

**Master List of SSC Comments DS448 Predisposal Management of Radioactive Waste from Nuclear Reactors  
September 2014 (SPESS Step 11)**

Type	MS	No.	Para/Line No.	Proposed new text	Reason	Accept	Accepted, but modified as follows	Reject	Reason for modification/rejection
Clar	JAP NUS	1	Title	Predisposal Management of Radioactive Waste from Nuclear <del>Reactors</del> Power Plants	“Nuclear Reactors” is ambitious. Be consisted with NPPs’ requirements such as SSR-2/1 and 2/2. In addition to this, the scope is described focused on NPPs.	X	“...Nuclear Power Plants and Research Reactors”		Clarity
Gen	ENISS	0	General	It was very difficult to correlate comment resolution table to new text. For instance Canada comment 21 on previous par.3.20 does not fit at all with new 3.20. Finland comment n.4 on 6.30 actually fits with new 6.32.ENISS comment n.17 on previous 6.82 that seems accepted cannot traced at all.	Due to the short time provided it would have been better to have available a text with comments on modifications made	C			<b>Comment only</b> Some changes have been superseded during harmonization of the documents
Gen	GER2	1	General	Germany appreciates the IAEA secretariat’s commitment regarding the further development of the Safety Guides DS447 and DS448 on predisposal management of radioactive waste. The current version of DS448, which has been improved considerably compared with the previous version, represents a major step towards the completion of the Safety Guide. Nevertheless, there still remains a need for further improvements. These are addressed below.	Comment only.	C			<b>Comment only</b>
Edit	GER3	54	General	Please check spelling in the document: ‘nonradioactive’ vs. ‘non-radioactive’.	Harmonization of spelling throughout the document is recommended.	X	non-radioactive		Review by NS-SSCS underway and will be uploaded
WMS	JAP WAS	1	General	Add some explanation of “thermal treatment” elsewhere.	Until a previous version of this document, the term “incineration” had been used. The change of this term is deemed to expand the concept of this kind of treatment. Hence, sme explanation or examples rather	X	Added Para 6.32, referring to IAEA-TECDOC-1527. Elsewhere, replaced “thermal treatment” with “incineration”		Although various thermal treatment techniques exist, incineration is the most commonly used

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					than incineration are useful.				
Clar	RUS	1	General	DS447 and DS448 should be checked for consistency in wording and the completeness.		X			To be discussed w WASSC representative (need more detailed proposals) <ul style="list-style-type: none"> <li>• Documents were significantly revised to address similar MS comments</li> <li>• Review by NS-SSCS underway and will be uploaded</li> </ul>
WMS	RUS	2	General	Specificity of spent sealed sources predisposal management should be indentified.		X	Text added (para's 6.68 – 6.71)		<ul style="list-style-type: none"> <li>• Disused/spent SRS are not typical sources of RW generated by NPPs/RRs</li> <li>• Spent SRS from radiological facilities dealt with in Radiation SSs (RS-G-1.10, DS434)</li> <li>• WS-G-2.7 (DS454) addresses management of spent/ disused SRS generated at research facilities</li> </ul>
Gen	SAF	5	General	There is no need to separate DS448 and 447. Especially with the concept of graded approach.				X	SG developed in response to requests from MSs to have a self-standing publication. In this regard, it also includes requirements on "general" safety matters with

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									facility-specific details  The intent is to address the different communities of users separately and to expand the documents with facility specific details
Gen	USA	1	General	DS448 current version has been improved substantially from the previous draft revision. Apparently, it has been harmonized with DS447 with minimization of overlaps and redundancies as practicable. In addition, the illustrative figures and flow diagrams presented in Appendix 4 are quite helpful to understand sources of waste generation and generic waste treatment processes.	Feedback				<b>Comment only</b>
Str/sc	UKR NUS	1	1.01, 1.15, 6.13, 6.16, App.3	It is proposed to ensure consistence between paras. 1.1, 1.15, 6.13, 6.16, and App.3 concerning the consideration of « <i>spent fuel declared as waste</i> ».	According to para. 1.1 “Typical waste from reactors includes, but is not limited to: spent ion exchange resins, filters, activated metals, liquid and gaseous effluents, irradiated experimental components, <i>spent fuel declared as waste</i> and waste from decommissioning”. However, the mention of “ <i>spent fuel declared as waste</i> ” is missing later in paras. 6.13, 6.16 and App.3. Moreover, according to para 1.15, SG should also cover spent fuel treatment outside the nuclear power plant or	X	1.15: “This Safety Guide is not specifically intended to cover the management of spent nuclear fuel as long as it remains a part of the operational activities of a nuclear power plant or research reactor. Management of spent nuclear fuel in facilities that are collocated with a nuclear power plant or research reactor is addressed in Safety Guide SSG-15, Storage of Spent Nuclear Fuel [8] and NS-G-1.4, Design of Fuel		See USA add. Comment 2.

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					research reactor.		Handling and Storage Systems in Nuclear Power Plants [33].”		
clar	USA add	1	1.04/1	Modify sentence to read: ...encompasses all <i>activities</i> from waste generation up to....	Previous version of DS448 stated, “steps and activities”. Paragraph 1.5/line 1 starts, “These activities include;” If “steps” is not changed, it’s confusing as to what “activities” refers to.	X			
Clar	USA add	2	1.04/3-6	Delete line 3 beginning with “While the generation and” and all of lines 4-6.	This sentence is about spent fuel and this guide is not intended to address spent fuel. Additionally, it precedes paragraph 1.5, “These activities include;” and none of the activities listed address spent fuel so the flow is confusing.	X			See UKR NUS Comment 1
Clar	GER2	2	1.05	Last bullet: “Storage ... is an interim activity with the intent to retrieve the waste at a later date for clearance, <a href="#">authorized use (e.g. subsequent to a decay period)</a> , processing and/or disposal <del>at a later time</del> , or, in the case of effluent, for authorized discharge.”	Clarification and completeness. It is not reasonable to retrieve waste from a storage facility when no authorized disposal facility is available for delivery.	X			
Clar	ENISS	1	1.07	Reactor waste management is further complicated by the problem of mixed waste. Reactor wastes <del>commonly</del> may contain other hazards, in addition to radiological hazards, which require specific measures to address conventional health and safety and need to be regulated appropriately.	Too general. In reality all waste must comply also with conventional environmental regulations in particular for disposal but this doesn’t mean that there are necessarily other hazards.	X	Para deleted		
clar	GER2	3	1.07	The 2 <sup>nd</sup> sentence states: “Reactor wastes commonly contain other	Conventional health and safety issues as well as environmental	X	Para deleted		This type of detail not considered appropriate

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				<p>hazards, in addition to radiological hazards, which require specific measures to address conventional health and safety and need to be regulated appropriately.”</p> <p>For illustration purposes, one or two examples should be included to provide more detailed information on other hazards commonly contained in reactor wastes. Are such hazards specific for radioactive wastes generated in NPPs and research reactors ? May such hazards also be contained in other radioactive wastes originating, e.g. from nuclear fuel cycle facilities ?</p>	<p>impacts are also required to be considered for the predisposal management of radioactive waste from nuclear fuel facilities (see Paras 2.3 and 2.4 of DS447, version September 2014) and from the use of radioactive materials in medicine, industry, agriculture, research and education (see Para 2.4 of DS454, version August 2014).</p>				<p>in Ch 1, considering that the focus of SS's is on radiological hazards</p>
Clar	FIN	1	1.09 p.4	<p>Please clarify the sentence: "In some instances, the predisposal waste management solution has to be found optimizing conflicting demands. Such considerations include the balancing of exposures of workers and/or those of members of the public,..."</p>	<p>This can be applied e.g. for gaseous discharges but as such, standing alone, the sentence appear a bit weird.</p>	X	<p>"In some instances (e.g., gaseous discharges), the predisposal waste management solution has to be found optimizing conflicting demands, e.g., balancing of exposures..."</p>		
	GER1	5	1.10	<p>2<sup>nd</sup> sentence:            "In cases where wastes are to be stored for extended periods, conservative assumptions <del>need to</del> <u>should</u> be made, e.g. the time scale in which a disposal facility will be available <u>and, thus, on the behaviour and stability of the waste during the anticipated storage period.</u>"</p>	<p>1. When no disposal facility is available, it is essential to make assumptions on the behaviour and stability of the waste during the anticipated storage period, in order to avoid e.g. its physical degradation or uncontrolled chemical reactions.</p> <p>2. In an IAEA Safety Guide, usually recommendations (or "should" statements) are provided.</p>	X			
Clar	GER2	4	1.10	<p>1<sup>st</sup> sentence:</p>	<p>1. Amendment for clarifica-</p>	X			

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				“To select the most appropriate type of pre-treatment, treatment and conditioning for the radioactive waste when no disposal facility has been established, reasonable assumptions <del>have to</del> <u>should</u> be made about the likely disposal option, <u>including likely waste acceptance criteria.</u> ”	tion. 2. In an IAEA Safety Guide, usually recommendations (or “should” statements) are provided.				
Edit	GER3	6	1.10	3 <sup>rd</sup> sentence: “All assumptions made that impact on the selection of <del>pre-disposal</del> <u>predisposal</u> management options should be properly justified.”	Editorial.	X			
Edit	JAP WAS	7	1.10/5	All assumption <u>s</u> made that impact on the selection of pre-disposal management options should be properly justified.	Editorial	X			
	RUS	3	1.13	<del>While it is recognized that T</del> he recommendations <del>of in</del> this publication are applicable to the generation of radioactive waste at nuclear reactors <u>and their predisposal management</u> ; however, operation of nuclear reactors is outside the scope of this Safety Guide	The recommendations of the SG are applicable not only to the stage of generation of radioactive waste.	X			
Edit	GER3	14	1.14, Footnote 4	Note: Footnotes 4 and 6, which are assigned to the Paras 1.14 and 3.24, respectively, contain identical text. As the term ‘permanent shutdown’ is introduced in Para 3.24, we recommend to delete footnote 4.	Unnecessary duplication of information should be avoided.	X			
	KOR	1	1.14, Footnote 4	<i>It is recommended to delete the footnote No. 4.</i>	Footnotes No. 4 and 6 contain the same descriptions on the term “permanent shutdown”, although term “permanent shutdown” was first used in Para. 3.24.	X			
	JAP	2	1.19	This document is under Step 11. Even if only	Comment only.	X			

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	WAS			the structure of this document is described in this paragraph, texts must be added.					
	SAF	1	2.08	Doses and risks associated with the transport of radioactive waste have to be managed in accordance to requirements in [10]	To avoid confusion proper reference must be provided. "the same way as other radioactive material" adds no value and can be confusing.	X			
	USA	2	3.06	"The management of radioactive waste may entail the transfer of radioactive waste from one operating organization to another and also from one national or governmental entity to another..."	Clarity	X	" The management of radioactive waste may entail the transfer of radioactive waste from one operating organization to another, from one national or governmental entity to another, or from one country to another."		
	GER1	7	3.07	"The government is responsible for establishing a regulatory body independent from the owners of the radioactive waste <del>or</del> and the operating organizations managing the radioactive waste, ..."	The regulatory body must be independent from the owners of the radioactive waste as well as from the operating organizations managing the radioactive waste. Otherwise the effective independence of the regulatory body is not ensured.	X			
Clar	ENISS	2	3.09	A mechanism for providing adequate financial resources should be established to cover future costs; in particular, the costs associated <u>with</u> decommissioning of the reactor and waste management facilities, and also the costs of long-term management of radioactive waste (including storage and disposal). The financial mechanism should be established at <u>installation construction</u> licensing and should be updated as necessary. Consideration should	To be consistent with the request of a preliminary Decommissioning plan made in other sections of the guide.	X	"...and disposal). The identification of the provision of financial resources begins at the design stage and should be updated as necessary ..."		

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				also be given to provision of the necessary financial resources in the event of a premature shutdown of the <u>reactor</u> or an early dispatch of the waste to a disposal facility.					
Edit	GER3	8	3.09	1 <sup>st</sup> sentence: “... in particular, the costs associated <u>with</u> decommissioning of the reactor and waste management facilities, ...”	Editorial (missing word).	X			
	EC	1	3.13	Suggested to replace “should” with “may” in the last sentence: The regulatory body should also provide specific guidance on how to meet requirements as related to the safe management of radioactive waste.	Not all countries provide guidance and also it is up to the licensee to demonstrate compliance with the regulatory requirements			X	Coherency w GSR Part 5
Clar	GER2	9	3.14	2 <sup>nd</sup> sentence: “At each phase in the lifetime of these facilities or activities (including decommissioning), the safety case <u>and supporting safety assessment</u> should be <u>reviewed and</u> updated <u>periodically</u> by the operator and <u>subsequently</u> reviewed by the regulatory body.”	Important amendment to be in line with Para 4.15 of the Safety Guide GSG-3 “The Safety Case and Safety Assessment for the Predisposal Management of Radioactive Waste”.	X			
	JAP WAS	3	3.14/1	The regulatory review of the <u>licensing documentation</u> (safety case) for the predisposal management of radioactive waste...	Consistency with DS447.	X			
	SAF	4	3.14	The regulatory review of the safety case for the predisposal management <u>of</u> radioactive waste at reactors should follow a graded approach, particularly considering the phases in the lifetime of the predisposal radioactive waste management facility or activities.	Grammatical corrections	X			
	USA	3	3.14	“At each phase in the lifetime of these facilities or activities (including decommissioning), the safety case should be <u>reviewed and updated periodically</u> <del>updated</del> by the operator and <u>subsequently reviewed/approved</u> by the regulato-	Clarity and consistency: Changed to add some time aspect between operator actions and regulatory control. This language is consistent with	X			



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				ry body.	GSG-3, 4.15				
	USA add	3	3.14/3	At each phase in the lifetime of these facilities or activities (including decommissioning), the safety case should be <b>reviewed and updated</b> by the operator and reviewed by the regulatory body.	Changed to add some time aspect. This language is consistent with GSG-3, 4.15	X			
	EC	2	3.15	The regulatory body should periodically verify that the key aspects of the operation of the radioactive waste management facility meet the requirements of the national legal system and facility licence conditions, such as those relating to the keeping of records on inventories and material transfers, compliance with requirements for processing, storage, maintenance, inspection, testing and surveillance, operational limits and conditions, modifications to the facility, emergency preparedness and response.	Para 3.31 highlights the importance of modifications to the facility. Modifications should also be verified by the regulatory body.	X			
	SAF	2	3.16	The regulatory body should follow a graded approach in informing interested parties about regulatory processes and should consult these parties, as appropriate, in an open and inclusive manner	The safety aspects of the radioactive waste management facility are the responsibility of the licensee, and application of graded approach on safety aspects of a facility is far-fetched	X	Para. clarified		Coherent w SS's on Mgmt Sys
Edit	GER3	10	3.17 (c)	"Possible long term storage of radioactive waste after the reactor has been <u>permanently</u> shut down and decommissioned."	Ensuring consistency with Footnotes No. 4 and 6.	X			
	USA add	4	3.17 (c)	Delete "and spent fuel"	Per paragraph 1.15, guide is not intended to cover spent fuel storage.	X			
	SAF	3	3.18	No suggested text	This is more of a GSR-1 requirement. A guide has to be more explicit than a require-	X	Para revised		Coherency w GSR Part 5 and SS's on Mgmt Sys

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					ment document.				
Clar	ENISS	3	3.19 P.11	Add Furthermore, the operating organization retains its responsibility for the safety of the facility and activities, and a continuous commitment <b>to safety</b> by the organization remains a prerequisite to ensuring safety and the protection of human health and the environment.	Clarity	X			
Clar	GER2	12	3.22 (m)	"... In situations where acceptance criteria for disposal are not yet available, ensuring that the management of radioactive waste is based on reasonable assumptions for the anticipated disposal option, <a href="#">including provisions for waste characterization in order to supply data for future decisions with respect to disposal</a> ; and making provisions ..."	Clarification and completion.	X			
Edit	GER3	11	3.22 (c)	"Development of operational limits, conditions, and controls, including waste acceptance criteria <a href="#">of the waste management facility</a> consistent with the safety case for approval by the regulatory body;"	For completeness.	X			
	USA	4	3.22 (k)	(k) Limiting onsite contamination and occupational exposure, <b>within the regulatory limits</b> ; OR <b>in accordance with requirements established or approved by the regulatory body</b> ;	Clarity & Completeness: Add the statement to reiterate the regulatory limits.	X			
	FIN	2	3.24 p. 16	"The decommissioning plan should be reviewed and updated at each phase <i>and periodically</i> in the lifetime of the facility. Requirements on decommissioning are established in GSR Part 6,..."	Harmonization with GSR Part 6, Req. 10, para 7.6 "For existing facilities where there is no initial decommissioning plan, a suitable plan for decommissioning shall be prepared by the licensee as soon as possible	X			

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					and the plan shall be <i>periodically</i> reviewed and updated.”				
	FIN	3	3.24 p. 15	facility <sup>6</sup>	Typo	X			
Edit	GER3	13	3.24	2 <sup>nd</sup> sentence: “... disposal of radioactive waste after permanent <del>shutdown</del> <del>shut down</del> of the facility <sup>6</sup> .”	Editorial. Arrange footnote as superscript number.	X			
	JAP WAS	8	3.24 Footnote 6 (p.15)	Delete footnote <sup>6</sup> .	Duplication Footnote on the term “permanent shutdown” has already attached in footnote <sup>4</sup> .		Footnote 4 deleted	X	See Korea comment 1
	KOR	2	3.24	The decommissioning plan should consider possible long term storage and disposal of radioactive waste after permanent shut down of the facility <sup>6</sup> .	To clarify the number “6” represents the footnote number	X			
	USA add	5	3.24/3	“...facility <sup>6</sup> ...”	“6” needs to be a superscript to denote a footnote.	X			
	EC	3	3.25	Suggested to move to Requirement 20 on pages 40 and 50	Applicable to decommissioning plans of reactors.	X	P 50		Req 20 is cited on p 50 only
Edit	GER3	15	3.25	1 <sup>st</sup> sentence: “For <u>nuclear power plants and research</u> reactors, decommissioning plans need to consider that spent fuel and high level waste may be present, the need to avoid high doses to the workers and to minimize the generation of radioactive waste during decommissioning options ...”	Wording.	X			
Clar	ENISS	4	3.27	The operating organization should carry out pre-operational tests and commissioning tests to demonstrate compliance of the radioactive waste management facility and its activities with the requirements of the safety case and supporting safety assessment and with the	Unknown terminology	X	See Germany comment 16		

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				safety requirements established by the regulatory body. A report summarizing the results of such these pre-operational and commissioning tests ( <del>inactive commissioning</del> ) should be prepared and submitted to the regulatory body for review and acceptance.					
Clar	GER2	16	3.27	2 <sup>nd</sup> sentence: "A report summarizing the results of <del>such these</del> <u>the</u> pre-operational and commissioning tests <u>before the introduction of radioactive material (i.e. inactive commissioning or 'cold processing')</u> should be prepared and submitted to the regulatory body for review and acceptance."	Amendment to clarify the meaning of the term 'inactive commissioning' because it is not defined in the IAEA Safety Glossary (2007 Edition). As an alternative to the terms 'inactive commissioning' and 'active commissioning', also the designations 'cold processing' and 'hot processing' have become established in the industry.	X			
	KOR	3	3.30	The operating organization should develop and maintain a records system on the generation, processing, storage and transfer of radioactive waste (e.g., for further processing, storage, or disposal), which should include among others the radioactive inventory, location and characteristics of the radioactive waste, information on ownership, origin and transfer location ( <del>Safety Guide GS-G-3-3, The Management System for the Processing, Handling and Storage of Radioactive Waste</del> ) [24]. [...]	It is not needed to give the title and document ID for the report which has been already fully listed in REFERENCES.	X			
Edit	GER3	17	3.33	1 <sup>st</sup> sentence: "... (GS-R-2, GS-G-2.1, GSG-2) ..."	Editorial (missing hyphen).	X			
	JAP WAS	9	3.35/4	(GSR- <del>Part</del> 2, GS-G-2.1, GSG-2)	Editorial			X	See Germany comment 17
	EC	4	4.03	... all the requirements for nuclear safety, radiation protection, radioactive waste manage-	Nuclear safety should also be taken into account	X			

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				ment, and nuclear security should be taken into account.					
	JAP WAS	10	4.04/ last text	...as described in <del>Chapter</del> <a href="#">Section 2</a> .	Editorial	X			
	USA add	6	4.05/4	"...criteria."	Extra space between criteria and the period.	X			
	EC	5	4.06	Rephrase the last sentence, e.g. "All secondary waste should be taken into consideration in the predisposal management at a facility and or facilities at a multi-facility site."	The current text could be interpreted that specific requirements and authorization for secondary waste are proposed in the Guide.	X	"This also applies to secondary wastes produced in the facility."		Clarity
Clar	GER2	18	4.07	"... however, in the case that a disposal option has not been identified at a certain stage, reasonable assumptions should be made about the likely disposal options, <a href="#">including likely waste acceptance criteria</a> , and these should be set down clearly."	Clarification.	X			
Clar	GER2	19	4.09	3 <sup>rd</sup> to 6 <sup>th</sup> sentence: "In this case, proper determination and documentation of the characteristics of waste form and waste <del>container package</del> should be ensured <a href="#">to provide data for future decisions</a> . Independent of this, all radioactive waste arisings are required to be managed. This requires decisions on waste forms to be produced <a href="#">and waste containers to be used</a> . <del>Such decisions should which, in this situation, must</del> be made before all radioactive waste management activities are finally established."	Clarification and completeness. The waste form and the waste container constitute the waste package.	X			
	RUS	4	4.09	<i>In this case, proper determination and documentation of the characteristics of waste form, waste package and/or waste container should</i>	Proper determination and documentation of the characteristics of waste should be	X			See Germany comment 19

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				<i>be ensured.</i>	ensured <b>in any case</b> , not only if disposal facilities are not yet available				
	JAP WAS	4	4.10/4	The interdependences between the <del>waste generator</del> <u>nuclear reactor</u> , the <u>predisposal radioactive waste management facility</u> and the (existing or anticipated) disposal facility should also be defined	The attribute of waste generator is different from latter 2 facilities. The definition of “radioactive waste management” covers “disposal”.	X			
Clar	GER2	20	4.14 (f)	“Preservation and quality of records and of information (e.g. details of radioactive waste inventories, facility siting, design, <u>commissioning</u> , operation, <u>decommissioning</u> , and safety case development); and”	Completeness with regard to the phases in the facility’s lifetime requiring preservation of records and information.	X			
	ENISS	5	4.16 after Identified as 3.34 P.19	Delete	The recommendation is always true: in the design of waste management facility, consideration should always be given to the incorporation of measures that will ease operation, maintenance of equipment and eventual decommissioning of the facility	X			
Edit	GER3	21	4.16 after	Note: Wrong numbering of a single paragraph (3.34 instead of 4.17).	Editorial. Renumbering of subsequent paragraphs in Section 4 is required.	X			
	KOR	4	4.16 after (3.34)	<i>It is recommended to correct the errors in numbering Para. 3.34 which is just next to Para. 4.16.</i>	To check and correct the paragraph numbering errors	X			
	GER1	22	4.18	1 <sup>st</sup> sentence: “Consideration should be given to the possible need to relocate radioactive waste if problems	The retrieval or recovery of radioactive waste after its emplacement in a disposal	X			

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				arise after it has been placed in long term storage <del>or disposal</del> (e.g. threats to the integrity of containers or problems associated with criticality or decay heat)."	facility is out of the scope of this Safety Guide (compare with the equivalent Para 4.19 of DS447, version September 2014).				
Edit	GER3	23	4.19	1 <sup>st</sup> sentence: "... other natural or human induced hazards are minimized (e.g., principle of redundancy)."	Editorial (missing bracket).	X			
Clar	GER2	24	5.02	1 <sup>st</sup> bullet: "Description of the design and operation of radioactive waste management structures, systems and components (SSCs) (waste generation and control, waste <a href="#">pretreatment</a> , treatment and conditioning, storage)"	Pretreatment is part of processing of waste. According to the IAEA Safety Glossary (2007 Edition), the term 'pretreatment' includes e.g. 'collection', 'segregation', 'chemical adjustment' and 'decontamination'.	X			
	JAP WAS	5	5.07/4	Such uncertainties should be a focus of an examination of the interdependences by the regulator between the boundaries of interlinking safety cases <a href="#">for the predisposal radioactive waste management facility and the nuclear reactor</a> .	Clarification	X			
Clar	GER2	26	6.04	2 <sup>nd</sup> sentence: "This implies that <a href="#">each waste package, i.e.</a> the final waste form and <a href="#">the waste package container</a> , have to comply with the waste acceptance requirements of the disposal facility as well as the operational safety requirements of the storage facility."	The waste form and the waste container constitute the waste package.	X			
Clar	GER2	27	6.04	Last sentence: "In situations where acceptance <a href="#">criteria requirements</a> for disposal are not yet available, waste acceptance criteria should be based on reasonable assumptions for the anticipated	Given that disposal is the final step in the management of radioactive waste, the waste packages must comply with the waste acceptance require-	X			

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				disposal option.”	ments of the disposal facility. Waste acceptance requirements result in particular from the safety case and are to be authorized by the competent regulatory body. If a selected or anticipated disposal option is available, but the performance of the safety case is still missing or pending and, thus, waste acceptance requirements are not available or not finalized, the term ‘waste acceptance criteria’ should be used.				
Edit	GER3	25	6.04	1 <sup>st</sup> sentence: “The ultimate goal of predisposal management of radioactive waste that is not cleared, discharged, <u>recycled</u> or reused is to make the waste suitable for disposal (or for storage if no disposal facility is available).”	For completeness.	X			
Clar	GER2	28	6.05	2 <sup>nd</sup> sentence: “Requirements and guidance on transport of radioactive waste can be found in SSR-6 [10] and <del>TS-G-1.1</del> <u>SSG-26</u> [32].”	In the meantime, TS-G-1.1 has been superseded and replaced by SSG-26.	X			
Clar	GER2	29	6.07 (b)	“The selection of design options, <del>process and materials selection</del> , construction methods, commissioning, and operational procedures that facilitate waste minimization throughout the facility’s entire lifecycle, including its <del>final</del> decommissioning;”	1. The selection of processes and materials is already mentioned in bullet (a). 2. Editorial.	X			
	JAP WAS	11	6.07(b)/3	...throughout the <del>facility</del> facility’s entire lifecycle,...	Editorial	X			



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	USA add	7	6.15/5	Need to indent (c)		X			
	KOR	5	6.15	<i>It is recommended to delete Item (c) Spent ion exchange resin in Para. 6.15 and add it as a new item under Para. 6.16.</i>	Spent ion exchange resins are generally classified as "solid waste", though they are usually flushed with water and transferred to the spent resin storage tank as slurry. In addition, there is no actual difference in managing spent resins at power reactors and research reactors.	X			
	KOR	6	6.15 and Footnote 7	<i>Footnote No. 7 should be also modified as follows:</i>  Although ion exchange resins are in fact solids, they are managed along with the carrier liquid <del>as liquid waste</del> in most applications. Resins are eventually separated from the carrier liquid during treatment and conditioning.	To keep consistency with Para. 6.13 where the spent resin was exemplified as a solid radioactive waste	X			
	KOR	7	6.18	[...] Criticality risk <del>(SSG-27)</del> [21];	It is not needed to give the document ID for the report which has been already fully listed in REFERENCES.	X			
Clar	GER2	30	6.21	2 <sup>nd</sup> sentence: "The features adopted for waste characterization and process control should provide confidence in the quality of the characterization data that the envisaged <del>that the</del> properties of waste packages (i.e. the fulfillment of waste acceptance criteria) will be ensured."	Clarification.	X			
	GER1	31	6.26	Include new last sentence: "... for separate treatment. <u>If liquid radioactive</u>	In case of a chemical non-compatibility between the	X			

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				<a href="#">waste is immobilized or solidified in a suitable matrix, the chemical compatibility between the liquid waste and the immobilization/matrix material should be ensured.</a>	liquid waste and the immobilization/matrix material, no stable waste forms may be produced.				
	EC	7	6.29 and 6.40	Resolve the repetition between these two paragraphs	Clarity of the text	X	6.29 1st sentence moved to 6.40; remaining text deleted		
Edit	GER3	32	6.31	Last sentence: "Appendix 6 provides an illustrative example of a radioactive waste management system of a pressurized water <del>nuclear power</del> reactor (full flow condensate polishing)."	Editorial.	X			
	EC	6	6.32	Rephrase "and may also be, in some cases, the most economical option."	The viability of this option depends on many more factors than the dose reduction and the economics. The mention to a hypothetical economic efficiency might not be neutral.	X	Sentence deleted		
	RUS	5	6.34	Pretreatment <del>includes</del> operations such as waste collection, segregation, chemical adjustment and decontamination <del>and is may result in performed to reduce a reduction in</del> the amount of waste needing further treatment and conditioning, storage and disposal. <del>Actions can be performed</del> to adjust the characteristics of the waste, to make <del>waste it</del> more amenable to further processing, and to reduce or eliminate certain hazards posed by the waste owing to its radiological, physical and chemical properties.	The objectives of pretreatment should be identified more clearly.	X			
Edit	GER3	33	6.35	Last sentence: "In the segregation of waste, it should also be taken into account whether regulatory control	Ensuring consistency with Paras 3.22 (o) and 6.87 (d) which use the term 'decay storage'.	X			

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				can be removed from the waste or whether it can be recycled or released, either directly or after allowing for a decay <u>storage</u> period.”					
	RUS	6	6.36 Add new para after	<u>Spent sealed sources should be segregated from other waste.</u>	Spent sealed sources should be segregated from other waste.	X			
	RUS	7	6.36 Add new para after	<u>Liquid waste should be segregated taking into account the following waste properties:</u> <ul style="list-style-type: none"> <li>• <u>radionuclide half-life (e.g. very short lived and not very short lived);</u></li> <li>• <u>specific activity;</u></li> <li>• <u>composition (e.g. organic and aqueous, low and high salt-containing aqueous);</u></li> <li>• <u>phase status (e.g. ion exchange resins, sludge).</u></li> </ul>	Principles of liquid waste segregation should be identified.	X			
	USA add	8	6.40/2	Waste streams that are mixed should be compatible...	Mixed waste streams could be confused with mixed waste (which is described in paragraph 1.7). Mixed waste in the U.S. is defined as waste that is both regulated as hazardous and radioactive.	X			
	RUS	8	6.43	A great number of processes are available <i>for producing acceptable waste packages.</i>	Treatment objective is not to produce <i>waste package</i> and usually not result in <i>producing waste packages</i> but waste form (according IAEA Radioactive waste management glossary (2003 Edition)).	X			
Clar	JAP WAS	6	6.44/1	<del>Incineration</del> Thermal treatment of combustible solid waste ...	The term “incineration” is more appropriate.	X			
	RUS	9	6.44	<del>Thermal treatment is also an advantageous technique for treating radioactive organic</del>	This section devotes to solid waste treatment.	X	Deleted		Included in para 6.54

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				<del>liquids because the products of complete combustion are ash, carbon dioxide and water.</del> Or should be removed to "liquid" part.					
	RUS	10	6.48	For non-combustible and non-compressible solid waste, for which delay and decay or decontamination is not a viable option, direct conditioning without prior treatment should be considered. Melting metal scrap, with resultant homogenization of the radioactive material and its accumulation in the slag, may be considered as a means of achieving authorized reuse or removal of regulatory control.	It is better to indent a new line (or point) to identify new provision.	X			
Clar	KOR	8	6.49	[...] If the waste contains fissile material, the potential for criticality should be evaluated and eliminated to the extent practicable by means of design features and administrative safety measures <del>(SSG-27)</del> [21]. [...]	It is not needed to give the document ID for the report which has been already fully listed in REFERENCES.	X			
Clar	ENISS	6	6.50	Spent ion exchange resins <del>may be</del> flushed out as slurry and subsequently managed as liquid waste until the resin can be separated from the carrier liquid, although some operators retain the resins as a dry solid.	Need further discussion	X			See Korea Comment 9
Clar	KOR	9	6.50	Spent ion exchange resins are usually flushed out as slurry <del>and subsequently managed as liquid waste until the resin can be separated from the carrier liquid</del> , although some operators retain the resins as a dry solid. [...]	Spent ion exchange resins are generally classified as "solid waste", though they are usually flushed with water and transferred to the spent resin storage tank as slurry.	X			See ENISS Comment 6
Clar	RUS	11	6.53	For routine discharges of liquids to the environment, the main types of <del>control</del> options <del>include are to provide</del> either storage <del>of liquids facilities</del> , so that short lived radionuclides can	This provision should be formulated more clearly.	X			

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				decay before release, or <u>their</u> treatment <del>facilities to</del> <del>that</del> remove radionuclides from the effluent stream for disposal by other means.					
	ENISS	7	6.54 P.37	In last sentence, add The treatment steps of organic liquid waste that should be considered <u>are</u> : incineration, emulsification...		X	See Germany comment 34		
Edit	GER3	34	6.54	Last sentence: “The treatment steps of organic liquid waste that should be considered <u>include</u> incineration, emulsification to facilitate encapsulation into cement, absorption into matrix, distillation and wet oxidation.”	Editorial (missing word).	X			
Edit	USA	5	6.58	<u>..., and implementation of the provisions of over pack, as necessary.</u>	edits	X			
Clar	GER2	35	6.64	1 <sup>st</sup> sentence: “The waste <u>form</u> and its container should be compatible.”	The waste form and its container constitute the waste package. According to the IAEA Safety Glossary (2007 Edition), the term ‘waste form’ means waste in its physical and chemical form after treatment and/or conditioning, resulting in a solid product prior to packaging.	X			
Edit	GER3	36	6.65 (d)	“Meeting <u>waste</u> acceptance requirements of the disposal facility.”	Wording.	X			
Clar	GER2	37	6.67	2 <sup>nd</sup> sentence: “Provisions <u>should</u> <del>has to</del> be made for the regular monitoring, inspection and maintenance of the waste and of the storage facility to ensure their continued integrity.”	In an IAEA Safety Guide, usually recommendations (or “should” statements) are provided.	X			
Clar	USA	6	6.67	At the end of Para 6.67 add:	Completeness	X			

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				<i>“Means should also be provided for maintaining performance parameters of such facilities within acceptable operational and regulatory limits.”</i>					
Edit	RUS	12	6.69	<a href="#">Design of SS</a> storage facilities and waste packages should take account of the waste form (i.e. solid, liquid or gas), radionuclide content and half-lives, activity concentrations, the total radioactive inventory, non-radiological characteristics and the expected duration of storage.	Editorial modification	X			
Clar	GER2	38	6.73	1 <sup>st</sup> sentence: “Radioactive waste should be stored in a segregated manner such that it can be retrieved for further treatment, <a href="#">conditioning</a> , transfer to another storage facility or disposal.”	Conditioning is part of processing of radioactive waste.	X			
Clar	EC	8	6.74	... will depend on the number of waste packages, the anticipated duration of storage of the waste, the future steps of management, and the hazard associated with it	The future steps on waste management will certainly affect the labelling.	X			See ENISS comment 8
Clar	ENISS	8	6.74	A tracking system for waste packages should be developed and implemented. The system should provide for the identification of waste packages and their locations and an inventory of waste stored. The sophistication of the waste tracking system required (e.g. including labelling and bar coding) will be defined on the basis of overall national obligation and of final disposal needs <del>depend on the number of waste packages, the anticipated duration of storage of the waste and the hazard associated with it.</del>	It id difficult to imagine to have many tracking systems on a single State. Depending on hazards associated with a specific waste some parts of the associated modules may not be filled.	X			
Clar	KOR	10	6.74	<i>It is recommended to address some IAEA documents in REFERENCES relating to the tracking system for waste packages such as TECDOC-</i>	To provide readers with relevant information available in the IAEA’s previous technical	X	Ref. added to 6.70		SSs typically do not make reference to TECDOCs since they are

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				<i>1222 (2001), Waste inventory record keeping systems (WIRKS) for the management and disposal of radioactive waste.</i>	documents				revised more frequently than SSs
Clar	EC	9	6.76	Consider adding that the overpack could also be a solution to comply with transport requirements.	There will be transport requirements that need also to be satisfied by the waste packages.	X			
Clar	GER1	39	6.79 after	At the end of subsection "Radioactive waste acceptance criteria", please add a new paragraph with the following text: <u>"The operator should put contingency measures in place for the event waste packages whose characteristics do not comply with the acceptance criteria are received. Such measures may include, after placing the waste package into a safe and secure quarantine area, the return of the waste package to the facility that generated the waste or sending it to an alternative processing facility."</u>	On the one hand, it is important for waste processing facilities to have waste acceptance criteria. On the other hand, the facilities should also have contingency measures in place to deal with any waste packages that do not comply with those criteria (compare with the equivalent Para 6.76 of DS447, version September 2014).	X			
Edit	RUS	13	6.79 after	<u>FACILITY</u> LIFETIME SAFETY CONSIDERATIONS	Editorial modification	X			
	ENISS	9	6.80	Criteria for siting and methods that could be used in a graded approach in the siting of nuclear installations are dealt with in NS-R-3 [34], SSG-9 [35], SSG-18 [36], SSG-21 [37], and DS433 (in preparation) [38]. Criteria for designing nuclear power plants, research reactors and spent fuel storage facilities are dealt with in SSR-2/1 [39] and NS-G-4.6 [40] <u>and SSG-15</u> respectively.	Also SSG-15 contains siting criteria.	X			
Clar	GER2	40	6.80	2 <sup>nd</sup> sentence: <del>"Criteria for</del> <u>Requirements and recommendations on the</u> designing of nuclear power plants and research reactors are dealt with in SSR-2/1	1. Wrong reference is cited in this paragraph. 2. For the sake of completeness, the counterpart to the	X			

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				<p>[39], <a href="#">NS-R-4 [45]</a>, and NS-G-4.6 [<del>40</del>46], respectively.”</p> <p>Please add the Safety Standards NS-R-4 and NS-G-4.6 to the list of references:</p> <p>“<a href="#">[45] INTERNATIONAL ATOMIC ENERGY AGENCY, Safety of Research Reactors, IAEA Safety Standards Series No. NS-R-4, IAEA, Vienna (2005). Currently under revision (DS476)</a>”</p> <p>“<a href="#">[46] INTERNATIONAL ATOMIC ENERGY AGENCY, Radiation Protection and Radioactive Waste Management in the Design and Operation of Research Reactors, IAEA Safety Standards Series No. NS-G-4.6, IAEA, Vienna (2008).</a>”</p>	Safety Requirements SSR-2/1 for research reactors (NS-R-4) should be referred to as well.				
	EC	10	6.81	Redraft to consider that waste storage facilities can also be away from reactor (i.e. a centralized waste storage)	Accuracy of the text	X	“While waste processing and storage facilities may be located away from the reactor (e.g., centralized waste management facility), they should be...”		
Edit	GER3	41	6.84 (c)	“Minimization of air spaces near neutron sources to reduce the production of <del>41A</del> <a href="#">Ar-41 by thermal neutron activation.</a> ”	Wording/Editorial.	X			
	EC	11	6.86	... gaseous radioactive waste and gaseous effluents should include...	Consistency with 8.87 on liquid radioactive waste and liquid effluents	X			
	USA add	9	6.86/2	Line should not be indented.		X			
	GER1	42	6.87 (e)	Please include new bullet after (e): “ <a href="#">Provisions for segregating liquid waste by type (aqueous, organic);</a> ”	Consistency with the guidance provided in Paras 6.26 and 6.40. The new bullet is the counterpart to 6.88 (a) which	X			



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					refers to the segregation of solid waste by type.				
	JAP WAS	12	6.87(i)	(g) Provisions for filtration in liquid waste collection lines to prevent the release of solids; (h) ..... <del>(i) Provisions for filtration in liquid waste collection lines to prevent the release of solids.</del>	Duplication	X			
	USA add	10	6.87 (j)	Add: (j) Provisions to avoid combining liquid waste that would result in a mixed waste or an undesirable chemical reaction (e.g. hydrogen generation).	Mixed waste is only described in 1.7 and there is no other mention of it.	X			
	USA add	11	6.88	Add: (h) Provisions to avoid combining waste types that would result in a mixed waste.		X			
Clar	GER2	43	6.91	1 <sup>st</sup> sentence: "For the conditioning of waste, all relevant characteristics of the waste form <del>should</del> <del>need</del> <del>to</del> be considered and provided for in the design of the waste package."	In an IAEA Safety Guide, usually recommendations (or "should" statements) are provided.	X			
Clar	USA	7	6.92/Line 11	Add: <del>Storage facilities for liquid HLW should be provided with off-gas systems that employ appropriate filtration systems to control the release of airborne effluents , within the regulatory limits</del>	Completeness, added emphasis on control and compliance with regulatory limits.	X			
Clar	GER2	44	6.93	2 <sup>nd</sup> sentence: <del>"Criteria for Requirements and recommendations on the</del> commissioning of nuclear power plants are dealt with in SSR-2/2 [41] <del>and SSG-28 [47], whereas requirements and recommendations on the commissioning of research reactors are provided in NS-R-4 [45] and NS-G-</del>	Clarification and completion.	X			

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				<p><a href="#">4.1 [48].</a></p> <p>Please add the Safety Standards SSG-28 and NS-G-4.1 to the list of references:</p> <p><a href="#">“[47] INTERNATIONAL ATOMIC ENERGY AGENCY, Commissioning for Nuclear Power Plants, IAEA Safety Standards Series No. SSG-28, IAEA, Vienna (2014).”</a></p> <p><a href="#">“[48] INTERNATIONAL ATOMIC ENERGY AGENCY, Commissioning of Research Reactors, IAEA Safety Standards Series No. NS-G-4.1, IAEA, Vienna (2006).”</a></p>					
Edit	GER3	45	6.94	<p>Last sentence: “However, a change in module design may require some of the commissioning steps to be repeated for the new design <a href="#">[8]</a>.”</p>	<p>Please include a reference to the Safety Guide SSG-15 “Storage of Spent Nuclear Fuel” which provides further guidance on modular storage systems (compare with the equivalent Para 6.90 of DS447, version September 2014).</p>	X			
Edit	GER3	46	6.102	<p>Note: Numbering of bullets (e) – (i) should be changed to (a) – (e).</p>	<p>Wrong numbering of bullets in this paragraph.</p>	X			
Edit	GER3	47	6.105	<p>Last sentence: “... resources necessary for an emergency response are available and in working order when needed- (GS-R-2, GSG-2.1) <a href="#">[25, 44 42]</a>.”</p>	<p>Wrong reference is cited in this paragraph.</p>	X			
	KOR	11	6.105	<p><i>It is recommended to replace the Sub-section title “Emergency preparedness” with “Emergency preparedness and response (arrangements)”.</i></p>	<p>To reflect Para. 6.105 deals with both Emergency Preparedness and Emergency Response Arrangements;</p>	X			

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					To keep consistency with the structure of DS447				
	EC	12	App. 2 Page 53 g)	Processing radioactive waste compatible with waste acceptance criteria and transport requirements to ensure safe storage and disposal, and safe transport;		X			
	USA add	12	App. 4	Change "Solidification Process" box to "Solidification/Dewatering Process."	In the U.S., most spent resin is dewatered; not solidified. Resins are dewatered in the waste package (e.g. carbon steel liner or high integrity container)	X			
Edit	GER3	48	Ref. [24]	"... The Management System for the Processing, Handling and Storage of Radioactive Waste, IAEA Safety Standards Series No. GS-G-3.3, IAEA, Vienna (2008). <a href="#">Currently under revision (DS477)</a> "	Amendment for completion.	X			
Edit	KOR	12	Ref. [24]	[24] INTERNATIONAL ATOMIC ENERGY AGENCY, The Management System for the Processing, Handling and Storage of Radioactive Waste, IAEA Safety Standards Series No. GS-G-3.3, IAEA, Vienna (2008). <a href="#">Currently under revision (DS477)</a>	To take into account GS-G-3.3 is now under revision process as DS477 "The Management System for the Predisposal and Disposal of Radioactive Waste"	X			
Edit	GER3	49	Ref. [29]	"... Format and Content of the Safety Analysis Report for Nuclear Power Plants, <a href="#">Safety Guide</a> , Safety Standards Series No. GS-G-4.1, IAEA, Vienna (2004)."	Uniform citation of publications issued in the IAEA Safety Standards Series.	X			
Edit	GER3	50	Ref. [30]	"... Periodic Safety Review for Nuclear Power Plants, IAEA Safety <a href="#">Standards</a> Series No. SSG-25, IAEA, Vienna (2013)."	Editorial.	X			
Edit	GER2	51	Ref. [32]	"... Advisory Material for the IAEA Regulations for the Safe Transport of Radioactive Material ( <a href="#">2012 Edition</a> ), IAEA Safety Standards Series	The Safety Guide SSG-26 has been published in June 2014. It supersedes and replaces TS-G-	X			

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				No. <del>SSG-26, FS-G-1.1 (Rev. 1)</del> , IAEA, <a href="#">Vienna (2014)</a> . <del>(2008). Currently under revision (DS425)</del> "	1.1.				
Edit	JAP NUS	2	Ref. [34]	INTERNATIONAL ATOMIC ENERGY AGENCY, Site Evaluation for Nuclear Installations, IAEA Safety Standards Series No. NS-R-3, Vienna (2003). Currently under revision (DS462 <u>and DS484</u> )	Update the latest information.	X			
Edit	GER3	52	Ref. [39]	"... Safety of Nuclear Power Plants: Design, <del>Specific Safety Requirements</del> , IAEA Safety Standards Series No. SSR-2/1, IAEA, Vienna (2012). <a href="#">Currently under revision (DS462)</a> "	1. Uniform citation of publications issued in the IAEA Safety Standards Series; 2. Amendment for completion.	X			
Edit	JAP NUS	3	Ref. [39]	INTERNATIONAL ATOMIC ENERGY AGENCY, Safety of Nuclear Power Plants: Design Specific Safety Requirements, IAEA Safety Standards Series No. SSR-2/1, IAEA, Vienna (2012). <del>Currently under revision (DS462)</del> .	Update the latest information.	X			
Edit	GER3	53	Ref. [41]	"... Safety of Nuclear Power Plants: Commissioning and Operation, IAEA Safety Standards Series No. SSR-2/2, IAEA, Vienna (2011). <a href="#">Currently under revision (DS462)</a> "	Amendment for completion.	X			
Edit	JAP NUS	4	Ref. [41]	INTERNATIONAL ATOMIC ENERGY AGENCY, Safety of Nuclear Power Plants: Commissioning and Operation, IAEA Safety Standards Series No. SSR-2/2, IAEA, Vienna (2011). <del>Currently under revision (DS462)</del> .	Update the latest information.	X			