

**Master List of comments and resolutions for DPP DS489 for the Revision of SSG-15, Storage Spent Nuclear Fuel
November 2014 (SPESS Step 3)**

MS	No.	Para/Line No.	Proposed new text	Reason	Accept	Accepted, but modified as follows / remarks	Reject	Reason for modification/rejection / remarks
ARG (N)	1	General	The revision of SSG-15 by amendment is a must due to explanation provided in the first paragraphs of the Background, Justification and Overview. The amended version will be welcome by the nuclear community and, therefore, this DPP should be endorsed by NUSSC in order to continue the revision process.		C			Comment only
	2	General	However at the forthcoming NUSSC meeting some discussion would be fruitful, for instance third bullet of Objective and Scope: the topic “Avoiding long term off site contamination through strengthening severe accident mitigation” seems unrealistic as a general case.			To be discussed at WASSC/NUSSC session		
FIN(N/W)		General	The proposal to update the SSG-15 by amendment is good. Updated guide enables the effective implementation of the lessons learned from the Fukushima Daiichi accident.		C			Comment only
FIN(N/W)		General	It is good that the Feedback Analysis Report is submitted with the DPP. However the results of the review could be presented in more detail showing the paragraphs or chapters needing the changes.		X (Feedback analysis report is updated)			
FIN(N/W)		4 Objective and Scope	The main objective of the revision of SSG-15 is to incorporate the result of the gap analysis on the Safety Requirements and Safety Guides based on the feedback from the Fukushima Daiichi Accident. The revision will	Delete the third bullet. The severe accident in the spent fuel storage should be practically eliminated.		To be discussed at WASSC/NUSSC session		

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			<p>include following topics:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Strengthening accident management <input type="checkbox"/> Preventing severe accident through strengthening the design basis, including strengthening the consideration of external hazards and sufficient margins <input type="checkbox"/> Avoiding long term off site contamination through strengthening severe accident mitigation <p>The current version of the Specific Safety Guide, "Storage of Spent Nuclear Fuel" (SSG-15) covers spent nuclear fuel storage facilities that may be either collocated with other nuclear facilities (such as a nuclear power plant, research reactor or reprocessing plant) or located on their own sites. This document scope will not be affected by this revision.</p>					
FIN(N/W)		5	GSR Part 6 (Decommissioning) should be added to the reference list.	Interface between storing and decommissioning.			X	Section 5 shows the list of interface documents mainly taken into consideration during this revision taking into account lessons from the Fukushima Daiich Accident.
FRA	1	4. Objectives and scope	<p>The main objective of the revision of SSG-15 is to incorporate the result of the gap analysis on the Safety Requirements and Safety Guides based on the feedback from the Fukushima Daiichi Accident. The revision will include following topics:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Strengthening accident management <input type="checkbox"/> Preventing severe accident through strengthening the design basis, including strengthening the consideration of external 	<p>Delete the third bullet.</p> <p>The severe accident in the spent fuel storage should be practically eliminated.</p>	To be discussed at WASSC/NUSSC session			

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			hazards and sufficient margins <input type="checkbox"/> Avoiding long term off site contamination through strengthening severe accident mitigation					
GER	1	General	Germany welcomes the IAEA secretariat's intention to revise and update the Safety Guide SSG-15 in the light of lessons learnt from the Fukushima Daiichi NPP accident. The German experts for nuclear safety and waste safety fully support the objective to incorporate the topical issues addressed in the Feedback Analysis Report into SSG-15. Due to the interface with the five Safety Requirements that have recently been revised under DS462, it would be useful to present the outcomes of the review in a more detailed manner, showing the subsections or paragraphs which will need to be revised in SSG-15.	Comment only.	X (Feedback analysis report is updated)			
GER	2	General	As stated in the Feedback Analysis Report, several points for improvements were identified in order to enhance consistency of SSG-15 with the overarching Safety Requirements GSR Part 5 and NS-R-5. As NS-R-5 is currently under revision (DS478), particular attention is required when revising SSG-15 in parallel, in order to maintain consistency with regard to terminology, concepts and approaches.	At present, the concept of design extension conditions (DEC) is only established in SSR-2/1 "Safety of Nuclear Power Plants: Design", but neither in GSR Part 5 nor in NS-R-5. Therefore, its implementation into the Safety Guide SSG-15 will not be a straightforward exercise.	C			Comment only This comment will be taken into account during the development of DS489.
GER	3	Chapter 1	Document Category: "Specific Safety Guides"	Clarification regarding the new classification system for publications issued in the IAEA Safety Standards Series.	X			
GER	4	Chapter 2	Please add a new last paragraph with the following text: "In 2011, the IAEA established a "Joint	One of the recommendations of the Joint Working Group provided to WASSC (availa-			X	In order to focus on incorporating with lessons learned from

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			<p><u>Working Group on Guidance for an Integrated Transport and Storage Safety Case for Dual Purpose Casks for Spent Nuclear Fuel</u>”. This three-year project has clarified many important issues related to the safe management of DPCs. The results of the Working Group’s activities have been consolidated in a technical document with the provisional title “Guidance for preparation of a safety case for a dual purpose cask containing spent fuel”, which is expected to be published as part of the IAEA TECDOC Series. In addition, the Working Group provided recommendations to WASSC and TRANSSC for revisions to be made to existing IAEA Safety Standards relevant to licensing and use of transport and storage casks for spent fuel, inter alia SSG-15.”</p>	<p>ble at http://www-ns.iaea.org/downloads/rw/waste-safety/disp/transcc-wass-recomm-dual-spentfuel-casks-tecdoc.pdf) can be summarised as follows: Current SSG-15 describes an ageing management programme only generally. It would be more informative for Member States if it could include a guideline for preparing an ageing management programme. Therefore, it is recommended to include the description in Chapters 1.12.2 (Essence of systematic approach to ageing management) and 1.12.3 (Ageing management programme for DPC storage facilities) of the technical document mentioned at the left into SSG-15 as an Annex. A key issue is how to maintain the DPC safety case for transport during storage – recognizing that storage may be for an extended period of time – so that the DPC can be used for transport regardless of the period of storage. This requires periodic inspections of the DPC as well as periodic review of the DPC safety case.</p>				<p>the Fukushima Daiich Accident, the incorporation of recommendations to WASSC from the joint WG is proposed to be considered at the time of full revision of SSG-15.</p>
GER	5	Chapter 3	2 nd paragraph:	This is an update of the cur-		“In addition, as a result		

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			<p>“In addition, as a result of gap analysis of existing Safety Standards based on the feedback from the Fukushima Daiichi Accident, revision of the Safety Requirements GSR Part 1, NS-R-3, SSR-2/1, SSR-2/2 and GSR Part 4 are in progress as DS462. DS462 has finally been approved by the Safety Standards Committees and is currently in STEP 11 under review by the Commission on Safety Standards (CSS). It and it is expected that the revision process will be completed soon by the end of 2014.”</p>	<p>rent development status of DS462. This paragraph may need further update after the 36th CSS meeting in November 2014 where endorsement of DS462 is envisaged.</p>		<p>of gap analysis of existing Safety Standards based on the feedback from the Fukushima Daiichi Accident, revision of the Safety Requirements GSR Part 1, NS-R-3, SSR-2/1, SSR-2/2 and GSR Part 4 are in progress as DS462. DS462 has finally been endorsed by the Commission on Safety Standards (CSS) and is currently in STEP 11 awaiting establishment by the Publication Committee.</p>		
GER	6	Chapter 3	<p>Please add a new last paragraph with the following text: “Furthermore, the input and feedback of the Joint Working Group on Guidance for an Integrated Transport and Storage Safety Case for Dual Purpose Casks for Spent Nuclear Fuel” on ageing management programmes for DPC storage facilities justifies the need for a revision of SSG-15 with respect to topics other than the ones included under the DS462 Addenda to the IAEA Safety Requirements in response to the Fukushima Daiichi NPP accident.”</p>	<p>Unfortunately, the recommendations and outcomes of the Joint Working Group are not mentioned at all in the Feedback Analysis Report, although they were presented at the 35th and 37th WASSC meeting.</p> <p>SSG-15 was endorsed at the 27th CSS meeting held in March 2010. Since that time, new regulations came into force in several countries where there is a need for extended dry storage of spent fuel beyond the regulatory licensing timeframe, e.g.</p> <ul style="list-style-type: none"> • in Germany: the Nuclear Waste Man- 			X	<p>In order to focus on incorporating with lessons learned from the Fukushima Daiichi Accident, the incorporation of recommendations to WASSC from the joint WG is proposed to be considered at the time of full revision of SSG-15.</p>

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				<p>agement Commission (ESK) issued “Guidelines for the performance of periodic safety reviews and on technical ageing management for storage facilities for spent fuel and heat-generating radioactive waste” (March 2014);</p> <ul style="list-style-type: none"> • in the United States: the NRC issued the final report “Standard Review Plan for Renewal of Spent Fuel Dry Cask Storage System Licenses and Certificates of Compliance” (NU-REG-1927, March 2011) which contains a dedicated section on ageing management review. <p>Germany recommends a thorough review of SSG-15 in order to evaluate whether the Safety Guide reflects a current state-of-the-art of industry practices and R&D results with respect to the following topics:</p> <ul style="list-style-type: none"> • Application and review of ageing management programmes for long term operation of spent fuel storage facilities; • Management of obsolescence of SSCs important to 				

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				safety; • Interfaces between ageing management, periodic safety review, and license renewal.				
GER	7	Chapter 4	2 nd bullet: <u>“Protection against internal and external hazards. The design of a spent fuel storage facility should provide for an adequate margin to withstand internal or external hazards exceeding those to be considered for the design. Preventing severe accident through strengthening the design basis, including strengthening the consideration of external hazards and sufficient margins”</u>	The main idea is to protect the spent fuel storage facilities against internal and external hazards in such a manner that no uncontrollable accidents will be initiated. Adequate margins to avoid cliff edge effects for higher magnitudes of the hazards than considered for the design should be provided, taking into account the site hazard evaluation. For ensuring consistency with the Safety Requirements SSR-2/1 Rev. 1 “Safety of Nuclear Power Plants: Design” (DS462, version July 2014), the term ‘adequate margin’ (instead of ‘sufficient margin’) should be used in the bullet.	X			
GER	8	Chapter 4	3 rd bullet: <u>“Practical elimination of core melt accidents leading to early or large releases Avoiding long term off site contamination through strengthening severe accident mitigation”</u>	To be consistent with the strategy for wet storage of spent fuel in pools at a reactor site, accidents leading to core melt shall be practically eliminated. Assuming that the residual heat of fuel assemblies in dry storage is much lower than in spent fuel pools, the same stringent requirement has to be applied here.		To be discussed at WASSC/NUSSC session		

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GER	9	Chapter 5	Please add the following IAEA Safety Standards to the list of interface documents: 5. GSR Part 6: Decommissioning of Nuclear Installations 6. GSR Part 3: Radiation Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards 7. SSG-27: Criticality Safety in the Handling of Fissile Material	For completeness.			X	Section 5 shows the list of interface documents mainly taken into consideration during this revision taking into account lessons from the Fukushima Daiich Accident.
JPN (N)	1	General	“The Feedback Analysis Report” which contains the outcome of SSG-15 review is supposed to be attached to this DPP. There is no attachment to this DPP.	Clarification.	X (uploaded on 19, Sep.)			
JPN (N)	2	4. OBJECTIVE AND SCOPE	One of the important issues we have lessons and learn from the Tepco Fukushima Daiichi accident is a design and management philosophy of the spent fuel pool collocated with a nuclear power plant. How to deal with the maximum allowable time and amount of spent fuels in the SFP should be discussed in the OBJECTIVE AND SCOPE of this DPP?	Clarification taking into account the lessons and learnt from the Tepco Fukushima Daiichi NPPs accidents.			X	Spent fuel pool collocated with a nuclear power plant is out of scope of SSG-15, but (DS487 (revision of NS-G-1.4)).
JPN (N)	3	4. OBJECTIVE AND SCOPE 2 nd bullet	•Preventing severe accident through strengthening the design basis, including strengthening the consideration of external hazards and sufficient <u>adequate</u> margins	Be consisted with SSR-2/1 rev.1 as DS462 para. 5.21a. for protecting external hazards.		Second bullet of Objective and Scope is revised as: Protection against internal and external hazards. The design of a spent fuel storage facility should provide for an adequate margin to withstand internal or external hazards exceeding those to be considered for the design.		

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						(Germany comment No.7)		
JPN (N)	4	6. OVERVIEW 2nd sentence	It will be a revision by amendment.	Mainly we agree with the scope as limited to the amendment only, however, to be consisted with the revision of the amendment, it might be modified accordingly.			X	It should be clearly addressed that this is the revision of the amendment,
JPN (N)	5	7. PRODUCTION SCHEDULE	Since this revision is not expected to affect the current structure and the most of the current text of the guide, and revised by the amendment only, the PRODUCTION SCHEDULE should be shortened.				X	Considering that NS-R-5 is also under revision, it is proposed to keep the schedule.
ROK	1	General comments	We welcomes the idea of revising SSG-15 by amendment light of the lessons learned from the Fukushima Daiichi Accident.		C			Comment only
ROK	2	2. BACKGROUND	...the Waste Safety Requirements and Guides at <u>in</u> the light of the lessons learnt...	To use more adequate expression	X			
ROK	3	2. BACKGROUND	...in the light of Fukushima Daiichi lessons learned <u>the lessons learned from the Fukushima Daiichi Accident</u> ...	To use more adequate expression	X			
ROK	4	4. OBJECTIVE AND SCOPE	The revision will include <u>the</u> following topics <u>but not limited to</u> :	The areas of amendment of SSG-15 proposed by Consultancy may include other issues such as the reliability of ultimate heat sink, prevention of fuel uncover (for wet storage), etc.	X			
UKR	1	4. OBJECTIVE AND SCOPE	Extend the topics to be considered under SSG-15 revision with the “Strengthening <u>safety analysis</u> and accident management”	Strengthening <u>safety analysis</u> is a precondition to enhance accident management and should be considered as well.			X	It is considered that this point is covered by the second bullet.

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USA	1	Proposed Action	Delete "by amendment"	There does not seem to be an obvious advantage to making this change by amendment. There seems to be enough time to consider any other necessary changes to the document (although few are expected).			X	Considering that SSG-15 was published in 2012, this revision should focus on the lessons learned from the Fukushima Daiichi Accident.
USA	2	Page 2, 4) Objective and Scope	Modify first bullet to read: <ul style="list-style-type: none"> Strengthening safety of accident management including extreme situations (e.g.; multiple initiating events occurring simultaneously). 	Completeness and consistency with the "Feedback Analysis Report."			X	Definition of accident management already includes extreme situations.
USA	3	Pg. 2, Section 4, Third bullet under topics	Change to language closer to the performance criteria used in the Fukushima changes to SSR 2-1. (e.g. practically eliminating early and large releases)	Consistency	To be discussed at WASSC/NUSSC session			
USA	4	Page 2, 4) Objective and Scope	Establish harmony with relevant updated safety requirements document.	This is a key objective since SSG-15 was developed much earlier than recently updated key requirements.	X (Added to 4.)			
USA	5	Pg. 2, Section 4	It should be clearer that the purpose of this change is to introduce the concept of design extension conditions into this safety guide. It is problematic because the requirements document that introduced this concept to SFPs (SSR 2-1) is not one of the requirements documents listed in Section 1.8 of SSG-15.	De-facto new requirements should not be introduced at the safety guide level.			X	The concept of design extension conditions is introduced in GSG-3. SSR-2/1 is addressed as the „RELATED PUBLICATIONS IN THE IAEA SAFETY STANDARDS SERIES“ in Annex IV of SSG-15.
USA	6	Page 2,	At the end of last Para of Section 4 (Objec-	Handling of SNF after cease			X	Considering that SSG-

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		4) Objective and Scope	tives and Scope) add: The scope also covers spent nuclear fuel (SNF) after cease of operation and during decommissioning before license termination.	of operation and during dismantling and decommissioning is an important aspect anticipated to be covered by DS489.				15 was published in 2012, this revision should focus on the lessons learned from the Fukushima Daiichi Accident.
USA	7	Page 3, 5), after Item #5 add two items	Add: 6. SSR-4: Safety of Nuclear Fuel Cycle Facilities 7. GSR Part 3: radiation Protection and Safety of radiation Sources	Relevance and Completeness.			X	Section 5 shows the list of interface documents mainly taken into consideration during this revision taking into account lessons from the Fukushima Daiichi Accident. DS478 (revision of NS-R-5) is included in the reference list.
USA	8	Pg. 3, Section 6, Overview	Although the feedback analysis report provides some background, a more detailed description of which new or revised paragraphs are contemplated should be provided.	Too difficult to ascertain the nature of the changes contemplated by the DPP.	X (Feedback analysis report is updated)			
USA	1(additional)	4) Objective and Scope	If the term “severe accident” is not defined for these facilities, it needs to be defined.	It may not be appropriate to apply the DEC concept to installations other than NPPs.	C			Appropriate description will be proposed during the development of DS489
USA	2(additional)	4) Objective and Scope		Incorporating severe accidents into the design basis could confuse the fact that analyses for DEC can be realistic analyses while analyses for design basis are typically bounding analyses (both deterministic and probabilistic).	C			Appropriate description will be proposed during the development of DS489
USA	3(ad	4) Objec-	The term “design basis” is not well under-	The design basis for a compo-	C			Appropriate description

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	ditional)	tive and Scope	stood, and needs to be defined for these facilities.	ment may be different than the design basis for a plant safety analysis. For example, the requirements for quality assurance of SSCs are different from traditional design basis information.				will be proposed during the development of DS489
USA	4(adtional)	4) Objective and Scope		In the context of SSR2/1, there was lengthy discussion of radiological consequences. There was agreement that "large" and "early" releases should be used as a design criteria vice "avoidance of land contamination." This concept needed to be modified for spent fuel pools, since there is no distinction between the releases. Instead, the design criteria was focused on preventing high radiation doses, primarily through preventing loss of inventory below the top of the fuel. This thought is not captured in the objectives	To be discussed at WASSC/NUSSC session			
ENISS	1	General	It is clear that there needs to be a distinction between the types of fuel storage. For example the recommendations from the Feedback Analysis Report include "Strengthen Accident Management" and "Avoiding long term off site contamination through strengthening severe accident mitigation". These recommendations may well be appropriate for wet fuel storage where active cooling and active containment is required. However it is not appropriate for a Dry Fuel Store with passive	The DPP correctly excludes the storage of spent fuel on the NPP spent fuel pools that is dealt with on the revision of SSR2/1 just finished. This means that the scenarios that more easily could cause spent fuel damage should be excluded.	C			Comment only This comment will be taken into account during the development of DS489.

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			cooling and multiple (passive) containment barriers. The revision should also take into consideration progressive reduction of residual heat produced by the spent fuel	The reduced residual heat production, once the spent fuel can be stored in casks or on of site pools, provides longer time than usual for recovery actions. The time available will increase progressively giving more certainty to the recovery actions.				
ENIS S	2	Objective 1 st bullet	Strengthening accident management	It seems that this constitutes an extension of the scope (revision of SSG 15).			X	Operation of spent fuel storage facilities is a part of SSG-15
ENIS S	3	Objective third bullet	Avoiding long term off site contamination through strengthening severe accident mitigation <u>features, if needed.</u>	The term mitigation alone may be misleading. The SSG 15 is basically a design guide so better specify that revision will deal with the SSC of the facilities.	To be discussed at WASSC/NUSSC session			
ENIS S	5	Interfaces with planned publications	Add <u>DS 483 (REVISION OF NS.G-2.15) Severe Accident Management Programme for Nuclear Power Plants.</u>	For completeness.	X			