

**DS508: DPP Application of Safety Principles and General Design Requirements for NPPs  
Step 3: Resolution of NUSSC Comments**

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: B. De Boeck / Pieter De Gelder		Page.... of....					
Country/Organization: Belgium / Bel V		Date: 15/05/2017					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	General	We are of the opinion that this DPP is well written and the writing of this new SSG is justified		Yes			
2	§3	There is one new element that is missing in the DPP and that is “multi-unit site” aspects. SSR 2/1 mentions at several places this (new = after Fukushima) aspect, but the DPP of the SSG does not mention it. “Multi-unit site” aspects should be mentioned in §3 of the DPP (when talking about missing topics) and maybe it also merits a specific paragraph in the proposed Structure of the SSG (in § 7 of the DPP).		Yes	Specific aspects of multi unit sites are addressed in req. 17, internal/external hazards (noting changed after the Fukushima accident) and 33 (safety systems and features for DEC in multi unit sites-existing in SSR 2/1 but changed) of SSR 2/1, rev. 1  The future SG will take give specific consideration to multi unit plants when dealing with the topics that the guide will address. It has been indicated in the DPP. We are not sure that the best way to approach it in the safety guide would be to have a dedicated section (for the moment inserted). It should be analysed and decided during the development of the safety guide		

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1.	General		<p>As this Safety Guide was not identified in the long term structure of Safety Standards, its need should be better justified. It should also include why other type of documents, such as Tecdoc or Safety Reports would not be better tools to address these topics and provide examples from various States or reactor designs on how to meet the Safety Requirements</p> <p>Moreover, considering the overall strategy of standard development, if such a guidance is necessary for NPP due to revision of SSR-2/1 and GSR part 4, similar documents should be developed for fuel cycle facilities (deep modifications of NS-R-5) and research reactors (deep modifications of NS-R-4) to ensure a consistent strategy for all facilities. The scope of such Safety Guide, should its existence approved, should therefore need to be expanded</p>		<p>The position of France seems not to be very in favor of the development of the safety guide. Therefore, it is not very meaningful at this stage to argue on some detailed comments if there is no agreement on the need for the SG, its scope, etc.</p> <p>The need for the safety guide should be discussed at the NUSSC meeting first, before entering in discussions about comments on the wording of the DPP</p> <p>The reasons for developing the SG are expressed in the DPP.</p> <p>All SGs under GSR Part 4 are specific SGs for NPPs, not generic. It is impractical and contradictory to expand the scope of the proposed SG to other types of facilities</p> <p>SSG-20 and SSG-23 deal with the safety assessment for research reactors and fuel cycle facilities. Applicable topics for such installations should be covered there.</p> <p>The proposal for NPPs comes in the first instance after the detection of gaps originated by superseding NS G 1.2</p>		

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2.	Title	Application of Safety Principles and <u>of</u> General <del>Design</del> Requirements for <u>design</u> <u>of</u> NPPs	As a Safety Guide, it should not establish general design requirements. They should be set in SSR-2/1 Alternate wording aims at having a title closer to the potential objective of the document (although this objective is not clear).  The title may also have to be changed if scope is expanded to non NPP installations (see previous comment).	y/n	The SG will not establish requirements at all. It relates to the application of the existing requirements.  The title of the SG has been changed as proposed and should be discussed if necessary.  We disagree with expanding the scope of the SG to other types of installations. See previous comment		
3.	Review Committees	RASSC, EPRESC and WASSC may need to be involved. NSGC has to be involved	Radiation safety and waste management matters are constraints for the detailed design of an NPP.  In the tentative table of content of the Guide “radiation protection in design” is included.	y	NSGC has been involved. The SG doesn’t plan to address specifically topics of waste management. Waste management is not the subject of this DPP. There is a SG on radiation protection in design  We consider the role of RASSC secondary, the role of WASSC marginal, if any, and the role of EPRESC irrelevant. Since there are comments in relation with the contents of the guide (radiation protection in design), once they are solved, the intervention of other committees could be clarified. Taking into account other comments, the topic of radiation protection has been tentatively removed.		

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4.	2	The background shall be clarified	<p>Safety principles are listed in SF-1 : SF-1 is not quoted or even referenced in the DPP.</p> <p>“General design requirement” shall be defined. In IAEA standards hierarchy, “general requirements” are presented with regards to “specific requirements” which does not seem to be the approach in the DPP...</p>	y	<p>All safety standards are connected to SF-1. SF-1 has been included in the list of documents related to the SG.</p> <p>General design requirements are those in sections 3 to 5 of SSR 2/1 as explained in SSR 2/1, Par 1.9 Structure. We changed it in the title and clarified it in section .</p>		
5.	2	At the same time, SSR 2/1 introduced also relevant changes in the design safety principles of nuclear power plants with the objective of practically eliminating plant conditions leading to large or early releases	<p>“practical elimination... “ is not the only major change introduced in SSR-2/1. It is not relevant to focus only on this one (there are also ambitious objective for mitigation of severe accident”, DEC approach, improvement of consideration of hazards, multiple units NPP, fuel storage...)</p> <p>“practical elimination...” is not presented as an objective in SSR-2/1</p>	y	<p>We agree with the new text proposed but not totally with the reasons. It is not worth to work on a more detailed wording for the section on Background. We agree with the elimination.</p> <p>For Info: <i>SSR 2/1, Par. 2.1: ... Plant event sequences that could result in high radiation doses or in a large radioactive release have to be ‘practically eliminated’ and plant event sequences with a significant frequency of occurrence have to have no, or only minor, potential radiological consequences. An essential objective is that the necessity for off-site protective actions to mitigate radiological consequences be limited or even eliminated in technical terms, although such measures might still be required by the responsible authorities.</i></p>		

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6.	3	The following reason should be complemented: “As a result of the changes introduced in the safety requirements for nuclear power plant design and safety assessment, overarching guidance is needed on the application of some requirements”	<p>Inception of numerous changes in a document does not automatically imply the need of guidance for this document (see also general comment n° 1).</p> <p>The following paragraphs of chapter 3 only provide a list of topics and assert that there is a risk of inconsistent interpretation: it is not a risk, there is no concern if a requirement could be achieved by different approach as far as the requirement is achieved.</p>	y	<p>We understand the comment and could work on providing more convincing arguments in the DPP on this regard. An example on DiD has been introduced at the end of section 3 for clarification.</p> <p>However, this comment is closely related to the 1st and general comment about the need for developing the SG. It should therefore be discussed in this context</p>		

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7.	3.	<p>Ensure para is consistent with para 4 with regard to the parts of SSR-2/1 which will be addressed in the guide</p> <p>More generally, clarify which parts of SSR-2/1 will be addressed : would it be topics of TECDOC 1791, other topic → Insert <b>SS-2/1</b> gap analysis result as an annex to the DPP</p>	<p>The DPP states that: <i>“Therefore, a new safety guide is necessary covering the changes in the requirements that have been indicated.”</i> and that <i>“treating these new and cross cutting topics in a separate safety guide reduces the risk for inconsistent interpretation and recommendations if they are treated in several safety guides related to plant system design.”</i></p> <p>Why would the DPP be limited to new requirements and not address all general requirement, to fully implement this idea to avoid “for inconsistent interpretation and recommendations if they are treated in several safety guides”?</p> <p>Furthermore, this would be more in line with the statement in para 4 of DPP (<i>“The objective of the new specific safety guide is to provide recommendations on the application of safety principles and general requirements in SSR 2/1, Rev.1”</i>)</p> <p>Topics addressed in SSR-2/1 but not in existing Safety Guide or Safety Guides currently under development should be captured in the DPP to ensure gaps are filled.</p>	y/n			<p>While the SG will in principle address most general requirements, it is understood that little guidance is necessary in the application of some of them, e.g. on single failure criterion, whereas the assessment of others, in relation for instance to DiD or “practical elimination” requires more guidance and it is not restricted to the design of individual systems but cross cutting topics.</p> <p>The presentation to NUSSC 37th on the gap analysis has been attached</p> <p>See next comment</p>
			6/31				

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8.	3	Insert the GSR Part 4 gap analysis result as an annex to the DPP	Topics addressed in GSR Part 4 but not in existing Safety Guide or Safety Guides currently under development should be captured in the DPP to ensure gaps are filled.	y	<p>The gaps were created by instilling requirements from NS-G 1.2 to generate GSR Part 4 and then only developing guides on DSA and PSA for NPPs. Guidance in these two areas (DSA and PSA) is indeed broader than before but the practical guidance on the remaining topics of the safety assessment for NPPs is largely lost because GSR Part 4 is of a high level standard and not specific for NPPs.</p> <p>There are not two different gap analyses for SSR 2/1 and GSR Part 4. New safety guides on NPP design, for instance on auxiliary systems, human factors engineering, etc. are being developed. The SG proposed will not deal with the specific requirements in SSR 2/1 for system design</p> <p>It is perhaps excessive to list of all the gaps of different kinds and magnitude at this stage. A gap analysis was presented already a few years ago to NUSSC. It provided an idea of the most relevant gaps.</p> <p>There is a need for a careful analysis of the potential gaps during the development of the SG. The gaps identified however, can be considered sufficient to develop a SG.</p>		

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9.	4	The objective related to “principles” should be clarified.	GSR and SSR are established to present “requirements” (consider the answer of this comment for the title + see also comment on background)		Title should be agreed and we should find an acceptable formulation  In any case, the SG doesn’t aim at providing safety principles. The comment seems to represent a narrow view on “safety principles”. SF-1 contains 10 Fundamental safety principles. INSAG 12, Basic safety principles for NPPs, describes for instance a broad set of principles, general and specific, some of them for design. DiD is considered a safety principle in this and several other publications.		



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10.	4.	Insert in the DPP a sentence acknowledging that there was no consensus on some topics discussed in Tecdoc 1791.	<p>The DPP recognizes that “<i>Such topics have been addressed in TECDOC 1791, Considerations on the Application of the IAEA Safety Requirements for the Design of Nuclear Power Plants. This TECDOC, which is not part of the safety standards series.</i>”</p> <p>It should be recognized that there are some controversial topics in the matters addressed in this Tecdoc. Is it likely that a consensus will be achieved, thus enabling a Safety Guide to be published?</p>	n	<p>Do we really need this remark when a Tecdoc is by definition not a document of consensus by the Member States? However, this TECDOC in particular has received contributions and comments by several NUSSC members and had to receive their “green light” for publication.</p> <p>Do I need to tell the committees and the CSS that TECDOCs are not part of the safety standard series?</p> <p>We know that there is controversy on some matters addressed in this TECDOC and at least to some extent they should be solved through the safety guides, for which consensus is required. The idea is not to reproduce this TECDOC as a safety guide. We hope that consensus will be reached on some of the topics. In fact, this TECDOC is being taken into consideration for the review of other safety guides.</p> <p>We should think that if we have produced requirements for which the MSs cannot find consensus in their interpretation at some level, then we should admit that they are not useful as a standard.</p> <p>Should we give up without trying?</p>		
11.	4	The safety guide will provide also recommendations for the application of those safety requirements of GSR Part 4, rev. 1 relevant for nuclear power plants and associated requirements in SSR 2/1, rev. 1 that are still not covered by other safety guides (see details in annex).	See previous comment on inserting in the DPP the results of the gap analysis.	y	We will insert the preliminary result of the previous gap analysis presented at NUSSC 37th meeting		

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12.	5	The new safety guide will <b>cover</b> the <b>requirements covering</b> topics described in the previous section. A preliminary table of contents is provided in <del>section 7</del> <u>annex</u>	Section 7 is a table of contents. It is not sufficient to identify the requirements that should be exhaustively identified in the DPP (see also comments on gap analysis)	?	The comment is not well understood. Section 7 provides a preliminary structure of the SG with sufficient detail at this moment. The comment suggest that a table of contents is provided in an annex instead of in section 7, but then the comment says that section 7 is a table of contents and it is not sufficient to identify the requirements that should be exhaustively identified in the DPP. This was not the purpose.  If we agree on the need of the SG , then we could work on this comment		
13.	6	The safety guide will be a specific guide for nuclear power plants directly related with the following safety standards – <del>without listing all of them</del> – and other relevant publications	To ensure the relevance and the consistency of the development of the current guidance in the standards structure, it is necessary that the links with other guidance are exhaustively identified (see also comments on gap analysis)	n	This list cannot be regarded as an exclusive or exhaustive list. It contains the safety guides related to SSR 2/1 and GSR Part 4. It is not possible or practical to list other type of publications. What would be the purpose? It has not been the practice for other DPPs, including others currently being submitted to NUSSC.  If you miss some publication we would be glad to include it. It is possible that during the development of the SG other relevant documents would be identified and included as references.		

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14.	6	Relevant Nuclear Security Series publications should be included	Security aspects have to be taken into account when designing the plant.	y	We don't have a problem in including security series publications in the DPP. The experience shows however that they are not very useful in the later development of the SG. We have introduced references to security publications used for other safety guides.		
15.	7 4.		It is unclear why design principles would be established in a Safety Guide rather than in a Safety Requirement. Either delete chapter 4 or reformulate its title.	N/A	Nothing is being proposed  The SG will not establish design principles. The title is being modified with other comment  The second part of the comments is the same as the next one		
16.	7 4.	Consider deletion of 4 or clarify what is the aim of the guidance to be provided.	What is the expected guidance on plant states except, maybe, for DEC? Is the guidance needed on how DEC are identified or on what radiological consequences and assessment method (conservative, best estimate...) can be accepted?	y	This section has been reorganized and brought under the "Engineering Aspects of Safety" in which the assessment of engineering rules for design, layout, etc. indicated there should be applied as appropriate to the assessment of the systems for NO, AOO, DBA and DEC. Certainly the more expected part would be in relation to the safety features for DEC  The demonstration of practical elimination has been put after the assessment of DiD (both are interrelated) together with the assessment of safety functions in line with your next comment.		

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17.	7 4. And 5.	<p>5. ASSESSMENT OF SAFETY FUNCTIONS</p> <ul style="list-style-type: none"> <li>- Fulfilment of fundamental and related safety functions</li> <li>- Safety approach and plant safety architecture</li> <li>- <u>Assessment of practical elimination of plant conditions potentially leading to large or early releases</u></li> <li>- Radiation protection in design</li> <li>- <u>Ensuring safety and security in design</u></li> </ul>	<p>If safety functions are ensured, then plant conditions potentially leading to early or large releases won't happen.</p> <p>It would be worth to add some guidance on safety/security interface as it may have very significant input in the design... ensure</p>	y	<p>The assessment of safety functions is a requirement in GSR Part 4.</p> <p>It has been placed after the section on DiD, as the assessment of safety function is if you wish a conclusion of the assessment.</p> <p>We are bringing under this section the assessment of practical elimination, that was before under section 4, according to your proposal in this comment.</p> <p>Radiation protection has been removed.</p> <p>In relation to the safety security/ interface from the point of view of safety, some aspects would be addressed in the safety guides on design against malevolent human induced external hazards. The focus here should be in verifying also that provisions for security don't affect safety. The topic is of interest, but we don't think first that this is the best place to introduce it. Secondly, we are reluctant to address this topic, as it could complicate the finalization of the SG perhaps more than any other.</p> <p>The feedback from NUSSC on this topics would be important, and we would be willing to include it (better as a separate topic) if so decided.</p>		

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18.	7 6.		It is unclear what kind of guidance will be provided on the listed topics	n/A	This is a very important part of the gap created by superseding NS-G 1.2. and relevant parts of this guide would be considered. Please see it for information. It corresponds to the assessment and verification that the corresponding design requirements have been met.		
19.	7 7.		Tecdoc 1791 recognizes 2 interpretations of the DID structure. Is there any chance, in the short/medium term, to get to a unique interpretation or will the guide formally endorse both interpretations. If two interpretations are in the Safety Guide, is it really a Safety Guide?	n/a	If SSR 2/1 was approved in spite of it, the same can happen with the SG. Establishing a correspondence between plant states and the application of DiD is forcing too much the application of principle of DiD. We can live without associating DEC without significant fuel degradation to level 3b or 4b.  The important aspects are the expected reliability of safety provisions for each plant state and the independence, in particular provisions for DBA and provisions for severe accidents.		

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20.	7	More generally, consider full review of table of contents to ensure that the guidance could be easily read when applying requirement of SSR-2/1 and GSR part 4	The DPP present the guidance as guidance for SSR-2/1 (and also for GSR part 4). Thus, its structure should be closer to SSR-2/1 to be easily readable.		<p>SSR 2/1 and GRS Part 4 don't have the same structure. GRS part 4 is for activities and facilities and it covers also siting and other plant life stages not only design. Having this in mind, the intention is to have a logical structure in relation to the scope and objectives addressing the general design requirements in SSR 2/1, but whatever structure is proposed now, it is very likely that it would be changed during the development of the SG</p> <p>We have incorporated all your previous specific comments on the content to the extent possible</p> <p>It can be improved, but as a starting point, we think it is acceptable</p> <p>On the other hand, this comment/change is in would be in contradiction with a previous one demanding that the guide would not be only for NPPs</p> <p>At this stage the table of contents should be considered as an expression of the topics to be covered, without too much detail. It is likely, and this is the experience with many safety guides that the final table of contents of the safety guide considerably deviates from the originally planned in the DPP, when taking into account the advice of the experts participating in the development and the comments from the committees and MSs.</p>		

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21.	8.		Considering the challenging task faced to develop Tecdoc 1791, is it realistic to believe a Safety Guide, i.e. a document benefiting from international consensus, will succeed to be developed in 3 years?	n/a	Like any other safety standard, the development plan is made on the basis of the work involved and the time to go through all the steps in SPESS for the approval of the document. The estimate may be optimistic and we can adjust it. Time plans for this or other standards don't consider delays resulting from a draft being rejected at some point by a committee or the CSS.  If we really agree that we want to do this guide and what we want the guide to address, we could do it. If we let the development of the guide start without a solid agreement, there could be many comments and delays later on.		
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Reviewer: <b>Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB)</b> (with comments of GRS) Country/Organization: <b>Germany</b>					Pages: 4 Date: 16.05.2017			
Relevanz	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	1	Page 2 / line 7	Guidance is needed on the implementation of some important changes introduced in SSR 2/1, such as the introduction of the so called “design extension conditions” in the plant design envelope as well as the need to demonstrate that <u>event sequences plant conditions</u> leading to large or early releases have to be practically eliminated.	According to 2.11 of SSR 2/1 event sequences leading to large or early releases shall be practically eliminated. This would be more specific and precise than the proposed term plant condition.	Yes	The term “condition” is used in the explanatory footnote for practical elimination		
2	2	Page 2 / line 10	Other relevant changes introduced in SSR 2/1 after the Fukushima Daiichi accident include requirements for <del>more</del> <u>safety margins in design extension conditions</u> and strengthening the implementation of the defence in depth <u>concept</u> .	SSR 2/1 does not requires more safety margins (which are not at all quantified) but requires to take into account margins also in DEC to avoid cliff edge effects.  To be consistent with the terminology used in SSR 2/1. On page 6 the heading reads “THE CONCEPT OF DEFENCEIN DEPTH”.	Yes	Modified as requested, but comparing par. 5.21 and 5.21A, some equipment need to have margins for higher levels of hazards.  ----- Page 6 introduces the concept. Req. 7 is about the application of DiD. SF-1 doesn’t use concept. It is not relevant. We have included “concept” here.		
2	3	Page 3 /	The objective of the new specific safety	It is proposed to move			No	The current order



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		lines 1-4	<p>guide is to provide recommendations on the application of safety principles and general requirements in SSR 2/1, Rev.1, including those related to the extension of the plant design envelope and the practical elimination of plant conditions leading to early or large releases.</p> <p><u>The new safety guide will mainly address the following requirements in GSR Part 4:</u></p> <ul style="list-style-type: none"> <li>• <u>Requirement 7: Assessment of safety functions</u></li> <li>• <u>Requirement 10: Assessment of engineering aspects</u></li> <li>• <u>Requirement 13: Assessment of defence in depth (DiD)</u></li> </ul> <p>Such topics have been addressed in TECDOC 1791, Considerations on the Application of the IAEA Safety Requirements for the Design of Nuclear Power Plants. This TECDOC, which is not part of the safety standards series, would be useful in the development of the proposed new safety guide.</p> <p>The safety guide will provide also recommendations for the application of those safety requirements of GSR Part 4, rev. 1 relevant for nuclear power plants and associated requirements in SSR 2/1, rev. 1 that are still not covered by other safety guides.</p> <p><del>The new safety guide will mainly address the following requirements in GSR Part 4:</del></p> <ul style="list-style-type: none"> <li>• <del>Requirement 7: Assessment of safety functions</del></li> </ul>	<p>these four lines. It fits better after first sentence of section 4. The explanation on the use of TECDOC 1791 should follow in a new paragraph.</p>			<p>is more logical and accurate. TECDOC 1791 does not address these requirements of GSR part 4</p>
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			<ul style="list-style-type: none"> <li>• Requirement 10: Assessment of engineering aspects</li> <li>• Requirement 13: Assessment of defence in depth (DiD)</li> </ul>					
1	4	Page 4 / lines 5-7	IAEA Safety Report Series No. 46, Assessment of Defence in Depth for Nuclear Power Plants (2005), provides particular insights that can be useful help for the development of this safety guide. <u>Note: Design extension conditions have been introduced in SSR 2/1. The described approach need to be updated to take into account new design expectations.</u>	Comment: The quoted Safety Report Series No. 46 is based on the defence in depth concept defined in superseded safety standards NS-R-1. In the former standard BDBA are controlled mainly by accident management measures. In the modern requirement SSR 2/1 DEC have to be controlled primarily by designed safety features. This should be reflected and taken into account when seeking advice in Safety Report Series No. 46.			N	<p>We are aware of the comment.</p> <p>Report Series No. 46 is mentioned in the DPP as an interface document. We only consider that insights from this document can be useful. It is in line with GSR part 4, Req. 13, 4.46</p> <p>Some other publications listed are also older than SSR 2/1.</p> <p>We can eliminate this reference if needed</p> <p>We don't consider the additional text necessary. Whether is necessary or not to update this safety report is not relevant to the SG.</p>
1	5	Page 5 / line 15	<ul style="list-style-type: none"> <li>• Demonstration of practical elimination of <del>plant conditions</del> <u>event sequences</u> potentially leading to large or early releases</li> </ul>	According to 2.11 of SSR 2/1 event sequences leading to large or early releases shall be practically eliminated. This would be more specific and precise than the proposed term plant condition.	Yes	See comment 1		

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1	6	Page 5 / line 27	<ul style="list-style-type: none"> <li>• Design for reliability <u>taken into account CCF</u>, such as:             </li> </ul>	The main purpose of diversity is to avoid common cause failures. See requirement 24 of SSR 2/1.	yes	<p>This is a preliminary list of aspects that are relevant to component/system reliability. Several of these aspects are indeed aimed at preventing CFFs, like diversity or physical separation. This table of contents is preliminary.</p> <p>Nevertheless we have included and prevention of CCFs. .</p>		
1	7	Page 5 / line 29	<ul style="list-style-type: none"> <li>○ Physical separation and <u>functional independence</u></li> </ul>	To avoid that a failure propagates to other redundant SSCs physical and functional separation is required in SSR 2/1. In Requirement 21 it is called <i>functional independence</i> .			No	Functional independence is indeed very relevant but not the only type of independence. Req. 21 says ' <i>Physical separation and independence of safety systems</i> '
1	8	Page 5 / line 33	<ul style="list-style-type: none"> <li>• <u>Assessment of passive safety features</u></li> </ul>	Advanced reactor concepts rely often on passive safety features. This requires additional effort to assess that those passive systems achieve the required reliability. This topic shall be addressed in the new safety guide.	Y	<p>Thanks for the comment. This is a relevant topic that perhaps needs some discussion by NUSSC.</p> <p>SSR 2/1 doesn't include specific requirements for passive systems., but has a requirement on proven engineering practices. We will try to cover it under "innovative design features", which is</p>		

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					<p>broader than passive systems. However, we don't have safety guides providing specific recommendations for the design of passive features, for instance for core or containment cooling that should be considered in the safety assessment</p> <p>SSG 3 addresses the reliability of passive systems, SSG-2 however doesn't and it is at an advanced state of review</p>		
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COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Japan NUSSC member		Page.1 of 1					
Country/Organization: Japan NRA		Date: 17 May, 2017					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modif./rejection
1.	<b>7. OVERVIEW</b>	4. DESIGN SAFETY PRINCIPLES • Plant states considered in the design : ○ Normal operation ○ <del>Abnormal operation</del> <u>Anticipated operational occurrences</u> ○ Design Basis Accidents ○ Design extension conditions without significant fuel degradation ○ Design extension conditions with core melting	To keep a consistency with SSR-2/1 (Rev. 1), "plant states".	Yes			
2.							

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COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Country/Organization: Republic of Korea / Korea Institute of Nuclear Safety Date: May 16, 2017							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	General		It is meaningful to develop a guide for certain topics not covered in other IAEA safety series to support GSR and SSR.	Yes			
2	Sec. 3		In the presentation at the 37th NUSSC meeting, it was planned to develop an SSG, 'Engineering and design safety assessment' focusing on the topics not covered in SSG-2 through gap analysis with SSG-2. It seems to be more generalized as 'Application of Safety Principals and General Design Requirements for Nuclear Power Plants' from the original plan. In the title, it is recognized that this guide is to deal with the comprehensive and systematic application of GSR and SSR requirements. If that is	Yes	The scope includes additional aspects to those that we planned to cover after the gap analysis.  It is not easy to select a title that reflects precisely the contents.  Since there are more comments in relation to the title, this subject will be discussed during the NUSSC meeting.		

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			not the case, it would be better to change the title to match the topics.				
3	Sec. 7		'Inherent safety' concept is one of the important aspects of Defense in Depth, as mentioned in GSR-4 Requirement 7. It should be stated explicitly in the guide.	Y	<p>It is true that this aspect is important. A combination of active, passive and inherent design safety features as well as operational measures for each level can be mentioned under chapter 7, 1st point on implementation of DiD.</p> <p>It will be addressed, but perhaps we don't need to include such a title in the potential contents. We would have to include other type of features.</p> <p>On the other hand, the assessment of some inherent measures is in practice part of the safety analysis (SSG-2)</p>		

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COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Robert Moscrop				Page 1 of 1			
Country/Organization: ONR/UK				Date:12/5/17			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	General	We have no comments at this stage but are keen to engage more proactively with this guide when it is developed.		Yes			



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COMMENTS BY REVIEWER				RESOLUTION			
Reviewer		Page.... of....					
Country/Organization: WNA/CORDEL							
Date: May 16, 2017							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
<p><b>General comment</b>            Issuing this safety guide may be a challenge. Of course all the topics proposed to be developed in this guide are of great interest. However, the list and the <b>scope of topics as described in the DPP are both too large and not comprehensive</b> (see specific comments below). It may be advisable to adopt a less ambitious objective and to <b>split the proposed scope in several guides or even TECDOCs</b>.</p>					It will  This requires a discussion at the NUSSC meeting.  For this reason also, full explanations to questions below are not provided		
1	§4	Requirement 7: Assessment of safety functions <input type="checkbox"/> <del>Requirement 10: Assessment of engineering aspects</del> <input type="checkbox"/> Requirement 13: Assessment of defence in depth (DiD)	Req 10 deals with many topics that have nothing to do with defense in depth, DEC and practical elimination. Each of these topics could be dealt with independently in a dedicated guide: operational feedback, R&D, safety classification (SSG30), external events, internal events, selection of materials, fail safe design, ageing, qualification, site events,		It should be part of the discussion during the NUSSC meeting .  The following response below is not complete	Yes	It is not the purpose to limit the SG to DiD, DEC and PE. The scope of the safety assessment is to check that the requirements for siting , design, operation, etc. are met.  NS-G 1.2 used to cover the analysis/verification that engineering aspects of safety in the <u>design</u> were met.  The SG will not go in any detail when specific guides exist (e.g. SSG 30) and it will not provide specific

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			<p>decommissioning. Besides each of these topics requires specific competencies, it means that many consultants should be necessary to write appropriate guidance. Eventually it would be difficult to grasp the purpose of a guide that would deal with so many independent topics.</p>			<p>recommendations for the design of systems.</p> <p>It will relate to the verification that the applicable requirements are met and that the corresponding safety analysis has been carried out.</p> <p>The comment could be discussed at the NUSSC meeting in the context of the need and scope of the SG.</p>	
2	§ 4	<p><u>Page 5, Proposed structure for the safety guide, Section 4 Design Safety Principles – Plant states considered in the design:</u></p> <p><u>Recommend including Abnormal Operational Occurrences as a state.</u></p> <p><u>Also, change “Design extension conditions with core melting” to “Design extension conditions with significant fuel degradation.”</u></p>	<p>AOO’s represent a class of operational events that could be considered “not normal” but not necessarily “abnormal”.</p> <p><u>The design extension conditions with and without (core melting or significant fuel degradation) state is confusing.</u></p> <p><u>It is recommended that both subsections use the phrase “significant fuel degradation” and that a concise definition of what that entails be provided.</u></p> <p><u>Otherwise there is no clear boundary between</u></p>	Yes	<p>AOOs will be used .</p> <p>In the safety glossary they are the same. The AOO brings the plant into abnormal operating.</p>	No	<p>This is the terminology used in SSR 2/1 to denote that a severe accident in the SFP needs to be practically eliminated and the plant is only designed for core melt accidents</p> <p>The pertinent explanations will be given within the safety guide</p>

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			<u>the sets of design extension conditions.</u>				
3	§7	<p>5. ASSESSMENT OF SAFETY FUNCTIONS</p> <p><input type="checkbox"/> Fulfilment of fundamental and related safety functions</p> <p><input type="checkbox"/> Safety approach, <b>identification of functions important to safety</b> and plant safety architecture</p> <p><del><input type="checkbox"/> Radiation protection in design</del></p>	<p>The identification of functions important to safety deserves some consideration as this topic should not be limited to accident mitigation.</p> <p>Radiation protection is a major issue in NPP design and operation, however it is not addressed in the same way as the 3 fundamental safety functions. The guide would be more clear if it would focus only on these 3 functions in a homogeneous way.</p> <p>Remark regarding "plant safety architecture": there are many different ways to achieve the safety goals through the safety architecture, only general statement can be made in a guide.</p>	<p>Y</p> <p>Y</p> <p>Y</p>	<p>We agree. It is not said that it is limited to accident mitigation</p> <p>Radiation protection is linked to a fundamental safety function. It could be presented as a separate topic</p> <p>For the moment it has been removed considering other comments</p> <p>We agree. The guide will not provide recommendations for design. It just a short title to indicate that this is part of the intended content</p>		
4	§7	<p>7. ASSESSMENT OF DEFENCE IN DEPTH</p> <p><input type="checkbox"/> Implementation of defence in depth</p>	<p>"Robustness" is ambiguous here. Does it refer to the safety margins</p>	<p>Y</p>	<p>It can be changed to reliability of safety provisions for each level of DiD</p>		

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		<input type="checkbox"/> Assessment of robustness of each DiD level <input type="checkbox"/> Independence of safety provisions for different defence in depth levels	required in GSR part4 §4.48?		<p>Robustness reflects the qualities of being very reliable and strong, i.e. incorporating margins. The title can be changed if there is other preference</p> <p>Under chapter 7, the par. from 4.45 to 4.48A should be considered.</p>	
5		8. CONSIDERATION FOR MULTIPLE UNIT NUCLEAR POWER PLANTS	<p>2<sup>nd</sup> paragraph of § 4 ‘Objective’ at bottom of page 2 states that the guide will provide recommendations for the application of those safety requirements ... still not covered by other safety guides.</p> <p>Unless we are mistaken, it seems that requirements 33 of SSR-2/1 rev.1 dealing with multiple unit NPP is not addressed in any other guide from a design standpoint. Therefore, it may be worth developing a section elaborating overarching requirement 33 and more particularly</p>	y		<p><i>“of GSR Part 4, rev. 1 relevant for nuclear power plants and associated requirements in SSR 2/1, rev. 1 that are still not covered by other safety guides”</i></p> <p>Perhaps the wording is not sufficiently precise and too ambitious. The DPP refers <u>to the safety assessment</u> associated with meeting the design requirements.</p> <p>Req. 33, should be primarily addressed in SGs for the design of electrical systems, cooling water systems, etc. First, the design requirements should be met. Recommendations for it don’t belong to this SG. This SG could address the verification</p>

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			<p>requirement 5.63.</p> <p>In addition, unless this is planned to be done in upcoming revisions of SSG-3 or SSG-4, it may be interesting elaborating how multiple units should be considered in probabilistic safety analyses.</p> <p>Finally, even if this guide is dedicated to design aspects, it may be worth indicating that possibilities of interconnections between units should not be credited in technical specifications for example.</p>			<p>that SSCs under Req. 33 are not shared</p> <p>Then, SSG-2, SSG-3 and SSG-4 should provide recommendations for the analysis in such cases. The safety demonstration for one unit should perhaps not rely on the back up from the other unit.</p> <p>With this in mind, a new entry in the table of content on this topic has been included</p> <p>Technical Specifications are out of the scope of this SG.</p>
6		<p><u>Not a proposal for new text but a question</u> : where is it planned to discuss / provide recommendation about 'Loads and conditions generated by internal and external hazards to be considered for each plant state ?</p>	<p>Unless we are mistaken, there are no such recommendations in other safety guides</p>	N/A	<p>Recommendations for the design are supposed to be considered in the SGs for the design external hazards and specifically in relevant safety guides for the design of plant systems, such as the SG for the design of the containment. This</p>	

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					<p>SG could only address them in the context of assessment of engineering aspects of items important to safety.</p> <p>We have included it</p>		
7		<p><u>Not a proposal for new text but a question</u> : where is it planned to discuss / provide recommendation about “adequate margins” as mentioned in requirements 5.21 and 5.21A and 5.73 and 6.40A ? Or is it addressed in other safety guides ?</p>	<p>Those requirements were modified during revision 1 of SSR-2/1 and have not been addressed in other guides, unless we are mistaken.</p>		<p>The assessment of margins in relation to external hazards should be addressed primarily in the corresponding guides for design, e.g. DS490: Seismic Design and Qualification for Nuclear Power Plants. Those related to the safety analysis (5.73) in SSG-2</p>		

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