

DS 509 Operational Limits and Conditions and Operating procedures for Research Reactors (Revision of NS-G-4.4)

COMMENTS BY REVIEWER					RESOLUTION			
Reviewer:		Page.						
Country/Organization:		Date: 24 October 2019						
Comment No.	Country Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
General								
1.	Finland 1	General	The consolidated approach to security should be established for the set of guides.		X			Interface between safety and security addressed in all guides.
Section 1								
2.	Germany 1	1.1	This publication supersedes the Safety Guide on “Operational Limits and Conditions and Operating Procedures for Research Reactors” that was issued in 2008 as Safety Guide No. NS-G-4.4 ...	Clarification that this is the title of the Safety Guide			X	Standard format for referencing superseded guides.
3.	Ukraine 1	1.2	Under the responsibility of the operating organization, these limits on operating parameters and requirements should be developed in the evaluation of the design	Abbreviation OLC is already expanded in §1.1. Therefore, it is suggested to replace “operational limits and conditions (OLCs)” with “OLCs”.	X			

			safety as a set of operational limits and conditions (OLCs) ² .					
4.	Ukraine 2	1.3	This set should satisfy the Requirement 71 for the OLCs as established in SSR-3 [1],	It is suggested to replace “Requirements 71” with the singular form of the word “Requirement”.	X			
5.	USA 1	1.3	“This set needs to satisfy Requirement 71 for OLCs as established in SSR-3 [1].”	Typos, and avoid using “should” to indicate that SSR-3 is a requirement.	X			
6.	Pakistan 3 WASSC	1.3 (line no. 8 to 10), 3.1 (line no. 4 to 7 and 3.8limiting conditions on equipment and operational characteristics of the reactor; surveillance requirements for maintenance, periodic testing and inspection; design feature and administrative requirements.	The term design feature is conventionally used in OLCs as mentioned in Section 4 of NUREG 1431 Rev. 4.			X	OLCs are derived from design safety features
7.	USA 2	1.7	“...applicable to most types of research reactors, including critical and subcritical assemblies. ” “All the guidance provided should be applied unless it can be justified that, for a specific research reactor (or critical or subcritical assembly) , the application...”	Make clear up front that critical and subcritical assemblies and considered “research reactors” (consistent with SSR-3) and within scope of document.	X			
8.	Pakistan 1 WASSC	1.7 (last line)the level of detail required in the application of the guidelines should be agreed upon by the operating organization and the regulatory body to develop a set of OLCs and	The term operating procedure should be added in sentence as set of operating procedure that falls under OLCs are approved by Regulatory body.	X			

			operating procedure acceptable to the regulatory body.				
9.	Ukraine 3	1.8	Low risk research reactors having a power rating of up to tens of kilowatts, critical and subcritical assemblies may need less comprehensive OLCs and operating procedures than those outlined here.	Subcritical assemblies are omitted in the paragraph. In §5.21 and §II.1, subcritical assemblies are mentioned together with other low power facilities. It is suggested to add subcritical assemblies to the paragraph.		X	For consistency with comment on 1.8 from Germany.
10.	Germany 2	1.8	Low risk Research reactors <u>with a low risk potential</u> having usually a power rating of up to tens of kilowatts and like critical assemblies may need less comprehensive OLCs and operating procedures than those outlined here.	According to SSR-3 2.17 and SSG-22 2.7 thermal power is only one of the factors to apply a grading to a research reactor. The more general term “hazard potential” is more suited.		X <u>Research reactors with a low risk potential</u> having a power rating of up to tens of kilowatts, critical assemblies and subcritical assemblies may need less comprehensive OLCs and operating procedures than those outlined here	For consistency with comment on 1.8 from Ukraine.
11.	Finland 2	1.8.	Low risk research reactors having a power rating of up to tens of kilowatts and critical assemblies may need less	Please harmonize the terminology within the set of safety guides.		X Research reactors with a	for consistency with comment

			comprehensive OLCs and operating procedures than those outlined here. While all recommendations in this Safety Guide should be considered, some may not apply to these low risk reactors. For these reasons, the recommendations and guidance provided in this Safety Guide should be graded for applicability to a particular research reactor (see Ref.SSR-3 [1], paras 12.1115–12.1417).	Low risk research reactors or Low power research reactors?		low risk potential...		on 1.8 from Germany.
12.	Japan 1	1.8.	<p>Revive the list of factors for graded approach, with citing para 2.17 of SSR-3, as follows;</p> <p>The factors to be considered in deciding whether the application of certain requirements established here may be graded include:</p> <ul style="list-style-type: none"> (a) The reactor power (b) The potential source term; (c) The amount and enrichment of fissile and fissionable material (d) Spent fuel elements, high pressure systems, heating systems and the storage of flammable materials , which may affect the safety of the reactor- (e) The type of fuel elements ; (f) The type and the mass of 	This list is described in SSR-3 and it is understandable to delete it from the draft to avoid duplication. However, it would be user-friendliness to describe the list here, as the text of SSR-3 is cited throughout this document			X	List removed to avoid duplication in accordance with DPP DS509. Reference to SSR-3 Paras added.

			<p>moderator, reflector and coolant;</p> <p>(g) The amount of reactivity that can be introduced and its rate of introduction reactivity control, and inherent and additional safety features (including those for preventing inadvertent criticality);</p> <p>(h) The quality of the containment structure or other means of confinement;</p> <p>(i) The utilization of the reactor (experilmental devices. tests and reactor physics experiments);</p> <p>(j) The site evaluation, including external hazards associated with the site and the proximity to population groups;</p> <p>(k) The ease or difficulty in changing the overall configuration.</p>				
13.	Korea 1	<p>1.8</p> <p>3.1</p> <p>3.3</p>	<p>1.8. ... (see <u>paras 2.15-2.17 of SSR-3 [1]</u>SSR-3 [1] paras 2.15-2.17).</p> <p>3.1. ... (see <u>para 7.33 in Requirement 71 of SSR-3 [1]</u>SSR-3 [1], Requirement 71 para. 7.33).</p> <p>3.3. <u>Para 7.32 in Requirement 71 of SSR-3 [1]</u>Requirement 71 para 7.32 of SSR-3 requires that ... as stated</p>	Unified format of referring the requirements and/or paragraph of SSR-3 is necessary, for example, <u>paras 2.6-2.7 in Requirement 1 of SSR-3, paras 2.6-2.7 of SSR-3, and Requirement 3 of SSR-3.</u>	X		The current approach is consistence with guidance from the standards specialist; however, all reference formats will be

		4.17	in <u>Para 3.7 in Requirement 1 of SSR-3 [1]</u> Requirement 1, para 3.7 of SSR 3 [1].					standardized at final stage, as required..
		4.19	4.17. ... (see <u>para 7.36 of SSR-3 [1]</u> SSR 3 [1] para. 7.36).					
		6.28	4.19. ... In <u>Para 7.37 in Requirement 71 of SSR-3 [1]</u> SSR 3 [1] para. 7.37 of Requirement 71 requires that ...					
			6.28. ... <u>Para 7.69 in Requirement 77 of SSR-3 [1]</u> Requirement 77, para 7.69 of SSR 3 requires that ...					
14.	Pakistan 2 WASSC	Para 1.9 & 1.10 last line	“...depending on the factors listed in para 1.11 SSR-3 (para 2.17)”	Para 1.11 does not enlist the required factors	X			
15.	Ukraine 4	1.9	However, the number of OLCs may vary depending on the factors listed in SSR-3 [1], paras 2.15–2.17.	§1.11 referenced in the paragraph is now §1.8. However, its text has changed and now does not contain any factors but reference to SSR-3. It is suggested to replace the reference to §1.11 in the paragraph with §§2.15–2.17 of SSR-3 to which §1.11 refers.	X			
16.	Ukraine 5	1.10	Since the operating procedures are required to be consistent with the OLCs, the number and the complexity of the procedures may	§1.11 referenced in the paragraph is now §1.8. However, its text has changed and now does not contain any factors but reference to SSR-3. It is suggested to replace the	X			

			vary depending on the factors listed in SSR-3 [1], paras 2.15–2.17.	reference to §1.11 in the paragraph with §§2.15–2.17 of SSR-3 to which §1.11 refers.				
17.	USA 3	1.10	“...required to be consistent with the OLCs in accordance with Requirement 74 of SSR-3 [1] , the number...”	Add citation for referenced requirement.		X ...with the OLCs (see Requirement 74 of SSR-3 [1]),...		For consistency with rest of Guide.
Section 2								
18.	Korea 2	2.1	2.1. ... Further guidance is provided in paras 4.7-4.20 of SSR-3 [1] and IAEA Safety Standards Series No. GS-G-3.1, ...	It is appropriate to refer the relevant paragraphs in SSR-3 at first and then refer other IAEA publications later.			X	SSR-3 does not provide guidance, it provides requirements.
19.	USA 4	2.5	“...ensure that the processes for development and implementation of OLCs and operating procedures describe...”	Revision for clarity.	X			
20.	USA 5	2.7	“...external personnel (including suppliers and contractors) who perform...”	Revise for clarity and consistency with 2.8.	X			
21.	Iran 4 EPRReSC	Page 14/ Subclause 2.7/ Second bullet/first line	"Supervising external personnel (including suppliers and experimenters) who perform safety related activities and ensuring that..."	Please consider subclause 4.15 (Bullet B) of SSR-3 and comment no.3.	X			
22.	USA 6	2.9	Delete first sentence of paragraph.	Not sure what this sentence means or adds, second paragraph of sentence appears sufficient.			X	First sentence refers to the operating organization's

								MS. Second sentence refers to the supplier's MS
23.	USA 7	2.14	“Solicitation of feedback, and use of operating experience”	Revision for clarity.		X Use of feedback and operating experience		For clarity
24.	Iran 1 EPRReSC	Page 16/Subclause 2.16/ Fifth bullet	"The facility emergency planS and procedures"	Considering subclause 2.8, 2.12, 7.90 and 7.92 of SSR-3	X			
25.	Turkey 6	2.16	The first sentence of the paragraph should be rewritten.	Editorial correction.		X		Not clear - no editorial correction shown
26.	Turkey 7	2.16 and 4.43 (c)	"The drill and exercise programme" can be added.	Drills and exercises are very important parts of the emergency preparedness and they should be assessed periodically for effective implementation and should be retained accordingly.		X the emergency plan (including drills and exercises)...		Added ...
Section 3								
27.	USA 8	3.3	Move last sentence of paragraph (which quotes SSR-3, para 3.7) to beginning of paragraph. “In order to achieve these requirements...”	Revision for clarity.			X	Order is consistent with remainder of guide.

28.	Pakistan 4 WASSC	3.4	The OLCs should be submitted for the review and approval of the regulatory body as an important part of the licensing process, on the basis of which the operating organization is authorized to operate the facility.	Para covered in 3.1		X	3.1 gives the requirements and 3.4 is for licensing.
29.	USA 9	3.8	Revise first sentence to “The OLCs at research reactor facilities are required to include the following items, in accordance with SSR-3, paragraphs 7.35-7.40:” Combine last 2 sentences to “ Each OLC’s clear statement of its objective, applicability, specification and justification, as appropriate, should be included in the documentation on OLCs to increase the facility personnel’s consciousness of the OLCs’ application and observance.”	Revise to clarify that including the types of OLCs is a requirement. Revision for clarity, and second to last sentence currently uses “should” to restart a requirement (which is also already quoted in 3.5).		X ...are required to include the following items (see SSR-3 [1], para 7.35-7.40):	
30.	Korea 3	3.8	(a) Safety limits (see para 7.35 of SSR-3 [1] , paras 4.5–4.13); (b) Safety system settings (see para 7.36 of SSR-3 [1] , paras 4.14–4.18); ... (f) Violation of OLCs (see paras 7.41-7.42 of SSR-3 [1]).	It is appropriate to refer the relevant paragraphs in SSR-3 obviously.		X 3.8 The OLCs at research reactor facilities are required to include the following	Reference to SSR-3 paras added in first line and also in relevant paras, e.g., 4.5 through 4.43. Violation of OLCs is

				And new item shall be added as (f) in accordance with the Requirement 71 of SSR-3 [1].		items <u>(see SRR-3 [1], para 7.35-7.40):</u>		covered under administrative controls. Guidance on violations is also covered in another section of this guide (see 4.44)
31.	Ukraine 7	3.8 (d), (e)	(d) Requirements for maintenance, periodic testing and inspection (see paras 4.28–4.33); (e) Administrative requirements (see paras 4.34–4.44).	Wrong reference. It is suggested to replace the reference to §§4.27–4.32 and §§4.33–4.43 with §§4.28–4.33 and §§4.34–4.44 respectively.	X			
32.	Korea 4	3.13	3.13. In accordance with <u>Requirement 71 of SSR-3 [1]</u> para. 3.10, the operating organization is ...	It is appropriate to refer the relevant Requirement of SSR-3 rather than the paragraph in this Safety Guide itself, when the requirement is addressed.	X			
33.	USA 10	3.13	Revise first sentence to “The operating organization is responsible for ensuring compliance with the approved OLCs.”	Reference to 3.10 does not appear to be relevant in this paragraph.		X		Revised per resolution to Korea comment 4.
34.	USA 11	3.16	Revise last sentence to “The presentation should, if appropriate , also include a statement...”	Additional qualifier should be included if this is being upgraded to a recommendation. Action statements are not necessary for many OLCs for many facilities.	X			

			Revise paragraph reference at end of last sentence from 4.43 to 4.44.	Paragraph reference appears to be incorrect.				
35.	Ukraine 8	3.16	The presentation should also include a statement describing actions to be taken, with the allowed completion time, in the event of deviations from the established OLCs (see para. 4.20) or in the case of violation of an operational limit or condition (see para. 4.44).	Wrong reference. It is suggested to replace the reference to §4.43 with §4.44.	X			
36.	Ukraine 6	3.17	The requirements for maintenance, periodic testing and inspection should include the requirements for inspection , operability checks and calibrations, as applicable, and should clearly establish the frequency and scope of the tests required to verify that the performance levels for safe operation as set in the OLCs are met.	Avoid repetition.	X			
37.	Germany 3	3.25 Line 7	[...] Specifications may be derived from the design, from the safety analysis report and from <u>operating</u> experience.	Clarification	X			
38.	Korea 5	3.26	3.26. Reasons should be given for the selection of the specification according to para 7.34 of SSR-3 [1] that states	In order to specify the relevant paragraph, it is appropriate to insert the number of relevant paragraph obviously.	X			

39.	USA 12	3.26	Revise first sentence to “Reasons should be given for the selection of the specifications, to help ensure that the SSR-3 [1], paragraph 7.34, requirement that ‘[quote requirement]’ is met.”	Revise for clarity.	X			
Section 4								
40.	USA 13	4.4	“An example would be stating that OLCs are applicable during the commissioning stage...”	Revise for clarity.	X			
41.	Ukraine 9	4.6	The normal operation should be restored only after an appropriate evaluation has been performed and the regulatory body has reviewed evaluation report.	Correction is aimed to avoid situation of operation restoration without permission of the regulatory body.	X	The normal operation should be restored only after an appropriate evaluation has been performed, the evaluation report has been submitted to the regulatory body for assessment, and approval for restarting has been given in accordance with established procedures		The guidance is for actions of the operating organization. For consistency with DS-497A, NPP Guide NS-G-2.2,

42.	USA 14	4.8	<p>“In this case, the safety limit may still be a maximum fuel temperature based on the characteristics of the fuel; however, the safety limit is often expressed...”</p> <p>“...or natural convection, such safety limits...”</p>	Fuel temperature is often a safety limit even when it is not directly measured.	X			
43.	Germany 4	4.19	<p>Limiting conditions for safe operation are administratively established constraints on equipment and operational parameters that must be adhered to during the startup, operation, shutting down (including extended shutdown and transition <u>phase</u>) <u>as well as in decommissioning phase</u> of a research reactor to provide acceptable assurance of safe operation within the reactor licence conditions and within applicable regulations.</p>	One need limiting conditions at all reactor states also after operation without the authorization for decommissioning – transition phase – and in the decommissioning phase.			X	For consistency and coherence with NS-G-2.2, OLCs and Operating Procedures for NPPs, the limiting conditions are focused on startup, operation shutting down and shutdown. Decommissioning is out of scope and is covered elsewhere. See SSG-47.
44.	USA 15	4.20	<p>“...the safety fallback state (i.e., a state in which the given equipment is not necessary for safety, such as reactor shutdown or reduced reactor power) in the event that...”</p>	<p>“Safety fallback state” is not a common term, clarify what this means.</p> <p>Add flexibility (since prescribed actions may not be needed in</p>	X			

			“...and any prescribed actions to be taken by the operating personnel...”	Limiting Conditions for Safe Operation for all facilities) and consistency with proposed revision to 3.16.				
45.	Germany 5	4.21	Operability requirements should state for the various modes of normal operation <u>and transition phase as well as in decommissioning phase</u> the number of systems or components important to safety that should be either in operating condition or in standby condition. These operability requirements define the minimum safe facility configuration for each mode of normal operation.	One need operability requirements at all reactor states also after operation without the authorization for decommissioning – transition phase – and in the decommissioning phase.			X	For consistency and coherence see comment on 4.19 from Germany 4.
46.	USA 16	4.25(c)	“Reactor core configuration ”	Suggest keep as is in current version of document, “core configuration” is appropriate terminology and consistent with other documents (and I.4 of this document).	X			
47.	Korea 6	4.30	4.30. The requirements for surveillance maintenance, periodic testing and inspection requirements should be specified	Correction of typo error.		X	requirements for maintenance, periodic testing and inspection	Corrected as in SSR-3
48.	USA 17	4.32	Revise first sentence to delete “Limiting conditions for safe operation concerning the”	The requirements referenced would not be limiting conditions for safe operation.	X			

49.	Germany 6	4.33	<p>Some of the OLCs, including requirements for maintenance, periodic testing and inspection, may not apply during extended periods of shutdown of the reactor, <u>during transition phase as well as in decommissioning phase of the reactor</u>. For example, calibration of a power measuring channel may be deferred but should be performed before the next reactor startup. Some additional special requirements for maintenance, periodic testing and inspection may be necessary during an extended shutdown period, such as during major maintenance or modifications, <u>as well as during transition phase and in decommissioning phase</u>. For these reasons, the requirements for maintenance, periodic testing and inspection for extended shutdown periods, <u>for transition phase as well as in decommissioning phase</u> may be specified separately.</p>	Please include transition phase and the decommissioning phase.			X	Decommissioning is out of scope and is covered elsewhere. See SSG-47.
50.	Germany 7	4.33 Bullet (r)	<p>[...] (r) Surveillance and maintenance <u>maintenance, periodic testing and inspection</u> records.</p>	Bringing in accordance with Paras 1.11, 3.7 etc. Or, if the Statement from SSR-3 is primary one (see Para 3.1 with quotation) please make changes in all the document accordingly	X			Note Para 4.43 revised. The text is from 4.43.

51.	Ukraine 10	4.34	This section of the OLCs document specifies the administrative requirements for the reactor facility.	Footnote 12 is deleted in the Safety Guide. But it still exists in §4.34. It is suggested to remove the footnote reference.	X			
52.	Pakistan 5 WASSC	Para 4.34, 2nd line	Please remove the reference of footnote.	Correction error	X			
53.	Iran 2 EPreSC	Page 21/ Subclause 4.38/ Third line	"...maintenance personnel, emergency response personnel emergency workers and others who ..."	Taking into consideration the definition of "emergency worker" in IAEA Safety Glossary and GSR Part 7, also "emergency response personnel" has not been used in them and SSR-3, It is suggested to change the text.	X			
54.	Iran 3 EPreSC	Page 21/ Subclause 4.38/ Whole paragraph	"4.38. The administrative requirements should include a statement that reactor manager , shift supervisors, reactor operators, radiation protection staff, experimenters , maintenance personnel staff , emergency response personnel and others who frequent the reactor facility should be properly trained."	According to footnote (10) on Page 15 of SSR-3: "The operating personnel comprise the reactor manager , the shift supervisors, the operators, the maintenance staff and the radiation protection staff." Not including reactor manager, means that reactor manager does not need training that is not correct. Also, it is mentioned in subclause 4.15 (Bullet B) of SSR-3: "External personnel (including suppliers and experimenters) are adequately trained and qualified"	X	The administrative requirements should include a statement that reactor manager, shift supervisors, reactor operators, radiation protection personnel, experimenters, maintenance personnel..	Experimenters should be adequately trained	

				and perform their activities..." this is considered in 2.7.				
55.	Korea 7	4.44	More paragraphs should be developed in accordance with paras 7.41-7.43 in Requirement 71 of SSR-3 [1].	There are not sufficient contents regarding 'Action required in the event of a violation of OLCs'		X The responsibilities to carry out the necessary compliance controls and for responding to violations of OLCs should be defined.		Additional guidance added to 4.44
Section 5								
56.	Germany 8	5.1	All safety related activities should be performed in conformance with documents issued in accordance with approved operating procedures ^x . <u>*An operating procedure is a document on how to execute and fulfill a task at the research reactor. It should consist of step-by-step information.</u>	We are missing the definition of "operating procedures" and suggest to add the footnote with explanation. This issue is important in order to distinguish between "operating procedures" and "operational procedures"			X	The term procedure is defined in the Glossary, the term operating procedure is widely used in the safety standards in a general sense. Operational procedures are described in Appendix II.
57.	USA 18	5.1	Revise first sentence to "All safety related activities should be performed in accordance with approved operating procedures."	Revise for clarity and eliminate redundancy.	X			

58.	Germany 9	5.2	<p>The operating procedures for normal operation should be developed to ensure that the research reactor is operated in compliance with the OLCs and should provide instructions for the safe conduct of operation in all modes, such as startup, shutdown, power level changes, fuel loading and handling <u>as well as in transition phase and decommissioning phase, facility states</u>. For anticipated operational occurrences, design basis accidents and design extension conditions without significant core degradation the operating procedures should provide instructions for the return to a safe state.</p>	Clarification			X	Decommissioning is out of scope and is covered elsewhere. See SSG-47
59.	Germany 10	5.3	<p>In this Safety Guide the term ‘operating procedures’ also covers other activities that are conducted by means of written instructions and step by step descriptions of operations, such as commissioning, maintenance, experiments and modifications, activities in emergencies and radiation protection services <u>as well as in transition phase and decommissioning phase</u>.</p>	Please include transition phase and the decommissioning phase.			X	Decommissioning is out of scope and is covered elsewhere. See SSG-47

60.	Germany 11	5.8 Line 4	[...] The assistance of external consultants may also be sought. <u>Operating procedures should take into account international operating experiences if applicable.</u>	Additional item for helpful assistance.		X The assistance of external consultants may also be sought and <u>operating experiences should be taken into account, if applicable..</u>		
61.	Germany 12	5.13	The safety committee should review and assess the OLCs and operating procedures important to safety .	It is not clear why the phrase “important to safety” is added here. Are there really OLCs or procedures not important to safety? Who will select the important OLCs and operating procedures (regulator or reactor manager)? The OLCs and operating procedures of special importance can be underlined in the operating manual. We suggest to delete “important to safety” here.			X	All OLCs are important to safety but not all operating procedures are important to safety. The guidance is that the safety committee should review to operating procedures that are important to safety (but not necessarily all operating procedures). Edits made to clarify
62.	Germany 13	5.18	The reactor manager should ensure that latest approved operational procedures ^{xx} are readily available	We are missing the definition of “operational procedure” and suggest to add a footnote with			X	See response to Germany

			<p>for reference close to the point where the work is done, or operations are carried out.</p> <p><u>xx “operational procedure” could be a task according to the operating manual or a work order.</u></p>	<p>explanation. This issue is important in order to distinguish between “operating procedures” and “operational procedures”</p>				comment 8 above.
63.	Germany 14	5.20	<p>The operating procedures should be available to the regulatory body, when needed.</p>	<p>Possible misunderstanding: according to Para. 5.19 the regulator had approved the operating procedures already made available.</p> <p>Or, perhaps “the operational procedures” like work orders are meant here?</p>		X ...when requested		The RB may not review all Operating Procedures, however, they should be available to the RB when requested.
64.	USA 19	5.20	<p>“The operating procedures should be made available...”</p>	<p>Revise for clarity.</p>		X		
65.	Finland 3	5.21	<p>Procedures should be developed for all safety related operations</p> <p>37</p> <p>that may be conducted over the entire lifetime of the research reactor. For this reason, it is convenient to categorize procedures according to their purpose and content. One such categorization is as follows:</p>	<p>Please replace physical protection in (i) with security.</p> <p>Physical protection covers only part of the needed security measures.</p>			X	Physical protection procedures are required.

			<p>(a) Commissioning procedures;</p> <p>(b) Operational procedures;</p> <p>(c) Maintenance procedures of major components or systems that could affect reactor safety;</p> <p>(d) Inspection, calibration and periodic testing procedures of structures systems and components that are essential for safe operation of the reactor;</p> <p>(e) Radiation protection procedures;</p> <p>(f) Procedures for the authorization of operation, maintenance, irradiation or experiments that could affect reactor safety or the reactivity of the core;</p> <p>(g) Procedures for reactor operator's response to anticipated operational occurrences and design basis accidents, and, to the extent feasible, to design extension conditions;</p> <p>(h) Emergency procedures;</p> <p>(i) Physical protection <u>Security</u> procedures;</p> <p>(j) Procedures for the handling of radioactive waste, monitoring and control of radioactive releases;</p> <p>...</p>				
66.	Germany 15	5.24	<p>[...]</p> <p>(a) Core configuration <u>Reactor core management</u></p>	<p>Clarification According to Para 4.23 it is the "reactor core management"</p>		X Reactor core configuration.	<p>Changed to reactor core configuration for consistency throughout, including Appendix I.4</p>

67.	Germany 16	5.24	[...] (j) <u>Surveillance maintenance, periodic testing and inspection</u> of equipment;	Bringing in accordance with Paras 1.11, 3.7 etc. Or, if the Statement from SSR-3 is primary one (see Para 3.1 with quotation) please make changes in all the document accordingly	X			
68.	Germany 17	5.29	Human factors should be taken into account to develop safe, reliable, <u>ergonomic</u> and effective operating procedures.	Ergonomic aspects help to optimize working conditions and sequence of work in order to prevent failures.			X	Human factor covers ergonomics, layout, clarity of objectives and meaning, etc. Text retained for consistency with DS497A
Section 6								
69.	Pakistan 6 WASSC	Para 6.10	Please add the reference number of NS-G-4.1 and update the table of references accordingly		X			
70.	Pakistan 7 WASSC	Para 5.24, 6.49 (j), 6.72 (k), 8.4 and appendix II (II.15)	Please replace the term quality assurance with management system to maintain consistency in the document.				X	Quality assurance is still needed. Management systems are covered elsewhere
71.	Germany 18	6.23 Line 2	[...] These procedures should be prepared for all activities performed by the operating personnel for all operational states of the reactor as well as in	Please include transition phase and the decommissioning phase.			X	Decommissioning is out of scope and is covered elsewhere. See SSG-47.

			<u>transition phase and decommissioning phase</u> and, where appropriate, for experiments and for the handling of fuel assemblies or other core and reflector components, including experimental devices.				
72.	USA 20	6.30	Revise beginning of paragraph to be a direct quote of 2 sentences in SSR-3 para. 7.69: “In accordance with requirements of the management system...shall include acceptance criteria.” Also, revise last sentence to “Maintenance procedures should incorporate the requirement of a work permit as a prerequisite to performing the maintenance.”	Revise for clarity and better understanding of requirements vs. recommendations.	X		
73.	Germany 19	6.32 Line 3	[...] It should be ensured that the updated <u>current</u> versions of drawings and manuals are used.	To clarify that not only any updated version is mentioned, but that the newest version must be used.	X		
74.	Germany 20	6.33	Maintenance procedures should specify that the results of maintenance, <u>periodic testing</u> and inspection should be assessed by properly qualified personnel	Clarification	X		
75.	Germany 21	6.38	The frequency of the surveillance <u>maintenance, periodic testing and inspection</u> activities should be stated and should be based on:	Bringing in accordance with Paras 1.11, 3.7 etc. Or, if the Statement from SSR-3 is primary one (see Para 3.1 with quotation) please	X	The frequency of the <u>periodic testing and inspection</u>	For consistency with the section heading. Maintenance is

			— Experience gained from previous <u>surveillance maintenance, periodic testing and inspection</u> results;	make changes in all the document accordingly		activities should be stated and should be based on: — Experience gained from previous <u>periodic testing and inspection</u> results		covered in the previous section.
76.	Korea 8	6.38	6.38. The frequency of the <u>activities for maintenance, periodic testing and inspection</u> surveillance activities should be stated and should be based on:	It is necessary to add explanation for ‘surveillance activities’.		X		For consistency with resolution of comment 21 from Germany
77.	Germany 22	6.41	Periodic testing procedures should have provisions for resolving non-conformances with the OLCs.	Wording	X			Comment not clear
78.	Germany 23	6.46	Radiation protection provisions for those personnel operating the reactor, conducting maintenance, and periodic testing, <u>inspection</u> or performing experiments should be included in each of the relevant procedures and, if necessary, in the work permits for their implementation.	Clarification	X			
79.	Japan 2	6.51.	Procedures for guiding the response of the operator to anticipated operational occurrences, and <u>design basis</u>	Duplication of 'beyond design basis accident conditions' and design extension conditions.	X			

			<p>accidents and, to the extent feasible, beyond design basis accident conditions, and, to the extent feasible, to design extension conditions should be prepared and should be periodically exercised. To improve their execution, the procedures should be reviewed periodically depending upon their safety significance and modified on the basis of operational experience and the performance of the exercises.</p>				
80.	Korea 9	6.52	<p>6.52. The procedures <u>for dealing with proposals for experiments</u> should be included with the operational procedures for the reactor.</p>	It is necessary to specify the procedures in detail.	X		Procedures for experiments are also covered in 6.70 to 6.73
81.	Iran EPreSC	5 Page 50/ subclause 6.53	<p>"Emergency procedures should be prepared, and they should be a component of the operating organization's emergency preparedness arrangements <u>for preparedness for, and response to, a nuclear or radiological emergency</u> as required by Requirement 81 of SSR-3 [1] and in accordance with IAEA Safety Standards Series No. GSR Part 7, Preparedness and Response for a Nuclear or Radiological Emergency [12]. Their development should be based</p>	<p>Considering GSR Part 7 and IAEA Safety Glossary, there is no definition for "emergency preparedness arrangements". Not so agree with the last four lines. There is no definition for "intervention staff" and "emergency facilities".</p>	X		

			<p>on the evaluation and analysis of all aspects of possible accidents in the safety analysis report as well as those additionally postulated for the purpose of emergency preparedness and response depending upon the hazard assessment. The procedures should specify the methods and duties of intervention staff and the emergency actions that are necessary to mitigate the possible consequences of the emergency. The emergency procedures should describe in detail the actions to be taken by emergency workers in an emergency. They should refer to the emergency response facilities, emergency services, response organizations and emergency equipments.</p>				
82.	Iran EPreSC	6 Page 50/ subclause 6.54/ First and second lines	<p>"Emergency drills and exercises should be periodically conducted. On the basis of experience gained from the performance of the drills exercises, the procedures,,,"</p>	According to Requirement 25 of GSR Part 7 and subclause 7.92 of SSR-3	X "Emergency drills and exercises should be periodically conducted. On the basis of experience gained from the performance of the drills and	Experience from both drills and exercises would be useful.	

						exercises, the procedures,,,"		
83.	Turkey 8	6.54	First sentence can be written as "Emergency drills and exercises should ..."	Exercises should also be covered in this paragraph.	X			
84.	Turkey 9	6.55	"Law enforcement forces" can be used instead of "police forces".	More general expression can cover all the cases possible to be encountered.			X	Editorial
85.	USA 21	6.56	"...ambulance crews, etc.) in implementing the requirements of GSR Part 7 [12]. Further guidance is provided in..."	Revise for clarity. Also revise to make clear the specific "should" statement is not a requirement (does not appear to be a GSR Part 7 requirement).	X			
86.	Finland 4	6.57	PHYSICAL PROTECTION <u>SECURITY PROCEDURES</u>	Please see comment 5.21. Extra text is needed to cover all aspects of security.			X	Physical protection procedures are also required.
87.	Germany 1 WASSC	6.62	"At some research reactor facilities, the operating personnel and radiation protection staff handle, collect, process, account for, store <u>radioactive waste</u> and <u>is responsible that the waste is disposed</u> of <u>safely</u> . radioactive waste . In this case the procedures for radioactive waste are usually considered to be radiation protection procedures."	The old text creates the impression that personnel directly disposes radioactive waste which should not be the case.	X			
88.	USA 22	6.64	"...for ensuring the safety of activities during extended shutdown, in implementing Requirement 87... "	Correct typo, revise for clarity, and make clear the specific "should" statement is not a requirement.	X			

89.	Germany 24	6.64	Procedures should be prepared for the management of extended shutdown <u>as well as in transition phase and decommissioning phase</u> and for the provision of adequate resources for ensuring the safety activities during extended shutdown as per Requirement 87, para 7.124 of SSR-3 [1] <u>as well as in finally shutdown phase and decommissioning phase.</u>	Please include transition phase and the decommissioning phase.			X	Decommissioning is out of scope and is covered elsewhere. See SSG-47.
90.	Germany 25	6.67	Surveillance Maintenance, and <u>periodic testing and inspection</u> procedures to be used during extended shutdown periods for the reactor should be derived from the surveillance procedures for an operating reactor, with exemptions given for certain activities or strengthening of the procedures for others.	Bringing in accordance with Paras 1.11, 3.7 etc. Or, if the Statement from SSR-3 is primary one (see Para 3.1 with quotation) please make changes in all the document accordingly	X			
91.	Finland 5	6.72.	The following considerations should be addressed in the modification procedure: (a) Description and drawings of the proposed modification; (b) Justification of the need for the modification; (c) Design requirements and criteria; (d) Safety assessment supporting the modification, including influences on other systems;	Please replace physical protection with security.			X	Physical protection procedures are also required

			<p>(e) Manufacturing processes;</p> <p>(f) Installation processes;</p> <p>(g) The commissioning process;</p> <p>(h) Review and modification of existing operating procedures and the need for new procedures;</p> <p>(i) Updating of documentation (drawings, training materials, etc.);</p> <p>(j) Training requirements for reactor operators and support staff (including requalification and relicensing, if necessary);</p> <p>(k) Quality assurance requirements;</p> <p>(l) Requirements for the optimization of radiation protection;</p> <p>(m) Requirements for physical protection <u>security</u>;</p> <p>(n) Requirements for radioactive waste disposal.</p>				
92.	Germany 26	6.77 Line 4	[...] The procedures should require comparisons, where appropriate, with the pre--modification conditions to determine possible failures and to permit timely corrective action.	Wording	X		
93.	Ukraine 11	Page 54 above §6.80	MANAGEMENT SYSTEM PROCEDURES	The name of subchapter in the list in §5.21 is “(m) Management system procedures”. It is suggested to rename the subchapter from “ADMINISTRATIVE PROCEDURES” to			X 5.21 (m) reverted to Administrative Procedures. Administrative procedures are

				“MANAGEMENT SYSTEM PROCEDURES”.			a subset of IMS.
Section 7							
94.	Japan 3	7.3.	Replace “retraining programme” with “continuing programme.	To keep a consistency with NS-G-4.5, in which the term.		X ... continuing training programme	
95.	Finland 6	7.3.	Retraining in the use of procedures should be included in the retraining programme for operating personnel and others, and the frequency of the retraining programme should be specified. Retraining should be conducted according to a plan, and special attention should be paid to emergency procedures and infrequently performed procedures. Typical examples of these are: — Operation of the emergency core cooling systems; — Operation of the air cleaning system for the containment or the means of confinement; — Testing the leak rate of the leaktightness of the reactor building containment / confinement; — Handling of highly radioactive material under abnormal conditions; — Fuel shipment; — Emergency actions such as responses to a fire alarm or evacuation alarm in the reactor building, a personal injury, the release of airborne radioactive material and weather warnings; — Use of personal protective equipment.	Emergency procedures only for DEC?		X special attention should be paid to emergency procedures, including those for design extension conditions, ...	Revised in accordance with comment from France 1.

			— Emergency actions to be performed under design extension conditions						
96.	France 1	7.3	<p>...special attention should be paid to emergency operating procedures, including those for design extension conditions, and infrequently performed procedures. Typical examples of these are:</p> <p>-...</p> <p>- Use of personal protective equipment.</p> <p>— Emergency actions to be performed under design extension conditions</p>	Most of the bullet list is relevant for design basis accidents or design extension conditions		X	special attention should be paid to emergency procedures, including those for design extension conditions , ...		
97.	Germany 27	7.3 Line 7 New item	<p>[...]</p> <p>Typical examples of these are:</p> <p><u>— Executing of procedures to control of design basis accidents:</u></p> <ul style="list-style-type: none"> • Operation of the emergency core cooling systems; <p>Operation of the air cleaning system for the containment or the means of confinement;</p>	Missing in the list.				X	The list includes typical examples and is not meant to be exhaustive.
98.	Turkey 10	7.3	"alarms from the area radiation detectors" can be added to the expression in bullet #6.	Alarms from radiation monitoring equipment inside the reactor building should be covered in this section.				X	The list includes typical examples and is not meant to be exhaustive.
Appendix I									
99.	USA 23	I.1	Revise "research reactor, critical assemblies and subcritical	Currently implies that critical and subcritical assemblies are not				X	Retained for consistency with para 1.7

			assemblies” to “research reactor” (2 instances)	research reactors. Revise to clarify.				
100.	Germany 28	I.4.	REACTOR CORE CONFIGURATION <u>MANAGEMENT</u>	Clarification. Bringing in accordance to Para. 4.25			X	For consistency with USA comment 16
101.	USA 24	I.10	Add to list: “Environmental monitoring requirements”	Commonly included in OLCs.			X	Liquid or gaseous effluents are addressed in the list.
102.	USA 25	I.12	Add to list (2 items): “Maximum reactivity of secured (fixed) and non-secured (movable) experiments”, “Requirements related to consequences of experiment failure”	Commonly included in OLCs.			X	Redundant. experiments fixed or not fixed already covered in I.5 (g)
Appendix II								
103.	Germany 29	II.2	[...] (m) Procedures for <u>identification, removal and verification of devoiding</u> of foreign material;	The whole process is needed.		X	...Procedures for <u>identification, and removal of foreign material;</u>	
104.	Germany 30	II.2 New item	[...] (p) <u>Verification and test of pneumatic tube systems;</u>	Necessary to show the leak tightness of the systems in reactor and laboratories before operation.			X	Indicative list, not meant to be exhaustive.

105.	France 2	Appendix II	f) Credible reactor accident, including design basis accident (e.g. loss of primary coolant, abnormal release of radioactive material, rapid insertion of positive reactivity, significant fuel failure) and design extension conditions ; (g) Aircraft crash, sabotage or attempted sabotage; (g)(h) Response to design extension conditions.	Design extension conditions are credible accident: non-credible situations are not considered.	X			II.9
106.	USA 26	II.2	Add to list: “Control of environmental radiation exposure, such as procedures for environmental monitoring”	Commonly used procedures.		X Control of discharges to the environment and monitoring of radioactive material		For clarity
107.	Germany 31	II.8	[...] (b) Operator response to failures of experiments, <u>experimental systems or equipment</u> ;	One also need procedures if something is going wrong with experimental systems or equipment and which can affect the reactor.	X			
108.	Germany 32	II.9	[...] (c) Tornado, hurricane, typhoon, flood, <u>precipitation</u> or other weather related emergency;	OPEX has shown that precipitation was sometimes not analyzed conservatively enough and led to internal and external intrusion of rain water. So, it should be directly addressed.	X			

109.	Finland 7	II.10	<p>II.10. PHYSICAL PROTECTION PROCEDURES</p> <p>(a) Surveillance and alarm system tests for fuel storage areas;</p> <p>(b) Surveillance and alarm system tests for facility access points;</p> <p>(c) Required patrols and inspections during reactor operation and when the reactor is shut down;</p> <p>(d) Control of access to the facility (e.g. identification badges, door locks, closed circuit television monitoring systems, electronic card keys);</p> <p>(e) Preventing and/or coping with an unauthorized intruder;</p> <p>(f) Coping with an attack;</p> <p>(g) Coping with a civil disturbance.</p>	security			X	Physical protection is also required.
110.	Germany 33	II.13	<p>DECOMMISSIONING</p> <p>PROCEDURES TO SUPPORT PLANNING FOR <u>FINAL SHUTDOWN</u> AND DECOMMISSIONING</p>	Final shutdown is missing			X	Scope includes preparation for decommissioning. Decommissioning is covered in SSG-47.
111.	Germany 34	II.13	<p>[...]</p> <p>(a) Procedures for updating the initial <u>final shutdown</u> as well as decommissioning plan and associated documentation.</p>	Final shutdown is missing			X	See resolution to Germany comment 33 above.
112.	Germany 35	II.15 New item	<p>[...]</p> <p><u>(n) Accessibility to reactor site in case of external hazards</u></p>	One need procedures if the normal access is not available, like in			X	Not administrative. Part of

				cases due to earthquake or flooding				emergency procedures.
113.	Ukraine 12	II.15.	II.15.MANAGEMENT SYSTEM PROCEDURES	The name of subchapter in the list in §5.21 is “(m) Management system procedures”. It is suggested to rename the subchapter from “II.15. ADMINISTRATIVE PROCEDURES” to “II.15.MANAGEMENT SYSTEM PROCEDURES”.			X	5.21 (m) revered to Administrative Procedures. Administrative procedures are a subset of IMS.