"* in the entire guide, or proper one time definition (note) of term *"safety"* in the context of this guide should be added in the 1.2 or 1.3 paragraph.		

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No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
18	Cover page	Change the title to 'Spent Nuclear Fuel Storage Facility' (HIND)	Since the guide is on Treatment of SF storage as a separate facility, this would brinq more clarity	Rejected	The guide is related to the process of storage, considering different types of facilities: pools, dry storage facility, dual purpose casks
19	Background		Section uses 3 different term for the reactor (AR) pool. Consider using the same term! (TS Enercon) (HUN)	Check consistency	1.4: Second sentence: consider writing "it is stored in the reactor **spent** fuel storage pool
20	Contents	MONITORING instead of ~~Monitoring~~	Formatting	Deleted from the content	
21	Contents	Check page number for COMMISSIONING OF SPENT NUCLEAR FUEL FACILITIES (ARG)	Must be 46 instead of 31	To be done before publishing	
22	Footnote 7 (p.13)	..., INFCIRC/153(Corr.) [20bis]~~[33]~~, also … (JP)	References should be numbered in order of appearance.	To be done before publishing	
23	Page 7 / Note3	(MEX)	Is not matched with the text in this page	Rejected	

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
24	Page 41 Footnote 11	~~[11] By virtue of this principle, two unlikely independent and concurrent incidents are beyond the scope of the required analysis~~ [11] Double contingency principle requires to incorporate sufficient safety factors in the design so that at least two unlikely, independent and concurrent changes in process conditions are needed before a criticality accident is possible (FR/ENISS)	The definition of the Original NS-R-5(Rev.1) page 95 should be kept! Or, at least definition established in DS478	See comment n° 9 Consider changing to the IAEA glossary definition	Double contingency principle: a principle applied, for example, in the design of processes for NFCF: a criticality accident would not be possible unless at least two unlikely and independent changes in process conditions were to occur concurrently.
25	1.1.	Storage options include wet storage in or dry storage. Storage casks can be located in a designated area on a site or in a designated storage building. (HUN)	There are wet and dry storages. Dry storage can be in vaults, casks or silos. (TS Enercon)	Consider if change needed (Andrey)	It seems to be correct and reasonable to be accepted during the full scale revision.
26	1.1/ 1 & 2	Spent fuel is generated from the operation of nuclear reactors of all types and needs to be safely managed following its **permanent** removal from a reactor core. (ARG)	For consistency with the definition n. for "spent fuel" from ARTICLE 2. DEFINITIONS of the Joint Convention.	Consider adding permanent in 1.1	Definition of the Joint Convention: Spent fuel means nuclear fuels that has been irradiated in and **permanently** removed from a reactor core.
27	1.1 / 2 and 5	Spent fuel management options may involve disposal (as part of what is generally known as the 'once through	For consistency with the definition of "disposal" from the Joint Convention. Furthermore, according to the Joint	Rejected	Not necessary in the current revision

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		fuel cycle') or reprocessing (as part of what is generally known as the 'closed fuel cycle'). (ARG)	Convention, spent fuel is neither considered nor defined nor designated as waste.		
28	1.1 / 9	Final step (or stage) of the management (ARG)	"final management option" is a misleading statement	Rejected	Option is reprocessing or not, and storage construction is necessary even if you did not take the decision between reprocessing or not.
29	Para 1.1 page 7	"…Spent nuclear fuel (SNF) is considered as radioactive waste in some ~~circumstances~~ cases or as a potential future energy resource in others and, as such, SNF management options may involve direct disposal... Either SNF management option will involve a number of steps… This time period for storage of SNF can differ, depending on the management strategy adopted... The necessary time period for storage of SNF will be a significant factor in determining the SNF storage facility arrangements adopted. The final management option may not have been determined	1. Editorial remarks. 2. Unclear "management" of what? 3. Unclear "storage" of what or for which "storage"? (see general comment 4).	Editorial remarks rejected except the last one about wet or dry storage **facilities**.	There is no need to repeat SNF in each sentence.

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		at the time of design of the SNF storage facility… SNF ~~S~~storage options include wet storage in some form of storage pool or dry storage in a facility or storage casks built for this purpose. SNF ~~S~~storage casks can be located… A number of different designs for both wet and dry SNF storage facilities have been developed and used in different States." (PL)			
30	1.2	*"* Irrespective of the consideration of spent fuel (either waste or an energy resource), the safety aspects for storage remain* ***mainly*** *the same as those for radioactive waste, which are established in GSR Part 5 [1]. This safety guide shows at first each of the requirements of GSR Part 5 and then explains how the requirement for radioactive waste is applied to the storage of spent fuel."* (NL)	The original text implies that the safety aspects are the same for the case spent fuel is considered as waste and as potential future energy source. The choice between treating spent fuel as waste or energy source could lead to very different solutions with respect to long term storage (facilities), in particular with respect to retrievability. The safety aspects of a retrievable long term storage solution can differ from that of a non-retrievable one, e.g. with respect to design, operating and maintenance of the facility as	Why not adding mainly in the sentence? (Andrey?)	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			well as to different requirements for storage containers, security measures and other aspects.		
31	1.2 / 1	Irrespective of the end point of the management of spent fuel (either reprocessing or disposal) (ARG)	For consistency with the definition of "spent fuel" from the Joint Convention. Furthermore, according to the Joint Convention spent fuel is neither considered nor defined nor designated as waste.	Rejected See comments 6, 7 and 8	
32	1.2/4 (p.1)	…then explains how the requirement ~~for radioactive waste~~ is applied to the storage of spent fuel. (JP)	Some countries don't regard spent fuel as radioactive waste.	Ok, consider deleting **radioactive waste**.	Mention of radioactive waste is not necessary.
33	1.3 / 2 and 3	Heat removal and radiation shielding and, in addition, retrievability should be provided because storage is an interim management step (ARG)	For consistency with paragraph 5.10 and 6.4	Ok, consider adding, **in addition, retrievabilityshould be provided beacause storage is an interim management step.**	Retrievability is inherent for storage.
34	Para 1.3 page 7	"…is ensured by: appropriate containment of the ~~radionuclides involved~~ radioactive material, criticality safety, SNF decay heat removal, radiation shielding and retrievability." (PL)	Editorial remark It should be specified that the *"spent nuclear fuel decay heat removal"* is considered. The guide should be screened for term *"heat"* and term *"heat"* replaced by *"SNF decay heat"* in the entire guide text as applicable.	Ok. Consider adding **spent nuclear fuel decay**. Only once time in the document during following full scale revision. – …is ensured by: appropriate containment of the radionuclides in spent nuclear fuel, criticality safety, decay heat removal, radiation shielding and retrievability.	

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No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
35	1.4 / 3	or disposal. (ARG)	According to ARTICLE 10. DISPOSAL OF SPENT FUEL of the Joint Convention spent fuel is disposed of as such and does not need to be considered as radioactive waste to be disposed of.	OK. Consider deleting the end of the sentence between brackets. In the full scale revision!	
36	Para 1.4 page 7	"Spent fuel is generated continually by operating nuclear reactors. After unload from the reactor SNF ~~It~~ is stored in the *reactor fuel storage pool*… The *spent fuel storage pools* of some reactors have sufficient capacity to accommodate all the spent fuel that will be generated during the design lifetime of the reactor". (PL)	Editorial remark The term *"lifetime"* should be replaced by the term *"design lifetime"* where design lifetime is considered in the entire guide text as applicable. For extended periods it should be clearly stated, that this is beyond *"design lifetime"*.	Rejected	It is just an introduction and not requirements for design.
37	1.5	(heat generation, higher enrichment and cladding materials) (ARG)	The text before the parenthesis does not mention a specific fuel type	See comment 38	Differences cover all different types of fuel (NPP, research reactors…)
38	1.5	An approach should be adopted that takes account of the differences between the fuel types (e.g. lower burnup level heat	It is reasonable to replace the criterion "heat generation" with "burnup level" since heat generation level (as well as SNF	Consider replacing the text between the brackets by (burnup level, heat generation, initial enrichment, cladding material, corrosion resistance…)	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		generation, higher enrichment and cladding materials that are less corrosion resistant) when considering containment, heat removal, criticality control, radiation shielding and retrievability (RUS)	radioactivity level) is proportional to burnup level.		
39	1.6.	Many at reactors storage pools were intended to serve for a limited period of time (a few years) as a place to keep spent fuel between unloading from the reactor and its subsequent reprocessing or disposal. In view of the time being taken to develop disposal facilities and the *limited* reprocessing programmes, storage periods are being extended from years to decades. (HUN)	At reactor storage facilities can only be pools (see terms). Availability of reprocessing has never been a limiting factor, it is not a typical choice. (TS Enercon)	Consider reviewing the sentence: Many spent fuel storage facilities at reactors were intended to serve for a limited period of time (a few years) as a place to keep spent fuel between unloading from the reactor and its subsequent **storage**, reprocessing or disposal.	
40	1.6 / 7	"...mixed oxide (MOX) fuel, re- racking, use of bumup credit, use of boron credit" as this is soluble boron credit and, in some applicable to some plants, cases, extension of storage..."	Add "use of soluble boron credit" as this is applicable to some plants, e.g. Koeberg.	Rejected	To specific for an introduction.

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No	Para	Proposed new text	Reason/Comment	Proposal	Reason
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		(RSA)			
41	1.7	Safety Guide on Storage of Spent Nuclear Fuel[1] (ARG)	Put 1 as superscript	Ok	
42	1.7./l4	…… the Tepco Fukushima Daiichi Nuclear Power Plants Accidents,…. (J)	Completeness.	Accepted	
43	Paragraph 1.7	Safety Guide on Storage of Spent Nuclear Fuel[1] (NUSSC)	Editorial: 1 is reference to footnote	Ok	
44	1.7/1 (p.2)	1.7. The present publication supersedes the Safety Guide on Storage of Spent Nuclear Fuel~~1~~, which was issued in 2012 as IAEA Safety Standards Series No. SSG-15. (JP)	Editorial.	Ok see comment 43	
45	Paras 1.7, 3.8, and 3.18	The foot note designations should be superscript. (US)	Editorial	Ok see comment 43	

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No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
46	Para 1.7 page 8	"The present publication supersedes previous issue of the Safety Guide on Storage of Spent Nuclear Fuel~~1[1], which was issued in 2012 as IAEA Safety Standards Series No. SSG-15~~". (PL)	1. Number 1 next to "fuel" should be written as a link to bottom page note, i.e. as the upper index. 2. The text after link to note in general repeats the note itself, does not provide any additional information, is surplus and as of that should be deleted.	Ok see comment 43	
47	1.8./2,3 (p.3)	…the requirements established in the following IAEA Safety Requirements publications: Safety of Predisposal Management of Radioactive Waste [1], Nuclear Fuel Cycle Facilities [3], ~~Predisposal Management of Radioactive Waste [1],~~ Safety of Nuclear Power Plants: Design[X], Safety Assessment for Facilities and Activities [4], and Leadership and Management for Safety [5].	More appropriate sequence of Safety Requirements publications. SSR-2/1 is also relevant, hence it should be added to References on page 81.	Accepted	
48	1.8, line 3	Replace "facility" by "facilities." (US)	Editorial	To be checked against editorial rules.	

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1	2	3	4	5	6
49	1.8/p. 2	The objective of this Safety Guide is to provide up-to-date guidance and recommendations on the design, **commissioning,** ~~safe~~ operation, **decommissioning** and assessment of safety for the different types of spent nuclear fuel storage facility (wet and dry),… (CZ)	To be consistent with chapter 6 and Requirements of GSR Part 5 (e.g. Requirement 4).	Accepted	
50	1.10/	Add the following text at the end of the paragraph In view of the broad diversity of facilities and operations covered, the recommendations established in this publication are to be applied in a manner that is commensurate with the potential hazard for each facility in accordance with a graded approach. (JP)	Considering DEC, graded approach should be applied especially to transport and/or storage cask.	Rejected	Not in this section " scope of the document " To be considered in the next full scale revision.
51	Para 1.11 page 9	"The Safety Guide does not provide comprehensive and detailed recommendations on ~~physical protection~~ nuclear security of nuclear material and nuclear facilities. Recommendations and guidelines on ~~physical protection~~ nuclear security	*"Physical protection"* is outdated term and should be replaced by new term *"Nuclear security"*. Since the new term *"Nuclear security"* was adopted, the usage of old outdated term in all new IAEA publications, guides, requirements, should not be	To be checked against editorial rules.	

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		arrangements at nuclear facilities, including risk assessment, threat definition, designing, maintaining and operation of ~~physical protection~~ nuclear security systems, evaluation of effectiveness and inspection of ~~physical protection~~ nuclear security systems, are provided in Ref. [7] and in supporting publications in the IAEA Nuclear Security Series. The Safety Guide considers ~~physical protection~~ nuclear security and accounting for and control of nuclear material only to highlight their potential implications for safety". (PL)	acceptable.		
52	1.11/18 (p.3)	As Ref. [6] has been deleted, the reference numbers should be reordered. (JP)	Editorial.	To be done before publishing	
53	Paragraph 1.11	(NUSSC)	Editorial: Edited the font	To be done before publishing	

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1	2	3	4	5	6
54					
55					
56	2.6/26 (p.5)	… [3, 5, 9, 11, 12] (JP)	As Ref. [5] is an important document for the safety culture, it should be maintained.	Accepted	
57	Requirement 3	The regulatory body shall review and assess the safety case[3] and the environmental (HUN)	Use Footnote! (TS Enercon)	Consider deleting reference to a footnote	
58	Requirement 3/5 (p.8)	The regulatory body shall review and assess the safety case~~3~~[3] and… Add an original footnote in GSR Part 5 (see below) to inside of the box. The safety case is a collection of arguments and evidence in support of the safety of a facility or activity. The safety case will normally include the findings of a safety	Editorial. Consistency with GSR Part5.	See comment 57	

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1	2	3	4	5	6
		assessment, and will typically include information (including supporting evidence and reasoning) on the robustness and reliability of the safety assessment and the assumptions made therein. Consequently, delete footnote 6. (JP)			
59	3.17.	The responsibilities of the licensee of a spent fuel storage facility typically include: (HUN)	The operating organization maybe the licensee, but not necessarily. (TS Enercon)	This issue is adressed in the footnote n°4 on page 11.	To be considered in the next full scale revision: distinction between licensee and operating organization.
60	Footnote 4.	Delete the first sentence! (HUN)	See above (comment to 3.1.7). Reflect situation in MSs! (TS Enercon)	See above	To be considered in the next full scale revision: distinction between licensee and operating organization.
61	Paragraph 3.3	regulatory body[3] (NUSSC)	Editorial: 3 is reference to footnote	Accepted	
62	3.3	The responsibilities of the regulatory body[3] (ARG)	Put 3 as superscript	Accepted	

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No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
63	3.3/1 (p.5)	The responsibilities of the regulatory body~~3~~[3], (JP)	Editorial.	?	
64	Para 3.3 page 13	"The responsibilities of the regulatory body[3] ~~3~~, the operating organization and, when appropriate, the spent fuel owner…". (PL)	Editorial remark Number 3 next to "body" should be written as a link to bottom page note, i.e. as the upper index.	?	
65	Para 3.12 page 15	"…The regulatory body should periodically verify that the key aspects of the operation of the storage facility meet the requirements of the national legal system and facility licence conditions, such as… ~~physical protection~~ nuclear security of nuclear material and arrangements for emergency preparedness and response." (PL)	*"Physical protection"* is outdated term and should be replaced by new term *"Nuclear security"*. Since the new term *"Nuclear security"* was adopted, the usage of old outdated term in all new IAEA publications, guides, requirements, should not be acceptable.	See comment 51 To be checked against editorial rules.	
66	7/3.5	Clarification The government is responsible for establishing a national policy and corresponding strategies for the	Such policy is appropriate for radioactive waste as required in GSR Part 1. It is for the states to decide whether they treat SF as waste or not. If	Just a comment.	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		management of spent fuel and for providing the legal and regulatory framework necessary to implement the policy and strategies. The policy and strategies should cover all types of spent fuel and spent fuel storage facility in the State, with account taken of the interdependences between the various stages of spent fuel management, the time periods involved and the options available (HIND)	treated as waste then it gets covered in the national policy for waste management. If not considered as waste then in that case there is no need to have a national policy regarding storage of SF for reprocessing including aspects like time periods for storage etc. as required in the guide		
67	3.9/3	…and providing advice ~~and expert services~~ **to the government authorities** for emergency response	It may not be the function of regulatory body to provide expert services during the emergency response instead it gives advices to the government authorities.	Rejected	GRS Part 1. 2.24. In preparing an emergency plan and in the event of an emergency, the regulatory body shall advise the government and response organizations, and shall provide expert services (e.g. services for radiation monitoring and risk assessment for actual and expected future radiation risks) in accordance with the responsibilities assigned to it.

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
68	Preamble of para 3.9 page 14	"…The regulatory body shall review and assess the safety case~~3~~[4] and the environmental impact assessment for radioactive waste management facilities and activities…". [4] The safety case is a collection of arguments and evidence in support of the safety of a facility or activity. This collection of argument and evidence may be known by different names (such as safety report, safety dossier, safety file) in different States and may be presented in a single document or a series of documents (see Section 5). (PL)	The term *"safety case"* is widely used in the guide. But the meaning of this term is unclear and not direct (there is a link 3 in the preamble before paragraph 3.9, but no any note is provided at the bottom on the page). It should be noted, that nevertheless some states use this term, others states do not use. From the *"safety case"* definition provided in the IAEA Safety Glossary 2016 edition and in the note 6 to this guide it might be understandable that term *"safety case"* can be easily replaced in the guide by other terms: *"safety assessment"*, *"safety report"* or *"safety justification"*. Such edition would make guide text more universal (not specified exclusively for certain states) and more clearly understandable for states which do not use the term *"safety case"*. In any case, the definition (note 4) of term *"safety case"* should be provided at the place it is	Rejected See comment n° 2	

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			used first time, i.e. in the preamble before paragraph 3.9. Accordingly the note 6 with definition of *"safety case"* provided in the paragraph 3.18 **should be deleted** and all the notes following paragraph 3.9 **should be renumbered**.		
69 .	3.11/7	The decommissioning plan should be updated regularly **after every five years** by the licensee and updates should be reviewed by the regulatory body	Updating frequency of decommissioning plan has been included in consistence with GSR Part 6 and SRS-45.	Rejected, but "regularly"=> "periodically"	GRS Part 6, 7.5. The decommissioning plan shall be updated by the licensee and shall be reviewed by the regulatory body periodically (typically every five years or as prescribed by the regulatory body)
70	3.11/3 (p.8)	The decommissioning plan should be updated periodically ~~regularly~~ by the licensee and … (JP)	To be consistent with para. 7.5 of GSR Part 6.	Accepted	
71	Text box above 3.16	REMOVE FOOTNOTE 5 (ARG)	For consistency with the definition of "spent fuel" from the Joint Convention. Furthermore, according to the Joint Convention spent fuel is neither considered nor defined nor designated as waste.	Accepted (?) operating organization =?= lecensee	
72	Para 3.17 page	"The responsibilities of the	1. It is doubtful if permission to	Out of the scope of this revision	a) According to the national

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
	16	operating organization of a spent fuel storage facility typically include: (a) Application to the regulatory body for permission to prepare the site, ~~design,~~ construct, commission, operate, modify or decommission a spent fuel storage facility; … (c) Operation of the spent fuel storage facility in accordance with the ~~requirements of~~ restrictions and operational limitations defined in the safety case, the licence conditions and the applicable regulations;…" (PL)	design the SNF storage facility should be required from Regulatory Body. The designing process of any facility is not related with nuclear safety even if final product is intended to be used for nuclear safety related activities. There can be facility vendors already providing SNF facilities and their standard design at the nuclear market. The operating organization should be responsible for providing final SNF facility design for Regulatory Body for approval (but not for acquiring the permission to design). Proper clarification or guide text correction should be provided. 2. In the preamble before paragraph 3.16 is written: *"The operator shall carry out safety assessments and shall develop a safety case"*, i.e. the operator is responsible for safety case development and as of that operator can't be the same time responsible for setting out the requirements for itself as		regulations. c) in accordance with the safety case, To be considered in the next full scale revision.

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			organization. Seems, there is considered operational restrictions and limitations defined in safety case for SNF storage facility safe operation. Proper clarification or text correction should be provided.		
73	Paragraph 3.18	regulatory body with a safety case[6] (NUSSC)	Editorial: 6 is reference to footnote	accepted	
74	3.18	"case[6]" (BEL)	Typo "case6"	accepted	
75	3.18	Prior to authorization of a spent fuel storage facility, the operating organization should provide the regulatory body with a safety case[6] (ARG)	Put 6 as superscript	accepted	
76	3.18/p.11	Prior to authorization of a spent fuel storage facility, the operating organization should provide the regulatory body with a safety case[6] that demonstrates the safety of the proposed **facility and** activities and also demonstrates that the proposed **facility and** activities…	Also the SF storage facility contributes to the safety of SF management and therefore the safety case(s) shall cover both the facility itself and activities performed there.	Rejected	Not necessary: safety of activities is closely linked to the facility safety.
77	3.18/2 (p11)	Prior to authorization of a spent fuel storage facility,	Footnote 6 has a more appropriate place to add	accepted	

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		the operating organization should provide the regulatory body with a safety case~~6~~ that (JP)	because "Safety case" is appeared before this paragraph.		
78	3.18/2 (p.11)	3.18 Prior to authorization of a spent fuel storage facility, the operating organization should provide the regulatory body with a safety case~~6~~ that….. (JP)	Editorial	accepted	
79	3.18/4-5	…The operating organization should establish specific operational limits and conditions based on the resign requirements and results of safety assessment …	Operation limits and conditions should be established on the basis of design requirements, which might be complemented by the safety assessment. Safety assessment itself provides only a tool to verify and prove safety.	Just a comment	Safety assessment is an iterative process.
80	3.18.	"The operating organization should set an operational target level below these specified limits to assist in avoiding any breach of approved limits and conditions." (HUN)	Setting an operational target level below the approved limit enhances nuclear safety. (HAEA)	Just a comment	

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
81	3.18.	case[6] that (HUN)	Use Footnote! (TS Enercon)	accepted	
82	3.21/5	Supervisory staff should be competent to perform their activities and should, therefore, be selected, trained, qualified and authorized for that purpose **as per criteria approved by regulatory body**.	The training and qualification should be in accordance with some criteria established by regulatory body.	Rejected	It should be competent and their competency should be authorized…
83	Para 3.21 page 17	"…Supervisory staff should be competent to perform their activities related to […] and should therefore be selected, trained, qualified and authorized for that purpose…" (PL)	It is unclear which activities supervisory staff should be competent to perform. Without the proper definition of activities the purpose as well is unclear, i.e. it is unclear for which "that purpose". Proper clarification should be provided.	Supervisory staff should be competent to perform their activities **related to safety** and should therefore be selected, trained, qualified and authorized for that purpose. Supervisory staff should be competent to perform all their activities they are authorized to perform as a supervisor.	
84	Para 3.23 page 17	"The operating organization should ensure that discharges of radioactive material and other potentially hazardous material to the environment ~~are in accordance with the conditions of~~ during normal operation, anticipated operating occurrences and design basis accidents will not be above the conditions set in	Such text structure implies that discharges are postulated, mandatory and unavoidable. Better is to write that operator should ensure, that discharges what might occur during normal operation, AOO and DBA will not be above the conditions set in licence.	Rejected	Discharges mean planned and controlled releases in normal operational conditions. Nothing related to incident or accident.

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		licence." (PL)			
85	Para 3.24 page 18	"The operating organization should prepare plans and implement programmes for personnel monitoring [?], area monitoring [?], environmental monitoring [?] and for emergency preparedness and response" (PL)	It is unclear which personnel, area and environmental monitoring is considered here. Is that a monitoring of doses, monitoring of ionizing SNF material radiation, monitoring of radioactive materials discharges, monitoring of environmental radioactivity, etc.? Proper clarification and specification should be provided.	Rejected	Reference to para. 6.43 explains that monitoring is devoted to radiation protection issues. See IAEA glossary
86	3.25.	The Licensee should (HUN)	See above (TS Enercon) *MSkr: not sure WHICH "above" from the original Hungarian table, so cannot refer straightly*	Out of the scope of the current revision	Licensee versus operating organization
87	Para 3.25 page 18	"The operating organization should establish a process on how to authorize and make modifications [?] to the spent fuel storage facility, storage conditions, or the spent fuel to be stored [?], which is commensurate with the significance of the modifications". (PL)	1. Hardly understandable sentence. The requirements for modification implementation and authorization process should be established by regulatory body (not the operator). The operating organization should develop procedures in accordance with regulatory requirements how to approve and implement modifications.	Consider editing during full scale revision: The operating organization should establish a process on how to authorize internally and make modifications to the spent fuel storage facility, to the storage conditions, or to the spent fuel to be stored,	

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			Due to said above simple would be write that such *"Modifications of spent fuel storage facility, storage conditions, or the spent fuel to be stored shall be justified and approved by regulatory body before the implementation in accordance with established process and procedures"*. 2. It is unclear that is understandable as *"spent fuel to be stored"* modifications. Modifications for spent nuclear fuel is not provided. That is provided is modifications for <u>new types of fresh nuclear fuel</u> to be used in the reactor and then transferred to the SNF storage facility which might be not taken into account during storage facility design. Proper clarification should be provided in the guide regarding explanation of the meaning of *"spent fuel to be stored"* modifications.		
88	3.26.	The Licensee should (HUN)	See above (TS Enercon) *MSkr: not sure WHICH "above" from the original Hungarian table, so cannot refer*	Out of the scope of the current revision	Licensee versus operating organization

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			straightly		
89	3.27.	The Licensee should (HUN)	See above (TS Enercon) *MSkr: not sure WHICH "above" from the original Hungarian table, so cannot refer straightly*	Out of the scope of the current revision	Licensee versus operating organization
90	Para 3.27 page 18	"The operating organization should develop and maintain a records system [?] on spent fuel data and on the storage system, which should include the radioactive inventory [?], location and characteristics [?] of the spent fuel, information on ownership and origin [of what?] and information about its characterization [?]. An unequivocal identification system should be established, with markings [of what?] that will last for the duration of the storage period [?]. Such records should be preserved and updated [?], to enable the implementation of the spent fuel management strategy, whether disposal or reprocessing." (PL)	Hardly understandable paragraph. Too much information is left behind which can't be guessed adequately what is not acceptable in nuclear safety. 1. It is unclear if "records system" should not be a part of "nuclear material accounting system" (see paragraph 3.31). Proper clarification should be provided regarding "records system" relation with "accounting system" and nuclear security in general. 2. It is unclear what is understand by records of "radioactive inventory". In most cases radioactive inventory of SNF is unknown and can't be identified without proper isotopic composition spectroscopic analysis. What is known is initial fresh fuel enrichment and final burnup	Writing issue not related to the aim of this revision	To be considered in the next full scale revision.

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			of fuel assembly. Proper clarification and definition (note) should be added in the guide regarding meaning of "radioactive inventory". 3. It is unclear which characteristics of SNF should be recorded. Proper clarification with SNF characteristics specification should be provided in the guide. 4. It is unclear "characterization" of what – spent nuclear fuel, ownership or origin? Also unclear "origin" of what? Proper clarification should be provided in the guide. 5. It is unclear "with markings" of what – spent nuclear fuel assemblies, SNF casks or records itself? Proper clarification should be provided in the guide. 6. It is unclear what is the object of consideration in the part: *"will last for the duration of the storage period"*		

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			Storage period of what – SNF in the storage facility or records itself? Other question is if records should not be transferred together with SNF to final disposal facility or reprocessing facility? Proper clarification should be provided in the guide. 7. It is unclear, what is understandable as records update. Radioactive inventory and characteristics of the spent fuel should be recorded at the moment of SNF unload from reactor and transfer to the storage facility. Radioactive inventory (isotopic composition) and characteristics, for example decay heat and activity of the spent fuel changes continuously during all the time of storage, but such changes are not trackable. Proper clarification and explanation of what should be updated in the records and with what period should be provided		

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			in the guide.		
91	Para 3.28 page 18	"The operating organization should draw up emergency plans on the basis of the potential radiological impacts of accidents at the SNF storage facility…" (PL)	It should be clarified, accidents where – at SNF storage facility or nearby other nuclear objects which might be the source of external hazard.	Consider reviewing the section during full scale revision: The operating organization should draw up on-site emergency plans on the basis of the potential accidents which could occur in its facility or in other facilities located on the site, taking into account their potential radiological impact.	
92	3.29.	including financial liabilities, should be responsible HUN)	do not use different terms! (TS Enercon)	Accepted. Consider deleting the text between the brackets	
93	Para 3.29 page 14	"…The interface between the responsibilities of the operating organization and the spent fuel owner, if they differ, should be clearly defined, agreed upon and documented [?]. The spent fuel owner,… should be responsible for the overall strategy for the management [?] of its spent fuel. In determining the overall strategy, the owner should take into account interdependences between all stages [?] of spent fuel management,…".	1. General comment. Paragraph 3.29 in particular and subsection "RESPONSIBILITIES OF THE SPENT FUEL OWNER" in overall arises more question than it provides explanation. Seems this subsection needs deeper development. In general entire guide provides recommendations as if operating organization is also a licensee and SNF owner (has financial liabilities and is spent fuel producer) and in most cases does not provide any clarification regarding responsibilities when operating	Consider reviewing the first sentence: The responsibilities of the operating organization and the responsabilities of the spent fuel owner should be clearly defined, agreed upon and documented.	

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		(PL)	organization is not a SNF owner or even a licensee (see paragraph 3.16 and current note 4). The guide should be more specific when referring to operating organization. Usage of term "licensee" or "SNF owner" might be more applicable in one or other case. 2. It is unclear on what basis operating organization and SNF owner division of responsibilities should be defined and agreed upon. The guide should provide more wide clarification and explanation regarding division of responsibilities with proper examples. 3. It is unclear what is meant by *"overall strategy for management of its spent fuel"*. If this part would be clarified then SNF owners responsibilities would become more evident what will allow to clarify all the responsibilities in the entire guide. 4. It is unclear what is "stages of		

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			spent fuel management". Proper clarification and list of all SNF management stages should be provided in the guide.		
94	3.31, lines 2/3	Modify the "State system of accounting for control (SSAC)" to: "State System of Accounting for Control, (SSAC)"	Editorial	3.31, lines 2/3 Section number is missing. State System of accounting for and Control of nuclear material. 7 is a reference to the footnote.	Modify the "State system of accounting for control (SSAC)" to: "State System of Accounting for Control, (SSAC)"
95	3.31 (p.13)	Add an original text of SSG-15 (see below) to the end of this paragraph. In addition, physical protection systems for deterrence and detection of the intrusion of unauthorized persons and for protection against sabotage from within and outside the facility will be designed and installed during the construction and operation of the spent fuel storage facility. (JP)	Clarification.	Accepted (Andrey?)	
96	Sec title before Para 3.31 page 19	"ACCOUNTING FOR AND CONTROL OF NUCLEAR MATERIAL AND ~~PHYSICAL PROTECTION~~ NUCLEAR SECURITY	*"Physical protection"* is outdated term and should be replaced by new term *"Nuclear security"*.	See comment 51 To be checked against editorial rules.	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		SYSTEMS" (PL)	Since the new term *"Nuclear security"* was adopted, the usage of old outdated term in all new IAEA publications, guides, requirements, should not be acceptable.		
97	3.32	The Fundamental Safety Principles [8] require that safety measures and security measures "must be designed and implemented in an integrated manner so that security measures do not compromise safety and safety measures do not compromise security". The operating organization should demonstrate to the regulatory body that physical protection systems security provisions and safety systems at the facility are managed in such a way as to achieve this.	Replace: physical protection systems to security provisions There could be also other measures that can compromise safety and vice versa	See comment 51 To be checked against editorial rules. Accepted	
98	Para 3.32 page 19	"The Fundamental Safety Principles [8] require that nuclear safety measures and nuclear security measures… The operating organization should demonstrate to the	Editorial remark.	To be checked against editorial rules. Andrey? 1.10 …"Safety measures and security measures must be designed and implemented in an integrated manner so that security measures do	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		regulatory body that nuclear security provisions, including ~~physical protection~~ nuclear security systems, and nuclear safety measures at the facility are managed in ~~such a~~ proper way ~~as to achieve this~~ that nuclear security and safety measures do not compromise each other. (PL)		not compromise safety and safety measures do not compromise security".	
99	Para 4.1 page 20	"The requirements on management systems for all stages [?] in the lifetime of a spent fuel storage facility are established…" (PL)	It is unclear what are *"all stages in the lifetime of a spent fuel storage facility"* at this point of guide. Some clarification regarding SNF storage facility lifetime stages first time is mentioned only in paragraph 5.2. It should be noted, that proper clarification (note) should be provided in the guide at the place where one or other object of consideration is mentioned first time. The list of SNF storage facility lifetime stages should be moved/copied from paragraph 5.2 to the paragraph 4.1.	Move from 5.2 to 4.1 to be thought about during next full scale revision.	
100	Para 4.2 page	"… and should be applied to	1. It is unclear what does it	1 – Not accepted and see comment	1 - Obvious

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
	20	all stages of the storage [?] of spent fuel that have a bearing on safety. It [who it?] should be aligned with the goals [?] of the operating organization and should contribute to their achievement… …the quality of the records and of ~~subsidiary~~ supplemented information [?] of spent fuel inventories is preserved… The SNF management system should also contain provisions to ensure that the fulfilment of its goals [?] can be demonstrated". (PL)	mean and what are *"all stages of the storage of spent fuel"*. It should be noted, that this comment is not related with comment 26 above as "stages of storage of SNF" is not the same as "stages of SNF storage facility". If the last can be assumed to be design, construction, commissioning, operation, etc., then the first one seems could be SNF wet storage, SNF transportation, SNF dry storage, etc. Proper clarification and the list of all stages of storage of SNF should be provided in the guide. 2. It is unclear who is "it" and with which goals of the operating organization it should be aligned. Proper clarification (link to other paragraph) should be provided in the guide. 3. It is unclear what is "subsidiary information". Proper clarification and specification (examples) of subsidiary information should be	99 2 – Consider starting the sentence by "The management system …" 3 – supplementary information 4 – Rejected	4 - Management system is not SNF management

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			provided in the guide. 4. It is unclear which goals SNF management system should fulfill. Proper clarification (link to other paragraphs) should be provided in the guide.		
101	4.3.	the performance of the spent fuel and storage facilities and activities will meet the safety requirements through the lifetime (HUN)	performance of the fuel is as important as that for the storage facilities and components (TS Enercon)	Accepted (?) SNF is part of SNFSF!!! But probably it should be addressed separately …next time	
102	4.4.	However, the licensee retains its responsibility (HUN)	See above (TS Enercon)	See comment n° 59	To be considered in the next full scale revision: distinction between licensee and operating organization.
103	Para 4.6 page 21	"…~~Senior management~~ Spent nuclear fuel owner should be responsible for making arrangements to provide adequate resources…". (PL)	Editorial remark. All the guide recommendation should be provided for organization, not the position. At least not in this case. See also paragraph 3.29 about SNF owners financial liabilities.	Consider writing this section in order to require that resource management is important and has to be clearly allocated to some entity during the full scale revision.	
104	Para 4.7 page 21	"…The ~~generator~~ producer of the spent fuel should establish an appropriate funding mechanism".	1. Editorial remark. The term "SNF producer" should be used in the entire guide instead of term "generator" (see paragraph	For next full scale review	Generator=producer but could be different from owner

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		(PL)	3.29). **2. Also it should be noted**: according to paragraph 3.29 for financial liabilities including establishing appropriate funding mechanism should be responsible current SNF owner which may not be a former producer of SNF. Taking into account the possibility of SNF ownership transfer (see paragraphs 4.5(c) and 4.8(a)) it should be clearly defined that with transferring of ownership of SNF all financial liabilities, including ensuring appropriate funding also are transferred to new owner. Proper clarification should be provided in the guide regarding this issue. The recommendation of comment 22 part 1 regarding usage of terms "operating organization", "licensee", "SNF owner" should be taken into account each time someone's responsibility is considered.		
105	4.7.	The owner of the spent fuel (HUN)	The generator of the spent fuel is an undefined term. (TS Enercon)	See comment 104	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
106	Para 4.8 (a) page 21	"For various reasons (e.g. bankruptcy, cessation of business), it may not be feasible to obtain the necessary funds from the spent fuel ~~generator~~ producer, especially if funds were not set aside at the time the benefits were received from the activity, or if ownership of the spent fuel has been transferred to other parties" (PL)	Same as above.	See comment 104	
107	Para 4.10 page 22	"…For long term spent fuel management activities, future infrastructural requirements should be specified and plans should be made to ensure that these [what ?] will be met… Consideration should also be given to the need to develop monitoring [of what?] programmes and inspection techniques for use during extended periods of storage facility operation [?]". (PL)	1. It is unclear what should be ensured to be met. Proper clarification should be provided. 2. It is unclear which parameters or what objects monitoring programmes might be needed to be developed. Proper clarification should be provided. 3. From how it is written it can be understandable that monitoring programs and inspection techniques are unnecessary (not needed) during design lifetime of SNF storage facility and are needed only for extended periods of operation	1 - requirements will be met. 2 – Rejected 3 - Consideration should be given to the need to develop monitoring programmes and inspection techniques for use during lifetime of the storage facility and eventually for extended periods of storage.	Monitoring progammes include SNF surveillance, facility monitoring, environment monitoring…

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			beyond the design lifetime? Proper clarification should be provided and guide text corrected accordingly regarding development and usage of monitoring programmes and inspection techniques during design lifetime of SNF storage facility (see also paragraph 5.12).		
108	4.11.	problems associated with decay heat removal (HUN)	No criticality event can lead to the need to relocate fuel from a cask! (TS Enercon)	To be addressed in the next full scale revision threats to the integrity of casks or problems associated with criticality or decay heat – IMPOSSIBLE TO INDICATE! If deleting examples it's obvious for ANY storage facility by definition.	This paragraph 4.11 is related to technical measures and not management system. Moreover, the recommendation is not clear: does it concern cask or canister?
109	Para 4.12 page 23	"Records concerning the spent fuel and its storage that need to be retained for an extended period [of what?] should be stored in a manner that minimizes the likelihood and consequences of loss… If records are inadvertently destroyed, the status of surviving records should be examined and the importance of their retention and their	1. General comment. It seems, that paragraph 4.12 speaks only about paper (hard) records. Meanwhile modern industry should seek to be environmentally friendly and use digital records as much as possible (saves paper, trees and the environment). The requirements for digital records storage differs from requirements for hard (paper)	Rejected	Text is applicable to any type of information support.

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
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		necessary retention periods should be re-evaluated". (PL)	records storage (computer security measures should be taken into account). But records digitalization has its own advantages. Due to said above: 1) Proper recommendations should be provided for records digitalization in the guide. 2) Proper clarification should be provided regarding technical means of "destroyed" (deleted, erased, formatted, etc.) digital records full or partial recovery, as well as recommendations for storage of records copies in backup servers. 2. Paragraph 4.12 considers only SNF records storage during extended period. There are no other related paragraph for records protection from destroying during envisaged storage period. Nevertheless, it is obvious, that similar recommendations should be applied and for anticipated storage period too. Besides, it is unclear which "extended period" is under consideration here. What are		

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			envisaged/anticipated period? (see related paragraph 6.131). Proper clarification should be provided in the guide.		
110	5.1.	approach, however, irrespective (HUN)	Typing error (TS Enercon)	Accepted	
111	5.1.	However, irrespective of the approach taken…. (ARG)	However in Capital Letters because it starts the phrase	Accepted	
112	Para 5.3 page 25	"The prime responsibility for safety throughout the lifetime of a SNF storage facility lies with the operating organization (licensee) [8]. This includes responsibility for both ensuring and demonstrating the safety of a facility in the safety case" (PL)	Editorial remark. Also, it should be noted that SNF facility operating organization might not be an owner of SNF or licensee (see paragraph 3.16 and current note 4). The responsibility for *"demonstrating the safety of a facility in the safety case"* should lay on licensee.	1 – Not necessary See comment n° 59	To be considered in the next full scale revision: distinction between licensee and operating organization.
113	5.4 / 1 and 2	period of time that exceeds the design lifetime of civil structures and this will have (ARG)	"normal" is a misleading adjective regarding design lifetime. ", including short term storage facilities," is a confusing statement in the context of the phrase.	Normal ➔ current qualified design lifetime	
114	5.4 / 5 and 6	the design lifetime of the facility, (ARG)	"anticipated" is a misleading adjective regarding design lifetime.	rejected	

Comments on: Revision by amendment of Draft Safety Guide DS489 Storage of Spent Nuclear Fuel

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		+ CHECK TERMINOLOGY: "storage facilities at reactor sites"			
115	Para 5.5 page 25	"The rationale for selection of the assessment [of what?] time frame [?] should be explained and justified. Depending on the purpose of the assessment (for design studies, licensing, etc.), for ease of modelling or presentation it might be convenient to divide the overall time frame [?] of the safety assessment into shorter 'time windows' [?] with various end points". (PL)	Hardly understandable paragraph. It is unclear assessment of what is considered here and further in the guide text. Also it is unclear what "assessment time frame" ("time windows") means in this context – the time what can take an assessment preparation, the period between assessment updates, the duration of SNF storage facility lifetime considered in assessment or something else? Proper clarification should be provided in the guide regarding: a) identification of the assessment object of consideration (the purpose is not an object of consideration) b) the meaning of "time frame" and "time windows".	rejected	
116	5.5 / 3 and 4	safety assessment into shorter time intervals with various end points.	"time windows" should be avoided for the sake of style.	To be addressed in the next full scale revision	

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		(ARG)			
117	Para 5.6 page 25-26	"(a) For most long term SNF storage systems (including storage casks, engineered constructions and the surrounding ~~environment~~ area), potential ~~health and environmental~~ radiological impact~~s~~ to health and environment may increase for a certain period of time after commissioning of the SNF storage facility. In the long term, depending on the nature of the SNF storage facility, potential radiological impact~~s~~ may decrease, in particular through decay of the radionuclide inventory of the spent fuel… (b) A further consideration that may influence decisions on assessment time frames is the return period of natural external hazards, such as extreme meteorological events or earthquakes [?]. (c) …Assessment time windows [?] may be defined, as appropriate, to reflect potential changes at the SNF storage facility, the site and its	(a) Editorial remarks. 1. From how it is written it is unclear which potential impacts are considered here – from facility to the health and environment or from health and environment to facility (see also 5.6(d) for term "radiological impact" usage). 2. It is unclear what *"period of time after commissioning of the facility"* is considered. It should be explained that increase of potential radiological impacts may arose during storage facility filling period. After the SNF storage facility is fully filled, starts the decrease of impacts due natural SNF inventory decay. (b) Unclear and hardly understandable recommendation. It is unclear what is the meaning of *"the return period of natural external hazards"*? External hazards should be estimated for entire lifetime of storage facility taking into account the probability of	To be addressed in the next full scale revision	+ AGING for LTS!!!

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		vicinity. (d) The location, habits and characteristics of the reference person [?] in radiological impact assessment may be changed over time". (PL)	external hazard occurrence during storage life time. Also, it should be noted, that even if extreme meteorological events can be seasonal, i.e. have return period, the earthquakes occurrence is unpredictable and as of that the return period cannot be assigned to earthquakes. Other question is if assessment time frames will be assigned to seasonal events, does it mean new safety assessment will be needed to be prepared for each season? Proper clarification and explanation should be provided in the guide. (c) *"construction of other facilities nearby"* is not a change of SNF storage facility itself, but is a change in SNF storage facility site vicinity. (d) The definition (note) of the "reference person" and his habits and characteristics should be provided in the guide.		
118	5.6 (c) / 7	Assessment time intervals may be defined, as (ARG)	"time windows" should be avoided for the sake of style.	See comment 116	

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
119	5.6. (d)	From the term "reference person" should use the term "representative person". (FIN)	Nowadays should use the term "representative person" instead of the term "reference person". In the IAEA Safety Standards, GSR Part 3, the term "representative person" has been used.	Accepted	Representative person is in the IAEA glossary.
120	5.7	The operating organization should apply passive safety features to the extent practicable.	Clarity needed	Rejected	Chapter 5 is addressed to SC and SA, that's why it's about DEMONSTRATION, but not application Para 5.7 wasn't affected by this revision
121	5.10 /2	for reprocessing or disposal at a later time.	"processing" was not defined before. Furthermore, it is not an end point for the management of spent fuel.	To be addressed in the next full scale revision	
122	5.11	The possibility of inadvertent human intrusion normally would not be considered relevant when assessing the safety of a storage facility because the facility will require continued surveillance and maintenance not only during but also after the spent fuel emplacement phase. **However, for security reasons,**	The safety case shall not address security measures. To ensure	The possibility of inadvertent human intrusion normally would not be considered relevant when assessing the safety of a storage facility because the facility will require continued surveillance and maintenance not only during but also after the spent fuel emplacement phase. Prevention of intentional human intrusion requires adequate security arrangements **(they are considered in the nuclear security series publications)** and these	This Guide isn't replacing ANY guidelines or recommendations from the Nuclear Security Series. Safety case should not assess security measures but should address them 1) in terms of using them as a reasonable argument to exclude human intrusion from consideration; 2) in terms of potential influence on the safety

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		prevention of intentional human intrusion **may** requires adequate security arrangements **(information on nuclear security issues are provided for in the nucelar security series)** ~~and these should be addressed in the safety case.~~ (NSGC, FR, ENISS)		should be addressed in the safety case.	(integrity of barriers etc.). *Para 5.11 wasn't affected by this revision*
123	5.11/1 (p.21)	…Prevention of intentional human intrusion requires adequate security arrangements (they are considered in the nuclear security series publications (e.g. Ref [7])) and these should be addressed in the safety case. (JP)	Clarification.	Accepted	
124	Page 24 5.11	Prevention of intentional human intrusion requires adequate security arrangements that should be addressed in the safety case (they are considered in the IAEA nuclear Security Series publications) (FR)	Clarity	Already done	

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
125	Para 5.13 page 27	"Because of the long time frames potentially involved, a plan for adequate record keeping over the expected time frame for storage [?] should be considered in the safety case". (PL)	It is unclear what is "expected time frame for storage", storage of what – records or SNF, and how it is related with anticipated period of storage of SNF or design lifetime of SNF storage facility. Also it is unclear if SNF records should be destroyed the moment SNF is transferred to final disposal facility or reprocessing facility, should be transferred together with SNF to final disposal or reprocessing facility or should be retained and kept till SNF storage facility full decommissioning. Proper clarification should be provided in the guide regarding "expected time frame for storage".	rejected	
126	Para 5.14 page 27	"Periodically, the safety case [which ?] should be reviewed to assess the continuing adequacy of the SNF storage facility capacity [?]; account should be taken of the predicted spent fuel arising, the expected lifetime of the storage facility and the availability of reprocessing or	1. The object of consideration is not specified. It is unclear which safety case or regarding what objects of consideration (monitoring, inspection, maintenance of the storage facility, etc.) should be reviewed. Proper clarification should be provided in the guide.	Accepted To be addressed in the next full scale revision	Only writing

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		disposal options". (PL)	2. From what is written, it is unclear why safety case should be periodically reviewed *"to assess the continuing adequacy of the storage capacity"*. Required SNF storage facility capacity should be assessed and determined during storage facility design stage. Nuclear and radiological safety of storage facility should be assessed for maximal SNF load (see paragraphs 5.21(a), 6.33(f)) SNF producer might need periodically update his SNF generation forecast in order to assess the potential need of storage facility extension on new storage facility construction, but this forecast should not affect the safety case and related safety assessments of existing SNF storage facility. Proper clarification should be provided in the guide.		
127	Para 5.18 page 27	"In identifying the relevant postulated initiating events, generic lists [?] should be consulted (See Annexes ~~III, IV and~~ V, VI and VII). Such lists should not be relied on solely	1. It is unclear "generic list" of what is considered here. Proper clarification should be provided. 2. Numbers of Annexes is	Modification of reference to annexes accepted	

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		[of what?], since site specific environmental conditions and phenomena and the design and operation of the facility…". (PL)	mismatched. References to Annexes should be fixed to V, VI and VII. 3. It is unclear to be "relied solely" on what? Object of solely relation should be clarified in the guide.		
128	5.21.c, 6.60 and 6.75 or general	Threats of terrorism, landslide and collapse should be taken into account in Paragraph 5.21.c. Their relevant measures should be specified in adequate paragraphs between paragraph 6.60 and 6.75. (TUR)	Landslide and terrorism not considered	Accepted Consider referring annex 5, 6 and 7 into the paragraph instead of listing of the hazards (~~e.g. fires, handling accidents and seismic events~~ see. Annex 5, 6 and 7 presenting lists of hazards to be taken nto account)	
129 .	5.21(c)/1	Systematic identification of hazards and scenarios associated with operational states, accident conditions**, human induced** and external events (e.g. fires, handling accidents and seismic events).	The term "human induced" is added to cater for fuel handling accidents.	Rejected See proposal to comment 128	"Operational accident" conditions includes human activity and "external events" covers HI & natural events Reference to annex 6 which list human induced external hazards
130	5.21(c)/3	During the identification of hazards, consideration should be given to the combination of related hazards (e.g., earthquake	Text modified to include comprehensive hazard identification based on Fukushima experience.	Accepted	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		and fire, **earthquake and tsunami etc.)** that may occur and consequential effects.			
131	5.21 (c)	There should be a reasonable postulated causal relationship (or correlation) between hazards to support combining them for evaluation; (UK)	The previous words did not support the intended meaning.	Accepted There should be a reasonable causal relationship between hazards to support combining them as scenarios for evaluation; Consider replacing the last sentence by the above text.	Evaluated situations or scenarios in general are developed and justified within the safety assessment depending on specific context. It seems to be impossible to postulate all relationships.
132	5.21(c)	During the identification of hazards, consideration should be given to the combination of related hazards (e.g., earthquake and fire) that may occur and consequential effects.	Combinations are related to simultaneous effects, induced effects and non-related effects. Focusing on earthquake + fire does not cover all those aspects and could narrow the reflections on those topics.	Rejected See comment N°128 with reference to annexes Consider adding an annex with a list of combinations which could be relevant.	Hazards could last different time and while one could start the first and cause another, they can take place "simultaneously" for at least some time.
133	5.21(c)/4 (p.22)	During the identification of hazards, consideration should be given to the combination of related events and hazards (e.g., earthquake and tsunami~~, collapse and fire~~) that may occur and consequential	"Collapse and fire" is not appropriate for the combination as "related events".	Accepted Earthquake and fire is a good example of combination and should be kept. Consider adding an annex 8 with a list of combinations which could be	

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		effects. (JP)		relevant.	
134	5.21.(c)/5 (p.22)	Combination of hazards into scenarios for evaluation should be reasonable, ~~casual~~ causal and logical. (JP)	Clarification	Accepted	
135	5.21.c. line 5.	causal instead of casual (HUN)	Probable typo, but has an unfortunate meaning in this context. (HAEA)	Accepted	

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
136	5.21.c.	Delete the last sentence or replace it with a new one. (HUN)	Last sentence could be deleted as it is too general. Any scenario evaluation should be reasonable, casual and logical. As the combination of the external hazards are not spent fuel facility specific issue, the guidance could be derived from the other IAEA Safety Guides to give recommendations on how to select the hazard combinations. (SOM System)	See comment N°131	
137	5.21 (c)/p. 22	Systematic identification of hazards and scenarios associated with operational states**, including incidents** and accident conditions (CZ)	To cover in the safety case also deviations from normal operation, such as human errors, equipment failures, which may have impact on the safety of the facility and activities.	Rejected	Anticipated operational occurrences are included in the definition of normal operation (IAEA glossary)
138	Page 26 5.21(c)	Combination of hazards into scenarios for evaluation should be reasonable~~, casual~~ and logical (FR)	Unclear Delete or find another word.If it was meant for causally linked hazards, this may be already covered by “logic”	See comment N°131	

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
139	5.21 (c)	Systematic identification of hazards (internal and external) and scenarios ~~associated~~ involving them ~~with~~ during any specific operational states ~~and accident conditions and external events~~ (e.g. fires, ~~handling accidents~~ and seismic events during handling sequences). During the identification of hazards, consideration should be given to the combination of related events and hazards (e.g., earthquake and tsunami, collapse and fire) that may occur and consequential effects. Combination of hazards into scenarios for evaluation should be reasonable, ~~casual~~ and logical. (ENISS)	Clearer distinctions between hazards (internal/external) versus operational states (for which those hazards [or combination of hazards] may (or may not) generate any Initiating Events or impact any Design Basis sequence) Unclear Delete or find another word	Accepted Systematic identification of internal and external hazards during any specific operational states (see. Annex 5, 6 and 7 presenting lists of hazards to be taken nto account). During the identification of hazards, consideration should be given to the combination of related events and hazards (e.g., earthquake and tsunami, collapse and fire) that may occur and consequential effects (see annex 8). There should be a reasonable causal relationship between hazards to support combining them as scenarios for evaluation.	
140	5.21(d)	Those low-probability combinations with high potential consequences that are below the design basis threshold should be considered for defense in depth and emergency preparedness purposes (design extension consideration)(definition	Add for clarity.	Add the Footnote instead of the text	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		see SSR 2/1 rev. 1)			
141	5.21. (d)	An evaluation of hazards and scenarios including screening of those combinations that may result in a release of radioactive material to identify those combinations warranting consideration in the design basis of the facility. Those low-probability combinations with high potential consequences that are below the design basis threshold accidents should be considered for defense in depth and emergency preparedness purposes (design extension consideration);	Clarification. Unclear for “design extension consideration”.	Replaced with “design extension conditions” Consider replacing “that are below the design basis threshold accidents” by “not considered for design basis accidents”.	As it was proposed in other comment

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
142	5.21(d)	(d) An evaluation of hazards and scenarios including screening of those combinations that may result in a release of radioactive material to identify those combinations warranting consideration in the design basis of the facility. Those low-probability combinations with high potential consequences that are below the design basis threshold should be considered for defence in depth and emergency preparedness purposes (i.e. design extension consideration conditions[1]); [1]The analysis of design extension conditions for the facility could be performed by means of a best estimate approach (more stringent approaches may be used according to States' requirements).	In order to avoid confusion, design extension should be used. A footnote is added to clarify the type of analysis, required for DEC. The Footnote is taken from SSR 2/1, Requirement 20: DEC, footnote 13 of paragraph 5.27, switching plant by facility. The text "below the design basis threshold" is misleading consider rephrase it to avoid confusion.	"consideration" is to be replaced with "conditions".	The footnote with the DEC definition is to be inserted for the para 1.7

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
143	5.21 (f)	Establishment of operational limits, conditions and administrative controls based on the safety assessment. *If necessary, the design of the spent fuel storage facility should be modified and the safety assessment should be updated*. Such controls should include acceptance criteria for spent fuel casks, including canisters containing failed fuel.	To be clarified	To be considered in the next full scale revision: If the design of the spent fuel storage facility is modified, the safety assessment should be updated and the OLC reviewed."	
144	5.21/(j)	…implications considering also response to possible malfunction of equipment.	Emergency preparedness	Accepted	*Para 5.11 wasn't affected by this revision*
145	5.21 (j)/p. 23	Procedures and operational manuals for activities with significant safety implications considering also response to **incidents such as** possible malfunction of equipment. (CZ)	See comment No. 5	See comment N°144	
146	5.21 (l)	The expected values for subcriticality, heat removal capacity and calculated radiation doses	This is part of OLC – See para. (f)	To be considered in the next full scale revision	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		inside and at the boundary of the spent fuel storage facility.			
147	5.21/(n)	…experience and its implementation into manuals, guidelines and training.	Lessons learned	Accepted	*Para 5.11 wasn't affected by this revision*
148	Para 5.21(u) page 30	"Provisions for the management of radioactive waste [?] and for decommissioning". (PL)	It is unclear which radioactive waste are considered here. Radioactive wastes other than SNF is not stored in SNF storage facility. It should be clarified if we talk here about radioactive wastes generated during operation of storage facility, like polluted equipment and instruments. Proper clarification (note) should be provided in the guide regarding type of radioactive waste under consideration.	Accepted Consider modifying the sentence : Provisions for the management of radioactive waste produced during storage facility operation and decommisioning	
149	5.21 (v)/p. 24	Whenever the safety of facilities and related activities depends on human actions, including actions taken in **incidents and** accidents … (CZ)	See comment No. 5	Rejected See comment N°137	Anticipated operational occurrences are included in the definition of normal operation (IAEA glossary)

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
150	5.21.v.	The predicate is missing from the sentence. (HUN)	For example: assessment of these human interactions with this specific facility or activity *is necessary/must be performed. (HAEA)*	Rejected	*Writing issue* *This is a list a items.*
151	5.21 (v) /3	activity should be performed.	Missing verb.	See comment 150	
152	5.21/p. 22	A ~~facility specific~~ safety case and supporting **safety** assessment should generally include aspects such as: (CZ)	Obsolete, safety case shall cover both the facility and activities performed there. See items (a), (b), … Just only for clarification – safety assessment	1 – rejected 2 - Accepted to add safety before assessment	Any safety case includes the activities performed within the facility.
153	Page 27 5.22	Where facilities on the site share resources (whether human or material resources) in accident conditions, the safety assessment should demonstrate that the required safety functions can be fulfilled at each facility, including a process to prioritize usage between the ~~sites~~ facilities, as needed. (FR/ENISS)	In this paragraph, facilities are co-located in the same site	Accepted	

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
154	5.30 / 5 and 6	Assumptions and generic information used in the safety case must be justified in the documentation. (ARG)	Reword for the sake of clarity.	Rejected	*Current writing points out assumptions whiech are more sensitive than generic information.*
155		Requirement 11 (GSR Part 5, Ref. [1]): Storage of radioactive waste Waste shall be stored in such a manner that it can be inspected, monitored, retrieved and preserved in a condition suitable for its subsequent management. Due account shall be taken of the expected period of storage, and to the extent possible, passive safety features shall be applied. For long term storage8 in particular, measures shall be taken to prevent the degradation of the waste containment. (FIN)	GSR Part 5 scope is the waste management. The spent fuel storage is covered by other requirements documents such as Spent fuel storage is included in the SSR-2/1 and NS-R-5 (Rev. 1) and its revision to SSR-4 (DS478 in this 42th NUSSC to be submitted to CSS) Please check the referenced requirements.	Rejected	*Para 1.1 introduces both situation related to SNF. In para 1.2 it was and is written that this SG is following GSR Part 5. The scope wasn't changed in this revision.*
156	6.2.	Spent fuel is stored in essentially one of four different modes: (HUN)	There are wet and dry storages. Dry storage can be in vaults, casks or silos. (TS Enercon)	To be addressed in the next full scale revision	IAEA TecDoc-1100 – Survey of wet and dry storage – July 1999 Vaults consist of above- or below-ground reinforced concrete buildings containing

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
					arrays of storage cavities suitable for containment of one or more fuel units. *Concrete casks are moveable structures with one storage cavity. They are used in storage, and in some cases, transport of spent fuel. Structural strength and radiological shielding are provided by reinforced regular or high density concrete. Concrete cask systems may use sealed metal canisters housed inside the concrete storage cask to contain spent fuel.* *Silo systems are monolithic or modular concrete reinforced structures. The concrete provides shielding while containment is provided by either an integral inner metal vessel (liner), which can be sealed after fuel loading, or by a separate sealed metal canister. In silos, spent fuel may be stored in vertical or horizontal orientation.*

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
157	Para 6.2(a) page 33	'…The spent fuel is stored in standard storage racks or in compact storage racks in which closer spacing of the fuel assemblies or fuel elements is allowed in order to increase the SNF storage facility capacity. In case of SNF storage in compact storage racks proper nuclear safety measures, such as […] should be implemented". (PL)	The need to increase the SNF storage facility capacity is not by itself the reason to allow usage of compact storage racks. It should be proper explained which nuclear safety measures are necessary to be met to allow SNF storage in compact storage racks to ensure protection against criticality. (see also paragraph 6.30).	To be addressed in the next full scale revision Proposal: The spent fuel is stored in racks.	
158	6.2 (b) / 6	"...arranged either vertically or horizontally." (RSA)	Editorial: Remove period after the word "vertically".	Rejected	
159	6.2 (b), (c)/p. 27-28	**Subcritical state of stored SF** *(text to be developed)* (CZ)	Items in para 6.2 contain description of basic safety functions of two types of SF storage facilities. Consider to add the most important one – maintaining the subcritical state of stored SF (already considered in the rest of the document, e.g. para 6.12, 6.32, Appendix I…).	Rejected	It is a description of different types of storage solutions but not of basic safety functions.
160	6.2. b)	They are usuallyl cylindrical in shape, circular in cross-section, with the long axis arranged either vertically or horizontally (ARG)	Elimination of the point between vertically or horizontally.	Rejected	
161	6.2.b.	Vertically, or horizontally	Typing error (TS Enercon)	Rejected	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		(HUN)			
162	6.2.c.	This heat is released to the atmosphere. (HUN)	There is no vault system in the World, which uses air filtration, and a secondary cooling circuit. (TS Enercon)	Habog ?	
163	6.2 (c)	Some systems also use a secondary cooling circuit to provide for confinement of radioactivity. ~~However, if natural convection is to be used, the need for active components, e.g. pumps and ventilators, should be minimized through higher operational reliability of the system and corresponding cost reduction.~~	Identify purpose of secondary cooling loop. Delete last sentence because it is unclear.	Some systems also use a secondary cooling circuit.	No deal with the FDI. P. 6.2 describes modes, but not purposes, cost and other aspects. *Para 6.2(c) wasn't affected by this revision*
164	6.2	Consider maintenance of the sentence: "However, if natural convection is to be used, the need for active components, e.g. pumps and ventilators, should be minimized through higher operational reliability of the system. (FR)	No reason to remove it	Already taken into account	
165	6.4	… A multi-barrier approach should be adopted in ensuring containment, with account taken of all elements including the fuel	Delete all In line with SSR-2/1, Req. 80 and para. 6.64 -6.68	Rejected in this revision To be considered in the next full scale revision Add wet storage Fuel matrix is rarely considered as a containment barrier	*There isn't a contradiction between para 6.4b and paras 6.64-6.68 of SSR 2/1*

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		matrix, the fuel cladding, the storage casks, the storage vaults and any building structures that can be demonstrated to be reliable and competent; …(FIN)			
166	6.4 / 3	retrievability of the spent fuel or the spent fuel package. (ARG)	For consistency with 6.4 (g) /1.	Accepted	
167	6.4. (d)	Safety systems should be designed to function with minimum human intervention. If the performance of safety systems depend on actions carried out by personnel, those human interactions with the facility or activity should be assessed for design basis accidents and design extension conditions; (J)	Clarification.	Accepted To be considered in the next full scale revision	
168	6.4/(d)	Indention of the text is different to the rest of the document.	Formatting	Accepted	
169	6.4 (d)/p.28	Safety systems should be designed to function **passively, without human intervention or** with	To emphasise one of design features of some SF storage facility types – their passive character contributing to the	Accepted To be considered in the next full scale revision	

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		minimum human intervention… (CZ)	overall safety of the facility.		
170	Page 29	Move second and third gray boxes of page 31 below DESIGN OF SPENT FUEL STORAGE FACILITIES. (ARG)	For the sake of style consistency.	?	
171	6.5 – 6.10	To exclude or to significantly reduce the section	The existing IAEA Safety Guide "Design of systems for the treatment of fuel and its storages on nuclear power plants" (NS-G-1.4, 2005) acts contains the requirements for design of SNF storages on the NPP which are much more in details stated. As requirements for design of SNF storages on the NPP and other objects (Research reactors, radiochemical plants) are almost identical, it is quite enough to refer to this document as it is made concerning requirements for physical protection, the account and control of nuclear materials.	Andrey?	
172	Para 6.5 page 35	"…Only verified and validated methods should be used for ~~predicting~~ justification the safety of operational states ~~or~~ and predicting the consequences of accidents.	1. Editorial remark 2. It is unclear which input data should be after all – conservative or realistic. It should be noted, that current	Accepted Only verified and validated methods should be used for assessing the safety of operational states and predicting the consequences of accidents.	Improve the text

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		The input data selected should be conservative but realistic [?]…". (PL)	practice is to use conservative input data for DBC and best estimate, i.e. realistic input data for DEC. Some additional clarification (note) should be provided regarding "conservative but realistic" meaning in the guide.	The input data selected should be conservative.	
173	6.7/20 (p.29)	6.7. The design against levels of external hazards selected for the design basis in order to address cliff edge effects[9bis]. [9bis] A 'cliff edge effect' is an instance of severely abnormal conditions caused by an abrupt transition from one status of a facility to another following a small deviation in a parameter or a small variation in an input value. (JP)	As a guidance document, consideration on the cliff edge effects should be more precisely explained. A new term 'cliff edge effect' should be explained in a footnote.	Accepted The design should provide for an adequate margin against levels of external hazards selected for the design basis in order to **avoid** cliff edge effects.	
174	6.7/p.29	The design should provide for an adequate margin against levels of external hazards selected for the design basis. ~~in order to address cliff edge effects~~ (CZ)	Try to avoid using new or not widely used terms. If they are needed, provide definitions.	Rejected	Definition provided: see comment 171

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
175	6.7 Page 34	Add as a footnote : Cliff edge effect: sudden and large variation in the facility conditions in response to a small variation in an input. (ENISS)	The proposed definition of "Cliff edge effect" is derived from the one given by the IAEA Glossary.	Rejected	Definition provided: see comment 171
176	Para 6.8 page 35	"~~Items~~ SSCs important to safety~~, including structures, systems and components,~~ should be identified and classified according to their relative importance. Procedures to ensure that the ~~items~~ SSCs important to safety will have appropriate ~~qualities~~ functional and performance characteristics to perform their safety functions for the design lifetime of the SNF storage facility or a defined replacement interval should be established. The relative importance of the ~~items~~ SSCs should be considered in establishing the necessary qualities…". (PL)	1. Editorial remark (see general comment 5). 2. Meaning of "appropriate qualities" is unclear and should be clarified or replaced by "appropriate functional and performance characteristics" or "appropriate technical specification". 3. Meaning of "the life of the facility" is unclear. Is it a SNF storage facility design lifetime?	Accepted: Items important to safety~~,~~ including structures, systems and components (SSCs)~~,~~ should be identified and classified according to their relative importance. Procedures to ensure that the items s important to safety will have appropriate ~~qualities~~ functional and performance characteristics to perform their safety functions for the lifetime of the SNF storage facility or a defined replacement interval should be established. The relative importance of the items should be considered in establishing the necessary qualities…".	
177	6.10 / 9	"(e) Degradation of the fuel cladding," "(f) Degradation of the fuel assembly structural material."	Add these two items which are not explicitly covered by the items currently listed as 6.10 (a) to (d).	?	

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		(RSA)			
178	Page 31	Delete first gray box. (ARG)	Requirement 10 seems to be misplaced.	rejected	
179	6.12/3, 6.13/4 (p.31)	[3~~,30~~] (JP)	SSG-41 (Ref.30) does not explicitly mention "defence in depth". The original reference in SSG-15 is WS-G-2.6 which refers to "defence in depth" in para. 5.2.	Rejected	Reference 30 Para. 6.95 mentionnes defence in depth
180	Para 6.19 page 38	"Structural materials and welding methods should be selected on the basis of accepted nuclear industry codes and standards…". (PL)	Editorial remark. Meaning of "accepted codes and standards" should be clarified.	To be considered in the next full scale revision	
181	Para 6.24 page 39	"In evaluating the structural integrity of the facility building and the structures inside, justification should be provided for the structural and mechanical loads evaluated for both normal ~~anticipated~~ operation conditions and for postulated accident initiating events…" (PL)	Editorial remark. Meaning of "normal anticipated conditions" is unclear. There are "normal operation conditions" and "anticipated operating occurrences (AOO)".	accepted	
182	6.29	«The physical layout and arrangement of the spent	Subcriticality may be ensured not only	To be considered in the next full scale revision	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		fuel storage facility should be designed in such a way as to ensure, through construction material characteristics and geometrically safe configurations, that subcriticality will be maintained in all operational states and for credible accident conditions for all kind of spent fuel assemblies to be stored in the storage». (RUS)	with geometry of SNF assemblies layout, but also with construction material of elements (cases, racks).		
183	6.30	«Where spent fuel cannot be maintained subcritical by means of safe geometrical configurations alone, additional means such as fixed neutron absorbers could be applied. The use of a burnup credit (see Appendix II, paras II.7- II.10) could be applied for the justification of storage safety». (RUS)	It is necessary to apply burnup credit of SNF only as additional measure for justification of storage safety.	Consider adding a paragraph dealing specifically with burnup credit, before talking about geometry or neutron poisons. It could be recommended to use only fresh fuel for LWR spent fuel storage. To be considered in the next full scale revision	
184	6.32/p. 35	An adequate margin of subcriticality in the effective neutron multiplication factor k_{eff} that is acceptable to the regulatory body should be	See comment No. 5 + try to avoid using not widely used terms or specify what are CREDIBLE accident conditions.	To be considered in the next full scale revision	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		maintained for operational states**, incident** and ~~credible~~ accident conditions (CZ)			
185	6.32. line 5.	The potential rearrangement of the geometrical configuration of the fuel assemblies or fuel elements should also be considered in demonstrating the required subcriticality margin. (HUN)	Using the expression *geometrical configuration*, like DS488 1.4 (b), should cover all the possibilities that can happen, for example compaction, but gives space for other possibilities as well. (HAEA)	To be considered in the next full scale revision Taking into consideration FDI lessons, consider adding: For a wet spent fuel storage facility, the minimum margin should be maintained even in the event of water boiling (storage could be more reactive under water vapor conditions than under water) after a loss of cooling or a water leak.	
186	6.32.	"The potential for rearrangement, compaction, or shattering of fuel pins, should also be considered in demonstrating the required subcriticality margin" (HUN)	Shattering of fuel pins also should be considered in demonstrating the required subcriticality margin. (HAEA)	To be considered in the next full scale revision	
187	6.32. Footnote 10.	(HUN)	In a 107 page document, there is no place for a clear definition of subcriticality requirements? (TS Enercon)	Just a comment	
188	6.32 – Footnote	After inclusion of uncertainties in the calculations and data, a margin to criticality of 5% or less is applied in many States. Another margin can be	From the text, it can be understood that a unique margin of "5% or less" is to be respected, whatever the case that is considered. Most countries	Accepted Consider reviewing the sentence as follow: After inclusion of uncertainties in the calculations and data, a margin to	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		specifically set for credible accident conditions, to highlight significant differences regarding normal operation. (ENISS)	consider a margin of 5% in normal conditions and 2-3% in accidental (or so-called abnormal) conditions.	criticality of 5% is applied for normal conditions and less (2 or 3 %) for abnormal conditions, in many States	
189	Para 6.33(d) page 41	"The highest nuclear reactivity may be reached at some intermediate density of water, for example…". (PL)	Editorial remark. It is unclear "intermediate density" of what medium was considered here. Proper clarification should be provided.	See comment 183	
190	6.33(e)	For certain accident conditions such as ~~boron dilution~~ a fuel handling accident, limited credit for soluble boron may be allowed in view of the double contingency principle[11]. (US)	Boron dilution is not independent of the soluble boron. If soluble boron can be diluted, it makes little sense to credit it in combatting a dilution event. A fuel handling accident (e.g., a fuel assembly in an invalid storage location) is an event independent of boron dilution events, so limited credit for soluble boron could be allowed to ensure an adequate subcritical margin for the fuel handling accident.	Consider adressing this question to a criticality specialist.	
191	Para 6.33(g) page 42	"Credit [?] should not be claimed for neutron absorbing parts or components of the spent fuel storage facility unless they are permanently	It should be noted, that IAEA Safety Glossary 2016 edition does not provide the definition of "credit". The proper definition (note) of	To be considered in the next full scale revision	

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		installed,…". (PL)	term "credit" meaning should be added to the guide or it should be written directly, that *"Neutron absorbing parts or components of SNF storage facility should not be taken into account (excluded) in estimating SNF storage facility subcriticality level and nuclear safety justification…"*. In last case if no definition of "credit" will be provided, all the rest of paragraphs where "credit" is mentioned should be corrected proper way providing direct meaning of "claiming credit". Also, it should be noted, that Appendix II provides quite poor explanation of the "Burnup Credit" meaning, but it does not provide any definition or clarification regarding "Neutron absorbers credit".		
192	Para 6.33(i) page 42	"All fuel should be assumed to be at a burnup and enrichment value that results in maximum nuclear reactivity, <u>unless credit for burnup is assumed</u> on the basis of an adequate justification…	1. Additional clarification should be provided in the guide why it is required to take into account possible changes in the nuclide composition of the spent fuel with storage time when burnup credit is applied and why it is not necessary then burnup	Rejected The first sentence could be improve in the next full scale revision.	If fresh fuel is considered, no isotopic evolution could increase reactivity. In the case of burnup credit demonstration, in some case reactivity could increase through the time.

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		For application of burnup credit in long term storage, possible changes in the nuclide composition of the spent fuel with storage time should be taken into account for the entire period of SNF storage in the SNF storage facility". (PL)	credit is not applied. Spent fuel isotopic composition changes during storage time independently of applying or not applying burnup credit. It seems, that recommendation of taking into account *"possible changes in the nuclide composition of the spent fuel with storage time"* is excess and surplus when burnable absorbers is not taken into account (not credited). At least it should be explained ability or prevention to use both burnup credit and burnable absorbers credit (see 6.33(h)) at the same time. 2. Another question is for what spend fuel storage period spent fuel isotopic composition changes should be taken into account. Hundred years, thousand years or million years? Proper clarification should be provided.		
193	6.35	Also, Uranium – Thorium MOX fuel…	Element are written in Capital Letters	Depends on the editing rules	
194	Para 6.36 page 42	1. Clarify the subchapters title prior the paragraph 6.36	Editorial Remark. 1. Poor, not informative title of	See comment N°34	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		"**Spent fuel decay heat removal**" 2. "6.36 Spent fuel storage facilities should be designed with SNF residual decay heat removal systems that are capable of reliably cooling the stored spent fuel when the fuel is initially received at the facility…". (PL)	subchapter. It should be clarified which heat removal is under consideration. 2. Here and in all subsequent paragraphs it should be clarified that it is *"spent fuel residual decay heat removal systems"* what are under consideration.		
195	6.36	In addition, the temperature of other safety-related components in the facility should also not exceed their maximum allowable temperatures *in normal operation and anticipated fault conditions.* *(UK)*	The requirement is not sufficiently specific	The heat removal capability should be such that the temperature of all spent fuel, including that of the spent fuel cladding, does not exceed the maximum allowable temperature and that the temperature of other safety related components in the facility doesn't exceed their maximum allowable temperatures *in normal operation, anticipated operational occurrences and accident conditions, including the design extension conditions.*	It wasn't clear from the text, as it was written, if it relates to the heat removal system or just to the monitoring system. As soon as 6.36 addresses heat removal the wording is proposed to be changed as follows.

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
196	6.36, Last (new) sentence	… To improve accident management capabilities, passive measures, such as dispersing high decay heat fuel assemblies uniformly among low decay heat assemblies, should be considered. …	Quoted text introduces a new element (…dispersing high decay heat fuel assemblies uniformly among low decay heat assemblies …). I consider this to be more of a criticality issue than heat removal issue. If spent fuel assemblies are still submerged in cooling water the heat will probably be evenly distributed regardless of configuration of assemblies. If decided to keep this element I propose to keep as separate paragraph and move to sub-chapter/section OPERATION	See comment 198.<br ~~To improve accident management capabilities, passive measures, such as dispersing high decay heat fuel assembly packages uniformly among low decay heat assembly packages, should be considered~~	
197	6.36. Last 1 line	…… among low decay heat fuel assemblies, should be considered.	Editorial.	Accepted	
198	6.36/9	To improve accident management capabilities, passive measures, such as dispersing high decay heat fuel assemblies uniformly among low decay heat assemblies, should be	Clarity; the important thing is « passive measures should be considered ». Dispersing high decay heat fuel assemblies uniformly among low decay heat assemblies is one	To improve accident management capabilities, passive measures should be considered, such as dispersing high decay heat fuel assemblies uniformly among low decay heat fuel assemblies.	"Such as" is used to demonstrate that it is just one of examples

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		considered. For example, dispersing high decay heat fuel assemblies uniformly among low decay heat assemblies could be considered. (ENISS & ?)	example of passive measure.		
199	Page 42 6.36	The heat removal capability should be such that the temperature of all spent fuel, including that of the spent fuel cladding, does not exceed the maximum allowable temperature~~, and that the temperature of other safety related components in the facility should also not exceed their maximum allowable temperatures.~~ in normal operation, anticipated operational occurrences and accident conditions, including the design extension conditions (FR/ENISS)	**In case of a fire** (which is an accident condition), some safety related components may be be destroyed but redundant design shall maintain the safety function	To be discussed again Consider adding a new paragraph : In case of an external fire aggressing a storage cask, some safety related components may be destroyed and the safety functions shall be ensured by redundant design of the cask.	
200	6.36./8,9 (p.37)	To improve accident management capabilities, passive measures, such as dispersing high decay heat fuel assembly packages uniformly among low decay	What does "assembly package" mean? Please add more explanation.	6.36./8,9 (p.37) See comment N°196	To improve accident management capabilities, passive measures should be considered, such as dispersing high decay heat fuel assemblies uniformly among

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		heat assembly packages, should be considered (JP)			low decay heat fuel assemblies.
201	6.36,6.56/The last text (p.37, 43)	A period is missing. (JP)	Editorial.	accepted	A dot is missing at the end of the paragraph.
202	6.36	"///capable of reliably cooling the stored spent fuel during the entire lifetime of the installation, including during its initial loading" (BEL)	It is not clear why this requirement is limited to the initial receipt. Perhaps this requirement is based on the underlying assumption that in the initial receipt the total heat load goes from zero to the maximum heat load – thus covering the entire lifetime, but this is a very implicit reasoning and a more general text is preferred.	Accepted capable of reliably cooling the stored spent fuel **during the entire lifetime of the installation,** ~~including during its initial loading~~" Consider deleting the end of the sentence: "including during its initial loading"	It is possible to have an increase of the heat load in storage pools at the entrance of reprocessing plants, depending on the burnup of the spent fuels r**e**ceived. .
203	Para 6.38 page 43	"The SNF residual decay heat removal system should be designed for adequate removal of the heat likely to be generated by the maximum inventory of spent fuel anticipated during operation, i.e. for fully filled SNF storage facility. In determining the necessary heat removal capability of the facility, the post-irradiation cooling interval and the burnup of the spent fuel to be stored should	Editorial remark.	Rejected	See comment N°34 for decay Two other proposals are not necessary.

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		be taken into consideration…". (PL)			
204	Para 6.39 page 43	"In the case of modular facilities such as vaults, the fact that the heat produced from the decay of spent fuel fission products decreases with time can be taken into account in the design [of what?]…". (PL)	It is unclear "design" of what? Proper clarification should be provided.	Rejected;	It is the design of the facility of course and an example is following in the para 6.39
3	6.40 6.56 6.60 6.72		Design extension conditions is not defined (SP)	Accepted	The footnote with the DEC definition is to be inserted for the para 1.7
205	6.40.	The heat removal systems should have redundancy and/or diversity commensurate with the reliability of the function considered in the design process. The design should include provisions to monitor and retain coolant inventory, such as the water level in wet storage facilities and the pressure of circulating gases within dry storage canisters, during normal operational states	To keep consistency with plant states used in SSR-2/1 (Rev. 1). "Design extension conditions" are already included in "accident conditions".	…The design should include provisions to monitor and retain coolant inventory, such as the water level in wet storage facilities and the pressure of circulating gases within dry storage canisters, during normal operation, anticipated operational occurrences and accident conditions, including the design extension conditions. Consideration should be given to the potential for fuel overheating over an extended period of time.	It's important to highlight that DEC should be addressed

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		and accident conditions, and the design extension conditions. Consideration should be given to the potential for fuel overheating over an extended period of time.			
206	6.40/4, 5 (p.37)	The design should include provisions to monitor and retain coolant inventory, such as the water level in wet storage facilities ~~and the pressure of circulating gases within dry storage canisters,~~ during normal operation, anticipated operational occurrences and accident conditions, including the design extension conditions. Consideration should be given to the potential for fuel overheating over an extended period of time. (JP)	It is not typical to monitor the pressure of circulating gases within dry storage canisters. Generally, dry cask storage system store spent fuel cooled more than 5 years after discharge from reactor. Then, the heat is removed by natural cooling (passive convection of air). Even after an accident including design extension conditions, the heat removal system will be secured, inspected, or easily recovered if necessary, as was in the Fukushima accident.	Accepted. The design should include provisions to monitor and ensure effectiveness of the cooling system during normal operation, anticipated operational occurrences and accident conditions, including the design extension conditions. In wet storage facilities, it could be done by monitoring the temperature and the level of the water. In dry storage vault facility, it could be done by monitoring temperature and flowrate of the coolant gas. Consideration should be given to the potential for fuel overheating over an extended period of time in the case of a long term loss of cooling or of electricity supply.	
207	Page 43; § 6.40.	The use of redundant and/or diverse heat removal systems may be appropriate, depending	Heat removal in the long term: as the residual heat is decreasing, only sufficient	See above comment 206	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		on the type of storage system used and the potential for fuel overheating over an extended period of time, reliability of the systems function should be considered in the design process. The design should include provisions to monitor and retain sufficient coolant ~~inventory~~, such as the water level in wet storage facilities and the minimum pressure of circulating gases within dry storage canisters, during normal operation, anticipated operational occurrences and accident conditions, including the design extension conditions. Consideration should be given to ~~the potential for fuel overheating~~ impact on fuel integrity over an extended period of time. (FR/ENISS)	cooling parameters are necessary to maintain sufficient safety level.		
208	Para 6.40 page 43	"The use of redundant and/or diverse SNF residual decay heat removal systems may be appropriate, depending on the type of storage system [?] used and reliability of the systems [which ?] function should be considered in the design [of	1. Editorial remark. 2. It is unclear what is considered by *"depending on the type of storage system"*. Proper clarification of different storage systems types should be provided.	1 – Rejected 2 – Accepted The use of redundant and/or diverse heat removal systems may be appropriate, depending on the type of storage (wet or dry), and the reliability of the heat removal	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		what?] process. The design [whose?] should include provisions to…". (PL)	3. It is unclear which systems reliability is considered – SNF residual decay heat removal systems or "type of storage system used" 4. It is unclear "design" of what? Proper clarification should be provided.	systems function should be considered in the design process.	
209	6.40/p. 37 + whole document	The design should include provisions to monitor and retain … the pressure of ~~circulating~~ gases within dry storage canisters, during normal operation, ~~anticipated operational occurrences~~ **incidents** and accident conditions … (CZ)	Some gasses do not circulate in storage cases (between lids) + harmonise in the whole document the terminology used (incidents vs. anticipated operational occurrences).	Accepted See comment N°206	
210	6.40.	The design should include provisions to monitor and retain coolant inventory, such as the water level in wet storage facilities and the gas pressure within dry storage canisters during normal operation (HUN)	No monitoring of circulating gases within dry storage canisters is done, delete text! (TS Enercon)	Accepted See comment N°206	
211	6.40.	"The use of redundant and diverse heat removal should be appropriate" (HUN)	Heat removal systems are very important for practical elimination of accidents leading to early or large releases. (HAEA)	Just a comment	

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
212	6.40	[remove or rephrase] "Consideration .. time" Suggestion: "These considerations should limit the potential for fuel overheating over an extended period of time" (BEL)	The purpose of the last sentence is and how to apply it are not at all clear. The proposed text may or may not correspond to the intentions.	Accepted See comment N°206	
213	37/6.40	The use of redundant and/or diverse heat removal systems may be appropriate, depending on the type of storage system used and reliability of the systems function should be considered in the design process. The design should include prov1s1ons to monitor and retain coolant inventory, such as the water level in wet storage facilities, temperature of pool water and the pressure of circulating gases within dry storage canisters, during normal operation, anticipated operational occurrences and accident conditions, including the design extension conditions. Consideration should be given to the	Temperature of Pool water is an important parameter for information on performance of the cooling system.	Accepted See comment N°206	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		potential for fuel overheating over an extended period of time. (HIND)			
214	Para 6.41 page 44	"…Containment should be ensured by at least two independent static barriers [?]…". (PL)	It is unclear what is understandable as SNF storage facility containment and what are these two static barriers. Moreover, there can be open air dry SNF storage facilities: *"Casks may be enclosed in buildings or stored in an open area"* (see 6.2 9b)). Proper clarification should be provided what is understood as containment in case of open air dry SNF storage facilities and what is this independent static barriers in general.	Rejected	Containment is always related to radioactive materials.
215	Para 6.44(a) page 44	"Appropriate ventilation, including efficient, appropriately qualified and designed air filtration systems [?] and provision for their periodic checking, should, as necessary, be included in the design [of what?] to maintain the concentrations…" (PL)	1. It is unclear "included in the design" of what? Proper clarification of the object of consideration should be provided. 2. It is doubtful how this recommendation regarding ventilation and air filtration systems can be applied for open area dry SNF storage facilities. Proper clarification should be provided in the guide regarding	Rejected	1 – design of the facility 2 – Ventilation is included, as necessary, in the design. Obviously, it is not necessary for dry cask storage.

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			open area dry SNF storage facilities.		
216	Para 6.44(b) page 44	"Provision should be made for the monitoring of all ~~radioactive~~ effluents from SNF storage facility and timely radioactivity detection". (PL)	Proper clarification should be provided in the guide regarding place of the monitoring of radioactive effluents. Otherwise all effluents from SNF storage facility should be monitored, not only radioactive. Besides how it is written now it allows to suppose, that "radioactive effluents" cannot be avoided, are regular or even mandatory, but this is not the true. The subparagraph should be corrected accordingly to state, that provision should be made which will allow to detect and monitor the radioactivity leakage in case it happens.	Rejected	Section is dedicated to radiation protection.
217	6.45 (b) Last (new) sentence	… The facility design …	The added element is relevant. But I propose to reword slightly so as to avoid long and complicated sentence.	Rejected	No other comments about wording of this para. Better wording can be found later if needed.
218	6.45/(b)	Indention of the text is different to the rest of the document.	Formatting	Accepted	

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
219	6.45.(b)/3 to 5 (p.39)	The facility design should include provisions ……, such as ….~~and where water may be used for neutron shielding in dry storage, alternate neutron shielding if water could be lost.~~ (JP)	It is not typical for dry storage to use water for neutron shielding.	Accepted	
220	**6.45. and 6.71.**	Review the whole text and extend it with reference to the Design Extension Conditions where it seems to be missing. (HUN)	The concept of the Design Extension Conditions has been introduced. According to its definition during such events releases of radioactive material are kept within acceptable limits. Based on that for example in the paragraph 6.45 (c) and paragraph 6.71 the reference to the DEC seems to be missing. (SOM System)	Accepted for 6.71 For wet storage facilities, the water level in it should be monitored and provisions to identify the potential for water leakage during both normal and accident conditions, including design extension conditions, should be provided.	
221	6.45.b.	for shielding in wet storage facilities. (HUN)	water is not used for neutron shielding in any dry storage (TS Enercon)	accepted	
222	6.45. b.	"Suitable shielding should be provided for normal operation, anticipated operational occurrences and accident conditions" (HUN)	Anticipated operational occurrences should be also included, for the consistency of the text. (HAEA)	accepted	
223	6.45	(b) Suitable shielding should be provided for normal operation and accident	In order to be more specific, the word "unacceptable" could be completed, in order to link the	Accepted	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		conditions. The facility design should include provisions to prevent unacceptable loss of liquid shielding ~~during~~ regarding accessibility needs in accident conditions, such as design features to retain minimum water levels for shielding in wet storage facilities and where water may be used for neutron shielding in dry storage, alternate neutron shielding if water could be lost. (ENISS)	loss of shielding to accessibility needs in accident conditions.		
224	6.45	[remove or rephrase] ",alternate … lost" (BEL)	This last part of the sentence is not clear and does not match the rest of the sentence	Accepted See comment 220	
225	Para 6.46 page 45	1. Clarify the subchapters title prior the paragraph 6.46 "**Layout of spent fuel storage facility**" 2. "6.46(d) The need to move heavy objects over stored spent fuel and ~~items~~ SSCs important to safety should be minimized by the layout [of what?]". (PL)	Editorial Remark. 1. Poor, not informative title of subchapter. It should be clarified which layout is under consideration. 2. Here and in all subsequent paragraphs it should be clarified what *"layout"* is under consideration.	Rejected	Consistent with others titles For items see comment N°16.

Comments on: Revision by amendment of Draft Safety Guide DS489 Storage of Spent Nuclear Fuel

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
226	Para 6.46(i) page 46	"Division of the storage area into sectors should be such as to facilitate access to any stored fuel and to avoid application of the 'first in last out' [?] concept to enable different storage configurations [?]". (PL)	1. The meaning of "first in last out" is unclear. Usage of slang words in quotes " " should be avoided in such nuclear safety related documentation as guides. Proper clarification or definition of used term "first in last out" should be provided in the guide. 2. Due to hardly understandable structure of the sentence it is unclear if *"different storage configurations"* should be avoided as can be enabled by "first in last out" concept, or *different storage configurations* should be enabled by avoidance of "first in last out" concept. Proper revision of recommendation and/or clarification should be provided in the guide.	Accepted Division of the storage area into sectors should be such as to facilitate access to any stored fuel and to enable different storage configurations, avoiding 'first in last out' concept." Consider adding a footnote : The first object introduced in the storage will be the last to go out.	
227	Para 6.46(n) page 46	"Appropriate arrangements for containment measures and the safe storage of degraded or failed fuel should be provided". (PL)	1. It is unclear, how to fulfill this recommendation for open area dry SNF storage facilities (see also comment 53). Proper clarification regarding appropriate arrangements and examples of containment measures for SNF storage facilities, including open area	1 – Rejected 2 – Accepted Consider adding a paragraphe in section "containment of radioactive material": - In the design of spent fuel storage	See comment 214

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			dry SNF storage facilities, should be provided in the guide. 2. It is proposed to reflect this issue regarding containment measures and safe storage of degraded or failed fuel more detailed in the "Containment" subchapter as this issue is important to nuclear safety and radiological protection.	facility, it should be forecast the arrival of failed fuel and provisions should defined in order to manage the containment of such fuel elements.	
228	Para 6.46(p) page 46	"Penetrations [through what?] should be designed in such a way as to prevent the ingress of foreign material (e.g. rain, inorganic solutions, organic materials) that could reduce subcriticality margins…". (PL)	1. It is unclear which penetrations and where are considered in this recommendation. Proper clarification should be provided in the guide. 2. It is unclear how prevention of penetration of foreign material (e.g. rain…) can be applicable to open area dry SNF storage facilities. Proper clarification should be provided in the guide regarding open area dry SNF storage facilities.	Accepted Consider adding: Penetrations through containment barriers	
229	Para 6.47 page 47	1. Clarify the subchapters title prior the paragraph 6.47 "**Handling of spent fuel**" 2. "6.47(a) Fuel handling	Editorial Remark. 1. Poor, not informative title of subchapter. It should be clarified handling of what is under consideration	1 – Rejected 2 - Rejected	Consistent with others titles Fuel handling machine is a specific fuel handling equipment used to load/unload

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		~~machines~~ equipment;" (PL)	here. 2. The term "machines" should be replaced by term "equipment" (see paragraph 6.48). It should be noted, that this is the only place term "machines" is used.		reactors, hot cells and pools.
230	Para 6.49 page 48	"Where operating personnel will require information on the non-visible state of the equipment or components in order to verify the safety of a planned operation, ~~as stated in the safety case,~~ provision should be made in the design [of what?] for effectively transmitting such information to the operating personnel…". (PL)	1. *"as stated in the safety case"* is surplus or even applying unnecessary limitations and should be deleted from the text. Proper provision should be implemented for gathering the *"information on the non-visible state of the equipment or components in order to verify the safety"* even if it is not covered by "safety case". 2. It is unclear which design is under consideration here. Proper clarification should be provided in the guide.	To be Accepted during full scale revision Consider adding: "in the design of the facility".	
231	6.51.	To minimize the probability of an accidental drop of any load, equipment for transferring spent fuel to a spent fuel storage facility should be designed to	The prevention can rely upon the design of the equipment (mechanical strength) and/or the operational limits and conditions (lifting height)	Equipment should be designed and operational limits and conditions should be established such that, in the event of an accidental drop of a load… In addition, the design and	Limits and conditions can't be used INSTEAD of design provisions. L&C are also addressed in Chapter 3 (3.18).

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		ensure that the equipment is capable of withstanding conditions of normal operation, anticipated operational occurrences and accident conditions. Equipment should be designed and/or operational limits and conditions should be defined such that, in the event of an accidental drop of a load, the containment or the shielding of fuel casks will not be damaged in a manner that could result in unacceptable radiation exposure of workers or the public. In addition, the design and operational limits and conditions should be such that an accidental drop will neither prevent fuel retrieval nor cause significant damage to the spent fuel or spent fuel storage facility.		operational limits and conditions should be such that an accidental drop will	Para 6.51 wasn't affected by this revision.
232	6.51	[Rephrase entirely] (BEL)	Several issues: 1. Since the equipment is used for transferring SF to (i.e. not "in"), the storage	To be considered in the next full scale revision.	

Comments on: Revision by amendment of Draft Safety Guide DS489 Storage of Spent Nuclear Fuel

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			facility, it should be clarified which conditions are referred to and if this is applicable at all. Perhaps a reference to transport standards and practices is more in place. 2. According to IAEA definitions accident conditions include "beyond design/design extension" accidents. If this includes the initiator, e.g. an aircraft crash, then it is unlikely that the equipment can withstand that. It is also not clear why this requirement is justified – transport containers themselves are typically able to withstand these conditions and back-up transfer equipment could be present on-site. 3. Does "fuel retrieval" refer to the fuel retrieval at the end of the storage period (ref. 6.132) or directly after the occurrence of the accidental drop. Are alternative to the original		

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			transfer equipment allowed? If yes, on which timescale after the drop??		
233	Para 6.52 page 48	"Assumptions made that are critical to operational safety should be documented at the design stage [?] to facilitate the subsequent development of operating procedures…". (PL)	Ii is unclear whose "design stage" is under consideration here – the SNF handling equipment or SNF storage facility? Proper clarification should be provided in the guide.	rejected	Design stage means design of the facility and of all equipment.
234	Para 6.55 page 49	"The dropping of spent fuel during transfer from the cask to the storage rack (or vice versa in the case of cask loading for dry storage) could result in impacts that should be avoided, such as: …". (PL)	This paragraph doesn't provide any recommendations, just warning. Besides, it should be noted, that not the impacts should be avoided in first row, but the dropping of spent nuclear fuel itself. The paragraph might need to be reconsidered to be written as recommendation for a proper action to avoid mentioned consequences (like using proper handling equipment with anti-drop protection, the limiting of the height of lifting, establishing safe routes for SNF movement, using impact shock absorber on the pool bottom floor, etc.) or should provide recommendations for correction	To be considered in the next full scale revision.	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			actions if dropping of the SNF happened.		
235	Page 49 Tittle before 6.56	Ventilation system for spent fuel storage facilities (FR/ENISS)	§6.56,§6.57 and §6.58 are applicable for facilities (wet or dry) but not applicable to casks or canister systems	Accepted	
236	Para 6.56 page 49	"The design [of what?] may consider the potential for pressure build-up in the facility during accidents…". (PL)	It is unclear "design" of what is under consideration here. Proper clarification should be provided in the guide.	Refused	Design of the ventilation systems.
237	Page 49 6.56	The design should ~~may~~ consider the potential for pressure build-up in the facility during accidents including design extension conditions, and provide for a means to prevent hydrogen gas concentrations which could give rise to disruptive explosions (FR/ENISS)	The hazard is the production of H_2 due to Zr /H_20 at high temperature. For spent fuel storage, the recommendations on the water level (§6.45 (b), 6.71 and I.6) exclude such a reaction in the pool so that this recommendation is valid for H_2 arising from a close reactor vessel	Accepted DEC include severe accidents. In that case, reaction between Zr and water is possible.	Consistency of the document
238	6.56/22 (p.43)	…The design should ~~may~~ consider the potential for pressure build-up in the facility during accidents including design extension conditions, and is required to provide for a means to prevent hydrogen gas concentrations which could	In the design of ventilation systems, measures to prevent hydrogen gas explosion should be considered. Preventing hydrogen gas concentration is addressed in DS478 (para9.123)	1 - Accepted 2 - Rejected	See comment 237.

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		give rise to disruptive explosions. (JP)			
239	6.57	Ventilation systems should be operated in such a way …	Propose to move paragraph to subchapter/section OPERATION	Ventilation systems should be designed…	Could be accepted while para 6.57 wasn't affected
240	6.61	The operation of fuel handling …	Propose to move paragraph to sub-chapter/section OPERATION	To be considered in the next full scale revision	
241	Para 6.57 page 49	"Ventilation systems should be designed in such a way as to have proper provisions for control [?] the accumulation of flammable and/or explosive gases (e.g. hydrogen gas formed by radiolysis). Consideration should also be given [?] to the potential for the drawing in of hazardous gases from external sources". (PL)	1. From how it is written now, it is unclear if ventilation system should control accumulation of gases or rather ventilation system should have proper provisions for gases accumulation control. In first case it is unclear, how ventilation systems might control and by what means the accumulation of flammable gasses. Also, it is unclear what does the "control" means in this context – flammable gases concentration measurement, monitoring and detection of gases accumulation or active control of the rate of gases accumulation. In last case it is unclear, how ventilation systems might control (by what	To be considered in the next full scale revision	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			means) the accumulation of flammable gasses. Proper clarification should be provided in the guide or text corrected accordingly to eliminate equivoque. 2. It is unclear what was intended to state by the 2nd sentence of this paragraph. The recommendation should be clear and should require that ventilation systems design should be such, that drawing in of hazardous gases from external sources should be prevented or ventilation system should be designed taking into account potential additional loads to system capacity of hazardous gases from external sources. Proper clarification should be provided in the guide regarding protection measures against drawing in of hazardous gases from external sources.		
242	6.60	When provided, control functions should be designed to be independent of indications, alarms, and any automatic protective	Delete. The control functions and protective actions have to be clarified	Instrumentation should be provided to detect conditions that may result in loss of residual heat removal capability and excessive radiation levels. This instrumentation should	To use this sentence as it was in SSG-15

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		actions.		provide appropriate alarms and indications at a protected location that would result in timely initiation of corrective actions by local operators and, when specified in the safety case, automatic initiation of protective actions. The indicating range and design of the specified instrumentation should allow for monitoring of conditions during accidents and including design extension conditions considered in the safety case. When practicable, control and protection functions should be designed to be mutually independent and not affected by any protective actions. Where independence is not feasible, detailed justification should be provided for the use of shared and interrelated systems. Account should be taken of ergonomic factors in the design of alarms and indications to the operating personnel. Control and monitoring equipment should be calibrated for its intended use.	
243	6.60.	Instrumentation ~~should be provided to detect conditions that may result in loss of residual heat removal capability and excessive~~	It seems to be odd that the necessity of the heat removal capacity and the excessive radiation level monitoring has been prescribed at the section of	Rejected Consider deleting “residual” as it is not use through the document	Important issue taking into DEC and FDI feedback.

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		~~radiation levels. This instrumentation~~ should provide appropriate alarms and indications at a protected location that…. (HUN)	the Instrumentation and control. Replace it to the section dealing with monitoring. (SOM System)		
244	6.60/6 (p.44)	The indicating range and design of the specified instrumentation is required to allow for monitoring of conditions during accidents including design extension conditions considered in the safety case. (JP)	The guide should follow the requirement para. 6.177 of the DS 478 (Draft Safety of Nuclear Fuel Cycle Facility).	Rejected	To be consistent with the wording used in a guidance document.
245	Para 6.61 page 50	"The operation of the fuel handling and storage areas should be carried out in accordance with the fire protection recommendations…". (PL)	It is unclear, why only certain areas of SNF storage facility are considered. The operation of whole SNF storage facility should be carried out in accordance with the fire protection recommendations. Proper clarification should be provided why other SNF storage areas are excluded form fire protection coverage and which measures than should be implemented or be applied to those excluded areas.	To be considered in the next full scale revision	

Comments on: Revision by amendment of Draft Safety Guide DS489 Storage of Spent Nuclear Fuel

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
246	Para 6.62 page 50	"Fire protection systems of appropriate [?] capacity and capability should be provided". (PL)	The meaning of *"appropriate capacity and capability"* is unclear in this context as well as it is unclear for what purpose these capacity and capability are required. It should be clarified in the guide for which purpose fire protection systems should have proper capacity and capability (for example – enough to suppress the fire or to limit extension of fire) and for what time duration (for example – till external fire protection forces arrive, etc.). The time duration should be justified in safety case.	rejected	
247	Para 6.66 page 51	"Provision should be made for adequate and reliable lighting of SNF storage facility and the site in support of operation and to facilitate inspection and/or ~~physical protection~~ nuclear security of spent fuel storage areas". (PL)	1. Editorial remark. 2. *"Physical protection"* is outdated term and should be replaced by new term *"Nuclear security"*. Since the new term *"Nuclear security"* was adopted, the usage of old outdated term in all new IAEA publications, guides, requirements, should not be acceptable.	To be checked against editorial rules.	

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
248	Para 6.67 page 51	"For wet storage of spent fuel in pools, the pool area should be provided with the necessary lighting equipment…". (PL)	Editorial remark.	rejected	
249	Page 45 below paragraph 6.68	Monitoring (ARG)	For the sake of style consistency (instead of MONITORING)	accepted	
250	new 6.69.	Considering the non-passive heat removal spent fuel storage facilities, monitoring of the heat removal capability and excessive radiation level should be provided. (HUN)	See above. However, such kind of monitoring for the passive heat removal facilities seems to be not necessary.(SOM System)	Rejected	
251	Para 6.69 page 51	1. Clarify the subchapters title prior the paragraph 6.69 and unify the font type according to other same level subchapters font type and size. "~~**MONITORING**~~ **Monitoring of ionizing radiation**" 2. "6.69. Area [which?] monitoring should include measurements of radiation dose rates and airborne radionuclides. In controlled areas, fixed, continuously operating ~~instruments~~ instrumentation and sensors	Editorial Remark. 1. Poor, not informative title of subchapter. It should be clarified monitoring of what is under consideration here. 2. It should be clarified which area is under consideration here – SNF storage area, whole SNF storage facility, or the facility, site and vicinity. 3. Term "instruments" should be replaced by more proper term in this context, i.e. by	1 – Rejected Consider moving para. 6.69 and 6.70 to the section dealing with radiation protection. Consider deleting 6.71 2 – rejected 3 – Consider adding at the end of 6.69: Such instruments should have characteristics and ranges that are sufficient to cover potential radiation levels, during both normal and	These paragraphs are related to radiation protection. Issue is dealt with in 6.40 To include FDI lessons: radiation protection monitoring has also to planned for severe accident conditions (part of the DEC).

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		with local alarms and unambiguous readouts should be installed to provide information on radiation dose rates. Any such ~~instruments~~ instrumentation should have characteristics and ranges that are sufficient to cover potential radiation levels in the area [which?]". (PL)	"instrumentation" (see also paragraph 6.70).	accident conditions, including design extension conditions.	
252	Para 6.70 page 51	"…~~Instruments~~ Instrumentation for area [which?] monitoring and personnel [whom?] monitoring should be demonstrated to be fit for purpose [?] and should comply with appropriate nuclear industry manufacturing codes and standards". (PL)	1. Editorial remarks. 2. It is unclear which area and what personnel is under consideration here as well as what should be monitored in case of area and in case of personnel. Proper clarification should be provided in the guide. 3. It is unclear to what purpose monitoring ability to fit should be demonstrated as well as what does it mean in overall to demonstrate "to be fit for purpose". Seems, that capability of the radiation dose rates, airborne radionuclides or external contamination measurements should be demonstrated, not the	Rejected Consider deleting the following sentences: Instruments for area monitoring and personnel monitoring should be demonstrated to be fit for purpose and should comply with appropriate manufacturing standards. This instrumentation should be taken into account when developing provision for the decontamination of equipment, components and personnel.	Too detailed and could be applied to all equipment in a nuclear facility. Too detailed and the link between radiation protection instrumentation and provision for decontamination is not obvious and not specific to spent fuel storage.

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			fitness with purpose. Proper clarification should be provided in the guide.		
253	6.70 Last (new) sentence	… Provisions for decontamination …	Separate paragraph (6.72) in SSG-15. Propose to keep as separate paragraph also in document under development (DS489)	This instrumentation should be taken into account when developing provision for the decontamination of personnel, equipment and components. See comment N°252	Re-wording is proposed to make it more clear
254	Para 6.71 page 51	"For wet SNF storage facilities, the water level in ~~it~~ the pool should be monitored and provisions to identify the potential for water leakage during both normal and accident conditions should be provided". (PL)	Editorial remark. It is unclear what is meant by "it" and where it is. Proper clarification should be provided in the guide.	See comment N°252	
255	Para 6.71 page 52	"…a number of other support systems may be necessary to ensure the operation and safety of spent fuel storage facilities, e.g. emergency electrical power supply…". (PL)	Editorial remark.	See comment N°252	
256	6.71/p. 45	For wet storage facilities, the **chemical and physical properties of** water **and water** level in it should be	Not only the amount of water but also its properties (pH, temperature, concentration of ions, …) contribute to the safe	See comment N°252	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		monitored and provisions to identify the potential for water leakage ... (CZ)	operation and management of accidents.		
257	6.71.	provisions to identify any possible water leaks (HUN)	The potential for water leakage cannot be identified. (TS Enercon)	See comment N°252	
258	6.71.	"For wet storage facilities, the water level in it should be monitored and provisions to identify the potential for water leakage during both normal conditions, anticipated operational occurrences and accident conditions should be provided." (HUN)	Anticipated operational occurrences should be also included, for the consistency of the text. (HAEA)	See comment N°252	
259	45/6.71	Addition suggested : Monitoring of sub-surface water for presence of radionuclides to identify any leakage from SFPs to the environment. (HIND)	Such monitoring provides credible evidence about the integrity of the SFP.	See comment N°252	
260	6.72/(a-d)	Font size of point a-d is different to the rest of the document.	Formatting	Accepted	
261	6.72	Consider deletion of (d) (FR)	"(d) Procedures to implement protective actions for potentially affected populations"	Accepted Consider adding a recommendation	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			These actions are not relevant for operator and correspond to the mission of public authorities?	on arrangements with the off-site emergency organisation in the list.	
262	Para 6.76 page 53	"…to demonstrate the correct functioning of features specifically incorporated into the design [?] to provide for safe storage of spent fuel". (PL)	It is unclear what "design" is under consideration here – nuclear fuel, SNF storage pool, SNF storage facility or SNF cask. Proper clarification should be provided in the guide.	Rejected	
263	Para 6.77 page 53	"… (b) Provision [which?] and approval of documentation; (c) Responsibilities [whom?]; …". (PL)	It is unclear what "provisions" and whose responsibilities – SNF owner, operating organization, or licensee were considered here. Proper clarification should be added in the guide.	rejected	
264	(New) Sub-paragraph 6.72 (a)	~~Procuring~~ Ensuring availability of equipment to mitigate accident and design extension conditions included in the safety case,	It is not the procuring as such that is important but rather ensuring that the equipment is available …	Accepted	It could be available, but doesn't work. It's more important to have it available and ready to use…
265	6.79/28 (p.47)	The original texts in para.6.80 of SSG-15 should be remained. (JP)	Clarification.	Rejected	
266	6.79	[Rephrase needed]	1. "However" twice is not understandable	To be considered in the next full scale revision.	

Comments on: Revision by amendment of Draft Safety Guide DS489 Storage of Spent Nuclear Fuel

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		Suggestion: "For modular storage systems each module including its interfaces with the already operational modules needs to be subjected to the appropriate commissioning prior to the loading of SF" (BEL)	2. The text suggests that operation is possible before (or without) completing the commissioning process. This is not acceptable.		
267	6.80	Propose to reword: "Some commissioning steps may continue into the operation stage of ~~the~~ a spent fuel storage facility, e.g. commissioning of new spent fuel transport casks or commissioning of new spent fuel designs. Commissioning during the operation of the facility should be ~~already~~ taken into account already during the design phase (e.g. installation of additional heat removal systems) so as to allow for appropriate commissioning activities at later stages. ~~Otherwise the commissioning can be challenging due to~~	Reworded to be more straight-forward and with less descriptive text. I do not consider the following statement valid (… *For example, it may not be justified to test and verify the heat removal capacity of a storage pool until the facility has received spent fuel…) and propose to delete this part.*	Accepted	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		~~restrictions during normal operations. For example, it may not be justified to test and verify the heat removal capacity of a storage pool until the facility has received spent fuel. Some large facilities use storage transport casks and spent fuel of various designs. Some commissioning steps may need to be repeated when new casks or new spent fuel designs are first used~~.”			
268	6.80/2 (p.48)	6.80. Some commissioning steps may continue into the operation stage of the spent fuel storage facility, for example commissioning of new spent fuel transport and/or storage casks or commissioning of new spent fuel designs. Commissioning during operation of the facility should be taken into account already during the design phase (e.g. installation of additional heat removal	DPCs have larger impacts on the design and operation of storage facility rather than casks only for transport.	Accepted Consider writing: “new spent fuel storage or dual purpose casks”	Transport casks are not allowed to be used for storage.

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		systems) so as to allow for appropriate commissioning activities at later stages. (JP)			
269	6.80	Check all paragraph numbers after 6.80. (ARG)	Repetition of paragraph number 6.80.	Accepted	
270	6.80/7 (p.48)	There is two paragraph "6.80". (JP)	Editorial	Accepted	
271	(p.48)	This draft has no para 6.82. (JP)	Editorial	?	
272	6.80/p. 48	Some commissioning steps may continue **once the SF storage facility has been modified. Modification of SF storage facility may be a subject of regulatory authorisation and** ~~into the operation stage of the spent fuel storage facility, for example commissioning of new spent fuel transport casks or commissioning of new spent fuel designs. Commissioning during operation of the facility~~ should be taken into account already during the **initial** design phase (e.g. installation of additional heat removal systems) so as to allow for appropriate commissioning activities at	Modification of already operated SF storage facility is not considered in the document at all. Current text is somehow misleading – commissioning during operation is typical for some modular designs, but this subject is covered by the previous para. Also commissioning of new designs of storage cask and fuel designs is not a typical example of commissioning during operation. However commissioning after assumed modification of storage facility (e.g. construction of additional storage halls) may be taken into account in initial design.	Rejected See comment 267	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		later stages. (CZ)			
273	6.80.	or commissioning of new components which are required for spent fuel of new designs. (HUN)	There is no commissioning of new spent fuel designs. (TS Enercon)	Accepted See below	
274	Para 6.80 page 54	"… (d) Non-active commissioning [?]; (e) Active commissioning [?]". (PL)	The meaning of used terms *"Non-active commissioning"* and *"Active commissioning"* is unclear. IAEA Safety Glossary 2016 edition does not provide the definition of "active commissioning" and "non-active commissioning" terms meaning. Instead "non-nuclear / non-radioactive" and "nuclear / radioactive testing" is used. Also "cold and hot commissioning" terms might be used too. Proper clarification of the meaning and definition of used terms "active commissioning" and "non-active commissioning" should be provided in the guide, or should be used terms from IAEA Safety Glossary 2016.	Rejected Final proposition for 6.80: Some commissioning steps may continue during the operation of a spent fuel storage facility, e.g. commissioning of **new spent fuel storage or dual purpose casks** or commissioning of **new equipment necessary for new spent fuel designs**. Commissioning during the operation of the facility should be taken into account already during the design phase (e.g. installation of additional heat removal systems) so as to allow for appropriate commissioning activities at later stages.	

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			In case if other terms will be applied paragraphs 6.85 and 6.86 should be corrected proper way as well.		
275	6.82.	(HUN)	Paragraph 6.82 is missing in the document. (HAEA)	?	
276	6.80.-6.82.	There is a mistake with the numbering of the paragraphs: Two times number 6.80 and 6.82 is missing. (FIN)		Accepted	
277	6.8/6	… modifications during all the lifetime of the facility should also be defined.	"subsequent stages of the lifetime" might be interpreted ambiguous. For example, not during operation, but on the subsequent stage – when decommissioning.	rejected	
278	6.95	Where appropriate, the receipt, handling and storage of such fuel should be made subject to specific procedures. (ARG)	Where in Capital Letters because it starts the phrase.	?	
279	Para 6.96 page 57	"Operating procedures should be developed for containment systems [?] in the spent fuel	Proper clarification should be provided in the guide what is "containment systems in the spent fuel storage facility" in	Rejected	See comments above

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		storage facility…”. (PL)	general and what is understandable as “containment system” for dry open area SNF storage facilities (see also comment 53).		
280	6.96 a)	Crane failure with a water filled and loaded cask suspended outside the pool; (ARG)	Elimination of the colon between cask and suspended	To be checked by the editor	
281	6.96 d)	(to reduce the risk of fire, the amount of combustible material or waste should be controlled, as should be the amount of other flammable materials (see para 6.63)); (ARG)	Elimination of the colon between fire and the amount and also between controlled and as should be	To be checked by the editor	
282	6.96 g)	External human induced events (airplane crash, sabotage, etc.); (ARG)	Separation between human and induced words.	accepted	
283	6.96 (g)/p. 52	External ~~humaninduced~~ human induced events (CZ)	Typographical error	accepted	
284	6.96.g.	External human induced events. (HUN)	Typing error (TS Enercon)	accepted	
285	6.96 (g) page 52	human induced (MEX)	Is missing a space in humaninduced	accepted	

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
286	6.96/4-5 (p51)	However, some of these events or a combination of events could also lead to severe accidents, which are addressed as design extension conditions ~~beyond the design basis~~. Whilst the probability of such conditions ~~beyond design basis accidents~~ occurring is extremely low, (JP)	Clarification. To follow SSR-2/1, the term "beyond the design basis accidents" is replaced by "design extension conditions" in this document.	accepted	
287	6.96 (g)/11 (p.52)	(g) External human_induced events (airplane crash, sabotage, etc.); (JP)	To insert space (editorial).	accepted	
288	Para 6.96(h) page 58	"Failure of the ~~physical protection~~ nuclear security system". (PL)	*"Physical protection"* is outdated term and should be replaced by new term *"Nuclear security"*. Since the new term *"Nuclear security"* was adopted, the usage of old outdated term in all new IAEA publications, guides, requirements, should not be acceptable.	See comments above on the same issue	
289	6.96	[Rephrase needed] Suggestion: "In the preparation of operating procedures and contingency plans, the	1. The first 3 sentences are confusing, wrong, and/or are already covered by more elaborate texts. These sentences are not considered necessary (in	Rejected See comment N°286 Consider adding in the list: i) Loss of cooling or electrical supply	

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		operating organization should consider events that are beyond the design basis and that could lead to severe accidents, such as…”| (BEL)	any case remove the “also” from the 3rd sentence. 2. The list itself should be reviewed critically. Some items should be included in the design at least to some extent (e.g. fire and loss of electricity).	for a long duration.	
290	Para 6.102 page 60	“…Operational limits and conditions for spent fuel storage facilities, which result from the need to meet legal and regulatory requirements, should be developed by the operating organization (licensee) and subject to approval by the regulatory body as part of the licence conditions…”.)PL)	Editorial remark. As it was stated in current guide note 3, operating organization might not always be a licensee, but setting operational limits and conditions is always licensee obligation. To avoid any misinterpretation of recommendations everywhere where actions is related with SNF storage facility operation licence as responsible body indicate licensee.	See comments above.	Operating organization versus licensee
291	6.103	Operational limits and conditions should be directed towards: (ARG)	Operational in Capital Letters because starts the phrase	Accepted	
292	6.103	The aim of operational limits and conditions should be to manage and control the hazards associated with	Editorial	accepted	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		the facility. O~~o~~perational limits and conditions should be directed towards: (JP)			
293	Para 6.103 page 60	"The aim of operational limits and conditions should be to manage and control the hazards [?] associated with the SNF storage facility. ~~o~~Operational limits and conditions should be directed towards: (PL)	1 Editorial remark New sentence starts from capital letter. 2. It is unclear how operational limits and conditions can help manage and control hazards. Hazards, internal or external exist with one or other probability independently of set operational limits and conditions. Probably the management and control of risks associated with hazards was considered here. I.e. we can control risks, but doubtful if we can control hazards. Proper clarification should be provided in the guide how operational limits and conditions should be used to manage and control hazards associated with the SNF storage facility, or paragraph text should be corrected accordingly.	rejected	

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
294	Para 6.106 page 61	"… (a) Maintenance and inspection of the lifting attachments [?] on the casks and of the lifting ~~apparatus~~ equipment (e.g. slings, beams, chains and hooks); … (c) Periodic load testing of cranes and other attachments [?]; …". (PL)	Editorial remark. The term "lifting apparatus" should be replaced by term "lifting equipment" (see paragraph 6.114 table 2) Usage of terms "lifting attachments" and "other attachments" is not well understandable in this context. It seems, that instead usage of term "lifting equipment items" might be more preferable. All main lifting equipment items are listed in table 2. It is suggested to add the reference to table 2 in (a) and (c) subparagraphs.	Accepted NEXT TIME	
295	Para 6.108 page 61	"…The safety case for the spent fuel storage facility will form a basis for preparation of the programme in terms of the SSCs ~~items, i.e. structures, systems and components~~, that should be included [where?] and the periodicity of planned activities [which?] for each ~~item~~ SSCs". (PL)	1. Editorial remark (see also General comment 5). 2. It is unclear where SSCs should be included and for which planned activities the periodicity should be set. Proper clarification should be provided in the guide.	1 - See comments above 2 – Consider revising the sentence: that should be included in the programme for maintenance, inspection and testing and the periodicity of these activities for each item.	Items versus SSC

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
296	6.114, table 2 p56 (FR)	Delete following ~~Video cameras~~ ~~Confirmation of functionality of cameras~~ ~~Security~~ ~~Confirmation of functionality of perimeter fences and/or gates~~	Testing of security equipment shall not be addressed in the safety case.	Rejected	Paragraph 6.114 doesn't address the safety case but the maintenance, inspection and testing within subchapter Operation of spent fuel storage facilities of chapter 6 General safety considerations for storage of spent fuel. *Para 6.114 wasn't affected by this revision*
297	57/6.116	An operational radiation protection programme should be put in place that ensures that areas of the facility are classified according to the radiation levels and that access control is in place in accordance with the level of classification. It should cover the monitoring of radiation levels in the facility and should include provision to ensure that personnel working in the facility are provided with appropriate dosimetry. A programme of work planning should also be put	As per IAEA GSR Part 3: + 3.96. Registrants and licensees, in cooperation with employers where appropriate, shall establish, maintain and keep under review a programme for workplace monitoring under the supervision of a radiation protection officer or qualified expert.	To be considered in the next full scale revision	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		in place to ensure that radiation exposure is kept as low as reasonably achievable under the supervision of a radiation protection officer appointed to oversee the application of radiation protection requirements. (HIND)			
298	Para 6.117 page 64	"Acceptance criteria [of what?] should be developed for the spent fuel storage facility and the spent fuel,… Before spent fuel is transferred to a storage facility, SNF owner must obtain acceptance ~~must be given by~~ from the operating organization of the SNF storage facility and the regulatory body. (PL)	1. It is unclear which "acceptance criteria" is under consideration here. Proper clarification of applicable "acceptance criteria" and specification for what purpose they should be developed should be provided in the guide (see also paragraph 6.115). 2. As it is written now, it is unclear for whom acceptance *"must be given by the operating organization of the facility and the regulatory body"* Proper clarification should be provided in the guide.	1 – Accepted Consider modifying the beginning of the sentence: Acceptance criteria for spent fuel or spent fuel packages should be developed for the spent fuel storage facility, with account taken… 2 – To be considered in the next full scale revision	Concerned fuel owner, licensee or operational organisation
299	6.118 / 17	"…pinholes, cracks, mechanical deviations, missing fuel assembly components, excessive bowing, excessive fretting, or serious physical damage."	Most irradiated fuel assemblies experience some level of bowing. Only excessive bowing is of concern. Similarly, some level fretting is quite common and	rejected	The last sentence mentioned criteria to be defined.

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		(RSA)	not a concern. However, excessive fuel rod fretting is a concern.		
300	6.118 (h) Page 58	Surface contamination level and dose rate for the fuel assemblies measured, estimated or calculated (MEX)	High cost low benefit from measuring every bundle	To be considered in the next full scale revision Calculation could be enough for dose rate depending on the burnup and the cooling time.	
301	Para 6.123 page 65	"Loss of containment has the potential for both exposing workers to radiation and releasing radioactive material to the environment…". (PL)	Proper clarification regarding meaning of "loss of containment" should be provided for dry open space area SNF storage facilities (see comment 53).	Rejected	It is about loss of radioactive materiel containment.
302	6.124/60	Addition Suggested: The integrity of spent fuel may become degraded and lead to a release of radioactive material to the storage environment. There are a number of causes for the degradation of fuel, including: (a) Manufacturing defects, such as defects due to incomplete welds or leaking end plugs; (b) Embrittlement of the cladding material due	Self-Explanatory	Accepted	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		to interaction with hydrogen or to high irradiation; (c) General corrosion of the cladding as a result of improper chemical composition of the cooling water; (d) Mechanical damage, e.g. as a consequence of stress corrosion or handling accidents; (e) Unrevealed failures that arose during irradiation in the reactor. (f) Overheating in the reactor core during transients/accident conditions resulting in damage to fuel integrity.			
303	Para 6.124 page 66	"The integrity of spent fuel may become degraded and lead to a release of radioactive material to the SNF storage facility environment…". (PL)	Editorial remark. Also it should be noted, that release of radioactive material might not be limited within SNF storage facility environment, but might spread beyond SNF storage facility boundaries. This should be clarified in the	Accepted Consider modifying the sentence: lead to a release of radioactive material **to the inside or the outside of the storage facility**.	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			guide as well.		
304	Para 6.125 page 66	"Usually, spent fuel with decreased integrity should be canned to maintain the quality of the SNF storage facility environment and/or to satisfy licensing requirements…". (PL)	Editorial remark.	See comment 303	
305	6.127	Stored degraded spent fuel should be monitored and to carry out monitoring appropriately the following should be ensured: (ARG)	Elimination of the colon between appropriately and the following	Suppression of the coma is accepted	
306	Para 6.127 page 66	"For storage of spent fuel that has been characterized as degraded or failed, consideration should be given in the design to the condition of the fuel. This may include… additional measures to ensure the robustness of containment since, for degraded fuel, the primary containment feature [?], i.e. the spent fuel cladding, cannot be relied upon for control of the spent fuel material…	1. The "defense in deep" approach is understandable, but there was no information presented about containment features (primary, secondary, etc.) in the guide. It is not clear how this "containment features" are related with "containment static barriers" (see paragraph 6.41 and comment 53). It should be noted, that as containment usually is understandable a physical structure, construction or	1 - Accepted: Consider replacing "feature" by "**physical barrier**" 2 – Rejected 3 – Accepted Consider adding containment **physical** barrier	 Monitoring of the spent fuel To be consistent with SSR-4

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		(a) Appropriate design of the SNF storage facility in order to facilitate monitoring [of what?]; (b) Monitoring of the efficiency of the containment as close as possible to each containment static barrier [?]; …". (PL)	building. Proper clarification regarding meaning of "primary, secondary, etc. containment features" and its relation with "containment static barriers" should be provided in the guide. 2. It is unclear "to facilitate monitoring" of what or which parameters. Proper clarification should be provided in the guide regarding object of consideration. 3. It is unclear what are this "containment barriers" and are they the same mentioned in paragraph 6.41 "containment static barriers". Also, if primary containment barrier (feature) is considered to be spent fuel cladding it is unclear how monitoring of each individual SNF assembly can be ensured. Moreover, it is unclear how monitoring of spent fuel cladding can be ensured if spent fuel is sealed in the SNF storage casks. Proper clarification, how		

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			"Monitoring of the efficiency of the containment as close as possible to each containment barrier" including spent fuel cladding should be explained and clarified in the guide.		
307	Para 6.130 page 67	"Since the SNF storage time could span more than one human generation, transfer of information from one human generation to the next is important…". (PL)	1. Editorial remark. It is unclear whose storage time is under consideration here – spent fuel or records. As of that it is unclear among whose generations – humans, hardware or computer systems, transfer of information should be ensured. 2. In general it is assumed that time frame between human generation is 20-30 years. But information and knowledge transfer should be constant process. The reality is that in nuclear industry knowledge might be lost if 5-10 years no information transfer to younger generation was made. Meanwhile, guide only states the importance of information transfer among generations, but does not provide any recommendation, except maintenance of records, how to	rejected	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			ensure this information transfer. The recommendation should be more specific and consider staff management in order to keep information and transfer of "know how".		
308	Para 6.131 page 67	"These records [which these?] should be duplicated and stored in separate locations. It should be ensured that the information is stored on media that remain accessible during and after the envisaged storage period [of what?]". (PL)	1. It is unclear which records is under consideration here. Each paragraph in the guide should clearly define the object of consideration related to this single paragraph separately and independently. Guess links to some previous paragraphs somewhere in the document is not acceptable in such level document as nuclear safety related guides. Proper clarification of which records are under consideration should be provided in the guide. 2. It is not clear whose "envisaged storage period" is considered here – SNF in storage facility, or SNF records. In last case, where – on media or in records archive in general (records can be copied from one media to other, as paper version of records can be scanned and	rejected	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			digitalized, etc.). Proper clarification should be provide in the guide regarding whose "envisaged storage period" is under consideration. 3. General comment. It should be noted, that proper information transfer among different generations of hardware, software and computer systems in general is also important issue. But no paragraphs 6.130 and 6.131 in particular, no guide in overall provides any recommendation how to ensure transfer of records stored on digital media or what precautions should be taken into account (see also related comment 31). Proper clarification and recommendations should be provided regarding accessibility of the information stored in digital media when generations of computer system changes during envisaged storage period.		
309	Para 6.135 page 67-68	1. Clarify the subchapters title prior the paragraph 6.135 "**Transport of spent fuel**	1. Poor, not informative title of subchapter. It should be clarified transport of	Accepted Consider replacing "paperwork" by "**documentation**".	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		after storage period" 2. "6.135 After end of SNF storage period, and before subsequent spent fuel transport, the integrity of the spent fuel and the storage and/or transport casks and the quality of associated ~~paperwork~~ records (documents) should be examined. The following issues should be addressed: (d) Conventional safety issues, such as periodic inspection of handling equipment; …". (PL)	what is under consideration here. 2. Editorial remark. 3. It is unclear how "inspection of handling equipment" is related to the aim of examination of "integrity of the spent fuel and the storage and/or transport casks". Proper clarification should be provided in the guide.	Consider moving d) bullet into para. 6.136.	
310	Para 6.137 page 68	1. Clarify the subchapters title prior the paragraph 6.137 "**Storage of spent fuel beyond the original design lifetime of storage facility**" 2. "6.137 If storage of spent fuel is envisaged beyond the original design lifetime of the SNF storage facility, the nuclear reactivity [?] of the fuel should be reassessed…". (PL)	1. Poor, not informative title of subchapter. It should be clarified transport of what is under consideration here. The same clarification of whose storage and beyond what design lifetime **should be provided in paragraph 6.138**, as well as in rest of paragraphs where object of consideration is missing (see general comment 4). 2. It is unclear, why only SNF	rejected	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			nuclear reactivity should be reassessed. Is there a risk of Keff increase during spend fuel storage time? How about degradation of installed permanent fixed additional neutron absorbers in storage area (see paragraph 6.30) with time? Shouldn't the degradation of fixed neutron absorbers be reassessed too? Can degraded fixed neutron absorbing parts of storage area be replaced in order to prolong SNF storage time beyond original design life time of storage facility? Proper clarification should be provided in the guide regarding reassessment of fixed neutron absorbers in SNF storage area.		
311	6.140	"Consequently, in the event that the..." (RSA)	Editorial: Start sentence with a capital letter.	accepted	
312	Para 6.140 page 69	"…This is generally longer than the average lifetime of a commercial company. ~~e~~Consequently, in the event that the SNF storage facility operating organization and/or SNF owner ceases to exist, for	1 Editorial remark New sentence starts from capital letter. 2. This paragraphs requires additional clarification, as SNF owner, SNF storage facility	Accepted See comments above To be addressed in the next full scale revision	Fuel owner, licensee, operating organization ?

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		example after several decades, transfer of ownership of the spent fuel and/or the spent fuel storage facility with all relevant financial liabilities to a government institute may be considered". (PL)	operating organization and SNF storage facility licensee might be two or three separate organizations (see paragraphs 3.16, 3.29, current note 4 and comment 22). SNF producer in case of ceasing to exist might transfer its ownership of spent fuel to SNF storage facility operating organization (licensee). Proper clarification regarding interfaces between operating organization, SNF owner and licensee should be provided in guide in case if one or other subject ceases to exist.		
313	6.150.	A final decommissioning plan is required to be submitted to the regulatory body for approval within a period determined by the regulatory body. (HUN)	Instead of *agreement*, a stricter statement should be used. (HAEA)	Accepted	
314	6.150.	A final decommissioning plan is required to be submitted to the regulatory body for approval ~~within a period agreed with the regulatory body~~ [18]. (HUN)	The time scale needed for the authority review must be defined by the law. (SOM System)	See comment 313	
315	**Structure and layout** before Paragraph I.13	**"Structure and layout"** (NUSSC)	Editorial: Should be on a new page, before paragraph I.13	Before publishing	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
316	**Page 66 to 77**	It is advisable to merge the content of APPENDIX I into the appropriate sections of chapter 6 (GENERAL, DESIGN and OPERATION) (ARG)	For the sake of style consistency	To be considered in the next full scale revision	
317	Page 72; I.3	Criticality safety of pool storage should not rely on the use of soluble neutron poison. If this is not possible or if the operating organization chooses to use a soluble neutron poison such as borated water for criticality control, the design of the facility should include engineering features to preclude an increase in the reactivity of stored fuel caused by inadvertent dilution of the pool water by the addition of non-borated water, ~~in circumstances where~~ when soluble boron is used for criticality control. (FR/ENISS)	More clear	See comment N° 319	
318	"Criticality safety of pool storage should not rely on the use of soluble neutron poison. If this	**Critical comment** This paragraph contradicts with paragraph 6.30 which allows usage only of fixed neutron absorbers in SNF storage area and paragraph 6.33(g) which allows for SNF	"Criticality safety of pool storage should not rely on the use of soluble neutron poison. If this is not possible or if the operating organization chooses to use a soluble neutron poison [?!] such as borated water for	rejected	6.30 introduces just example and it is not forbiddent to use soluble poisoning. See I.3

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
	is not possible or if the operating organization chooses to use a soluble neutron poison [?!] such as borated water for criticality control, the design of the facility should include engineering features…"	storage facility criticality assessment take into account only permanently installed neutron absorbing parts or components. This means, that SNF storage facility criticality safety in no way can rely on usage of soluble neutron absorbers and as of that criticality safety of any SNF storage facility should be justified as if pure water would be used for optimum moderation conditions (see paragraph 6.33(d)). In general appearance of this recommendation in the guide is not understandable as it is against common good nuclear safety practice. The use of soluble neutron poison should be permitted only in critical abnormal or accidental conditions when SNF geometrical configuration is disturbed and there is a risk of criticality. Proper clarification and elimination of contradictions with paragraphs 6.30, 6.33(g) and 6.33(d) should be	criticality control, the design of the facility should include engineering features…"		

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		provided in the guide regarding usage of soluble neutron poisons for wet SNF storage facility criticality control. (PL)			
319	Appendix 1. I.3.	of the pool water by the addition of non-borated water. (HUN)	Delete repeated text! (TS Enercon)	Accepted Consider deleting the last part of the sentence which is redundant.	
320	I.3 / 1	"* Criticality safety of pool storage should not rely on the use of soluble neutron poison, except for abnormal or accidental events." (RSA)	It could be acceptable to take credit for soluble boron under out of normal conditions. This is currently the situation at Koeberg.	To be considered in the next full scale revision	It is not recommended but not forbidden. To be discussed with specialist.
321	Appendix I, Para I.3	Criticality safety of pool storage should not rely on the use of soluble neutron poison. ~~If this is not possible or if the operating organization chooses to use a soluble neutron poison such as borated water for criticality control, the design of the facility should include engineering features to preclude an increase in the reactivity of stored fuel caused by inadvertent dilution of the pool water by the addition of non-borated water, in circumstances where soluble boron is used~~	Struck-out text is inconsistent with Para. 6.33(e). Added text is intended to reflect the double contingency principal referenced in Para. 6.33(e).	To be considered in the next full scale revision	It is not recommended but not forbidden. To be discussed with specialist.

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		~~for criticality control.~~ In the normal storage configuration, the fuel should be safely subcritical in pure, unborated water. Soluble boron may be credited to maintain an adequate margin to criticality during abnormal or accident conditions that would not credibly result in dilution of soluble boron. (US)			
322	Para I.4 page 72	"Active residual decay heat removal systems for wet spent fuel storage facilities should be designed to ensure the safe operation of the facility…". (PL)	1. It is unclear why only active residual decay heat removal systems should be used in the wet SNF storage facility design. Passive residual decay heat removal systems should be allowed as well, or even preferable. Proper clarification regarding usage of passive residual decay heat removal systems in wet SNF storage facility design should be provided in the guide. 2. Moreover, in abnormal, accidental conditions the air above wet SNF storage pool might act as UHS. In that case water supply or water make-up systems alone should be capable	rejected	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			to ensure SNF cooling and restoration of water loses due evaporation (see paragraphs I.6, I.10 and I.12 about water supply and water make-up systems). The role of water supply and water make-up systems in residual decay heat removal during abnormal or accidental conditions should be clarified and added to the guide (paragraph I.12 does not mentions this point of water make up system importance).		
323	Para I.8 page 73	"The design [?] should not allow the permanent installation of piping or other equipment that could inadvertently, e.g. by acting as a siphon, lower the pool water level below the minimum required level". (PL)	1. It is unclear which "design" is considered here. Proper clarification should be provided in the guide. 2. From how the paragraph is written it is unclear if does it means, that temporary installations of piping or other equipment might be allowed in the design of something. Proper clarification should be provided in the guide regarding temporary installations of piping and equipment. It should be clarified in which cases and for what time duration installation of temporary piping and other	Rejected	

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			equipment might be allowed.		
324	Para I.10 page 73	"…Furthermore, mixing spent fuels in the same zone with different limits or a different control mode for criticality [?] should be avoided". (PL)	It is unclear what does it means "different limits" and "different control mode for criticality". Proper clarification and specification of possible limits sets and criticality control modes should be provided in the guide.	To be considered in the next full scale revision	
325	I.12	Water level monitoring and the system or systems for providing make-up water should be assessed for performance in accident and design extension conditions (ENISS)	The make-up system used in normal conditions, accident, conditions and DEC can be different (you can have more than one make-up system).	Already accepted	
326	Page 73 I.12	Indications and alarms should be provided to alert facility personal of any unintended decrease in water level and when the minimum water level is reached. Water level monitoring and the system or systems for providing make-up water should be assessed for performance in accident, including design extension conditions when one at least should be kept operational (FR/ENISS)	Operator should know the pool water level including in DEC	Accepted	

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No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
327	I.16	Add an additional bullet: 'The civil structures supporting the pool should be designed for loads associated with a pool completely filled with spent fuel assemblies, including inserts, e.g. control rods, burnable poison absorbers and thimble plugs. (RSA)	The proposed sentence is an important structural design consideration which should be added.	Accepted Consider adding a paragraph I.17	
328	Para I.17 page 74	"…It should be ensured that the spent fuel storage racks or casks will not contaminate the pool water. The ease of decontamination of equipment [?] exposed to, or in contact with, pool water ~~is related to the surface of the materials used~~ depends from the materials used for equipment surface. The design~~er~~ [of what?] should provide [what?] for easy decontamination [of what?] when specifying the materials for such equipment". (PL)	Hardly understandable text. 1. 2nd sentence contradicts with 1st sentence. If pool water should be ensured not to be contaminated from SNF storage racks or casks, then it is unclear why decontamination of surfaces of SNF handling and storing equipment in contact with pool water should be needed. It should be noted, that absolute elimination of possibility of pool water contamination from SNF storage racks and casks might be impossible, if not in normal operation conditions, then in abnormal and accidental conditions. It should be clarified in the guide, that contamination of the	Rejected	

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No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			pool water should be excluded as much as possible by engineering technical means and operational measures. 2. It should be clarified which equipment decontamination is under consideration here. 3. Not the designer should provide, but the design. Also it is unclear design of what – SNF storage facility, SNF storage racks or casks, or SNF handling and storage equipment, as well as it is unclear provide what – means, measures, tools or instruments for easy decontamination. Proper clarification regarding means for decontamination and specification of equipment materials in accordance with nuclear industry codes and standards in the design should be provided in the guide. 4. It is unclear "decontamination" of what is considered here – SNF storage racks, casks or handling equipment. Proper clarification should be		

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			provided in the guide.		
329	Para I.18 page 75	"…The ~~clarity~~ proper chemical regime of pool water necessary for pool operation should be maintained". (PL)	It is unclear, what does it mean "clarity of pool water" in this context. It should be noted, that in nuclear facilities the water chemical regime is considered, not the water clarity (see Annex II, table II-1 item 3). Proper clarification should be provided in the guide. The same comment regarding "clarity" applies also to the paragraph I.24.	Rejected	Clarity means that vision through water is ok.
330	Para I.19 page 75	"The design of spent fuel handling systems and equipment should preclude…". (PL)	Editorial remark. Object of consideration, which handling systems, should be clarified in the guide.	rejected	All handling systems are supposed.
331	Para I.21 page 75	"…Over-raising of spent fuel or other components should be prevented by design features and/or by incorporation of dedicated interlocks to inhibit hoist motion in the event that high radiation fields are detected [?]… Operator failures should be	1. It is unclear, how the height of rising, spent fuel assemblies or SNF cask might be related with increase of radiation field. Seems, this might be applicable only for spent fuel other components movement under water in wet SNF storage facilities.	Rejected "Four eyes principle" to be addressed in the next full scale revision.	This section is related to wet storage. Over-raising will decrease the radiation protection performed by water.

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
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		avoided by applying the 'four eyes principle' or by use of check lists". (PL)	Proper explanation and clarification regarding reasons for high radiation fields occurrence during raising (lifting) of spent fuel and other components should be provided in the guide. 2. It is unclear, what does it means *"four eyes principle"*. Usage of slang terms in such level documentation as nuclear safety related guides is not acceptable. The direct meaning of "four eyes principle" should be provided in the guide. P.S.: Really, was it so hard to write, that all operations should be observed by two operators?		
332	Para I.22 page 75	"…The integrity of the spent fuel and the geometry [of what?] necessary to maintain subcriticality and for SNF residual decay heat removal ~~and~~ as well as ~~its~~ [whom its?] related containment barriers should be maintained throughout the whole lifetime, including design and extended periods, of the SNF storage facility and should be verified	1. Editorial remarks. 2. It is unclear, whose geometry is under consideration here – SNF assemblies, SNF casks, or SNF storage racks. Proper clarification should be provided in the guide. 3. It is unclear to whom was referred by "its". What is the object of consideration named as	Accepted for the next revision Consider revising the sentence: The integrity of the spent fuel, the geometry necessary to maintain subcriticality, the heat removal capability, and the radioactive material containment barriers should be maintained throughout the lifetime of the facility and should be	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
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		using appropriate methods". (PL)	"it". Proper clarification should be provided in the guide or word "its" deleted.	verified using appropriate methods.	
333	Appendix I Para I.23	Where soluble boron is used ~~for criticality control~~ to maintain margin to criticality under abnormal or accident conditions, operational controls should be implemented to maintain water conditions in accordance with specified values of temperature, pH,- ~~redox, activity~~ and other applicable chemical and physical characteristics so as to ~~prevent boron dilution~~ maintain the necessary soluble boron concentration. (US)	Boron should not be used to alone maintain criticality control. Chemical and physical characteristics of the water are more likely to affect the solubility of the boron rather than dilute the boron, which implies the addition of water.	See comment N°320 To be considered in the next full scale revision.	
334	Para I.23 page 75	"~~Where soluble boron is used for criticality control,~~ ~~o~~Operational controls should be implemented to maintain water ~~conditions~~ chemistry regime in accordance with specified values of temperature, pH, redox, activity and other applicable chemical and physical characteristics so as to prevent	1. Usage of soluble neutron absorbers for criticality control in wet SNF storage facility pools is unacceptable. No soluble boron or any other soluble neutron absorber should be allowed to use in SNF storage pools for criticality control (see critical comment 93).	See above	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
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		~~boron dilution~~ corrosion and degradation of installed permanent solid neutron absorbers". (PL)	Soluble boron or any other soluble neutron absorber might be allowed to use in wet SNF storage facility pools as precaution measure when required subcriticality level and criticality control is already ensured by other technical and engineering means, as safe spent fuel storage racks geometry, usage of burnup credit or permanently installed solid neutron absorbers (see paragraphs 6.30, 6.33(g) and 6.33(d)). Due said above, this paragraph should be removed completely or water condition and chemistry should be specified for the cases when solid permanent neutron absorbers are used in wet SNF storage facility.		
335	Para I.24 page 76	"Operational controls should include proper maintenance of underwater lighting and water ~~clarity~~ chemical regime, which are important for radiation protection of workers…". (PL)	Editorial remark (see comment 98). It might be clarified, that water chemical regime should be such, that the visibility of SNF stored under water and other components would be ensured.	Rejected See comment N°329.	
336	Para I.25 page 76	"Damage to the pool structure may occur if pool water is	This is abnormal conditions. It should be explained when it	Accepted	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		cooled to a very low temperature or until it freezes…”. (PL)	might happen and which internal or external hazards might initiate such event. Proper clarification regarding precaution and compensatory measures to prevent occurrence of such abnormal condition and to restrict its further evolution to accident conditions should be provided in the guide.	Consider revising this paragraph: Very low or very high temperatures have to be taken into account in the design of the facility, particularly for the cooling system. Such issues relating to heat removal should be considered also in the operational limits and in the development of administrative procedures.	
337	Para I.26 page 76	“Operating procedures should be such that the pool heat removal systems are monitored to ensure that operating conditions remain within the design specifications, and to ensure maximum availability [of what?] and avoid situations where the system [which?] is completely unavailable…”. (PL)	1. It is unclear “maximum availability” of what should be ensured. Proper clarification regarding object of consideration with “maximum availability” should be provided in the guide. 2. It is unclear, which “system” is considered here and should be prevented from unavailability – the SNF residual decay heat removal system or operating condition monitoring system. Proper clarification should be provided in the guide.	Accepted Consider revising the sentence: Operating procedures should be such that the pool heat removal system is monitored to ensure that operating conditions remain within the design specifications, and to ensure functioning of this system. Impairment or damage to pool heat removal system should be responded to in a timely manner to return the system to intended operating conditions. Furthermore, operating procedures should be such that the time when this system is unavailable due to routine maintenance and/or repair is minimized.	
338	Para I.27 page 76	“~~Heat transfer considerations may increase in importance~~ Residual decay heat removal	Hardly understandable paragraph.	To be considered in the next full scale revision.	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
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		system should allow to increase heat transfer rate (capacity) if spent fuel is placed in high density storage racks". (PL)	It should be written simple and clear: *"Residual decay heat removal system should allow to increase heat transfer rate (capacity) if…".* Also the meaning of "high density storage" is unclear and should be clarified in the guide.		
339	Appendix I.29/3 (p.70)	Dilution of boron in a moderated pool environment and the increase in the potential for a criticality accident where soluble boron is used for criticality control; (JP)	Clarification.	To be considered in the next full scale revision	To be discussed with specialist.
340	Appendix I, Para I.29(a)	Dilution of boron ~~in a moderated pool environment and the potential for a criticality accident where soluble boron is used for criticality control;~~ when soluble boron is credited to maintain a margin to criticality during abnormal or accident conditions. (US)	Improve consistency with Para. 6.33(e).	To be considered in the next full scale revision	To be discussed with specialist.
341	Para I.29(a) page 76	"~~Dilution of boron in a moderated pool environment and the potential for a criticality accident where soluble boron is used for~~	This subparagraph should be deleted as not applicable in general. Soluble boron should not be	To be considered in the next full scale revision	To be discussed with specialist.

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		~~criticality control~~ Degradation of water chemistry regime, water pH, redox and other applicable chemical and physical characteristics;" (PL)	allowed to be used for wet SNF storage facility critical control (see critical comments 93 and 102, and paragraphs 6.30, 6.33(g) and 6.33(d)). Instead proper precaution about degradation of water chemistry might be written		
342	Para I.31 page 77	"…Loss of shielding can result in high radiation exposure. Operational controls should address and set limits to preclude: (a) The hoisting of spent fuel higher than design limits during handling operations under water in the storage pool; (b) Inadequate depth of pool water; (c) Improper use of pool tools [?] (e.g. empty rather than flooded [?])". (PL)	1. It should be clarified that mentioned here "hoisting of spent fuel" operations is related to the handling and lifting operations under SNF pool water, but not in the storage pool in overall as hoisting and lifting operation might be and above water surface level, i.e. removal of SNF cask from the pool. 2. It is not clear which "pool tools" is under consideration here and which "flooded" ones are recommended to be used. Proper clarification and specification of used "pool tools" and applicable examples of "flooded" tools should be provided in the guide.	To be addressed in the next full scale revision. (b) Inadequate **level** of pool water; (c) Improper use of pool tools [?] (e.g. empty rather than flooded [?])".	C) bullet must be discussed and clarified.
343	Appendix I.32/21	Damage of spent fuel element or assembly and resulting contamination of the pool	The concern of the paragraph is the structure damage of a fuel element or a fuel assembly resulted from	Accepted	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
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		(RUS)	dropping.		
344	Para I.33 page 78	"Operational controls and engineered safety features such as […] should be implemented to preclude the drop of a spent fuel element or an assembly of fuel elements onto a pool storage rack or to fall on pool bottom floor during transfer". (PL)	Proper examples of "engineered safety features" which is recommended to implement should be provided in the guide. Also, it should be noted, that engineering safety features should be implemented not only to preclude the drop of SNF, but also to minimize the consequences of SNF drops, like usage of the dampers or other damper material on SNF storage pool bottom floor, as fuel assemblies might drop not only on top of storage racks, but also fall on pool bottom floor. This already happened in nuclear industry history. Proper clarification and examples of recommended "engineered safety features" should be provided in the guide.	Accepted Consider revising the sentence: Operational controls and engineered safety features should be implemented to preclude the drop of a spent fuel element or assembly onto a pool storage rack or onto the pool bottom, during transfer".	
345	I.35.	likely to result from the introduction of a moderator (HUN)	Delete text! (TS Enercon)	Rejected See comment N°346	
346	Para I.35 page 78	"Dry spent fuel storage facilities should be designed either to exclude the ~~introduction~~ possibility of	1. Editorial remark. The term "introduction of a moderator (water)" should be replaced by term "ingress of a	Accepted Consider writing:	To take into account other moderators than water

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
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		ingress of a ~~moderator~~ water or other moderating medium into the dry SNF storage facility or in such a way that ~~consequences likely to result from the redistribution or the introduction of a moderator as a consequence of an internal or external event can be accommodated~~ ingress of water or other moderating medium into dry SNF storage facility as a result of an internal or external event can be accommodated without the consequences to nuclear safety". (PL)	moderator (water). See paragraph I.49 regarding usage of proper term "ingress of water (moderator)". Also it should be clarified, where ingress of water should be avoided. 2. Usage of term "moderator" for dry storage facility is doubtful. It is suggested to use "water " term instead, or "water or other moderating medium" at least. In last case other "moderating mediums" which might ingress to dry spend storage facility, like snow, fire extinguishing foam, etc. should be specified. 3. 2nd part of sentence is hardly understandable. It is recommended to write it simpler and clear.	Dry spent fuel storage facilities should be designed either to exclude of **possibility of ingress of water or other moderating medium** in such a way that consequences likely to result from the redistribution or the introduction of a moderator as a consequence of an internal or external event can be accommodated.	
347	Para I.36 page 78	"…Damage to the SNF storage [what?] may occur in case of extreme cold weather conditions and extremely high or small decay heat rates [?]. Damage [to what?] may also result from high rates of temperature change that	1. It is unclear what was considered to be damaged – SNF storage facility, SNF casks, or SNF cask materials. Proper clarification should be provided in the guide. 2. There are some mismatch and contradictions. It is doubtful if	Accepted Consider splitting this paragraph into 3. Moreover, text should be improved by further editing during the next full scale revision. First one = former paragraph on siting: The storage facility should be	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
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		exceed the design limits… [Start as new paragraph] Sand storms, volcanic fly ash re-settled by the wind and land sliding can all hinder the cooling of dry systems, for instance, by stopping the air flow through it. Sand or volcanic fly ash can accumulate in front of the inlet of a building and, due to convective transport [of what?] phenomena, it can drag inside the facility and accumulate there… All these scenarios can hinder the decay heat removal for a time period that depends on the features of the deposited or consolidated material and should be considered in dry SNF storage facility design and location selection". (PL)	extreme cold weather might be a problem in case of high spent fuel decay heat rates. Also, small and continuously dropping spent fuel decay heat rates is one of goals and aims of overall interim storage of SNF. This parts needs further clarification to be provided in the guide. 3. It should be clarified "damage" to what – SNF cask materials or SNF storage facility equipment or something else "may also result from high rates of temperature change". 4. Sand storms and volcanic fly are natural phenomena (natural hazards) which should be considered in SNF storage facility design, but which are not related with climate changes considerations, i.e. increase of ambient temperatures and level of bodies of water. As of that this part of paragraph should be split and moved to separate paragraph. 5. It is unclear "convective transport phenomena" of what object (what medium) is	constructed in a location for which there has been due consideration of climate changes and associated potential increase in ambient temperatures and/or the level of naturally occurring bodies of water adjacent to the facility, and maintained in a manner which permits adequate heat dissipation. Design features should include provision to maintain cooling during adverse weather conditions, including high winds that might affect the performance of natural circulation design elements of a dry storage cask and the forced circulation and ventilation systems of a storage facility. Second one about minimum temperature and variations: Damage to the storage **structures (e.g. cracks …)** may occur in case of extreme cold weather conditions **combined with** extremely high or small decay heat rates. Damage may also result from high rates of temperature change that exceed the design limits. Such issues relating to heat removal should be considered in the specification of operational limits and in the development of administrative procedures. Third one about specific natural external hazards and their consequences on the	This sentence is not clear: is it about combination of extreme low temperature and extreme low heat decay?

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			considered here. Proper clarification regarding medium, which convective transport phenomena is considered should be provided in the guide.	cooling system of the storage: Sand storms, volcanic fly ash re-settled by the wind and land sliding can all hinder the cooling of dry systems, for instance, by stopping the air flow through it. Sand or volcanic fly ash can accumulate in front of the inlet of a building and, due to convective transport phenomena, it can drag inside the facility and accumulate there. Further, some of these materials become hard rocky ones, like volcanic fly ashes after rain and dryness that turns into a concrete-like material or mud left from land sliding after dryness turns into a very old known insulating material. All these scenarios can hinder the decay heat removal for a time period that depends on the features of the deposited or consolidated material.	
348	Appendix I.36 (p.72)	This paragraph is very long. If it would be possible to divide some shorter sentences or expressions like those of I.32, it is easier to understand. (JP)		See comment N°347	
349	I.36.	(HUN)	Delete the last 4 sentences as not relevant! (TS Enercon)	See comment N°347	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
350	1.36 / 8	It is stated that "Damage to the storage may occur in case of extreme cold weather conditions and extremely high or small decay heat rates." (RSA)	It is not clear how small decay heat rates can damage storage. Please review sentence for technical soundness.	See comment N°347	
351	I.36. line 12.	Sand or volcanic fly ash can accumulate in front of the inlet of a building and, due to convective transport phenomena, it can get inside the facility and accumulate there. Further, some of these substances can change their physical properties, for example volcanic fly ash can harden into a concrete-like material after coming into contact with water and drying out or the resulting mud from land sliding will turn into an old known insulating material after drying out. (HUN)	Changed the wording without altering the meaning of the sentence. (HAEA)	See comment N°347	
352	Para I.37 page 79	"…If forced circulation [?] of coolants [?] is used, it should be demonstrated to be sufficiently reliable during normal operation and accident conditions, with no adverse effects on systems, structures and components that are important to safety". (PL)	It is unclear what medium is considered as coolant to be used in forced circulation at dry SNF storage facility. Maybe it was considered the forced air ventilation or forced air convection (see paragraphs I.64 and I.66). Proper clarification regarding medium, which are intended to	Accepted If forced circulation of **air** is used, it should be demonstrated to be sufficiently reliable during normal operation and accident conditions, with no adverse effects on systems, structures and components that are important to safety.	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			be used as coolant and what is understandable as "forced circulation" should be provided in the guide.		
353	Para I.39 page 79	"The SNF storage facility and dry spent fuel storage casks should be designed to facilitate monitoring of the spent fuel containment and detection of containment failures. If continuous monitoring is not provided, periodic verification by observation or measurement should be carried out to ensure that the containment systems [?] are performing satisfactorily…". (PL)	It should be clarified in the guide, what is understandable as "containment systems" for SNF storage facility, including dry open area SNF storage facility, and for spent fuel storage casks.	rejected	
354	Para I.41 page 79	"Spent fuel loading and unloading operations should be carried out using equipment and methods that limit 'sky shine' [?] and reflection of radiation to workers and the public". (PL)	Another slang term "sky shine" is used. Meaning of this slang is not understandable. The true and direct meaning of effect under consideration should be provided in such level document as nuclear safety guide.	Accepted that limit scattering of radiation ("sky shine") and exposure of the workers and the public.	
355	Para I.42 page 79	"The dry storage facility should be monitored in order to detect increases in gamma and neutron fields that may indicate a degradation of	This paragraphs in some aspects (in recommendation of monitoring and detection of containment failures) repeats and in some aspect (in	Accepted Consider deleting reference to containment in this paragraph.	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		containment or shielding". (PL)	allowance to use only periodic measurements) contradicts paragraph I.39. It seems, that paragraph I.42 can be merged with paragraph I.39 or contradiction regarding allowance to use only periodic gamma and neutron fields measurement with paragraph I.39 should be eliminated.	The dry storage facility should be monitored in order to detect increases in gamma and neutron fields that may indicate a degradation of shielding.	
356	Para I.43 page 79	"Dry SNF storage facility areas with a significant potential for generating or accumulating unacceptable concentrations of airborne radionuclides…". (PL)	Editorial remark.	rejected	
357	Appendix I I.45.	Paragraph I.45 is missing, due to a mistake. Renumbering of paragraphs is needed. (HUN)	(HAEA)	To be consider for publishing	
358	Appendix 1.45/6	Change of numbering (RUS)	No paragraph No. 1.45	To be consider for publishing	
359	Para I.46 page 80	"…Static, impact and seismic loads should be considered in the design of spent fuel ~~and~~ casks or baskets". (PL)	Editorial remark. Spent fuel is not designed, SNF casks or baskets are.	Accepted Consider writing: If stacking is proposed for a dry fuel storage facility, the mechanical stability **of cask, rack, basket or canister** should be designed to withstand, without unacceptable structural deformation,	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
				the mass of a full stack. Static, impact and seismic loads should be considered in the design of **casks, rack, baskets and canisters.**	
360	Appendix I I.47	Consider deletion of "Sufficient clearances should be provided from all directions and on all sides to provide the necessary access." (FR)	"Sufficient clearances should be provided from all directions and on all sides to provide the necessary access." has been added → it is whether not usefull considering the first sentence, whether not compatible with security considerations ?	Accepted Consider deleting the last sentence.	
361	Para I.47 page 80	"Ease of access should be considered in the design [of what?] to facilitate the transfer of spent fuel to or from storage positions…". (PL)	It is unclear which "design" is under consideration here – SNF storage facility, SNF casks, or SNF stacks and baskets. Proper clarification should be provided in the guide.	rejected	
362	Para I.49 page 80	"The dry storage system area should be planned and the storage system [?] itself effectively sealed such that unacceptable leakage of radionuclides and/or inert gases is prevented and ingress of water (moderator) and/or air is prevented". (PL)	It is unclear, what is understood as "storage system". Proper clarification and definition of "storage system" should be provided in the guide. Also, the applicability of this recommendation to effectively seal from leakage of radionuclides and prevent of water and air ingress to open area dry SNF storage facilities should be explained in the	Accepted Consider editing the sentence: The dry storage system should be designed so that unacceptable leakage of radionuclides and/or inert gases is prevented and ingress of water (moderator) and/or air is prevented Consider adding a footnote linked to the first occurrence of "storage system" in order to define its meaning:	

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
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			guide. How it can be ensured prevention of air ingress in the "storage system" should be clarified as well.		
363	Para I.57 page 81	"The spent fuel storage container atmosphere should be adequately dried in order to attain and maintain the gaseous environment required to protect the integrity of the spent fuel. Drying of the fuel storage container atmosphere also ensures that any water entrained inside damaged fuel rods is adequately ~~evacuated~~ evaporated". (PL)	Editorial remark.	Spent could be accepted Evacuated must be kept.	
364	Para I.60 page 82	"For multipurpose SNF casks intended for storage, transport and potential disposal after storage, the means for appropriate handling at the end of the spent fuel storage period should be considered in the design [of what?]". (PL)	It is unclear, "design" of what is considered here – SNF multipurpose casks, or dry SNF storage facility. Proper clarification should be provided in the guide.	rejected	
365	Para I.63 page 82	"This can be done either deterministically or using a probabilistic analysis based on	Editorial remark. Mistype in words "human	accepted	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		consideration of external environmental events or human induced ~~humaninduced~~ accidents…”. (PL)	induced”.		
366	Para I.66 page 82	“For casks relying upon a gas medium for internal convective cooling, the quality and/or density of the gas should be monitored and maintained [how?] if maintenance of the gas medium is not ensured by the design [of what?]”. (PL)	Hardly understandable paragraph. Seems like two thoughts joined in one sentence with second part cut off. 1. It is unclear, how gas medium should be maintained if maintenance is not ensured by the design (of casks?). 2. It is unclear, what is the aim of gas medium quality and/or density monitoring if gas medium maintenance is not ensured by the design (of cask?). Proper clarification should be provided in the guide what is understandable as “gas medium maintenance” and what should be applied if “gas medium maintenance” is not ensured by the design (of cask?).	Accepted Consider revising the sentence as follow: For casks relying upon a gas medium for internal convective cooling, the quality and/or density of the gas should be monitored to keep it within design limits if it is not ensured by cask design.	
367	Para I.69 page 83	“Operational controls should be implemented to avoid a loss of shielding in spent fuel storage [?]…”. (PL)	It is unclear, what object related with “storage” is considered here – spent fuel storage cask (stack, basket, container), or spent fuel storage facility.	rejected	

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
368	Para I.70(a) page 83	"Partial defects in the spent fuel cladding, leading to leaks [of what] and, in case of cask loading in a storage pool, resulting in contamination of the storage pool water by fission products;" (PL)	1. It is unclear, what is considered to leak from defected spent fuel claddings. Proper clarification regarding leaking products (what is considered to leak) should be provided in the guide. 2. It should be noted, that main chapter is called "OPERATION OF DRY STORAGE FACILITIES". As of that, all provided precautions and/or described operations should be related to operations performed at dry storage facility. Meanwhile, SNF cask loading or unloading operations in the pool, belongs to operations performed in wet SNF storage facilities. Due to said above, part (a) of paragraph I.70 should be moved to paragraph I.32 and joined with one already existing similar precaution. Also, instead of I.70(a) proper precautions should be provided in case of dropping of SNF cask during handling operations in dry SNF storage facility.	Accepted. Consider deleting end of the bullet a): a) partial defects in the spent fuel cladding, leading to leaks of radioactive material;" Consider revising first sentence as follow: Operational controls should be implemented that avoid the dropping of spent fuel during transfer from the cask to the storage **system** (or vice versa in the case of cask loading). A drop of spent fuel could result, inter alia, in:	See comment N°362

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
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369	I.70. (c)	…… with low burn up ……	Editorial.	Rejected. "burnup"	This term is used through the all document
370	Para I.71 page 83	"Processes should be established to evaluate the effect of any dropped fuel on the integrity of the cladding of the dropped fuel and on any other structure or component impacted by the drop…". (PL)	The guide does not provide any recommendations how to protect spent fuel cask from drops and how to minimize the consequences of dropped SNF cask during handling and lifting operations in dry SNF storage facility. Proper recommendation regarding usage of operational controls, engineered safety features, SNF cask lifting height limitation as well as recommendations for shock absorbers and dampers usage on the SNF cask transfer route should be added to the guide.	To be considered in the next full scale revision	
371	II.2	Fuel made from a mixture of Uranium and recycled Plutonium oxide (MOX fuel) is increasingly being utilized in light water reactors. Although the fuel rods and fuel assembles are essentially identical in structure and in form to analogous Uranium oxide fuels…	Elements are written in Capital Letters (ARG)	To be check through the whole document and with editorial rules.	
372	II.3	Protection against criticality constitutes an important design requirement. In the analysis of	Elements are written in Capital Letters (ARG)	To be check through the whole document and with editorial rules.	

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
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		nuclear reactivity, special consideration has to be given to the nuclide vector of Plutonium as well as to the specification of an enveloping Plutonium and Uranium ratio.			
373	II.4	Spent MOX fuel may be loaded amongst Uranium fuel assembles.	Elements are written in Capital Letters (ARG)	To be check through the whole document and with editorial rules.	
374	II.5	Compared with uranium fuel, the increased heat generation…	Elements are written in Capital Letters (ARG)	To be check through the whole document and with editorial rules.	
375	II.6	Most safety measures necessary for the storage of MOX fuel are also applicable to the storage of high burnup fuel (a high burnup may be defined as a level higher than 55 GW d/t Uranium for light water reactors).	Elements are written in Capital Letters (ARG)	To be check through the whole document and with editorial rules.	
376	Para II.7 page 85	"…A decision to take credit for burnup should be fully justified with accurate experimental data, approved calculation methods and validated and verified benchmarked computer codes in accordance with international standards. This applies to both inventory determination calculations and criticality calculations…".	If "burnup credit" is applied, each SNF assembly calculated burnup should be confirmed by measurements of certain parameters which were benchmarked to comply with actual spent fuel burnup before placing SNF assembly in the storage rack or cask.	Rejected	Consider in paragraph II.8

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		(PL)			
377	Para II.8 page 85	"…The minimum [?] required burnup value should be verified by independent measurement". (PL)	There is some doubts if minimum required burnup value or actual spent fuel burnup should be confirmed by independent measurement (see comment 127). Proper recommendation could be to confirm actual spent fuel burnup by measurements and ensure that measured burnup value is greater than allowed minimal value of burnup for SNF to be placed in storage racks, stacks, baskets or casks. Clarification of this issue should be provided in the guide.	Rejected	Minimum burnup value is the value taken into account in the criticality safety calculations and demonstration.
378	II.16	Since Aluminum and its alloys…	Elements are written in Capital Letters (ARG)	To be check through the whole document and with editorial rules.	
379	Para II.16 page 86	"…meticulous control of pool water ~~composition~~ chemical regime is necessary to ensure the integrity of the fuel cladding…". (PL)	Editorial remark It is unclear what does it mean "water composition". In the nuclear industry "water chemical regime" term is used or at least it should be written "water chemical composition" (see comment 98 and Annex II, table II-1 item 3).	Accepted Chemical regime could be used with a footnote explaining the meaning in this context.	

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
380	Appendix II.16/14	In view of this it may be considered preferable in the longer term to store spent research reactor fuel in a dry storage environment or alternatively to reprocess research reactor spent fuel. Or remove the entire sentence. (RUS)	The wording implies single decision	Accepted Consider revising the sentence as follow: In view of this it may be considered preferable in the longer term to to avoid wet storage for spent research reactor fuel.	
381	Appendix IV	… Safety of Nuclear Power Plants: Design, IAEA Safety Standards Series No. NS-R-1 SSR-2/1 (rev.1) … (FIN)	Design requirements have been updated SSR-2/1 (rev.1) The Safety of Nuclear Fuel Cycle Facilities, IAEA Safety Standards Series No. NS-R-5 (Rev. 1) revision to SSR-4 should be mentioned..	Accepted Rejected	NS-R-5 (Rev. 1) is still in use
382	Page 81	amendment to the Convention on the Physical Protection of Nuclear Material (MEX)	Update reference [7]	To be checked	
383	References [6](p.81) [20](p.83)	REFERENCES ~~[6] INTERNATIONAL ATOMIC ENERGY AGENCY, The Convention on the~~	Not referred. If [6] is retained, it should be updated as "INFCIRC/ 274/Rev.1/Mod.1 (2016)"	To be checked	

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		~~Physical Protection of Nuclear Material, INFCIRC/274/Rev.1, IAEA, Vienna (1980).~~ [20bis~~33~~] INTERNATIONAL ATOMIC ENERGY AGENCY, The structure and content of agreements between the Agency and States required in connection with the Treaty on the Non-Proliferation of Nuclear Weapons, INFCIRC/153(Corrected), IAEA, Vienna (1972). (JP)	Renumbered in order of appearance (see J-08 on para. 3.31).		
384	References [27] (p.85)	…IAEA Safety Standards Series No. SSG-18, IAEA, Vienna (2011~~2003~~). (JP)	Editorial.	To be checked	
385	References [28] (p.85)	…IAEA Safety Standards Series No. NS-G-3.6, IAEA, Vienna (2004~~2005~~). (JP)	Editorial.	To be checked	
386	Annex I page 93-94	1. Accentuate (with bold fonts) title of subchapters: "**Short term storage**"	Editorial remark. 1. The Annex I consist of 2 parts (subchapters): "Short term storage" and "Long term	accepted	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		"**Long term storage**" 2. Keep gap between rows of text in the "Long term storage" subchapter the same as in the "Short term storage" subchapter. (PL)	storage", but the titles of subchapters are not underlined (accentuated) in any way. For better noticeability where one or other subchapter starts it is recommended to accentuate the titles of Annex I subchapters by bold fonts (similar as is done in main guide text). 2. First subchapter "Short term storage" has 1.5 lines gap between text rows, while the second subchapter "Long term storage" is written with single line gap. This makes impression of irregularity of the guide. The gap between each text row should be unified in the entire guide text, including Annex I.		
387	ANNEX II TABLE II–1.	4. Control of pool water level Radiation protection, heat removal ~~protection~~ (JP)	Editorial	accepted	
388	ANNEX II P.90	Delete text after TABLE II-2. (JP)	Text without meaning.	accepted	
389	Annex II page 97	Delete the text on page 97 as this is repeating of Annex II table II-2	Editorial remark. Text below Annex II table II-2 entire repeats the text and	accepted	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		(PL)	structure of table II-2 and as of that should be completely removed (deleted).		
390	Annex II / Table II-2 / Item 1.	Subcriticality, heat removal, radiation protection (RSA)	Radiation protection to be added to item 1 "Applicable safety functions" as the "Element" includes type and amount of spent fuel in storage.	accepted	
391	Annex II / Table II-2	Remove contents of page 91. (RSA)	Table U-2 on page 90 is repeated on page 91 (without a heading).	accepted	
392	ANNEX III f)	Producers providing completely detailed, step by step, operating instructions;	Add a colon between step and operating (ARG)	rejected	
393	Annex III (e) page 98	"Limitations and action levels on parameters being controlled (e.g. pool water ~~composition~~ chemical regime) and corrective measures to return parameters to within normal range". (PL)	Editorial remark (see comments 98, 129 and Annex II, table II-1 item 3)	See comment N°379	
394	ANNEX IV (p.93)	ANNEX IV • Leadership and Management for Safety, IAEA Safety Standards Series No. GSR Part 2~~; IAEA, Vienna (2016)~~	Editorial	To be checked	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
		• Safety Assessment for Facilities and Activities, IAEA Safety Standards Series No. GSR Part 4 (Rev.1) (JP)			
395	Annex IV page 99	The list of related publication in the IAEA safety standard series is recommended to merge with the list of References provided in the main guide. (PL)	The purpose of this Annex IV is unclear. There is already a list of References, including publications in the IAEA safety standard series, in the guide itself (see reference [1], [2], [3], [4], [5], [8], [21]). This Annex IV was referred only once in the "Introduction" and was not used or mentioned in the guide (reference to Annex IV in paragraph 5.18 is misleading – see comment 37). Due to said above, it is recommended to remove Annex IV and the list of publications merge with list of References provided in the guide. Otherwise some clarifying text, explaining the purpose of this publications, their importance to nuclear safety in general and their relation to SNF storage issues in particular should be added to the Annex IV. It should be noted, if Annex IV	To be checked	

COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			will be removed paragraph 5.18. should be corrected accordingly (see comment 37).		
396	Annex VII (29) page 105	"Removal or weakening of a structure or component in decommissioning [?] without realization of the possible effects on the structural integrity of other structures and components". (PL)	The Annex VII provides the list of postulated initiating events for consideration in a nuclear safety assessment and safety case preparation for SNF storage facilities (see paragraph 5.18 and comment 37). The decommissioning of SNF storage facility or any of its related structure or component might be allowed only after all spent fuel removal to disposal or reprocessing facility. But after all spent fuel removal from SNF storage facility there will be no more risks for nuclear safety. Due to said above, it is unclear what was considered by *"Removal or weakening of a structure or component in decommissioning"*. If it was considered the demolition (not the decommissioning) of certain supporting parts and components of operational SNF storage facility then this precaution has a sense and such	Accepted Consider writing the sentence as follow:Removal or weakening of a structure or component for **dismantling without taking into account of** the possible effects on the structural integrity of other structures and components.	Dismantling could be possible for part of facility without any intention of decommissioning.

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COMMENTS BY REVIEWER				RESOLUTION	
No	Para	Proposed new text	Reason/Comment	Proposal	Reason
1	2	3	4	5	6
			event should be taken into account during safety assessment preparation. Proper clarification regarding SNF storage facility structures and components decommissioning and its influence to nuclear safety or radiological protection should be clarified in the guide or term “decommissioning” should be changed to term “demolition”.		