

**Resolution Table of Comments on  
DS 486 - Establishing the Safety Infrastructure for a Nuclear Power Programme (Revision 2)**

**NUSSC**

COMMENTS BY REVIEWER				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
Reviewer:	Tanya Hewitt						
Page 1 of 7							
Country/Organization:	Canadian Nuclear Safety Commission						
Date:	October 2, 2015						
1	Page 14	<i>The link should be fixed: (see <a href="http://www-ns.iaea.org/standards/safety-glossary.htm">http://www-ns.iaea.org/standards/safety-glossary.htm</a>)</i>	Clicking on the link redirects to an error page	yes			
2	Figure 4	<i>Phases should be identified similar to Figure 6.</i>	As the phases are the main reference in the document, they should be clear on all figures.	yes			
3	2.20	A nuclear power programme in any State cannot be treated in isolation. <b>A nuclear accident would have two main consequences, repercussions: physical effects of a owing to the potential transboundary effects of a radioactive release, and the psychological effects of worldwide anywhere through the impact on public opinion.</b>	Wording to try to convey the impact of a nuclear accident.		A nuclear power programme in any State cannot be treated in isolation. A nuclear accident could have health and safety effects beyond national borders due to potential transboundary radioactive releases, and its impact on the worldwide public		to generalize the formulation

					opinion.		
4	2.60	If different authorities are to coexist, then clarity of their respective roles and responsibilities should be ensured, <b>while avoiding any conflict of interest.</b>	Highlighting the potential for conflict of interest in collaborative undertakings.	yes			
5	2.84	<i>[long paragraph about preparatory activities outlined once construction is decided upon. This is suggested to be added to the end]:</i>  Provision should also be made to allow appropriate regulatory oversight of activities relating to the manufacture of some components that will commence before the construction licence has been issued, <b>as well as the procurement and infrastructure needed for training.</b>	The training needs should be highlighted early in the process – prior to the construction licence issuance.	yes			
6	2.92	The government should establish a clear decision making process to justify a nuclear power programme, and this process should be communicated to the interested parties. <b>Involving the public in the early stages of decision making regarding nuclear power should be prioritized.</b>	Having the public defined as one of the interested parties every early on in the process can help significantly with the entire nuclear programme's public relations.	yes			
7	2.96	...and the necessity of measures such as establishing new organizations, building new national infrastructure and making financial provision for radioactive waste management and spent fuel management, <b>incorporating the transport of nuclear materials.</b>	Transport is discussed in the IAEA requirements later, but it should be mentioned in this section as well.	yes			
8	2.106	Also, technologies have certain design lifetimes, and equipment should be modernized as necessary to ensure the availability of spare parts. <b>Training needs will be continuous over the</b>	The maintenance of the physical plant is not the only consideration – the training programme has a “design lifetime” as well, and needs	yes			

		<b>lifetime of the plant, and need to be planned and funded in a systematic fashion.</b> In addition, ...	to be identified as a system that needs attention over the lifetime of the plant.				
9	2.109	Financial aspects should also be considered for basic education and training in subjects relevant to nuclear safety, for research that supports the development of the national knowledge base on nuclear safety, and for nuclear regulation. <b>A systematic approach to training is highly encouraged as the principal training programme at nuclear power plants.</b>	Recommending the structured approach to training standard in the nuclear industry.		A systematic approach to training is highly encouraged as the structured training programme at nuclear power plants.		to highlight the concept that SAT is a structured approach
10	2.110	Funding mechanisms should be considered for radioactive waste management and spent fuel management, for the decommissioning of the nuclear power plant and for the disposal of radioactive waste, <b>including transportation considerations.</b> Funding ...	Once again highlighting nuclear transport as a specialized consideration.	yes			
11	2.126	For instance, documented assurance that contractor personnel have the necessary qualifications could be requested prior to their involvement in safety related work. <b>This should be assessed, tracked and evaluated through the organization's systematic approach to training system.</b>	Contractor personnel need to be in the plant's training system.	yes			
12	2.136	For the coordinated development of industry in the State and for training the industry to deal with nuclear projects, the means for building a dedicated engineering organization <b>adopting a systematic approach to training</b> should be considered.	A centralized engineering organization, as proposed here, if meant to be the source of the training, should likely have an SAT system.	yes			
13	2.140	The operating organization and the government, if applicable, should	A key factor to the success of nuclear regulation is the		<b>....The independence of the regulatory body</b>		to give emphasis on the

		<p>promote the building of a network of industrial organizations in the State that are interested in entering and remaining in the nuclear business. Such independent competences will support the safe long term operation of nuclear power plants in the State. <b>The independence of the regulatory body from this process should be encouraged, and promoted to the general public.</b></p>	<p>independence of the regulatory body. This should be highlighted.</p>		<p><b>from this process should be preserved, and informed to the general public.</b></p>		<p>requirement of independence of the regulatory body</p>
14	2.145	<p>Knowledgeable and skilled personnel of the operating organization should be clearly identified and should be assigned to the supervision of contractors or temporary support staff. <b>The specific training needs of the contractors for the operating organization should be assessed, tracked and evaluated through a systematic approach to training system.</b></p>	<p>Again, highlighting the importance of the training being assessed, tracked and evaluated in a systematic fashion</p>	yes			
15	2.151	<p>Management systems, including safety culture <b>and training</b>, should be considered in the evaluation criteria.</p>	<p>Trying to highlight training as being an important consideration</p>	yes			
16	2.175	<p>In later phases, expertise should be available for commissioning, operation, maintenance, and radioactive waste management and emergency preparedness and response. <b>These should be managed by the operating organization through a systematic approach to training.</b></p>	<p>Trying to highlight the importance of the SAT programme</p>	yes			
17	2.182	<p>Where the assessment in Phase 1 has shown the need for new institutions or extended curricula, such new institutions should be established and curricula should be revised. <b>The operating organization should manage their training programme through a</b></p>	<p>Trying to highlight the importance of the SAT programme</p>	yes			

		<b>systematic approach to training.</b>				
18	2.186	The operating organization should recruit and train its staff to support construction, preparation for operation and licensing. <b>This operating organization should manage the training programme through a systematic approach to training.</b>	Trying to highlight the importance of the SAT programme	yes		
19	2.186	A full-scope plant specific simulator should be acquired for training the control room operators, and training should be arranged <del>in due time before commissioning of the plant early during the construction phase</del> , and in consideration of the relevant regulatory requirements.	Training considerations need to be addressed well before commissioning begins	yes		
20	2.211	... radioactive releases from the operation of the nuclear power plant are kept as low as reasonably achievable, and are satisfactorily controlled and monitored so that authorized limits on discharges are complied with. <b>Training in radiation protection should be incorporated in the operating organizations' systematic approach to training.</b> Non-radiological ...	Highlighting that RP training should be the normal course in an SAT.	yes		
21	2.228	The operating organization, which has the prime responsibility for safety, should recruit and train personnel with the skills and expertise necessary to develop the safety analysis to be included in the safety analysis report, or to assess the safety analysis report that will be provided by the vendor in the following phase. <b>The result of the safety assessment may serve as input to the operating organization's systematic</b>	Again, the expected input to an SAT for a NPP	yes		

		<b>approach to training.</b>				
22	2.244	The decision to select a particular alternative depends on many factors, some being cost based and others of a technical nature or matters of policy, <b>including security.</b>	Security concerns should be highlighted up front	yes		
23	2.259	Appropriate local and national organizations in the State should be aware that emergency arrangements require the involvement of many organizations and require complex interactions between the organizations — largely non-nuclear organizations. <b>The public should be involved in general emergency planning that could affect them.</b> During ...	Ensuring the public is involved in activities that will affect them at the earliest stage.		Appropriate local and national organizations in the State and the public should be aware that emergency arrangements require the involvement of many organizations and require complex interactions between the organizations — largely non-nuclear organizations.	to include public in the existing text
24	2.262	The gaps identified in existing emergency arrangements and capabilities of institutions and communication networks at all levels should be filled, or else the filling of these gaps should be realized through an action plan which implementation should be initiated in Phase 2 and completed in Phase 3. <b>The operating organization should track the progress of training towards filling these gaps through a systematic approach to training.</b>	Trying to highlight the importance of the SAT programme	yes		
25	3.1	Establishing and implementing a policy for personnel qualification, as well as systematic programmes for staff training and <b>retraining continual</b> training.	A process of continual training as opposed to retraining.	yes		

26	3.17	The organization should plan for the rapid change in its size, its functions, its responsibilities, its organization and its management techniques. <b>Training of all staff should be systematically designed, delivered and evaluated.</b> The growth and the change should be achieved while the safety culture continues to be developed throughout the organization.	Highlighting training in the IAEA expectations	yes		
27	3.32	A general survey should be conducted at the national and regional scale, on the basis of data, information and documentation that are already available, to determine the availability and acceptability of such sites. <b>The public should be invited at these early stages to help set and evaluate the selection criteria.</b> The ...	Early engagement of the public as a principle.		<b>.....The public should be engaged at these early stages. The ....</b>	to be less prescriptive on the scope of the public participation
28	3.39	<b>AsWith</b> regards to the ...	Wording	yes		
29	3.56	The key design safety principles and issues that should be taken into account in the design include: ... - <b>A systematic approach to training and qualification</b>	The comprehensive list of expectations did not mention SAT	yes		
30	3.70	... the operating organization should conduct an adequate design verification of the submitted bid so as to provide confidence that the main design features are in compliance with the respective safety requirements, <b>including qualified personnel.</b>	Assure that the trained personnel are taken into consideration.	yes		
31	3.79	<b>Beyondwhich</b> Beyond which	Introduce a space	yes		
32	3.80	Operating procedures should be validated to the extent practicable as part of the commissioning programme, with the	Again, highlighting the importance of trained personnel and SAT	yes		

		participation of the future operating personnel of the nuclear power plant. <b>The operating personnel should be trained through the operator's systematic approach to training programme.</b>					
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COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: M-L Järvinen, T. Virolainen, P. Karhu		Page.... of....					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	General		<p>Please ensure the consistence with the NSS 19, Establishing the Nuclear Security Infrastructure for a Nuclear Power Programme when security issues are discussed.</p> <p>The difference in terminology is a challenge.</p>	Yes	The IAEA is trying to improve the consistency of the terminology. There have been some historical differences in the past.		
2.	1.12	The seventh bullet: Industrial organisations, <b>including plant vendors, manufacturers, ...</b>	The main parties of the project should be named.	Yes			
3.	1.20	During phase 2, the country will carry out work required to prepare for the <b>regulating</b> , contracting,...	The view of safety requirement and safety regulation are missing.	Yes			
4.	1.3	... before <b>construction</b> and operating a nuclear power plant...	The safety culture should be strong already during construction as well as competences too.	Yes			
5.	2.106	Sustainable funding of safety related activities including emergency arrangements of respective response organizations should be provided for	Add: The continuous development of safety that can lead to safety improvements and	Yes			

		<p>the entire lifetime of a nuclear power plant. After the initial investment for construction of the plant, investments are needed for its regular refurbishment, because most equipment is of limited lifetime and should be replaced with new equipment as part of the ageing management programme <b>or as a result of enhanced regulatory requirements resulting from safety research or operating experience.</b> Also, technologies have certain design lifetimes, and equipment should be modernized as necessary to ensure the availability of spare parts. In addition, costs for decommissioning and waste and spent fuel management represent a significant part of the total costs of a nuclear power programme, and funding should be planned for this purpose from the beginning of operation of a plant.</p>	<p>corresponding costs is missing. As an example Tecpo Fukushima Dai-ichi lessons learned.</p>				
6.	2.117	...conducting independent safety analyses and assessments..	Both are often asked.	Yes			
7.	2.128	<b>... When the work of external support organizations can affect the safety of the plant the management system of...</b>	Clarity, This should be the main rule.	Yes			
8.	2.129	Regulatory bodies and licensees need to keep a questioning attitude on safety matters. and <b>avoid over-</b>	This needs to be clarified.  What is expected?		Following sentence added at the end of the		

		<p>reliance on experts' advice in particular in cases of conflicting information conclusions regarding analysis of low probability/high consequences events. This is particularly relevant in the analysis of external hazards that are associated with large uncertainties.</p>	<p>...They should confirm themselves that adequate confidence level is achieved before decision making especially in the case of conflicting conclusions regarding analysis of low probability/high consequences events. ...</p>		<p>paragraph: Therefore, the regulatory body should make conservative decisions in these instances.</p>		
9.	2.135	The government should start to identify and <b>encourage</b> industrial organizations...	Identification does not lead to anything.	Yes			
10.	2.153	<p><del>The organization (regulatory body, operating organization and other relevant organizatyon)</del> In all the relevant organizations need to ensure that an integrated management system should be implemented. and that The managers at all levels of the organizations demonstrate leadership, which gives giving an overriding priority to safety and fostering a strong safety culture.</p>	Editorial	Yes			
11.	2.154	... Effective arrangements <b>should</b> be put...	shall => should	Yes			

12.	2.159	All organizations should avoid self-complacency and maintain the overall <b>attention</b> on public health and safety.	Clarity: Maintain the <u>overall</u> focus on safety ?	Yes			
13.	2.165	Regulatory bodies should also implement a <del>more</del> —specific regulatory oversight of safety culture of <b>the</b> licensees.	clarity	Yes			
14.	2.219	...before issuing authorizations for the construction and <b>operation</b> of the plant.	Usually starting the operation is a clear holdpoint of authorization.		..before issuing authorizations for the <b>construction, commissioning and operation</b> of the plant.		
15.	2.22	The requirement from phase 1 => phase 2	Phase 1 is a quite early phase to start the co-operation on a practical level.			Yes	The intention is to promote early communication with neighboring states.
16.	2.232	Should be deleted.	Requirements 2.230 and 2.31 cover all assessments and analyses needed – this is a design requirement that should not be in this guide.			Yes	Lessons learned from Fukushima
17.	2.234	...Such improvements include any safety related improvements <b>to fulfil national safety requirements as well as improvements</b> that are being...	Usually some modifications are needed to reach the safety level/goals/requirements of the state.	Yes			
18.	2.251		Corresponding			Yes	Beyond phase 3 in

			recommendation for spent fuel intermediate storage is missing.				this document.
19.	2.253	<p><b>Good design</b> Safety features incorporated in the design of nuclear power <b>and effective management system with a strong management commitment to safety and a strong safety culture</b> are made to ensure the practical elimination of plant event sequences that could result in high radiation doses or radioactive releases. <del>and safety culture as well as safe operation of a nuclear power plant should make the probability of a large radioactive release extremely low.</del> However, the despite the high level of confidence that the occurrence of such sequences is extremely unlikely the application of the concept of defence in depth requires additional barriers to mitigate the consequences of radioactive releases that could potentially result from accident conditions. <del>probability is not zero.</del></p>	2.253 SF-1, Safety Principle 8 3.32 DiD prevention of accidents	Yes			
20.	2.261	During Phase 2, implementation details do not need to be in place, but implementation of the general approach for emergency planning should be started and development of a protection strategy should be initiated. This covers, inter alia:	Use threat instead of hazard.			Yes	To maintain consistency with security documents.

		<ul style="list-style-type: none"> <li>— Basic legislation and regulations for emergency planning;</li> <li>— Threat Hazard-assessment;</li> <li>— Emergency response plans, procedures and concepts of operations;</li> <li>— Procedures for protecting emergency workers and helpers;</li> <li>— Demographic characteristics of the site or sites selected;</li> <li>— Procedures for provisions for public notification, information and instruction;</li> <li>— Procedures for the implementation of urgent protective actions and other response actions;</li> <li>— Procedures for medical response;</li> <li>— Procedures for the implementation of longer term early protective actions and other response actions ;</li> <li>— Procedures for dealing with non-radiological consequences.</li> </ul>				
21.	2.38	...instead it <b>usually</b> specifies <b>the highest level safety goals</b> and general rules and procedures...	Safety should be visible.		Delete highest levels.	
22.	2.5	...is important to <b>ensure</b> that...	ensure is also widely used in the guide. Would be good to harmonize.			Yes In this case the message is that the regulatory actions aim at verification. Ensuring is the responsibility of the

						licensee.
23.	2.84	...following broad areas: <b>civil construction, manufacturing, installation and commissioning of SSCs, safety culture,...</b>	The scope should cover all sub-phases during the phase as well as all type of entities.		In 5th line after management systems added: (including safety culture)	
24.	2.84	... Once the construction license is issued and possible other pre-approvals are given by the regulatory body, construction starts...	In some countries the construction license is not granted by the regulatory body and some other approvals of SSCs are needed prior to starting manufacturing/construction.	Yes		
25.	2.87	...it should ensure that it has the technical <b>as well as organizational</b> knowledge...	Both skills are needed prior to starting inspections.		Add: (technical knowledge and skills)	
26.	3.23	Replace physical protection with security measures	physical protection => security measures	Yes	Not replaced but deleted bullet on physical protection.	
27.	3.25	Modify: <u>The operating organization should implement a nuclear security system and measures in accordance with ref. x.</u>  Add: <u>NSS 19, Establishing the Nuclear Security Infrastructure for a Nuclear Power Programme</u> as ref. x  Additionally, add, at an appropriate place, a general reference to NSS 19 for State level measures.	There is a whole guide in the NSS for the topic. The use of different terminology in this publication confuses.  Additionally, add, at an appropriate place, a general reference to NSS 19 for State level measures.	Yes	Deleted 3.25.	

		<p>for State level measures.</p> <p><del>The operating organization should prepare a physical protection security programme that prevents or deters unauthorized access, intrusion, theft, direct attack and internal or external sabotage of systems important to safety and nuclear materials. This programme should include clear plans and procedures to provide physical protection physical of the site by means of vehicle entrance and exit control, vehicle parking and traffic control and personnel access control.</del></p>	<p>Security is wider than physical protection. See also 3.103</p>			
28.	3.52	... impact assessment...	Word assessment was used earlier in the guide.			Not found in para 2.52
29.	3.56	<p>...control systems.</p> <ul style="list-style-type: none"> <li>- <b>independency of defense in depth lines and possible deviations</b></li> <li>- <b>protection against internal and external events or threats and consequences to plant lay-out</b></li> <li>- <b>design extension conditions</b></li> <li>- <b>multi-unit aspects</b></li> <li>- <b>severe accident management</b></li> <li>- <b>ERP.</b></li> </ul>	New text proposed is too technical and detailed – not so “goal oriented” as earlier ones in 3.56. Should be drafted again.		Yes	The intention of the para is only to highlight the areas. Specific guidance is contained in SSR-2/1

30.	3.57	<p>A comprehensive consideration of external hazards in the design of NPPs needs to include among others:</p> <ul style="list-style-type: none"> <li>- Consideration of hazards during the design of the plant layout</li> <li>- Consideration that a total loss of all power sources might occur, regardless of its low or very low probability, as a result from an external event (eg; natural phenomena) and result in a severe accident.</li> <li>- Periodic assessment of the severity of the external hazard design basis, taking into account up to date scientific knowledge;</li> <li>- Evaluation of safety margins beyond the design basis (in particular, in the case of extreme external hazards), including scenarios leading to core damage and major releases of radioactivity to the environment;</li> </ul> <p><u>3.55.</u> - Stricter consideration of uncertainties associated with site characterization and in the siting and design of new nuclear power plants is needed.</p> <p><del>- A questioning attitude to emphasize safety and proactively implement countermeasures based on the understanding that records of</del></p>	<p>Stricter consideration of uncertainties associated with site characterization Stricter ? Should be clarified.</p>		<p>Delete the word stricter.</p>	

		natural phenomena can be limited and highly uncertain.				
31.	3.60	<p>...be supported by a number of external factors <b>and connections, like connections to external electrical grids or water supplies...</b></p> <p><b>One vital factor...</b></p>	There are also many other important factors, like roads, services, possible water connections etc. The plant is equip with safety classified internal power sources. External grid connections should not be vital for safe shutdown of the plant even in longer term.		Add; These include the reliabilities of external electrical grids and water supplies.	
32.	3.62	<p>... power plant, <b>and external grid connections are the normal way to feed safety related consumers of the plant.</b> Consideration...</p>	The original text gives wrong impression that external grid connections are the most qualified way to feed safety related consumers.	Yes		
33.	3.7	- The preliminary environmental impact <b>assessment</b>	Word assessment was used earlier in the guide.	Yes		
34.	3.73	... A radiological environmental impact <b>assessment...</b>	Word assessment was used earlier in the guide.	Yes		
35.	3.79	overall cold and hot <b>system performance</b> tests	More descriptive wording.	Yes		
36.	3.86	<b>delete</b>	3.86 refers to safety analysis report that is usually reviewed in operating license phase prior to fuel loading. 3.79 covers all other aspects.			Yes It is complementary to 3.79
37.	action 177	...should establish a “design authority”...	Wording used usually.	Yes		

38.	Action 85		How the government can recruit experts to meet the needs of <u>all organisations</u> ?			Yes	The action is in Phase 1 and its intent is awareness of manpower needed for the nuclear power programme.
39.	FIG 4	Phase 1, phase 2,...	Phases are missing from the upper part of the drawing.	Yes			
40.	FIG 6.	Involvement of the operating organization should be like involvement of the regulatory body.	As the operating organization means the licensee that takes the responsibility, the involvement should be high when the plant is selected and SSCs are designed, manufactured and commissioned. The number of the staff can be even higher than during the power operation of the plant.			Yes	The figure is related to the establishment of the organization and is only qualitative.
41.	FIG. 1	Negative option after phase 2	It is possible that the project ends after first feasibility studies etc.			Yes	FIG. 1 is based on INSAG 22 and is not intended to address negative decisions which may occur after Phase 1.
42.	FIG. 1, new FIG 3.	Phase 3: 7-15 years	If a bidding phase is included, it typically takes more than 10 years.			Yes	It is only an indicative range and consistent with Milestones

							document.
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# NSGC

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: J. JALOUNEIX		Date: 12/10/2015		Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	General	Delete the reference to INFIRC 225, rev 4.	INFIRC 225 rev 4 has been upgraded to INFIRC 225 rev 5 which is also NSS 13 already mentioned in the references	yes			
2	General	Add a reference to NSS 13 dealing with radioactive material and associated facilities and activities	This reference deals notably with the transport of radioactive materials.			yes	<b>NSS 13 is sufficient for the nuclear power programme as it deals with physical protection of nuclear material (including during transport) as well as nuclear</b>

							<b>facilities.</b>
3	Action 200/§3.111	Replace the wording “physical security” by “physical protection”;	To be consistent with the wording of the nuclear security series.	yes			

	COMMENTS BY REVIEWER					RESOLUTION		
	Reviewer: <b>Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB)</b> (with comments of GRS) Country/Organization: <b>Germany</b>			Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected
Relevance	Comment No.	Para/Line No.						
3	1	1.8	Last sentence: “The IAEA promotes national ‘self-assessments’ and provides for the application of its safety standards through safety review services such as the Integrated Regulatory Review Service ( <a href="#">IRRS</a> ), the Operational Safety Review Team service ( <a href="#">OSART</a> ) or the Emergency Preparedness Review service ( <a href="#">EPREV</a> ) upon request by the State, to guide and/or to peer review a national self-assessment in specific areas.”	The commonly used abbreviations of the IAEA review services should be inserted here for completeness.	Yes			
2	2	1.16	“The objective of this Safety Guide is to provide guidance on the establishment of a framework for safety in accordance with the IAEA safety standards for States deciding on and preparing to embark on a nuclear power programme. In this regard, it proposes <del>200</del> <a href="#">197</a> safety related actions to be taken in the first three phases of the development of the nuclear power programme, …”	As an outcome of the Agency’s internal review of the revision of SSG-16, the Actions 195, 196 and 198, which are part of element 20 “Interfaces with nuclear security”, were deleted without replacement. Thus, only 197 actions remain in the current version of DS486.	Yes			
2	3	1.19	2 <sup>nd</sup> sentence: “The recommendations are presented for ease of use in the form of <del>200</del> <a href="#">197</a> actions.”	See our corresponding comment on Para 1.16.	Yes			
3	4	1.23	“Research reactors and <a href="#">nuclear</a> fuel cycle facilities are not explicitly covered in this Safety Guide, which concentrates on the nuclear power	Wording.	Yes			

			programme.”				
2	5	Figure 3 in Section 1	Please include a legend to Figure 3 (referred to in Para 1.21) with the following text: “ <i>FIG. 3. Indicative time frame and some important milestones for the development of a nuclear safety infrastructure.</i> ”	The legend to Figure 3 is missing in the document.	Yes		
2	6	2.12	“The government should also take into account: <ul style="list-style-type: none"> <li>– Binding international instruments and other international instruments (see also paras <a href="#">2.18–2.32</a> <a href="#">2.20–2.36</a> on the global nuclear safety regime);</li> <li>– The necessary scope and elements of the governmental, legal and regulatory framework for safety (see also paras <a href="#">2.33–2.47</a> <a href="#">2.37–2.52</a> on the legal framework and paras <a href="#">2.48–2.83</a> <a href="#">2.53–2.90</a> on the regulatory framework);</li> <li>– The need for and provision for a vigorous competence building programme and the associated human and financial resources (see also paras <a href="#">2.158–2.177</a> <a href="#">2.173–2.189</a> on human resources development and paras <a href="#">2.97–2.106</a> <a href="#">2.106–2.115</a> on funding and financing);</li> <li>– The provisions and framework for research and development (see also paras <a href="#">2.178–2.189</a> <a href="#">2.190–2.201</a> on research for safety and regulatory purposes);</li> <li>– The promotion of leadership and management for safety, including safety culture (see also paras <a href="#">2.142–2.157</a> <a href="#">2.152–2.172</a> on leadership and management for safety);</li> <li>– The need for and provision for spent fuel management and radioactive waste management, including disposal of radioactive waste (see also paras <a href="#">2.222–2.238</a> <a href="#">2.236–2.252</a> on safety of radioactive waste</li> </ul>	Wrong paragraphs are referred to in several bullets.	Yes		

			<p>management, spent fuel management and decommissioning'); <b>and</b>            – Potential environmental, social and economic impacts of a prospective nuclear power programme;<b>; and</b>            – The need for upgrade or for establishment ...”</p>				
2	7	2.14	<p>Penultimate sentence:            “The radiological environmental impact analysis (which in most States constitutes one section of the environmental impact assessment) is further addressed in paras <a href="#">2.190–2.201</a> <a href="#">2.190–2.201</a> on radiation protection and paras <a href="#">3.24–3.48</a> <a href="#">3.26–3.53</a> on site survey and site evaluation.”</p>	Wrong paragraphs are referred to.	Yes		
2	8	2.41	<p>“...            (1) Safety principles for protecting people – individually and collectively – society and the environment from radiation risks, both at present and in the future (see also paras <a href="#">2.190–2.201</a> <a href="#">2.202–2.214</a> on radiation protection);            ...            (5) Provision for the involvement of interested parties and for their input in decision making (see also paras <a href="#">2.84–2.96</a> <a href="#">2.91–2.105</a> on transparency and openness);            (6) Provision for assigning legal responsibility for safety ... (see also paras <a href="#">3.1–3.25</a><a href="#">3.23</a> on the operating organization);            (7) The establishment of a regulatory body (see also paras <a href="#">2.48–2.83</a> <a href="#">2.53–2.90</a> on the regulatory framework);            (8) Provision for the review and assessment of facilities and activities, in accordance with a graded approach (see also paras <a href="#">2.202–2.221</a> <a href="#">2.215–2.235</a> on safety assessment);            (9) The authority and responsibility of the regulatory body for promulgating (or</p>	Wrong paragraphs are referred to in several items.	Yes		

	<p>preparing for enactment) regulations and preparing guidance for their implementation (see also paras <a href="#">2.48–2.83</a> <a href="#">2.53–2.90</a> on the regulatory framework);</p> <p>(10) Provision for the inspection of facilities and activities and for the enforcement of regulations, in accordance with a graded approach (see also paras <a href="#">2.48–2.83</a> <a href="#">2.53–2.90</a> on the regulatory framework);</p> <p>...</p> <p>(12) Provision for preparedness for and response to a nuclear or radiological emergency (see also paras <a href="#">2.239–2.250</a> <a href="#">2.253–2.269</a> on emergency preparedness and response);</p> <p>(13) Provision for the interface with nuclear security (see also paras <a href="#">3.94–3.108</a> <a href="#">3.102–3.112</a> on interfaces with nuclear security);</p> <p>...</p> <p>(15) Provision for acquiring and maintaining the necessary competence nationally for ensuring safety (see also paras <a href="#">2.158–2.177</a> <a href="#">2.173–2.189</a> on human resources development and paras <a href="#">2.178–2.189</a> <a href="#">2.190–2.201</a> on research for safety and regulatory purposes);</p> <p>(16) Responsibilities and obligations in respect of financial provision for the management of radioactive waste and of spent fuel, and for decommissioning of facilities and termination of activities (see also paras <a href="#">2.222–2.238</a> <a href="#">2.236–2.252</a> on safety of radioactive waste management, spent fuel management and decommissioning, and paras <a href="#">2.97–2.106</a> <a href="#">2.106–2.115</a> on funding and financing);</p> <p>..."</p>			
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2	9	2.55	1 <sup>st</sup> bullet: “Ensuring that on site emergency arrangements including emergency plans and procedures are in place and provide assurance of an effective response and that they are integrated with emergency arrangements of other response organizations and other plans as appropriate (see Ref. [20] [26]),”	Wrong reference is cited in this bullet. The Safety Guide SSG-12 has to be replaced by the General Safety Requirements GSR Part 7.	Yes		
2	10	2.58	“Development of human resources of the regulatory body and the development of its management system are addressed in paras <a href="#">2.158–2.177</a> <a href="#">2.173–2.189</a> on human resources development and paras <a href="#">2.142</a> <a href="#">2.157</a> <a href="#">2.152–2.172</a> on leadership and management of safety, respectively.”	Wrong paragraphs are referred to.	Yes		
3	11	2.96	1 <sup>st</sup> sentence: “... adequate preparedness to effectively respond to emergencies in relation to the nuclear power programme (including <del>very low probability</del> severe accidents conditions <a href="#">with a very low probability of occurrence</a> ) and ...”	Better wording.	Yes		
2	12	2.106	“Phase 1  The following actions are recommended to be completed in this phase as a step towards the full implementation of all relevant IAEA Safety Requirements: – ... – <a href="#">Requirement 9 of GSR Part 6 Requirements 6.1 to 6.5 of WS-R-5</a> [18] – ...”	Meanwhile, the Safety Requirements WS-R-5 have been superseded and replaced by GSR Part 6 (issued in July 2014). Please refer to the valid IAEA Safety Standard.	Yes		
3	13	2.156	“An integrated management system needs to integrate all elements of management including safety, health, environmental, security, quality, <a href="#">social societal</a> and economic elements so that safety is not compromised.”	To be in line with the wording in the Draft Safety Requirements DS456 “Leadership and Management for Safety” (future GSR Part 2), it is	Yes		

				recommended to replace ‘social’ by ‘societal’. Compare with Requirement 7 and Paras 1.3 and 4.18 (b) of DS456 (latest version dated 16 June 2015).			
2	14	2.185	“A sustainable level of expertise in nuclear power technology and safety should be maintained by means of the continuous recruitment of competent staff and long term generic research programmes on safety that provide and preserve the strength of the nuclear power programme (see paras <a href="#">2.178–2.189</a> <a href="#">2.190–2.201</a> on research for safety and regulatory purposes).”	Wrong paragraphs are referred to.	Yes		
2	15	2.229	2 <sup>nd</sup> sentence: “External expert support is addressed in paras <a href="#">2.107–2.141</a> <a href="#">2.116–2.151</a> .”	Wrong paragraphs are referred to.	Yes		
2	16	2.237	“A State considering a nuclear power programme is likely already to be engaged in activities involving sources of radiation (e.g. research reactors, or industrial or medical applications of radiation) which require arrangements for the <a href="#">predisposal</a> management and disposal of low level and intermediate level radioactive waste.”	According to the IAEA Safety Glossary, the term ‘radioactive waste management’ covers all administrative and operational activities involved in the handling, pretreatment, treatment, conditioning, transport, storage and disposal of radioactive waste. This implies that disposal is included in the definition of this term. Predisposal management of radioactive waste, as the term is used in GSR Part	Yes		

				5, covers all the steps in the management of radioactive waste from its generation up to (but not including) disposal.			
2	17	2.240	1 <sup>st</sup> sentence: “In some States, a dedicated organization is established for radioactive waste management. In other States, the operating organization takes care of the <u>predisposal</u> management and <u>final</u> disposal of radioactive waste generated by its nuclear power plants, or at least of the low level waste and intermediate level waste.”	According to the IAEA Safety Glossary, the term ‘radioactive waste management’ covers all administrative and operational activities involved in the handling, pretreatment, treatment, conditioning, transport, storage and disposal of radioactive waste. This implies that disposal is included in the definition of this term. Predisposal management of radioactive waste, as the term is used in GSR Part 5, covers all the steps in the management of radioactive waste from its generation up to (but not including) disposal.  The word ‘final’ should be deleted because a contrast between interim disposal and final disposal does not exist.	Yes		
3	18	2.241	“The scope of this Safety Guide does not include <u>nuclear</u> fuel cycle facilities. However, if <u>nuclear</u> fuel cycle facilities form part of the	Consistency with the terminology used in the IAEA Safety Glossary.	Yes		

			nuclear power programme, the safety requirements of NS-R-5 [43] and <a href="#">the recommendations of</a> the supporting Safety Guides would apply.”	2 <sup>nd</sup> sentence: The original wording is potentially misleading as it suggests that the safety requirements of the supporting Safety Guides would apply, in addition to the safety requirements of NS-R-5. Safety Guides, however, do not establish any requirements. Therefore, wording needs to be adjusted.			
2	19	2.242	“Financial aspects relating to the safety of radioactive waste management and of spent fuel management are addressed in paras <a href="#">2.97–2.106</a> <a href="#">2.106–2.115</a> on funding and financing in this Safety Guide.”	Wrong paragraphs are referred to.	Yes		
3	20	2.243	1 <sup>st</sup> sentence: “The availability of alternative options for managing high level radioactive waste, including its <del>final</del> disposal, should be considered before making a decision on launching a nuclear power programme.”	Consistency with the terminology used in the IAEA Safety Glossary. The word ‘final’ should be deleted because a contrast between interim disposal and final disposal does not exist.	Yes		
2	21	2.244	Last sentence: “Regardless of the alternative selected, cost estimates for <del>final</del> waste disposal should be made to assess the economics of nuclear power production and to be able to provide sufficient funds for radioactive waste management (see also paras <a href="#">2.97–2.106</a> <a href="#">2.106–2.115</a> on funding and financing).”	1.) The word ‘final’ should be deleted because a contrast between interim disposal and final disposal does not exist. 2.) Wrong paragraphs are referred to.	Yes		

2	22	2.246	<p>1<sup>st</sup> sentence: “Alternative <del>interim</del> storage and disposal strategies for low level, intermediate level and high level radioactive waste and for spent fuel should be studied in Phase 2.”</p> <p>3<sup>rd</sup> and 4<sup>th</sup> sentence: “As concerns the disposal of low level and intermediate level radioactive waste, it should be decided whether the operating organization will do this on the site, or whether there will be a national approach with a central <del>final</del> <del>repository</del> <a href="#">disposal facility</a>, and possibly a dedicated organization to operate such a facility. This should be decided early enough that the <del>treatment</del> <a href="#">processing</a> facilities and <del>interim</del> storage facilities for low level and intermediate level radioactive waste can be taken into account in the design of the nuclear power plant.”</p>	<p>Storage is, by definition, an interim measure, but it can last for several decades if a disposal option is not available. Consequently, the term ‘interim storage’ would be appropriate only to refer to short term temporary storage when contrasting this with longer term storage.</p> <p>Storage as defined in the IAEA Safety Glossary should not be designated as interim storage.</p> <p>Although defined in the IAEA Safety Glossary, the term ‘repository’ is meanwhile considered as outdated and should be replaced by ‘disposal facility’. The Safety Requirements SSR-5 and all associated Safety Guides (GSG-1, SSG-14, SSG-23, SSG-29 and SSG-31) solely refer to disposal facilities.</p> <p>According to the IAEA Safety Glossary, the term ‘processing’ is more comprehensive and includes ‘pretreatment’,</p>	Yes		
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				‘treatment’ and ‘conditioning’ of radioactive waste.				
3	23	2.247	1 <sup>st</sup> sentence: “For managing long lived radioactive waste and high level radioactive waste and spent fuel, the government and the waste management organization should assess whether the <b>final</b> disposal of radioactive waste can be provided by means of national arrangements or whether assistance from other States is necessary.”	Consistency with the terminology used in the IAEA Safety Glossary. The word ‘final’ should be deleted because a contrast between interim disposal and final disposal does not exist.	Yes			
3	24	2.249	“Detailed regulations governing the back end of the <b>nuclear</b> fuel cycle are not necessary by the end of Phase 2, but work should be started to establish the policy and regulations governing such areas as the transport and <b>interim</b> storage of radioactive waste.”	Consistency with the terminology used in the IAEA Safety Glossary. Storage is, by definition, an interim measure, but it can last for several decades if a disposal option is not available. Consequently, the term ‘interim storage’ would be appropriate only to refer to short term temporary storage when contrasting this with longer term storage. Storage as defined in the IAEA Safety Glossary should not be designated as interim storage.	Yes			
3	25	Action 130	“The operating organization, and the radioactive waste management organization if applicable, should make their respective <b>interim</b> storage facilities fully operational and ready to receive radioactive waste and spent fuel from the nuclear power plant.”	Storage is, by definition, an interim measure, but it can last for several decades if a disposal option is not available. Consequently, the term ‘interim storage’ would	Yes			

				be appropriate only to refer to short term temporary storage when contrasting this with longer term storage. Storage as defined in the IAEA Safety Glossary should not be designated as interim storage.			
3	26	2.250	“Work should be started by the operating organization, and by the radioactive waste management organization, if applicable, to determine and to evaluate the arrangements and sites that would be viable for the <del>final</del> disposal of low level and very low level radioactive waste.”	Consistency with the terminology used in the IAEA Safety Glossary. The word ‘final’ should be deleted because a contrast between interim disposal and final disposal does not exist.	Yes		
2	27	2.251	1 <sup>st</sup> sentence: “The <del>treatment</del> <u>processing</u> facilities for low level and intermediate level radioactive waste should be incorporated as necessary into the nuclear power plant.”	According to the IAEA Safety Glossary, the term ‘processing’ is more comprehensive and includes ‘pretreatment’, ‘treatment’ and ‘conditioning’ of radioactive waste.	Yes		
2	28	2.252	“The mechanism for funding the decommissioning costs and the costs for radioactive waste management <u>and the (including</u> disposal of <del>ra-</del> <u>dioactive</u> waste) should be established by legislation before the startup of the first reactor (see also paras <u>2.97–2.106</u> <u>2.106–2.115</u> on funding and financing).”	Wrong paragraphs are referred to.  According to the IAEA Safety Glossary, the term ‘radioactive waste management’ covers all administrative and operational activities involved in the handling, pretreatment,	Yes		

				treatment, conditioning, transport, storage and disposal of radioactive waste. This implies that disposal is included in the definition of this term.			
3	29	3.2	"It is therefore the operating organization that has to meet the fundamental safety objective "To protect people and the environment from harmful effects of ionizing radiation", by taking the following measures <a href="#">addressed in para 2.1 of Ref. [1]</a> : ..."	Completeness of citation. Compare with the equivalent references in Paras 2.236 and 3.26 of DS486.	Yes		
2	30	3.5	"Staffing of the operating organization and the development of its management system are addressed in paras <a href="#">2.159–2.177</a> <a href="#">2.173–2.189</a> on human resources development and paras <a href="#">2.142–2.157</a> <a href="#">2.152–2.172</a> on leadership and management for safety of this Safety Guide."	Wrong paragraphs are referred to.	Yes		
2	31	3.7	6 <sup>th</sup> bullet: "The design authority function (see paras <a href="#">3.49–3.69</a> <a href="#">3.54–3.75</a> on design safety);"	Wrong paragraphs are referred to.	Yes		
2	32	3.21	1 <sup>st</sup> bullet: "Safety analysis reports (see paras <a href="#">2.202–2.221</a> <a href="#">2.215–2.235</a> on safety assessment for further information)."  2 <sup>nd</sup> bullet: "Probabilistic safety analyses (which might be included in the safety analysis report; see paras <a href="#">2.202–2.221</a> <a href="#">2.215–2.235</a> on safety assessment for further information on probabilistic safety analysis)."	Wrong paragraphs are referred to in the 1 <sup>st</sup> and 2 <sup>nd</sup> bullet.	Yes		
2	33	3.23	"... the areas to be covered by various management programmes for the safe operation of the plant should include, but are not limited to, the following:	Wrong paragraphs are referred to in several bullets.	Yes		

	<ul style="list-style-type: none"> <li>– Staffing (see paras <a href="#">2.158</a>–<a href="#">2.177</a> <a href="#">2.173</a>–<a href="#">2.189</a> on human resources development);</li> <li>– Qualification and training (see paras <a href="#">2.158</a>–<a href="#">2.177</a> <a href="#">2.173</a>–<a href="#">2.189</a> on human resources development);</li> <li>– Commissioning (see paras <a href="#">3.70</a>–<a href="#">3.77</a> <a href="#">3.76</a>–<a href="#">3.86</a> on preparation for commissioning);</li> <li>...</li> <li>– Radiation protection (see paras <a href="#">2.190</a>–<a href="#">2.201</a> <a href="#">2.202</a>–<a href="#">2.214</a> on radiation protection);</li> <li>...</li> <li>– Waste management (see paras <a href="#">2.222</a>–<a href="#">2.238</a> <a href="#">2.236</a>–<a href="#">2.252</a> on safety of radioactive waste management, spent fuel management and decommissioning);</li> <li>– Environmental monitoring (see paras <a href="#">2.190</a>–<a href="#">2.204</a> <a href="#">2.202</a>–<a href="#">2.214</a> on radiation protection and paras <a href="#">3.24</a>–<a href="#">3.48</a> <a href="#">3.26</a>–<a href="#">3.53</a> on site survey and site evaluation);</li> <li>– Emergency preparedness (see paras <a href="#">2.239</a>–<a href="#">2.250</a> <a href="#">2.253</a>–<a href="#">2.269</a> on emergency preparedness and response);</li> <li>...</li> <li>– Quality assurance (see paras <a href="#">2.142</a>–<a href="#">2.157</a> <a href="#">2.152</a>–<a href="#">2.172</a> on leadership and management for safety and paras <a href="#">2.107</a>–<a href="#">2.141</a> <a href="#">2.116</a>–<a href="#">2.151</a> on external support organizations and contractors);</li> <li>...</li> <li>– Plant modifications (see paras <a href="#">3.49</a>–<a href="#">3.69</a> <a href="#">3.54</a>–<a href="#">3.75</a> on design safety);</li> <li>– Document control and records (see paras <a href="#">2.142</a>–<a href="#">2.157</a> <a href="#">2.152</a>–<a href="#">2.172</a> on leadership and management for safety);</li> <li>...</li> <li>– Decommissioning (see paras <a href="#">2.222</a>–<a href="#">2.238</a></li> </ul>			
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			<a href="#">2.236–2.252</a> on safety of radioactive waste management, spent fuel management and decommissioning).”				
3	34	3.25	1 <sup>st</sup> sentence: “... a physical protection programme <del>s</del> that prevents or deters ...”	Editorial.	Yes		
3	35	Footnote No. 1 to 3.36	Note: Renumeration (1 → 17) of the footnote is required to follow a consecutive numbering.	Wrong numbering of the footnote.	Yes		
2	36	3.38	1 <sup>st</sup> sentence: “The expected impacts of the plant on the public and the environment <u>should be</u> <del>are</del> considered, to estimate the consequences of discharges in normal operation and potential radioactive releases resulting from accidents.”  Last sentence: “This should be done as part of the radiological environmental impact analysis addressed in paras <del>2.190–2.201</del> <a href="#">2.202–2.214</a> on radiation protection.”	A Safety Guide should rather provide recommendations and guidance (i.e. “should” statements) than only describe good practices.  Wrong paragraphs are referred to.	Yes		
3	37	3.45	“During Phase 2, all site evaluation tasks should be conducted in accordance with the requirements and recommendations of the IAEA safety standards on site evaluation [31, 44–49, <a href="#">58</a> ].”  Please add Ref. [58] to the list of references: <a href="#">“[58] INTERNATIONAL ATOMIC ENERGY AGENCY, Volcanic Hazards in Site Evaluation for Nuclear Installations, IAEA Safety Standards Series No. SSG-21, IAEA, Vienna (2012).”</a>	The IAEA Safety Guide SSG-21 provides recommendations and guidance on the assessment of volcanic hazards in site evaluation. For the sake of completeness, a new reference [58] to this publication should be added here.	Yes		
2	38	3.53	“Activities for radiological environmental impact analysis or environmental monitoring are addressed in paras <del>2.190–2.201</del> <a href="#">2.202–2.214</a> on radiation protection.”	Wrong paragraphs are referred to.	Yes		

3	39	3.54	<p>“Principle 8 of the IAEA’s Fundamental Safety Principles [1], ‘Prevention of accidents’, states that “All practical efforts must be made to prevent and mitigate nuclear or radiation accidents.” Also, <a href="#">para 3.31 of Ref. [1]</a> says: “The primary means of preventing and mitigating the consequences of accidents is ‘defence in depth’.””</p>	<p>Completeness of citation. Compare with the equivalent references in Paras 2.236 and 3.26 of DS486.</p>	Yes			
2	40	3.59	<p>3<sup>rd</sup> sentence: “The IAEA Safety Requirements publication SSR-2/1 [33] states in para. <del>3.6 that</del> <a href="#">4.15</a>: <a href="#">“Where</a> <a href="#">National and international</a> codes and standards <a href="#">that</a> are used as design rules, <a href="#">they for items important to safety</a> shall be identified and evaluated to determine their applicability, adequacy and sufficiency, and shall be supplemented or modified as necessary to ensure that the <del>final</del> quality <a href="#">of the design</a> is commensurate with the <del>necessary</del> <a href="#">associated</a> safety function.”</p>	<p>The original citation is taken from Para 3.6 of the old Safety Requirements NS-R-1, which were superseded and replaced by SSR-2/1 and later on by SSR-2/1 (Rev. 1). Adjustment of citation is required.</p>	Yes			
2	41	3.84	<p>“The operating organization should establish mechanisms <a href="#">to for the</a> transfer <del>from the vendor</del> the ownership of the plant systems <a href="#">from the vendor</a>.”</p>	<p>Clarification. The original wording is confusing.</p>	Yes			
1	42	3.99	<p>“An evaluation should also be made of the expected needs for the transport of low level and intermediate level radioactive waste generated during plant operation. This applies if a national <del>interim</del> storage or disposal site is under consideration, as opposed to the <del>disposal</del> <a href="#">storage</a> of radioactive waste in a location on the nuclear power plant site.”</p>	<p>Experience in Member States reveals that NPP sites are, in the vast majority of cases, not considered being appropriate locations for the disposal of radioactive waste. Therefore, such approach should not be promoted in DS486.</p> <p>Storage is, by definition,</p>	Yes			

				an interim measure, but it can last for several decades if a disposal option is not available. Consequently, the term ‘interim storage’ would be appropriate only to refer to short term temporary storage when contrasting this with longer term storage. Storage as defined in the IAEA Safety Glossary should not be designated as interim storage.			
3	43	Headline after 3.101	“ACTIONS 193– <a href="#">197</a> <del>200</del> : INTERFACES WITH NUCLEAR SECURITY”	As an outcome of the Agency’s internal review of the revision of SSG-16, the Actions 195, 196 and 198 in this subsection were deleted without replacement. Renumbering of the remaining actions in this subsection is required.	Yes		
3	44	3.102	“The IAEA Fundamental Safety Principles [1] state <a href="#">in para 1.10</a> that “safety measures and security measures have in common the aim of protecting human life and health and the environment” and that “safety measures and security measures must be designed and implemented in an integrated manner so that security measures do not compromise safety and safety measures do not compromise security”.”	Completeness of citation. Compare with the equivalent references in Paras 2.236 and 3.26 of DS486.	Yes		
3	45	3.103	Last sentence: “A specific Implementing Guide <a href="#">[56]</a> in relation to the establishment of nuclear security	This sentence refers to NSS-19. For the sake of completeness, a	Yes		

			infrastructure for a nuclear power programme is available in the IAEA Nuclear Security Series.”	reference to this publication should be added.				
3	46	3.104	<p>1<sup>st</sup> sentence:</p> <p>“The fields covered by safety and by nuclear security, respectively, are distinct, but safety and nuclear security have a common purpose, to protect people and the environment from harmful effects of ionizing radiation <del>and to protect people and the environment</del> as well as from the harmful <del>effects</del> consequences of a nuclear security event, and are therefore complementary.”</p> <p>3<sup>rd</sup> sentence:</p> <p>“Nuclear security is concerned with the prevention of, detection <del>or of</del>, and response to, criminal or intentional unauthorized acts involving or directed at nuclear and other radioactive material, associated facilities and associated activities [55].”</p>	<p>Streamlining of the text without loss of the key message.</p> <p>Editorial.</p>	Yes			
3	47	3.105	“ <u>During each phase of the development process of a nuclear power programme, N</u> nuclear security [56] and safety infrastructures <del>should be developed during each phase of the development process of a nuclear power programme. They</del> should be developed, as far as possible, in a well coordinated manner.”	Our proposed formulation is more concise and merges both sentences into one.	Yes			
3	48	Action 193	“The government should foster both safety culture and <u>nuclear</u> security culture, taking into account their commonalities and differences.”	Ensuring consistency with the terminology used in other actions and paragraphs of the subsection “Interfaces with nuclear security”.	Yes			
3	49	3.107	“A safety culture and a <u>nuclear</u> security culture that govern the attitudes and behaviour of individuals should be developed within the	Ensuring consistency with the terminology used in other actions	Yes			

			management system.”	and paragraphs of the subsection “Interfaces with nuclear security”.				
2	50	Ref. [45]	“INTERNATIONAL ATOMIC ENERGY AGENCY, <del>Flood Hazard for Nuclear Power Plants on Coastal and River Sites Meteorological and Hydrological Hazards in Site Evaluation for Nuclear Installations</del> , IAEA Safety Standards Series No. <a href="#">NS-G-3.5 SSG-18</a> , IAEA, Vienna <del>(2004) (2011)</del> .”	Meanwhile, the Safety Guides NS-G-3.5 and NS-G-3.4 have been superseded and replaced by the Specific Safety Guide SSG-18 (issued in November 2011). Please refer to the valid IAEA Safety Standard.	Yes			
2	51	Ref. [46]	<del>“INTERNATIONAL ATOMIC ENERGY AGENCY, Meteorological Events in Site Evaluation for Nuclear Power Plants, IAEA Safety Standards Series No. NS-G-3.4, IAEA, Vienna (2003).”</del>	See our corresponding comment on Ref. [45].	Yes			
2	52	Ref. [47]	“INTERNATIONAL ATOMIC ENERGY AGENCY, Evaluation of Seismic Hazards for Nuclear Power Plants, IAEA Safety Standards Series No. <del>NS-G-3.3 SSG-9</del> , IAEA, Vienna <del>(2003) (2010)</del> .”	Meanwhile, the Safety Guide NS-G-3.3 has been superseded and replaced by the Specific Safety Guide SSG-9 (issued in August 2010). Please refer to the valid IAEA Safety Standard.	Yes			

COMMENTS BY REVIEWER Reviewer: Japan NUSSC Country/Organization: Japan/NRA				RESOLUTION			
No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modif./reject.
1.	General	How do you update this guide consisted with requirements being revised such as GS-R-3, NS-R-3 and so on?	Clarification.		It is explained in the DPP		
2.	General	Be consisted with DS455 as "Infrastructure for Radiation Safety."	DS455 is focused on radiation safety area.	Yes			
3.	General	GSR Part 1 <a href="#">(Rev.1)</a> GSR Part 4 <a href="#">(Rev.1)</a> NS-R-3 <a href="#">(Rev.1)</a>	Should be referred to the latest version, as GSR Part 7 has already introduced here.	Yes			
4.	2.6	Referred to GSR Part 1 Requirement 5.	Very important role of prime responsibility for safety.		Stated in 1.2 referring to safety principle 1.		
5.	2.17	The government should establish clear <u>national</u> policy and strategy for safety and demonstrate a firm commitment to safety by providing its support and the necessary resources for the implementation of an effective safety infrastructure.	Editorial.  Be consisted with GSR Part 1 Requirement 1.	Yes			
6.	2.47	Delete "CBRN" or make it clear.	Clarification.		CBRN chemical, biological, radiological,		

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Japan NUSC		Page 1 of					
No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modif./reject.
					nuclear materials		
7.	2.153	Referred to GS-R-3 as “integrated management system.”	Clarification.		Add Reference 16 after “integrated management system”		
8.	2.213 and others	“Accident conditions” are used as plant states for design basis accidents and design extension conditions for NPPs defined in SSR-2/1, and “beyond design basis accidents” are no more used. Should be used in consisted with this guide	Clarification. Accident conditions and beyond design basis accident should be clearly defined as stated in SSR-2/1 (Rev. 1).		Delete accident conditions and replace by: design basis accident and design extension conditions.		
9.	3.71	Add Action 186 as follows; <b>“The operating organization should establish a severe accident management programme before starting the commissioning.”</b>	SAMG is one of the key elements of lessons learnt from the Tepco Fukushima Dai-chi NPPs accidents.		Action 185, add at the end: including the establishment of a severe accident management programmer.		
10.	Action 195, 196 and 198	Action 195, 196 and 198 are deleted but there are still these actions in appendix.	Inconsistency.	Yes			

COMMENTS BY REVIEWER				RESOLUTION			
Comment No.	Para/Line No.	Identified problem/Proposed new text	Reason/Description	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	Page 61 §2.93	The government should ensure that <del>all</del> <u>the public and other</u> interested parties ...	For clear meaning and understanding	Yes			
2	Page 62 Action 42	All relevant organizations should continue to inform the public and <u>other</u> interested parties ...	For clear meaning and understanding	Yes			
3	Page 62 §2.94	... benefits to <u>the public and other</u> interested parties ...	For clear meaning and understanding	Yes			
4	Page 62 §2.95	... the involvement of <u>the public and other</u> interested parties ...	For clear meaning and understanding	Yes			
5	Page 62 §2.96	The government should inform <del>all</del> <u>the public and other</u> interested parties ...	For clear meaning and understanding	Yes			
6	Page 63 §2.99	The operating organization should explain to <u>the public and other</u> interested parties ...	For clear meaning and understanding	Yes			
7	Page 83 §2.165	Regulatory bodies should also implement a more specific regulatory oversight of safety culture of licensees <u>with a careful consideration of the impact of regulatory oversight on licensees' safety culture.</u>	Regulatory bodies should also consider the impact of regulatory oversight on licensee's safety culture.			Yes	The underlining consideration is that the prime responsibility for safety is with the operator. The regulatory body should not evaluate how its actions affect the safety culture of the

						licensee.
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COMMENTS BY REVIEWER				RESOLUTION			
Reviewer:	NUSSC						
Page.... of....							
Country/Organization:	Republic of South Africa						
Date:							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	Contents page	The table of content indicates page numbers where sections headings are located in the document but the entire document has no page numbers. The writer/s should insert page numbers.	It is difficult to navigate a document with no page numbers.	Yes	Page numbers have been inserted to the extent possible and will be revised after cleaning of section breaks and page breaks.		
2	Figure 5	The table shown presents 20 elements of the safety infrastructure, including design safety. Construction safety is not shown on the list. It is important to include nuclear construction and manufacturing since they are important to nuclear safety. However, this will make the number of elements to be 21 instead of 20. To keep the number at 20 the 17th element (design safety can be modified to read: "Design and Construction Safety".	It is important to include nuclear construction and manufacturing since they are important to nuclear safety.			Yes	Construction and manufacturing safety in SSG-16 applies to establishing a regulatory framework for a nuclear power programmer. Construction safety is addressed through relevant elements and not a standalone element.
3	Figure 6	Figure 6 is a repeat of the top part of Figure 4. It is better to add the information in Figure 6 to Figure 4	Repetition			Yes	Makes document more user-friendly.

		and then remove Figure 6 and rather refer to Figure 4.				
4	Action 95	Action 95. The operating organization, the regulatory body, and external support organizations and all other relevant response organizations should ensure the availability of <b>a sufficient number of suitably qualified and experienced personnel</b> for the efficient and effective conduct of all activities at the appropriate time.	Competency alone is not adequate since its assessment may be very difficult and subjective			Yes Current text is clear.
5	Action 102.	Action 102. The government should implement plans to establish new institutions for research relating to safety, as necessary, <b>and funding thereof</b> .	It is also important to highlight that funding of nuclear safety research is essential and that it should be a government responsibility.			Yes Action 48 covers funding.
6	Action 173.	Action 173. <b>Government</b> or/and the operating organization should conduct a thorough market survey of the available nuclear power technologies and should investigate their safety features.	In most cases the choice of nuclear technology is made at government policy level. Therefore it seems appropriate that this action item is performed by government.			Yes The action is for the operating organization. However, in some countries the operating organization may belong to the government.
7	Action 198	Since this action is deleted it means there are 199 action items. The introductory part of the document claims that there are 200 action items. This needs to be corrected.	Consistency.		Revised number of actions is 197.	

COMMENTS BY REVIEWER				RESOLUTION			
Reviewers: U.S. Nuclear Regulatory Commission Country/Organization: United States of America / NUSC Date: 9 October, 2015							
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	General	The document is effective with respect to addressing the various IAEA Safety Standards Series, throughout the five phases of establishing a safety infrastructure for nuclear power generation. The comments below are provided for completeness and clarity.		Yes			
2	General	<p>The division of the infrastructure for safety into five phases in a nuclear power program spans a period of 100 years. Therefore, for continuity, to ensure safety during such period is of paramount importance. In this regard, we suggest that DS486 address the following aspects:</p> <ul style="list-style-type: none"> <li>• Knowledge transfer, training, and knowledge management;</li> <li>• Development of indigenous skilled human resources to enable independent safety operations, maintenance; and safe decommissioning.</li> <li>• Update of software and</li> </ul>	<p>The safety infrastructure involving nuclear power programs requires planning and for long-term commitments for safety throughout the five phases of a nuclear power program.</p> <p>Therefore, we believe aspects of knowledge transfer, training, and knowledge management, as well as updating of software and technology management, particularly to counter threats and cyber security, are important aspects that</p>			Yes	The DPP was approved for a limited revision, only to incorporate changes in safety requirements and other safety insights arising from their revision after Fukushima.

COMMENTS BY REVIEWER				RESOLUTION			
Reviewers: U.S. Nuclear Regulatory Commission Country/Organization: United States of America / NUSSC Date: 9 October, 2015							
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		technology, as well as managing emergency situations. • Cyber security.	need to be addressed in more detail.				
3	Page Numbering	DS468 has no page numbering on printed hard copy.	We suggest adding a page number for this version for appropriate reference of comments and for future record.	Yes	Page numbers have been inserted to the extent possible and will be revised after cleaning of section breaks and page breaks.		
4	NOTE BY THE SECRETARIAT	Now that the IAEA Fukushima Report has been published, you may want to refer to it along with a link until such time that the standard can be updated.				Yes	Safety requirements have already been revised by the IAEA in the light of Fukushima.
5	1.12	Add footnote to "research centres" to include both government and private research centres.	Different states organize the development and funding of research centers as both government labs and commercial sector labs.	Yes			
6	2.2 / 1	for embarking on <b>the</b>	Editorial. Adds clarity.		Embarking on		

COMMENTS BY REVIEWER				RESOLUTION			
Reviewers: U.S. Nuclear Regulatory Commission Country/Organization: United States of America / NUSSC Date: 9 October, 2015							
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		<b>construction of a NPP</b>			a nuclear power programmer.		
7	2.5 / 7	...funding, sufficient expertise, <b>- and</b> legal responsibility, <b>training and education.</b>	In new nuclear states education and training will be an important part of developing expertise.	Yes			
8	2.16	Educational and research organizations should also be addressed in this section.	These are critical parts of the infrastructure.			Yes	Education and research organizations are covered in other sections particularly Research for Safety and regulatory purposes.
9	Actions 39-47 "Transparency and Openness" 2.91 (p. 61)	We recommend changing the title to "Public and Stakeholders Involvement." We also emphasize that <b>involvement of the public and stakeholders is a continuous process</b> throughout all phases of nuclear power program development.	Although the text under the title "Transparency and Openness" presents public involvements in the decision-making process starting with siting, licensing, environmental monitoring, and ending with selection of options for decommissioning, we recommend that this section's title be changed to reflect important		Transparency and openness is IAEA used terms. 2.91 will be changed as suggested (involvement of the public....)		

COMMENTS BY REVIEWER				RESOLUTION			
Reviewers: U.S. Nuclear Regulatory Commission Country/Organization: United States of America / NUSSC Date: 9 October, 2015							
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			aspects of stakeholders and public involvement. In other words, "Transparency and Openness" may not reflect actual public involvement in the decision-making process.				
10	2.136	Add educational and research organizations to this section	Planning for these organizations should start in phase 1.			Yes	Systematic approach to safety is included. Moreover the topic is addressed throughout the report.
11	2.164 / 3	its senior management and staff	To be more inclusive, the term 'senior' should be deleted.	Yes			
12	2.188 / 5	2.188 For the purpose of providing highly skilled experts for the operating organization, the regulatory body and other organizations with crucial safety related tasks, educational institutions should continue to offer curriculums that are appropriate to meeting the needs of the nuclear power programme, <b>including safety culture</b> .	Training and Education should include "Safety Culture." This is essential knowledge.	Yes			

COMMENTS BY REVIEWER				RESOLUTION			
Reviewers: U.S. Nuclear Regulatory Commission Country/Organization: United States of America / NUSCC				Date: 9 October, 2015			
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
13	Page 98 Paragraph 2.208	“radiological environmental impact analysis” should be revised to radiological environmental impact <b>assessment</b> for consistency with the previous paragraphs.	consistency	Yes			
14	Actions 122 – 132  2.236 (p. 78)	DS486 addressed most important aspects of radioactive waste management and decommissioning. Nevertheless, there are certain specific aspects that need to be discussed, as described below: 1. Waste minimization during operation; 2. Early allocation of financial assurance decommissioning funds. 3. Early decisions regarding decommissioning options based on NPP safety performance and other factors that may influence decisions during operation.	We recommend that aspects of waste minimization during operation as well as early allocation of financial assurance decommissioning funds be addressed in Phase 4 or earlier.			Yes	The scope of this safety guide is limited to the 3 initial phases.
15	Actions 122 – 132  2.236 (p. 78)	DS486 is cited in the text GSR Part 5, “Predisposal Management of Radioactive Waste.” However, throughout	We suggest to reconcile use of the term “Predisposal management” as	Yes			

COMMENTS BY REVIEWER				RESOLUTION			
Reviewers: U.S. Nuclear Regulatory Commission Country/Organization: United States of America / NUSC Date: 9 October, 2015							
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		the text, the term “predisposal management” was never used; rather, the term used was “waste management.” In order to be consistent with GSR Part 5, we suggest using the term “Predisposal Management” wherever applicable.	appropriate in order to be consistent with GSR Part 5.				
16	2.253 / 1	design of nuclear power plants	Editorial. Adds clarity.	Yes			
17	2.264	2.264 One of the Fukushima lessons learned was that there needs to be a sufficient number of emergency responders to respond to simultaneous emergencies on all units. The operating organization...	Please consider adding this to the paragraph.		Deleted: One of the Fukushima lessons learned.		
18	Page 131 Para. 3.23	The reference in the “Radiation Protection” bullet should be revised: <del>2.190–2.204 2.202–2.214</del> for accuracy with the document.	accuracy	Yes			
19	Page 137 Paragraph 3.38	“radiological environmental impact analysis” should be revised to radiological environmental impact <b>assessment</b> for consistency with the referenced paragraphs.	consistency	Yes			
20	Page 137	The referenced paragraphs in	accuracy	Yes			

COMMENTS BY REVIEWER				RESOLUTION			
Reviewers: U.S. Nuclear Regulatory Commission Country/Organization: United States of America / NUSC Date: 9 October, 2015							
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
	Paragraph 3.38	the last line should be revised to <b>2.202-2.214</b> for accuracy with the document.					
21	Page 141 Paragraph 3.53	“radiological environmental impact analysis” should be revised to radiological environmental impact <b>assessment</b> ” for consistency with the referenced paragraphs.	consistency	Yes			
22	141 Paragraph 3.53	The referenced paragraphs in the should be revised to <b>2.202-2.214</b> for accuracy	accuracy	Yes			
23	3.56 / 34	For multiple unit plant sites, the design shall take due account of the potential for specific hazards to give rise to impacts on <del>several</del> <b>all</b> units on the site simultaneously;	Incorrect characterization. Please Revise bullet to state “all units”.	Yes			
24	3.57 / 15	<b>Implementation of</b> countermeasures based on the understanding that records...	Editorial. Adds clarity.	Yes			
25	3.61 / 2	Individuals to be involved in the nuclear power programme should start <b>acquiring</b> knowledge...	Editorial. Adds clarity.	Yes			
26	3.80 / 5	...participation of the <b>future</b> operating personnel of the nuclear power plant.	Incorrect characterization	Yes			

COMMENTS BY REVIEWER				RESOLUTION			
Reviewers: U.S. Nuclear Regulatory Commission Country/Organization: United States of America / NUSSC Date: 9 October, 2015							
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
27	3.106 / 7	The interfaces between safety and nuclear security have to be recognized and safety and nuclear security infrastructures should be developed in a manner that complements and enhances each other <b>both</b> disciplines.	Editorial. Adds clarity.	Yes			