Master Resolution Table

DS518B Safety of Nuclear Fuel Cycle Research and Development Activities (Revision of SSG-43)– Step 9

COMMENTS BY REVIEWER Reviewer: All Country/Organization: All				Date: 2 November 2022	RESOLUTION			
No.	Country	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	GER1	1.2	This Safety Guide provides specific recommendations on the safety of nuclear fuel cycle research and development (further in text: nuclear fuel cycle R&D) facilities.	In the current text the following abbreviations are used: 1) R&D facility 2) nuclear fuel cycle R&D facility 3) Nuclear Fuel Cycle Research and Development Facilities (as in para. 4.8). We would like to ask you kindly to decide which abbreviation is appropriate, introduce it and use the same abbreviation all over the text.	X			
2.	GER2	1.3	Nuclear fuel cycle R&D facilities can receive, handle, process and store various nuclear and radioactive materials including uranium, other actinides ~~and~~ or fission products, ~~and~~ or activated materials in multiple physical forms such as powders, liquids and gases.	An overall coverage of activities cannot be assumed.		X Nuclear fuel cycle R&D facilities may receive, handle, process and store various nuclear and radioactive materials including		Used 'may' instead of 'can' as proposed

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						uranium, other actinides, fission products, or activated materials in multiple physical forms such as powders, liquids and gases.		
3.	GER3	1.6	This Safety Guide supersedes IAEA Safety Standards Series No. 43, Safety of Nuclear Fuel Cycle Research and Development Facilities. The terms used in this Safety Guide are to be understood as defined and explained in the IAEA Nuclear Safety and Security Glossary and in chapter "Definitions" in SSR-4.	Please add that terms are according to IAEA Glossary and Definitions from SSR-4.			X	Relevant statement regarding the terms used is included in all IAEA Safety Standards.
4.	GER4	1.7	The objective of this Safety Guide is to provide recommendations on safety in the siting, design, construction, commissioning, operation, and preparation for decommissioning of nuclear fuel cycle R&D facilities to meet the relevant requirements	We think it is useful to install connection with the Safety Guide "Safety of Nuclear Fuel Reprocessing Facilities"			X	There are other several safety guides related to NFCFs including fuel fabrication, enrichment, reprocessing facilities, it is not appropriate to list only DS518A or all of

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			established in SSR-4 [1]. Specific recommendations on the safety of nuclear fuel reprocessing facilities are provided in Safety Guide DS518A.					the other ones here.
5.	GER5	2.1	In nuclear fuel cycle R&D facilities, fissionable material and other radioactive materials are present in different forms with diverse physical and chemical characteristics. The main hazards are potential nuclear criticality, loss of confinement, radiation exposure (both internal exposure and external exposure), fire, floods, chemical~~, floods~~ and explosive hazards.	Clarification	X			
6.	PAK1	2.2 (C)	(c) Nuclear criticality safety monitoring systems and reactivity control systems	In bullet (c) Text may also include **Reactivity Control systems** to ensure prevention of criticality		X (c) Criticality safety systems;		Reactivity control systems are not common in Nuclear Fuel Cycle R&D facilities.
7.	US4	Section 2. Item 2.3 (d), page 8	Item 2.3 (d) needs to be revised. The use of the word "critical" in this context is unclear. The text could be interpreted in more than one way: ▪ Example 1: The text may suggest that uranium hexafluoride cannot become critical, which is	The use of the word "critical" in this context is unclear. The text could be interpreted in more than one way.	X			

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			categorically false. If so, we suggest revising the information in this item as follows: *"The chemical toxicity of material used in nuclear fuel cycle R&D facilities has to be considered (e.g., uranium hexafluoride, which if released, could react with ambient moisture to form uranium hexafluoride and uranyl fluoride~~, which in turn, unlike uranium hexafluoride, can become critical~~). Therefore, the safety analysis of such an R&D facility should also address impacts resulting from these chemicals and their potential mixing (e.g., in liquid effluent streams)."* ▪ Example 2: The use of the word "critical" may suggest that an accumulation of uranyl fluoride, as a result of a UF_6 release, "…can result in severe health impacts."					
8.	GER6	3.3 Line 11	… Communications regarding safety and security should ensure that	Clarification, as wording "this includes" is not clear			X	The intent is to express the need for

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			confidentiality of information is maintained. ~~This includes~~ Concerning the system of nuclear material accounting and control, ~~for which~~ its information security should be coordinated in a manner ensuring that subcriticality is not compromised.					confidentiality including nuclear material accounting.
9.	US5	Section 3, Item 3.5, page 9	Consider revising the second sentence of item 3.5 as follows: "This should also include all aspects of ~~criticality~~ safety (radiological, criticality, chemical, etc.)."	The discussion focuses on criticality only. Safety culture involves all technical areas important to safety, as well as protection of people and the environment and not just criticality.		X This should address all aspects of safety (including radiological safety, criticality safety and chemical safety).		Clarity
10.	GER7	3.9 Line 7	… The management system should include ~~arrangements for empowering relevant personnel to stop~~ clearly defined and documented responsibilities besides productive circles, to allow for stop of unsafe operations at the reprocessing facility once identified.	Call for responsibility			X	Responsibilities are addressed in other paras, proposed revision changes the intent of the original text. Consistently with other Guides, the focus of the text is arrangements and authorities to stop unsafe

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								operation.
11.	GER8	3.13	Requirement 58 of SSR-4 [1] states that "The operating organization shall ensure that all activities that may affect safety are performed by suitably qualified and competent persons." In accordance with paras 9.398–9.47 of SSR-4 [1], the operating organization is required to ensure that these personnel receive training and refresher training at suitable intervals, appropriate to their level of responsibility. In particular, personnel involved in activities with fissile material (both uranium and plutonium), radioactive material including waste and with chemicals should understand the nature of the hazard posed by these materials and how the risks are controlled by the established safety measures, operational limits and conditions, and operating procedures. Certain operating positions may require formal authorization or a licence.	Please include also, that, according to SSR-4 para 9.38, certain operating positions may require formal authorization or a licence.		X Changed 9.39 to 9.38		Repeating the text of 9.38 is not needed as its already referenced.
12.	GER9	3.15	In accordance with para. 4.16(b) of SSR-4 [1], the operating organization is required to ensure that suppliers of items and resources important to safety	Only to conduct audits might not be enough. Requirement 11 of GSR Part 2 states that "The organization shall put in			X	The context here is resource management. Audits are specifically mentioned as their

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			have an effective management system. To meet these requirements, the operating organization should conduct audits of the management systems of the suppliers and should put in place arrangements with vendors, contractors and suppliers for specifying, monitoring and managing the supply to it of items, products and services that may influence safety.	place arrangements with vendors, contractors and suppliers for specifying, monitoring and managing the supply to it of items, products and services that may influence safety.”				conduct needs resources management.
13.	US6	Section 3, Item 3.16 – 3.22, pages 11-12	Items 3.16 through 3.22 appear to be focused on criticality safety only. If so, consider revising the titles of these sections as follows: ▪ Items 3.16 to 3.18: “PROCESS IMPLEMENTATION FOR THE MANAGEMENT SYSTEM FOR CRITICLITY SAFETY AT A NUCLEAR FUEL CYCLE R&D FACILITY ▪ Items 3.19 through 3.22: “MEASUREMENT, ASSESSMENT, EVALUATION AND IMPROVEMENT OF THE MANAGEMENT SYSTEM FOR CRITICLITY SAFETY AT A NUCLEAR FUEL CYCLE R&D FACILITY”	The revision will provide clarity on what the discussion in this section focuses on.			X	The items referred to are not only on criticality safety.

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14.	GER10	3.21	(a) An analysis of the causes of the deviation to identify ~~lessons~~ roots and to determine and implement corrective actions to prevent a recurrence; …				X	Causes (including root causes), are already addressed in the first part of the phrase. The aim here is identification of the lessons learned to determine and implement corrective actions.
15.	RUS1	3.23	In accordance with Requirement 5 of SSR-4 [1], the safety of a nuclear fuel cycle R&D facility is required to be ~~assessed~~ **verified by means of comprehensive safety assessment** ~~in the safety analysis~~ **and systematically assessed throughout the lifetime of the facility**, e.g. ~~verified~~ by periodic safety reviews.	It is following by Requirement 5 of SSR-4. Periodic safety review is one of the tools of safety verification.		X The safety of a nuclear fuel cycle R&D facility is required to be verified by means of comprehensive safety assessment and systematically assessed throughout the lifetime of the facility, for example by periodic safety reviews (see		Clarity

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						Requirement 5 of SSR-4 [1]).		
16.	RUS2	3.23	~~The operating organization should ensure that these periodic safety reviews of the facility form an integral part of the organization's management system.~~	The statement is confusing and needs to be reworded. Periodic safety review could not be an integral part of the management system (according to GSR Part 2).		X The operating organization should establish a process for periodic safety reviews as part of the management system.		Consistency with other safety guides
17.	GER11	4.2	The site evaluation process for a nuclear fuel cycle R&D facility will depend on a large number of variables. Since the earliest stage of planning of a facility, a list of potential hazards due to external events (e.g. earthquakes, accidental aircraft crashes, fires, nearby explosions, floods, extreme weather conditions) is required to be developed, the relevant hazard evaluated and the design basis for the facility carefully determined: see section 5 of SSR-4 [1]. In addition, the radiological risk posed by the facility to workers, the public and the environment in both ~~normal~~		X			

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			~~operation~~ operational states and accident conditions is required to be evaluated: see Requirement 12 of SSR-1 [15]					
18.	GER12	4.5, Line 2	[…] The application of a graded approach is expected to be especially relevant for nuclear fuel cycle R&D facilities; nevertheless, care should be taken and an adequate review and justification ~~and~~ should be made for any graded application of the requirements for site evaluation. […]	Editorial	X			
19.	GER13	4.5 (b)	The incorporation of continuous or periodic~~, ongoing~~ evaluation of ~~the site parameters for~~ natural ~~processes and~~ phenomena and human induced events that might affect the site during ~~in~~ the ~~design basis for~~ operation of the facility;	The original text was difficult to understand. To combine a continuous process such as "periodic, ongoing evaluation" with the "design basis" (which is something – more or less – fixed) seemed strange. The proposed new wording might be clearer.		X The incorporation of periodic review of all natural and human induced external hazards and site conditions in the design basis for the facility		Consistency with SSR-1 on site evaluation for nuclear installations.
20.	GER14	5.1	Requirement 7 of SSR-4 [1] states: "The design shall be such that the following main safety functions are met			X All these safety functions are		Clarity

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			for all facility states of the nuclear fuel cycle facility: (a) Confinement and cooling of radioactive material and associated harmful materials; (b) Protection against radiation exposure; (c) Maintaining subcriticality of fissile material." It is likely that all these safety functions could be applicable to Case ~~2~~ 1 nuclear fuel cycle R&D facilities ~~(see para. 1.10). This is much less likely for Case 1 facilities. For Case 1 facilities, this may be applied~~ in accordance with a grade approach. The safety measures identified in the design of a nuclear fuel cycle R&D facility should comprise those items important to safety and operational limits and conditions that, when taken as a whole, provide the main safety functions above.			likely to be applicable to Case 2 nuclear fuel cycle R&D facilities (see para. 1.10). The safety measures identified in the design of a nuclear fuel cycle R&D facility should comprise those items important to safety and operational limits and conditions that, when taken as a whole, fulfil these main safety functions..		
21.	IND1	Page 14	Graded approach	"Grade" to "graded"		X Referred		See response to GER14

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		Para 6, Line 9 Section 5.1				sentence is removed		
22.	ISR1	5.1 Line 3	It should probably be **graded** (not grade)			X Referred sentence is removed		SEE response to GER14
23.	GER15	5.2.	Requirements on the confinement of radioactive material are established in Requirement 35 and paras 6.157–6.159 of SSR-4 [1]. During ~~In normal~~ operation, internal exposure should be avoided by design, including static and dynamic barriers and adequate zoning. The need to rely on personal protective equipment is required to be minimized: see para. 3.93 of IAEA Safety Standards Series No. GSR Part 3, Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards [19].	In SSG-4 we have two related requirements: **Para. 6.120.** In normal operation, internal exposure shall be minimized by design and shall be as low as reasonably achievable. **Para. 9.100**. During operation (including maintenance interventions) the prevention of internal exposure shall be controlled by both physical and administrative measures, limiting the need for personal protective equipment as far as practicable. We think that wording "during operation" is more appropriate here.			X	Consistency with SSR-4.
24.	ISR2	5.2	It seems that the relevant cited		X			

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		Line 2	paragraphs from SSR-4 should be **6.123-6.128** and not ~~6.157-6.159~~ which belong to a different Requirement.					
25.	GER16	5.9	The specification of the design basis will depend on the potential radiological hazard associated with the facility, and will need to comply with design requirements as well as siting and other regulatory requirements. Consideration should be given to all internal hazards, ~~and~~ external hazards and combination of them, selected in the site evaluation phase and associated to the design basis of nuclear fuel cycle R&D facilities.	Please include combination of hazards as well.		X Consideration should be given to all internal hazards, external hazards and their credible combinations selected in the site evaluation phase and associated with the design basis for the facility..		Clarity
26.	IND2	Page 16/ Para 5.13/ Line 1	The ~~reprocessing~~ R&D facility should be designed to retain and detect promptly any leakage of liquids from process equipment, vessels and pipes and to recover the volume of liquid to the primary containment.	Editorial (This safety guide is for R&D facilities instead of reprocessing facilities)	X			
27.	JAP1	5.13.	The ~~reprocessing~~ nuclear fuel cycle	Typo.	X			

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			R&D facility should be designed to retain and detect promptly any leakage of liquids from process equipment, vessels and pipes and to recover the volume of liquid to the primary containment. This is particularly important for both design and operation, where the first static barrier provides other safety functions, e.g. favourable geometry for criticality avoidance or exclusion of air for flammable liquids.					
28.	GER17	5.19	Airborne contamination (from liquids or dispersible solids) is required to be prevented or the level kept as low as reasonably ~~practicable~~ achievable in all facility states: see Requirement 34 and para. 6.123 of SSR-4 [1]. The ventilation system for a nuclear fuel cycle R&D facility should include filters, in series, to protect workers, the public and the environment by filtering the air ~~during normal operation~~ so that releases are kept as low as reasonably achievable and within authorized limits in normal operation and within acceptable limits in accident conditions	According to Requirement 34 of SSR-4 releases should be kept as low as reasonably achievable and within authorized limits in normal operation and within acceptable limits in accident conditions. Should ventilation system for a nuclear fuel cycle R&D facility cope with this requirement? Please make adjustment in the text.		X Airborne contamination (from liquids or dispersible solids) is required to be prevented or the level kept as low as reasonably achievable(see paras 6.120 and 6.123 of SSR-4 [1]).		Clarity and consistency with SSR-4.

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			and to ensure the integrity of the static barriers (see also paras. 6.127 and 6.128 of SSR-4 [1]). Filters should also be used when airflow passes through confinement barriers, for example, at cooling inlets and where air exits the facility.			The ventilation system for a nuclear fuel cycle R&D facility should include filters in series, to protect workers, the public and the environment by filtering the air in all facility states, and to ensure the integrity of the static barriers (see also paras. 6.127 and 6.128 of SSR-4 [1]). Filters should also be used when airflow passes through confinement barriers, for example, at		

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						cooling inlets and where air exits the facility.		
29.	ISR3	5.23	The cited paragraphs should be **5.12-5.22** (not ~~5.21~~), and also **5.31-5.35** (not ~~5.30~~ to ~~5.34~~) and also **5.36-5.38** (not ~~5.35~~ to 5~~.37~~)			X Protection against radiation exposure relies on an appropriate combination of controls on the magnitude of the source, on the dispersion of the source (i.e. confinement — see paras 5.12–5.22) and on parameters that contribute to internal exposure (see paras 5.31–5.34) and external		Correct references.

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						exposure (see paras 5.35–5.37).		
30.	GER18	5.31	The static barriers (~~at least one is required between radioactive material and working areas~~ (in new facilities at least two static barriers should be provided, so that radioactive material is confined inside the first static barrier during normal operations) normally protect workers from internal exposure and external exposure (see Requirement 35 with paras 6.123–6.125 of SSR-4 [1]). An appropriate number of complementary static physical barriers and dynamic containment systems should be provided as determined by the safety analysis.	Please put in line with SSR-4.		X Removed the phrase "(at least one is required between radioactive material and working areas)"		This sub-section is on "protection of workers" does not need to mention the number of barriers required.
31.	IND3	Page No.19, Section 5.32; Line No.1	For fume hoods, ~~Gloveboxes and hot cells,~~ the effectiveness of confinement is determined by…	Glove-boxes and hot cells need to be removed as this sentence is talking about size of any openings and the air velocity at the face.	X			

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32.	JAP2	5.34.	Where radioactive powders or liquids are handled in the R&D facility or experiment, the installation of collection equipment (such as drip trays) should be considered to prevent the accidental spreading of radioactive material or hazardous material and to control ~~fissile geometry~~ subcritical shape and dimension.	To clarify "to control fissile geometry" .		X Where radioactive powders or liquids are handled in the nuclear fuel cycle R&D facility or experiment, the installation of collection equipment (e.g. drip trays) should be considered to prevent the accidental spreading of radioactive material or hazardous material and for geometry control.		Used term "geometry control" to be consistent with SSG-27
33.	PAK2	5.35	~~For normal operation, the need for use of respiratory protective equipment~~	Section may be deleted, same is already addressed in **section 5.2.**	X			

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			~~should be minimized through careful design of the static and dynamic containment systems.~~					
34.	UK1	5.40/Line 4 et seq.	Please replace the last two sentences with: 'Safety margins should be derived and applied in accordance with paras 2.4-2.7 of SSG-27[3]'	The guidance in SSG-27 is better developed and more complete than the last 2 sentences. It includes the option to compare with values of control parameters, whereas DS518 only includes determination of k_{eff}. This option is in the existing SSG-42 sec 4.23 and remains valid.	X			
35.	PAK3	5.43	In many nuclear fuel cycle R&D facilities in which fissile materials are handled, prevention of criticality by means of mass control is used as a deterministic safety measure that is not usually available in full scale facilities. As far as possible, the control by mass in an area should be preferable of all other parameters listed in para. ~~**5.43 b) – j)**~~ **5.44 (b - j).** A number of such areas may coexist independently in a single facility with suitable interface controls.	Incorrect reference may be deleted. Correct reference is mentioned.			X	The incorrect reference is now correct due to revision of text in previous sub-sections.
36.	UK2	5.43/Line 4	'… all other parameters listed in para. 5.44 b) – j).'	Typographical error.			X	The incorrect reference is now correct due to revision of text in previous sub-sections.
37.	GER19	5.49	In accordance with para. 6.60 of SSR-4	Please consider combination of		X		Clarity

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			[1], postulated initiating events from the list of internal hazards, ~~and~~ external hazards as well as combination of them for nuclear fuel cycle R&D facilities are required to be identified for detailed further analysis.	hazards as well.		In accordance with Requirement 19 and paras 6.1 and 6.60–6.76 of SSR-4 [1], postulated initiating events from the list of internal hazards and external hazards for a nuclear fuel cycle R&D facility, and credible combinations thereof, are required to be identified for detailed further analysis.		
38.	GER20	5.55, after the bullet list	~~Fire prevention, detection and mitigation~~	Editorial. The text doesn't belong to Para. 5.55. Is it a sub-heading? There is already a heading "Fires and Explosions" that is followed with the discussion	X			

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				of fire issues (without a separate "Fire" heading). Please clarify				
39.	GER21	5.59, after the paragraph	~~Explosions~~	Editorial. This seems to be intended as a heading, but it doesn't fit into the structure of the document: There is a already a heading "Fires and Explosions" that is followed with the discussion of fire issues (without a separate "Fire" heading). Please clarify	X			
40.	GER22	5.63 New footnote	Paragraphs 6.80–6.89 of SSR-4 [1] establish requirements to address equipment failure among the initiating events considered in the design of a nuclear fuel cycle R&D facility. Thus, an R&D facility is required to be designed to cope with the failure of equipment that would result in a degradation of confinement, shielding or criticality control or a reduction in defence in depth. As part of the design, the failure of all ~~structures, systems and components~~ SSCs important to safety is required to be assessed and consideration given (in accordance with a graded approach) to the design or procurement of items that fail to a safe state[footnote]. Where no fail-safe state can	Abbreviation SSCs is introduced already in para. 1.18. We suggest to use it continuously all over the text. As this is the first case the term "safe state" is being used in the text, we suggest to add explanation.		X structures, systems and components changed to SSCs. 'safe state' changed to 'safe configuration'		Technical precision and clarity.

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			be defined, the functionality of ~~structures, systems and components~~ SSCs important to safety is required to be maintained (e.g. by redundancy, separation, diversity and independence, as necessary). Footnote. According to SSR-4 safe state is the facility state, following an anticipated operational occurrence or accident conditions, in which the nuclear fuel cycle facility is subcritical and the main safety functions can be ensured and maintained stable for a long time.					
41.	GER23	5.69	The loss of general supplies such as gas for actuators ~~of the instrumentation and~~ for the control of the operations, water for process equipment and ventilation systems, heating, breathing air and compressed air might also have consequences for safety. Examples of suitable measures to be addressed in the design of a nuclear fuel cycle R&D facility to ensure safety include the following:	What type of gas is meant here? Process gas? Please clarify. Additionally, para. 5.103 of this Safety Guide is listing safety related instrumentation and control systems at a nuclear fuel cycle R&D facility. Do the listed systems use gas? If not, it is not rather correct to talk about instrumentation and control systems in case of loss of gas, "control of operation" might be better. Please verify.		X The loss of services such as compressed air, water for process equipment and ventilation systems, heating, and breathing air might also have consequences		Gas for actuators of instrumentation includes compressed air used for instrumentation purposes (also known as instrument air), and other gasses that can be used for the purpose.

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				Please put in line with para. 5.92 of DS518A.		for safety		
42.	GER24	5.71	Consideration should be given to processes that generate heat and ventilation systems that require cooling. A loss of cooling can challenge the main safety functions by reducing the safety margin for confinement (and for criticality where fissile material is present). A large pilot ~~plant~~ facility ~~-~~can have significant heat loads and might be shut down quickly if there is a loss of a service such as power. The provision of an alternative means of cooling should be considered for heat generating materials and pilot ~~plants~~ facilities ~~s~~ with large heat sources.	Please check the wording – pilot plant or pilot facility, in Safety Guide both versions are used: "pilot plant" in paras 2.4 and 5.71; "pilot facility" in para.5.44. We suggest to use "pitot facility" in all cases.	X	X A Case 2 facility can have significant heat loads and might need to be shut down quickly if there is a loss of a service such as power. The provision of an alternative means of cooling should be considered for heat generating materials and Case 2 facilities with large heat sources.		Clarity
43.	IND4	Page No.27;	"equipped with alarms and interlocks to prevent overfilling and also to cutoff	The sentence is suitably modified to give the intended meaning.		X Vessels		Clarification

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		Section 5.74; Line1	further supply to the tank"			containing significant quantities of fissile material in liquid form should be equipped with alarms and interlocks to prevent overfilling and subsequent overflow or spillage.		
44.	UK3	5.74/Line 1 et seq.	Please amend sentence as follows: Vessels containing significant quantities of fissile material in liquid form should be equipped with level indication and high level alarms, to prevent overfilling and subsequent overflow/spillage. The area beneath the vessels should include means to ensure that spilled fissile materials will be safely contained, for example ~~and should be provided with~~ drip trays configured to ensure criticality safety ~~and of a capacity that equals or exceeds~~	Level indication is important, when coupled with high level alarms, to prevent overfilling and subsequent spillage. This also provides clarity regarding the means and purpose of the spillage collection and that drip trays are just one method of doing this [the guide should not necessarily be recommending that a drip tray is the most appropriate option].		X Vessels containing significant quantities of fissile material in liquid form should be equipped with alarms and interlocks to prevent overfilling and subsequent		See also response to comment IND4

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			that can safely accommodate the volume of the vessel.			overflow or spillage. The area beneath the vessels should include means to ensure that spilled fissile material will be safely contained, for example with drip trays configured to ensure criticality safety and of a capacity that can safely accommodate the volume of the vessel.		
45.	GER25	5.75	Leakage of coolants where there might be physical or chemical incompatibility with the materials or equipment present should also be considered. The possibility of an unintended chemical reaction causing the precipitation of	Editorial		X Leakage of coolants where there might be physical or chemical		Clarity

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No.	Country	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			fissile material should be considered as well (see also para. 6.139(c) of SSR-4 [1]).			incompatibility with the materials or equipment present should be considered. The possibility of an unintended chemical reaction causing the precipitation of fissile material should also be considered (see also para. 6.139(c) of SSR-4 [1]).		
46.	GER26	5.82	The design of a nuclear fuel cycle R&D facility is required to take into account the nature and severity of external hazards: see Requirement 16 and paras 6.49–6.54 of SSR-4 [1]. Such external hazards, either natural or human induced, are required to be identified and evaluated in accordance with the provisions of SSR-1 [15]. Detailed	Please add SSG-79, Hazards Associated with Human Induced External Events in Site Evaluation for Nuclear Installations (Publication 2023).	X			

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			recommendations on external hazards are provided in IAEA Safety Standards Series Nos SSG-9 (Rev. 1), Seismic Hazards in Site Evaluation for Nuclear Installations [24], SSG-18, Meteorological and Hydrological Hazards in Site Evaluation for Nuclear Installations [25], SSG-21, Volcanic Hazards in Site Evaluation of Nuclear Installations [26], SSG-67, Seismic Design for Nuclear Installations [27] and SSG-68, Design of Nuclear Installations Against External Events Excluding Earthquakes [28], SSG-79, Hazards Associated with Human Induced External Events in Site Evaluation for Nuclear Installations.				
47.	GER27	5.84	In accordance with Requirement 14 and para. 6.49 of SSR-4 [1], a reprocessing facility is required to be designed to withstand the design basis earthquake. The design should also be evaluated for beyond design basis seismic events to ensure that events moderately exceeding the design basis ~~such an event~~ will not impair the function of control rooms, will not cause loss of confinement or a criticality accident,	Without a restriction on the severity of the beyond design basis event, the recommendation cannot be fulfilled. It is hard to imagine how it could be ensured that a ground motion exceeding the design basis, e.g., by a factor 5 would not impair the function I&C equipment or even confinement. The proposed change might solve this problem. If it is considered too		X 5.83. In accordance with Requirement 14 and para. 6.49 of SSR-4 [1], a nuclear fuel cycle R&D facility is required to be		Clarity and consistency with SSR-1 and SSR-4

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			and that there is adequate seismic margin to avoid cliff edge effects.	weak, the paragraph should be reformulated and based on the ideas of "sufficient safety margins" and "avoiding cliff-edge effects" or a limit for the exceedance frequency of, e.g., the ground motion of the beyond design basis seismic hazard should be given.		designed to withstand the design basis earthquake. The design should also be evaluated for beyond design basis seismic events considered as design extension conditions (see para 6.73 of SSR-4 [1]), to ensure that such an event will not impair the function of control rooms (where provided), will not cause loss of confinement or a criticality accident, and that there is an adequate		

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						seismic margin to avoid cliff edge effects.		
48.	GER28	5.87 (d)	~~Keeping the groundwater level within acceptable limits during flooding;~~ Ensuring that high groundwater levels during floods do not jeopardize the integrity and functionality of safety related structures, systems and components;	Controlling the ground water level might be difficult and is not the usual approach to this issue. Consideration of high ground water levels in the design of structures and systems seems mor appropriate.		X (d) Means of ensuring that high water levels during floods do not jeopardize the integrity and functionality of SSCs important to safety		Clarity
49.	GER29	Heading before 5.88	~~Tornadoes~~ High Winds	As windborne missiles can also arise from high linear winds (not only tornadoes), the heading should be modified to account for that.			X	Consistency with safety standards.
50.	GER30	5.90	Besides the temperatures themselves, the ~~The~~ potential duration of extreme low or high temperatures is required to be taken into account in the design: […]	Clarification. Although it is obvious, it might be good to mention that not only the duration of extreme temperatures but also the temperatures themselves need to be taken into account.		X Extreme low or high temperatures, and their potential duration are required to be taken into		Clarity

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No.	Country	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
						account in the design…		
51.	GER31	5.92	The occurrence of snowfall and ice storms and their effects are required to be taken into account in the design of the facility and the safety analysis: see paras 5.11 and 5.27 of SSR-1 [17]. Snow and ice are generally taken into account as an additional load on the roofs of buildings. Icing in outdoor switchyards may lead to short circuits and thus a loss of off-site power. […]	The paragraph correctly addresses issues related to snowfall, but the specific effects of icing are missing.	X			
52.	GER32	5.94	For extreme rainfall, attention should be focused on the stability of buildings (e.g. hydrostatic and dynamic effects), the water level and, where relevant, the potential for mudslides. Besides the results of the flooding hazard assessment according to SSG-18, ~~C~~consideration should be given to the highest flood level historically recorded […]	Although it is very important to consider historical flood levels, assessments of flooding hazards are typically based on probabilistic / statistic criteria, i.e. water levels with a specific exceedance frequency (cf. SSG-18). This fact should be reflected in this paragraph too.		X In addition to the results of the flooding hazard assessment performed in accordance with the recommendations provided in SSG-18 [26], consideration should be given to the highest flood		Clarity

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No.	Country	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
						level historically recorded…		
53.	IND5	Page 31/ Para 5.95/ Line 1	Measures for the protection of the facility against inundation events (dam burst, flash flood, storm surge, tidal wave, seiche, tsunami), including both static effects (floods) and dynamic effects (run-up and draw-down), will depend on the data collected during site evaluation for the area in which the ~~reprocessing~~ R&D facility is located.	The sentence is suitably modified to give the intended meaning.	X			
54.	JAP3	5.95.	**External hazards at a nuclear fuel cycle R&D facility** Measures for the protection of the facility against inundation events (dam burst, flash flood, storm surge, tidal wave, seiche, tsunami), including both static effects (floods) and dynamic effects (run-up and draw-down), will depend on the data collected during site evaluation for the area in which the ~~reprocessing~~ nuclear fuel cycle R&D is located.	Typo.	X			
55.	PAK4	5.95	Measure for the protection of the facility against inundation events (dam	Reprocessing facility may be deleted, it is irrelevant with this	X			

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			burst, flash flood, storm surge, tidal wave, seiche, tsunami), including both static effects (floods) and dynamic effects (run-up and draw-down), will depend on the data collected during site evaluation for the area in which the ~~**reprocessing facility**~~ **nuclear fuel cycle R&D facility** is located……	section. Relevant facility is mentioned.				
56.	GER33	5.96	In accordance with the risk identified in the site evaluation (see Section 4), the R&D facility is required to be designed to withstand other detrimental impacts ~~the design basis impact~~: see para. 5.7(e) of SSR-4 [1] and para. 5.35 of SSR-1 [15].	Para. 5.7(e) of SSR-4 [1] and para. 5.35 of SSR-1 are dealing with aircraft crashing and chemical explosion. Wording "other detrimental impacts" might be more suitable here, as term "design basis impact" is not defined in IAEA Safety Glossary.			X	"other detrimental impacts" not defined"
57.	GER34	5.99	Instrumentation and control systems are required to be provided for criticality control ~~safety~~, and for hot cells, gloveboxes and hoods for fulfilling their requirements for static and dynamic confinement: see paras 6.172–6.174 of SSR-4 [1].	Please make wording more precise.	X			
58.	RUS3	5.99	This statement is confusing and needs to be reworded.	It can be mistakenly understood that instrumentation and control systems are required to be provided only for criticality safety, and for hot cells,		X Instrumentation and control systems are required to be		The requirement of instrumentation and control systems for monitoring and control of all the process

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				gloveboxes and hoods but not for many other processes and systems.		provided for criticality control, and for hot cells, gloveboxes and hoods for fulfilling their requirements for static and dynamic confinement: see paras 6.172–6.174 of SSR-4 [1]		parameters that are necessary for safe operation are referred to in the previous paragraph. Also see response to comment GER34
59.	RUS4	5.100	It is recommended to clarify when automatic control systems are required to be provided.	Recommendations on the necessity of automatic control systems provision are important.			X	Recommendations are provided in subsequent paras
60.	JAP4	5.103. (a)(i)	Safety related instrumentation and control systems for a nuclear fuel cycle R&D facility include the following, as determined by the application of a graded approach: (a) Criticality control, criticality detection and alarm: (i) Depending on the method of criticality control, the monitoring and control parameters include mass, concentration, acidity, isotopic	It seems difficult to understand the reason why acidity is included here. Please explain it.				Acidity could impact solubility, extraction, stripping or precipitation, thus could affect criticality safety.

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			composition or fissile content, burnup and quantity of reflectors and moderators as appropriate……					
61.	PAK5	5.109 (d)	Training of operators on procedures to be followed for normal, ~~and~~ abnormal and Accident conditions	Training on procedures may also include implementation of procedures during accident conditions.		X The training of operating personnel on procedures to be followed in operational states and accident conditions		
62.	GER35	5.111	The list of postulated initiating events identified is required to take into account all the internal and external hazards and the resulting event scenarios: see Requirement 19 of SSR-4 [1]. The safety analysis is required to consider all the ~~structures, systems and components~~ SSCs important to safety and their supporting systems that might be affected by the postulated initiating events identified: see para. 4.20 of GSR Part 4 (Rev. 1) [13].	Supporting systems of SSCs are also important in this case.		X The safety analysis is required to consider all the SSCs important to safety that might be affected by the postulated initiating events identified (see para. 4.20 of		Clarity. SSCs important to safety includes also supporting SSCs

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						GSR Part 4 (Rev. 1) [14]).		
63.	GER36	5.112	For nuclear fuel cycle R&D facilities, the safety analysis should be performed iteratively with the development of the design with the objectives of achieving the following: (a) That doses to workers and the public during operational states do not exceed dose limits and are as low as reasonably achievable ~~practicable~~, in accordance with Requirement 9 of SSR-4 [1]; (b) That the doses to workers and the public during and following accident conditions remain below acceptable limits and are as low as reasonably achievable in accordance with Requirement 9 of SSR-4 [1];	SSR-4 only cites as low as reasonably achievable. Also, the next bullet point cites "achievable".	X			
64.	GER58	5.121 (d)	Identification and analysis of conditions at the facility, including internal and external events that could lead to a release of material or of energy with the potential for adverse effects regardless of their likelihood, the time frame for emissions and the exposure time, in accordance with	We suggest adding the phrase to extend the analysis to rare events, as these rare events tend to have a high potential for large consequences.			X	Technically imprecise.

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No.	Country	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			reasonable scenarios.					
65.	GER59	5.121 (f)	These structures, systems and components that are credited in the safety assessment and are required to be qualified to perform their functions reliably in accident conditions: see paras ~~4.30~~4.19 and ~~4.36~~4.22 of SSR-4 [1].	editorial		X (see Requirement 30 of SSR-4 [1])		Relevant Requirement referred.
66.	GER60	5.122	see para~~-~~s 9.118 and 9.119 of SSR-4 [1].	editorial	X			
67.	GER37	5.126	Design extension conditions include events more severe than design basis accidents that originate from extreme events or combinations of events that could cause damage to ~~structures, systems, and components~~ SSCs important to safety or that could challenge the fulfilment of the main safety functions. The list of postulated initiating events provided in Appendix of SSR-4 [1], including combinations of these events, should be used as well as events ~~with~~ causing additional failures.	Clarification		X Design extension conditions include events more severe than design basis accidents that originate from extreme events or combinations of events that could cause damage to SSCs important to safety or that		Clarity. Change from 'events with additional failure' to 'events causing additional failure rejected on basis of 'technical imprecision'

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						could challenge the fulfilment of the main safety functions at the nuclear fuel cycle R&D facility.		
68.	GER38	5.128	For analysing design extension conditions, best estimate methods with realistic boundary conditions ~~can~~ should be applied. Acceptance criteria for the analysis, consistent with para 6.74 of SSR-4 [1], should be defined and reviewed by the regulatory body	Clarification		X For analysing design extension conditions, best estimate methods with realistic boundary conditions are used		.
69.	GER39	5.135	(c) Test (aerosol) injection systems and the associated sampling and analysis equipment for checking of ~~(~~filter efficiency~~)~~.	Clarification		X (c) Test (aerosol) injection systems and the associated sampling and		Clarity

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No.	Country	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
						analysis equipment for testing filter efficiency .		
70.	GER40	5.145 Line 7	…. The conditions under which an off-site emergency response might need to be initiated include the internal hazards and external hazards identified as the postulated initiating events for a nuclear fuel cycle R&D facility: see paras 5.4~~8~~9 –5.9~~6~~7	Editorial	X			
71.	GER61	5.146	It should also address the infrastructural elements and provisions to be prepared (including training, drills and exercises) that are necessary to support these functions.	We suggest including the addition to emphasize that also equipment and other items for the execution of the processes must be kept ready and available at relevant locations.			X	Equipment and other items are included in infrastructural elements
72.	GER41	5.148	For Case 2 R&D facilities, the hazards listed in the IAEA Safety Guides related to the corresponding type of nuclear fuel cycle facilities, for example in SSG-79, SSG-5 [20], SSG-6 [5], SSG-7 [21] and SSG-42 [22], should be considered in the hazard assessment used for developing the emergency arrangements.	Please check if adding of a new SSG-79, Hazards Associated with Human Induced External Events in Site Evaluation for Nuclear Installations (Publication 2023), is useful here.			X	Here the intent is to address safety guides of corresponding type of nuclear fuel cycle facility. SSG-79 is referred in subsection "External hazards at a nuclear fuel cycle R&D facility"
73.	GER42	Title before	~~AGEING MANAGEMENT AT A NUCLEAR FUEL CYCLE R&D~~	Chapter "Ageing management at a nuclear fuel cycle R&D facility" is			X	Ageing management subsection in Section 5 is

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No.	Country	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		5.151 Paras 5.151 – 5.153	~~FACILITY~~ ~~5.151. The design of a nuclear fuel cycle facility is required to take into account the effects of ageing on systems, structures and components important to safety to ensure their reliability and availability during the lifetime of the facility: see Requirement 32 of SSR-4 [1].~~ ~~5.152. The design of a nuclear fuel cycle R&D facility is required to facilitate the inspection of systems, structures and components important to safety. This should include the detection of the effects of ageing (static containment deterioration, corrosion) and allow the maintenance or replacement of such items, if needed.~~ ~~5.153. An ageing management programme is required to be implemented by the operating organization: see Requirement 60 of SSR-4 [1]. This programme should be implemented at the design stage to allow equipment replacements to be anticipated.~~	present twice in current document. We suggest to delete paras here and to remove them to Section 8.				ageing management considerations during design stage. Section 8 deals with operation stage.
74.	GER43	6.2	For a complex nuclear fuel cycle R&D	Commensuration with the potential			X	Although is technically

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			facility (e.g. a Case 2 facility), regulatory authorization should be sought in several stages. Each stage may have a hold point at which approval by the regulatory body may be necessary before the subsequent stage may be commenced, as described in para. 7.2 of SSR-4 [1]. The extent of involvement by the regulatory body during construction should be commensurate with the potential hazards of the facility.	hazards of the facility should be mentioned as well.				correct, but the text is already stated in the SSR-4.
75.	GER44	6.4	Modular components (e.g. gloveboxes, hot cells, fume hoods, monitoring systems) should be used in the construction of nuclear fuel cycle R&D facilities ~~used for fundamental research (i.e. Case 1 facilities)~~. This enables equipment to be tested and proven at the manufacturer's premises before installation in the R&D facility. This approach also aids commissioning, maintenance and decommissioning.	Modularized, standardized components should be used, for example, for reprocessing facilities as well – see para 6.4 of DS518A. Reducing of statement about "modular components" to Case 1 facilities/ fundamental research might be not correct. Please verify.		X Modular components (e.g. gloveboxes, hot cells, fume hoods, monitoring systems) should be used, as far as practicable, in the construction of a nuclear fuel cycle R&D		Clarity.

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						facility		
76.	GER45	8.1	The specific hazards associated with a nuclear fuel cycle R&D facility described in Section 2 should be taken into account in meeting the safety requirements for operation established in section 9 of SSR-4 [1].	Editorial. There is more than one hazard.	X			
77.	GER46	8.2	~~Safety should be coordinated between the operational functions and the research functions of the nuclear fuel cycle R&D facility.~~ The safety policy established and implemented by the operating organization should give safety the utmost priority, overriding all other demands, including those of project schedules or research and development programmes. The safety committee should provide an interface between operations and research; however, this should not be used as a substitute for everyday communication and cooperation on safety between these functions, which should also be documented. Responsibilities that should be coordinated carefully include the management of radioactive material, the monitoring of experiments	Please put in line with SSR-4, para.4.5. Wording "safety should be coordinated" is misleading.		X The 1st sentence is revised as "The activities related to operational functions and research functions of a nuclear fuel cycle R&D facility should be coordinated to ensure that safety is the overriding priority."		The intent here is to recommend coordination between the research and operation functions, to ensure safety.

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			and the management of radioactive waste. The safety committee of the R&D facility should include representatives of operations, safety and research functions.					
78.	GER47	8.3	Research programmes should comply with findings of a safety assessment and a statement of confidence in these findings (i.e. ~~the~~ safety case) ~~existing safety case~~ or be considered as a modification. Research involves flexibility in the materials and processes used and the safety case should anticipate a variety of research needs. The domain of safe operation defined through the operational limits and conditions should be sufficiently large to avoid frequent modifications of the safety case or of the regulatory authorization. Any modification should be reviewed and made subject to approval by the appropriate authority, in accordance with regulatory requirements.	As this is the first time the term "safety case" is used, we suggest to add an additional explanation.			X	Safety case is defined in the IAEA Glossary
79.	GER48	8.4	Paragraph 9.3 of SSR-4 [1] establishes requirements related to interdependencies and communication between facilities on the same site.	Editorial: using of "specifications" or "determinations" might make the statement more clear			X	The para is clear as is

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No.	Country	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			Different organizational units within a nuclear fuel cycle R&D facility should hold regular work planning meetings to achieve a common work plan and to coordinate activities. Clear ~~definitions~~ specifications of individual assignments should be documented and made subject to approval at a suitable level within the operating organization.					
80.	IND6	Page No.45, Section 8.9; Line No.3.	"gloveboxes and hot cells involving handling of tongs and master slave manipulators including the actions to be taken in response to anticipated operational occurrences (e.g., a punctured glove in a glovebox, sleeve failure and ~~or a~~ loss of ventilation in a hot cell etc.)	Sentence is modified to stress the need for training the R&D facility personnel in handling tongs and master slave manipulators in glove boxes and hot cells respectively and the associated challenges in handling them.		X Many processes relating to glovebox and hot cell operations involve manual intervention. Therefore, special attention should be paid to the training of nuclear fuel cycle R&D facility personnel who		Clarity and technical precision

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No.	Country	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
						use gloveboxes and hot cells involving the handling of tongs and master–slave manipulators. This training should include the actions to be taken in response to anticipated operational occurrences (e.g. a punctured glove in a glovebox, sleeve failure or loss of ventilation in a hot cell).		
81.	GER49	8.12	In order to ensure that under normal circumstances, the R&D facility operates well within its operational limits and conditions, a set of limits on operating parameters are required to be	Please put in line with wording of para. 9.31 of SSR-4.	X			

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			defined by the operating organization (para. 9.31 of SSR-4 [1]). The margins should be derived from the design considerations and from experience of operating the facility (both during commissioning and subsequently). The objective should be to maximize the safety margin while ~~minimizing~~ avoiding breaches of the sub-limits.					
82.	PAK6	8.16	Limits that should be set for a nuclear fuel cycle R & D facility include the following, as applicable: (a) …. **(h) Process parameters such as temperature, pressure & flow to ensure safe operation of the facility**	Limit on process parameters may be identified and maintained during all conditions. It may be added to ensure compatibility with Para 8.17		X Added as "(d) Limits on process parameters such as temperature, pressure and flow to ensure safe operation of the facility;"		Clarity
83.	PAK7	8.22	The management of the R&D facility should arrange pre-job briefings…. **Similarly post job debriefings should also be conducted.**	The bold text may be included at the end of 8.22. Human Performance tool of Post Job De-briefing is important to learn from the experience and record it for future reference.	X	X Added "Post-job debriefings should also be conducted"		Clarity

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84.	GER50	8.28	Regular verification of the availability of materials necessary for maintenance should be conducted. For continuity of safe operations of a nuclear fuel cycle R&D facility, and to prevent the installation of counterfeit, fraudulent or suspect items, as well as non-conforming or sub-standard components, a programme for the provision of spare parts for items important to safety, including radiation monitoring equipment, should be established and implemented (see also para. 6.3 of this Safety Guide).	Reference to para. 6.3, which is dealing with the same issue, might be useful.	X			
85.	GER51	8.31A	The design of a nuclear fuel cycle facility is required to take into account the effects of ageing on systems, structures and components important to safety to ensure their reliability and availability during the lifetime of the facility: see Requirement 32 of SSR-4 [1].	Please move here content of para. 5.151			X	Place of the text is appropriate as is in Section 5, Design of nuclear fuel cycle facilities.
86.	GER52	8.31B	The design of a nuclear fuel cycle R&D facility is required to facilitate the inspection of systems, structures and components important to safety. This should include the detection of the effects of ageing (static containment	Please move here content of para. 5.152			X	Place of the text is appropriate as is in Section 5, Design of nuclear fuel cycle facilities.

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			deterioration, corrosion) and allow the maintenance or replacement of such items, if needed.					
87.	GER53	8.31C	An ageing management programme is required to be implemented by the operating organization: see Requirement 60 of SSR-4 [1]. This programme should be implemented at the design stage to allow equipment replacements to be anticipated.	Please move here content of para. 5.153			X	Place of the text is appropriate as is in Section 5, Design of nuclear fuel cycle facilities.
88.	GER54	8.32	The ageing management programme should also consider the physical ageing and the non-physical ageing (obsolescence i.e. their becoming out of date in comparison with current knowledge, codes, standards and regulations, and technology).	Editorial (in word ageing)	X			
89.	GER55	8.36	In accordance with the safety significance of the modification, and in accordance with regulatory requirements, modifications should be assessed by the operating organization and then submitted to the regulatory body for authorization (or, if appropriate, by ~~registration~~ notification: see para. 3.8 of GSR Part 3 [19]) before the modifications are implemented.	Para. 3.8 of GSR Part 3 is dealing with notification. Please check if usage of the word “notification” is more appropriate here.		X The operating organization of a nuclear fuel cycle R&D facility is required to inform the regulatory body of planned		Clarity and consistency with safety standards.

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						modifications, in accordance with regulatory requirements (see para. 9.57(h) of SSR-4 [1]). The impact of modifications on the safety of the facility are required to be assessed by the operating organization and may require the approval of the regulatory body before the modifications are implemented (see para. 9.57(a) and (d) of SSR-4 [1]).		
90.	GER56	8.47	(f) Emergency drills and/or exercises	Editorial	X			

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			(see paras 8.834–8.889);					
91.	JAP5	8.48.	The tools used for the purposes of accounting for and control of nuclear material, such as mass, volume or isotope measurements and accounting software, may also contribute to criticality safety. However, where there ~~is any uncertainty about~~ are any uncertainties in the characteristics of fissile material, conservative values are required to be used for parameters such as fissile material content and isotopic composition: see ~~para. 7.52~~paras 6.140 and 6.156 of SSR-4 [1]. This is especially important when managing cell floor or glovebox sweepings and similar waste material.	To keep a consistency with DS518A para. 8.61.	X			
92.	GER57	8.56	(c) The operating organization is required to designate controlled areas and supervised areas, as described in para. 5.26~~6~~7 of this Safety Guide. In addition, to further identify the risk involved in a task, facility areas should be classified into radiation and contamination zones. The boundaries between such zones should be regularly checked and adjusted to match current situation ~~conditions~~.	Editorial		X Para number changed		The remaining text is clear as is.

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93.	ISR4	8.56	(c) It should be **5.27** (~~5.26~~).		X			
94.	ISR5	8.68	It should be **5.29(c)** and **5.103(e)(i)** and not ~~5.28(c)~~ and ~~5.101(e)(i)~~		X			
95.	PAK8	8.68	Where the assessment of occupational exposure is necessary (see Requirement 25 of GSR Part 3 [19]), this should be based on individual dosimeters, as described in paras ~~**5.28(e)**~~ 5.29 (c) and ~~**5.101 (e) (i)**~~ **5.103 (e) (i)** and ~~**8.64**~~ **8.65** of this Safety Guide……	Incorrect references may be deleted. Correct references are mentioned.	X	X ….as described in paras 5.29(c) and 5.103(e)(i) and 8.64 of this Safety Guide		Reference corrected as necessary
96.	GER62	8.86	As part of emergency preparedness, arrangements are required to be developed for the coordination between the operating organization and the local, regional and national emergency response organizations:	We suggest adding the arrangements for the facility-internal emergency preparedness and response to the list of required arrangements, to be commensurate with Requirement 22 of GSR Part 7.	X			
97.	GER63	8.86	~~These~~ ~~arrangements~~ Training, drills and exercises are required to ~~be tested~~ test these arrangements periodically to ensure that emergency response functions are performed effectively during a nuclear or radiological emergency: see Requirement 25 of GSR Part 7 [17] and para. 9.130 of SSR-4 [1].	We suggest specifying the measures for testing the arrangements, as is stated in the cited references.			X	Clear as is
98.	GER64	8.87	Clear communication protocols and means of communication are required to be established with local authorities	We suggest including the technical requirements for the communication with authorities in addition to the		X 8.87. Suitable, reliable and		"Communication protocols" includes "means of

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			and response organizations: see para. 5.43 of GSR Part 7 [19]. 8.88 Arrangements shall be made to provide the public with instructions, warnings and relevant information for emergency preparedness and response (see Requirement 10 GSR Part 7)	content requirements. We also suggest adding this paragraph. Communication about potential hazards in an emergency should not be limited to staff and authorities.		diverse means of communication are required to be established with local authorities and response organizations (see para. 5.43 of GSR Part 7 [20]). 8.88. Requirement 10 of GSR Part 7 states: "The government shall ensure that arrangements are in place to provide the public who are affected or are potentially affected by a		communications. Proposed text in line with the style of a safety guide.

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						nuclear or radiological emergency with information that is necessary for their protection, to warn them promptly and to instruct them on actions to be taken.””		
99.	MEX1	8.91	The programme for the feedback of operational experience at a nuclear fuel cycle R&D facility should cover experience and lessons ~~learnt~~ learned from events (including low-level events) and accidents at the facility as well as from other nuclear fuel cycle facilities worldwide: see para. 9.133 of SSR-4 [1]. Lessons from relevant events at other (i.e. non-nuclear) facilities should also be considered. This programme should include the evaluation of trends in operational	Include requirements from para 9.135 of SSR-4 about reporting all significant safety events and their learned lessons. Not only those which are related to operational limits conditions. (8.17 SSG-43). As a suggestion, Use "learned" instead of "learnt" for consistency in the wording throughout the document.	X			

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			disturbances, trends in malfunctions, near misses and other incidents that have occurred at the R&D facility and, as far as applicable, at other nuclear installations. The programme is required to include a reporting system and consideration of technical, organizational and human factors: see para. 9.134 and 9.135 of SSR-4 [1].					
100.	US1	General	Consider including a section listing and spelling out the acronyms.	For clarity and better understanding of the information discussed/provided.			X	Not needed in a safety guide.
101.	US2	General	The document includes a reference to "The Management System for the Safe Transport of Radioactive Material" [TS-G-1.4 2008] as reference [12]. o While currently accurate, that document has been revised, and the revisions are in the works within the IAEA's Transport Safety Unit for finalizing the updates prior to providing them to the IAEA Technical Editor. These steps could be accomplished later this year. o Suggest advising the "owners" of DS518B to check on the status of	Ensure reference to the latest document.	X			

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			the revision for TS-G-1.4 as progress continues.					
102.	US3	Footnote 9, page 67	Footnote 9 on page 67 references the IAEA's transportation regulations [i.e., "Regulations for the Safe Transport of Radioactive Material, IAEA Safety Standards Series No. SSR-6, IAEA, Vienna (2012)"]. The footnote should be changed to "Regulations for the Safe Transport of Radioactive Material, IAEA Safety Standards Series No. SSR-6 (Rev. 1), IAEA, Vienna (2018)."	Ensure reference to the latest document.		X Referred footnote removed.		Consistency with safety standards.
103.	IND7	Page 62/ Annex I/ Heading	Comment on Heading: PROCESS ROUTE IN AN R&D FACILITY: ~~PILOT~~ LABORATORY SCALE (CASE 1)	Editorial (to be consistent with Annexure-1) (Description of figure in Annex I mentions laboratory scale instead of pilot scale, quoted as '*Diagram showing the general processes in an R&D facility operating at laboratory scale (Case 1)'*)	X			
104.	PAK9	Annex-I	PROCESS ROUTE IN AN R&D FACILITY: ~~**PILOT**~~ **LABORATORY** SCALE (CASE 1)	Title should be consistent with the caption.	X			