TITLE: DS487 DPP Design of Fuel Handling and Storage Systems for NPPs

COMMENTS BY REVIEWER				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
Reviewer Nuclear Regulatory Authority, **Argentina** / Data:23 May 2014							
1	General	a) Technical topics outside the scope (listed in Section 4) are not minor and they should not be just mentioned, they also need updated guidance. The Secretariat should verify that they are effectively considered by other Safety Guides; if it is not the case, new complementary or reviewed/revised at least Safety Guides should be produced for dealing with. A proposal should be presented at the forthcoming NUSSC meeting.		X (as follows :) 1) In-core fuel management and associated reactor physics considerations (refer to Safety Guide NS-G-2.4); ~~2) The design of fuel handling system components that are irrelevant to fuel design;~~ 3) The design of transport casks (refer to Safety Guide SSG-15); 4) ~~Fuel storage over the long term, exceeding the design lifetime of~~			

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				~~the NPP~~; 5) ~~Loading of damaged fuel into transport casks with fuel exposed to coolant~~; 6) Design of storage facilities for spent fuel, which are not an integral part of an operating NPP, although such facilities may be located on the same site (refer to Safety Guide SSG-15).			
		b) In section 7 the target publication date seems realistic but taking into account the wider scope post-Fukushima intended for the revised NS-G-1.4, the new version should be published as soon as possible. Newcomers and organizations designing new generation NPPs will surely					Comment is noted. The target date for the final publication remains unchanged, due to a long and uncertain process for Member States' comment and disposition. Nevertheless, the actual implementation will be conducted to pursue

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		be grateful. In brief, NUSSC should approve this DPP.					early completion.
Reviewer: STUK, **Finland** / Data: 22 May 2014							
1	Section 2, Pg. 3	a… and means for maintaining the cooling in the spent fuel storage systems with a goal practical elimination of the severe accidents in spent fuel pools and strengthening level four of defense-in-depth consideration of external hazards and sufficient marg*ins*.	a) Add: the goal of practical elimination of the severe accident should be mentioned and the strengthening for the external hazards.	X (Incorporate as suggested)			

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			b) This is a design guide and the sentence "In the past, analysis of severe accidents in spent fuel pool was not widely performed." can be deleted. The analysis of the accidents in spend fuel pool should be in the analysis guide.			X	The comment is noted but not accepted, because: (1) Design covers all areas considered in the design process; safety assessment is a part of the design process (requirement 10, SSR-2/1); (2) Safety analysis is one essential element for the safety assessment; therefore, safety assessment/safety analysis cannot be excluded from this Guide; (3) Note a contradictory comment (U.S.A #2 comment) that requires a new section for "Design and Defense-in-Depth Evaluation". Also note that "analysis of severe accidents" is reworded to read as "analysis of such accidents", according to France #2 comment.
2	Attachment - Table of Contents	3. General Design Basis • General considerations • Practical elimination of	There are several new topics to be handled in this	X (Combining this comment with France #11 and			For complete and comprehensive description.

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		severe accidents (new) • Operational States • Postulated Initiating Events • Extreme external hazards (new) • Safety- security interface (new) • Other considerations	document. From the TOC it is not clear were the issues are to be discussed.	U.S.A #2 comments, the following contents for Section 3 are proposed: 3. General Design Basis • General Considerations • Operational States • Postulated Initiating Events • Design Basis Accidents • Extreme External Hazards • Practical Elimination of Severe Accidents • Safety Assessment • Safety- Security Interface • Other Considerations			Refer to France #11 for "Design Basis Accidents". Refer to U.S.A #2 for "Safety Assessment".

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Reviewer: ANS, **France** / Data: 23 May 2014							
1.	Section 1		Why is NSGC consultation "for information"?	X			"For information" is removed to avoid confusion.
2.	Section 2	For example, as discussed at an international experts' meeting[2], design and defense in depth evaluations of spent fuel pools and associated structures, systems and components should consider events that may lead to spent fuel damage in storage (e.g., re-criticality, fuel degradation, hydrogen production and explosion, and zirconium fire during loss of cooling or loss of pool inventory). In the past, analysis of ~~severe~~ such accidents in spent fuel pools was not widely performed.	Severe accidents should be avoided in spent fuel pool	X (Incorporate as suggested)			
3.	Section 4	•The transfer of unirradiated fuel into the reactor vessel; • The removal of irradiated fuel from the reactor vessel;	Clarification		Change "the reactor vessel" to "the reactor core".		A general term that is applicable to all reactor types (for example, CANDU does not use the term "the reactor vessel").
4.	Section 4	• The storage, inspection and repair of the irradiated fuel ~~in the reactor pool and its preparation for removal from the reactor pool~~; and	Such activities may also be performed in the fuel building…	X (Incorporate as suggested)			

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5.	Section 4	Add a bullet in the operations to be addressed: • The removal of irradiated fuel from the spent fuel pool (for long term storage or reprocessing)	Removal should be treated as a separate topic and not be mixed with fuel reparation or inspection	X (Incorporate as suggested)			
6.	Section 4	The physical protection of fuel or aspects associated with the safeguarding of nuclear material ~~are is~~ also considered ~~for information~~ and safety/security interface will be addressed.	Safety/security/safeguard interface has to be taken into account	X (Incorporate as suggested)			
7.	Section 4	• Fuel storage over the long term, ~~exceeding the design lifetime of the NPP~~;	No need to introduce lifetime of NPP		The sentence is removed for the clarification of the scope.		Close to comment disposition for Argentina #1.
8.	Section 5		References of the relevant IAEA Nuclear Security publications should be inserted.	X (Incorporate as suggested)			

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9.	Section 5		Storage of fresh/irradiated fuel also occurs in fuel cycle facilities and research reactor. Provisions developed in NS-R-5 and NS-R-4 and associated Safety Guide should also be considered as input to increase consistency of IAEA recommendations for fuel storage and handling.	X (Incorporate as suggested)			
10.	Section 5		Add the references of the Safety Standards (requirements and guides) dealing with management system as §8 of tentative table of contents (ToC) includes a chapter on management system See also comment on ToC	X (Incorporate as suggested)			

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11.	Tentative ToC	3. General Design Basis - General Considerations - Operational States - Postulated Initiating Events and accident conditions - Safety/security interface - Other Considerations	Clarification	X (Combining this comment with Finland #2 and U.S.A #2 comments, the following contents for section 3 are proposed: 3. General Design Basis • General considerations • Operational States • Postulated Initiating Events • Design Basis Accidents • Extreme external hazards • Practical Elimination of Severe Accidents • Safety Assessment • Safety- security interface • Other considerations)			Close to comment disposition for Finland #2 and U.S.A. #2.

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
12	Tentative ToC	4. Systems for the Handling and Storage of Unirradiated Fuel ~~- Safety Requirements~~ - System Design - Equipment - Support Systems - Handling Operation	Safety requirements are established in SSR-2/1 and 2/2		Reword from "Safety requirements" to "General Considerations".		The intention is to make link to specific safety requirements established in SSR-2/1. Reword to read as "General Considerations" to avoid confusion.
13	Tentative ToC	5. Systems for the Handling and Storage of Irradiated Fuel and Other Core Components ~~- Safety Requirements~~ - System Design - Equipment - Support Systems - Operation - Provision for Dismantling and Reconstitution of Irradiated Fuel - Provision for Damaged Fuel	Safety requirements are established in SSR-2/1 and 2/2		Reword from "Safety Requirements" to "General Considerations".		The intention is to make link to specific safety requirements established in SSR-2/1. Reword to read as "General Considerations" to avoid confusion.
14	Tentative ToC		Is there an actual need to provide recommendations on management system (chapter 8)?				Section 8 Management System for Design is intended to cover QA and Documentation for Design.

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Reviewer: **Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU)** (with comments of GRS), **Germany** / Data: 2 May 2014 Note: German comments were provided for use in both NUSSC and WASSC review.							
1	Section 2, Pg. 2	"The Safety Guide mainly deals with ~~mainly~~ the design of fuel handling and storage systems for both unirradiated and irradiated fuels …"		X (Incorporate as suggested)			
2	Section 2, Pg. 3	"A gap assessment for the Specific Safety Requirements ~~in~~ SSR-2/1 with respect to the lessons learned from the Fukushima Daiichi accident also showed a need to strengthen means for reliable monitoring and controlling ~~of~~ the water level and means for maintaining the cooling in the spent fuel storage system in accident conditions."	Amendment to be in line with the wording used in the new Para 6.68a introduced in Revision 1 of SSR-2/1 (see DS462, latest version dated March 2014).	X (Incorporate as suggested)			
3	Section 3, Pg. 2	"Furthermore, the current NS-G-1.4 was issued in 2003 based on the previous ~~Specific~~ Safety Requirements document ~~(~~NS-R-1~~,~~ (issued in 2000)~~, while the previous requirements document NS-R-1~~ which was superseded by the new Specific Safety Requirements document ~~(~~SSR-2/1~~)~~ in 2012."	NS-R-1 was not categorised as a Specific Safety Requirements document. The new classification system for publications issued in the IAEA Safety Standards Series was established in 2009.	X (Incorporate as suggested)			

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4	Section 5, Pg. 1	"This Safety Guide will provide guidance on compliance with the regulatory aspects of the Safety Requirements on: Safety Assessment ~~and Verification~~ for ~~Nuclear~~ Facilities and Activities (GSR Part 4, 2009); and Safety of Nuclear Power Plants: Design (SSR-2/1, 2012)."	Citation of the correct publication title of GSR Part 4.	X (Incorporate as suggested)			
5	Section 5, Pg. 2	"The following IAEA Safety Standards ~~documents to be~~ will interface~~d~~ with the revision of NS-G-1.4 (the list is not intended to be final or exhaustive): …"	1.) All the documents cited have been issued in the IAEA Safety Standards Series. 2.) The current wording suggests that the subsequent list of publications is complete. This misunderstanding should be avoided by the insertion in brackets.	X (Incorporate as suggested)			

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6	Section 5	According to Chapter 4, the revised NS-G-1.4 will address the handling of the transport casks loaded with spent fuel assemblies. Casks that are to be transported off the reactor site to a spent fuel storage facility (either for disposal as radioactive waste or for reprocessing) are subject to the requirements of the IAEA Regulations for the Safe Transport of Radioactive Material (SSR-6) and other appropriate international standards and national regulations. Therefore there might be an interface with SSR-6 as well, although the design of the transport casks is outside the scope of this Safety Guide. Depending on the national regulatory approach, the casks will be used for transport as well as for storage (dual purpose casks), requiring an integrated safety case for transport and storage.	For completion, add SSR-6 as interface document in the list.	X (Incorporate as suggested)			

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Reviewer: U. S. Nuclear Regulatory Commission, United States of America / Data: 23 May 2014							
1	General	The Table of Content (TOC, Pages 5-6) lacks a Section on documentation, audit, and QA/QC. We suggest adding a Section in this regard to address handling issues, status, and inventory of nuclear fuel as such documentation is quite important for audit and inspection through the life cycle of nuclear fuel handling system.	Completion and accountability for control of nuclear fuel.	X			Commenter's intention is indeed included: Section 8 Management System for Design is intended for "QA and Documentation for Design".
2	General	We suggest adding a Section in the TOC on "Design and Defense-In-Depth evaluation for SF Pools and Associated Structures and Components." This issue was identified by the international expert as a gap to be addressed in its meeting held in Vienna, Austria on March 19-22, 2012.	Completeness to address key safety issues identified by international experts.	X (Combining this comment with Finland #2 and France #11 comments, the following contents for section 3 are proposed: 3. General Design Basis • General considerations • Operational States • Postulated Initiating Events • Design Basis Accidents • Extreme external			The intention of the comment will be captured in the subsection entitled "Safety Assessment" under Section 3. Also close to comment disposition for Finland #2 and France #11.

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				hazards • Practical Elimination of Severe Accidents • Safety Assessment • Safety- security interface • Other considerations)			
3	Section 1	Add TRANSSC as a Review Committee	Section 4, includes transport cask handling and receipt as within the scope. Guidance associated with transport casks should be reviewed by TRANSSC.	X			The DPP will be submitted for TRANSSC review in the next meeting (scheduled for November 2014).
4	Section 2, line 3	After "Specific Safety Requirements document, add: SSR-2/1 (under final review by SCCs).	Completeness &, clarification.	X (Incorporate as suggested)			
5	Section 4, Pg. 2	The handling of the storage or transport casks.	To maintain consistency with section 4	X (Incorporate as suggested)			