

DS489 “Storage of Spent Nuclear Fuel” - Draft Safety Guide 2016-09-26

ENISS Comments

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: ENISS		Pages: 3					
Country/Organization: ENISS		Date: 2016-20-26					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	<b>General comment</b>	<i>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 This draft DS489 should not be published but should be used as an input for being revisited to get it fully in line with the coming NS-R-5</i>				Y	DS489 isn't a full scale revision of SSG-15 but a revision by amendment (see the Note of the Secretariat in the Comment Web Folder). If the new SSR-4 (full revision of NS-R-5 (Rev. 1)) is published before DS489 is finalized, which will most likely be the case, all potential contradictions will be eliminated.
2.	5.21(c)	During the identification of hazards, consideration should be given to the combination of related hazards ( <del>e.g., earthquake and fire</del> ) 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.			Y	Hazards could last different time, and while one could start at first and cause another one, they can occur simultaneously for at least some time.
3.	5.21(d)	Those low-probability combinations with high potential consequences that are below the design basis threshold	Add for clarity.	Y	The definition of the term “design extension		

		should be considered for defence in depth and emergency preparedness purposes (design extension consideration)(definition see SSR 2/1 rev. 1)			conditions” taken from SSR-2/1 (Rev. 1) will be inserted as a footnote.		
4.	6.36	To improve accident management capabilities, passive measures, <del>such as dispersing high decay heat fuel assemblies uniformly among low decay heat assemblies</del> , should be considered. <b>For example, dispersing high decay heat fuel assemblies uniformly among low decay heat assemblies could be considered.</b>	Clarity; the important thing is « passive measures should be considered ». Dispersing high decay heat fuel assemblies uniformly among low decay heat assemblies is one example of passive measure.	Y	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 an example.
5.	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 ensure that the equipment is capable of withstanding conditions of normal operation, anticipated operational occurrences and accident conditions. Equipment should be designed <b>and/or operational limits and conditions should be defined</b> 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 <b>and operational limits and conditions</b> 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.	The prevention can rely upon the design of the equipment (mechanical strength) and/or the operational limits and conditions (lifting height)	Y	Equipment should be designed <b>and operational limits and conditions should be established</b> such that, in the event of an accidental drop of a load, ...  In addition, the design and operational limits and conditions should be such that an accidental drop will neither ...		Limits and conditions can't be used INSTEAD of design provisions. Limits and conditions are also addressed in Section 3 (Para 3.18).  <i>Para 6.51 wasn't affected through this revision by amendment (please refer to the Note of the Secretariat in the Comment Web Folder).</i>

6.	6.60	<del>When provided, control functions should be designed to be independent of indications, alarms, and any automatic protective actions.</del>	Delete. The control functions and protective actions have to be clarified	Y	Instrumentation should be provided to detect conditions that may result in loss of residual heat removal capability and excessive radiation levels. This instrumentation should 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. <b>When practicable, control and protection functions should be</b>		To use this sentence as it was in SSG-15.
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					<p><b>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.</b> 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.</p>		
7.	I.12	Water level monitoring and the system <b>or systems</b> for providing make-up water should be assessed for performance in accident and design extension conditions	The make-up system used in normal conditions, accident, conditions and DEC can be different (you can have more than one make-up system).	Y			

*DS489 – Storage of Spent Nuclear Fuel Step 7,*

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: M-L Järvinen, Country/Organization: STUK		Page.... of.... Date: 25.10.2016					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
	General	Please check the terminology, in the guide the term safety case is used for the overall safety assessment.	The use of term “safety case” is not well known in all of the MS.			Y	The term “safety case” is introduced in the IAEA Safety Glossary and used in the IAEA Safety Standards since about 10 years.
	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 <del>physical protection systems</del> <u>security provisions</u> 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 verse	Y			
		<b>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</b>	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			Y	Para 1.1 introduces both situation related to spent nuclear fuel. In para 1.2 it was and is written that SSG-15 is following GSR Part 5. The scope wasn’t changed in this revision.

		<p><b>features shall be applied. For long term storages in particular, measures shall be taken to prevent the degradation of the waste containment.</b></p>	<p>and NS-R-5 (Rev. 1) and its revision to SSR-4 (DS478 in this 42th NUSSC to be submitted to CSS)</p> <p>Please check the referenced requirements.</p>				
	6.4	<p>...</p> <p>A multi-barrier approach should be adopted in ensuring containment, with account taken of all elements including the fuel matrix, the fuel cladding, the storage casks, the storage vaults and any building structures that can be demonstrated to be reliable and competent;</p> <p>...</p>	<p>Delete all</p> <p>In line with SSR-2/1, Req. 80 and para. 6.64 - 6.68</p>			Y	<p>There isn't a contradiction between para 6.4b and paras 6.64-6.68 of SSR-2/1 (Rev. 1).</p>
	Appendix IV	<p>...</p> <p>Safety of Nuclear Power Plants: Design, IAEA Safety Standards Series No. <del>NS-R-1</del> SSR-2/1 (rev.1)</p> <p>...</p>	<p>Design requirements have been updated</p> <p>SSR-2/1 (rev.1)</p> <p>The Safety of Nuclear Fuel Cycle Facilities, IAEA Safety Standards Series No. NS-R-5 (Rev. 1) revision to SSR-4 should be mentioned.</p>	Y		Y	<p>NS-R-5 (Rev. 1) is still in use, although it is currently under revision by DS478.</p>

**COMMENTS ON NUCLEAR SAFETY DOCUMENTS DS 489**

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: G/DANDRIEUX Page.... of 6 Country/Organization: MEEM Date:28/10/2016							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	P19	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. <b>However, for security reasons, prevention of intentional human intrusion may requires adequate security arrangements (information on nuclear security issues are provided for in the nuclear security series) and these should be addressed in the safety ease.</b>	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. <b>Prevention of intentional human intrusion requires adequate security arrangements (they are considered in the</b>		The Draft Safety Guide DS489 will not replace ANY recommendations or guidelines from the Nuclear Security Series. The 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; and 2) in terms of potential influence on safety (integrity of barriers etc.).  <i>Para 5.11 wasn't affected through this</i>

					<b>nuclear security series publications) and these should be addressed in the safety case.</b>		<i>revision by amendment (please refer to the Note of the Secretariat in the Draft Standards for Comment Web Folder).</i>
2	6.114, table 2 p56	Delete following <del>Video Confirmation of cameras functionality of cameras</del> <del>Security Confirmation of perimeter fences and/or gates</del>	Testing of security equipments shall not be addressed in the safety case.			Y	Para 6.114 doesn't address the safety case but the maintenance, inspection and testing within the Subsection "Operation of spent fuel storage facilities" of Section 6 "General safety considerations for storage of spent fuel".  <i>Para 5.11 wasn't affected through this revision by amendment (please refer to the Note of the Secretariat in the Draft Standards for Comment Web Folder).</i>

**Draft Safety Guide DS489 - “Storage of Spent Nuclear Fuel”**  
**(Draft dated 26 September 2016)**  
**Status: STEP 7**

Note: [Blue parts](#) are those to be added in the text. [Red parts](#) are those to be deleted in the text.

COMMENTS BY REVIEWER					RESOLUTION			
Reviewer: <b>Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB)</b> (with comments of GRS) Country/Organization: <b>Germany</b>					Page 1 of 1 Date: 2016-10-19			
Relevance	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
3	1	Contents	<a href="#">MONITORING</a> instead of <del>Monitoring</del>	Formatting		Deleted from the content.		
1	2	5.21/(j)	...implications <a href="#">considering also response to possible malfunction of equipment.</a>	Emergency preparedness	Y			<i>Para 5.21 (j) wasn't affected through this revision by amendment (please refer to the Note of the Secretariat in the Draft Standards for Comment Web Folder).</i>
1	3	5.21/(n)	...experience <a href="#">and its implementation into manuals, guidelines and training.</a>	Lessons learned	Y			<i>Para 5.21 (n) wasn't affected through this revision by amendment (please refer to the Note of the Secretariat in the Draft Standards for Comment Web Folder).</i>
3	4	6.4/(d)	Indention of the text is different to the rest of the document.	Formatting	Y			
3	5	6.45/(b)	Indention of the text is different to the rest of the document.	Formatting	Y			
3	6	6.72/(a-d)	Font size of point a-d is different to the rest of the document.	Formatting	Y			

Relevance:  1 – Essentials  2 – Clarification  3 – Wording/Editorial

## TITLE Japan NUSSC Comments on DS489 “Storage of Spent Nuclear Fuel”

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Japan NUSSC member Country/Organization: Japan / NRA-Japan			Page 1 of 2 Date: 28 Oct, 2016				
No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modif./reject.
1	General	Need to be reviewed by <a href="#">TRANSSC</a> .	There are over 26 times of “transport”, especially, dual purposes transportations is mentioned in para. 6.12. (b) or somewhere.			Y	In the DPP for DS489, TRANSSC wasn’t identified as Review Committee.
2	1.7./14	..... the <a href="#">Tepco</a> Fukushima Daiichi <a href="#">Nuclear Power Plants Accidents</a> ,....	Completeness.	Y			
3	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 <a href="#">threshold accidents</a> should be considered for defence in depth and emergency preparedness purposes ( <del>design—extension consideration</del> );	Clarification. Unclear for “design extension consideration”.	Y	Replaced with “design extension conditions”.		As it was proposed in another comment.
4	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 <a href="#">design basis accidents</a> and design extension conditions;	Clarification.	Y			
5	6.36. Last 1 line	..... among low decay heat <a href="#">fuel</a> assemblies, should be considered.	Editorial.	Y			

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Japan NUSSC member Country/Organization: Japan / NRA-Japan		Page 1 of 2 Date: 28 Oct, 2016					
No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modif./reject.
6	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 <del>normal operational states</del> and accident conditions, <del>and the design extension conditions</del> . Consideration should be given to the potential for fuel overheating over an extended period of time.	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 and accident conditions, <b>including</b> 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's should be addressed.
7	6.56. 6.60. 6.72. I.12.	The design may consider the potential for pressure build-up in the facility during <del>accidents and design extension accident</del> conditions, and provide for a means to prevent hydrogen gas concentrations which could give rise to disruptive explosions.	(ditto)		The design may consider the potential for pressure build-up in the facility during accidents, <b>including</b> design extension conditions, and provide for a means to prevent hydrogen gas concentrations which could give rise to disruptive explosions.		It's important to highlight that DEC's should be addressed.

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Japan NUSSC member		Page 1 of 2					
Country/Organization: Japan / NRA-Japan		Date: 28 Oct, 2016					
No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modif./reject.
8	I.70. (c)	..... with low <u>burn up</u> <del>burnup</del> .....	Editorial.		“burnup”	Y	The term “burnup” is used throughout the document.

Storage of Spent Nuclear Fuel (DS-489)

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer:		Page..1. of...1.					
Country/Organization: Pakistan Nuclear Regulatory Authority		Date: 28.10.2016					
Comm ent No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	3.9/3	...and providing advice <del>and expert services to the government authorities</del> 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.			Y	GSR Part 1 (Rev. 1), Para 2.24: <i>In preparing an emergency plan and in the event of an emergency, <u>the regulatory body shall advise the government and response organizations, and shall provide expert services</u> (e.g. services for radiation monitoring and risk assessment for actual and expected future radiation risks) in accordance with the responsibilities assigned to it.</i>
2.	3.11/7	The decommissioning plan should be updated regularly <b>after every five years</b> 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.		“regularly”=>”periodically”	Y	GSR Part 6, Para 7.5: <i>The decommissioning plan shall be updated by the licensee and shall be reviewed by the regulatory body <u>periodically</u> (typically every five years or as prescribed by the regulatory body).</i>
3.	3.21/5	Supervisory staff should be competent to perform their activities and should,	The training and qualification should be in				It should be competent and their competency should be authorized

		therefore, be selected, trained, qualified and authorized for that purpose <b>as per criteria approved by regulatory body.</b>	accordance with some criteria established by regulatory body.				
4.	5.21(c)/1	Systematic identification of hazards and scenarios associated with operational states, accident conditions, <b>human induced</b> and external events (e.g. fires, handling accidents and seismic events).	The term “human induced” is added to cater for fuel handling accidents.			Y	“Accident conditions” includes human activity, and “external events” covers human induced & natural events.
5.	5.21(c)/3	During the identification of hazards, consideration should be given to the combination of related hazards (e.g., earthquake and fire, <b>earthquake and tsunami etc.</b> ) that may occur and consequential effects.	Text modified to include comprehensive hazard identification based on Fukushima experience.	Y			

**TITLE**

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer:		Page of 2					
Country/Organization: Spain/CSN		Date:25/10/2016					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	General and 1.7	Please consider a new paragraph 1.8 to introduce “design extension conditions” concept in connection with paragraph 1.7 (c).	The term “Design extension conditions” (DEC) is firstly introduced in the expected content of the safety case in 5.21 (d) and other paragraphs (6.40,6.56, 6.60 6.72) but it has not been defined or stated. The most relevant IAEA document capturing DEC is SSR 2/1: Requirements for Design of NPPs (Rev. 1 published in 2016). Our proposal is to include an additional paragraph to account for DEC in the introduction. A reference for the text may be excerpted from requirement 20 of SSR 2/1 and replacing plant by facility.		The definition of the term “design extension conditions” taken from SSR-2/1 (Rev. 1) will be inserted as a footnote.		It would be possible to address the design extension conditions in more detail, if needed, when making the full scale revision of SSG-15.
2	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	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.	Y	The word “consideration” is to be replaced with “conditions”.		The footnote with the DEC definition is to be inserted for para 1.7.

		for defence in depth and emergency preparedness purposes (i.e. design extension <del>consideration</del> conditions <sup>1</sup> ); <sup>1</sup> 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).	The text "below the design basis threshold" is misleading consider rephrase it to avoid confusion.				
3	6.40		Design extension conditions is not defined please see comment number 1	Y			The footnote with the DEC definition is to be inserted for para 1.7.
4	6.56		Design extension conditions is not defined please see comment number 1	Y			The footnote with the DEC definition is to be inserted for para 1.7.
5	6.60		Design extension conditions is not defined please see comment number 1	Y			The footnote with the DEC definition is to be inserted for para 1.7.
6	6.72		Design extension conditions is not defined please see comment number 1	Y			The footnote with the DEC definition is to be inserted for para 1.7.

**SE comments on: Revision by amendment of Draft Safety Guide DS489 Storage of Spent Nuclear Fuel**

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: <b>Bengt Hedberg</b> Country/Organization: Sweden/Swedish Radiation Safety Authority    Date: <b>31/10/2016</b>							
Comment No.	Para/Line No.	Proposed new text	Reason/Comment	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
Miscellaneous			<p>Experience feedback to IAEA secretariat:</p> <p>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).</p> <p>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.</p> <p>E.g. former paragraph 6.5 has been deleted.</p> <p>E.g. former paragraphs 6.71 and 6.72 has in revised document been merged into new (renumbered) paragraph 6.70</p> <p>E.g. New text has been introduced as paragraph 6.71</p>	Y			

**SE comments on: Revision by amendment of Draft Safety Guide DS489 Storage of Spent Nuclear Fuel**

1.	New sub-paragraph 5.21 (v)	(v) Whenever the safety of facilities and activities ...	Sentence does not make sense. Propose to improve wording (make sentence complete) and propose to consider to formalize as a separate (new) paragraph.	Y	(v) Assessment of human interactions with the facility or activity, including actions taken in accidents, and other human actions the safety of facilities and activities might depend on.		The following wording is proposed to make the text more clear.
2.	Paragraph 5.22	In case of co-location of spent fuel storage facilities with other facilities ...	Sometimes a licensed SF storage facility is located at “same site” as other licensed storage facilities, but the legal entities being licensee may be different. It might thus be formally (legally) challenging to assign the legal entity (licensee) operating the SF facility to assume responsibility for accidents that may occur in a facility operated by another legal entity (licensee).  Propose to carefully reconsider wording so as to address this aspect.			Y	No responsibilities are discussed here but only SC and SA that should consider potential hazard independently from the licensee for each co-located facility.
3.	Paragraph 6.7	“... cliff edge effect ...”	Propose to use a different way to express the intention with the expression. The reason being that the concept “cliff edge effect” according to IAEA 2007 Glossary (“ <i>In a nuclear power plant, an instance of severely abnormal plant behaviour caused by an abrupt transition from one</i>			Y	In the 2016 Edition of the IAEA Safety Glossary, the term “cliff edge effect” is addressed to “facility” which includes, but is not limited to, NPPs: “ <i>An instance of severely abnormal</i>

**SE comments on: Revision by amendment of Draft Safety Guide DS489 Storage of Spent Nuclear Fuel**

			<p><i>plant status to another following a small deviation in in a plant parameter, and thus a sudden large variation in plant conditions in response to a small variation in an input.”)</i> is dedicated to nuclear power plants.</p> <p>Also, the concept “cliff edge effect” is may be not equally relevant for facilities covered by DS489/SSG-15 as for NPPs.</p>				<p><i>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”.</i></p>
4.	Paragraph 6.36, Last (new) sentence	<p>...</p> <p>To improve accident management capabilities, passive measures, such as dispersing high decay heat fuel assemblies uniformly among low decay heat assemblies, should be considered. ...</p>	<p>Quoted text introduces a new element (...dispersing high decay heat fuel assemblies uniformly among low decay heat assemblies ...).</p> <p>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.</p> <p>If decided to keep this element I propose to keep as separate paragraph and move to sub-chapter/section OPERATION</p>				
5.	Paragraph 6.45 (b) Last (new) sentence	<p>...</p> <p>The facility design ...</p>	<p>The added element is relevant. But I propose to reword slightly so as to avoid long and</p>			Y	<p>No other comments about wording of this para. Better wording can be found later if</p>

**SE comments on: Revision by amendment of Draft Safety Guide DS489 Storage of Spent Nuclear Fuel**

			complicated sentence.				needed.
6.	Paragraph 6.57	Ventilation systems should be <b>operated</b> in such a way ...	Propose to move paragraph to subchapter/section OPERATION		Ventilation systems should be <b>designed</b> ...		Could be accepted while para 6.57 wasn't affected.
7.	Paragraph 6.57	The <b>operation</b> of fuel handling ...	Propose to move paragraph to sub-chapter/section OPERATION				Can't identify the text.
8.	Paragraph 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)	Y	This instrumentation should be taken into account when developing provision for the decontamination of personnel, equipment and components.		Re-wording is proposed to make it more clear.
9.	Paragraphs 6.72 & 6.73		Propose to move subsection "Emergency preparedness" with paragraphs 6.72 and 6.73 to sub-chapter/section OPERATION.			Y	Nothing with the Fukushima Daiichi Accident. Against DPP - the structure is kept as it is.
10.	(New) Sub-paragraph 6.72 (a)	<del>Procuring</del> <u>Ensuring</u> <u>availability of</u> 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 ...		Procuring and periodic testing of equipment...		It could be available, but doesn't work. It's more important to have it available and ready to use...
11.	Paragraph 6.80	Propose to reword: "Some commissioning steps may continue into the operation stage of <del>the</del> <u>a spent fuel storage facility, e.g. commissioning of new spent fuel transport casks or</u>	Reworded to be more straightforward and with less descriptive text.  I do not consider the following statement valid (... <i>For example, it may not be justified to test and verify the heat removal capacity</i>	Y			

**SE comments on: Revision by amendment of Draft Safety Guide DS489 Storage of Spent Nuclear Fuel**

	<p><u>commissioning of new spent fuel designs.</u> Commissioning during the operation of the facility should be <del>already</del> taken into account <u>already</u> during the design phase (e.g. installation of additional heat removal systems) <u>so as to allow for appropriate commissioning activities at later stages.</u> <del>Otherwise the commissioning can be challenging due to 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."</del></p>	<p><i>of a storage pool until the facility has received spent fuel... ) and propose to delete this part.</i></p>				
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**TITLE**

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Office for Nuclear Regulation Page..1.. of...1. Country/Organization: United Kingdom Date:21/10/2016							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	5.21.c	There should be a reasonable postulated causal relationship (or correlation) between hazards to support combining them for evaluation;	The previous words did not support the intended meaning.	Y	There should be a <b>reasonable causal relationship between hazards</b> to support combining them for evaluation;		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.
2	6.36	In addition, the temperature of other safety-related components in the facility should also not exceed their maximum allowable temperatures <i>in normal operation and anticipated fault conditions</i> .	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 <b>and that the temperatures of other safety related components in the facility do not exceed their maximum allowable temperatures <i>in normal operation and anticipated fault conditions</i>.</b>		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 Para 6.36 addresses heat removal, the wording is proposed to be changed as given on the left.

## USA Comments on IAEA DS489 “Storage Spent Nuclear Fuel”

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: US Nuclear Regulatory Commission (POC Bobby Eid: <a href="mailto:Bobby.Abu-Eid@nrc.gov">Bobby.Abu-Eid@nrc.gov</a> )							
Country/Organization: USA/U.S. NRC				Date: 11/01/2016			
Comment No. /	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	5.7	The operating organization should apply passive safety features to the extent practicable.	Clarity			Y	Section 5 addresses Safety Case and Safety Assessment, that's why it's about DEMONSTRATION, but not application.  <i>Para 5.7 wasn't affected through this revision by amendment (see Note of the Secretariat in the Draft Standards for Comment Web Folder).</i>
2	6.2 (c)	Some systems also use a secondary cooling circuit to provide for confinement of radioactivity. <del>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.</del>	Identify purpose of secondary cooling loop. Delete last sentence because it is unclear.		Some systems also use a secondary cooling circuit.		No relationship with the Fukushima Daiichi Accident.  Para 6.2 describes modes, but not purposes, cost and other aspects.  <i>Para 6.2 (c) wasn't affected through this revision by amendment.</i>
3	6.33(e)	For certain accident conditions such as a fuel handling accident,	Boron dilution is not independent of the				<i>Para 6.2(c) wasn't affected through this</i>

**Kommentar [GA1]:** No technical ideas BUT...

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: US Nuclear Regulatory Commission (POC Boby Eid: <a href="mailto:Boby.Abu-Eid@nrc.gov">Boby.Abu-Eid@nrc.gov</a> )							
Country/Organization: USA/U.S. NRC		Date: 11/01/2016					
Comment No. /	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		limited credit for soluble boron may be allowed in view of the double contingency principle	soluble boron, so double contingency does not apply. Fuel handling accident is independent of boron concentration.				<i>revision by amendment.</i>