Review of Safety Guide on "Format and Content of the Safety Analysis Report for NPPs" (DS449)
Addressing the comments provided by MSs *(Deadline to provide comments: 12 May, 2017)*

For the Review Committees (meetings of November, 2017)

<u>Comments provided</u>
On schedule: Thailand (n/c); Slovakia (2); Tajikistan (n/c); Mexico (n/c); Japan (35); Finland (43); Argentina (6); Russia (21); Sweden (support); Poland (33)
Close to DL: USA (30), Canada (21) // 2nd week: Hungary (5), France (7)
Later: Ukraine (20); Germany (80)

6 September, 2017

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
General comments							
Argentina 1	General		This draft is reasonably *well-cooked* and after discussion of comments sent by Member States at the forthcoming NUSSC meeting, I assume it will be approved shortly. The updated Safety Guide will be welcomed by States, particularly those that are starting with a nuclear power program.		*[Appreciated]*		
Sweden 1	General	*Acceptance of the Safety Guide.* *No changes requested*	Ringhals AB (part of Vattenfall AB) has reviewed the document and finds the structure (division into chapters) to be similar to Reg. Guide 1.70/1.206. For Ringhals AB this is welcome since the SARs of two of their PWR:s, Ringhals 3 and		*[Appreciated]*		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			Ringhals 4, to a large extent follow this structure. Ringhals AB finds that DS449 is relevant for the future development of their SARs. They furthermore finds the report to be fairly clear, to have the right scope and to contribute to stability. Ringhals AB also remarks that ENISS (European Nuclear Installations Safety Standards Initiative), in which Vattenfall is participating, follows the standards development of the Agency and that ENISS has commented on this draft in an earlier step. Finally, Ringhals AB notes that at this stage they have no further comments on the factual matter of the draft report.				
USA-G1	General	It appears that this standard template was developed to cover all reactor designs, i.e., traditional PWRs, BWRs, small modular reactors, gas cooled reactors, Sodium cooled fast reactors…etc. However, the document inherently assumes that this standard template is for PWRs. In reality, the template should be allied to both traditional PWRs and BWRs in the world, and, all other reactor type. From this perspective, it is recommended that IAEA reduce the scope of this			*Clarifications regarding BWR systems have been incorporated in several paras, mainly from chapters 5 and 10.* *As indicated in SCOPE, para 1.7, line 5*, "This Safety Guide was written to apply directly for water cooled reactors		

COMMENTS BY REVIEWER Reviewer: Country/Organization:			Page…. Of…. Date:	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		document to traditional PWRs. Or, revise this document significantly to cover all other designs. This observation is based on the review of Chapter 4, 6, 5 and 15. The following are two examples that show the details only for PWRs: 1. Many descriptions of the ECCS and decay heat removal systems are based on the PWR configuration. The discussion of emergency feedwater system on Page 31, Section 3.6.9 is another typical example of a typical PWR system. For a BWR system, this part of the description may not be necessary. 2. On Page 31, containment systems are discussed. However, for gas cooled reactor, this may not be needed.			and in particular for LWRs, although many sections may be applicable for other reactor types as well. The particular contents of the SAR for these reactor types will depend on the specific design of the NPP, which will determine how sections and subsections described in this Safety Guide are included in the SAR.		
USA-G2	General	*Practical elimination* of events are discussed in section 1.4, 3.3.21, and 3.9.6. However, it appears that the language used in this “Format and Content” Standard does not reflect what was included in the Standard SSR2/1 for the term *practical elimination*. If this is a guidance document for IAEA Standard SSR2/1, the US strongly recommends that it match the text in SSR2/1. The text below (from sections 1.4, 3.3.21, and 3.9.6) shows this inconsistency and selectively combines SSR2/1 text from			*The following changes will be incorporated to align the wording used in both documents:* *Paragraph 1.4, line 4, will be modified as follows::* *“*… external hazards, and the practical elimination of plant event sequences that ~~would~~ could result in		*Note: The terms* “early radioactive release or a large radioactive release” *are frequently used in SSR-2/1 (Rev.1), e.g. in paras 2.13 (4), 5.21A, 5.27, 5.31, 5.73, 6.28A and 6.68. There is no wording regarding “significant radioactive release” in SSR-2/1 (Rev.1)*

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		sections 2.11 and 5.31, and footnote 16. The text below emphasizes “possibility” and doesn’t mention the “extremely unlikely to arise” (the PRA aspect…). Footnote 16 form SSR2/1 states that “the possibility of certain conditions arising may be considered to have been ‘practically eliminated’ if it would be physically impossible for the conditions to arise or if these conditions could be considered with a high level of confidence to be extremely unlikely to arise.” This document also introduces text on “an early radioactive release or a large radioactive release” where SSR2/1 simply says “significant radioactive release”. The US recommends making these documents consistent: Here is the text from sections 1.4, 3.3.21, and 3.9.6: 2.4. The most significant changes made in this Safety Guide are those corresponding to the new safety requirements established in SSR-2/1 (Rev. 1) [3], in particular the requirements regarding design extension conditions, the strengthening of the independence and effectiveness of the different levels of defence-in-depth, the robustness of the plant against extreme external hazards, and the practical elimination of event			high radiation doses ~~a lead to an early radioactive release~~ or ~~in~~ a large radioactive release.” *Heading of para. 3.3.21 will be modified accordingly:* *Practical elimination of the possibility of plant event sequences ~~certain conditions~~ arising that could result in high radiation doses ~~lead to an early radioactive release~~ or in a large radioactive release.* *Paragraph 3.3.21, will be modified also, taking into account this comment and France-1:* 3.3.21. This ~~sub~~section should describe the approach used to identify the conditions which could lead to high		

COMMENTS BY REVIEWER Reviewer: Country/Organization:			Page…. Of…. Date:	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		sequences that would lead to an early radioactive release or a large radioactive release. The importance of addressing these changes was also strongly highlighted by the feedback of experience and lessons from the Fukushima Daiichi nuclear power plant accident. *Practical elimination of the possibility of certain conditions arising that could lead to an early radioactive release or a large radioactive release* 3.3.21. This subsection should describe the approach used to identify the conditions which could lead to an early radioactive release or to a large radioactive release and to summarize the design and operational provisions implemented to demonstrate the 'practical elimination' of the possibility of certain conditions arising that could lead to an early radioactive release or a large radioactive release (see SSR-2/1 (Rev. 1), para 5.31 [3]. 3.9.6. For reprocessed and irradiated fuel, information provided should include considerations such as appropriate provisions for radiation protection, criticality prevention, fuel integrity control, including special provisions to deal with failed fuel, fuel chemistry, fuel cooling, and arrangements for fuel consignment			radiation doses ~~an early radioactive release~~ and to summarize **(…)** implemented to demonstrate their 'practical elimination'[3] ~~of the possibility of certain conditions arising that could lead to an early radioactive release or a large radioactive release~~ (see SSR-2/1 (Rev. 1), para 5.31 [3].) 3.9.6. For reprocessed and … transport. Special attention should be devoted to the provisions to 'practical elimination' of conditions that could lead to an early radioactive release or a large radioactive release due to severe fuel damage in a spent fuel pool.		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		and transport. Special attention should be devoted to the provisions to ’practical elimination’ of severe fuel damage in a spent fuel pool.					
Canada 1	General *[See below, treated with para. 1.7]*		Suggest clarifying if report is applicable for a unit, plant or site as some sites could have different units with different designs.		*[Resolution treated with para. 1.7, see below]*		
Hungary security, comment 1	General	The draft practically does not contain the physical protection or nuclear security issues. There is no suggestion that these questions are included in a separate material or a classified part of PSR.	The security is an important safety issue.				*Security related aspects are mentioned in several chapters/paras of the Safety Guide, such as in Chapter 7, in 3.13.27-28, 3.17.8, 3.19.6 and 3.19.12. This Safety Guide was reviewed by NSGC and includes its recommendations*.
Germany 1	General	The expected content of SAR Chapter 5 “Reactor Coolant System and Associated Systems” is much more written for PWR rather than BWR.			*See resolution to USA-G1*		
Germany 2	General	The description of the information concerning I&C in Chapter 7 is more detailed compared to other chapters.			*Further detail is provided in some chapters/sections given its nature and the level of familiarity with corresponding guidance, e.g. chapters 7 and 18*		
SECTION 1. INTRODUCTION							

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
Russia 1	1.2, Line 2	"…Further requirements on documentation of the safety assessment in the form of a safety analysis report, its objectives, scope and level of detail and on updating the safety analysis report are established in Requirement 20 of GSR Part 4 (Rev. 1), paras 4.62 to 4.65 [2]. in which it is established that safety report presents the assessments and the analyses that have been carried out for the purposes of demonstrating that the NPP and associated activities is in compliance with the fundamental safety principles and the requirements established in GSR Part 4 (rev 1) publication, and with any other safety requirements established in national laws and regulations.	To add this para with the indication that according to requirements of the standard GSR Part 4 (Rev 1) the safety analysis report has to reflect requirements of this standard which have the general character, and requirements established in national laws and the regulations.			X	*Requirements paraphrase is not permitted/used in the Safety Guide. On the other hand, para. 1.2 is the second one of the Safety Guide, i.e. quite simplified in its nature and content.*
Russia 2	1.3, Line 1	1.3 This Safety Guide supersedes the guidance provided in the previous version detail information of which reflects compliance with IAEA standard requirements.	To add this sentence with the indication on that the detail of information provided in the mentioned IAEA Safety Guide reflects compliance with requirements of standards of IAEA. At the same time national safety analysis reports have to reflect, first of all, compliance to the national legislation and the regulation requirements.			X	*The use of this sentence is generic in the Safety Guides and its extension is unnecessary. The additional idea suggested is presented with further level of detail in other sentences of the paragraph.*
Russia 3	1.3, Line 5	"…In particular, the Safety Requirements on design and on commissioning and operation of nuclear power plants have been revised as SSR-2/1 (Rev. 1) Safety of	Along with the SSR-2/1, SSR-2/1 and NS-R-3 standards (Rev 1) which provided progress of			X	*Addition of GSR Part 2 would be correct and consistent, as indicated in the rationale provided. However, the*

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		Nuclear Power Plants: Design [3] and SSR-2/2 (Rev. 1) Safety of Nuclear Power Plants: Commissioning and Operation [4], and the safety requirements on site, evaluation for nuclear installations have been revised as NS-R-3 (Rev. 1) Site Evaluation for Nuclear Installations [5] and Leadership and management for safety have been developed as GSR Part 2 [X]. SSR-2/1 (Rev. 1), SSR-2/2 (Rev. 1), and NS-R-3 (Rev. 1) and GSR part 2, together with the other safety requirements revised and applicable to this Safety Guide, establish significant enhancements of the safety of a nuclear power plant, which is to be adequately demonstrated in the safety analysis report."	approaches to safety of the NPP specified in these sentences and which is the basis for development of the considered draft it is necessary to include in their number the GSR Part 2 standard Leadership and management for safety". This standard made basic changes to approach related to account of a human stages of life cycle of the NPP for the purpose of implementation of the fundamental principle 3 with the same name.				*rationale might apply also to other general and specific Safety Requirements revised affecting significantly some chapter/s of the Safety Guide. This para. seems sufficiently detailed with the examples included and should not be exhaustive, is for that is indicated "*…together with the other safety requirements revised and applicable to this Safety Guide. …". *The relevance of and the need to comply with GSR Part 2 requirements is clearly stated in 3.17.1*
Poland 1	1.4 page 1	---	Please state/add comment to the paragraph why the order of chapters and split of the text is different than in the previous guide GS-G-4.1.			X	*The explanation is provided in the second sentence of para. 1.3:* "…The update reflects good practices and experience from the use of safety analysis reports for newly built nuclear power plants in different States; …"
Canada 1	General *[Treated*		Suggest clarifying if report is applicable for a unit, plant or site as some sites could have		*(See resolution to Russia 4, para. 1.7).* *This Safety Guide*		

COMMENTS BY REVIEWER Reviewer: Country/Organization:			Page…. Of…. Date:	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
	with para. 1.7]		different units with different designs.		*applies to a single unit, although in case of multi-unit sites the adverse effects of the other units are taken into account (e.g., see SSR-2/1 (Rev.1), para. 5.15B and Req 33).*		
Russia 4	1.7, End of line 2	"…In accordance with current practices. ~~multiunit nuclear power plants having the same unit design have a common safety analysis report and. t~~This Safety Guide applies also in seeking authorization of ~~this kind~~ the separate unit of multi- unit nuclear power plants.	The statement in this sentence declares that in accordance with current practices multi-unit plants with the same unit design have the common safety analysis report applied in seeking authorization of such plants. This statement is unacceptable, at least, for some IAEA member States. Each unit of multi-unit plant, irrespective of its design is under construction and commissioning individually and therefore has to have the separate safety analysis report and get separate authorization at all stages of life cycle. Besides, separate units of multi-unit nuclear power plant are under construction and commissioning not at the same time and in the course of construction of them there can	X	*Paragraph 1.7 will be modified as follows:* "… nuclear installations or facilities. In accordance with current practices, ~~multi-unit nuclear power plants having the same unit design have a common safety analysis report and~~ this Safety Guide applies also in seeking authorization of units ~~this kind~~ of a multiple ~~multi-~~unit nuclear power plant~~s~~. This Safety Guide was written …"		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			be specific features even at identical initial design, which have to be reflected in the safety analysis report. It is one more reason of why such report cannot be common. According to this, it is necessary to correct edition of this sentence.				
Ukraine-1, comment 1	1.9	1.9. Although intended mainly for use for new nuclear power plants, the guidance presented in this Safety Guide should also be used, as far as practicable, for existing nuclear power plants when the operating organization reviews the existing safety analysis report to identify any areas ~~in which~~ of improvements ~~of the safety analysis report may be appropriate~~, updates the safety analysis report to reflect the state of knowledge of the methods for safety assessment and safety-related activities are performed during the lifetime of existing nuclear power plants.”	It is proposed to specify and extend the application of the Safety Guide for existing nuclear power plants. As far as practicable, the SG should also be used when the operating organization updates SARs for existing NPPs during the nuclear power plant lifetime to reflect the state of knowledge of the methods for safety assessment and safety-related activities. The proposed text will allow the SAR for existing NPPs to condier new safety requirements established by SSR-2/1 (DEC, cliff-edge effect, etc.) and relevant safety upgrades implemented to fulfill them (that were not in the GS-G-4.1).			X	*Paragraph 1.9 has descriptive nature and does not provide guidance. The level of detail seems sufficient and covers the idea indicated in the comment. Addition of the suggested part would make the sentence too long and difficult to understand.*

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
SECTION 2. GENERAL CONSIDERATIONS							
Russia 5	2.2, Line 7	"…The safety analysis report should reflect design which taking ~~take~~ into account the whole set of applicable rules, including principles for their hierarchical application with specified process to resolve potential differences that may arise between alternative rules. ~~If a hierarchic set of applicable rules has not been previously established, such a set should be established for the purpose of the safety analysis report development and afterwards strictly followed throughout the entire life of the safety analysis report.~~ The universal principle of application of various rules consists that they can be applied regarding not contradicting national laws and the regulation requirements mandatory for application.	The set rules, the hierarchy of their application and specified process to resolve potential differences that may arise between alternative rules are considered at design of nuclear power plant. The safety analysis report has to reflect the approach accepted in the design. The universal principle of application of various rules consists that they can be applied regarding not contradicting national laws and the regulation requirements mandatory for application. Inthis regard the 5th sentence of this paragraph should be replaced with another, and - to modify the fourth.		*From line 7, para. 2.2 will be modified as follows:* "…The safety analysis report should present ~~take into account~~ the whole set of applicable rules, including principles for their hierarchical application with specified process to resolve potential differences that may arise between alternative rules. ~~If a hierarchic set of applicable rules has not been previously established, such a set should be established for the purpose of the safety analysis report development and afterwards strictly followed throughout the entire life of the safety analysis report.~~		
Russia 6	2.6 Line 6	"…~~The amount of information to be provided in the preliminary safety analysis report should depend on the extent to~~	This sentence in which it is claimed that the amount of information provided in the		*Last sentence of para. 2.6 will be put in footnote and*		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		~~which the proposed reactor design conforms to a generic or standard design for which the licensing process has been followed previously, including the associated safety analysis report.~~	safety analysis report has to depend on, whether the design is standard on which license process was already carried out, including the corresponding safety analysis report, is necessary to be excluded. Amount of information presented in the safety analysis report has to be full according to national requirements and on anything not to depend. This report is necessary not only for licensing procedure, but also for the subsequent operation as a license basis.		*modified as follows:* "... specific aspects[(3)]" ***Footnote***: "(3) In some cases (e.g. in states deploying a given reactor design in several units), ~~T~~the amount of information to be provided in the preliminary safety analysis report might ~~should~~ depend on the extent to which the proposed reactor …"		
USA 1	2.7 New para after 2.7	2.7b Additional information obtained during the operational stage should be incorporated periodically into the FSAR. This information should include ….. *[authors insert]*. Particular attention should be given to documenting information that might affect the decommissioning of the installation.	The sentence on the FSAR should be expanded to describe what is the expected content, similar to other SAR discussions in 2.5-2.7		*Last sentence of para. 2.7 will be deleted and put as first sentence of a new para. that will be added:* 2.7A The Final Safety Analysis Report (FSAR) should contain revisions of POSAR. Additional information obtained during the		

COMMENTS BY REVIEWER Reviewer: Country/Organization:			Page…. Of…. Date:	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
					operational stage should be incorporated periodically into the FSAR. This information should include any plant modifications with their justification. Particular attention should be given to documenting information affecting the decommissioning of the installation.		
Finland 3	General comment concerning safety analysis report *[Treated with **para 2.7**]*	The Chapter: *Structure of the safety analysis report for various stages of the nuclear power plant life time* doesn't really consider safety analysis report and its updates for decommissioning. Final safety analysis report exist at the end of NPP operation. In 2.21.7 there is requirement for safety analysis report for decommissioning. There is probably a difference between these documents because the risks are different as the plant is not more in operation and the fuel is removed from the plant after suitable cooling period. IAEA should consider development of the guidance on the topic. At least list the possible differences between the FSAR and safety analysis report during decommissioning or refer to document, where this has been stated.			*A new para. will be added:* 2.7B. This Safety Guide specifies the periodic updates of the approach and associated conditions regarding the future nuclear power plant decommissioning (see Chapter 21). However, it does not specifically address the scope of the safety analysis report for an advanced decommissioning phase, when the nuclear fuel has been removed from the		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
					plant after a suitable cooling period,.		
Russia 7	2.8, lines 18 and 19	~~Chapter 17. Management systems;~~ ~~Chapter 18. Human factors engineering;~~ Chapter 17. Management for safety	Chapter 17 "Management system" and chapter 18 "A human factor engineering" should be combined in the form of chapter 17 "Management for safety". It is necessary for the comprehensive taking into account of requirements of the new standard of IAEA GSR Part 2 "Leadership and management for safety" and recommendations about their realization in the standard GS-G-3.1 "Application management system for facility and activity" and standard GS-G-3.5 "Management System for Nuclear Installations". The human factor is inseparably linked with activity at which it is revealed. There is activity of two types - realization of processes and management of them. To take the description of a human factor out of a context of the description of processes in which it is revealed is incorrectly. In this case the human factor turns into a certain abstraction and it			X	*The approach used regarding the format and content presented in chapters 17 and 18 of this Safety Guide is to separate the aspects associated with "quality assurance procedures" and with "engineering". In Chapter 18 is treated how the **design** of the plant takes into account the human factors. In Chapter 17 is treated "Management", which is only partially 'design' dependent.*

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			becomes difficult to influence it. Namely it is told about in para 2.32 of the standard GS-G-3.5 and practically the same in para 2.3 of GS-G-3.1. As for technological processes, the most part of the safety analysis report is devoted to their description. According to the unified description of systems, structure and components the description of such processes as operation, monitoring, inspections, tests and maintenance enters here. Here it is also necessary to reflect features of revealing of a human factor in these processes according to the unified description of processes which should be added to the Appendix II. As for control of technological processes, it is in details described in chapter 7 "Instrumentation and control". Here it is necessary to describe also the human-machine interface, and also other questions of interaction of the human and the machine interaction which				

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			should be excluded from chapter 18 combined with chapter 17. The general questions of a human factor and human factor in other processes which are not connected directly with the technology of the electric power production on nuclear power plant, such as planning, development of operational documentation, repair, recruit and training of the personnel, procurement of a new equipment and spare parts, etc. have to be considered in the offered new chapter 17 according to requirements of the mentioned IAEA GSR Part 2 standard and recommendations about application of the integrated management system in the GS-G-3.1 and GS-G-3.5 standards and the generic description of processes.				
Russia 8	2.10 Line 3	"…Examples of such chapters are "reactor", "reactor coolant and associated systems", "engineered safety features", "instrumentation and control", "electric power", "auxiliary systems and civil	The chapters specified in this sentence as the new in this draft - "operational limits and conditions", "management system", "emergency		*Paragraph 2.10 will be modified as follows:* 2.10. The proposed structure of the safety		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		structures", " steam and power conversion system".	preparedness", environmental aspects" and "decommissioning and end of life aspects" everything are contained in the previous version GS-G-4.1. Chapters which are new in the considered draft: "reactor", "reactor coolant and associated systems", "engineered safety features", instrumentation and control", "electric power", "auxiliary systems and civil structures", " steam and power conversion system" and "human factors engineering". As appropriate with taking into account comment in item 7 it is necessary to correct the text of the second sentence.		analysis report incorporates several ~~new~~ chapters, which were often ~~traditionally either missing in the safety analysis report or~~ covered by separate documents. Examples of such chapters are “operational limits and conditions”, “management systems”, “emergency preparedness”, “environmental aspects” and “decommissioning and end of life aspects”. ~~Also, the chapter “safety analysis” includes both deterministic and probabilistic safety analysis.~~		
Russia 9	2.11 Title	UNIFIED DESCRIPTION OF THE DESIGN OF PLANT SYSTEMS AND PROCESSES	To add heading with words: "and processes". All processes directly or indirectly influencing safety also have to be described with emphasis for a role in them of a human factor and measures for prevention of its adverse			X	*Extension of the title would incorporate confusion, since only processes associated with specific systems are described, not the processes related to the whole plant. The information about the*

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			emergence. Requirements to such description can be presented in the Appendix II where sections II.8 and II.10 are devoted to the description of processes. They need to be added with a role in these processes of a human factor.				*processes is given in Chapter 13 (conduct of operations).*
Russia 10	2.11, Line 1	2.11 In general, all plant systems and processes that have the potential to affect safety should be described in the safety analysis report.	To add this sentence with words: "and processes". The reason - see the comment in the item 9			X	*See Resolution to Russia 9*
Russia 11	2.11, Line 2	"…The amount of information to be included in the safety analysis report about them depends on the particular type and design of the reactor selected for construction and shall be sufficient for judgement about compliance described systems to national laws and regulation mandatory for application.	To add this sentence with the indication that the amount of the provided information has to be sufficient to judge about compliance of the described systems to national laws and regulation mandatory for application.		*(Combined with Germany 3)* *The para. will be modified as follows:* "…The type ~~amount~~ of information to be included in the safety analysis report about each plant system ~~them~~ depends on the particular type and design of the reactor selected for construction and should be sufficient to review their compliance to the national laws and		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
					regulation mandatory for application.		
Germany 3	2.11	2.11. In general, all plant systems that have the potential to affect safety should be described in the safety analysis report. ~~The amount of information to be included in the safety analysis report about them depends on the particular type and design of the reactor selected for construction.~~ (…)	This sentence is misleading. The required information should not depend on a particular reactor design. The required information in any case shall be sufficient to review that a safe operation of the proposed reactor will be possible. The last two sentences of para. 2.11 and in addition para. 2.12 explain sufficiently what is expected in the SAR.		*Combined with Russia 11, see the resolution there*		
Russia 12	2.12 Line 5	"…content is provided in Appendix II. Requirements to the description of processes can be presented in the same appendix	To add this para with the indication that requirements to the description of processes can be presented in the same appendix			X	*See Resolution to Russia 9*
USA 2	2.12, line 4	Change "systems" to SSCs "… In order to ensure consistency and comprehensiveness in the description of all the ~~systems~~ SSC's or equipment important to safety, a common structure with more ..."	Since SSC was used on line 1, use of "systems" in line 4 implies comprehensiveness is not applicable to structures or components.	X			
USA 3	2.13, line 1	Change "~~to the licensing and to provide public~~" to "to licensing, and also should provide public" 2.13. The use of the safety analysis report should not be limited ~~to the licensing and to provide public~~ to licensing, and also should provide public assurance regarding the	Clarify and revise; confusing sentence structure.		*First sentence of para. 2.13 will be modified as follows:* 2.13. The use of the SAR should not be limited to ~~the~~ licensing ~~and to~~		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		safety of the plant prior the operation.			providing ~~provide~~ public assurance regarding the safety of the plant prior the operation.		
Slovakia 1	2.15 Line 1	2.15 ~~Ideally, t~~The Safety Analysis report should correspond to the current plant status at all times. Ideally the report is continuously updated to reflect on plant modification that have an impact on nuclear safety in the frame of plant modifications process in accordance with NS-G2.3, paras 11.2 and 11.3 [37]. Since … "	This is an actual practice in NPPs		*Resolution to the comments Slovakia 1 and 2 plus Russia 13.* *Paragraph 2.15 will be modified as follows:* 2.15. The SAR should be consistent with the plant configuration over the plant lifetime. Therefore the SAR should be updated in timely manner to reflect plant modifications that have an impact on safety in accordance with NS-G-2.3, paras 11.2 and 11.3 [11]. It is considered a good practice to update SAR once a year. ~~Ideally, the~~ SAR~~should correspond to the current plant status at all times. Since such ideal situation is difficult to achieve, it is considered a good practice to update the~~ SAR ~~once a year, e.g. by replacing affected parts of the~~ SAR ~~by the corresponding new versions. As a minimum, updating of~~		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
					~~the~~ SAR ~~should be a part of the periodic safety review usually scheduled every ten years (see SSG-25 [10]).~~ However, it is essential that all the activities that could impact the validity of the SAR are clearly identified and controlled by procedures that include a requirement to ~~timely~~ review the impact of each activity~~event~~. The full impact of any modification on the safety of the NPP should be evaluated and submitted to the regulatory body for approval before being implemented. ~~The SAR should be updated in timely manner to reflect the current state of the plant configuration~~.		
Slovakia 2	2.15 Line 1	"… Since the achievement of such ideal situation ~~is difficult to achieve~~ depends on the plant configuration management system implemented by the operating organization (see requirement 10 from SSR-2/2 (Rev . 1) (4]). It is considered a good practice to update the safety analysis report once a year, e.g. by replacing affected parts of the safety analysis report by the corresponding new versions.	E.g. the usual practice is that the NPP operating organization has implemented a system to ensure consistency between design requirements, physical configuration and plant documentation. In case of plant modifications that have an impact on nuclear safety the affected part of SAR		*Treated in combination with Slovakia 1 and with Russia 13. See the resolution in Slovakia 1*		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			and all related documentation have to be updated and approved by the regulatory body before the modification is implemented. When the intended modification is completed,the updated part of SAR is consequently replaced in all official copies of SAR .				
Russia 13	2.15,	2.15 ~~Ideally, T~~The safety analysis report should correspond to the current plant status at all times. ~~Since such ideal situation is difficult to achieve, it is considered a good practice to update the safety analysis report once a year, e.g. by replacing affected parts of the safety analysis report by the corresponding new versions. As a minimum, updating of the safety analysis report should be a part of the periodic safety reviewusually scheduled every ten years (see SSG-25 [10]). However~~, It is essential that all the activities that could impact the validity of the safety analysis report are clearly identified and controlled by procedures that include a requirement to timely review the impact of each event.	Changes have to be made to the safety analysis report every time when there are changes, important for safety at plant. Therefore sentences 2 and 3 should be excluded, as not corresponding to this provision, and in sentences 1 and 4 to exclude unnecessary words: "Ideally" and "However".		*Treated in combination with Slovakia 1 and 2. See the resolution in Slovakia 1*		
Canada 2	2.15.	Suggest adding a note which states and explains an interface of the Safety Analysis Report as per the current guide and Periodic Safety Reviews per SSG-25 (e.g. SF reports, GAR and IIP should be included in				X	*SSG-25 is provided as a Reference in the text*

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		safety analysis report).					
Germany 4	2.15	(…) However, it is essential that all the activities that could impact the validity of the safety analysis report are clearly identified and controlled by procedures that include a requirement to timely review the impact of each event. ~~The full impact of any modification on the safety of the nuclear power plant should be evaluated and submitted to the regulatory body for approval before being implemented.~~ The safety analysis report should be updated in timely manner to reflect the current state of the plant configuration.	Sentence on modification not needed and is out of the scope of DS449. Modifications and the procedures to be followed are described in NS-G-2.3. This sentence does not provide further guidance on the format and content of the SAR. Furthermore, involvement of the regulator depends on the safety significance of the proposed modification, see NS-G-2.3 paras 4.3 – 4.7.			X	*This sentence refers to the need of updating the SAR after modifications 'relevant to safety'*
USA 4	2.20, Line 2	Delete "most" from "important safety materials" *Interpretation by TO:* "…The ~~most~~ important supporting materials should be referenced…"	Use of "most" is too subjective and could limit referencing of safety significant information.	X			
Finland 5	2.23. Line 3	2.23. Consistency and continuity of information provided in different licensing documents as well as in subsequent stages of the safety analysis report should be ensured in accordance with GSR Part 1 (Rev. 1), para 4.28 [1]. In case a subsequent stage of the safety analysis report ~~provides more pessimistic results~~ indicate decline of the safety level as the information is improved or changes have been made than the previous stage, the changes incorporated should be justified. Any significant differences between information provided in these documents should be explained and justified.	Please clarify, Pessimistic results is ambiguous expression.		*Comment treated taking into account Poland 2 and Germany 5.* *This part of the para. 2.23 will be modified as follows:* "…~~In case~~ If a subsequent stage of the SAR indicates different results in comparison with those from ~~provides more pessimistic results than~~ the		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
					previous stage, as the information is improved or changes have been made, the changes incorporated should be explained and justified. ~~Any significant differences between information provided in these documents should be explained and justified.~~		
Poland 2	Para 2.23 Line 3	"…In case a subsequent stage of the safety analysis report provides ~~more pessimistic~~ different results than the previous stage, the changes incorporated in the plant design, initial input data, analysis methodology, used calculation codes and acceptability criteria should be described and analyzed to identify reasons for these differences and estimate their impact ~~justified~~. Any significant differences between information provided in these documents should be explained and justified."	In case a subsequent stage of the safety analysis report provides different results compared to previous one, i.e. the consequences of transient or accident are less or more stressful, it is important to identify the reasons for such differences and evaluate their impact. Incorporated changes must be justified, especially if less conservative approach has been implemented. All the changes in the plant and SSC design, input data, calculation codes and the methodology should be explained and justified.		*See resolution to the comment: Finland 5*	X	*Not necessary to include this detail, which at its turn would need further elaboration.*
Germany 5	2.23	In case a subsequent stage of the safety analysis report provides more pessimistic results than the previous stage, the changes	The term "significant" is not well defined and let too much freedom of interpretation.		*See resolution to the comment: Finland 5*		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		incorporated should be justified. Any ~~significant~~ differences between information provided in these documents should be explained and justified.	Especially in case of more pessimistic results in the subsequent stage of SAR, it is necessary to justify all differences between information provided in these documents.				
USA 5	2.24 Line 6	"…Change "safety or lead to" to "safety, security, or lead to" *[TO:* "…nuclear power plant safety, security, or lead to violation of intellectual property rights. At the same time, it is also understood …"*]*	Security is an important but separate consideration for restricting SAR information.	X			
Germany 6	2.24 Line 3	The latter may include limitations of access to certain parts of the safety analysis report, to ensure that the information publicly available will not disclose data which could be misused for malicious acts endangering nuclear power plant safety or lead to violation of intellectual property rights, business or industrial secrets. At the same time, it is also understood that intellectual property rights business or industrial secrets should not impede a comprehensive review of the safety analysis report by the regulatory body, which should have access to all information deemed necessary to perform its function.	Indeed, the proper treatment of sensitive and confidential information in SAR is very important.		*Taking into account NSS-23, this para. will be modified as follows:* " … of intellectual property rights, business or sensitive information. At the same time, it is also understood that intellectual property rights, business or sensitive information should not impede a comprehensive … " "~~CONFIDENTIAL~~" *will be also deleted in the title.*		
Germany 7	2.24	(…) In some states a safety report for public consultation will be prepared in addition to	It is seen as a good practice that in some states in addition		*(See resolution to Germany 6).*		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		the safety analysis report used by the regulatory body. The public version should not contain any restrictive information.	a "safety report" will be prepared. This report does not contain restrictive information and is used for informing the public. This report is not intended to be used by the regulator for review and assessment.		*At the end of para. 2.24 it will be added:* "In addition to the safety analysis report used in the licensing it might be convenient to prepare a safety report for public consultation; in that case the public version should not contain any sensitive information."		
SECTION 3							
CHAPTER 1. INTRODUCTION AND GENERAL CONSIDERATIONS							
Internal review	3.1.1 Bullet (a)	*Before the existing bullet (a), to incorporate a new bullet (a) indicating:* (a) Identification of the purposes of the installation, justifying the need for energy and the choice of the nuclear option;	Although power generation is the typical purpose of a NPP some other additional purposes may apply, in which case should be mentioned (e.g. water desalination or heat/steam generation).		*The items included in para. 3.1.1 will be modified as follows:* "(a) Identification of the purpose of the installation, justifying the need for energy and the choice of the nuclear option; (~~a~~b) A statement of the main purpose of the SAR;"		
Germany 8	3.1.4 Headline before	**Information on the plant layout and other aspects**	To clarify that the plant layout should be addressed and not the layout of the SAR.	X			

COMMENTS BY REVIEWER Reviewer: Country/Organization:			Page…. Of…. Date:	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
Germany 9	3.1.5.	3.1.5. The main interfaces and boundaries between on-site equipment with equipment and systems external to the plant should be described. It should be clearly described which external equipment is in the responsibility of the operating organization and where the operating organization depends equipment in the responsibility of third parties.	To clarify the responsibility of the operating organization and dependencies on third parties. This information is also important for the regulator to identify possible negative impacts on nuclear safety. Examples are sometimes the transformers and off-site grid or dykes for flood protection.		*This para. will be completed as follows:* "… to the plant should be described. Regarding external equipment it should be clearly specified additionally, which one is under the responsibility of the operating organization and what other is under the responsibility of other organizations."		
Poland 3	Para 3.1.6 Lines 2 and 3	"3.1.6 This section may also refer to confidential information on the provisions made for the ~~physical protection~~ nuclear security of the plant. It may also include appropriate coverage of the steps taken to provide protection in the event of a malicious criminal act on or off the site."	"Physical protection" is outdated term. According to "IAEA Safety Glossary. Terminology Used in Nuclear Safety and Radiation Protection" instead of "Physical protection" the term "Nuclear security" should be used.		*(See resolution to Germany 6 about para. 2.24).* *This para. will be modified as follows:* "3.1.6 This section may also refer to sensitive ~~confidential~~ information on the provisions made for the ~~physical protection~~ security of the plant. It may also include appropriate coverage of the steps taken to provide protection in the event of a malicious act on or off the site."		*Notes:* *The term* "security" *includes* "nuclear security". "Malicious act" *is the term used in the security glossary.*
Germany 10	3.1.7	This section should provide a general	To clarify that a description of		*This part of the para.*		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		description of the plant, including overall safety philosophy, ~~current~~ (to be) applied safety concepts and a general comparison with appropriate international practices. (…)	the actual safety concept of the plant is expected.		*will be modified as follows:* "…safety philosophy, ~~current~~ safety concepts to be applied and a general comparison …"		
Germany 11	3.1.8.	3.1.8. The section should briefly present (e.g. in a table) the principal elements of the plant, including the number of units, ~~where appropriate,~~ the type of the reactor, the principal characteristics of the plant, …	The requested information are basic information and should be always presented. Even for a site permit a rough description of the envisaged reactor project should be provided.	X			
Canada 3	3.1.11 Line 2	3.1.11 All operating modes of the nuclear power plant should be described, including startup, power operation, shutting down, shutdown (including long term shutdown), maintenance, testing, refuelling and any other allowable modes of normal operation, including load-following operation. ... "	Long term shutdown for refurbishment might create a specific case which might be in between of construction and maintenance.	X			
CHAPTER 2. SITE CHARACTERISTICS							
Poland 4	3.2.1 Line 4	"Chapter 2 should provide information on… characteristics of external human induced ~~events~~ hazards, in conjunction with the information on the radiological dispersion characteristics of the site and surrounding environment…"	Editorial remark. Human activities induces hazards, which not necessary should evolve to events. See paragraph 3.2.10: *"…detailed evaluation of natural and human induced hazards at the site to be taken into account…".*	X			
USA 6	3.2.1, Lines 1-3	"Chapter 2 should provide information on the geologic (Including geometry, age, and	[1] Capturing information on faulting under geologic		*Paragraph 3.2.1. will be modified as*		*3.2.1 is the first para. of the chapter (more*

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		displacement of faults), lithologic, tectonic, seismic (including earthquake recurrence interval), volcanic ... characteristics of the site and surrounding region ...“ *Interpretation (TO):* “3.2.1 Chapter 2 should provide information on the geologic~~al~~ (including ~~fault displacement~~ geometry, age, and displacement of faults), ~~volcanic, hydrological (including flooding)~~ lithologic, tectonic, seismic (including earthquake recurrence interval), volcanic ... characteristics of the site and surrounding region ...“	characteristics because data for characterization of faults as specific seismic sources are geologic in nature. [2] Added lithologic characteristics because rock type influences the feasibility of non-tectonic deformation (e.g., collapse due to dissolution of limestone). [3] Added earthquake recurrence interval to seismic characteristics, even though data for assessing earthquake recurrence are geologic in nature, to capture seismic source zones that might not be characterized by mapped known faults. [4] Used “geologic” rather than “geological” and “seismic” rather than “seismological” to keep those characteristics parallel in labeling with “volcanic”.		*follows:* “3.2.1. Chapter 2 should provide information on the geological, seismological ~~(including fault displacement)~~, volcanic, hydrological ~~(including flooding)~~, meteorological and geotechnical characteristics of the site…”		*general). Suggested specifics are provided in other paras (e.g. 3.2.4). Not all the detail indicated is necessary. The term* “lithologic” *is not used in the Safety Standards (SSG-9, SSG-3.5, Safety Glossary).* “Geological” *is the term used in the Safety Glossary*
USA 7	3.2.1, End of paragraph	Sentence to consider adding at end of existing paragraph: “Information on geologic, lithologic, tectonic and geotechnical characteristics of foundation materials at a specific site location can best be acquired by detailed	The suggested sentence shows the importance of a detailed investigation of foundation materials at a site, which in the US as an example. is imposed on a licensee by the regulator (NRC) through the Geologic			X	*See resolution to USA-6.* *References included provide specific guidance (e.g. [14] and [15])*

COMMENTS BY REVIEWER Reviewer: Country/Organization:			Page…. Of…. Date:	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		geologic mapping of excavations for safety-related engineered structures."	Mapping License Condition. That license condition requires a licensee to [a] perform detailed geologic mapping of excavations for safety-related structures; [b] examine and evaluate geologic features discovered in the excavations; and [c] notify the NRC once the excavations are open for examination by NRC staff. NRC staff members conduct QA inspections to confirm the licensee's conclusions that potentially detrimental geologic features do not occur in the excavations for safety-related structures by directly examining the excavations in the field and comparing what is observed with the information shown on the licensee's geologic maps. Staff considers that this approach provides sufficient data for an independent evaluation to assess site characteristics of foundation materials that could potentially affect safety of the plant.				
Germany 12	3.2.1	Chapter 2 should provide information on the ~~geological, seismological (including fault displacement), volcanic, hydrological (including flooding), meteorological and~~	The list of natural hazards is too detailed. Some natural hazards are mentioned explicitely, while human-		*See resolution to USA-6*		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		~~geotechnical~~ site specific characteristics of natural hazards ~~the site~~ and the surrounding region and characteristics of external human induced hazards ~~events~~, in conjunction with the information on the radiological dispersion characteristics of the site and surrounding environment, the present and projected population distribution and land use that is relevant to the safe design and operation of the plant.	induced are only in general. A more detailed list is already included in para. 3.2.4 a). Replace external human induced events be external human induced hazards.				
Japan 1	3.2.3	3.2.3 Site characteristics that may affect the safety of the plant should be investigated and the relevant results of the corresponding assessment should be included in this chapter (see NS-R-3 (Rev. 1) (DS484 Step5) [5], NS-G-3.1 [12], NS-G-3.2 (DS427 Step 11) [13], NS-G-3.6 [14], SSG-9 [15], SSG-18 [16], SSG-21 [17] and SSG-35 [18].	Completeness. NS-R-3 (Rev. 1) is being revised as DS484.		*In Section* „REFERENCES“, *Reference* [5] *will be modified as follows:* „… Series No. NS-R-3 (Rev. 1), IAEA, Vienna (2016). *[Note: DS484 (Step 8 in July 2017), Site Evaluation for Nuclear Installations, complete revision of NSR-3 and establishment of SSR-1]*		*Status of revision of references is not provided in the main body of the Safety Guides*
USA 8	3.2.4, Bullet (a), Lines 1&2	(a) "Site-specific hazard evaluation for external events of natural origin (e.g., earthquakes, surface deformation related to tectonic (i.e., faulting) and non-tectonic causes, ..." *TO's interpretation:* (a) "Site-specific hazard evaluation for external events of natural origin (~~such~~	Replacing "surface faulting" with "surface deformation related to tectonic (i.e., faulting) and non-tectonic causes" to capture both tectonic faulting and such non-tectonic events as subsurface limestone dissolution that		*Comment combined with USA-10.* *Bullet (a) will be modified as follows:* *"a)* Site specific hazard evaluation for external events of natural origin (~~such~~		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		~~as~~ e.g., earthquakes, ~~and~~ surface ~~faulting,~~ deforrmation related to tectonic (i.e., faulting) and non-tectonic causes, ...”	could result in surface deformation. This suggested change reflects how both tectonic and non-tectonic surface deformation are captured in the SRP (NUREG-0800).		~~as~~ e.g., earthquakes, ~~and surface faulting~~, surface deformation related to tectonic (i.e., faulting) and non-tectonic causes, meteorological events, flooding, geological ~~geotechnical~~ and volcanic hazards, and hazards from …”		
USA 10	3.2.4 (a) (original), 2nd line	“… (a) Site specific hazard evaluation for external events of natural origin (such as earthquake hazards and surface faulting, meteorological events, flooding hazards, ~~geotechnic~~al geological and volcanic hazards, and hazards from biological organisms) and …	Geotechnical is not a hazard; rather, it includes site soil and/or rock characteristics and analyses to design against hazards.		*Comment combined with USA-8, see resolution there*		
USA 11	Section 3.2.4 (a) (original), 3rd and 4th lines	… human induced origin (such as aircraft crashes, ~~and~~ chemical explosions and activities at nearby industrial and military facilities);	Hazards from nearby industrial and military facilities may pose significant hazards to a nuclear power plant operation. This will lead to the discussion given in Section 3.2.18.		*Last part of bullet (a) will be modified as follows:* “ … human induced origin (such as aircraft crashes and chemical explosions from activities performed at nearby facilities (industrial and other facilities));		
Finland 1	Comment provided as	According to section 3.2, e.g., point 3.2.4 I the design basis for external events should	For clarity and to facilitate updates throughout the whole		*Item 3.2.4. (c) will be deleted, since it is*		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
	"General", treated in 3.2.4 (c)	be presented in CHAPTER 2 of the SAR, and according to point According to section 3.3, e.g., point 3.3.36 quantitative design parameters of individual hazards should be presented in CHAPTER 3 of the SAR. The design basis for external hazards should be presented only in CHAPTER 3 in connection with other design basis information.	lifetime of the NPP, the design basis of SSC should be presented in one chapter only. CHAPTER 2 should describe only the site, so that the same text can be used in the SARs of different installations at the same site.		*covered by 3.3.36:* ~~(c) Definition of the design basis of an SSC for external events, depending on the safety importance of each SSC, including consideration of adequate margins;~~		
USA 9	Section 3.2.4 (d) *to be placed as (a)*	(a~~d~~) Collection of site reference data for the plant design (geological, seismological, geotechnical, volcanic, hydrological and meteorological); [currently labeled as (d)]	Collection of site reference data, as described in (d), may come first in the list of information necessary. Information in (a) should be relabeled as (b) and similarly other items in 3.2.4.	X			
Germany 13	3.2.4 (d)	(d) Collection of site reference data for the plant design ~~(geological, seismological, geotechnical, volcanic, hydrological and meteorological)~~;	Relevant data for human induced hazards are also important for an appropriate design of the plant. It is proposed to deleted the bracket. Advice on natural hazards to be considered is already included in 3.1.2 a).			X	*It should be specified what kind of site reference data are collected here.*
USA 12	3.2.7, Last line	"… on the control of activities with the potential to affect plant operation, including nearby flight-related activities, flight exclusion zones, pipelines, roadways and waterways.	Information on these broad activities/areas are necessary to assess the potential hazards to the plant. Consultation with other parties is necessary to assess potential hazards.	X			
USA 13	3.2.8,	"… (airports, harbours, rail transport	Seems pipelines, roadways,	X			

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
	Line 3	centres, pipelines, roadways, waterways, factories and other industrial sites, schools, hospitals, police …”	and waterways are missing from the list where control of activities may be necessary.				
USA 14	3.2.18, Line 2 and 3	“… a detailed evaluation of the effects of potential accidents at industrial, military, transport or other installations in the vicinity of the site.	Activities at nearby large government facilities (e.g., military) could pose significant hazards to a plant operation.			X	*The term* “military” *is not used but* “other”
USA 15	3.2.24	The information given in this section should be prepared to allow the assessment of the transport of radionuclides in the groundwater and surfacewater system, the dispersion of radionuclides to the environment and the measures taken to preclude the release of radionuclides to the environment through characterization of hydrogeologic subsurface properties and surface water features.. *TO's interpretation of this comment:* 3.2.24 The information given in this section should be prepared to allow the assessment of the transport of ~~radioactive material to and from the site~~ radionuclides in the groundwater and surface water system, the dispersion of radionuclides to the environment and the measures taken to preclude the ~~transport of radioactive materials~~ release of radionuclides to the environment through ~~subsurface characteristics~~ characterization of hydro geologic subsurface properties and surface water features..	We believe the intended purpose of this text is to describe hydrologic characterization of the site for use in accidental radionuclide transport scenarios. Therefore, the text was clarified to that effect.	X	(“geologic” *replaced by* “geological”)		
USA 16	3.2.27, Line 2	“… wind speeds for straight and rotational winds including tornadoes (due to the sudden pressure drop that accompanies the	Tornado-generated missiles seem to be missing, which can pose significant hazard to a		*Combined with USA-17, see resolution in USA-17*	X	

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		passage of the center of a tornado) and associated tornado-generated missiles of debris, …”	plant.				
USA 17	3.2.27, Line 7	“…The potential for lightning and windborne debris to affect plant safety (including the design-basis missile hazard from hurricanes and tornadoes) should be considered, where appropriate.”	Paragraph 3.3.46 states that protection against all external missiles as identified in Chapter 2 should be included. This proposed change in Chapter 2 is intended to ensure that Chapter 2 contains information on external missile hazards. Note: we recognize that careful wording of the phrase “missile hazards” needs to be consistent throughout to alleviate future translation problems to ensure that “debris missiles” are deconflicted with “military missiles.”	X			
USA 18	3.2.28, Lines 1-4	3.2.28 “This section should provide information concerning the geologic, lithologic, tectonic, seismic, and volcanic characteristics of the site and a sufficiently large region surrounding the site. The evaluation of seismic hazard should be based on a suitable seismotectonic model substantiated by appropriate seismic evidence and geologic data.” *TO’s interpretation of this comment:* 3.2.28 “This section should provide information concerning the geologic~~al~~, ~~seismic and~~ lithologic, tectonic, seismic and	Suggested sentence parallels the topics specified in Section 3.2.1 to ensure consistency in regard to stating what information is needed from the fields of both geology and seismology to ensure that all pertinent data are acquired and considered by an applicant/licensee for evaluation of potential natural hazards that could affect a site. Again, these hazards could be generated by both tectonic and		*This part of the para. will be modified as follows:* 3.2.28. This section should provide information concerning the geological, ~~seismic and,~~ tectonic, seismological and volcanic characteristics of the site and ~~of the~~ a		*Consistency with 3.2.1. (see resolution to comment USA-6) and with Safety Glossary have been taken into account in the modification.*

COMMENTS BY REVIEWER Reviewer: Country/Organization:			Page…. Of…. Date:	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		volcanic characteristics of the site and ~~of the~~ a sufficiently large region surrounding the site. The evaluation of seismic hazard should be based on a suitable seismotectonic model substantiated by appropriate seismic evidence and geologic data."	non-tectonic causes (e.g., surface deformation resulting from faulting or subsurface dissolution, earthquakes resulting from movement along mapped known fault sources or unknown faults in a seismic source zone).		sufficiently large region surrounding the site. The evaluation of seismic hazards should be based on a suitable seismotectonic model substantiated by appropriate seismological evidence and geological or seismological data..."		
USA 19	3.2.28, lines 4-6	Rephrase; revise *[TO]. Existing sentence is:* "… The results of this analysis to be used further in other sections of the safety analysis report in which structural design, seismic qualification of components and safety analysis are considered should be described in sufficient detail."	Sentence has convoluted wording and meaning is not clear.		*This part of the para. will be modified as follows:* "… The results of this analysis that will ~~to~~ be used further in other sections of the safety analysis report ~~in which~~ (including structural design and~~,~~ seismic qualification of components ~~and safety analysis are considered~~) should be described in sufficient detail."		
USA 20	3.2.28, end of paragraph	Add: "…The potential for volcanic phenomena to affect plant safety should be considered, where appropriate."	Volcanic hazards (SSG-21) are distinct from seismic and tectonic features and warrant mention herein (cf. 3.2.27)	X			
Finland 6	3.2.29	*Term "soil" and properties mentioned in the text excludes the sites located on hard,*			*Combined with USA-21, see resolution*		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		crystalline rock / bedrock. Key engineering properties may be significantly different (such as brittle zones or features with potential displacements or general rock quality)			*there.*		
USA 21	Section 3.2.29	3.2.29 Site reference data relating to geotechnical properties of soil ~~properties~~ and rock underlying the site (both static and dynamic properties including damping and modulus degradation properties) should be ~~provided~~ discussed. ~~Geotechnical~~ Geological hazards such as slope instability, ~~collapse,~~ subsidence or uplift of the site surface, soil liquefaction, instability of subsurface materials and ~~behaviour of,~~ the long-term performance of subsurface materials and foundations over the life of a plant should be characterized in this section. The process of the collection of data for the design of foundations, the evaluation of the effects of site response and soil–structure interaction, the construction of earth structures and buried structures, the effect of groundwater conditions, and soil improvements at the site should be described.	To be specific that soil dynamic properties data include damping and modulus degradation are necessary for site response analysis. The list includes geological hazards. Geotechnical is generally not associated with hazards. Additionally, it is not clear what collapse is discussed here. Added site response to mention the in-between analysis step. Long term properties of subsurface materials and foundations will affect the performance of superstructures. Groundwater condition will greatly affect the performance of subsurface materials and its effect need to be discussed in application.	X	(*with a change*: "… over the life of the plant …")		
USA 22	3.2.30	3.2.30 This section should present the relevant data for the site and the associated	To be specific that spatial variability of a site parameter	X			

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		ranges of uncertainty including spatial variability to be used in site seismic response analysis and ~~the~~ structural design and analysis. Reference should be made to the technical reports describing in detail the conduct of the investigation campaigns, and their extension, and the origin of the data collected on a regional basis and/or on a bibliographic basis.	also needs to be characterized for input to structural design. Site subsurface material properties are important input parameters for site seismic response analysis and foundation/structure stability analyses.				
Japan 2	3.2.37.	3.2.37 The needs for any necessary administrative measures~~, such as agreements with local authorities and support services,~~ should be identified, together with the relevant responsibilities of bodies and response organizations other than the operating organization.	These examples are not general and are too detail in this paragraph as common practices in the States.	X			
Poland 5	Para 3.2.37	3.2.37 The needs for any necessary administrative measures, such as including agreements with local authorities and support services such as […], should be identified, together with the relevant responsibilities of bodies competent authorities and off-site response organizations other than the operating organization."	Editorial remark. It is proposed to clarify which support services are considered here and need to be identified. The definition of response organizations should be provided.			X	*See resolution to Japan-2 and guidance provided in Chapter 19*
USA-23	3.2.39 Lines 1-3	3.2.39. The provisions to monitor site related parameters affected by earthquakes and surface faulting, volcanic phenomena, meteorological events, flooding, geological, and hazards from biological organisms or human induced hazards (such as aircraft ~~crashes and~~ flight activities, chemical explosions, and activities at nearby	Geological has been replaced by geotechnical. Aircraft flight activities added instead of aircraft crashes as monitoring flight activities is important. Activities at nearby industrial and military facilities have been added to the list of		*This para. will be modified as follows:* 3.2.39. The provisions to monitor site related parameters affected by earthquakes and surface faulting,		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		industrial and military facilities) should be described…"	human-induced hazards need monitoring. Monitoring programmes are consistent with SSG-2/1 requirements. *[TO: SSR-2/1]*		geological and volcanic phenomena, meteorological events, flooding, and hazards from biological organisms or human induced hazards (such as aircraft ~~crashes and~~ flight activities, chemical explosions and activities at nearby industrial and other facilities) should be described…"		
USA-26 *[TO: USA-24 and 25 belong to Chapter 3]*	3.2.42 new	On-site seismic monitoring programme to assess the effects of an earthquake at a nuclear power plant should be described. Sensors installed at appropriate locations of the plant and free field may be used to compare with the design basis, typically ground motion or in-structure response spectra. Along with a plant walkdown, the measured values are necessary to decide whether plant shutdown is required after an earthquake. To be effective, the instrumentation system needs to be functional and operating at all times.	Requirement of an on-site seismic monitoring programme is missing, which is necessary to assess whether an earthquake exceeded the design basis. Requirement of in-structure monitoring of seismic response makes this section distinctly different from Section 3.2.39.			X	*Proposed text represents a level of detail which is provided in specific Safety Guides. Guidance provided in 3.2.39 covers the scope of this Safety Guide*
Chapter 3: Safety objectives and design rules of structures, systems and components							
Germany 14	3.3.2	3.3.2. The overall safety philosophy and general approaches for ensuring safety should be presented in this section. These	With respect to chapter 3 of the SAR a reference to SSR2/1 (design) seems to be more		*This para. will be modified as follows:* 3.3.2. The overall		

COMMENTS BY REVIEWER Reviewer: Country/Organization:			Page…. Of…. Date:	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		approaches should be based on the IAEA Safety Requirements established regarding nuclear power plant design, (SSR-2/1 (Rev. 1)) [3] ~~and safety assessment (GSR Part 4 (Rev. 1)) [2]~~. Several relevant subjects are discussed in the following subsections.	appropriate than GSR Part 4. Chapter 3 does not deal with safety assessment, but explaining the principles for a safe design.		safety philosophy (…) section. In addition to the national requirements, ~~T~~these approaches should be based on the IAEA Safety Requirements established regarding nuclear power plant design, (SSR-2/1 (Rev. 1)) [3] ~~and safety assessment (GSR Part 4 (Rev. 1)) [2]~~. Several relevant subjects …"		
Germany 15	3.3.4	This subsection should identify plant specific safety functions to fulfil the ~~fundamental~~ main safety functions by the plant design features, in accordance with the Requirement 4 of SSR-2/1 (Rev. 1) [3] and depending on the nature of the facility or activity. The corresponding relevant SSCs necessary to fulfil these safety functions should be introduced.	According to the IAEA Glossary the term *fundamental safety function* is replaced by *main safety functions*. Note: This is not consequently applied in the IAEA Safety Standards. SSR 2/1 still uses the term fundamental safety functions. It is recommended to harmonized the terminology across the Safety Standards or the modify the definition in the Glossary.	X			
Germany 16	3.3.5	If ~~fundamental~~ main safety functions are subdivided into more detailed specific safety functions and functional criteria, with the objective to facilitate their use, they should be listed here; for example heat		X			

COMMENTS BY REVIEWER Reviewer: Country/Organization:			Page…. Of…. Date:	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		removal, which is considered a safety function necessary not only for the safety of the reactor core but also for the safety of any other part of the plant containing radioactive material that needs to be cooled, such as spent fuel pools and storage areas.					
Germany 17	3.3.6.	This subsection should describe in general terms the design approach adopted to meet the fundamental safety objective (see SF-1, para 2.1 (a) [19]) and to ensure that, in all plant states including decommissioning, radiation doses within the installation or in the plant surroundings due to any release of radioactive material are kept below authorized limits and as low as reasonably achievable (ALARA).	Design should already include decommissioning phase.			X	*Decommissioning is not a "plant state" as defined in the Safety Standards (see SSR-2/1 (Rev.1)*
Germany 18	3.3.7.	3.3.7. Relevant radiological acceptance criteria for nuclear power plant staff and for the public assigned for each category of plant states consistently with their concurrency (normal operation, anticipated operational occurrences, design basis accidents and design extension conditions and decommissioning) should be introduced in this subsection.	Design should already include decommissioning phase.			X	*Decommissioning is not a "plant state" as defined in the Safety Standards (see SSR-2/1 (Rev.1)*
Canada 17	3.3.12 Line 5-6	Delete: "…~~Particular emphasis should be placed on independence of safety systems and safety features for design extension conditions with core melting~~." *[TO: see comment from Canada-NUSSC in previous step]*	This especially pertains to existing plants where severe accident management systems are being retrofitted and where this may be nearly impossible to do.		*This part of the para. will be modified as follows:* "… Particular emphasis should be placed in describing how ~~on~~ independence of safety systems and safety features for design extension		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
					conditions with core melting is approached.”		
Canada 18	3.3.17 Line 3-4	Delete, “…~~If relevant, consideration is given to the possibility of a single failure occurring while a redundant train of a system is out for maintenance and/or is impaired by internal or external hazards~~.”	For existing plants, this will severely limit operations and maintenance. It should suffice to identify and have a mitigation strategy in place when performing maintenance leads to single-point vulnerability.			X	*It is indicated* “If relevant” *(i.e. whenever applicable)*
France 1	3.3.21	3.3.21 This subsection should describe the approach used to identify the conditions which could lead to an early radioactive release or to a large radioactive release and to summarize the design and operational provisions implemented to demonstrate their ‘practical elimination’[3] ~~of the possibility of certain conditions arising that could lead to an early radioactive release or a large radioactive release~~ (see SSR-2/1 (Rev. 1), para 5.31 [3].	Editorial	X	*(See resolution to General Comment USA-G2)* *The heading and the para. will be modified as follows:* *Practical elimination of the possibility of plant event sequences ~~certain conditions~~ arising that could result in high radiation doses ~~lead to an early radioactive release~~ or in a large radioactive release.* 3.3.21 This ~~sub~~section should describe the approach used to identify the conditions which could lead to high radiation doses ~~an~~		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
					~~early radioactive release~~ or to a large radioactive release and to summarize the design and operational provisions implemented to demonstrate their ‘practical elimination’[3] ~~of the possibility of certain conditions arising that could lead to an early radioactive release or a large radioactive release~~ (see SSR-2/1 (Rev. 1), para 5.31 [3].		
Russia 14	Footnote (3) in 3.3.21	***Footnote 3****:* SSR 2/1 (Rev 1) [3], footnote 4: The possibility of certain conditions arising may be considered to have been ‘practically eliminated’ if it would be physically impossible for the conditions to arise or if these conditions could be considered with a high level of confidence to be extremely unlikely to arise. This approach is not accepted in all countries members as it is associated with the rejected after Chernobyl accident concept of the hypothetical accidents.	To add a footnote with the indication that this approach is accepted not in all countries members as it it is associated with the rejected after Chernobyl accident concept of the hypothetical accidents			X	*Comment treated in DS491 (Safety Guide on Deterministic Safety Analysis). The resolution (rejection) was already accepted there*
Canada 19	3.3.25 Line 2,3,4	Delete, “…~~In case of external hazards, it should be described how adequate safety margins are ensured for events initiated by external hazards exceeding the limits~~	The acceptance criteria should be in line with severity and frequency of the external hazard being addressed.		*This part of the para. will be modified as follows:* “… ~~In case of~~		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		~~considered in the design~~….”			~~external~~ Regarding natural hazards, it should be described how adequate safety margins are ensured for ~~events initiated by external~~ hazards exceeding ~~the limits~~ those considered in the design, see paragraph 5.21A ~~requirement 17~~ from SSR-2/1 (Rev. 1) [3].		
Poland 6	Para 3.3.26	3.3.26 This subsection should describe ~~differences in~~ design approaches adopted to demonstrate performance of the safety functions in the reactor and in the fuel storages, in particular in the spent fuel pool. ~~These differences~~ Different design approaches may imply differences in implementation of defence in depth, different specification of derived safety functions, different monitoring means and substantial differences in time evolution of accidents.	Hardly understandable paragraph. Seems, that this subsection of SAR should describe reactor and fuel storage safety functions design approaches, but not the differences of design approaches applied for reactor and fuel pool. The potential differences in reactor and fuel pool design approaches will follow from design description by itself. Also, it is not clear, why different design approaches for reactor and fuel pool should be applied, as well as it is not clear if differences in design approaches are encouraged or should be avoided?		*This part of the para. will be modified as follows:* 3.3.26 This subsection should describe ~~differences in~~ design approaches adopted to demonstrate performance of the safety functions in the reactor and in the fuel storage~~s~~ areas, in particular in the spent fuel pool. These ~~differences~~ design approaches may imply differences in implementation …”		
Germany 19	3.3.26/1-3	This subsection should describe the general	It is not clear what kind of		*Comment considered*		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		design concept and the approaches ~~differences in design approaches~~ adopted to demonstrate performance of the safety functions in the reactor and in the fuel storages, in particular in the spent fuel pool.	differences in design approaches should be described here. It is also not clear, why only the differences should be highlighted. For the evaluation of the safety analyses it is more useful to have the entire and comprehensive description.		*together with Poland 6. See resolution there*		
Poland 7	Para 3.3.27 Line 2	"…It should be confirmed that Requirement 33 from SSR-2/1 (Rev. 1) [3] regarding safety systems, and safety features for design extension conditions, of units of a multiple unit nuclear power plant is met."	General comment. When referring to a single requirement, the main objective of that requirement should be provided in the guide directly. It is not clear what should be met, i.e. what is the objective of referred Requirement 33. The main objective of Requirement 33 from SSR-2/1 (Rev. 1) [3] what is required to be met should be clarified. All the safety guide structure is written in such a way, that cross-references for detailed information to certain paragraphs and references to other documents are provided. Nevertheless in most cases except few, it is clear what is the main objective of referred requirement, or to which action referred requirement is related. In addition, it should be noted			X	*This kind of clarifications is not used in this Safety Guide. It is considered unnecessary.*

COMMENTS BY REVIEWER Reviewer: Country/Organization:			Page…. Of…. Date:	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			the term "safety features" has not been defined neither in the IAEA Safety Glossary (2007 and 2016 editions) nor SSR-2/1 Rev. 1. So, this involves some confusion with respect to the meaning of other related terms such as safety systems and engineered safety features.				
Poland 8	Para 3.3.40	3.3.40 The seismic design characteristics and codes and standards applicable for the design, methodologies, basic assumptions, specific requirements regarding SSCs [performance, functionality ?] to be taken into account should be presented in this section; see SSR-2/1 (Rev.1) [3]. The SSCs design solutions for ensuring the required safety/performance and compliance with the nuclear safety [?] requirements should be presented".	Some clarification is needed. It should be clarified to what or whom specific requirements should be taken into account and compliance with which requirements should be presented.		*This part of the para. will be modified as follows:* 3.3.40 The seismic design characteristics and specific design requirements applicable for design of SSCs, including codes and standards ~~applicable for the design~~, methodologies~~,~~ and basic assumptions, ~~specific requirements~~ to be taken into account should be presented in this section; see SSR-2/1 (Rev.1) [3]. The SSCs design solutions for ensuring the ~~required safety/performance and~~ compliance with these requirements		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
					should be presented in chapters 4-12. …”.		
USA 24	3.3.40 Pages 18-19	Safe Shutdown Earthquake (SSE)	Suggest adding		*Comment combined with USA-25.* *Second bullet will be modified:* • Design ground motion (including levels SL-1 and SL-2);		*SSE and OBE are not used in the Safety Standards, but SL-1 and SL-2*
USA 25	3.3.40 Pages 18-19	Operating Basis Earthquake (OBE)	Suggest adding		*See resolution to USA-24*		
Poland 9	Para 3.3.42	“3.3.42. Possible off-site protective actions and the required human interactions, such as […] to mitigate the impact of extreme weather conditions should be specified in Chapter 13 and described in details with the justification of the successful protection against the design basis hazard for each case.”	1. The clarification which off-site protective actions and human interactions with whom are required in order to mitigate extreme weather conditions should be added to the guide for comprehensiveness. 2. It should be noted, that so		*This part of the para. will be modified as follows:* “3.3.42. Possible off-site protective actions and the required human interactions to mitigate the impact of extreme weather		*Examples would be temporary dams, snow removal, sewage inlets cleaning, etc, but are site dependent and seem not necessary*

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			far very limited technological capabilities to control weather conditions are available, and in particular to mitigate extreme weather conditions, such as tornado. Seems, that this SAR chapter should describe off-site protective actions and the required human interactions to mitigate consequences of extreme weather conditions but not the weather conditions itself.		conditions …"		
Internal review	3.3.43 And title				~~*External flooding*~~ *Extreme hydrological conditions* 3.3.43. This subsection should present the design basis external flooding or low water level conditions and hazards as identified in Chapter 2 of the SAR, ….		
Ukraine-1 comment 2	3.3.45	3.3.45 This subsection should specify and describe all structures, systems (or parts of systems) and components that are ~~to be protected against damage from aircraft crash. These are the SSCs~~ necessary to perform functions required to attain and maintain a safe shutdown condition or to mitigate the consequences of an aircraft	The statement "to protect the SSCs against damage from aircraft crash" seems to be too strict and quite non-realistic. It is proposed to combine two sentences with the main focus on safety functions that are required.	X			

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		crash ~~accident~~”.					
Poland 10	Para 3.3.45 Line 4	“…It should define the design basis aircraft crash characteristics… and applicable design codes and standards, assumptions and specific requirements regarding loads and load combinations to be taken into account.”	Editorial remark. (see paragraphs 3.3.46, 3.3.47, etc.)	X			
Poland 11	Para 3.3.49 Bullet 4 and 6	“…The list of internal hazards should include the following: … • Pipe whipping following their ruptures and dynamic effects associated with high energy pipe ruptures; • ~~Dynamic effects associated with high energy pipe rupture;~~	Seems like double repeating of the same internal hazard. Otherwise the difference between these hazards should be explained and clarified.	X			
Poland 12	Para 3.3.52 Line 2	“3.3.52 This subsection should summarize the protection against internal floods. The design requirements, the resulting loads and their implications, off-site protective actions [?] and the required human interactions should be specified and described with the justification of the successful protection… (…) The design measures for ensuring the required safety level and compliance with the nuclear safety [?] requirements should be presented.”	1. It is not clear which off-site protection actions should be initiated for internal flooding. Clarification and examples of off-site protection actions in case of internal flooding should be provided. 2. The clarification of requirement of compliance with which requirements should be provided. 3. Same comments regarding clarification of off-site protective actions and specification of referred		*The following editorial enhancements will be incorporated:* “… loads and their implications, ~~off-site protective actions~~ and the required human interactions should be specified and described with the justification of the successful protection. This includes the identification of all ~~of the~~ potential flooding mechanisms ~~of water~~		*This para. is not adequate to quote examples of human interactions; see 3.3.53-54 and Chapter 13 (3.13.22-28)*

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			requirements applies to other internal events (paragraphs 3.3.53, 3.3.54, 3.3.55).		~~or steam floods~~ and the protection and drainage …”		
Poland 13	Para 3.3.61 Bullet 3	“…Other buildings, for which the design rules should be described, include: … • Fresh Nuclear Fuel storage building;	Editorial remark. Should be specified, that fresh nuclear fuel is considered here.			X	*It refers to fresh and/or irradiated fuel*
Canada 4	3.3.61. Bullet 4	3.3.61. Other buildings, for which the design rules should be described, include: • Auxiliary building; • Safety building; • Fuel storage building; • Control building or facilities (such as main control room, secondary control room and emergency secondary control room); • Diesel generator building.	Usually control facilities don’t have a separate building and should be located in separate buildings to avoid common cause failure.		*Fourth bullet will be modified as follows:* • *Building with control locations* ~~*Control building*~~ *(i.e. CR, supplementary CR and other emergency response facilities and locations)*		
USA 27	3.3.62~~59~~	*Please add the text in red.* 3.3.62~~59~~. Relevant information on design principles and criteria, and the codes and standards used in the design of mechanical components, and physical design arrangement should be included in this section. Information should be provided concerning the design loads and load combinations with appropriate specified design and service limits for components and supports.	Need to ensure multiple trains of equipment are protected from each other and individual trains are protected from local hazards.		*This para. will be modified as follows:* 3.3.62. Relevant information on design principles and criteria, ~~and the~~ codes and standards used in the design of mechanical components ~~including~~ and information on physical separation		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
					should be included in this section. …”		
USA 28	3.3.64~~61~~	*Please add the text in red.* 3.3.64~~61~~. A complete list of transients used in the design and fatigue and fracture analysis of all reactor coolant system and core support components, component supports, ~~and~~ reactor internals, and other systems that perform a safety function should be presented. The list should include the number of events for each transient, …”	Other safety systems beside the reactor coolant system also need to be designed to withstand transients.		*Treated together with Germany-20.* 3.3.64. A complete list of transients used in the design and fatigue and fracture analysis of all reactor coolant system and core support components, ~~component supports,~~ as well as other supporting components and reactor internals, and other systems that perform a safety function should be presented. The list should include the number of …”		
Germany 20	3.3.64	3.3.64. A complete list of transients used in the design and fatigue and fracture analysis of all reactor coolant system and core support components, ~~component supports~~, as well as other supporting components and reactor internals should be presented.	The sentence is not entirely clear.	X	*Treated together with USA-28, see the resolution there*		
USA 29	3.3.65~~62~~ Line 4	*Please add the text in red.* 3.3.65~~62~~. Requirements for ensuring structural integrity of pressure-retaining components, component supports, and core support structures designed and constructed	Safety systems need to be protected from external hazards.		*This para. will be modified as follows:* 3.3.65. Requirements for ensuring structural integrity of		

COMMENTS BY REVIEWER Reviewer: Country/Organization:			Page…. Of…. Date:	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		in accordance with the rules should be described. This discussion should also incorporate design information related to component design and include current design information, representative, or bounding information. Design information should be given for other non-important to safety components that are located in the vicinity of safety components and how the failure of these components will not adversely affect the functioning of the nearby safety components.			pressure-retaining components, with their component supports, and core support structures designed and constructed (…) or bounding information. Design information should be given also for components not important to safety located in the vicinity of safety components and how the failure of these components will not adversely affect the function of the nearby safety components.”		
Finland 7	3.3.67 Line 4.	3.3.67. Relevant information on design principles and criteria and the codes and standards used in the design of instrumentation and control systems and components should be included in this section. Information on general design principles should be provided regarding: (a) Performance; (b) Reliability; (c) Independence of provisions for the different plant states; (d) Qualification; (e~~) Single failure criterion application; (f) Access to equipment; (g) Quality; (h) Testing and testability; (i) Maintainability; (j) Identification of items important to safety.~~	Add: V&V Security Update the list accordingly. V&V for the I&C is as important as the Qualification. The security aspect are becoming more and more important in the future and they should be considered also in this paragraph.	X (with a change in (h))	*This part of the para. will be modified as follows:* (e) Verification and Validation; (~~e~~f) Single failure criterion application; (~~f~~g) Access to equipment; (h) Security aspects (maybe treated in a separate classified document); (~~g~~i) Quality; (~~h~~j) Testing		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		(e) Verification and Validation (f) Single failure criterion application; (g) Access to equipment; (h) Security aspects; (i) Quality; (j) Testing and testability; (k) Maintainability; (l) Identification of items important to safety.			and testability; (~~i~~k) Maintainability; (~~j~~l) Identification of items important to safety.		
Finland 8	3.3.68. Line 1	3.3.68 The design basis should identify functional and non-functional requirements including such as functions, conditions and requirements for the overall instrumentation and control and each individual instrumentation and control system. This information is then used to categorize the functions and to assign them to systems of the appropriate safety class; see SSG-30 [21].	Add: should identify functional and non-functional requirements including such as clarity, functional and non-functional requirements is a standard expression, the list is only examples of such requirements.		3.3.68 The design basis should identify functional and non-functional requirements including functions, conditions and requirements for the overall instrumentation …”		
Finland 9	3.3.69. Line 5	3.3.69 Relevant information on design principles and criteria, and the codes and standards used in the design of electrical systems and components should be included in this section. Information should be provided on general design principles regarding: (a) Redundancy; (b) Independence; (c) Diversity; (d) Controls and monitoring; (e) Identification; (f) Capacity and capability of systems for different plant states; (g) Considerations of the external grid and related issues.	Add: (g) Considerations of the external grid and related issues. The interface to the external grid and the related disturbances should be considered.	X			
Finland 10	3.3.70. Line 1	3.3.70 The design basis should identify functional and non-functional requirements including functions, conditions and requirements for the overall electrical systems and for each individual electrical system should be also described and how	Add: should identify functional and non-functional requirements including such as	X			

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		this information is used to categorize the functions and to assign them to systems of the appropriate safety class in accordance with SSG-30 [21].	clarity, functional and non-functional requirements is a standard expression, the list is only examples of such requirements.				
Poland 14	Para 3.3.71 Line 1	"3.3.71. This section should describe, consistently with SSR-2/1 (Rev. 1) [3], the scope of equipment [SSCs] qualification and qualification procedure adopted to confirm that the nuclear power plant ~~items~~ SSCs important to nuclear safety…"	Editorial remark. It should be clarified what should be qualified – the equipment in particular or SSCs in general.		*Looking for clarity, the last part of the para. will be modified as follows:* "… requirements and of remaining fit for purpose in ~~when subjected to~~ the range of individual or combined environmental challenges identified for the situations under which they are supposed to perform. The identified challenges should take into account all the stages and duration of~~,~~ ~~throughout~~ the plant lifetime~~ of the plant~~."	X	*The term "items important to safety" is used according to the Safety Glossary (see "Plant equipment")*
Poland 15	Para 3.3.72 Line 1	"3.3.72. It should be presented how the equipment [SSCs] qualification programme takes account of all identified and relevant potentially disruptive influences…"	Editorial remark. It should be clarified what qualification programme is considered here.			X	*Clarification seems unnecessary*
Poland 16	Para 3.3.74	"3.3.74 The criteria should be provided that are used for equipment [SSCs]	Editorial remark (see comment for paragraph 3.3.72).			X	*Clarification seems unnecessary*

COMMENTS BY REVIEWER Reviewer: Country/Organization:			Page…. Of…. Date:	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		qualification, including the decision criteria for selecting a particular test or method of analysis… and the process to demonstrate the adequacy of the equipment [SSCs] qualification program. The criteria should be presented for electromagnetic qualification, including… the considerations defining the electromagnetic impact, and the process to demonstrate the adequacy of the equipment [SSCs] electromagnetic resistance qualification program.”					
USA 30	3.3.76~~72~~ Line 3	*Please add the text in red.* 3.3.76~~72~~. This section should provide an overview of regulations, norms and standards applicable for the area of in-service monitoring, tests, maintenance and inspections. Specific rules for each of the areas listed should be provided. A detailed description of the in-service testing and in-service inspection programs for safety components should be included.	Necessary to support a review, which includes pre-service testing requirements and component qualification testing to meet design criteria.			X	*This para. refers to general regulations, norms and standards. Detailed descriptions of testing and programmes are part of the documentation of operation. (3.13.10-13)*
CHAPTER 4. REACTOR							
Russia 15	3.4.3	3.4.3 For each of the reactor components and key processes, a more detailed description should be provided, in accordance with Appendix II.	To add the sentence of this para with words: "and key processes" in terminology of GS-G-3.1 as the description includes not only the equipment, but also such key processes as operation, monitoring, inspections, testing and maintenance.			X	*This chapter mainly describes the design of the reactor including fuel, nuclear, thermal-hydraulic, reactivity control system and core components design. The key processes are treated in chapters 13, 14 and 16.*

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
Ukraine-1 comment 5	3.4.5	*Add:* (vii) Irradiation of the reactor pressure vessel Neutron flux and neutron fluence distribution in the core, at core boundaries and on walls of the reactor pressure vessel for various core configurations (or calculation spectra). These data should correlate with neutronic characteristics.	Requirements for presentation of information are missing		*RPV is treated in Chapter 5. At the end of para. 3.***5***10 it will be added:* "…embrittlement considerations. Information on neutron flux distribution and expected neutron fluence on the walls of the reactor pressure vessel, derived from the core characteristics, should be included (see chapter 4)." *Paragraph II.6 of Appendix II will be also modified:* II.6 In this section, adequate and sufficient information should be provided regarding the materials used in components, the behavior of these materials under irradiation (when applicable), as well		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
					as the material interactions with fluids … (…) … Their specific properties, quality and chemistry requirements should be ~~are~~ described ~~in this section~~.		
Japan 3	3.4	*Addition to the last paragraph somewhere as follows;* Equipment qualification The equipment qualification should be briefly addressed in this section.	Clarification. The equipment qualification is one of the most important processes for safety system.			X	*Equipment qualification is indeed indicated in Appendix II (see II.3, bullet 9). Regarding this chapter, para. 3.4.1 refers to DS488 (Step 11e) where Section 4 deals with qualification and testing. (Connected with Japan 4 about 3.5.10)*
Germany 21	3.4.9	3.4.9. This section should also include failure analyses to demonstrate that the reactivity control systems are not susceptible to common-cause failures ~~when used redundantly~~. These failure analyses should consider failures originating within any of reactivity control system as …”	Common cause failures are typically for non-diverse redundant systems. It is not necessary to explain it further by “*when used redundantly”*.	X			
CHAPTER 5. REACTOR COOLANT SYSTEM AND ASSOCIATED SYSTEMS							
Japan 4	3.5.10. Line 5	**Reactor vessel** 3.5.10 The description of the reactor vessel design should be provided in this section in	Clarification. The equipment qualification is one of the most important			X	*See resolution to Japan 3 in Chapter 4. Equipment qualification is indeed indicated in*

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		a manner that is detailed enough to demonstrate that the materials, fabrication methods, inspection techniques and load combinations used conform to all applicable regulations, industrial codes and standards. Design information should include the reactor vessel materials, the pressure-temperature limits and the integrity of the reactor vessel, including embrittlement considerations. The equipment qualification should be briefly addressed in this section.	processes for safety system.				*Appendix II (see II.3, bullet 9).*
Germany 22	headline before 3.5.12	**Reactor coolant pumps / recirculation pumps**	Para. 3.5.12 is too much focused on PWR. Also in case of BWR the recirculation pumps have an effect on fuel cooling and reactivity of the core.	X			
Germany 23	3.5.12	A description and justification should be provided of the performance and design features that have been implemented to ensure that the reactor coolant pumps (PWR) or recirculation pumps (BWR) meet the safety requirements for design. (…)	Para. 3.5.12 is too much focused on PWR. Also in case of BWR the recirculation pumps have an effect on fuel cooling and reactivity of the core.	X			
Japan 5	3.5.13. Header	**Primary heat exchangers (steam generators for PWR)**	Steam generators are equipped only with PWR. Should specify the reactor type here.	X	*Same comment than Germany 24*		
Germany 24	Headline before 3.5.13	**Primary heat exchangers (steam generators) in PWR**	Steam generators as described in paras 3.5.14 to 3.5.15 are typical components of PWR not for BWR.	X	*Same comment than Japan 5*		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
Japan 6	3.5.17.	**Reactor pressure control system** 3.5.17. A description and justification should be provided of the performance and design features that have been implemented to ensure that the reactor pressure control system meets the safety requirements for design. In addition to the pressurizer systems (pressurizer heaters and sprays for PWR), these should include also the de-pressurizing systems such as ~~pressurizer~~ pressure relief tank or pool, pressure ~~the piping connections from the tank to the pressurizer~~ relief and safety valves~~, the relief tank spray system~~ and associated piping~~, the nitrogen supply piping, and the piping from the tank to the cover gas analyser and the reactor coolant drain tank~~.	Clarification. This description is only for PWR. Should specify and simplify descriptions here.	X	*Taking into account Japan 6 and Germany 25, this para. will be modified as follows:* "… In addition to the pressurizer systems (pressurizer heaters and sprays in PWRs), these should include also the depressurization systems such as ~~pressurizer~~ pressure relief tank or pool (in PWRs) or wet wells (in BWRs), pressure ~~the piping connections from the tank to the pressurizer~~ relief and safety valves~~, the relief tank spray system~~ and associated piping~~, the nitrogen supply piping, and the piping from the tank to the cover gas analyser and the reactor coolant drain tank~~.		
Germany 25	3.5.17	A description and justification should be provided of the performance and design features that have been implemented to ensure that the reactor pressure control	In BWR the wet well is used for depressurization. In the current version 3.5.17 is too PWR specific.	X *(see Japan 6)*	*Combined with Japan 6, see resolution there*		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		system meets the safety requirements for design. In addition to the pressurizer systems (pressurizer heaters and sprays in PWR), these should include also the pressurizer relief tank (PWR) or wet well (BWR), the piping connections from the tank to the pressurizer relief and safety valves, the relief tank spray system (PWR) and associated piping, the nitrogen supply piping, and the piping from the tank to the cover gas analyser and the reactor coolant drain tank.					
Poland 17	Para 3.5.18	3.5.18 ~~Distinction should be made between~~ The description of the reactor depressurization systems used for design basis accidents and those used for design extension conditions should be provided, including the justification of distinction between design basis accident and design extension conditions reactor depressurization systems due to the relevance of these systems for the independence of the levels in defence in depth.”	This paragraph in its original written form sounds like <u>a recommendation for reactor design</u>. The text should be transformed to the guide applicable recommendation for SAR content or SAR preparation.		3.5.18. ~~Distinction should be made between~~ The description of the reactor depressurization systems used for design basis accidents and those used for design extension conditions should be provided, including a clear justification of ~~due to the relevance of these systems for~~ the independence of the levels in defence in depth due to the relevance of these systems.		
CHAPTER 6. ENGINEERED SAFETY FEATURES							

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
Germany 26	Headline before para 3.6.1	CHAPTER 6. ~~ENGINEERED SAFETY FEATURES~~ SAFETY SYSTEMS AND SAFETY FEATURES FOR DEC	Being aware, that the term *engineered safety features* is frequently used, especially in SARs based on NUREG 800, the term is not defined in the IAEA safety standards. It is proposed to change the title according to IAEA terminology (see page 14 of TECDOC 1791)			X	*The term is used in Safety Glossary (see "defence in depth") and in other Safety Standards (e.g.: Paragraphs 2.13 and 4.11 from SSR-2/1 (Rev.1) and DS449)*
Germany 27	3.6.1	3.6.1. Chapter 6 should present relevant information on the ~~engineered~~ safety systems, safety features for DEC and associated systems. ~~Engineered~~ Safety Systems and safety features for DEC to be covered in chapter 6 are understood as those SSCs needed for performing safety functions adequately in case of design basis accidents~~,~~ and design extension conditions, including core melt accidents~~, and for some anticipated operational occurrences~~.	Being aware, that the term *engineered safety features* is frequently used, the term is not defined in the IAEA safety standards. This term is mostly assigned to those items important to safety to control DBA (see SSR 2/1 para 2.13 No. 3 and, in addition, also discussion in TECDOC 1791). In principle safety systems and safety features for DEC should not be credited for AOOs.			X	*See resolution to Germany 26*
Germany 28	3.6.2	3.6.2. Description of the ~~engineered~~ safety systems and safety features for DEC should demonstrate their capability to mitigate the consequences of the accidents and to bring the nuclear power plant to the controlled ~~or~~ and finally a safe ~~shutdown~~ state, in accordance with the relevant requirements established in SSR-2/1 (Rev. 1), requirements 51to58 and 65 to 67 [3].	See comment above on AOOs. For accidents the objective is to achieve a safe state. A controlled state is acceptable for AOOs. For accident conditions the controlled state is an interim state. According to the definitions in SSR 2/1 Rev.1 the term *safe state* is used rather than *safe shutdown state*. The safety state is already characterized		*This para. will be modified as follows:* "… to bring the NPP to the controlled state ~~or~~ and finally to reach a safe ~~shutdown~~ state, in accordance with the relevant requirements established in SSR-2/1 (Rev. 1), …"		*See resolution to Germany 26*

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			by subcriticality.				
Germany 29	3.6.5	The ~~engineered~~ safety systems and safety features for DEC provided in different plant designs may vary. The ~~engineered~~ safety systems and safety features for DEC explicitly discussed in this chapter are those that are typically used to limit the consequences of postulated accidents in light-water-cooled power reactors, and should be treated as illustrative of the ~~engineered~~ safety systems and safety features for DEC and of the kind of informative material that is needed.	To avoid the term *engineered safety features*. (see our comments above)			X	*See resolution to Germany 26*
Canada 20	3.6.6	Delete the clause, "~~3.6.6 When using non-permanent equipment as part of the accident management, it should be described in this chapter that there are adequately robust design features to enable reliable connection of non-permanent equipment, including conditions induced by external hazards exceeding those of design basis (see paras 6.28B, 6.45A and 6.68 from SSR-2/1 (Rev. 1) [3]).~~"	This is temporary equipment and may change or be upgraded frequently. It wouldn't make sense to document it in the Safety Report			X	*The information should be given not about the equipment themselves but about the design features to enable reliable connection of non-permanent equipment, including conditions induced by external hazards exceeding those of design basis.*
Canada 21	3.6.7 Lines 6-7	Delete, "…~~All organic materials that exist in significant amounts within the containment building should be described, including plastics, lubricants, paints or coatings, electrical cable insulation and asphalt~~."	An EQ program should detail how critical equipment should be maintained.			X	*An EQ program will detail how critical equipment should be maintained. However, the SAR should include information about material potentially affecting operation of safety equipment*
Germany 30	3.6.7	For each of the ~~engineered~~ safety systems	To avoid the term *engineered*			X	*See resolution to*

COMMENTS BY REVIEWER Reviewer: Country/Organization:		Page…. Of…. Date:		RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		and safety features for DEC, detailed description should, as far as reasonable, include the items specified in Appendix II. In describing the materials used in ~~engineered~~ safety systems and safety features for DEC components, material interactions with fluids that could potentially impair operation of engineered safety features should be taken into account. The description should cover the compatibility of materials for ~~engineered~~ safety systems and safety features for DEC with core coolant and containment spray solutions. (…)	*safety features*. (see our comments above)				*Germany 26*
Germany 31	3.6.8	(…) The description should cover both ~~engineered safety features:~~ safety systems designed to cope with design basis accidents and safety features for design extension conditions, including core melt accidents. (…) It should provide relevant information on all ~~the engineered~~ safety systems and safety features for DEC, either active or passive in accordance with the general design aspects presented in Chapter 3 in order to meet the requirement 52 of SSR 2/1 (Rev. 1) [3] and the guidance provided in NS-G-1.9 (DS481 Step 5) [26]. (…)	To avoid the term *engineered safety features*. (see our comments above)			X	*See resolution to Germany 26*
Japan 7	3.6.11. Header	**Emergency reactivity control system for PWR** 3.6.11. This section should provide information on any means for ensuring reactor shutdown (e.g. by injecting concentrated boron) in addition to those	The emergency reactivity control system is used only for PWR. Should specify and simplify descriptions here.			X	*Also BWR have systems for poisoning the reactor coolant if the control rods cannot be inserted. Boron injection is given as an example.*

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		provided by the standard emergency core cooling system					
Germany 32	3.6.11	3.6.11. This section should provide information on any means for ensuring reactor shutdown (e.g. by injecting concentrated boron) in addition to those provided by the standard ~~emergency core cooling~~ reactivity control system.	The objective of the emergency reactivity control system is to ensure reactor shut down in case of an unavailability of the reactivity control system and serves as a diverse shutdown system. Proposed changes will also reflect much better BWRs.	X			
Japan 8	3.6.14. Bullets 1 and 2	Description of the systems in this section should include both primary and secondary containment systems. Description and justification of the required performance should be provided for design of the concrete and steel internal structures of the containment. The systems to be covered should include, as applicable: • Containment ~~active~~ heat removal systems/the containment spray system and other ~~active~~ heat removal systems; • ~~Containment passive heat removal systems;~~ • The system for control of hydrogen and other combustible gases in the containment; • ……	There is no need to distinguish between <u>active</u> and <u>passive</u> for containment systems to keep a consistency with SSR-2/1 (Rev. 1).		*The following editorial changes will be incorporated:* • The ~~C~~containment ~~active~~ heat removal systems / ~~the~~ containment spray system and other active heat removal systems; • The ~~C~~containment passive heat removal systems; • (…); • The ~~C~~containment isolation system; • (…) • The ~~C~~containment penetrations, airlocks, doors and hatches.	X	„Passive containment heat removal systems" *is used in DS482, Step 11* (Safety Guide on Design of Reactor Containment Structure and Systems for NPPS)
Poland 18	Para 3.6.15 Line 3-4	"…This section should provide sufficient basis for development and implementation of such containment leakage testing	Editorial remark. It should be clarified what testing programme is	X			

COMMENTS BY REVIEWER Reviewer: Country/Organization:			Page…. Of…. Date:	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		programme;…"	considered here.				
Germany 33	3.6.15	3.6.15. In this section the maximum allowable leak rate should be specified for normal operation and accident conditions. In addition, containment leakage testing system should be described in this section. It should be demonstrated that the containment (…)	The maximum acceptable leak rate to meet radiological acceptance criteria should be provided.		3.6.15. In this section the maximum allowable leak rate for accident conditions should be specified. In addition, containment leakage testing …"		*Leak rate for NO is not relevant.*
Germany 34	3.6.16	This section should present relevant information on the habitability systems. The habitability systems ~~are those engineered safety features provided to~~ ensure that essential plant personnel can remain at their posts, including those in the main and supplementary control rooms, technical support centres, emergency centres as well as other relevant places, needed to take actions to operate the plant safely in operational states and to maintain acceptable conditions in case of accidents. (…)	To avoid the term *engineered safety features*. (see our comments above)		*Some editorial changes will be incorporated:* "… provided to ensure that essential plant personnel can remain at their posts, including those in the control locations (i.e. control room, supplementary control room and other emergency response facilities and locations)~~main and supplementary control rooms~~, technical support centres, emergency centres, …"	X	*See resolution to Germany 26*
Canada 5	3.6.17 Line 2	3.6.17 Habitability of control places under design extension conditions with core melting should be addressed in this section of the safety analysis report. Special			*This para. will be modified as follows:* 3.6.17. Habitability of control locations		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		attention should be paid for habitability on remote sites, which could have extremely severe weather conditions combined with SBO.			~~places~~ under DEC with core melting should be addressed in this section of the SAR. For remote sites, habitability of those locations should be demonstrated in case of combination of external hazards exceeding the design basis events and internal events.		
Germany 35	Headline before 3.6.19	**Other ~~engineered~~ safety systems and safety features for DEC**	To avoid the term *engineered safety features*. (see our comments above)			X	*See resolution to Germany 26*
Germany 36	3.6.19	This section(s) should present relevant information on any other ~~engineered~~ safety systems or safety features for DEC implemented in the plant design and not covered by previous sections. Examples include, but are not limited to: the steam dump to the atmosphere and backup cooling systems. (…)	To avoid the term *engineered safety features*. (see our comments above)			X	*See resolution to Germany 26*
Argentina 2	Chapter 6	Regarding “Habitability systems”	A cross-reference to HVAC in Chapter 9, Part 9A should be added		*Last sentence of para. 3.6.16 will be completed as follows:* “… provisions for control of working conditions (see paras 3.9.12 and 3.9.18).		
Argentina 2 bis			Similarly, between applicable items of other chapters in order			X	*No specific proposal is made regarding new*

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			to associate complementary safety SSC for preventing unnecessary duplication and, in such a way, facilitating comprehension.				*text neither items where a link should be done. The draft contains relevant level of details on cross-references.*
CHAPTER 7. INSTRUMENTATION AND CONTROL							
Russia 16	Paragraphs 3.7.1 – 3.7.34, in Chapter 7	Human-machine interface design	To relocate into this chapter section 18.3 from chapter 18 combined with chapter 17 according to the reasons presented in the comment of the item 7, except subsections 18.3.6 and 18.3.7. These subsections belong to the description of such supporting processes as "development of procedures" and "development of training programs". They have to be described in new chapter 17 "Management for safety".			X	*This chapter is dedicated to I&C from the technical point of view. Chapter 18 is dedicated to HFE, not to I&C design. Interaction between both aspects is covered in para 3.7.24*
Germany 37	3.7.2	3.7.2. This chapter should identify those instruments and their associated equipment that constitute provisions for plant operational states ~~normal operation, for design basis~~ and accident conditions ~~and for design extension conditions~~.	Consideration of instruments and their associated equipment constituting provisions for anticipated operational occurrences should not be explicitly excluded here.	X			
Japan 9	3.7.4. and others Line 4	3.7.4 This section should identify al l instrumentation, control, and supporting systems, including alarm, communication, and display instrumentation and should specify functions allocated to individual	General comments as editorial. "Sub-section" appears in 3.13.10, 3.13.12, 3.13.14, and many other paragraphs.	X			

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		systems. Furthermore, this ~~sub-~~section should describe:					
Poland 19	Para 3.7.5 Bullet 5	"… • Unauthorized access control, ~~cybersecurity~~ computer security and other aspects regarding nuclear security;	Editorial remark. It is recommended to use the term "Computer security" instead of "Cybersecurity".		*Bullet 5:* • ~~Unauthorized~~ ~~a~~Access control, ~~cybersecurity~~ computer security and other aspects regarding security		*See resolution to Poland-3 about para. 3.1.6*
Japan 10	3.7.5. *After the last bullet*	Add the followings in the last bullets; • Replacement, upgrades and modifications policy for degradation of instrumentation and control systems	It is necessary to replace, upgrade and modify I&C system as a general design consideration stated in SSG-39.	X			
Ukraine-4, comment 1	3.7.5 *(after bullet 10)*	To extend as follows: (11) Single failure criterion	Single failure criterion is necessary criterion for all safety systems			X	*Covered by bullet 6,* "Redundancy and diversity requirements"
Ukraine-4, comment 2	3.7.5 *(bullet 12)*	*To modify as follows:* "Defence in depth and diversity analyses for each potential failure mode, including ~~software~~ common cause failure and exposure of the system to both internal and external hazards;	Common cause failures are sufficient not only for software, but for hardware as well		*Modification of bullet 12:* "DiD and diversity analyses for each potential failure mode, ~~including software~~common cause failure (including software) and exposure of the system to both internal and external hazards		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
Ukraine-4, comment 3	3.7.5-3.7.33	The list of individual I&C systems is different from list of these I&C systems and equipment in IAEA SSG-39, issued in 2016.	It will be better to make this list the same as in IAEA SSG-39.			X	*The list is the most commonly used in international practices for SARs. SSG-39 has a much larger coverage and follows different logics.*
Hungary security, comment 2	*[TO: it seems 3.7.5]*	In the subchapter 3.7 General design aspects for instrumentation and control systems and components there are certain requirements for cyber security against cyber-attacks. However the risk analysis of such external hazard is lacking, as well as test procedures of implemented hardware and software solutions (e.g. data diode).	The present and future challenge is the vulnerability to cyber-attacks.		*A new sentence will be added after the bullets:* "Description how the "security by design" principle is applied on the bases of computer security analysis maybe treated in a separate classified document (see 3.13.27)".		
Poland 20	Para 3.7.7 Bullet (G) Line 2	… "(g)… verification and validation and functions of ~~cyber~~ computer security tools, as applicable, should be provided."	Editorial remark. It is recommended to use the term "Computer security" instead of "Cybersecurity".	X			
Germany 39	Headline before 3.7.8	**Safety ~~A~~actuation systems ~~for engineered safety features~~**	It is proposed to avoid the term *engineered safety features* and use the term *safety actuation system* according to the IAEA Glossary.			X	*See resolution to Germany 26*
Germany 40	3.7.8	3.7.8. This section should provide relevant information on the safety actuation systems ~~for engineered safety feature actuation system~~ and to demonstrate how Requirement 61 from SSR 2/1 (Rev.1) [3]	It is proposed to avoid the term *engineered safety features* and use the term *safety actuation system* according to the IAEA Glossary.			X	*See resolution to Germany 26*

COMMENTS BY REVIEWER Reviewer: Country/Organization:			Page…. Of…. Date:	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		is met. In particular, information on the specific aspects listed in para 3.7.7 regarding the reactor protection system, as applicable, should be provided here also.					
Germany 41	3.7.9	3.7.9. In some plant designs, the actuation systems for reactor trip and the ~~engineered~~ safety ~~feature~~ actuation systems for safety systems and safety features for DEC are designed as one single system. (…)	It is proposed to avoid the term *engineered safety features* and use the term *safety actuation system* according to the IAEA Glossary.			X	*See resolution to Germany 26*
Germany 42	3.7.10	3.7.10. This subsection should describe the instrumentation and controls of the systems required to achieve and maintain a safe state ~~shutdown condition of the plant~~, which are described in chapters 5, 9 and 10 of this Safety Guide. (…)	The term *safe state* is defined in SSR 2/1.	X			
Germany 38	3.7.22	3.7.22. This section should describe how the instrumentation and control systems allow the operating organization in the control room to initiate or take manual control of each function necessary to control the plant and maintain safety.	Missing word.	X			
Finland 11	3.7.23. Bullet 4	3.7.23. This section should provide a description of the main control room layout, with an emphasis on the presentation of information from the instrumentation and control in the main control room and human–machine interface, including: • Sufficient displays in the control room to monitor all functions important to safety; • The status of the plant; • Safety status and trends of the key plant parameters;	Add: procedures or There could also be severe accident management systems and related procedures.		*Last bullet will be modified as follows:* • Safety ~~classified~~ indications and controls to implement emergency operating procedures and severe accident management procedures or guidelines.		*[Note: SAM guidelines might include procedures, making the change (SAMPs or guidelines) confusing. Final terms are being considered under DS483]*

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		• Safety classified indications and controls to implement emergency operating procedures and severe accident management procedures or guidelines.					
Finland 12	3.7.32.	3.7.32 This section should describe the automatic control systems not important for safety. It should be demonstrated that postulated failures of control systems will not degrade the operation of systems important to safety. It should also be demonstrated that the effects of a failure of an automatic control system will not create a condition that exceeds the acceptance criteria or assumptions established for design basis ~~accidents~~ envelope.	The whole design including the DECs should be considered not only the DBAs.				*If an automatic control system (mainly dealing with NO and AOOs) fails, the reactor protection system shall reliably prevent an escalation to DEC keeping the plant under the acceptance criteria for DBA*
Japan 11	3.7.33.	3.7.33 If digital instrumentation and controls systems are used, the overall scope of the application should include information on (1) the design qualification including the verification and validation of digital systems, (2) protection against common-cause failure, and (3) functional requirements when implementing a digital protection system.	Addition of one of the most important terms of "V&V."		*(Combined with Ukraine 4, comment 4; see below).* *Bullets from para 3.7.33 will be modified as follows:* (1) the design qualification including the V&V of digital systems, (2) protection against common-cause failure, (3) functional requirements		**(7)**

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
					when implementing a digital protection system, (4) predeveloped software, (5) software tools, and (6) digital data communication.		
Ukraine-4, comment 4	3.7.33 Last line	*To extend as follows:* (4) predeveloped software, (5) software tools, (6) digital data communication	Important issues for digital safety systems	X	*(Combined with Japan 11. See resolution there).*		
Germany 43	3.7.33	If digital instrumentation and controls systems are used, the overall scope of the application should include information on (1) the design qualification of digital systems, (2) protection against common-cause failure, and (3) functional requirements when implementing a digital protection system. The description should demonstrate that Requirement 63 of SSR 2/1 (Rev. 1) [3] is met. Additionally, protection against cyber-attack, prevention of unauthorized access and other computer security measures should be provided. Sensitive and confidentially information should be provided in a corresponding security report.	Information on digital infrastructure is usually very sensitive and should be treated confidentially. For this reason, the SAR should contain only a brief description of this topic and detailed information should be provided in a corresponding security report.		*Last sentence will be modified as follows:* "… should be provided (see 3.13.27).		
CHAPTER 8. ELECTRIC POWER							
Germany 44	3.8.3	3.8.3. Chapter 8 should provide definitions, design features and classifications of off-site power system, on-site power system,	In case of loss of all AC power supply systems, DC power is available (e.g. batteries). This	X	"… standby power system, ~~and~~ alternate AC power system		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		standby power system, ~~and~~ alternate AC power system, as well as DC power supply systems.	should also be described in this section of the SAR. DC power is addressed in the following paras.		and DC power systems."		
Germany 45	3.8.4	3.8.4. This section should describe ~~one kind of~~ failure mode and effects analysis of off-site power system components. In addition, results of grid stability analysis (including stability after the main generator trip) should be provided.	Clarification, "*one kind of*" not necessary.	X			
Finland 13	3.8.6. Bullet (a)	3.8.6 Among the safety design criteria, rules and regulations, the following information specific to electrical systems should be described: (a) *Anticipated electrical events* considered in the design with all functional requirements under the steady state conditions, short term operation conditions and transient conditions defined in the design basis; (b) …	Please clarify, new terminology introduced *Anticipated electrical events* PIE/electrical event?		*Bullet (a) will be modified as follows:* a) ~~Anticipated electrical~~ Postulated initiating events considered in the design with all functional requirements to the electrical systems under the steady state conditions, short term operation conditions and transient conditions defined in the design basis;…		
Japan 12	3.8.6. After (h)	(i) Replacement, upgrades and modifications policy for degradation of electric power systems.	It is necessary to replace, upgrade and modify electric power system as a general design consideration stated in SSG-34. The same commnets #10. *[TO: see Japan 10 about 3.7.5]*	X			

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
Germany 45	3**.8.10** *(written 3.8.4 but referred to 3.8.10)*	3.8.4. This section should describe ~~one kind of~~ failure mode and effects analysis of off-site power system components. In addition, results of grid stability analysis (including stability after the main generator trip) should be provided.	Clarification, "*one kind of*" not necessary.	X			
Internal review	3.8.11	3.8.11. This ~~sub~~section should provide relevant information on the plant specific AC power system and its main equipment. It should include a description of the on-site AC power systems, including	Consistency with 3.8.14 (On-site DC power systems) and with corresponding section in the Annex (see 8.7)	X			
Ukraine-2, comment 2	3.8.12 Line 6	(g) the number of trains, and the minimum number of trains of engineered safety features to be energized simultaneously, (h) instrumentation and control equipment provided in the main control room to monitor and control the on-site power systems	see Requirement 5.278 IAEA SSG-34 [TO: referred paragraph states*:* CONTROLS AND MONITORING 5.278 Sufficient instrumentation and control equipment should be provided in the main control room to monitor and control the on-site and off-site power systems.]			X	*This aspect is part of the scope of 3.7.22. All aspects related to I&C are treated in Chapter 7 of this Safety Guide*
Germany 46	3.8.12.	This subsection should describe the power requirements for each plant AC load, including: (a) the steady state load; the start-up kilovolt-amperes for motor loads; (b) the nominal voltage; (c) the allowable voltage drop (to achieve full functional capability within the required time period); (d) the sequence and time necessary to achieve full functional capability for each load; (e) the nominal frequency; (f) the	To avoid the term *engineered safety features*. (see our comments above)			X	*See resolution to Germany 26*

COMMENTS BY REVIEWER Reviewer: Country/Organization:			Page…. Of…. Date:	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		allowable frequency fluctuation; (g) the number of trains, and the minimum number of trains of ~~engineered~~ safety systems and safety features for DEC to be energized simultaneously.					
Ukraine-2, comment 3	3.8.16 Line 3	3.8.16. This subsection should demonstrate continuity of DC power supply so that the monitoring of the key plant parameters and for the completion of short term actions necessary for safety is maintained in the event of loss of all the AC (alternating current) power sources. Information on possibilities to recharge batteries from alternate AC power sources should also be provided	see Requirement 68, para 6.45A from SSR-2/1 *[TO: referred paragraph states:* 6.45A. The design shall also include features to enable the safe use of non-permanent equipment to restore the necessary electrical power supply[25]. *Footnote* ***25****: Non-permanent equipment need not necessarily be stored on the site.]*	X			
Canada 6	3.8.17.	3.8.17 .This subsection should demonstrate that electrical equipment, cables and their raceways (including cable supports, wall and floor penetrations and fire stops) are selected, rated and qualified for their service and for environmental conditions **(**including electromagnetic interference**).**	Electromagnetic interference should be included in the report (here or in some other place).	X	*Additionally, last sentence will be modified as follows:* "… Seismic qualifications, ~~and~~ fire resistance of electrical equipment, buses, cable trays and their supports and electromagnetic interference qualification should be also described."		
Germany 47	3.8.18	3.8.18. This subsection should identify ~~at least three~~ four classes of cables: ~~(1) control~~	The IAEA document SSG-34 (*Design of Electrical Power*	X	*Acceptance of the proposal represents*		

<table>
<tr><td colspan="4">COMMENTS BY REVIEWER
Reviewer: Page…. Of….
Country/Organization: Date:</td><td colspan="4">RESOLUTION</td></tr>
<tr><td>Comment No.</td><td>Para/Line No.</td><td>Proposed new text</td><td>Reason</td><td>Accepted</td><td>Accepted, but modified as follows</td><td>Rejected</td><td>Reason for modification/rejection</td></tr>
<tr><td></td><td></td><td>~~and instrumentation cables, (2) low voltage power cables (e.g. 1000 V or less), and (3) medium voltage power cables (e.g. 33 kV or less).~~ (1) Instrumentation and control cables; (2) Low voltage power cables (1 kV or less); (3) Medium voltage power cables (greater than 1 kV to 35 kV); (4) High voltage power cables (greater than 35 kV).</td><td>*Systems for Nuclear Power Plants*, published 2016) distinguish four classes of cables.
It would be good to have consistent information among different IAEA documents.</td><td></td><td>*the following changes:*
3.8.18. This ~~sub~~section should identify at least four ~~three~~ classes of cables: (1) instrumentation and control ~~and instrumentation~~ cables, (2) low voltage power cables (1 kV ~~e.g. 1000 V~~ or less), (3) medium voltage power cables (greater than 1 kV to 35 kV); and (4~~3~~) high ~~medium~~ voltage power cables (greater than 35 kV~~e.g. 33 kV or less~~).</td><td></td><td></td></tr>
<tr><td>Finland 14</td><td>3.8.20.</td><td>3.8.20 A description of electromagnetic compatibility protection of the nuclear power plant and its’ electrical and I&C systems should be also provided. A description should be provided of the grounding and lightning protection (both internal and external protection) system, including the components associated with the various grounding subsystems (e.g., station grounding, system grounding, equipment safety grounding, any special grounding for sensitive instrumentation and computer or low-signal control systems). Grounding and lightning protection plan</td><td>Clarity,

reorganize and add and its’ electrical and I&C systems</td><td>X</td><td>*This para. will be modified as follows:*
3.8.20. A description of electromagnetic compatibility protection of the NPP and its’ electrical and I&C systems should be provided. This section should also include a~~A~~ description ~~should be provided~~ of the grounding and</td><td></td><td></td></tr>
</table>

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		drawings should be also included.			lightning protection (both internal and external protection		
CHAPTER 9. AUXILIARY SYSTEMS AND CIVIL STRUCTURES **9A. AUXILIARY SYSTEMS**							
Argentina 3 and 3Bis	Chapter 9, 9A Auxiliary Systems		Diverse communication systems (on-site and off-site) for normal operation and during and after accidents are missing, they should be added. 3Bis: Note that in Chapter 7 "Data communication systems" are of a different nature (communication within and among digital systems).		*Paragraph 3.9.18 will be modified:* " … Examples of systems to be included in this section are: • Communications systems, including diverse means to ensure communication on-site and off-site; • Lighting and emergency …		
Canada 7	3.9.4. Bullet 2	"… The following subsystems should be covered: • Fresh fuel storage and handling system; • Spent fuel storage and handling system including dry storage and on-site handling system for irradiated fuel; • Spent fuel pool cooling and clean-up system; • Handling systems for refueling fuel	Missing system and activity			X	*Dry storage is not part of the NPP and corresponding fuel handling is bullet 4*

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		cask;					
Germany 48	3.9.4 last bullet	Handling systems for ~~refuelling~~ fuel casks.	The word refuelling is confusing. According to NS-G-1.4 the term fuel cask is sufficient.		*Changes in fourth bullet:* Handling systems for ~~refuelling~~ fuel casks loading.		
Ukraine-1, comment 6	3.9.5	Add "transportation": "…include considerations such as packaging, transportation, storage,…"	Fuel management includes not only storage but also transport from the fresh fuel storage to the reactor compartments, temporary keeping in the spent fuel pool, etc.		*The para. Will be modified as follows:* "…include considerations such as packaging, handling, storage,…"		*The term transportation or transport refers typically to [off-site] shipping.*
Japan 13	3.9.6. Line 4	"…Special attention should be devoted to the provisions to 'practical elimination' of ~~severe~~ significant fuel damage in a spent fuel pool.	To keep a consistency with SSR-2/1 (Rev. 1).		*This part of the para. will be modified as follows:* "… 'practical elimination' of ~~severe~~ significant fuel degradation ~~damage~~ in a storage ~~spent~~ fuel pool and uncontrolled releases.		
Internal review	3.9.8 Heading	**Water ~~Heat transport~~ systems**					
Canada 8	3.9.12. Footnote	*Change the footnote#7 to:* It also applies to the supplementary control room (including other I&C and electrical rooms required temperature control, specially computer room) and to other emergency response facilities	Missing requirements		*Bullet changes:* • Control locations (and other areas requiring habitability control)~~room~~[1] heating,		

____

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
					ventilation, air conditioning; *Footnote changes:* It includes ~~also applies to~~ the main control room, the supplementary control room, ~~and to~~ other emergency response facilities and other areas/rooms hosting sensitive equipment (e.g. I&C or electrical equipment and computers)		
Canada 9	3.9.15. First Bullet	… • Diesel generator (or gas turbine generator) fuel oil storage (including its capacity) and transfer system;	Capacity of fuel storage for the diesel generator should reflect mission time for BOP, especially for remote site.		*Editorial change incorporated (line 4):* "…The design of supporting systems should be such as (…) significance of the system or component that they serve in all plant states. The following …"	X	*Capacity is indeed included in "fuel oil storage".*
Poland 21	Para 3.9.17	"… "Information to be provided should include: (a) parameters defining the load that, if dropped, would cause the greatest damage; (b) the areas of the plant where the load	Editorial remark. One element of group list is missing assignment (b). Besides it is recommended to separate the group elements, similar like it is done at	X			

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		would be handled; ~~(b)~~ (c) the design of the overhead lifting equipment; ~~(c)~~ (d) and the operating, maintenance and inspection procedures applied."	paragraph 3.9.20.				
Japan 14	3.9.18. Bullet 4	• ~~Communications systems;~~	Duplication.	X			
Finland 15	3.9.18. Bullet 4	3.9.18. This section should provide relevant information on any other plant auxiliary system whose operation may influence plant safety and that has not been covered in any other part of the safety analysis report. Examples of systems to be included in this section are: • Communications systems; • Lighting and emergency lighting systems; • Equipment and floor drainage system; • ~~Communications systems;~~ • Interfacing water systems (raw water reserves, demineralized water system, potable and sanitary water system); • Chemistry.	Communication systems is twice on the list.	X			
Japan 15	3.9.18. After the last bullet	Add the followings in the last bullets; • Storage system for non-permanent equipment in severe accident conditions	Addition of a bullet whose importance was re-established in severe accident conditions.	X	• Storage system for non-permanent equipment in severe accident ~~conditions~~		
9B. CIVIL ENGINEERING WORKS AND STRUCTURES							
Japan 16	3.9.24.	"3.9.24 Similarly as in previous cases, other	Completeness and clarification		*A new sentence will*		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		civil structures of the plant that are relevant to nuclear safety, should be described in this section. These are including, but not limited to, control building, auxiliary building, ultimate heat sink structures and emergency response facility on the site.”	of "other civil structures".		*be added*: “… in this section; this includes the control building, the auxiliary building, the ultimate heat sink structures and the emergency response facilities.”		
CHAPTER 10. STEAM AND POWER CONVERSION SYSTEMS							
Germany 49	3.10.5	Descriptions should include sufficient details for ensuring reliable performance of safety functions, including fast and reliable isolation and steam relief. Demonstration that separation of steam lines prevents leakage from one affecting the other and protection against aircraft crash should also be included. Detailed demonstration on protection against terroristc aircraft crash should be provided in corresponding security report.	Information on protection against terroristic aircraft crash is usually very sensitive and should be treated confidential.		*Cross-reference to para. 3.3.45 will be added* “...protection against aircraft crash should also be included (see para. 3.3.45).	X	*The clarification seems not necessary here. How to deal with security aspects is indicated in para. 3.13.27*
Japan 17	3.10.17.	3.10.17 This section should describe the scope of the break preclusion implementation in the main steam and feedwater lines. Those aspects should be emphasized which are important from the viewpoint of the direct impact on the plant safety (either direct effects on performance of the fundamental safety functions, or indirect effects like secondary damage of the plant systems e.g. by pipe whip or extraordinary pressure loading). If relevant, the description should include how the leak	Clarification for BWR main steam and feedwater lines, which need different handling from those for PWRs.		*The following change will be made in para.* ***3.10.3:*** 3.10.3. In this section, a summary description indicating principal design features **(…)** rated power, and should indicate safety related system design features. The		*Proposed additional text seems not necessary. In para. 3.10.6 the system boundary for the main steam supply system from BWRs is defined. In this case it is clear what has to be included in chapter 5 and in chapter 10 of the SAR. Para. 3.5.9 is applicable to both PWR*

COMMENTS BY REVIEWER Reviewer: Country/Organization:			Page…. Of…. Date:	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		before break concept has been implemented. Paragraph 3.5.9 should be applied to the main steam and feedwater lines inside the BWR containment vessel.			boundaries between the reactor coolant system and the main steam supply / feedwater system should be specified.		*and BWR as well.*
CHAPTER 11. RADIOACTIVE WASTE MANAGEMENT							
USA-G3	General to "Solid waste management systems"	*This section includes a very high-level description/statement to "prepare material for safe transport". A similar statement is included for liquid waste management.* *DS449 is focused on SARs for nuclear power plants and is not intended to be or include the specific instructions for packaging and transporting radioactive material. Other safety guides make that nexus for transportation. A reference to SSR-6 is all that is needed*	DS449 is not intended to include/describe the details and related IAEA safety guides and standards for packaging and transporting radioactive material. Other related safety guides do so		*A reference to SSR-6 will be added at the end of the para 3.11.17 as follows:* "3.3.17. Similarly as in the case (…) of waste to another facility for long term storage or disposal, confirming that applicable requirements from SSR-6 [36] are met."	X	*For consistency with guidance from US RG 1.206. In addition, SAR should only include high level description of how the applicant complies with SSR-6 and not actual procedures.*
Germany 50	3.11.1	3.11.1. This chapter should describe the adequacy of the measures proposed for the safe management of radioactive waste of all types that is generated throughout the lifetime of the plant. This should include a description of the measures to minimize the generation of radioactive waste as required in SSR-2/1 para 4.8 [3]. Treatment of radioactive waste is covered by requirements 78 and 79 from SSR-2/1 (Rev. 1) [3] and by Requirement 21 from SSR-2/2 (Rev. 1) [4]. (…)	For new plants it is a design requirement to minimize the generation of radioactive waste as well as discharges (see SSR-2/1 para 4.8). This aspect (here generation of radioactive waste) should be addressed in the SAR. Chapter 11 seems to be very well suited.		*Reference to para. 4.8 from SSR-2/1 (Rev.1) will be added. Editorial changes will be incorporated also as follows:* "… generated throughout the lifetime of the plant. Applicable requirements include those regarding waste		*This para. is introductory and just indicate applicable requirements and guidance. Minimization is covered in para. 3.11.9 (now also mentioned in 3.11.2)*

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
					minimization (see SSR-2/1 para. 4.8 [3]) and ~~T~~treatment of radioactive waste (~~is covered by~~ see requirements 78 and 79 from SSR-2/1 (Rev. 1) ~~[3]~~ and ~~by~~ Requirement 21 from SSR-2/2 (Rev. 1) [4]). Further requirements are ~~information on matters to be covered in this chapter of the safety analysis report is~~ provided in GSR Part 5 Predisposal Management of Radioactive Waste [33~~2~~]~~;~~ and specific guidance in GSG-3 The Safety Case and Safety Assessment for the Predisposal Management of Radioactive Waste [34~~3~~]~~;~~ and SSG-40 Predisposal Management …”		
Germany 51	3.11.2 Item 1	1. The capabilities of the plant to minimize, control, collect, handle, process and store liquid, gaseous, and solid wastes that may contain radioactive materials, and	For new plants it is a design requirement to minimize the generation of radioactive waste as well as discharges (see SSR-2/1 para 4.8). This aspect (here	X			

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			generation of radioactive waste) should be addressed in the SAR. Chapter 11 seems to be very well suited.				
Ukraine-3, comment 1	3.11.2. Item 1	Replacement. "…~~wastes that may contain radioactive materials~~" to be replaced with "…radioactive waste".	Clarification. "…wastes that may contain radioactive materials" should be considered and handled as radioactive waste unless they are cleared from the regulatory control.	X			
Finland 16	3.11.2. Item 2	3.11.2. More specifically, this chapter should describe among others: 1. The capabilities of the plant to control, collect, handle, process and store liquid, gaseous, and solid wastes that may contain radioactive materials, and 2. The instrumentation used to monitor the releases of ~~radioactive wastes~~ radioactivity, both on-site and off-site. Disposal of the waste takes place in a dedicated facility (final radioactive waste repository) and is therefore not covered in this chapter."	Release of radioactivity, not release of radioactive wastes. Radioactive wastes are handled, stored and disposed of but not released.	X	*It covers Ukraine 3, comment 2*		
Ukraine-3, comment 2	3.11.2. Item 2	Replacement. "…~~the releases of radioactive wastes~~" to be replaced with "…radioactive discharges and releases".	The term "the releases of radioactive wastes" seems to be incorrect. It is proposed to use "radioactive discharges and releases" instead.			X	*Covered by the proposal provided in Finland 16*
Germany 52	3.11.2 No. 2	2. The instrumentation used to monitor the possible releases of radioactive wastes, both on-site and off-site.	Make clear that waste is not released under normal conditions. If liquids or gases are released on purpose this should be defined as discharges.	X			

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
Germany 53	3.11.2.	Disposal of the waste takes place in a dedicated facility (final radioactive waste repository) and is therefore not covered in this chapter. However, acceptance criteria for repositories if existing should be considered under 1.	Acceptance criteria of waste of the repository have impact on conditioning.	X	*A new sentence will be added:* "… However, acceptance criteria for repositories, if existing, should be taken into account in this chapter."		
Japan 18	3.11.4. Line 2	3.11.4 Sections below should provide relevant information on the radioactive waste processing (i.e., pretreatment, treatment and conditioning) systems as well as waste storage facilities on site. They should include description of the design features of the facilities that control, collect, handle, process and store solid, liquid and gaseous forms of radioactive waste arising from all activities on the site throughout the lifetime of the plant…"	Addition of waste storage facilities on site which are missing in the original guide.	X	"…storage facilities located on-site. They should …"		
Ukraine-3, comment 3	3.11.4 line 7	Delete the word "~~escapes~~" from the sentence.	The word "escape" seems to be not appropriate to the contents of the sentence	X	"…incorporated to monitor possible leaks ~~or escapes~~ of radioactive waste …"		
Ukraine-3, comment 4	3.11.5	3.11.5. Description of the main sources of solid, liquid and gaseous wastes and estimates of their generation rate ~~and their normal operational releases~~, as well as liquid and gaseous releases under normal operational conditions, in compliance with the design requirements, should be provided in this section"	Clarification. See comment 2. *[TO: it refers to 3.11.2, item 2]*	X	*Changes incorporated:* 3.11.5. Description of the main sources of solid, liquid and gaseous radioactive wastes and estimates of their generation rate ~~and their normal operational releases,~~ as well as liquid and		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
					gaseous releases under the operational states, in compliance with the design …” *(See Germany 54)*		
Germany 54	3.11.6	Assessment of gaseous and liquid releases resulting from ~~anticipated operational occurrences and~~ accident conditions should be covered in chapter 15 and used as input here.	AOO belongs to the operational states and should be taken into account. It is not expected that AOOs will generate much more waste than normal operation. In addition, consistency with paras. 3.11.12 and 3.11.14 will be improved.	X			
Ukraine-3, comment 5	3.11.8	*Modification and replacement.* It is proposed to state para. 3.11.8 as follows: “This section should consider the options for the safe predisposal management of waste. The consideration of waste should cover solid, liquid and gaseous wastes, as appropriate, at all stages of their management”. *[TO: In practical terms:* 3.11.8. This section should consider the options for the safe predisposal management of waste. The consideration of waste should cover solid, liquid and gaseous waste, as appropriate, in all stages of their management ~~the development of measures to deal with radioactive waste safely throughout the lifetime of the plant. This section should consider the options for~~	Clarification of the contents of the paragraph.		*These following changes will be incorporated:* 3.11.8. The consideration of waste should cover solid, liquid and gaseous waste, as appropriate, in all stages of their management-and ~~the development of measures to deal with radioactive waste safely~~ throughout the lifetime of the plant. This section should describe ~~consider~~ the specific options considered for the		*It seems not necessary to change the approach of the existing paragraph, first general and then the specific part covered by the section.*

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		~~the safe predisposal management of waste]~~			safe predisposal management of waste.		
Germany 55	3.11.9.	Measures should also be aimed at minimizing both the volume and the activity of the waste… This should include also possible treatments in plants outside of the NPP and its facilities, e.g. abroad.	Treatments of e.g. operational waste should include possibility of transboundary shipment.			X	*Outside the scope of the Safety Guide. Different legislation applicable*
Germany 56	3.11.10	This section should describe the capabilities of the plant to control, minimize, collect, process, handle, and store liquid radioactive waste generated during operation and resulting from accident conditions.	For new plants it is a design requirement to minimize the generation of radioactive waste as well as discharges (see SSR-2/1 para 4.8). This aspect (here generation of radioactive waste) should be addressed in the SAR. Chapter 11 seems to be very well suited.			X	*Minimization is covered under "source term", see 3.11.9. This part and the next deal with "waste management systems"*
Germany 57	3.11.17.	Similarly as in the case of liquid wastes, information provided for solid waste should cover their control, handling, processing, storage and preparations for safe transport… This should include also possible treatments in plants outside of the NPP and its facilities, e.g. abroad.	Treatments of e.g. operational waste should include possibility of transboundary shipment.			X	*See resolution to Germany 55*
Poland 22	3.11.18 Line 4	"… This section should also demonstrate that the means of radiation monitoring are in accordance with Requirement 82, paras 6.77 to 6.82, from SSR-2/1 (Rev. 1) [3] and those for off-site monitoring comply with para 6.84 of the same reference."	Editorial remark.	X			
Germany 58	3.11.18	**Process and effluent radiological monitoring and sampling systems, including on-site and off-site monitoring**	Para 3.11.18 and headline before seems to be misplaced in the chapter on waste			X	*It could be part of chapter 20, although it belongs also to this*

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		~~3.11.18.~~ 3.20.9 This section should describe the systems and equipment that monitor and sample the process and effluent streams in order to control and observe the authorized limits of releases of radioactive materials generated in operational states and accident conditions. This section should also demonstrate that the means of radiation monitoring are in accordance with Requirement 82, paras 6.77 to 6.82, from SSR-2/1 (Rev. 1) [3] and those for off-site monitoring with para 6.84 of the same reference.	management. It will be better placed in CHAPTER 20. ENVIRONMENTAL ASPECTS. This information is important to assess the dose limits for the public in operational states. It is proposed to relocate para 3.11.8 between para. 3.20.8. and 3.20.9				*chapter*
CHAPTER 12. RADIATION PROTECTION							
Germany 59	3.12.1	3.12.1. This chapter should provide information on the policy, strategy, methods and provisions for radiation protection. The expected occupational radiation exposures during operational states, including measures to avoid and restrict exposures, should also be described. However, public exposure for all plant states, including determination of doses during normal operation, should be addressed separately in chapter 15 and chapter 20 of the safety analysis report.	As the radiological impact is also expected to be described in CHAPTER 20. ENVIRONMENTAL ASPECTS, a reference to chapter 20 should be added.		"… chapter 15, and used in chapter 20, of the SAR."		Only radiological environmental aspects should be included in this chapter of the safety analysis report
Germany 60	3.12.8. Line 3	… The necessity of workers' presence in certain plant areas where radiation levels are high should be justified and working hours in those areas limited, other means as e.g. prior mock up training, temporary shielding etc. should also be considered…	Prior mock up training is an essential measure to reduce exposure time and to avoid accidental situations.			X	*See para. 3.12.13.*
Germany 61	3.12.13.	Use of shielding, remote control, prior	Prior mock up training is an	X			

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
	Bullet 2	mock up training and other staff actions to shorten time of external exposure;	essential measure to reduce exposure time and to avoid accidental situations.				
Germany 62	3.12.14	3.12.14. The principles of radiation protection applied in the design and operation should be described, including description of means implemented to ensure that:	By design alone, radiation protection would be insufficient. For example, exceedance of dose limits (see bullet (a)) cannot be achieved. Dose rates in controlled areas could be (at least in Germany) up 3 mSv/h. In addition, operational measures, like dose warner and restrictions of working hours are necessary.			X	*This section is devoted to "design"; see para. 3.12.20 for "operation"*
Germany 63	3.12.14. Bullet (d)	(d) Measures are taken to protect workers from receiving doses near the dose limits by e.g. by prior dose planning year by year;	Prior dose planning is an essential measure to reduce exposure and to keep dose constraints.			X	*Example seems not necessary*
Germany 64	3.12.14. Bullet (e)	(e) All practicable steps are taken to prevent exposure due to accidents with radiological consequences including analysis of potential accidents and response with countermeasures;	Analysis of potential accidents and response with countermeasures is essential to be prepared in case of an accident.	X			
Germany 65	3.12.17.	3.12.17. Means (fixed and portable) for monitoring and decontamination of personnel should be described.	For completeness		3.12.17. Means for monitoring and decontamination of personnel, including both fixed and portable, should be described. "		
Germany 66	3.12.20. Item (b)	(b) The designation and functions of qualified experts including demonstration of actual qualification certificates, as appropriate;	Qualification certificates are usually time limited and should periodically be renewed.			X	*Part of oversight and inspection; outside the scope of this Safety Guide*

<table>
<tr><td colspan="4">COMMENTS BY REVIEWER
Reviewer: Page…. Of….
Country/Organization: Date:</td><td colspan="4">RESOLUTION</td></tr>
<tr><td>Comment No.</td><td>Para/Line No.</td><td>Proposed new text</td><td>Reason</td><td>Accepted</td><td>Accepted, but modified as follows</td><td>Rejected</td><td>Reason for modification/rejection</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Germany 67</td><td>3.12.20. Item (g)</td><td>(g) Limiting the number of personnel for working in the controlled areas and management of work planning including dose uptake and work permits;</td><td>Prior dose planning is an essential measure to reduce exposure and to keep dose constraints.</td><td></td><td></td><td>X</td><td>See bullet (k)</td></tr>
<tr><td colspan="8">CHAPTER 13. CONDUCT OF OPERATIONS</td></tr>
<tr><td>Argentina 4</td><td>Chapter 13</td><td>“Organizational structure of operating organizations”</td><td>Should include management of significant organizational modifications. In this regard INSAG-12 and 13 Reports should be referred.</td><td></td><td>[Requirement 6 (taking into account its para. 4.13) from GSR Part 2 will be added to para 3.17.11]</td><td></td><td>The comment seems more applicable to Chapter 17</td></tr>
<tr><td>Germany 68</td><td>3.13.2</td><td>The level of detail provided in this chapter may differ significantly between different stages of the safety analysis report; most complete information should be provided in the <s>preliminary safety analysis report or</s> final safety analysis report.</td><td>When submitting the PSAR, the operating organization has not yet been fully established. Usually, the vendor or architect engineer plays the most important role. When applying for the operating licence, the FSAR should describe the organizational structure of the operator.</td><td></td><td></td><td>X</td><td>Both stages of the SAR apply</td></tr>
<tr><td>Japan 19</td><td>3.13.3.
Header
And last line</td><td>Organizational structure <s>of operating organization</s>
Add the following sentence at the end of the para.
“…<u>Recommendations regarding Organizational structure of operating organization are provided in NS-G-2.4 [xx] (DS497 Step 4, The operating organization in Nuclear Power Plants).</u></td><td>Editorial to avoid redundant expression.
Should refer to NS-G-2.4 and its revision as DS497.</td><td></td><td>Organizational structure of the operating organization
“… and reviewing functions, are adequately addressed (see NS-G-2.4 [xx]).
(This reference has</td><td></td><td>Title terms seem acceptable</td></tr>
</table>

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
					been added in "REFERENCES")		
Germany 69	3.13.5	3.13.5. This section should also identify qualification requirements for the ~~key~~ staff allowed to carry out tasks important to safety.	*Key staff* is an unclear term. To clarify, for which staff qualification requirements are expected, the safety importance of the task is addressed.		"… qualification requirements for the personnel considered key staff by the operating organization."		
Japan 20	3.13.6. Last	Add the following sentence after the last. "…Recommendations regarding training are provided in NS-G-2.8 [xx] *(DS497 Step 4, Recruitment, Qualification and Training of Personnel for Nuclear Power Plants).*	Should refer to NS-G-2.8 and its revision as DS497.	X	"… and should be briefly described (see NS-G-2.8 [xx]). *(This reference has been added in "REFERENCES")*		
Finland 17	3.13.8. Line 1	"…for the licensing of operators and other licensed roles or positions, …"	Add and other licensed roles or positions There may be also other positions than operators that need licensing (compare in Finland several such as responsible manager, responsible for security arrangements etc.)		"… includes provision for the licensing of operators and for personnel in other roles or positions, this section should describe …"		
Japan 21	3.13.14./ last	Add the following sentence after the last. "…Recommendations regarding core management and fuel handling are provided in NS-G-2.5 [xx] *(DS497 Step 4, Core*	Should refer to NS-G-2.5 and its revision as DS497.		"… and should be briefly described (see NS-G-2.5 [xx]).		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		management and fuel handling for Nuclear Power Plants).			*(This reference has been added in "REFERENCES")*		
Japan 22	3.13.16. Header and para.	*Ageing Management ~~of ageing~~ and long term operation* 3.13.16 This ~~sub-~~section should describe all parts of the plant that can be affected by ageing and should present the proposals made for addressing the selected issues identified, in accordance to the safety relevance of SSCs. The long term operation programme focused on ageing management should be described; the description should cover appropriate material monitoring and sampling programmes needed for verification of the ability of equipment and the structures, systems and components to perform their safety function throughout the lifetime of the plant. Appropriate consideration should be given to the feedback of operational experience with respect to ageing. Recommendations on ageing management and long term operation are provided in NS-G-2.12 [36] (DS485 Step 10, Ageing Management and Development of a Programme for Long Term Operation of Nuclear Power Plants).	To keep a consistency with DS485. In addition, ageing management should be addressed in each SSC in Appendix II.10 as commented #34.	X	"… to ageing. Recommendations on ageing management and long term operation are provided in …"		
Japan 23	3.13.17 Line 4	*Control of modifications implementation* "… Recommendations regarding plant modifications are provided in NS-G-2.3 [37] and *(DS497 Step 4, Modifications to*	Should refer to NS-G-2.3 and its revision as DS497.		*Revision of NS-G-2.3 has been included in References*		

COMMENTS BY REVIEWER Reviewer: Country/Organization:			Page…. Of…. Date:	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		Nuclear Power Plants).					
Japan 24	3.13.20. Last Line	This section (*Documents and records*) should be moved to Chapter 17 MANAGEMENT SYSTEM. Add the following sentence after the last. "…Recommendations regarding documents and records are provided in NS-G-2.4 [xx] *(DS497 Step 4, The operating organization in Nuclear Power Plants).*	Recommendation for betterment. "Documents and records" are subjects of the management system in chapter 17. Should refer to NS-G-2.4 and its revision as DS497.		*NS-G-2.4 will be added:* " … of waste and decommissioning of the plant (see NS-G-2.4 [38])."		*Chapter 17 covers the general aspects of the MS. This para. is specific and deals with documents and records* "relevant for the operation".
Germany 70	3.13.21. Line 4	"… Particular attention should be paid to measures taken to ensure safety and radiation protection requirements during specific circumstances of the outages, such as multiple activities and actors from different fields and services, organization and planning, time pressure and management of unforeseen events.	For completeness	X	"…to measures taken to ensure safety and radiation protection during specific circumstances outages …"		
Argentina 4 bis		"Plant procedures and guidelines for accident management, in particular for severe accident"	Should explicitly include post-accident measures.				
Russia 17	3.13.24, Line 5	"…The approach used for verification and validation of the procedures should be presented, including, when it applies, human factors ~~engineering (see chapter 18)~~…."	To exclude from this sentence the words "engineering (see chapter 18)". In the standards on management system specified in the comment according to item 7 this term is not used, chapter 18 according to this comment should be combined with chapter 17	X			
Japan 25	3.13.25.	3.13.25 This ~~sub-~~section should provide a description of the selected approach to plant	To keep a consistency with	X			

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		accident management. The corresponding severe accident management procedures or guidelines developed to prevent the progression of accidents, including accidents more severe than design basis accidents, and to mitigate their consequences if they do occur, should be presented. The information provided should make reference to the overall accident management programme at the plant, if appropriate. Recommendations on the development and implementation of severe accident management procedures or guidelines are provided in DS483 [11].	SSR-2/2 (Rev. 1) para. 5.8.				
Germany 71	3.13.25. Line 2	"… The corresponding severe accident management procedures or guidelines developed to prevent severe accidents, and to mitigate their consequences if they do occur, should be presented including contact and information to local authorities for emergency response measures to protect population. The information provided should make reference to the overall accident management programme at the plant, ...	For completeness			X	*Too much detailed for the level of content of this para.*
Japan 26	3.13.26.	Add the followings in the last bullets; • The availability of interconnection means between units in a multiple unit site.	Addition of the 4th bullet in accordance with para 5.63. in SSR-2/1 (Rev. 1).	X			
Poland 23	Header and para 3.13.27	"**Nuclear safety and nuclear security interfaces** 3.13.27. Nuclear ~~S~~security issues are	Editorial remarks.			X	*This header and para. was reviewed by NSGC and includes its recommendations*

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		usually dealt with separately according to special regulations,… Although applicant's plans for ~~physical protection~~ nuclear security of the facility…”					
Poland 24	Para 3.13.28 / page 53	3.13.28 However this confidential section should indicate how the operating organization ensures that nuclear safety requirements and nuclear security requirements are managed without compromising each other, in accordance with Requirement 17 from SSR-2/2 (Rev. 1) [4]. This includes the establishment of an effective system to address nuclear safety and nuclear security aspects in a coordinated manner and involving all interested parties, together with the identification of specific provisions important for integration of nuclear safety and nuclear security.	Editorial remarks. It should be specified which type of safety and security is considered each time they are mentioned in the guide.			X	*This para. was reviewed by NSGC and includes its recommendations.*
CHAPTER 14. PLANT CONSTRUCTION AND COMMISSIONING							
Poland 25	Para 3.14.1	3.14.1 Chapter 14 should include demonstration that the nuclear power plant will be suitable for service prior [?] to entering the construction stage, in accordance with…”	The paragraph is hardly understandable. It is not clear, what should be demonstrated prior to starting nuclear power plant construction? It is not clear when power plant should be suitable for service – after it will be constructed and commissioned, or prior to construction? But prior to construction there is no power				*No specific proposals of change are made. This chapter refers to the planned or projected NPP. Paragraphs 1 and 2 are introductory and refer to the whole chapter, where demonstration elements are indicated. “Suitable” is a term used in the Safety Glossary. Paragraphs*

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			plant yet so how it could be suitable for service? Also it is not clear what is meant by power plant service and service suitability. Usually the power plant operation and operability is considered. The referred requirements from SSR-2/1 and SSR-2/2 does not mentions any service suitability. The clarification, definition and specification regarding nuclear power plant suitability for service prior plant construction should be added to the guide. It should be noted, that similar text line in paragraph 3.14.2: *"…the nuclear power plant will be suitable for service prior to its entering the operational stage…"* seems correct as power plant suitability for service (operation?) or whatever should be demonstrated before entering the operation stage.				*2.3 to 2.7. indicate the structure and content of the SAR for the different licensing stages.*
Poland 26	Para 3.14.3	3.14.3 ~~A link from the~~ Compliance [relation, fulfilment] between power plant nuclear safety justification ~~to~~ and the commissioning programme should be demonstrated. The commissioning	1. Editorial remark. 2. General comment. It should be noted, that expression *"items important to*		*First sentence will be modified as follows:* 3.14.3.Relationship between ~~A link from~~		*The term "item" is frequently used in the Safety Glossary.* "Items important to safety" *is specifically defined*

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		programme should, among other things, confirm that the separate plant ~~items~~ SSCs important to nuclear safety will perform within their specifications and ensure that the safety functions can be reliably performed.”	*nuclear safety”* is often used in the guide. **The term “item” should be replaced by SSC in the entire guide.**		the plant safety justification ~~to~~ and the commissioning programme should … “		*there.*
Japan 27	3.14.7. Bullet 3	“… • Plans to follow guidance in applicable regulatory guides in the development and conduct of the initial test programme, and in the development of inspection schedule prior to the fuel loading date;	Inspection schedule should be added here.	X			
Germany 72	3.14.8 Bullet 1	Description of the major stages of the commissioning program, including both: - non-nuclear testing, comprising individual pre-operational tests, overall pre-operational systems tests, structural integrity tests, integrated leakage tests for the containment and of the primary and secondary ~~and~~ system and - nuclear testing, comprising initial fuel loading, subcritical tests, initial criticality tests, low power tests and power ascension tests and the specific objectives to be achieved for each major stage;	This sentence is very long and difficult to understand, using items would make the message more transparent.			X	*Final edition will be treated by the Technical Editor before publication*
Japan 28	3.14.8. Bullet 12	“… • The schedule, relative to the fuel loading date, for conducting each major stage of the commissioning	Inspection schedule should be added here.		*Bullet 12 will be modified as follows:* “The schedule, relative to the fuel		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		programme and for receiving each major stage of the inspection;			loading date, for conducting each major stage of the commissioning programme, including the complete inspection schedule."		
CHAPTER 15. SAFETY ANALYSIS							
Finland 2	General *[to Chapter 15]*	The analysis of the accident beyond the design envelope is not covered in this draft DS449. The accident conditions cover the design envelope and also those accident more severe should be analyzed for the emergency preparedness purposes. IAEA GSR Part 4 (Rev.1), 4.50					*This Safety Guide covers all accidents, including severe accidents, except those to be 'practically eliminated'. It does not specify the scope of analysis to be performed for emergency preparedness.*
France 2	3.15.4	3.15.4. The information provided in this chapter should be sufficient to justify and confirm the design basis for the items important to safety, and to ensure that the overall plant design is capable of meeting the established acceptance criteria, in particular the authorized limits – if any - for radiation doses and radioactive releases for each plant state and that the consequences of accidents are as low as reasonably practicable.	Quantitative acceptance criteria for radiological consequences are not systematically established (not in France) and their achievement is not sufficient to demonstrate (ALARP principle)		*Changes incorporated:* " … established acceptance criteria, in particular the authorized limits for radiation doses and radioactive releases for each plant state and that the consequences of accidents are as low		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
					as reasonably practicable.		
France 3	3.15.8 and 3.15.17	~~3.15.8. The approach should also include description of and how the loads due to internal or external hazards have been considered as initiators for postulated initiating events.~~	The sentence is not clear (how the loads due to internal or external hazards have been considered as initiators for postulated initiating events.) It seems not adapted to the "General considerations" chapter. If no additional information is added with respect to 3.15.17, 3.15.8 can be deleted and 3.15.17 reformulated as follows: 3.15.17. It should be also described how relevant internal and external hazards, both of natural as well as of human induced origin~~, leading to initiating events which may potentially challenge the safety functions~~, have been considered in determination of postulated initiating events.	X	*Both paras will be modified as follows:* 3.15.8. The approach should also include description of ~~and how~~ the loads due to internal or external hazards, how have been considered as initiators for postulated initiating events and also how may challenge safety functions. 3.15.17. It should be also described how relevant internal and external hazards, both of natural as well as of human induced origin, leading to initiating events ~~which~~ that may also ~~potentially~~ challenge the		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
					safety functions, have been considered in determination of PIEs.		
Germany 73	3.15.15	3.15.15. ~~Where appropriate, considered interactions between the electric grid and the plant, and interactions between different reactor units on the same site should be described in this section.~~	Interfaces between electic grid and plant is expected to be described in CHAPTER 8. ELECTRICLA POWER. Multi-unit aspects should be addressed in CHAPTER 19. EMERGENCY PREPAREDNESS (see also Requirement 33 in SSR 2/1).		*Changes incorporated:* 3.15.15. Where appropriate for the consideration as sources of initiating events, ~~considered~~ interactions between the electric grid …		*Interaction of the plant with the grid considered only as a potential initiator of an event is meant here*
Germany 74	3.15.16	3.15.16. ~~Considered failures initiated in other plant systems besides the reactor coolant system, such as the containers or storages for fresh or irradiated fuel and storage tanks for radioactive gaseous or liquid wastes, should be also described here.~~	This is already addressed in para. 3.15.14 and partially in 3.15.17. The plant specific event list should be complete including all possible internal events challenging nuclear safety and / or radiological safety objectives.			X	*It is appropriate to mention this option explicitly.*
Ukraine-1 comment 4	3.15.16	3.15.16. Considered failures initiated in other plant systems besides the reactor coolant system, such as the containers or storages for fresh or irradiated fuel and storage tanks for radioactive gaseous or liquid wastes, should be also described here. Where appropriate, the interactions between the reactor core and spent fuel pool, as well as their mutual impact, should be identified.	Where appropriate, possible interactions and mutual impact between the reactor core and spent fuel pool should be considered in safety analysis, e.g. - reactor accident phenomena may influence SFP mitigation and vice versa; - sharing the reactor and SFP systems; – generation of additional hydrogen in SFP, etc		*The proposed sentence will be incorporated as a new paragraph:* 3.15.16A. Where appropriate for the consideration as sources of initiating events, the interactions between the reactor core and the spent fuel pool, as well as their mutual		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
					impact, should be identified.		
France 4	3.15.18	3.15.18. This section should also describe how the possibility of certain conditions arising that could lead to an early radioactive release or a large radioactive release were 'practically eliminated' due to measures taken to prevent the occurrence of such sequences and to their very low likelihood, with reference to specific analyses presented in this safety analysis report.	This point seems to be not adapted to the section "*Identification and categorization of postulated initiating events and accident scenarios*". It can be moved in a specific section about "practical elimination" after 3.15.47 Concerning the list of "practically eliminated situations", it can be added to 3.15.13 : "…the list of scenarios to be addressed in the safety analysis report should cover anticipated operational occurrences, design basis accidents, design extension conditions without significant fuel degradation, ~~and~~ design extension conditions with core melting and "practically eliminated" conditions.		*This para. will be modified as follows:* 3.15.18. This section should also list ~~describe how~~ the ~~possibility of certain~~ conditions ~~arising~~ that could lead to an early radioactive release or a large radioactive release ~~were~~ and thus need to be 'practically eliminated' ~~due to measures taken to prevent the occurrence of such sequences and to their very low likelihood,~~ with reference to specific analyses presented in this safety analysis report.		
Ukraine-1 comment 3	3.15.21	3.15.21. If probabilistic values such as core damage frequency or large releases frequency are set up as acceptance criteria or safety ~~design~~ objectives, these specific values should be also provided here".	Clarification. The term "safety objectives" is used throughout the SG.	X			
Canada 10	3.15.23.	3.15.23. This section should describe the approaches adopted to take into account	Usually only operator actions are accounted			X	*More general consideration of the*

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		human (operator) actions and the methods selected to model these actions …”					*different human actions is meant here, not only those from control room staff. Indeed, there are local actions to be described, notably in probabilistic analyses.*
Germany 75	3.15.25	3.15.25. In this subsection it should be described ~~how~~, that sufficient margins ~~in safety analysis~~ have been demonstrated ~~ensured~~ using safety analysis applying acceptable approaches (i.e., conservative or realistic, as suggested in DS491 [41]), and how in the case of realistic analysis the uncertainties in the computer codes and other input data were taken into account.	Safety analyses don't need margins. The idea is that margins of SSCs will be determined by comparing results from safety analyses (including uncertainties) and the capability of SSCs to withstand static and dynamic loads.		*This para. will be modified as follows:* 3.15.25. In this ~~sub~~section it should be described ~~how~~ that sufficient margins ~~in safety analysis~~ have been demonstrated ~~ensured~~ using deterministic safety analysis in which acceptable approaches (i.e., conservative, best estimate or realistic, as suggested-in DS491 [41]) have been applied, and how in the case of best estimate ~~realistic~~ analysis the uncertainties in both the computer codes and the ~~other~~ input data…”		
Germany 76	3.15.27	3.15.27. Emphasis should be given to the brief substantiation of the applicability of	Not only code validation should be addressed but also	X			

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		the computer code to the particular analysis. In particular, a summary of the scope of validation and verification of the computer codes should be presented, with references to more detailed topical reports.	code verification. This can be documented in accompanying documents rather than in the SAR itself.				
Germany 77	3.15.28	3.15.28. The ~~plant models (including nodalization schemes) used for the deterministic analyses as well as the~~ assumptions made concerning plant parameters, the operability of systems and the operating organization's actions (if any) should be described. ~~The key validations of the plant model (including assessment on nodalization and physical models convergence) should also be summarized.~~ Sufficient plant data used for development of the plant models should be provided in order to allow for independent verification of safety analysis, if applicable; see GSR Part 4 (Rev. 1) [2].	Information on nodalization and validation of plant models is too detailed for a SAR. This information should be presented in detailed reports describing a safety analysis in more detail. This information should be made available to the regulator on request. The main objective of chapter 15 is the presentation of results of the safety analysis to demonstrate compliance with regulatory requirements and derived technical acceptance criteria (quantitative) or acceptance targets (qualitative).		*A few editorials will be incorporated:* 3.15.28. The plant models (including nodalization schemes) used for the deterministic analyses as well as the assumptions made concerning plant parameters, ~~the~~ operability of systems and ~~the~~ operating organization's actions (if any) should be described. The key validations of the plant model (including assessment on nodalization and physical models ~~convergence~~) should also be summarized. Sufficient plant data used for development of the plant models should be provided in order to allow for independent verification of safety analysis, ~~if~~ when applicable; see GSR Part 4 (Rev. 1) [2].	X	*As indicated, only a brief description is expected in the SAR, but without that information it is difficult to assess the quality of the deterministic safety analysis performed.*

COMMENTS BY REVIEWER Reviewer: Country/Organization:			Page…. Of…. Date:	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
France 5	3.15.31	This section should demonstrate that the normal operation can be carried out safely and hence should confirm that:	Editorial	X			
Poland 27	3.15.31 Bullet 1	3.15.31 This section should demonstrate that the normal operation can be carried out safely and hence should confirm that: • Radiation doses to members of the public corresponding to the planned discharges and/or releases of radioactive material from the nuclear power plant during normal operation are within the authorized limits;”	Editorial remark. It should be clarified, that radiation doses to members should be justified for normal power plant operation.			X	*It seems clear from the text of the whole para. that it relates to the normal operation*
Internal review	3.15.40 Bullet (d)	(d) Availability of systems (control and limitation systems, active and passive safety systems) and operator actions: A detailed …”	Consistency with DS491 (para 7.3)	X			
Canada 15	3.15.41	Add: “for existing plants for certain AOO can rely on safety systems to mitigate the accident scenario.”	Allows a graded approach for existing plants.			X	*The comment is reflected in standard conservative way of analysis of AOO. As indicated, para. 3.15.41 proposes to add “something”, which is needed to demonstrate independence between levels of DiD.*
Japan 29	3.15.43.	3.15.43 Scope and components of the information provided should be similar as described above for design basis accidents, taking into account the main differences in approaches to safety analysis, in particular a best estimate	Clarification. A best estimate approach is used for analysis of DEC.	X	3.15.43 Scope and components of the information provided should be similar as those described above for …… in approaches to safety		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		approach is used as described in *DS491 [41]*.			analysis, in particular a best estimate approach used as described in *DS491 [41]*.		
France 6	3.15.44 Heading and para.	***Analysis of design extension conditions with core melting and of practical elimination of conditions*** 3.15.44. This section should present the assumptions used and the results obtained from the analyses of design extension conditions with core melting, with subsequent releases of radioactive materials to the containment. The analysis presented in this section should identify the most severe plant parameters resulting from the core melt sequences, and demonstrate that: • The plant can be brought into a state where the containment functions can be maintained in the long term; • The plant structures, systems and components (e.g., the containment design) are capable of reducing the radiological consequences at an acceptable level. ~~preventing an early radioactive release or a large radioactive release, including containment by-pass. The information presented should contribute to confirmation that the possibility of~~ It should be also deterministically justified that Plant conditions ~~states~~ arising that could lead to an early radioactive release or a large radioactive release are 'practically	Practically eliminated conditions are part of DEC Idem + the objectives for DEC conditions are stronger : consequences should be minimized The sentence is not clear (The information presented should contribute to confirmation…)		*In this para. the second sentence of bullet 2 will be modified as follows*: "… The information presented should contribute to the demonstration ~~confirmation~~ that the possibility of certain plant states arising that could lead to an early radioactive release or a large radioactive release is 'practically eliminated';"		*Consistency with DS491 is necessary. The suggested modification of the title would imply relevant confusion. The analysis demonstrates practical elimination, but practically eliminated conditions are not part of DEC*

COMMENTS BY REVIEWER Reviewer: Country/Organization:			Page…. Of…. Date:	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		eliminated'; • Compliance with the acceptance criteria is achieved by features implemented in the design and not only by implementation of severe accident management guidelines.					
Canada 16	3.15.47	Delete, "anticipated design extension conditions with core melting." *[TO:* 3.15.47. Rather than presenting large number of accident scenarios, the information provided should address the impact of the conditions ~~of anticipated design extension conditions with core melting~~ to demonstrate that safety objectives and release limits are met.*]*	Not sure what this is referring to. Unlike DBA and AOO, there is no bounding scenario to reduce the large number of accident scenarios.		*Combined with France 7.* *This para. will be modified as follows:* 3.15.47. ~~Rather than presenting large number of accident scenarios, t~~The information provided should address the impact of the most challenging conditions ~~of anticipated design extension conditions with core melting~~ and ~~to~~ demonstrate that the established acceptance criteria ~~safety objectives and release limits~~ are met."		
France 7	3.15.47	3.15.47. Rather than presenting large number of accident scenarios, the information provided should address the impact of the conditions of anticipated design extension conditions with core	The sentence is not clear		*Combined with Canada-16, see the resolution there*		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		melting to demonstrate that safety objectives and release limits are met.					
Argentina 5	Chapter 15		Consideration should be given to level 3 for those Member States where its development is required by the Regulatory Body. It should also be included in Section “Probabilistic safety analysis”, or a justification of why not should be provided.			X	*Out of the scope of this Safety Guide. Additionally, no specific proposal of change is suggested.*
Canada 11	3.15.57.	*Add to the end:* Success criteria for different scenario might be extracted from DSA or calculated in PSA.	For different approaches PSA may or may not include calculations of success (core damage) for different sequences. Accident scenarios for DSA might be different for use in PSA.			X	*The proposal relates to PSA methodology, treated in [42]/[43], Level 1 PSA and Level 2 PSA, respectively.*
Germany 78	3.15.57	(…) The methodology and computer codes used should be described ~~characterized~~. Sources of important input data should be introduced with justification of their use. (…)	A description of the applied methodology and computer codes is sufficient.	X			
Hungary 15, comment 1	3.15.59 Line 2	3.15.59. The methods used and results of probabilistic safety assessment Level 1 should be summarized in this section. The results should include the results of accident sequence modelling, including event sequence and system modelling, human performance analysis, dependence analysis and classification of accident sequences into plant damage states.	Editorial. There is a missing comma (,) after the system modelling	X	*Additionally, Reference [42] will be incorporated:* 3.15.59. The methods used and results of probabilistic safety assessment Level 1 [42] should be summarized in this section. …”		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
					(Note: same applies to para. 3.15.61 for Level 2 PSA)		
Hungary 15, comment 2	3.15.60 Line 2	"… The results of probabilistic safety assessment Level 1 study should include a delineation of the likely frequency of core damage and fuel damage from events which occur when the plant is operating at power as well as when it is shutdown, considering in detail the occurrence of events both internal and external to the plant.	The Level 1 PSA results should contain the results of the spent fuel pool too (fuel damage), not only the core (core damage).	X			
CHAPTER 16. OPERATIONAL LIMITS AND CONDITIONS FOR SAFE OPERATION							
Germany 79	Headline before 3.16.7	Limits and conditions for ~~normal operation~~ operational states, surveillance and testing requirements	OLCs should also cover AOOs (see NS-G-2.2 section 3). Thus, the term *operational states* is more appropriate than *normal operation*.			X	*This section refers to NO*
Germany 80	3.16.7	The corresponding requirements for surveillance, maintenance and repair to ensure that the important parameters for ~~normal operation~~ operational states remain within acceptable limits and that systems and components are operable should be specified and described in this section. Where appropriate, such requirements should be justified taking into account insights from a probabilistic safety assessment. The actions to be taken in the event that operational limits and conditions are not fulfilled should also be clearly established.	OLCs should also cover AOOs (see NS-G-2.2 section 3). Thus, the term *operational states* is more appropriate than *normal operation*.		*Reference to NS-G-2.2 will be added in para. 3.16.3*	X	*This section refers to NO*
CHAPTER 17. MANAGEMENT SYSTEM							

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
Poland 28	Para 3.17.1	3.17.1 Chapter 17 should describe the overall management of all safety related activities to ensure compliance with principle 3 of SF-1 [19] regarding the leadership and management for safety….”	When referring to a single requirement or principle, the main objective of that requirement or principle should be provided in the guide directly. It is not clear compliance with whom or what should be ensured, i.e. the objective and scope of referred principle 3 should be clarified. See also related comment 8 for paragraph 3.3.27.	X			
Finland 20	3.17.1.	3.17.1 Chapter 17 should describe the overall management of all safety related activities to ensure compliance with principle 3 of SF-1 [19]. The information provided should cover establishing, assessing, sustaining and continuously improving effective leadership and management ~~of~~ for safety and should allow for verifying compliance with GSR Part 2 Leadership and Management for Safety [44].	Typo leadership and management of <u>for</u> safety and	X			
Canada 12	3.17.13. Last Line	*Add to the end:* "…Internal audits should be performed periodically (including audits by staff of similar plants).			The following sentence will be added at the end of paragraph: "…continuous improvement. Description of the arrangements should include internal and		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
					external audits performed periodically and other kinds of independent evaluations.		
Russia 18	Paragraphs 3.17.1 – 3.17.16, in Chapter 17	MANAGEMENT ~~SYSTEM~~ FOR SAFETY	To change heading of this chapter to "Management for safety" for more exact reflection of its contents according to requirements of the GSR Part 2 standard	X			
CHAPTER 18.: HUMAN FACTORS ENGINEERING							
Finland 4	~~1.7.~~ *Chater 18* *Provided as "general comment". It applies to Chapter 18*	Additional guidance on HFE design and development of human system interface (HSI) is available from Member States and from other organizations that develop industrial standards. Such standards give much greater detail than is appropriate for IAEA safety standards. It is expected that this Safety Guide will be used in conjunction with detailed industry standards.	Human system interface (HSI) is more appropriate concept than human machine interface (HMI) and reflects the fact that humans interact with different NPP systems (not machines) Use this systematically throughout the guide. (Even better concept in most cases would be human system interaction, because HFE includes also design of procedures and trainings ➔ the object of design is wider than mere interface				*Column "Proposed new text": References are indicated in DS492.* *Column "Reason": The term "human-machine interface" is used in SSR 2/1 (Rev.1), see Requirement 32, in SSG -29 and in DS492. Although other terms could be more adequate this Safety Guide should be consistent with other Safety Standards.*
Finland 21	3.18.1.	3.18.1. Chapter 18 of the safety analysis report should describe how human factors engineering principles are incorporated into	HFE should not be limited to HMI, training, and procedures. For all plant modifications,		*This para. will be modified as follows:* 3.18.1. Chapter 18 of		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		the NPP design, including the human-machine interface ~~design~~, procedures and training, to meet the…	human (and organizational factors) should be adequately considered. See e.g. Paragraph 4.40 of SSR 2/2 (Rev. 1) AND requirement 32 of SSR-2/1 (Rev. 1)		the safety analysis report should describe the ~~how~~ HFE ~~principles are incorporated into the human machine interface design, procedures and training~~ program, and its application to the specific plant design to meet the Requirement 32 (paras 5.53 to 5.62) from SSR-2/1 (Rev. 1) [3]; further guidance is being prepared under *DS492 (Step 10~~5~~) [47]*. The same applies to all operational states and accident conditions and to all plant locations where such interactions are anticipated. In particular the HFE considerations presented in the safety analysis report should cover at minimum the following ~~should be addressed~~: (1) HFE programme management, including the authority and oversight in the design process~~The planning and management of human factors engineering activities~~; (2) The human factors		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
					analysis methods applied ~~The plant design process~~; (3) Assumptions for the choice of HMI design taking into account HFE~~The characteristics, features of the human-machine interface design, procedures and training program~~; ~~(4)~~ Human factors verification and validation including identification and resolution of HFE issues identified during the design project and assumptions made during analyses~~The implementation of the human-machine interface design~~; (5) A description of how HMI design has been implemented in the overall plant design~~Monitoring of human performance at the site~~; (6) A description of human performance monitoring strategy for safety critical tasks.		
Russia 19	Paragraphs 3.18.1	HUMAN FACTOR ENGINEERING	According to the comment of the item 7, section 18.3 of			X	*It seems there is a misunderstanding. HFE*

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
	– 3.18.40, in Chapter 18		this chapter should be relocated to chapter 7 "Instrumentations and control" except subsections 18.3.6 and 18.3.7 according to comment on item 16, taking into account recommendations of the SSG-39 "Design of I&C Systems for NPPs" standard. All the rest should be included in chapter 17 "Management for safety" in that measure as it follows from requirements of the GSR Part 2 standard and recommendations of the GS-G-3.1 and GS-G-3.5 standards.				*is a stand-alone activity covering much broader scope than just I&C systems. Section 8 in SSG-39 describes only high level HFE guidance related to "HFI in design" but does not describe the entire HFE process in detail, which is described in a new Safety Guide (DS492).*
Finland 22	3.18.5. Bullet 4	3.18.5 This section should describe: (…) - The organization and competence ~~requirements for integrating~~ of the human factors engineering ~~into the design~~ team	I would remove the term "requirements" because P/FSAR is a report. It should not state requirements but instead report issues.		*Fourth bullet will be modified as follows:* "- The organization and competencies necessary ~~requirements~~ for integrating HFI into the design;"		
Finland 23	3.18.5. New Bullet	This section should describe: "… - The responsibility and authority of the human factors engineering team regarding integrating HE into the design (add a new bullet)	From HFE effectiveness point of view it is of utmost importance to understand the responsibilities and the authority of HFE.		*New bullet:* - The responsibility and authority in the HFE team regarding the integration of the HFE aspects into the design		
Poland 29	Para 3.18.5	3.18.5 This section should describe:.	The definition and description		In para. 3.18.5, bullet		

<table>
<tr><th colspan="4">COMMENTS BY REVIEWER
Reviewer: Page…. Of….
Country/Organization: Date:</th><th colspan="4">RESOLUTION</th></tr>
<tr><th>Comment No.</th><th>Para/Line No.</th><th>Proposed new text</th><th>Reason</th><th>Accepted</th><th>Accepted, but modified as follows</th><th>Rejected</th><th>Reason for modification/rejection</th></tr>
<tr><td></td><td>Bullet 2</td><td>…
– The coordination required between responsible personnel, <u>project and design authorities</u> [?] and different disciplines to perform human factors engineering activities;”</td><td>of the “project and design authority” should be added to the guide.</td><td></td><td>2, the word “authorities” will be replaced by “management”:
• The coordination required between responsible personnel, project and design management ~~authorities~~ and different disciplines …”</td><td></td><td></td></tr>
<tr><td>Finland 24</td><td>3.18.10</td><td>-</td><td>The para is very hard to understand. Consider re-phrasing.</td><td></td><td>This para. will be modified as follows:
3.18.10. This section should describe the ~~objectives and scope of~~ task analysis approach for groups of operating personnel (such as reactor operator, turbine operator, shift supervisor, field operator, safety engineer and operation and maintenance staff) relevant to the task being analyzed. The tasks described should cover all plant</td><td></td><td></td></tr>
</table>

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
					states.		
Finland 25	3.18.xx *[treated with 3.18.12]*	(add a new requirement) This section should report the scope, methods and main results of the conducted task analysis	It should be evident based on the safety analyses report what kind of task analysis has been conducted. (Applies to FSAR)		*A new para. will be added:* 3.18.12A. The main results of the task analysis conducted should be also described in a specific section.		
Finland 18	3.18.30 second bullet	"…conditions~~)~~;"	is there a lapses with "conditions)"	X			
Finland 19	3.13.6-8 3.18.29-30		There is some overlapping in the requirements concerning reporting training issues in SAR in these different chapters 13 and 18, which may cause difficulties in writing the document, i.e. what to report where. May lead to repeating or difficulties in dividing issues to report under two different topics.		*(No specific proposal is made).* *The following changes will be incorporated:* 1) 3.13.6. This section should provide information allowing verification that the general qualification and training programme for plant staff is adequate to achieve and maintain the required level of professional competence throughout the lifetime of the plant. 2) Paras 3.18.28-29: *HMI training programme*		*Paras 3.13.6-8 refer to the general "qualification and training programme" for plant staff and paras 3.18.29-30 to HMI training programme development.*

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
					development 3.18.29. In accordance with the general qualification and training programme (see paras 3.13.6-9), this section should document ~~in coordination with chapter 13,~~ a systematic approach for the HMI training programme development of personnel ~~training~~. 3.18.30. The overall scope of HMI training programme development should be defined, and should include the following: - (…); - ~~The f~~Full range of plant functions and systems, including those that may be different from those of ~~in~~ predecessor		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
					plants (e.g., passive systems and functions); - ~~The f~~Full range of relevant HMI (e.g., MCR, remote shutdown panel, local control stations and technical support centre) including characteristics that may be different from those of ~~in~~ predecessor plants (e.g., display ….		
Finland 26	3.18.32.	3.18.32. This section should document ~~whether~~ how the test scenarios used for validation testing allow for the assessment of the resources placed at the personnel's disposal over appropriate lengths of time and in an appropriate meaningful number of scenarios.	Change "whether" to "how".	X			
Finland 27	3.18.xx	(add new requirement) This section should describe the validation concept, including but not limited to: independence of validation from design, test design justifications, scenario selection, criteria selection	Principles and justification for validation concept should be provided in safety analysis because this is needed in order to understand whether the design meets requirements human factors.		*A new para. will be added:* 3.18.32A. This section should describe the validation concept, including the independence of validation from design, test design justifications, scenario selection		*Place and numbering of former paras 3.18.32 and 3.18.33 will shifted, becoming 3.18.33 and 3.18.32 respectively*

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
					and criteria selection		
Finland 28	3.18.xx	(add new requirement) This section should report the main findings/conclusions of the final HFE validation of the design.	Main findings from validation should be reported. (Applies to final SAR)		*A new para. will be added:* 3.18.33A. This section should describe the main findings and conclusions of the final human factors engineering validation of the design.		*Place and numbering of former paras 3.18.32 and 3.18.33 will shifted, becoming 3.18.33 and 3.18.32 respectively*
CHAPTER 19. EMERGENCY PREPAREDNESS							
Finland 29	3.19.6 Bullets 9 and last	… • ~~Assessing the initial phase~~ continuous safety assessments throughout the emergency; • Managing the medical response; • Mitigating non-radiological consequences; • Managing radioactive waste arising in a nuclear or radiological emergency; and • Keeping the public informed • terminating on-site emergency.	Please update the list of activities. The continuous assessment is important. Add termination phase.	X	• ~~Assessing the initial phase~~ Regular assessments of safety throughout the emergency;		
IAEA review	3.19.8 (a)	(a) On-site emergency facilities ~~An on-~~			*Paragraph 3.19.8.*		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		~~site emergency facility~~ in which response personnel will …			*will be modified:* 3.19.8. Information should be provided about the particular availability at the plant, including resistance to external hazards and habitability conditions, of the following (see Requirement 24 from GSR Part 7 [53]): (a) ~~An o~~On-site emergency facilitiies~~y~~ in which response personnel will decide on, initiate and manage all …"		
Finland 30	3.19.9.	3.19.9. Description of emergency response facilities should include details of any equipment, communications and other arrangements necessary to support the specific facilities' assigned functions and ensuring the continuous availability of emergency arrangements at the response facility. The habitability of these facilities and the provisions to protect workers during accident conditions should also be described and justified.	Add: "… and other arrangements necessary to support the specific facilities' assigned functions and ensuring the continuous availability of emergency arrangements at the response facility. Ensuring the availability of the facility should be described.	X	*This para. will be modified as follows:* "… to support the specific facilities' assigned functions and to ensure the continuous availability of emergency arrangements at the response facility. The		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
					habitability of these…”		
Poland 30	Para 3.19.12 Bullet 4	“(4) If applicable, address the training and emergency exercise requirements for operators of collocated ~~licensees~~ reactors and/or power units;”	It should be clarified, which exercises are considered here. Also, the meaning of “collocated licensees” is not clear. Proper clarification should be added.		*Item (4) will be modified as follows:* 4) If applicable, address the training and emergency exercise requirements for the operators from all the reactors~~colocated licensees~~;		
Canada 13	3.19.12	*Add:* (6) If applicable, address the requirements for construction and maintenance staff for units under construction or refurbishment licensees.				X	*From the proposed text it remains unclear how the construction and maintenance staff is related to the multi-unit site subject. The idea suggested is already addressed in 3.19.7.*
CHAPTER 20. ENVIRONMENTAL ASPECTS							
Japan 30	3.20.1.	3.20.1 This chapter should provide a brief description of the approach taken to assess the impact on the environment of the plant operation for operational states as well as for accident conditions, including severe accidents. ~~Only radiological~~ Radiological environmental aspects should be included in this chapter of the safety analysis report, if they are required by the national	Clarification. This is NOT a common practice in States. Generally, environmental aspects are presented in the different document than the safety analysis report during the early stages of the project.		*This para. will be modified as follows:* “… including severe accidents. ~~Only r~~Radiological environmental aspects should be included in this chapter of the safety		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		regulations.			analysis report.		
Finland 31	3.20.11 Header	**Environmental impacts of ~~postulated~~ accidents involving radioactive materials**	See below. 17.		**Environmental impacts of postulated accidents involving releases of radioactive materials**		
Finland 32	3.20.11. Last	3.20.11. The environmental effects of accidents involving radioactive material that can be postulated for the plant under review should be addressed in this section. The list of accidents covered should be provided. The scope of the section should cover the off-site consequences in terms of projected effective doses for sufficient distance from the plant for design basis accidents as well as for selected design extension conditions with core melting (except those which are practically eliminated). The type of data and information needed will be affected by site- and station-specific factors, and the degree of detail should be modified according to the anticipated magnitude of the potential impacts. An overview of the off-site protective actions to limit adverse radiological impacts during accidents should be described. The analysis of accidents shall also be made for the purposes of emergency preparedness.	Add: The analysis of accidents shall also be made for the purposes of emergency preparedness. The analysis of the accident conditions should be supplemented with the analysis of the accidents more severe in line with GSR Part 4. Note the change of definition of the accident conditions in modification of SSR-1/2.			X	*The comment is out of the scope of this Safety Guide and not relevant for chapter 20. This Safety Guide does not deal with the scope and use of deterministic accident analysis, but with the scope and content of the information to be included in SAR for each aspect.*
CHAPTER 21. DECOMMISSIONING AND END OF LIFE ASPECTS							
Ukraine-3,	General to	General comment. It is proposed to revise	In the Chapter, the following		*Bullet (g) from para.*	X	*No specific proposal of*

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
comment 6	chapter 21	the structure of this Chapter.	terms are mentioned: “decommissioning plan”, “decommissioning strategy”, “decommissioning project”, “decommissioning concept”. Probably, it means that different documents are to be developed. It is proposed to structure the contents of the Chapter in a logical way taking into account sequence of development of these documents and their interdependencies.		*3.21.6 will be modified as follows:* (g): “…preserve the institutional knowledge that will be needed during ~~at~~ the decommissioning stage. ~~for the duration of the decommissioning project~~…”		*change is provided. Chapter 21 has a logical structure, the terms used are in line with GSR Part 6 and the expected content of each section is provided in the chapter is. The need to update the SAR is indicated in several paras of this Safety Guide (e.g. 1.8, 2.4. new 2.7B and 2.15). See also resolution to Japan 31*
Japan 31	3.21.1.	3.21.1. This ~~Chapter~~ chapter ~~21~~ should conceptually describe decommissioning as a stage in the lifetime of a plant, which comes after the permanent cessation of operation (permanent shutdown) and plant transition period. The feasibility of decommissioning and capability to decommission the plant should be conceptually demonstrated already during design and construction stages, before the initial criticality occurs or before plant operation commences. This demonstration is usually done in an initial decommissioning plan. ~~If the initial decommissioning plan is part of the safety analysis report, a discussion of its content should be presented or reference be made to its contents in this chapter.~~	Modification for example. It is premature to describe the decommissioning plan in the safety analysis report during design and construction stages, before the initial criticality occurs or before plant operation commences.	X	*(Better to avoid repetition of the term “conceptually”; the second one will be incorporated)*		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
Ukraine-3, comment 7	3.21.3 Line 7	Wording. Delete the following sentence: "… ~~Decommissioning related considerations should be maintained in the initial decommissioning plan and its supporting documents, as required by GSR Part 6 Decommissioning of Facilities [53].~~ …". State the next sentence as: "… Further information on decommissioning is provided in ~~WS-G-2.1 (DS452 Step 11)~~ *GSR Part 6 [53] ("Decommissioning of Facilities"), DS452 [54] ("Decommissioning of Nuclear Power Plants, Research Reactors and Other Nuclear Fuel Cycle Facilities"; draft Safety Guide step 11)* and in WS-G-5.2 [55] ("Safety Assessment for the Decommissioning of Facilities Using Radioactive Material")".	Wording. It seems that "decommissioning related considerations" are obviously a part of initial decommissioning plan. Therefore, it is proposed to revise the contents of the paragraph. GSR Part 6 [53] ("Decommissioning of Facilities"), DS452 [54] ("Decommissioning of Nuclear Power Plants, Research Reactors and Other Nuclear Fuel Cycle Facilities"; draft Safety Guide step 11) and in WS-G-5.2 [55] ("Safety Assessment for the Decommissioning of Facilities Using Radioactive Material")".		*As proposed, this part of the para. will be modified as follows:* "… also be provided. ~~Decommissioning related considerations should be maintained in the initial decommissioning plan and its supporting documents, as required by GSR Part 6 Decommissioning of Facilities [53].~~ Further information on decommissioning is provided in GSR Part 6 [57], SSG-47 [58] ~~WS-G-2.1 (DS452 Step 11)~~ and in WS-G-5.2 ~~Safety Assessment for the Decommissioning of Facilities Using Radioactive Material~~ [59].		
Ukraine-3, comment 8	3.21.7 Bullet h)	h) Estimation of types and volumes of wastes arising from decommissioning including radioactive waste;	Clarification. Estimation of types and volumes of radioactive waste arising from decommissioning is important from the point of view of availability of storage	X			

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			and disposal capacities.				
Finland 33	3.21.7 Bullet h)	h) Estimation of types and volumes of wastes arising from decommissioning and the description of waste management strategies for different waste types	Waste management strategy for different waste types should be thought trough during decommissioning planning and should be described as part of the decommissioning plan. It can be added to point h) or could be inserted as a new point. After providing the strategy you are able the describe items required in i)		*Combined with Finland 34, see the resolution there*		
Poland 31	Para 3.21.9 B Bullet	"… (b) The justification, that ~~R~~radioactive (airborne and liquid) discharges during the power plant decommissioning process ~~should~~ will be in accordance with the ALARA principle and ~~should~~ will be kept within authorized limits should be provided;"	1. This paragraph (part (b)) in its original written form sounds like a requirement for reactor design. The text should be transformed to the guide applicable recommendation for SAR content or SAR preparation. 2. It should be clarified which process is considered here. Presumably it might be "decommissioning process".		*Bullet (b) will be modified as follows:* (b) Radioactive (airborne and liquid) discharges during the decommissioning process, demonstrating that will ~~should~~ be in accordance with the ALARA principle and ~~should~~ will be kept within authorized limits;		
Finland 34	3.21.10 Line 2 and 3	Remove: "… ~~This should include identification of potentially reusable or recyclable material arising from decommissioning.~~	This should be done earlier in the documentation. Could be added e.g to point 3.21.7 h). Instead I would rather see description of the possible later use of the sites and		***Two changes will be incorporated.*** *1) Combining Finland 33 and the "deleted" part of*		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		Instead add something like: "… This should include the description of the possible future use of the site and remaining facilities. 3.21.10. This section should specify the proposed end state of the site to be reached following decommissioning and site clearance works. ~~This should include identification of potentially reusable or recyclable materials arising from decommissioning.~~ This should include the description of the possible future use of the site and remaining facilities.	remaining buildings in this point.		*Finland 34, a new bullet will be added to **3.21.7:*** (h-bis) Description of waste management strategies for different waste types and identification of potentially reusable or recyclable material; 2) *3.21.10 will be modified as follows:* **3.21.10.** This section should specify the proposed end state of the site to be reached following decommissioning and site clearance works. This should include ~~identification of potentially reusable or recyclable materials arising from decommissioning~~ a description of the possible future use of the site and		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
					remaining facilities.		
APPENDIX I - DEVELOPMENT OF THE SAFETY ANALYSIS REPORT IN THE COURSE OF THE LICENSING STAGES							
Poland 32	Appendix I (Chapter **3**) / page 76	"… Compliance with ~~G~~general design requirements Compliance with ~~R~~reactor type specific design requirements …"	It is doubtful if "*requirements*" is a proper word in this case when SAR content is considered. SAR does not provide requirements, but describes design aspects and design compliance with the requirements. The "requirements" should be replaced by "compliance with requirements" in the entire Appendix I table.			X	*It is used in practically all the chapters of the columns "Site Permit ISAR" and "Construction Permit PSAR" and refers to the requirements "taken into account" in each chapter and "provided or established" in the SAR.*
APPENDIX II - UNIFIED DESCRIPTION OF THE DESIGN OF PLANT STRUCTURES, SYSTEMS AND COMPONENTS							
Russia 20	Appendix II	UNIFIED DESCRIPTION OF THE DESIGN OF PLANT STRUCTURES, SYSTEMS AND COMPONENTS AND PROCESSES	To add heading of this appendix with words: "and processes", and its text - recommendations about the description of processes according to the GS-G-3.5 standard.			X	*See resolution to comment "Russia 9":* "Extension of the title would incorporate confusion, since only processes associated with specific systems are described, not the processes related to the whole plant. The information about the processes is given in

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
							Chapter 13 (conduct of operations).”
Finland 35	Appendix II, II.3	This section should include the safety design criteria, rules and regulations applying to the SSC, such as: • List of plant operational conditions and postulated initiating events when the SSC is in operation or will be called upon; • Conditions to be practically eliminated; • Safety requirements related to operating conditions, including stresses and environmental conditions (e.g. temperature, humidity, pressure, vibration and irradiation); • Safety classification; • Protection against external hazards; • Protection against internal hazards; • Seismic categorization; • Single failure criterion and protection against common cause failures; • Isolation considerations; • Equipment qualification; • Verification and validation; • Design standards, requirements and fabrication, construction and operational codes and other more specific design aspects such as: ○ Overpressure protection; ○ Thermal shock; ○ Leakage detection or	Add: upon; □ Conditions to be practically eliminated; □ Verification and validation; The full coverage of the design basis issues should be ensured.		*The first new bullet requested will be incorporated as follows:* • Conditions to be practically eliminated, if relevant;		“Verification and validation” *seems not connected to design basis of SSCs*

COMMENTS BY REVIEWER Reviewer: Country/Organization:			Page…. Of…. Date:	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		collection.					
Finland 36	Appendix II, II.5	II.5 Summary information regarding manufacturing documentation and records of the main components should be described, indicating supporting documents available. And as appropriate the information on software based equipment and systems.	Add: And as appropriate the information on software based equipment and systems. The information should not be limited to the mechanical components or structures.		*A new sentence will be added as follows:* "… supporting documents available. Additionally, relevant information on software based equipment and systems should be also included."		
Japan 32	Appendix II.7	II.7 The support systems (e.g., those providing electric power, lubrication, ventilation and cooling water), supported systems and other connected systems should be described as well as the corresponding design requirements. Flow diagrams of pipelines and block-diagrams of instrumentation and controls, single-line diagrams, and locations of units and mechanisms including valves, pipelines, vessels, instrumentation and control and actuators should be presented. The boundaries with other systems should be shown.	Completeness. Addition of electrical drawings that are missing.		*The following changes will be incorporated:* " … block-diagrams of instrumentation and controls, single-line diagrams, and locations of units and mechanisms including valves, pipelines, vessels, instrumentation and control and actuators should be presented. Enclosing structures and system layout should be also presented. The boundaries with other systems should be shown.		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
Japan 33	Appendix II.7 Add new para.	Add the following para. after II-7; II-7A Constructability or installation readiness of the system, component or equipment at the plant should be provided to ensure it can work as designed after installation. Interference of the system, component or equipment with other systems and surrounding structures should be reviewed in the safety report to ensure the maintainability.	These are aiming at avoiding the most frequent issue found in the new plants these days. Without proper installation or maintenance, any systems cannot work properly.	X	*The new para. will be incorporated with these changes:* "… with other systems and surrounding structures should be also provided ~~reviewed~~ in the safety analysis report to ensure ~~the~~ maintainability."		
Japan 34	Appendix II.10	II.10 This section should present the monitoring, inspection, testing and maintenance including ageing management which will help demonstrate that: • The status of the equipment/system is in accordance with the design intent; • There is adequate assurance that the equipment/system is available and reliable to operate as required; • There has been no significant deterioration in equipment/system availability, performance and integrity since the last test.	Clarification that maintenance includes ageing management. Addition of the reliability.	X			
Finland 37	Appendix II, II.11	II-11 This section should describe the measures taken to ensure that the dose rates to operating personnel, arising from the equipment/system operation or maintenance, are as low as reasonably achievable in operational states and in	See. Comment on 3.20.11. Consistency of the document.			X	*The comment is not relevant for description of the systems. In addition, this Guide is not intended to specify the scope of accident*

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		accident or post-accident conditions. The analysis of accidents shall also be made for the purposes of emergency preparedness.					*analysis.*
ANNEX - TYPICAL TABLE OF CONTENT OF A SAFETY ANALYSIS REPORT							
Japan 35	Annex	This list should be consistent with the revised main titles.	To keep a consistency with the main body and the annex.		*Changes in the headings have been updated in the Annex*		*No specific proposal is provided*
Finland 38	ANNEX	3.7 General design aspects for instrumentation and control systems and components 3.7.1 Performance 3.7.2 Design for reliability 3.7.3 Independence 3.7.4 Qualification 3.7.5 Failure modes 3.7.6 Control of access to equipment 3.7.7 Quality 3.7.8 Testing and testability 3.7.9 Maintainability 3.7.10 Identification of items important to safety	Does design for reliability cover V&V process? Please clarify and indicate how V&V of digital systems is covered.		*A new item will be incorporated after 3.7.4, renumbering the other:* 3.7.5 Verification and validation		
Finland 39	ANNEX	3.9 Equipment qualification 3.9.1 Seismic 3.9.2 Environmental 3.9.3 Electromagnetic	Please clarify; Environmental qualifications in general cover seismic and EMC qualifications. Is there specific purpose to have division as proposed?		*"Environmental" refers to specific conditions under which the equipment will operate (e.g. steam, high temperature, high pressure, radiation, ..).*		
Finland 40	ANNEX	8.1 Description of the electrical power system 8.2 General principles and design approach	Ageing management is missing, only for specific components in paragraphs		*[See resolution to Japan-22 (about para. 3.13.16) and*		

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			8.7.1.9. Should be at higher level also.		*Japan-34 (about Appendix II, para. II.10)]* *Section 8.7 will be corrected/modified:* ~~8.7.1.9 Ageing management~~ 8.7.1.9~~10~~ Radiological aspects 8.7.10 Performance and safety evaluation		
Poland 33	Annex, page 99	9A.2.2, 9A.2.3 /	Duplication of paragraphs.	X			
Finland 41	ANNEX	9B.1 Foundations and buried structures	Ageing management should be presented also in this chapter.			X	*[See resolution to Japan-22 (about para. 3.13.16) and Japan-34 (about Appendix II, para. II.10)].* *See also 13.3.4. It would be too detailed to address "ageing management" in many SSCs of the SAR.*
Finland 42	ANNEX	15.1 General considerations 15.1.1 Introduction 15.1.2 Scope of safety analysis and approach adopted 15.1.3 Analysis of design basis conditions DS449 – F&C of the SAR for NPPs Step 8a 109	a) The practically eliminated and related justifications should be included. b) analysis of accident more severe than the design envelope?			X	*a) Approach to PE is described in 3.1.8 (Annex) and implications from the approach in 15.2.1, 15.2.4 (including para. 3.15.18), and in 15.2.5*

COMMENTS BY REVIEWER Reviewer: Page…. Of…. Country/Organization: Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		15.1.4 Analysis of design extension conditions 15.1.5 Analysis of the hazards 15.1.6 Applicable reference documents 15.1.7 Structure of chapter 15					*(including para. 3.15.55).* *b) Conditions more severe than those considered in the design are PE.*
Canada 14	Page 109	*Add this to* "15.2. Identification and categorization of postulated initiating events and accident scenarios"*:* 15.2.6. Containment by-pass IEs should be included in the following section:				X	*Too specific. Containment bypass should be part of 15.2.4. among all PIEs and accident scenarios*
Hungary 15, comment 3	Annex, 15.6, page 110	15.6.2 ~~Results~~ of pProbabilistic safety assessment Level 1 results and conclusions	The chapter of the Level 1 PSA should also contain the conclusions (as in the case of the following chapter: 15.6.3 Probabilistic safety assessment Level 2 results and conclusions).	X			
Finland 43	ANNEX	20.6 Environmental Impact of postulated accidents involving radioactive materials 20.6.1 Design Basis Accidents 20.6.2 Severe Accidents 20.6.3 Measures and controls to limit adverse impacts during accidents	GSR Part 4, analysis of accidents more severe than these included in the design envelope are missing.		*20.6.2 will be modified:* 20.6.2 Design Extension Conditions~~Severe Accidents~~		
Russia 21	ANNEX	TYPICAL TABLE OF CONTENT OF A SAFETY ANALYSIS REPORT	To transform this Annex in accordance with comments provided to this draft standard.	X	*(See resolution to Annex's comments)*		