

COMMENTS BY REVIEWER Reviewer: Marcus Grzechnik Country/Organization: ARPANSA, Australia Date: 9/10/18				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	General	The first three guides appropriately reference GSR Part 7, however consideration should be given to referencing GSR Part 7 in the remaining guides. This is particularly relevant where emergency plans are required (such as in NS-G-2.5 revision).		Ok  Text modified			

COMMENTS BY REVIEWER Reviewer: B. Ahier Country/Organization: Health Canada Date: 28 Sept 2018				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	4.32 and 4.33	Add reference to GSR Part 7, Requirement 25 (Training) in 4.32, and ensure consistency between this requirement and the text in 4.33	Descriptions of training for emergencies should be consistent with GSR Part 7, Requirement 25: Training, drills and exercises for emergency preparedness and response.	Ok  Ref. GSR Part 7 added in the para 4.32 Consistency checked in 4.33 (see new text in the margin of the NSG-2.8)			

		See NS-G-2.3 4.28.A The operating organization should ensure that training of plant personnel for normal operations, emergency operations, maintenance and testing on the modified plant structures, systems and components is provided. <a href="#">See Ref. Preparedness and Response for a Nuclear or Radiological Emergency [20]</a>		Ok <b>NS-G-2.3</b> See 4.28.A			
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COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: M-L Järvinen Country/Organization: STUK Date: 9 <sup>th</sup> October 2018							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	General	There is still overlapping and repetition in the guidance. AS an example NS-G-2.3 Modifications and NS-G-2.4 Operating organization discuss organizational changes.				X	DPP DS497 requires to include guidance on Management of modifications for organizational changes, temporary modifications and modifications to computer based systems. In NS-G-2.3 criteria and process are described.

2.	General	<p><del>NS-GS 2.29</del> NS-G-2.14 discusses the safety-security interface in a general manner in paragraphs 2.29 and 5.6. The approach covers physical security but data security is not so well covered. The need-to-share principle and the need-to-know principles should be presented in the safety guides as appropriate. In other safety guides the safety-security interface should be covered in a systematic manner. For instance, one key safety-security interface exists in maintenance and modifications. Firstly, it is essential to take into account both safety and security issues in the planning and design. The main designers should have enough knowledge of the boundary conditions related to security. Secondly, security measures appropriate to the safety-security significance of the structure, system or component should be applied during the maintenance or modification. Also, additional or compensatory security measures may be necessary.</p> <p><b>Modified text</b></p> <p>2.9.B Modifications and their phases should be planned taking into account e.g. the scope and significance of the</p>	<p>Ok</p> <p>Text modified</p> <p>See new 2.9.A</p>			
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		<p>modification, involved organizations and responsibilities, interactions between organizations, <b>interfaces to security</b>, modification phases and contents of the phases, input and output data for modification phases, structure of documentation, procedures to be applied, plans and programmes to be applied, utilization of previous experience, licensee activities, application of the graded approach and items requiring special attention, witness and hold points, reporting.</p> <p>4.11;</p> <p>4.1. It should be demonstrated by means of the comprehensive safety assessment that the modified plant can be operated safely and complies with the system specifications and safety requirements. Special consideration should be given to showing the following:</p> <ul style="list-style-type: none"> <li>— Compliance with all relevant safety standards for all conditions of operation is achieved;</li> </ul> <p><b>Interfaces to security</b></p>		Ok Text modified			
3.	General		“Should” is often used in the document in relation to issues that are, for all practical purposes, actual			X	Please provide examples where this is case; without examples, it is

			requirements in other binding documents where “shall” is used. This approach should be considered.				difficult to address the comment. Thank you.
4.	General		It should be considered whether organizational changes should be covered in a different guide which would only be referred to in this particular guide, especially since this guide is titled <u>Modifications to Nuclear Power Plants</u> .			X	DPP DS497 requires to include guidance on Management of modifications for organizational changes, temporary modifications and modifications to computer based systems. No related comment was provided during drafting and agreement of the DPP.
5.	1.1.	This Safety Guide was prepared under the IAEA’s programme for safety standards for nuclear power plants. It supplements Section 4.7 (Requirements 10 and 11) of Ref. <i>Safety of Nuclear Power Plants: Commissioning and Operation, Safety Standards Series No. SSR-2/2 (Rev. 1) [1]</i> , and section 4 (Requirement 6: <i>Integration of the management system, 4.13</i> ) of Ref. <i>Leadership and Management for Safety [4]</i> , which establishes the safety requirements for the modification of nuclear power	Please add reference to GSR Part 2 due to the fact that organizational changes are also discussed in this safety guide; (Reg. 6, 4.13) and management for safety.	Ok Text modified			

		plants including changes of the operating organization. This publication is a revision of the IAEA Safety Guide on Modifications to Nuclear Power Plants issued in 2001 as IAEA Safety Standards Series No. NS-G-2-3.					
6.	<del>2.9B</del> 2.9A	NEW: Modifications and their phases should be planned taking into account e.g. the scope and significance of the modification, involved organizations and responsibilities, interactions between organizations, modification phasing and contents of the phases, input and output data for modification phases, structure of documentation, procedures to be applied, plans and programmes to be applied, utilization of previous experience, licensee activities, application of the graded approach and items requiring special attention, witness and hold points, reporting.	Planning should be emphasized	Ok  See new 2.9.A			
7.	4.14	<del>OLD: Statement of requirements for the assurance of quality in the management system → NEW: Requirements (related to the modification) that may have a potential impact on the management system during or after the modification</del>  Changed 4.14: Statement of requirements for the assurance of quality in by the management system	The intended goal of requiring the following: "Statement of requirements for the assurance of quality in the management system" is unclear in the framework of modification proposals. Its purpose and added value should be clarified. Proposition given based on how the intent was			X	The text of the published version for this bullet addresses the quality assurance and quality control management as a contribution to quality, but not the impact on the management system during or after

			interpreted by the reviewer				implementation.
8.	4.15	[Revise based on comment]	The phrasing is somewhat open to interpretation. Is it the purpose to refer to the original design intent of the power plant/system etc.? This should be clarified.	Ok Text modified as:	4.15 should be read in context with 4.16. To clarify the focus 4.16 has been positioned directly after 4.15. 4.15 A has been changed to 4.16.A		
9.	4.28.A	The operating organization should ensure that training of plant personnel <u>for operational states and accident conditions</u> <del>normal operations, emergency operations for accidents,</del> maintenance and testing on the modified plant structures, systems and components <u>concerned</u> is provided.	Clarity	Ok Text modified	Following the definitions of SSR-2/1 and the IAEA Safety Glossary version 2016 4.28.A was rephrased.		
10.	10.2.A	NEW: Commissioning phase activities should be utilized for training purposes. Licensee personnel's participation in commissioning phase activities should be planned and managed accordingly.	Focus on developing licensee capability.			X	The knowledge transfer from commissioning has a considerable meaning for the operators in the frame of training programs and preparation of operation. This is already addressed in 10.2.

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: ? Country/Organization: FRANCE ASN IRSN Date: 17/10/2018							
Comm ent No.	Para/ Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	1.2.4	“increasing the maintainability of the plant or modifying the maintenance strategy”	The new part of the sentence “reducing the costs of plant Maintenance » may have a negative meaning related to safety	Agree  Text modified			
2.	1.4	<del>In addition the application of the recommendations of this safety guide will support the fostering of a strong safety culture.</del>	Regarding the definition of “safety culture”, there is no reason to enhance safety culture in the objective of this safety guide than in any other guide. Consider deletion or complementary explanation. Why does this sentence appear in DS 497?			X	All Safety Guides in DS497 describe measures and attributes which support the fostering of safety culture. Therefore, this context of this sentence is correct. DS497 approved. This sentence has been added in each guide for consistency

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: ? Country/Organization: Germany/Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) (with comments of GRS) Date: 05.10.2018							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	1.2	<p>The reasons for carrying out modifications to nuclear power plants may include:</p> <p>...</p> <ul style="list-style-type: none"> <li>- <u>Addressing reported experiences or forwarded reports on equipment failures in other plants</u></li> <li>- <u>Stepwise decommissioning of units from multi-unit plant sites</u></li> </ul> <p>.....</p>	<p>We suggest adding these points, as far as modifications may be required (1) while considering of the experience, gained by other operators worldwide and (2) by the partial decommissioning of the multi-unit plant (for instance if one unit is under decommissioning, and another one is still working)</p>			X	<p>Operating (reported) experience is already mentioned in 1.2 A. 4.9 A and 5.1 A. Decommissioning is one phase in the life cycle of a Nuclear Power Plant. To be comprehensive all phases would be needed to be referenced.</p>

2.	3. New	<p>ROLES AND RESPONSIBILITIES OPERATING ORGANIZATION</p> <p><u>The operating organization should apply for the necessary license or approval to execute the modification (if applicable) at the authority</u></p>	<p>We suggest to add this as a new item because modification may require permit by the authorities and this issue should be mentioned here.</p>	<p>Ok Text modified</p>	<p>3.1 A The operating organization should apply for the necessary license or approval to execute the modification (by the regulatory body if needed).</p>	<p>The extent of the involvement of the regulatory body in the modification process may vary from country to country based on the safety significance of the modification.</p>
3.	4.11	<p>Special consideration should be given to showing the following: ..... - <u>The modification will not, after finalisation, significantly increase either the doses to personnel and members of the public (in accordance with the as low as reasonably achievable (ALARA) principle) or the risk of an accident.</u> .....</p>	<p>Add this point to separate it from the simple “to carry out the modification”</p>			<p>X</p> <p>This item is focused on the practical implementation of modifications. The item “after finalisation” is addressed in bullet 1,2, 6, 7, and 8 of 4.11.</p>

4.	4.14	<p>... The amount of information needed will depend on the extent and complexity of the modification; however, submissions should include at least the following:</p> <p>.....</p> <p>- <del>An analysis of adverse environmental or operating conditions, including any implications for radioactive waste, any contamination and any exposure to radiation,</del> <u>any release of radioactivity in the plant, any release of radioactivity to the environment, any radiation exposure of workers or any radiation exposure to members of the public;</u></p> <p><b>Modified text:</b>  An analysis of adverse environmental or operating conditions, including any implications for radioactive waste, any contamination, <u>any release of radioactivity</u> and any exposure to radiation,</p> <p>- .....</p>	Clarification: to consider effluents from the plant and radiation exposure to workers and to public.	Ok Text modified			
5.	6.3.A.	A time limit should be specified for their removal or conversion into permanent modifications. Justification should be provided if a temporary modification persists longer than its agreed duration <u>and a new time limit should be specified.</u>	For clarification	Ok Text modified			

6.	7.4	<p>The following safety aspects of the modification should be considered in a systematic manner:</p> <ul style="list-style-type: none"> <li>— Exposure to radiation, including ALARA considerations;</li> <li>— <u>Provisions to reduce the radiation exposure at the site of implementing the modification (like temporary shielding)</u></li> <li>— Radioactive waste management, including transport, decontamination and dismantling, as applicable;</li> <li>— Provisions necessary to reduce the spread of contamination;</li> <li>...</li> </ul>	To consider these provisions in the same way as for the spread of contamination			X	The comment is already included in the first bullet of para 7.4: Exposure to radiation, including ALARA considerations.
7.	7.8	<p>The ability to operate the modified plant safely should be verified through a testing programme which includes checks, measurements and evaluations prior to, during and on completion of the modification. Testing and commissioning, which may include pre-installation tests of equipment <u>and mock-ups,...</u></p>	For clarification	Ok Text modified			
8.	7.20	<p>The list of spare parts <u>and consumables</u> to be kept in stores should be reviewed and updated as a consequence of a modification, so that the necessary new spare parts will be procured and those spare parts that no longer conform will be modified or disposed</p>	For clarification	Ok Text modified			

COMMENTS BY REVIEWER Reviewer: ? Country/Organization: Japan/NRA Date: 09/10/2018				RESOLUTION			
No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	Para. 2.9 Line1-3	2.9 When a specific modification is determined to be necessary, the full consequences of this modification for the safety of the plant should be reviewed and the related <u>physical</u> boundaries <u>including physical, system, control, environment, etc.</u> of the modifications should be defined.	When a specification is changed, a system, control, environmental boundary of influence other than a physical boundary should be considered.	Ok  Text modified			
2.	Paras 5.1-5.5	Move the 5 paragraphs to revised NS-G-2.4	Description on modification of organization are suitable to be delivered in section 2 of NS-G-2.3. This safety guide should focus on modification of engineering aspects.			X	Please see DPP DS497, page 4, step 1: For all Safety Guides, as appropriate, the following cross cutting issues will be addressed consistently: Organizational changes, outsourcing and downsizing aspects, load following regimes and other new operational practices.

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Robert Country/Organization: UK Office for Nuclear Regulation Date: 15 October 2018							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	1.6	<i>Text depends on safety guide intent</i>	In addition to excluding the design phase, is there intent to exclude modifications associated with decommissioning at the end of generation, or as part of the preparation for end of generation? The reason for such modifications would be different from those stated in para 1.2.			X	As stated in para 1.2 A most modifications, made on the basis of operating experience, are intended to improve the design, or improve operational performance and flexibility. Those items are not limited to the phase of generation of electrical power, but enclose all phases throughout the lifetime of the plant except the design phase.
2.	Paras 4.11	Move “Due account has been taken of the potential consequences if the modification is inadequately implemented” earlier and make more prominent in the Safety Assessment section	Hidden within a long list of items is “Due account has been taken of the potential consequences if the modification is inadequately	Ok Text modified			

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		<p><b>Modified text</b></p> <p>Special consideration should be given to showing the following:</p> <ul style="list-style-type: none"> <li>- Compliance with all relevant safety standards for all conditions of operation is achieved;</li> <li>- New and/or modified systems will not adversely affect the safety characteristics of other items important to safety under any conditions of operation;</li> <li>- <a href="#">Due account has been taken of the potential consequences if the modification is inadequately implemented;</a></li> </ul>	<p>implemented”</p> <p>It is suggested this consideration is made more prominent. The risk that something goes wrong while the modification is being implemented (or as a result of its implementation) is a key consideration in any safety assessment.</p>				
3.	4.12B	<p><i>Move to an earlier section of the guide</i></p> <p><i>Update Appendix II to include a review of alternatives</i></p> <p><b>Modified text</b></p> <p>Added in the Appendix II, Box</p> <ul style="list-style-type: none"> <li>• Basic design/ approach Objectives and scope, Feasibility Study on Safety, Reliability, Economy Categorization, <a href="#">alternative solutions</a> acceptance criteria for the confirmation of effectiveness and achievement of objectives and in the</li> </ul>	<p>This paragraph talks about using a risk informed approach to assess alternative solutions. This sensible advice to look at alternatives appears late in the guide, perhaps suggesting to the reader it is an after-thought to be considered after assessing the preferred solution.</p> <p>Where in the Appendix II flowchart should such a review of options be carried out?</p>	<p>Ok</p> <p>Text modified in Appendix II, in 3 boxes</p>			<p>As the risk informed approach is based on the results of the probabilistic and deterministic analysis and other contributions like engineering judgment and OPEX he may be carried out when the results exist and should not be mentioned before this step.</p>

		<p>boxes</p> <ul style="list-style-type: none"> <li>• detailed approach</li> <li>• detailed design</li> </ul>	<p>More generally, a review of potential alternative solutions should be performed by deterministic and probabilistic methods early on. If effort has been invested in justifying one particular solution, there will be a reluctance to make a change and/or effort will have been wasted if a change of approach is made because of probabilistic considerations.</p>				
4.	4.19	<p>Where alterations to the operational limits and conditions become necessary, they should be considered to be modifications <i>and categorized in accordance with their safety significance.</i></p>	<p>It states that if an alteration to operating limits and conditions is needed, they should be considered to be high safety significance. This can be true, however the draft guide NS-G-2.2 states that OLCs include:</p> <ul style="list-style-type: none"> <li>(a) Safety limits;</li> <li>(b) Limiting safety system settings;</li> <li>(c) Limits and conditions for normal operation;</li> <li>(d) Surveillance and testing requirements;</li> <li>(e) Action statements for deviations from normal operation.</li> </ul>			X	<p>The safety significance of the in NS-G-2.2 referenced parts of the OLCs may be different. Paragraph 4.19 requires their categorization in accordance to their safety significance.</p>

			Not all of these are necessarily of high significance.				
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COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: ? Country/Organization: United States of America/NRC Date: 10-11-2018							
Comment No.	Para/Line No.	Proposed new text/comments	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	General	Comment 7 in NS-G-2.2 above also applies to NS-G-2.3 through NS-G-2.8, namely, that these guides cite references and documents that were revised and published several years ago. The updated versions should be referenced.	Completeness and update.	Agree	This action will be implemented at the end of the process of revision (before publication)	X	Comment 7 in NS-G-2.2 deals with a missed text. Probably comment 5 is the correct reference. As far as updated Safety Guides has been published, they have been referenced. If the reviewer has detected incorrect references, it would be supporting to get this information.
2.	NS-G-2.3 Para 2.10	Incomplete sentence: "...operational conditions should comply with the safety requirements for design of	Rather than a general reference to SSR 2/1,			X	In the available version of NS-G-2.3 on IAEA's

	Page 15	_____??”	suggest identifying the specific SSR 2/1 requirements that relate to maintaining the capability to perform all safety functions, as stated in the next sentence.				NUSSC member area the following text is provided. Modifications relating to the configuration of the plant and the operational limits and conditions should comply with the safety requirements for design of Ref. Safety of Nuclear Power Plants: Design, Safety Standards Series No. SSR-2/1 (Rev. 1) [3]
3.	NS-G-2.3 Para 2.13.A	Proposed text addition: “Modifications to design features or equipment used for design extension conditions, including mobile and portable equipment, should be performed in accordance with the plant modification processes, procedures and/or safety assessments, as appropriate.”	Use of the words “as appropriate” maintains discretion in the available processes, procedures and or safety assessments that may be applicable when modifying the plant.	Ok Text modified			
4.	NS-G-2.3	Proposed text modification:	Distinguish			X	The continuous

	Para 5.8	“The operating organization should, as part of <del>continuous</del> <b>reasonably practicable</b> improvement processes, review the applicability of updates...”	between <b>practicable, and unending, improvement processes within resource constraints.</b>				improvement is referenced in SSR-2/2, GSR Part 2 and other IAEA publications. Its application on processes is the base for the enhancement of safety culture and nuclear safety.
5.	NS-G-2.3 Para 11.1.A Page 40	“...should be used to support the management of modifications and <del>so to</del> ensure the modification process stays consistent with...”  <b>Modified text 11.1.A</b> Information technology applications should be used to support the management of modifications <del>and so to</del> ensure <u>that</u> the modification process stays consistent with the plant’s physical configuration and plant documentation.	Consistency with rest of sentence.	Ok Text modified			