

**Draft Safety Guide DS427 “A general framework for prospective radiological environmental impact assessment and protection of the public”
(Draft Version Status: STEP 8 – Submission to the Member States for comments
6 dated March 2015)**

TABLE OF RESOLUTIONS BY SECRETARIAT (TO THE COMMENTS RECEIVED BY 20 JULY 2015)

Relevance (where provided by MS)	COMMENTS BY MEMBER STATES				RESOLUTION			
	Member State/Organization	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
2	Germany	General	Germany appreciates the IAEA secretariat’s commitment regarding the further development of the Safety Guide DS427 on prospective radiological environmental impact assessment. The current draft version of DS427 has been significantly improved and aligned with the related Safety Guides DS442 and DS432. Guidance on protection of humans and protection of flora and fauna is now presented in a more balanced way. The remaining need for further improvements and corrections in the draft text is addressed in our comments below.	Comment only.	X			
2	Germany	General	It is proposed to submit each new draft version of this Safety Guide in two different formats: one as ‘clean’ version, and another one as ‘track changes’ version.	This approach would considerably facilitate the work of the reviewers when tracking whether the number or sequence of paragraphs has changed, or the text of a certain paragraph was modified. Otherwise, it can be difficult to correlate the IAEA comment resolution table to the revised draft text.	X			
-	Swit-	General	<i>It is assumed, that the entire text of the</i>		X			

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	zerland		<i>draft will be reviewed with regard to the English language. Some issues, which are mostly of editorial matter, are mentioned below.</i>					
	ENISS	General	<p>The current version is a significant improvement of the former drafts and a well-balanced presentation of the protection of humans and animals and plants.</p> <p>The ICRP concept of reference animals and plants and the new system of ICRP 124 was put into context in a well-balanced way on the basic line of argumentation, that if man is protected also environment is protected adequately. We appreciate that. So, it is not to be expected that any non-human biota are endangered from the release of radioactivity if this release is governed by the protection of humans.</p> <p>The graded approach is now better explained, so the “small users” are more guided than before.</p> <p>DS 427 is closely connected with DS 432 and DS 442. All three standards have been presented now and it could be seen that they are aligned, especially DS 427 and DS 442. There are still some points where the same text should be used when the same issues are addressed. For more details see our comments below.</p>		X			
					X			
					X			
					X			

			<p>As mentioned in our former comments, it is not correct to quote chapter 1 of the BSS. Chapter 1 is an introduction only and has no requirement character. To quote chapter 1 of the BSS gives the misleading impression that requirements are quoted. A guide needs to start from the requirement and should give advice how to fulfil this requirement. It must not define new requirements.</p> <p>The proposed detailed changes are the following (marked in red) (Note: refers to ENISS comments).</p>		X	Text was modified. Deleting text from the introduction in BSS in some parts and noting in others that these considerations on protection of the environment in the BSS are not requirements		
-	Sweden	General	<p>In general the collected response to the draft guide is positive. It is noted that substantial improvements have been made on the draft version of the safety guide.</p> <p>Suggestions for further changes are made. Suggestions for change of language and style (in Sections 1-3) are made. The flow of the text is occasionally not good due to many references, parentheses & footnotes. Please consider a reduction.</p> <p>The text of Section 5 is well written, easily understood and informative.</p>		X			
			<p>Consider to further clarify differences between a “stand-alone” REIA and a REIA that is part of a broader EIA-process. What about the connection between a safety report and the REAI (EIA).</p>	<p>However, it also raises questions whether the REIA should be seen as part of the broader EIA process or not. The EIA</p>	X	Some of this issues (e.g. too many references, parenthesis, footnotes which are not essential) were considered and it will be improved more in the final editorial revision.		
						Some text was changed in relation with EIA. Comments to previous versions of the draft indicated the need to keep EIA		

		Figure 1 is a good illustration of that issue with many stages in the lifetime of nuclear installations where a prospective REIA would be a relevant/required input without being part of a broader EIA process.	process includes other formal (or internationally recognized) requirements than “just” assessments, for example specific requirements on public consultation, cumulative impacts, etc.		as vague as possible in this Safety Guide because EIA is defined by the government or other regulators than nuclear and there are different forms for an EIA in different countries.		
		Several facilities planned to be located or being located at the same site or close to one another is not much addressed (e.g. in para 5.36). Consider the issues of potential, cumulative impacts and the difficulties this could present, for instance with several licensees on one site.		X	The comment is noted, but is difficult to address without a specific recommendation from the reviewer. Some text was changed in para. 5.36. The Safety Guide is not intended to give specific guidance on multiple facilities at the same location, because, being a very site specific issue, is difficult to provide general guidance and it is preferred that the regulatory body tackle that issue on a case-by-case basis.		
		The direct exposures are little addressed in this safety guide, some is written in para 5.25. It could merit some more attention and discussion. Radiation doses to the public from waste storages are much often discussed.		X	Direct exposure/irradiation is now more explicitly and clearly addressed. Paragraphs were added.		
		A suggestion is to remove the second part of title: <i>...and protection of the public</i> in order to make it shorter.	The pertinent requirement 3.9(e) of GSR3 reads: <i>Shall, as re-</i>	X	The title was proposed by WASSC and endorsed by		

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				<p><i>quired by the regulatory body, have an appropriate prospective assessment made for radiological environmental impacts, commensurate with the radiation risks associated with the facility or activity. Hence the formulation of GSR Part 3 is meant to fully cover the needs of the protection of the public. No need to add <i>and the protection of the public</i> since this is probably anyhow the primary objective (see also 1.21 of the draft).</i></p>		<p>NUSSC and RASSC. It is still under discussion, and a shortening is proposed. The title will be discussed during final review and this comment will be noted. This issue will be discussed in next WASSC/RASSC/NUSSC sessions.</p>		
-	Australia	General	<p>Overall, we believe DS427 is a very useful document with information on dose assessment methodology and application to Planned, Existing and Emergency (or potential exposure) situations. It gives good guidance for performing assessments to the public and environment, particularly with regard to ICRP methodologies.</p> <p>In particular, DS427 gives regulatory bodies of MS sufficient freedom with how they apply the environmental protection framework.</p> <p>Consideration of specific effects on Flora and Fauna are listed as 'optional' or 'rare' in some places, including Paragraphs 1.21, 2.8, 2.13, I-</p>		X			
					X			
					X	The comment is noted and some text was modified. The fact		

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			<p>2 and I-3. Conversely, Paragraph 2.14 states that assessments should be commensurate with potential risk, which is followed up in Paragraphs 5.73 to 5.76 for Environmental Assessment. This is consistent with a graded approach and should be encouraged.</p> <p>Information provided in Annex I is consistent with the methodologies applied in the Australian Safety Guide for Radiation Protection of the Environment.</p> <p>We particularly appreciated the section on comparison of dose with reference levels for protection of the environment - Section I-32. This applies a reasonable approach to dealing with the use of DCRLs in demonstrating protection, and how refinements can be made while considering that these are not dose limits.</p>		X	<p>that explicit assessment of the level of protection of flora and fauna is not a requirement in the BSS was noted by WASSC/NUSSC/RA SSC. The advice to the Secretariat was to include in the main text in the Safety Guide only what is a requirement in the BSS (e.g. protect people and the environment by assessing radiological impact to humans) and bring to an Annex some example guidance on assessment of radiological impact to flora and fauna, as a complement, for those countries which so decide.</p>		
	Australia	Specific, throughout	<p>The em-dash is used through the document to emphasise certain points. The spacing around this should be consistent in the document. There are several instances where a space is applied, and oth-</p>		X			

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			ers where space is not applied (e.g. see Sections 4.6 & 4.7). We suggest that spaces are applied either side of the em-dash, as for the first two dashes in Section 5.11.					
3	Germany	1.1	1 st and 3 rd sentence: “In 2011, the IAEA published the interim version of the Safety Requirements: Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards, General Safety Requirements Part 3 (GSR Part 3) [H]. ... GRS <u>GSR</u> Part 3 was reissued in 2014 [1] with the cosponsoring of ...”	1 st sentence: Ref. [1] refers to the final version of GSR Part 3 issued in 2014, not to the 2011 interim version. 3 rd sentence: Typo.	X			
	Japan	1.1/5 (p.5)	GRS <u>GSR</u> Part 3 was reissued	Typo.	X			
	Australia	Paragraph 1.1, line 5	"GRS" should read " <u>GSR</u> ".		X			
-	Sweden	Page 5, para 1.2	Consider changing the order of the elements to read: ...principles of justification, optimization, and dose limitation...	The three RP principles of are listed in this order: 1 Justification 2 Optimisation of protection 3 Application of dose limits	X			
	Japan	1.2/2-3 (p.5)	the principles of justification, <u>optimization and dose limitation and optimization</u> ,	Sequence of the principles described here should be aligned with ICRP Publication 103.	X			
	Australia	Paragraph 1.3	Propose new paragraph following 1.3: <u>“The aim of a prospective radiological impact assessment is to determine whether</u>	There is no clear statement of the purpose of carrying out a	X	New Paragraph was added, using the proposed text.		

			there is a reasonable likelihood that the planned/proposed operation(s) will comply with current legislative and regulatory requirements under all reasonably foreseeable circumstances. The assessment should be as simple as possible, but as complex as necessary to achieve this aim.”	prospective assessment.				
-	Sweden	Page 5, para 1.3, 1 st sentence	Suggest removal of footnote 1	The definition is so general so a specification is not necessary. As stated in the footnote, the present set of facilities and activities is anyhow given in the Scope (1.11)	X	¹ Facilities and activities are defined in the IAEA Fundamental Safety Principles and the Safety Glossary [2, 4]. It is a general term encompassing all nuclear facilities and uses of all sources of ionizing radiation. The present guidance is pertinent to certain facilities and activities which are described under Scope.		We deleted the general definition in the footnote but we still think the term ‘facilities and activities’ are new for some of the target audience. We prefer to keep reference to Safety Fundamentals and Safety Glossary and the idea that DS427 applies only to some facilities and activities.
		Page 5, para 1.3, 2 nd sentence	Remove second footnote and simplify the text to read: <i>This assessment includes the consideration of expected exposures during normal operation and conceivable potential exposures.</i>	Avoid excessive use of parentheses and footnotes when not needed. The second footnote, if needed: “...conceivable means that the incidents to be considered are the result of a safety analysis, which includes characteristic of the incident and the proba-	X X	Text in the para. was amended. The footnote was deleted. Some parenthesis and footnotes were deleted but improvement on this issue will be done during the final editorial revision.		

				<i>bility.</i> ”, is better explained in the text.				
2	Germany	1.4	“The present Safety Guide interprets and elaborates on the requirements in GSR Part 3 for performing such assessments for certain facilities and activities and, in particular, on Requirement 7 for notification and authorization, which states in the subordinated Para 3.9 (e) that “Any person or organization applying for authorization: [...] shall, as required by the regulatory body, have an appropriate prospective assessment made for radiological environmental impacts, commensurate with the radiation risks associated with the facility or activity” [1].”	Clarification. The citation is taken from Para 3.9 (e), not from Requirement 7 as such.	X	Text modified		
-	ENISS	1.4	The present Safety Guide interprets and elaborates on the requirements in GSR Part 3 for performing such assessments for certain facilities and activities and, in particular, on Requirement 7 for notification and authorization, which states that “Any person or organization applying for authorization: [...] shall, as if required by the regulatory body, have an appropriate prospective assessment made for radiological environmental impacts, commensurate with the radiation risks associated with the facility or activity” [1].	As stated in the (new) §1.11, this Safety Guide only covers the facilities for which a radiological environmental impact assessment is mandatory. Thus, using the conditional ‘if’ seems more suitable.	X	Text modified		
	Japan	1.4/2-3 (p.5)	in particular, paragraph 3.9 (e) under on Requirement 7 for notification and authorization,	Clarifying the description.	X			
-	Switzerland	1.5 / 10	...presented in this Safety Guide may be used for informed judgments on the acceptability of the risk...	Editorial: meaning of current text is not clear	X			
-	Sweden	Page 5,	Consider changing last part of sentence as	Editorial	X			

		para 1.5, 2 nd sentence	to read: ...referred to as 'environmental impact assessment', (known by its acronym EIA and defined later). EIA covers not only...					
2	Germany	1.6	"This Safety Guide is related to other IAEA Safety Standards Series: These are the Safety Requirements for safety assessment of activities and facilities [5] and the Safety Guides for radiation protection of the public and protection of the environment against radiation exposure [6], on criteria for use in on-emergency preparedness and response for a nuclear or radiological emergency [7], and on regulatory control of radioactive releases discharges to the environment [8]."	To address the related Safety Guides with their corresponding titles.	X			
	Australia	Paragraph 1.7	"... with less level of details" is awkward. Recommend "... in detail ".		X			
-	Sweden	Page 6, para 1.8	Suggest change to: <i>IAEA has issued Safety Reports on methods and models that can be used to assess the impact of releases to the environment [11, 12] and Technical Report(s) relevant to environmental transfer parameters [13-15].</i>	These reports are of another nature than the IAEA Safety Standards.	X	Text was modified and para. was converted to footnote.		
	Sweden	Page 6, para 1.9, 1 st sentence	Change to: <i>This Safety Guide provides recommendations and guidance on a general framework for performing prospective radiological impact assessments for facilities and activities as identified under Scope, to estimate and control, using criteria, the radiological effects on the public and the environment.</i>	Unnecessary	X			
-	Switzerland	1.9 / 3	...to estimate and control, using criteria, the radiological effects...	Editorial: deleted text doesn't contribute to	X			

				clarity				
-	Sweden	Page 6, para 1.9, 2 nd and 3 rd sentence	Suggests: <i>This radiological assessment is intended for planned exposure situations as part of the (regulatory) authorization process and, when applicable, the governmental decision-making process for facilities and activities.</i> <i>The situations covered include both expected exposures and potential exposures (this is explained in more details in as explained in Section 2).</i>	The definition of authorization in GSR Part 3 (BSS) makes it clear that authorization is always by a regulatory body or other governmental body.	X			
-	Japan	General (e. g. 1.3/1, 1.9/5, and many.)	(regulatory) authorization process	As “authorization” has several aspects, it is important for users of this guide to understand what kind of “authorization” is written in a given section so the object of “authorization” should be clarified.	X	The comment is noted. The text “(regulatory)” was deleted (see previous comment). Authorization is discussed in more detail in Section 2		
-	Sweden	Page 6, para 1.10, footnote	Suggest shortening the footnote to read: <i>GSR Part 3 [1] defines an interested party to mean, in a broad sense, a person or group having an interest in the performance of an organization, business, system etc. It could also include other States, e.g. neighbouring States concerned with possible transboundary impacts.</i>	Editorial	X	Text modified		
	Sweden	Page 7, para 1.11	Suggest removing the parenthesis and instead write: <i>...a radiological impact assessment is</i>	Editorial	X			

			<i>mandatory. Guidance on how to determine the need and complexity of a radiological environmental impact assessment is given in Section 4 (for guidance on how to determine the need and complexity of a radiological environmental impact assessment see Section 4).</i>					
-	USA	1.11/line 1	... according to their characteristic ...	Grammatical	X			
-	Australia	Paragraph 1.11	Replace "accordingly" with "according".		X			
-	Sweden	Page 7, para 1.12	Consider changing the order so the latter part of the sentence reads: <i>...from facilities which are projected for a specific or generic site or located at a site ...</i>	In order to underline that the guide is applicable to new facilities before mentioning that it also can be used for existing facilities.	X			
		Page 7, para 1.12	Footnote 4 seems to be placed in the wrong place and is far too long. Either remove it completely or, alternatively, make a paragraph in the text – should it be in Section 4?	Paragraph 1.11 tells that 1) the Safety Guide is primarily for those facilities for which a REIA is required. 2) Further guidance is given in Section 4 on need and complexity of REIA. Footnote 4 of para 1.12 seems more coupled to para 1.11 or perhaps in Section 4 if it is seen as guidance on how to	X	Some modifications and deletions were done. Issues with footnotes will be revised during final editorial revision.		

				determine the need and complexity of a REIA? Perhaps it is not needed at all?				
	Japan	Foot-note4/7 (p.7)	predisposal <u>waste management processing of radioactive waste</u> facilities	Amendment to make the wording consistent with DS447 and DS447.	X			
	China	Page 7 Para 1.12 Line 4-5	Revising to be "and from which public may be exposed and the environment may be contaminated by radioactive materials".	Common usage.	X	Text modified		
3	Germany	1.13	"... and also those which can be conceived, by means of a safety analysis, ..."	Editorial.	X			
	Sweden	Page 7, para 1.13	Suggest re-writing and shortening: <i>The radiation exposures considered include those which are expected to occur as a result of normal operation, i.e. due to authorized discharges and direct external radiation, and also potential exposures identified after performing a safety analysis of events and accidents as defined in GSR Part 3 [1].</i>	Editorial and In GSR Part 3, page 381, it is stated: The following definitions apply for the purposes of these Standards. (Further definitions are provided in the IAEA Safety Glossary etc...)	X			
-	Sweden	Page 7, para 1.14	Suggests to delete the second sentence of 1.14 <u>or</u> to make it shorter: <i>These types of facilities and activities have very specific aspects which are not considered in the present guidance.</i> (Should first sentence of 1.14 use recommend or only guide?)	Editorial	X			

	Japan	Page 7 Para 1.14. Line	Insert the sentence below to the appropriate place of 1.14. “This Safety Guide covers the facilities and activities related to the pre-disposal of radioactive waste during the operational period.”	Adding explanation to clarify the scope of this Safety Guide. The lifetime of the disposal is classified into three periods: the pre-operational period, the operational period and the post-closure period. Our understanding is that, disposal during the post-closure period is only beyond the scope of this Safety Guide.	X			
	Sweden	Page 8, para 1.16- 1.17	Delete paragraph 1.17.	The statement of 1.17 is unclear and not related to this safety guide. This guide shall not decide on what assessments are required, precluded or done? That is an issue for Safety Requirements to recommend and Member States to decide on.			X	The paragraph is considered necessary. The comment is noted, but is difficult to address without a specific recommendation from the reviewer.
-	USA	1.18/line 3	... exposures to the public, ...	Grammatical	X			

-	Turkey	1.18	<p>Though it is stated in this para. that this safety guide doesn't cover the methodology for selection and analysis of accidents, only for EIA Report this safety guide is proposed to give methods for selecting the accidents and to give information at which detail these accidents are presented (DBA and severe accidents).</p> <p>For impacts of severe accidents, generic activity released to the environment, any INES-6 scale accident for radiological impact assessment in EIA may be proposed in this guide.</p> <p>The impacts of which design basis accident or accidents, and at which detail should be given in EIAR should also be clarified. For impacts of DBA, should many DBAs be presented briefly, or only INES-4 scale accident be sufficient to be analyzed in terms of radiological impacts?</p> <p>Whether the impacts of anticipated operational occurrences are included in EIAR and at which details they should be presented in EIAR should also be clarified.</p>	How the accidents are chosen for EIAR purpose is missing in any of IAEA documents. The referred IAEA document [5] which is GSR Part 4 discusses them only for licensing purpose. According to the EIA content described in IAEA No. NG-T-3.11 "Managing Environmental Impact Assessment for Construction and Operation in New Nuclear Power Programmes" impacts of design basis accidents, severe accidents, and beyond design basis accidents should be included in EIAR. But again there is no any methodology or prescription given. For impacts of accidents, generic source term or release (i.e. 100 TBq Cs-137 for severe accidents), are better to be used for the impact analysis. Since in most of the countries EIA Report is prepared at very early stage, even before technology of the reactor is chosen.			X	This Safety Guide has no the intention to discuss in detail the types of accidents (this was advised by NUSSC, WASSC because the assessment of the types of accidents is done in the framework of safety assessment, considered in other relevant IAEA Safety Guides. The presented in DS427 guidance just mention that accidents that should be considered should result from a safety assessment. This Safety Guide focuses on what should be done in a radiological environmental impact assessment once the accidents and their characteristics are provided.
	Australia	Paragraph 1.19	"... to verify that the models and assumptions used in the prospective assessments are correct appropriate."	Prefer not to suggest that models and assumptions are "correct" - "appropriate" may be better, simply because models and			X	

				assumptions in the context of this document are almost always approximations to the real situation.				
-	Switzerland	1.19 / 7	...that monitoring programmes ... exist (or will exist) and provided d —(or will provide)...	Editorial to increase clarity of text	X			
-	Switzerland	1.19 / 10	...described in this Safety Guide should also be used to inform <u>underpin</u> the definition or upgrade...		X			
	Finland	1.20	The Safety Guide does not cover occupational exposures (e.g. of workers) or medical exposures (ergr of patients). These categories...	Definition for medical exposure includes also other groups than patients. Clarifications are not needed here.	X			
	USA	1.21/line 2	... risk of radiological impacts to the health of individual members of the public...	Grammatical	X			
	Australia	Paragraph 1.21	Replace "... health of individuals in the members of the public" with "... health of individual members of the public ".		X			
	USA	1.21/line 4	... can be assumed, in most instances, sufficient to provide adequate protection of the ecosystems in the environment.	Grammatical	X			
	Sweden	Page 9, para 1.21	The second sentence (although in a strict sense true) has somehow the wrong focus and should be left out. In any case, the assessment does not protect anything by itself; it is the protective	It could also be written more positively: <i>In most instances it can be assumed that the ecosystems are protected if</i>	X	Text modified		

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			measures which are of importance.	<i>the members of the public are protected [1], however a REIA as part of an EIA is an opportunity to decide whether the siting of a facility or activity is less suitable.</i>				
-	Switzerland	1.21 / 4 – 8	...can be assumed, in most cases , sufficient to provide for an adequate protection of the ecosystems in the environment. For situations where the national or international regulatory frameworks deem necessary ... in an Annex I.	Editorial	X			
	Japan	1.21/7 (p.9)	...on the exposed flora and fauna, an example of methodology guidance is presented in an Annex I.	See comment No.19. (Note: comment No 19 refers to comment on paragraph 5.76 by Japan)	X			
-	Switzerland	1.22 / 4	... can serve s...	Editorial	X			
-	Australia	Paragraph 1.22	Replace "serves to" with " serve for ".		X			
-	Sweden	Page 9, para 1.22	There is something wrong with the last sentence...: <i>as described in this Safety Guide can serve as an input serves to that process.</i>	Editorial	X			
	USA	1.22 line 4	Editorial. "serve" rather than "serves"	Clarity	X			
-	USA	1.22/line 3	...; however, radiological environmental assessments as described in this Safety Guide may contribute to that process.	Syntax	X			

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-	Switzerland	1.23 / 4	... the scope <u>of</u> the present Safety Guide ...	Editorial	X			
		1.23 / 6	... is discussed in <u>another</u> ...		X			
	Sweden	Page 9, para 1.23	Change the full paragraph: 1) It should first be stated that optimization of the protection of the public is required. 2) Then it could be mentioned that overall optimization of the protection must address all exposed, both workers and the public, and must take account of economic and social factors. 3) Finally explain that the optimization process is guided in other documents but that the REIA gives a necessary input to the optimization process as for example to the establishment of discharge limits.	The logic is not clear. It was understood by some readers that optimization would not apply – it should be made clearer. The parenthesis and the footnote 9 can be taken out since it is anyhow not addressed in this guide. It is enough to say that optimisation of safety and protection of the public, as defined in GSR Part 3, is required.	X	Text modified		
-	Switzerland	1.24 / 4	... impacts on <u>features peculiar properties</u> of the environment such as ...	Editorial	X			
	Sweden	Page 9, para 1.24	Delete the last two sentences: <i>States are subject to the nationally and internationally relevant treaties...etc.</i>	These two sentences have nothing to do with how to perform a REIA or the scope of the present document.	X			
-	Switzerland	1.25 / 2	Section 3 describes the safety requirements <u>for governments, national regulatory bodies and licensees</u> related to the prospective radiological environmental assessment of the public and protection of the environment <u>based on stemming from</u> other IAEA standards.	Editorial to increase clarity	X	Text modified		

		1.25 / 8	Appendix I presents risk criteria discussed by relevant international organizations ...		X			
		1.25 / 12	... considerations <u>on risk</u> for the assessment ...	Editorial to be consistent with the title of Annex II	X			
	Sweden	Page 10, para 2.1, second sentence	Change the sentence to read... <i>Unless otherwise mentioned, concepts or terms are defined in the GSR Part 3 [1] or, if missing, as in the IAEA Safety Glossary [4].</i>	It has been agreed by the co-sponsoring partners and the IAEA member states that the GSR Part 3 definitions have precedence over any other glossary and that the meaning of requirements shall not be changed retrospectively. (See 13 above) (Note: 13 refers to comment from Sweden on Paragraph 1.13).	X			
	Switzerland	2.1 / 3	While approaches may be in principle consistent with these concepts and terminology, the use of the terms defined in this section could differ from those used in States.	This seems to be trivial and could be deleted without any loss of information	X			
2	Germany	2.2	Last sentence: “Both exposures <u>expected to occur</u> and potential exposures can and should be taken into account at the planning or design stage [6].”	Clarification that <i>expected exposures</i> and <i>potential exposures</i> are to be considered in the design of the facility, in order to be consistent with the title of the associated subsection	X			

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				“PLANNED EXPOSURE SITUATIONS: EXPECTED EXPOSURES AND POTENTIAL EXPOSURES”. With our proposed amendment, the statement corresponds to the last sentence in Para 2.4 of DS432 (latest draft version dated March 2015).				
-	Canada	2.2/7	“Both expected exposures and potential exposures can and should be taken into account at the planning or design stage [6].”	“Expected” is missing from sentence.	X			
	USA	2.3/line 1	In the context of this Safety Guide the term ‘governmental decision-making process’ refers to the procedures carried out at all planning, pre-operational, operational, and decommissioning stages by the government or governmental agencies, including the relevant regulatory body, to decide whether a project for a facility or an activity may be undertaken, continued, changed or stopped. It could also apply to areas of national policy such as whether to embark on a nuclear power program [23].	The governmental decision-making process is not limited solely to the planning phase, and should include all planning, pre-operational, operational, and decommissioning phases.	X			
	Sweden	Page 11	Take out the parenthesis of the Title and write: AUTHORIZATION PROCESS	Editorial	X			
	Japan	p.11/4	(REGULATORY) AUTHORIZATION PROCESS (OR LICENSING PROCESS)	See Comment No.1.	X	The text “REGULATORY” was deleted because is implicit in the definition of Authorization. The last parenthesis will be revised noting this comment, during the final editorial review		
	Sweden	Page 11, Para 2.5	The statement is not fully correct.	The definition of GSR Part 3 does not refer	X			

				to...,at different stages of the lifetime of the facility or the development of a facility it simply states: “The granting by a <i>regulatory body</i> or other governmental body of written permission for a person or organization to conduct specified activities”				
	Sweden	Page 11	Remove the footnotes 11 and 12. The information in footnote 12 could possibly go to paragraph 1.8 where safety reports and technical documents are mentioned.	Footnote 11 does not bring any further clarity to this document. Footnote 12 is improper in this place since it refers to IAEA Nuclear Energy Series and is not reviewed by the CSS or its subcommittees.			X	Footnote 11: We think that we need to explain what we meant by “governmental decision making process” (as different to authorization process). Examples come from some MS. X It is truth that the reference in footnote 12 is not a Standard, but some Member States asked to include it. The informative reference material which is not a Standard is only included as footnotes (para. 1.8 was converted to a footnote now too).
	Switzerland	2.7 / 5	... of <u>a</u> particular proposed activity or facility ...	Editorial	X			

	Australia	Paragraph 2.7	Insert an "a" into final sentence, to read "... risk of effects of a particular proposed activity...".		X			
	Sweden	Page 11, para 2.8	Delete or rephrase to: <i>Non-radiological impacts are included in an EIA subject to nationally and internationally applicable regulations..</i>	Last sentence of para 2.8 is repeating what have been said in para 1.24. Redundant	X			
	Switzerland	2.9 / 1	... the involvement of the organizer <u>applicant</u> of the proposed activity or facility ...	Editorial	X			
2	Germany	2.9	“In general, an EIA requires the involvement of the organizer of the proposed activity or facility, relevant governmental agencies, the regulatory body and a number of interested parties, <u>including the public</u> [24, 27– 32 31].”	To emphasize the importance of the involvement of the public in the EIA process. The phrase was contained in the equivalent Para 2.8 of the previous draft version 5 dated September 2014. It is not clear why it has been removed. Nuclear Energy Series publication NG-T-3.11 [32] provides useful information on EIA in the framework of development of a new nuclear power programme. For the sake of completeness, please add a reference to this publication.	X	It was noted from a comment from NUSSC that in some countries the involvement of the public is only done at some stages of the EIA processes. This is the reason to remove “public”. But it is truth that some EIA legislation include explicit ‘public’ consultation. Now the text was modified as follows: “ <i>including, in some States, the public</i> ”.		
	USA	2.9/line 1	2.9. In general, an EIA requires the involvement of the organizer of the proposed activity or facility, relevant governmental agencies, the regulatory body and a number of interested parties to consider radiological effects on human health and, in some cases,	The statement is too broad and does not adequately describe the level of involvement between the organizer of the proposed activity, the			X	The comment is noted and valid. However, we were required to keep EIA as general as possible. This is because EIA is regulated not only

			radiological effects on flora and fauna related to radioactive releases from activities and facilities to the environment. [24, 27–31].	governmental agencies, the regulatory body, and interested parties in considering the radiological effects on human health and the environment.				by the nuclear regulator but also (and mainly) by other governmental agencies legislations and different MS could have different approaches to EIA.
	Sweden	Page 12, para 2.12, last line	Change to reflect the wording in GSR Part 3: <i>...recreational activities; media, such as soil, water and air; and natural process, such as carbon, nitrogen and water cycles.</i>	Why change the original formulation – it does not strengthen credibility?	X			
	ENISS	2.12	GSR Part 3 [1] specifies that the protection of the environment means protection and conservation of non-human species, both animal and plant, and their biodiversity; environmental goods and services such as the production of food and feed; resources used in agriculture, forestry, fisheries and tourism; amenities used in spiritual, cultural and recreational activities; media such as soil, sediments, water and air; and natural processes.	To be deleted as the quotation gives the false impression that this text is a requirement. The quoted part is from BSS chapter 1 which has an introductory character only. See also comment above (Note: “above” refers to comment from ENISS to Para. 1.4).	X	Text modified to denote is a definition in the BSS (and not a requirement)		
	Sweden	Page 12, para 2.13	Suggests change in first line: <i>....described in the introduction of GSR Part 3, paras 1.32-1.35 [1] defines a framework...</i>	Perhaps a direct reference paras 1.32-1.35 of the introduction of the GSR Part 3 is warranted?	X			
	Switzerland	2.13 / 6 2.14 / 1	GSR Part 3 [1] introduction also mentions ... <i>or alternatively</i> <u>The introduction of</u> GSR Part 3 [1] also mentions ...	Editorial, same point in 2.14, Line 1	X	Text modified		
	ENISS	2.13	However, the introduction in GSR Part 3	See above (Note:			X	Now we are

			[1] acknowledges that some national regulations may require the explicit demonstration (rather than the assumption) of the protection of the environment. GSR Part 3 [1] introduction also mentions that the assessment of impacts on the environment needs to be viewed in an integrated manner with other features of the system of protection and safety and that the approach to the protection of people and protection of the environment is not limited to the prevention of radiological effects on humans and on other species [1].	“above” refers to comment from ENISS to Para. 1.4).				clearer in the text that this is only an ‘introduction’ in BSS, and not a requirement.
	ENISS	2.14	Finally, GSR Part 3 introduction states that, the protection of the environment is an issue necessitating assessment, allowing for flexibility in incorporating into decision making processes the results of environmental assessments that are commensurate with the radiation risks [1].	See above (Note: “above” refers to comment from ENISS to Para. 1.4).			X	See previous
	Sweden	Page 12, para 2.15	<i>Change to...With “radiological impact” is taken to mean the estimated detrimental health effects of exposure to radiation, including the likelihood of such effects occurring, and any other safety related risks, including those to the environment, that might arise by releases or by direct exposure from a facility or an activity.</i>	This safety guide cannot have its own definition of “radiological impact”. The suggested formulation is more or less taken from the definition of ‘radiation risks’ in GSR Part 3.			X	
	ENISS	2.15	The requirement to assess radiological environmental impacts is identified in GSR Part 3 [1], “ xxxxx ”	A complete quotation should be used here as it was done in the majority of paras in the guide. Otherwise there is the risk of misunder-			X	

				standings and wrong interpretations.				
	Australia	Paragraph 2.15	Propose footnote to clarify that the definition of "nuclear facilities" includes "facilities for the mining or processing of uranium ores or thorium ores and radioactive waste disposal facilities."	Need to emphasise that mining and processing activities, for example, can lead to exposures that can potentially exceed recommended dose limits.			X	This is explained in Scope in Section 1
	Turkey	2.15./ sixth line	"Within this Safety Guide, 'radiological impact' is taken to mean the estimated planned and potential exposures and risk of effects of radiation dose that may be caused by releases from a proposed facility or activity on human health and, if deemed necessary, other elements in the environment, for example flora and fauna."	The aim of radiological impact assessment is estimate doses and risks, for both normal operating conditions and accidental situations.		Text modified	X	
	Switzerland	2.15 / 7	... that may be caused by releases and direct radiation from a proposed facility or activity ...	Beside of the releases, also direct radiation plays a role for the exposure, cp. 1.12			X	
	China	Page 13 Para 3 Line 1-2	Revising to be "THE PUBLIC SAFETY REQUIREMENTS RELEVANT TO PROSPECTIVE ENVIRONMENTAL ASSESSMENT" .	Add "the public" in the title is more clear as defined about this safety standard for the public, not occupational exposure.			X	
3	Germany	3.1	Last sentence: "The requirements are addressed in in Sections 4 and 5 of this Safety Guide."	Editorial (redundant word).			X	
-	Switzerland	3.1 / 4	... addressed in in Section 4 ...	Editorial			X	
	Australia	Paragraph 3.1	Remove one instance of "in" from "...are addressed in in Section 4...".				X	

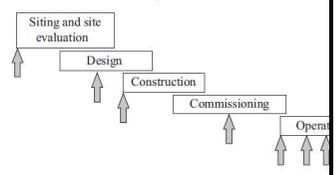
	ENISS	3.2	The GSR Part 3 [1] states that there is a need to control and minimize the radiological impact to members of the public and the environment: “ <u>xxxx</u> ”	See above (Note: “above” refers to comment from ENISS to Para. 2.15).	X			
-	Sweden	Page 13, para 3.2	Change to “ <i>...that there is a need to control the radiological impact and optimise the protection of the public and, as appropriate, the protection of the environment</i> ”	The GSR Part 3 does not talk of minimizing <u>unless it refers to deterministic effects</u> (but in medical exposure and at accidents this might not be possible, hence the use of minimize in this context).	X	Text modified		
-	Sweden	Page 13, para 3.4	It is 3.9 (e) of GSR Part 3 and not 3.8 (a) which is referred to. Consistency.	Editorial	X			
	Japan	3.4/1 (p.13)	Requirement 7 of GSR Part 3 [1] (paragraph 3.89)	Typo.	X			
	Sweden	Page 14, para 3.5	Consider changing (a) and (b) to (d) and (e)	Editorial - the quotes are from GSR Part 3, paragraph 3.15 (d) & (e).				
	USA	3.5/line 1	(a) ... shall, for the sources for which they are authorized and for which the regulatory body requires a prospective assessment to be made for radiological environmental impacts, conduct such an assessment and keep it up to date. (b) ... shall assess the likelihood and magnitude of potential exposures, their likely consequences and the number of persons who may be affected by them.”	Grammar	X			
	Japan	3.6/ 3 (p.14)	<u>Paragraph 5.34 and 5.35 of</u> Section 5 addresses this requirement.	Clarifying the description.	X			

	Sweden	Page 14, para 3.7	To make the quote complete change it to read... <i>approve constraints on dose and constraints on risk to be used.....including authorized limits for discharges</i> . Consider changing (a) to (e) as to reflect on 3.123 (e).	Editorial Consistency	X			
	Japan	3.7/7 (p.14)	<u>(e) Shall take into account the results of the prospective assessment for radiological environmental impacts that is undertaken in accordance with requirements of the regulatory body</u> ”.	Citing the description precisely from 3.123 (e) in GSR Part 3.	X			
	Sweden	Page 14	Remove the footnote – this is not the place to discuss this and it is anyhow already stated under Scope.	It is already stated in the paragraph 1.23	X			
-	France	3.9 a)	Shall determine the “ <i>characteristics</i> ” (...) and...	The word “ <i>characteristics</i> ” need to be precise to underline what is expected.			X	This is BSS quoting
	France	3.9 b)	Shall determine by an appropriate pre operational study all significant exposure pathways by which discharged radionuclides	These pathways are determined through studies. No need to do “pre operational studies”			X	This is BSS quoting
	Switzerland	3.9 / 4	... as appropriate adequate:	Editorial to avoid duplication in lit. b			X	This is BSS quoting
		3.9, lit. d	... in an integrated manner based on with features of the system of protection and safety	Editorial			X	This is BSS quoting
	USA	3.9 Foot-note 14	Editorial. Second sentence needs to be edited. Not a sentence.	Clarity	X	To be considered at the final editorial review.		
	Sweden	Page 15, para 3.11	This is already quoted in 3.5 so it is redundant and can be deleted.	Duplication			X	This para. 3.11 refers to the requirement of an assessment of potential expo-

								sures and 3.10 refers to the requirement to ensure that protection and safety is optimized, including the consideration of the potential exposures. 3.5 is kept and moved up.
2	Germany	3.13	“... The assessment and control of potential exposure is addressed in Section 5 and discussed in Appendix H I of this Safety Guide.”	Appendix II does not exist. The text should refer to Appendix I.	X			
	Sweden	Page 15, para 3.13	Indicate that it is 3.31 (a) and 3.31 (b) that are referred to.	Consistency	X			
	Sweden	Page 16, para 3.18	Please add... <i>“When a source within a practice could cause public exposure outside the territory or the area under the jurisdiction or control of the State in which the source is located, the government or regulatory body shall...”</i> Furthermore the second bullet is 3.124 (c) and not (b).	Completeness	X			
-	Sweden	Page 17, para 4.1	Include <i>...in a form and at a scale that impact...</i>	Editorial	X			
-	Australia	Paragraph 4.1	Insert comma in “... where radiation sources are used, processed and stored...”		X			
-	Japan	4.1/4 (p.17/1)	<u>medical application</u> medicine departments	Wording.	X	Text modified		
-	Japan	4.1/6 (p.17/3)	are used, processed or stored in a form and scale that impact to <u>the</u> public and the envi-	Editorial.	X			

			ronment is					
	Austral- ia	Para- graph 4.2	Insert text: “Activities and facilities which are unconditionally exempted ¹⁶ from regulatory control should not require a radiological environmental impact assessment for authorization, even if a generic assessment of the impact to public and environment may have been performed to support the conclusion on exemption. Where exemption is subject to conditions (for example on land use following the closure of a facility), future radiological impact assessment may be necessary. ”		X	Text modified		
	Japan	Footnote 16/2 (p.17)	is established in <u>Schedule I of</u> GSR Part 3 [1].	Clarifying the description.	X			
	Austral- ia	Para- graph 4.3		Good. Clear.	X			
3	Germa- ny	4.4	1 st sentence: “Factors which are important to define the need and complexity of the environmental radiological environmental impact assessment within a (regulatory) authorization process are: the source term, the level of expected doses, the safety characteristics of the activity or facility, the characteristics of the location, the national licen seing regulations for each type of facility and activity and the stage in the authorization process (see Table 1). ”	1. Wording. 2. This sentence provides a direct link to Table 1. Therefore, this table should be referred to here.	X			
	Austral- ia	Para- graph 4.3	The section and table seem to be missing	There are other factors	X	Additional text added		

	ia	graph 4.4 & Table 1	“Mechanisms of transport, e.g. wind, river/ocean.” This (or similar) could be added under “Local Characteristics”.	that should also be considered, such as demographics.				
	Australia	Figure 1	Modify FIG 1, to include “Conceptual design” as the first step, prior to “Siting and site evaluation”. The third step could then become “Developed design”. Or “Mature design”.	The logic is not correct. The proponent should have a clear design in mind before the site evaluation process begins. There is no point in selecting sites otherwise. After site selection, the design can then be modified if required.			X	This comment has been reviewed, and it is considered that the existing Figure is appropriate. The figure is illustrative and not intended to define a procedure. Each MS can use something similar but different, as far the elements are considered.
	Turkey	4.5	To be guiding, there may be some concrete criteria, such as type of facilities or activities, i.e. NPPs and reprocessing plants, research reactors with some power levels, or public doses incurred from normal operation of these facilities or activities, etc., for determining radiological environmental impact assessment to be complex or simple.	How radiological environmental impact assessment is determined as complex or simple is unclear in the draft document. There are some factors considered by applicant to decide whether the impact assessment should be complex or simple, and given in Table 1. However how are these factor used for determination?			X	The safety guide cover a wide range of facilities and activities and the idea is to mention the important factors but not to apply them case by case. Developing a TECDOC for different installations) is planned.
	China	Page 16 Para 4.5 Table 1	Presence of receptor: people (<i>the habits and career</i>), flora and fauna	People's habits and career are very important location characteristics affecting the level of complexity.	X	Text on habits was added. “Career” is not clear for the reviewer.		

	Sweden	Page 18, Table 1	It is suggested to add other examples than agriculture for land use or to write: <i>Land use and other activities</i>	Industrial activities such as food processing may not fit under the other selection of elements.	X			
	Finland	4.6-4.12		It is good that the rather complicated authorization process for nuclear installations has been taken as an example. It would be nice to have also an example of another, more simple case.	X	A new paragraph for simple installations was added		
	Sweden	Page 18, para 4.6	Suggest adding the word formal: ... <i>There are likely to be a number of formal stages in the (regulatory) authorization process [35].</i>	An authorization process is regulatory by default – remove this in the full document – it repeated several times in the text and is unnecessary.	X	“(regulatory)” was deleted. “formal” is not considered necessary.		
	Japan	4.7/1 (p.19)	Figure 1 (adapted and modified from [35]) presents...	Adding word for the precise description. (The actual structure of Figure 1 from SSG-12 is as below.) 	X			
	Australia	Paragraph	Suggested re-wording: “A screening assessment by use of regional or generic		X	Text modified considerin the proposal		

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		4.8	data should be conducted during the stage of siting and site evaluation to identify potential regions or sites for the facility (based on the conceptual design) or activity. Screening criteria should include site and regional characteristics that could obviously compromise safety, current and anticipated land use, cultural significance, economic significance, and demographic considerations. During this stage, different designs could also be still under scrutiny.”				
	Sweden	Page 19. paras 4.9-4.10	In this context, the complication of placing an installation at a site where other facilities with authorized releases are already placed is important (cumulative effects etc. It could be worth addressing this issue.	Both the existing levels of radionuclides in the environment and the comparison with criteria will be complicated by having several facilities, perhaps even with different licensees, at the same site.	X		
	Australia	Paragraph 4.9	Remove spurious comma, viz. “... obtain site-specific data,.”		X		
	Australia	Paragraph 4.9	Suggested re-wording: “Once a site or a reduced number of sites has been selected (by use of the screening criteria for site selection), a more detailed assessment for each particular location should be done using information on the proposed design together with site-specific data from the	The preliminary assessment for each site has already been done (as per para. 4.8). In addition, the aim of doing an assessment during site evaluation	X	Some text was modified but the concepts of “initial, preliminary and final” are kept.	

			<p>results of local measurements and surveys. The aim of this assessment should be to demonstrate (as early as possible) that there is a reasonable likelihood that all stages of the proposed operation will comply with relevant legislative and regulatory requirements under reasonably foreseeable circumstances. If this cannot be demonstrated, the proposed design can be modified, more site-specific data can be collected, and the assessment can be modified. This process can be continued until a clear conclusion is reached. The assessment process should be refined as the project evolves and more information becomes available; this allows for any decision to stop further development of the project to be made as early as possible, and helps to build confidence as the project evolves.”</p>	<p>(for the sites that pass the screening assessment criteria) should be to demonstrate that there is a reasonable likelihood that all stages of the proposed operation should be able to comply with all relevant legislative and regulatory requirements under reasonably foreseeable circumstances. For such an assessment, a clear design plan should be available. A further benefit of doing such an assessment is that potential problems show up early in the overall process and plans, designs, etc., can be modified. This is also part of the process of developing an evolving safety case.</p>				
	Switzerland	4.9 / 7 5.14 / 6 5.15 / 1 5.19 / 6 5.20 / 3	Replace “able” by “suitable”	Editorial	X X X X		X	

		5.27 / 3 5.53 / 1 I-18 / 5			X X		X	
	Sweden	Page 19, para 4.10	Suggest changing to... <i>an activity should be used as one of the inputs to determine...</i>	It might be an issue for reference [8] but optimization and the use of BAT “Best Available Technique” should also be included in deriving operational magnitudes.	X			
	China	Page 19 Para 4.11 Line 3-4	Revising to be “ <u>this review should include the consideration of the possible changes in the assumptions used to perform the prospective radiological environmental impact assessment and the monitoring data of the source and environment.</u> ”	Monitoring data of the source and environment might be helpful in the re-evaluation if available.	X			
1	Germany	4.12	“ At the end of a decommissioning stage or before release of a site from regulatory control <u>Prior to the conduct of decommissioning actions,</u> a radiological environmental impact assessment is also expected. <u>Before release of a site from regulatory control, a review of the radiological environmental impact assessment could be necessary, considering the final radiological status of the former facility.</u> However, for most of the activities and facilities, typically no releases or potential exposures are involved after decommissioning and the methods for exposure estimation and criteria could be different ...”	A REIA should already be performed prior to starting decommissioning, not only at the end. This is in line with Figure 1, which refers to a ‘Pre-decommissioning assessment’, as well as with the Safety Requirements GSR Part 6 “Decommissioning of Facilities”. In this context, Requirement 11 of GSR Part 6 states: “ <i>Prior to the conduct of decommissioning actions, a final decommissioning plan shall be prepared and shall be submitted to the regulatory body for approval.</i> ”	X	Text modified		

				<p>With regard to the final decommissioning plan, the subordinated Draft Safety Guide DS452 “Decommissioning of Nuclear Power Plants, Research Reactors and Other Nuclear Fuel Cycle Facilities” (revision of Safety Guides WS-G-2.1 and WS-G-2.4; latest version dated 3 December 2014) recommends:</p> <ul style="list-style-type: none"> • <i>“An environmental impact assessment should be developed concurrently with the final decommissioning plan, consistent with national requirements.”</i> (Para 2.8) • <i>“The licensee should indicate in the environmental impact assessment for decommissioning, which supports the final decommissioning plan, how compliance with applicable requirements for protection of the environment will be ensured, including responsibilities and measures for monitoring, control and surveillance during decommissioning and after its comple-</i> 				
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				<p><i>tion, if needed.” (Para 2.9)</i></p> <ul style="list-style-type: none"> • <i>“The impact of updates to the final decommissioning plan on the environmental impact assessment should also be considered. The environmental impact assessment should be updated when a previously unconsidered potential environmental impact is identified.” (Para 7.44)</i> • <i>“The final decommissioning report should summarize the final status of the former facility. ... A review of the environmental impact assessment may be necessary considering the final radiological status of the former facility, as required by national requirements.” (Para 9.2)</i> 				
-	ENISS	4.12	<p>At the end of a Before decommissioning stage or before release of a site from regulatory control a prospective radiological environmental impact assessment is also expected.</p>	<p>A prospective radiological environmental impact assessment is needed before decommissioning, not at the end. This is in agreement with FIG. 1 where it is mentioned a ‘Pre-decommissioning assessment’.</p>	X			

-	France	4.12	However, for most of the activities and facilities, typically no releases or potential exposures are involved after decommission and the methods for exposure estimation and criteria could be different (for example, the estimation of the doses should be based mainly on environmental monitoring data and the dose criteria could be below dose limits and constraints used for the operational stage).	Could lead to too much conservatism if results are below the detection limits. Sometimes such calculation based on monitoring data has no sense.	X			
	Sweden	Page 20, para 4.12	Add the letter g to decommissioning in line 4. Consider deleting the parenthesis ...could be different (for example, the estimation of doses should be based mainly on environmental monitoring data and the dose criteria should be below dose limits and constraints used for the operational stage). A particular situation...	The estimation of doses would not be based on data from environmental monitoring, at least not at nuclear installations. Perhaps true at mining or other activities?	X			
	USA	4.12 Line 4	"Decommissioning" rather than "de-commission?"	Clarity	X			
	China	Page 20 Para 4.12 Line 1-2	Revising to be "At the end of a decommissioning stage or before release of a site from regulatory control a radiological environmental impact assessment <u>should be carried out depending on certain situation</u> ."	At the end of a decommissioning stage or before release of a site from regulatory control, the radiological EIA is very necessary under certain situation. So "should" is more appropriate than "expected".	X			
	ENISS	4.12 a	However, For most of the activities and facilities, typically no releases or potential exposures are involved after decommission and the methods for exposure estimation and criteria could be different (for example, the estimation of the doses should be based mainly on environmental monitoring data and the dose criteria could be below dose limits and constraints used for the	For clarification old para 4.12 should be divided. The example is not very suitable as after decommissioning, there will be no dose criteria and constraints.	X	4.12 was re-written using the inputs		

			operational stage) etc.				
-	Switzerland	4.12 / 7	A particular situation <u>may arise after decommissioning of some activities and facilities involving large areas – like uranium mining and milling – where source terms are not negligible and impacts to the environment have still to be expected.</u>	Rephrasing to add clarity	X		
	Australia	Para's 4.13 & 4.14	Suggested replacement text for 4.14: <u>“The government or the regulatory body may establish thresholds and/or criteria at a level such that all projects of a certain type of facilities or activities would be exempted in advance from the requirement of an EIA, considering that impact is not expected either for normal operation or conceivable accidental scenarios. Alternatively, if an environmental assessment is required in all cases, the process should start with a very simple assessment followed by an increasing level of complexity until a clear, defensible conclusion is reached (a tiered approach). This approach is efficient and consistent with the graded approach, and ensures a high level of transparency and consistency across all types of facilities and activities.”</u>	The approach outlined here may work, but it is open to criticism on the grounds of lack of transparency. The same result can be achieved by requiring an assessment in all cases, but allowing the process to start with a very simple assessment and increase the level of complexity until a clear, defensible conclusion is reached (a tiered approach). This approach is efficient, and consistent with the graded approach, and ensures a high level of transparency and consistency across all types of activities.	X		
	Sweden	Page 20,	The word <i>body</i> should be inserted after	Editorial	X		

		para 4.14	...the regulatory...				
	Japan	4.14/1 (p.20)	The government or the regulatory should established thresholds...	Grammatical error.	X		
	Japan	4.14/ 3 (p.20)	Regarding phrase “impact is not expected ” other word “ foreseeable ” is also used in para.4.1. What is the intent of the usage of these words differently?	This is not comment but just for a confirmation.	X	Was changed to “expected”. In some places in the Safety guide though, “foreseeable” is kept.	
	Turkey	4.14./last line	Footnote ¹⁹ should also be placed after the sentence of “The government or the regulatory should established thresholds and/or criteria at a level such that all projects of a certain type of facilities or activities would be exempted in advance from the requirement of an EIA, considering that impact is not expected either for normal operation or conceivable accidental scenarios”.	Footnote ¹⁹ is EU Directive on the Assessment of the Effects of Certain Public and Private Projects on the Environment which establishes thresholds levels for facilities requiring EIA. Hence this directive should be cited after that sentence.	X		
	ENISS	4.15	A radiological environmental impact assessment done within an EIA process <u>governmental decision-making process</u> is normally done at early stages of the development and, typically, has a lower level of details and uses less specific data than an assessment conducted for a (regulatory) authorization process; however it should be consistent.	An EIA is one possible process amongst the governmental decision-making processes. This part of the Standard is related to an Assessment as part of a governmental decision-making process (besides an Assessment for the (regulatory) authorization process) and not as part of an EIA.	X		
	USA	4.15, line 4	Add at end of sentence: “, and may be specified by legislation or by the regu-	Added thought for consistency with	X		

			latory body.”	standards.				
	ENISS	4.16	Unless defined in the applicable national or international regulations, the level of complexity for the radiological environmental impact assessment for an EIA <u>governmental decision-making process</u> should be proposed by the applicant and agreed by the nuclear regulatory body(s) in the country in discussion with other governmental authorities or agencies. (...)	See previous comment.	X			
	USA	4.16	Unless defined in the applicable national or international regulations, the The level of complexity for the radiological environmental impact assessment for an EIA should be in line with the complexity of the radiological safety assessment for the proposed nuclear facility. Thus, the level of complexity should be defined in the applicable national regulations or guidance proposed by the applicant and agreed by the nuclear regulatory body(s) in the country in discussion with other governmental authorities or agencies. To this end, the radiological environmental impact assessment is as an extension of the radiological safety assessment since the methodology for determine radiological exposures in both assessments should the same.	The level of complexity for the radiological environmental impact assessment for an EIA should absolutely not be proposed by the applicant. They have an inherent financial conflict to complete the assessment with a minimum of expenditures. Rather, the nuclear regulatory body(s) should set clear expectations as an integral part of their regulatory structure through appropriate regulatory guides or designate technical guidance documents that specifically outlines the level of complexity for the type of nuclear facility being considered. It is also inherent in any	X	Text modified		

				radiological environmental impact assessment that the criteria for determining whether the project or nuclear facility is environmentally sound would be heavily dependent on what is followed for the accompanying radiological safety assessment.				
2	Germany	4.18	Delete this paragraph and the corresponding headline "ASSESSMENTS FOR OTHER PURPOSES".	The subsection "ASSESSMENT FOR OTHER PURPOSES" with its associated Para 4.18 should be deleted since it is out of the scope of this Safety Guide. Para 4.18 is related to a safety assessment of substantial improvements in the safety systems of a facility or an activity. Such kind of assessment is dealt with in another Safety Guide, where the REIA is at most marginal, taking into account that the modification of safety systems would result in a lower impact to the environment.			X	This para. is considered useful.
	Japan	COMMUNICATION OF RESULTS	A good practice about communication with interested parties along with DS460 should be added.	This is a proposal to make this Safety Guide better.			X	The comment is noted but it is difficult to address without a more specific

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							recommendation.
	China	(p.21) Page 21 Para 4.19 Line 7-9	Revising to be “Depending on the importance of the enterprise, the regulatory body <i>should request the governmental authorities to lead in the communication</i> when such communication is considered necessary for effectively performing the public informational functions of the regulatory body.”	Governmental authorities are more qualified to be in the leading position of such communication, rather than be involved.	X	Text modified	
	Australia	Paragraph 4.21	Remove the first instance of “the” in “...specific results the in the reports produced.”		X		
	Turkey	4.21./ last line	In the second sentence, (last line) “the” is surplus. It should be deleted.	Grammar correction	X		
	Australia	Paragraph 4.23	Add text at end of 4,23: “ In general, the aim should be to encourage as much transparency as possible in these matters, as this builds confidence and trust. ”		X	Text modified	
	USA	4.52 Line 8	Add “usually” after “measurements are”	Clarity	X	(refers to para 5.24)	
	Australia	Section 5		This entire section does not clearly distinguish between exposures due to routine discharges and (potential) accidental discharges, and the methodologies for assessing these different types of exposure. In particular the discussion on limiting risk is largely irrelevant			X

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				<p>when discussing (potential) accidental exposures, because in most accident situations, particularly in the early stages, there are higher priorities for emergency responders, such as bringing the discharges under control.</p> <p>The main reasons for looking at exposures due to routine and accidental discharges are quite different. For routine discharges the issue is usually compliance with legislative and regulatory requirements; however, for accidental discharges the main reason for estimating potential exposures is for planning responses.</p> <p>The document needs to more clearly differentiate between these approaches.</p>				
-	Lithuania	p. No 22	5.2. Since an assessment for protection of the public and protection of the environment	Only tested and approved by countries	X	Text was modified to incorporate 'verification'.		

		5.2	within this Safety Guide is prospective in nature, reliance will have to be placed on mathematical modelling for evaluating, for example, the dispersion of radionuclides in the environment, the transfer through environmental compartments, the transfer to humans and to the human food-chain and, finally, the radiation doses resulting from the associated external radiation or from the uptake of radionuclides. The models should be appropriate for the situation in which they are being applied, ensuring reasonable accuracy. Model assumptions and parameter choices should be sufficiently described and referenced to be transparent and allow independent verification. General models already used in practises by at least some countries and proposed by the IAEA in the technical documentation should be used that are validated at international level. Validation should be listed.	mathematical modelling software's should be used				
	Sweden	Page 22, para 5.2, 3 rd sentence	<i>The models should be appropriate for the situation in which they are applied, ensuring reasonable accuracy.</i> Perhaps a better statement would be: <i>The models should be appropriate for the situation in which they are applied, validated and verified.</i>	Validation and verification of the used model should be important in this context.	X			
	Sweden	Page 22, para 5.3	Remove the parenthesis (i.e. —over-protective)	In order to be protective calculations should be conservative but that does not mean that they are over-protective.	X			
	Switzerland	5.4 / 5	The national regulatory body needs to be satisfied <u>has to agree</u> that ...	The requirement of satisfaction of the regulatory body is too weak	X			

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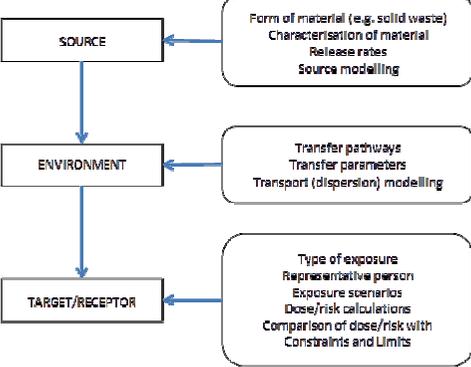
	France	5.5	Add at the end of the § “Especially when annual dose to reference group is lower than the exemption criteria of 10 µSv, a specific assessment of the protection of fauna and flora is not required”	To prevent small projects from unnecessary studies			X	This is discussed in Section 4.
	Australia	Paragraph 5.5	Suggested re-wording: “One consideration when deciding on the methods for a radiological environmental impact assessment is the balance between the amount of effort and the level of detail required. For example, for an installation with low levels of discharges and or low potential for accidents with consequences to the public and the environment, the use of detailed methods would not generally be necessary. For these types of installations, regulatory bodies, vendors or professional associations may develop generic guidance with simple and cautious calculation methods that can be used for the assessments by the applicants. However, in making such decisions, all relevant information should be considered; for example, even in cases involving low levels of discharges, bio-accumulation may be an issue. ”			Text modified	X	
	Sweden	Page 23, para 5.7	Delete or rephrase the paragraph as: <i>In order to control exposures and protect the public in accordance with the requirements of GSR Part 3 [1] there is a need to conduct assessments that include prospective estimations of doses to members of the public and compare results to defined criteria.</i>	The safety guides should use terms as: <i>prevent or minimise releases, very low amounts, negligible to very low doses.</i> The releases cannot be zero with any reason-		Text modified	X	

			Possibly the text of footnote 20 could be added to the paragraph as well: <i>Due to the low activity concentrations...etc</i>	ble technique and doses to workers in waste management etc. are to be considered. Such factors would be more interesting to address in this guidance.				
	Australia	Paragraph 5.7	Correct: "...very low amounts of radionuclides residues can be found...".		X			
	Australia	Footnote 20	Suggested re-wording: "Due to the low activity concentrations and high large volumes involved, it would be technically difficult to retain all this residues or material on-site and the cost of doing so would likely be may have an excessive and unjustified cost from the radiological protection perspective."		X			
3	Germany	Footnote No. 21 to 5.8	"The Safety Guide is intended to provide a general framework for radiological <u>environmental</u> impact assessment. ... Important steps which are not discussed but should be considered when performing the assessments are, i.e., selection of computer codes, uncertainty analysis, verification and QA/QC control ."	Wording.	X			
	Australia	Paragraph 5.8	Proposed text to add at end of para 5.8: " In assessments of this type, it is often more efficient to start with a simple assessment (for example, assuming continuous exposure and default site data) and to increase the complexity of the assessment (by use of site-specific data and more de-				X	This is discussed in other parts of the document.

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			tailed exposure scenarios) until a clear and defensible conclusion is reached.”					
	Japan	Page 23 Para 5.8. Line 9	The definition of occupational factor in Para 5.58 line 4 should be moved to this para as below. “...relevant habit data time-occupation factors (i.e. different occupation during day and night, existence of summer campsites and schools, presence of workers near the facility) to calculate intakes of...”	This is the first time of the term “occupational factor” described in this document, so its definition should be described here.	X	Text was modified		
	USA	5.9	The source term selected for a radiological environmental impact assessment should be appropriate for the type of facility or activity being considered. All relevant radionuclides, from a radiological point of view, should be identified along with the discharge route and the physical and chemical properties relevant for environmental transfers of these radionuclides. Releases to the atmosphere, releases to the aquatic environment, and direct radiation should be considered, as appropriate.	Add text to clarify that for receptors at a nuclear facility’s fence or boundary, direct radiation exposure from sources within the facility could be noteworthy and should be considered. Also, please note that this is mentioned in ¶ 5.25 on page 28, items (o) through (q).	X			
	Sweden	Page 23, Footnote 21	This statement should be put in the main text and not hidden in the footnote. Could be made into a paragraph in GENERAL CONSIDERATIONS (5.6bis)		X			
	France	Fig 2	In the second box, replace by “Dispersion/Environmental transfer/Direct Irradiation”	Mention proposed to warn the assessors not to forget direct exposure which can be THE relevant exposure way in some cases.	X	Figure was modified		
	Australia	Figure 2	A proposed replacement for FIG. 2 is supplied in the covering email, for considera-	FIG. 2 is confusing and could be considerably			X	The figure proposed has similar

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			<p>tion.</p>  <pre> graph TD S[SOURCE] --> E[ENVIRONMENT] E --> TR[TARGET/RECEPTOR] subgraph S_Box [] S1[Form of material (e.g. solid waste)] S2[Characterisation of material] S3[Release rates] S4[Source modelling] end subgraph E_Box [] E1[Transfer pathways] E2[Transfer parameters] E3[Transport (dispersion) modelling] end subgraph TR_Box [] TR1[Type of exposure] TR2[Representative person] TR3[Exposure scenarios] TR4[Dose/risk calculations] TR5[Comparison of dose/risk with Constraints and Limits] end S_Box --> S E_Box --> E TR_Box --> TR </pre>	<p>simplified. It does not reflect the process very well; e.g.:</p> <ul style="list-style-type: none"> • Use of the terminology “environmental transfer” and “exposure pathways” – the exposure is not transferred through the environment, which is what the term “exposure pathway” implies, but depends on the location of the exposed person(s) – it is the radionuclides that are transferred from source to receptor, and the transfer processes by which this takes place depend only on the environment and the physical/chemical form of the contaminants (transfer parameters). • Putting the exposure pathways/scenarios first - the exposure scenario depends on the identification of the repre- 			<p>elements, and it is considered not necessary to change the existing figure, taking into account that it is an illustrative figure and not a precise procedure. The discussion on what is identified first, if the ‘pathway’ or the ‘representative person’ depends on the approach and the method by the analyst or the requirements in the regulations.</p>
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				sentative person(s).				
	Sweden	Paras 5.8 – 5.76	The drafter should be commended for this section.	Section 5 is very well written and is of high quality.	X			
	Canada	5.9/2	“5.9. The source term selected for a radiological environmental impact assessment should be appropriate for the type of facility or activity being considered. The composition and amount of All-relevant radionuclides , from a radiological point of view, should be identified along with the discharge route and the physical (gas or aerosol) and chemical properties relevant for environmental transfers of these radionuclides. Releases to the atmosphere and to the aquatic environment should be considered, as appropriate.”	Paragraph 5.9 is the first time that elements of the source term are presented in full text in the document. The information in paragraph 5.9 should align with the information in paragraph 5.49 as paragraph 5.9 to provide more clarity for the reader.	X			
-	Switzerland	5.9 / 3	... the discharge route path ...	Editorial	X			
	China	Page 24 Para 5.10 Line 7-9	<u>To add a new paragraph after Para 5.10: <i>The characteristics of the radioactive waste management systems or process on which the calculation of the release source terms is depended should be specified.</i></u>	<u>The calculation of the release source terms depends on the design of the radioactive waste management systems or process, and the justification has been made by the applicants could also be specified through these specifications.</u>			X	The document assumes that the source term are the result from previous safety assessments (not a result of the radiological impact assessment which just ‘use’ the provided source term as an input)
	Canada	5.10/1	“5.10. The selection of radionuclides for the radiological environmental impact assessment should be adequately representative of the type of facility being assessed. In some cases, for instance at the governmental decision-making process or initial stages of a (regulatory) authorization process, generic source terms for the postulated facility or activity could be used, based on preliminary estimations, published data or on the experience from similar installations. Information on generic	The source term section should provide some guidance on the selection of the radionuclides used in the assessment. Selection of radionuclides used in the assessment should be representative of the facility being assessed. It is recommended that a brief sentence to this	X	Text modified		

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			source terms for normal operation of nuclear reactors can be found in [37, 38]... “	end be added.				
-	Switzerland	5.11 / 7	... - then the effects due to short-term releases will need <u>have</u> to be considered.	Editorial	X			
	Canada	5.11/7	“Where this assumption may not be valid, because significant variation in the discharges over a time period are expected — e.g. during refuelling of reactors, or for typical iodine-131 discharges to sewer from thyroid treatment departments at a hospital, or pulsed releases from processing facilities - then the effects due to these types of releases will need to be considered.”	The effects due to short-term releases will also need to be considered for non-continuous releases from certain types of nuclear facilities (i.e., processing facilities). Radiological environmental impact assessments typically assume that discharges are continuous and constant over a year. The text in paragraph 5.11 provides some discussion regarding periods when there might be variation in discharges in the short term. However, there is no discussion regarding non-continuous releases (or pulsed) releases from certain facilities like some processing facilities. The releases from these facilities are different from the shutdown periods for nuclear power plants. Recommend that text be added indicating that these non-continuous releases should also be assessed differently.	X	Text modified		
	France	5.11	Where this assumption may not be valid, because significant variation in the <i>discharges over a short time period</i> are expected -...	I that case (short time period discharge), calculation methods should be			X	The Safety Guide identifies the issue of short term

				precise. Which meteorological data? (the same for each release?). How to evaluate deposition accumulation for short time period discharges?				increased releases, but does not provide a detailed methodology for these particular and very variable cases. This more detailed methodology is planned for a TECDOC or Safety Report considering some specific facilities
	Australia	Paragraph 5.11	Add text to end of para: “It should also be considered that releases to the environment can continue after operations cease, due to the presence of residual contamination.”		X			
-	Switzerland	5.13 / 6	The regulatory body should confirm agree that ...	Editorial	X			
	Australia	Paragraph 5.15	Suggested wording: “(b) Deposition (and subsequent resuspension) of radionuclides from the atmosphere on the ground or other surfaces; (d) Accumulation (and subsequent remobilization) in aquatic sediments;”	Points (b) and (d) should include resuspension & remobilization.	X			
	Canada	5.17/3	“5.17. For facilities or activities needing simple assessments the meteorological and hydrological conditions could be of a generic character based on bibliography or national records (based on at least one year of data) . The meteorological and hydrological conditions used for the more complex assessments should be appropriate and specific for the	Paragraph 5.17 provides guidance regarding the amount of data (i.e., conditions) required for complex assessments. Similarly, the appropriate amount of data for conducting simple as-	X			

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			site in question and should preferably be averaged from several years of data (at least, 3–5 years). Such data may be available for the site itself or from nearby meteorological or hydrological stations.”	assessments should be provided. According to the US EPA’s Guideline on Air Quality at least one year of site-specific data is required for regulatory dispersion modeling. Or At least one year of meteorological or hydrological data should be used for simple assessments.				
	Turkey	5.17. /fith line	“The meteorological and hydrological conditions used for the more complex assessments should be appropriate and specific for the site in question and should preferably be averaged from several years of data (at least one year, preferably 3-5 years).”	The term in the parenthesis is proposed to be corrected. Since at least 3-5 years of meteorological data collection will be too long for dispersion analysis, and contradictory to para.5.51 of this draft and IAEA NS.G-3.2 para.2.11.	X	Text modified		This issue (number of years for the data) will be discussed at WASSC/NUSSC
	Australia	Paragraph 5.17	Remove comma within brackets, viz. “(at least 3-5 years)”.		X			
	Australia	Paragraph 5.18	Suggested text to add after first sentence (i.e. after “release point.” Delete “However,” and start next sentence after inserted text with “For more complex...”): “While Gaussian dispersion models are simple to use, they need to be carefully validated, as they make a number of assumptions to simplify the mathematical solution of the equations and each assumption introduces potential loss of accuracy.”				X	This is considered a too detailed discussion for the Safety Guide. Validation and uncertainty in general is discussed in the document.

-	Switzerland	5.18 / 6	... or in cases, where greatest <u>larger</u> distances need to be considered ...	Editorial	X			
		5.18 / 9	... <u>on</u> pessimistic assumptions when uncertainties or variability in the data prevent those realistic assumptions to be considered .		X			
	France	5.18	However, <u>for more complex dispersion conditions</u> , for example for installations located close to mountainous regions or places where complex local atmospheric circulations are expected, or in cases where greatest distances need to be considered, more complex dispersion models may be necessary <u>for accidental releases calculations</u> .	These methods should be used only for accidental releases			X	Complex dispersion models could be necessary for routine discharges (in particular scenarios), not only for accidental releases.
	Switzerland	5.19 / 4	... of the receiving <u>aqueous</u> environment, ...	Editorial	X			
	Australia	Paragraph 5.19	Remove comma, "... processes like water movement..."		X			
-	Switzerland	5.20 / 2	... being carried to sewage treatment <u>works plants</u> .	Editorial	X	Text modified		
	Australia	Paragraph 5.20	Add text at end of para: " <u>It may also be necessary to assess doses to workers involved in routine inspection and maintenance of sewerage systems.</u> "		X			
	Finland	5.20		It is noted that when assessing discharges to	X	It is indicated the possible type of mod-		

				sewers, the models should be able to estimate the transfer of the radionuclides to the sewage works and their subsequent releases into the environment. Are such models commercially available? If not, this Suggestion is rather strong.		els to be used (e.g. compartmental models with transfer factors).		
	France	5.20	Appropriate models should be available for the transfer of radionuclides through terrestrial food chains and for atmospheric releases.	Which kind of atmospheric release is expected after use of sludge?	X	Text modified.		
	Switzerland	5.21 / 4	... of the conditions when <u>equilibrium can be assumed</u> .	Rephrasing for simplification	X			
	Australia	Paragraph 5.21	Add text to end of para: "For facilities that discharge long-lived radionuclides (e.g. the naturally occurring uranium and thorium chain nuclides) the maximum exposures can occur well after operations cease, for example as a result of dispersion of released radionuclides in ground water. The assessment should take this type of possibility into account."		X			
	Switzerland	5.25 / 2	An indicative <u>exemplary</u> list of exposure pathways ...	Editorial	X			
	Australia	Paragraph 5.25	Suggest rephrasing to "could contribute to doses to members of the public".	The phrase "could contribute to doses to the member of the public" implies that a single	X			

				<p>member of the public is assessed, rather than a representative person based on an average of a most effected group (or representative of the most exposed group).</p> <p>It is important to emphasise that the exposure pathways are strongly site-dependent.</p>				
	Sweden	Page 28, para 5.25	Suggest changing the bullet (q) to read: <i>direct irradiation from the facility (i.e. from components, of the facility like nuclear reactors or coolant or steam systems)</i>	A typical example is high-energy γ -radiation from N-16 in the steam passing the turbine hall in boiling water reactors.	X			
	China	Page 28 Para 5.25	To add“(r) External or inhalation from natural radionuclides in consumer products“	The consumer products potential exposure from NORM and TENORM to the public, which should be considered.			X	Too detailed discussion for the Safety Guide
	France	5.25 (+5.26)	Doses should be calculated resulting from a number of <u>exposure pathways which are considered relevant</u> for releases to the environment in particular scenarios.	It is needed to precise when and how some pathways can be excluded without calculations...	X	Text modified		
	Australia	Paragraph 5.26	Suggested text to add to end of para: “If particular exposure pathways are not included, the decision should be justified (transparency).”		X	Text modified		

			Correct "... certain pathway are negligible" to "... certain pathways are negligible".		X			
	Germany	5.28	"Dose should be calculated to a representative person using characteristics selected from a group of individuals representative of those more highly exposed in the population. Ref. [42] gives guidance on the characteristics of the representative person. taking into account several age groups ."	In general, dose effects show a dependency on the age of the exposed person. For different age groups, doses per unit intake (i.e. dose coefficients) for the estimation of the committed effective dose for ingestion and inhalation of radionuclides are given in ICRP Publication 119 and GSR Part 3, Schedule III.			X	Age groups is discussed later in the Safety Guide
	Sweden	Footnote 24	Suggest deleting the footnote and instead write:...to a representative person as defined in GSR Part 3...	The reference to ICRP is made in the definition in GSR Part 3. No need to bring in the critical group in this context – it only confuses.			X	Many comments suggest to keep definition of representative person in this Safety Guide, specially taking into account the wide expected target audience.
	Australia	Paragraph 5.30	Amend final sentence: "Important characteristics when assessing doses to the representative person is are the assumed location (e.g. distance and direction from the point of release); where the representative person lives they live , obtains their food, and the fraction of the food consumed that is of local origin, occupancy times (time spent at different locations) "		X	Text modified. All the inputs were captured		

			and time spent outdoors and indoors.”					
	USA	5.30	... , obtain their food (e.g., whether from regional agricultural production or nearby subsistence hunting or gathering), ...	How a representative person obtains their food is important, whether from regional agricultural production or by subsistence hunting or gathering and the later needs to be mentioned in the text because it could be inadvertently not evaluated.	X	Text modified		
	France	5.31	Add a § after 5.31 “It should also be noted that unexpected exposure pathways may contribute significantly to the dose received by individual in particular circumstances, for example consumption of seasonal or atypical foods, use of algae as organics in orchards ...	To warn the assessors about the potential importance of such exposure pathways.			X	It is noted. However extreme doses in one or few individuals should not be considered for the definition of representative persons. We are afraid of giving the wrong message (i.e that representative person represent extremes).
	China	Page 29 Para 5.33 Line 6-8	Revising to be “Uncertainties in estimates of dose, particularly for prospective calculations, are generally not reduced significantly by increasing the number of age categories for which dose coefficients have been provided [42], and four age groups should be sufficient for dose assessment under most circumstances.”	Though this guideline is for the generic assessment purpose, the recommendation of age categories will be very helpful for the states which do not have the related standards or guidelines.	X			
3	Germany	5.34	2 nd sentence: “IAEA provides guidance for the definition and use of dose constraint for protection of	Grammar.	X			

			members of the public in planned exposures situations in [6].”				
	Australia	Paragraph 5.34	Replace “planned exposures situations” with “planned exposure situations”.		X		
	USA	5.34 Line 2	Revise to replace “define” with “define, or approve a proposal for”	Consistency with requirements.	X		
	Sweden	Page 29, para 5.35	Change the sentence to read: <i>GSR Part 3 lays down, in general, an effective dose limit of 1 mSv per year for members of the public.</i>	A dose limit is not defined, it is stipulated or laid down. The formulation of para 5.35 in the draft is strictly speaking not true since, in special circumstances, a higher value in a single year can be accepted if the average during five consecutive years does not exceed 1 mSv.	X		
3	Germany	5.35	2 nd sentence: “Dose constraints should fall within the range of ~0.1–1 mSv [6] and could be different for different facilities and activities or exposures scenarios.”	To align the text with the guidance provided in Para 3.39 of the Draft Safety Guide DS432 “Radiation Protection of the Public and Protection of the Environment” (latest version dated March 2015) which says: “ <i>The value of a dose constraint for public exposure in a planned exposure situation should be below the pertinent dose limit, namely 1 mSv for the effective dose. On the</i>	X		

				<i>other hand, a dose constraint should be higher than the level of dose which could be considered for exemption. Therefore, dose constraints should be within the range of ~0.1 – 1 mSv.”</i>				
	Japan	Page 30 Para 5.35. Line 5-7	“...the period for calculating the committed dose should be defined as 50 years for intakes by adults and up to age 70 years for intakes by children.”	Clarifying the description. It is necessary to define the period clearly for calculating the committed dose; but the wording “considering life expectancies” is not in line with this perspective.		X		Some of the text was modified in the paragraph. However the number of years for the committed dose is related to life expectancies.
-	ENISS	5.35	Dose constraints should fall within the range of 0.1–1 mSv [6] and could be different for different facilities and activities or exposures scenarios	In DS 442 the text is “~ 0.1-1 mSv”. This should be harmonized either way.		X		
	Czech Rep.	5.36	Drop all the text.	„dose constraints“ are already applied with regard to another installation located close by or in the same site, so another lowering would be unnecessarily.		X		

	China	Page 30 Para 5.37 Line 6-8	Once the radioactive discharge limits for a facility or activity are set by the regulatory body, a dose corresponding to the authorized discharge limit could be used for comparison to the results of the assessment. (This sentence should be removed.)	Normally the authorized discharge limit will be given a flexible margin due to the operational fluctuation, and the dose corresponding to the authorized discharge limit will not be exceeded if the actual or design source term did not exceed the discharge limit.	X			
1	Germany	5.39	“Facilities and activities are designed, constructed, commissioned, operated or conducted, maintained and decommissioned – and regulated throughout all these stages, in such a way to prevent and mitigate accidents that, in the vast majority of cases, result in no radiological consequences for the public [1, 2, 45, 46].”	The statement “in the vast majority of cases, results in no radiological consequences for the public” doesn’t serve as guidance. Moreover, it is not covered by the references. The expectation is that <ul style="list-style-type: none"> • for accidents without core melting, only minor radiological impact would be acceptable; • for accidents with core melting, only protective actions that are limited in terms of times and areas of application would be necessary. 	X	Text modified		
	Switzerland	5.39 / 3	... <u>in order</u> to prevent and mitigate accidents and, <u>thereby, to avoid</u> in the vast majority of cases <u>significant</u> radiological consequences for the public.	Rephrasing, for improved clarity	X			
	Sweden	Page 29, para 5.40, 2 nd sentence	Consider changing the second sentence to start: <i>These safety assessments enables to analyse...</i>	Change singular to plural in the full sentence.	X			

	Australia	Paragraph 5.40	Rewording of sentence two required. Suggest “These safety assessments enable analysis of whether adequate...”.		X			
-	Switzerland	5.42 / 8	... to make the input to environmental dispersion and transport <u>models</u> .	Editorial: The input is to the models and not to the dispersion or transport itself.	X			
	Australia	Figure 3		<p>FIG. 3 has the same problems as FIG. 2, and some additional problems:</p> <ul style="list-style-type: none"> • Putting the exposure scenario first - the exposure scenario depends on the identification of the representative person(s). • Use of the terminology “environmental transfer” and “exposure pathways” – the exposure is not transferred through the environment, which is what the term “exposure pathway” implies, but depends on the location of the exposed person(s) – it is the radionuclides that are transferred from 			X	See answer to comments to Figure 2.

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				<p>source to receptor, and the transfer processes by which this takes place depend only on the environment and the physical chemical form of the contaminants (transfer parameters).</p> <ul style="list-style-type: none"> • Identification of exposed persons is not relevant – it is the identification of the representative person(s) that is important. <p>Since both FIG. 2 and FIG. 3 refer to prospective assessments, the same figure will apply in both cases, because prospective exposures are (in practice) potential exposures.</p>				
-	Switzerland	5.47 / 3	... and the behavior and movement transport of any radioactive material ...	Editorial: the common term is “transport of radioactive material”	X			
	USA	5.47	Suggest considering a cross reference to state that the assumptions used should be the same as those being used for Emergency Preparedness considerations.	Consistency with requirements.			X	Cross reference with emergency is done in the introduction
-	Swit-	5.48	In general , the source term should include	Editorial	X			

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	zerland		the composition and amounts of radionuclides, the physical (e.g. gas or aerosol) and chemical form, the release point <u>and its</u> height (for an aerial release) or depth <u>below the surface</u> (for an aquatic release). The releases flow speed and the thermal energy associated with the release may <u>also be</u> necessary to assess the effective height <u>of</u> the radioactive plume could reach .					
-	Lithuania	p. No 33 5.49	5.49. For activities and facilities needing simple assessments, conservative assumptions for the meteorological and hydrological data may be made. For example, a uniform wind direction for atmospheric dispersion and low atmospheric dilution conditions, precipitation by raining at the time of the postulated accident may be assumed. Such assumptions would give conservative results and avoid the need to obtain site specific data. However, conservative assumptions are not straightforward, e.g. assumptions conservative for inhalation (i.e. that all the releases go to the atmosphere instead of to any aquatic media) may be not conservative for ingestion of food produced with irrigation. When different pathways are involved, it might be not so easy to identify the most conservative assumption and a careful compromise should be evaluated	All conservative assumptions should be taken into account	X			
2	Germany	5.50	1 st sentence: “If due to over conservatism, because of the use of assumptions which tend to largely overestimate the doses, the results are above else to the selected criteria, more realistic values	As long as the selected criteria are met, no further considerations are needed.	X	Text modified (comments to the same paragraph were combined)		

			for the applicable meteorological and hydrological parameters at the location of the facility or activity should be considered to reduce the level of uncertainty.”					
-	ENISS	5.50	If due to over conservatism, because of the use of assumptions which tend to largely overestimate the doses, the results are close to above the selected criteria, more realistic values for the applicable meteorological and hydrological parameters at the location of the facility or activity should be considered to reduce the level of uncertainty.	If the criteria are met, no further assessments are needed. This is the logic of a criterion. It would only be a waste of resources to proceed further.	X			
	Switzerland	5.50 / 1	If due to over conservatism the results are close to the selected criteria, because of the use of assumptions which tend to largely overestimate the doses, ...	Rearrangement of the sentence to add clarity	X			
3	Germany	5.51	2 nd sentence: “Site specific meteorological and hydrological data for nuclear facilities is are generally collected during the programme for site evaluation; detailed guidance on the type and characteristics of this these data is presented in [41].”	Grammar.	X			
	Australia	Paragraph 5.51	Typographical error. Remove space before comma, “...complex assessments , meteorological...”		X			
	Czech Rep.	5.51/1-4	For nuclear facilities or activities needing complex assessments, meteorological and hydrological data locally collected – over at least a year for the initial assessments, but preferable over 3– 10 years – should be used to specify characteristic accident dispersion conditions [40, 41].	Hydrological and meteorological data shall be known for more than 3-5 years, at least 10 years, if possible even more.	X			

	Turkey	5.51	The sentence of „Meteorological data required by numerical (complex) models can also be acquired by meteorological data centers“ may be added to this para.	Meteorological data required by numerical (complex) models can also be acquired by meteorological data centers such as NCAR, FNL etc. These centers create detailed meteorological data files for different countries.	X			
	Switzerland	5.52 / 1&2	For nuclear facilities and other <u>facilities</u> ... in order to reduce the calculation efforts, the hours <u>time</u> of occurrence of the accident ...	Editorial	X			
	Switzerland	5.53 / 7	... the dispersion and distribution of radio-nuclides in the environment .	Editorial	X			
	Turkey	5.53. last line	The reference [11] is mistakenly cited, correct one should be referred.	The cited reference [11] is IAEA SRS-19 which is applicable for routine releases and equilibrium conditions. For short term and long range transport, citation of this reference is inappropriate.	X			
	Switzerland	5.55 / 1	An indicative <u>exemplary</u> list ...		X			
	Australia	Paragraph 5.55	Suggest reword opening sentence: “An indicative list of exposure pathways relevant for / potential exposure scenarios which should be considered in the assessment is given below: ...”	One of the problems in separating exposure pathways and exposure scenarios is that, in many cases, the exposure pathway/s is/are	X			

				part of an exposure scenario. This is the case for almost all the exposure pathways listed in this paragraph.				
2	Germany	5.55	<p>“An indicative list of exposure pathways relevant for potential exposure scenarios which should be considered in the assessment is given below:</p> <p>(a) External irradiation due to deposition of radionuclides on skin;</p> <p>(b) External irradiation from the source;</p> <p>(c) External irradiation from the atmospheric plume (“cloud shine”);</p> <p>(d) External irradiation due to deposition of radionuclides on the ground (“ground shine”) or other surfaces;</p> <p>(e)(d) Inhalation of radionuclides from the atmospheric plume;</p> <p>(f)(e) Inhalation of resuspended material;</p> <p>(f) External irradiation due to deposition on the ground or other surfaces;</p> <p>(g) Intakes of radionuclides due to the inadvertent ingestion of radioactive material deposited on ground or other surfaces; and</p> <p>(h) Intakes of radionuclides due to the consumption of fresh and processed food and water.”</p>	<p>1. Please move bullet (f) behind (c), in order to arrange the possibly relevant exposure pathways in a more logical order (external irradiation – inhalation – ingestion).</p> <p>2. The Safety Guide GS-G-2.1 “Arrangements for Preparedness for a Nuclear or Radiological Emergency” uses the terms “cloud shine” and “ground shine”, see Para 2.16 therein. It is proposed to introduce the same terminology in bullets (c) and (d).</p>	X			
	Australia	Paragraph 5.56	<p>The ideas presented here might be more clearly stated as:</p> <p>“When considering accident situations, the simplest way to proceed is to consider all the major exposure scenarios that are</p>				X	The concept is correct but this Safety Guide is not to provide indications to emergency plan-

			likely to occur for the situation under consideration and establish which of these make the major contributions to the potential doses. This will provide a clear indication to emergency planners as to which protective measures are most likely to avert doses to members of the public.”					ners. The relation with emergency planning and potential exposures is discussed in the Section Introduction of the Safety Guide.
-	France	5.58	Different exposed population-groups may be identified, depending on the characteristics of the accident or event and the time of day or year of the postulated release, ...	It is very complex to evaluate (time of day !). That increase significantly the number of results in studies with a lot of hypothesis with a limited interest	X	Text modified		
	Japan	Page 35 Para 5.59. Line 6	“(for example, 10 mSv or 50 mSv per year – if such ...)”	Clarifying the description. Duration of dose assessment should be mentioned here.	X			
	USA	5.61 Line 5	Suggest adding a last sentence: “Such indications of risk should be used only in comparing options, and should not be used for attributing individual risk.”	Clarity. A needed warning to not use risk incorrectly.	X			
3	Germany	Footnote No. 31 to 5.64	“... but this safety guide <u>limits</u> the scope to individual effects.”	Grammar.	X			
	Japan	Page 36 Para 5.63. Line 4	over a three month period [reference]	Reference is necessary to justify the three month period.			X	3 months is a period suggested as an example for prospective assessments of potential exposures like in this Safety Guide. It is related to, for example, summer season, where

								more green vegetables contaminated by deposit may be expected.
-	Australia	Paragraph 5.65	Remove one instance of “activities” in first line.		X			
-	Switzerland	5.66 / 8	Ref. [50] illustrates with a range of probabilities ...	Editorial	X			
	USA	5.67	This paragraph would seem to be duplicative of the previous paragraph.	Clarity	X			
-	Switzerland	5.67 / 4	... The definition and use of risk constraints are more discussed <u>more extensively</u> in [6].	Editorial	X			
-	Australia	Paragraph 5.68	Final sentence. Suggest replacing with “ This is further discussed in Annex III. ”		X			
1	Germany	5.69	“Another option may be to express the criteria qualitatively, in terms of ‘a consequence to the public that would be unacceptable’. For instance, a criterion would should be that very disruptive countermeasures – like large evacuation or relocation – as a result of the potential accident scenarios specified for the facility or activity would are not be acceptable. <u>The safety objective in the case of an accident with significant off-site consequences is that only protective measures that are limited in terms of times and areas of application would be necessary and that off-site contamination or high radiation levels would be avoided or minimized.</u> Although this is in principle a qualitative criterion, the need of these countermeas-	Ensuring consistency with Para 2.13, bullet (4) each of the Safety Requirements SSR-2/1 Rev. 1 and DS478 (revision of NS-R-5 Rev. 1, latest version dated 19 April 2015). According to them, “... <i>only protective actions that are limited in terms of times and areas of application ...</i> ” are acceptable. Thus, the given example needs to be formulated in a generally applicable criterion.	X			

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			ures should be determined using estimations of projected doses (or related operational magnitudes) and comparing these estimations against emergency response decision numerical criteria. ...”					
	Switzerland	5.69 / 7	... comparing these estimations against emergency response decision numerical criteria.	Editorial	X			
	France	5.69	<i>Another option may be to express the criteria qualitatively, in terms of ‘a consequence to the public that would be unacceptable’. For instance, a criterion could be that very disruptive countermeasures-like large evacuation or relocation- as a result of the potential accident scenarios specified for the facility or activity would not be acceptable. Although this is in principle a qualitative criterion, the need of these countermeasures should be determined using estimations of projected doses (or related operational magnitudes) and comparing these estimations against emergency response decision numerical criteria. If this approach is used, the regulatory body should define the decision criteria for countermeasures to be used for the assessment of the potential exposures in line with the requirements in [18]. Examples of use of those decision criteria for countermeasures are available in [7].</i>	All the article 5.69 is difficult to understand. Should be reviewed	X	Text modified		
2	Germany	5.70	“Different criteria may be set for facilities and activities with varying levels of inventory and technological complexity. For instance, the regulatory body may specify one set of criteria for the nuclear fuel cycle and another set of criteria for hospitals or small laboratories.”	It is proposed to delete this paragraph. For the protection of the public it is irrelevant what type of facility causes an exposure leading to a certain dose. The protection of the public should be based on the potential doses but should not rely on the type of facility. In case of a lower inventory, also the resulting dose in case	X			

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				of a release would likely be lower. In addition, for all potential releases not only dose limits or intervention levels have to be considered, but also the principle of minimizing radiological impacts has to be applied.				
	ENISS	5.70	Different criteria may be set for facilities and activities with varying levels of inventory and technological complexity. For instance, the regulatory body may specify one set of criteria for the nuclear fuel cycle facilities and another set of criteria for hospitals or small laboratories.	For clarity.	X	Para. was deleted		
2	Germany	5.75	2 nd sentence: “ICRP [39 , 52, <u>56</u>] provides a practical approach to assess and manage the effects on flora and fauna due to releases to the environment; ...”	Wrong reference is cited here. The IAEA Safety Guide SSG-18 [39] must be replaced by the ICRP Publication 124 [56]. Compare with Para 5.76 of DS427.	X			
	France	5.75. 2 nd sentence last line	... this approach by ICRP is consistent with other equivalent approaches developed by different organizations [53-55].	Mentioning “States” is misleading as the references given page 46 are outside government decision-making process as they referred to [53] a DOE standard and DOE is Governmental department whose mission is to advance energy technology and promote related innovation and that standard is for its internal use for its own installations, to [54] the European ERICA project that is a Research &	X	The inclusion of these equivalent approaches was suggested during previous revisions of the Safety Guide. However, now references to other approaches used in MS are kept just in the Annex.		

				<p>Development Programme and to [55] a CSA document that is a standard promoted by the Canadian Standards Association. Canada by the way made it clear with the “Publication of final decision on the assessment of a substance — Releases of radionuclides from nuclear facilities (impact on non-human biota) — specified on the Priority Substances List (subsection 77(6) of the Canadian Environmental Protection Act, 1999) that “Notice therefore is hereby given that the Ministers of the Environment and of Health propose to take no further action under CEPA 1999 in respect of the said substance.” See the official reference : Canada Gazette Vol. 140, No. 35 Part I Ottawa, Saturday, September 2, 2006.</p>				
	Japan	5.76 (p.38)	<p>..., this Safety Guide presents, in Annex I, <u>an example of</u> a methodology to assess the impact to <u>on</u> flora and fauna for normal operation, ...</p>	<p>Clarification. Para 5.72 mentions “Considerations for radiological protection of the environment may vary between States and should be subject to the regulations and guidelines of the national competent authorities, including regulatory bodies”. Hence the</p>	X			

				methodology provided in Annex I is one of the option which should be used.				
	France	5.76	The methodology to assess the radiological impact to flora and fauna for normal operation will be found in ICRP publications for different ecosystems [52, 56].	<p>They are many national and international frameworks which require the explicit consideration of the protection of flora and fauna but at the exception of UK there is no explicit legal requirement to assess the radiological impact approach to fauna recommended by IAEA or in the pub 124 of ICRP as the States usually follow §5.73. The note 33 to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter is misleading as this convention does not require this approach as it simply forbids the dumping of radioactive material into the sea. In fact this approach was applied in 1988 by the Agency for the LDC, to redefine annual release rate limits for the purposes of the London Convention.</p> <p>The Annex I is useless as it repeats the methodology detailed in ICRP publication 124.</p>			X	Currently London Convention requires explicit consideration of marine flora and fauna. The IAEA was requested to provide the methodology for flora and fauna impact assessment. A recent IAEA reference related to London Convention (TECDOC) was added in a footnote.
							X	The IAEA proposes a practical methodology to assess impact to flora and fauna in the Annex based on the ICRP but it

								is not a repetition of ICRP 124.
	France	6	<i>“variability and uncertainty in the radiological environmental impact assessment”</i>	We consider that all the chapter regarding the uncertainties has to be deleted. Presentation of uncertainties will lead to complex studies. The benefit is very low according the hypothesis and the methods used.			X	The chapter was re-drafted considering several comments, including those from France, Canada, ENISS, Germany, Turkey and Australia.
	Canada	Section 6	Suggest section be re-organized to group similar ideas together and reduce repetition.	This section is very important but the key points are difficult to follow and seem to repeat themselves (e.g. 6.2 and 6.10 both seem to make similar points about sensitivity analyses).	X	Section was modified considering this comment		
	France	6.1	Uncertainty reflects the state of knowledge about the system being investigated and relates to how accurately the doses or the risk can be estimated.	Presentation of uncertainties will lead to very complex studies with very low benefit.	X	Section was modified considering this comment		
	France	6.3	Add at the end of the § “It should also be noted that in cases where assessors lack of data about the variability of transfer parameters, the use of pdf distributions should not be systematically recommended and doesn’t always lead to conservative results. Alternative methods such as fuzzy numbers or belief functions could be more relevant to represent expert judgment and to propagate such kind of uncertainties.	Warn the assessor about some traps of Bayesians approaches	X	Section was modified considering this comment		
	ENISS	6.4	When the doses estimated conservatively are closer to <u>above</u> the criteria	See above (Note: “above” refers to comment from ENISS to Para. 5.50).	X	Section was modified considering this comment		
2	Germany	6.4	3 rd sentence: “When the doses estimated conservatively are <u>equal to or above</u> closer to the criteria, or the decisions to be made with respect to the technology could have a high impact on the level	As long as the dose criteria are met, no further assessments are required.	X	Section was modified considering this comment		

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			of investment, the regulatory body should decide whether more detailed methodologies, including, for instance, the use of site specific data, are necessary to increase the realism in the assessment.”					
	Turkey	6.4	“If the doses calculated are close to 10% of the dose constraint, simple conservative methodologies could be considered sufficient”	The term of “smaller fractions” should be clarified. To be consistent with IAEA SRS-19, “10% of” may be used instead of “smaller fractions”. “criteria” in the next sentence should also be changed accordingly.			X	10% is also arguable. We prefer to leave this to the discretion of the national regulators on a case-by-case basis.
	Turkey	6.5 /third line	In the sentence “...public do not exceed the dose limits set by the national regulatory body.” The meant term whether or not it is “dose limits” or “dose constraint” is proposed to be checked.	Public doses shall not exceed the dose constraints which are established criteria. Why should probabilistic analysis of the doses and uncertainties in the results change the final dose criteria that shall be complied with?		X	Section was modified considering this comment	
	Canada	6.6	Include specific guidance for this scenario. “6.6. For assessments using single values of habit data, high percentiles in some of the habit data distribution could be used (for instance, in particular food consumption rates); for assessments considering the distribution of the habit data, the resulting dose in the 95% percentile could be used, where appropriate, should be used to be compared with the established criteria.”	In terms of uncertainty, the draft Guide suggests that an average measured value should be used for environmental parameters when available; however, for habit data (e.g. food consumption rates) a high percentile should be used if a single value is selected. The draft Guide then suggests that if a distribution of the habit data is used, the 95th percentile dose should be used for		X	Section was modified considering this comment	

				comparison to established criteria. However, if distributions are used in an assessment it is likely that they would be specified for other parameters than just habit data. There is no guidance for this scenario and this could lead to the application of the 95th percentile to the dose limit in all circumstances. More specific guidance should be provided and the wording changed from “should be”.				
	France	6.7	The establishment of environmental monitoring programmes, once the installation is operating, would provide confidence that the predicted doses are reasonable and do not underestimate real doses.	If routine measurements are below the detection limits, as usually, they can't be used for assessment studies...	X	Section was modified considering this comment		
	Australia	Paragraph 6.8	Suggested amendment: “If insufficient information or data is are available then a conservative estimate should be used. However, it should be avoided to combine many conservative assumptions and arrive at a result for the impact that is grossly pessimistic because this may result in unrealistic consequences use of a large number of conservative assumptions can result in unrealistic overestimation of doses and this should be avoided. One way of avoiding this is to look for a dominating exposure scenario that can be used to generate upper limit estimates of doses, or a scenario that can be used to represent a group of similar scenarios. Conservative assessment is also greatly facilitated by		X	Section was modified considering this comment		

			use of limiting values where possible (e.g. continuous exposures), or prescribed limits (e.g. nuisance dust limits, limits on radionuclide concentrations in food and drinking water) for appropriate exposure scenarios as a first step.”					
3	Germany	6.9 (a)	“Selection of potential exposures scenarios: ...”	Grammar.	X	Section was modified considering this comment		
	Australia	Paragraph 6.9(b)	Typographical error. Remove space before full-stop.		X	Section was modified considering this comment		
	ENISS	6.10	<u>For assessments with very realistic data in order to assess which source(s) of uncertainty is (are) dominating the global uncertainty and to identify which parameter(s) could need more realistic values,</u> sensitivity studies could be carried out to determine how sensitive the overall result is to any source of uncertainty etc.	A sensitivity study for assessments with conservative assumptions is not needed and would not give better results as the assumptions are still conservative and will still tend to overestimate the resulting dose. Sensitivity studies make only sense for assessments with very realistic assumptions. Sensitivity studies cannot be made without a clear and constructive objective: de-creasing the uncertainty, in this case.	X	Section was modified considering this comment		
	Australia	Paragraph	Suggest adding text to end of para 6.10 (perhaps new paragraph 6.11):		X	Section was modified considering this comment		

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		6.10	<p>“An issue with estimating prospective radiation exposures is that most of the uncertainty may be associated with the <i>choice</i> of exposure scenarios. This is very difficult to quantify, but it means that it is very important to choose exposure scenarios that are appropriate to the particular situation being assessed. For prospective assessments this means relying on past experience with similar situations (if available). If this past experience is not available, discussion with interested parties (including members of the public) is important in determining a set of reasonable (not realistic) possible exposure situations.”</p>				
	Australia	Section 6	<p>Perhaps add an additional paragraph (i.e. 6.12):</p> <p>“Other sources of uncertainty in any prospective assessment may include:</p> <ul style="list-style-type: none"> • changes in the source term due to degradation of barriers; and • demographic changes.” 	<p>Other sources of uncertainty in any prospective assessment are:</p> <ul style="list-style-type: none"> • Changes in the source term due to degradation of barriers; and • Demographic changes. 	X	Section was modified considering this comment	
3	Germany	Ref. [5]	<p>“INTERNATIONAL ATOMIC ENERGY AGENCY, Safety Assessment for Facilities and Activities, General Safety Requirements Part 4, No. GSR Part 4 Rev. 1, IAEA, Vienna (2009) (2015).”</p>	<p>In the frame of the IAEA Action Plan on Nuclear Safety, GSR Part 4 was revised by amendment (DS462). The final version of DS462 has been endorsed by the CSS (November 2014) and the</p>	X		

				Board of Governors (March 2015). Rev. 1 will be published this year.				
3	Germany	Ref. [6]	“INTERNATIONAL ATOMIC ENERGY AGENCY, Radiation Protection of the Public and Protection of the Environment , IAEA, Vienna (Draft DS 432).”	Citation of the correct working title of DS432.	X			
3	Germany	Ref. [33]	“INTERNATIONAL ATOMIC ENERGY AGENCY, Governmental, Legal and Regulatory Framework for Safety, General Safety Requirements Part 1, No. GSR Part 1 Rev. 1 , IAEA, Vienna (2010) (2015).”	In the frame of the IAEA Action Plan on Nuclear Safety, GSR Part 1 was revised by amendment (DS462). Rev. 1 will be published this year.	X			
3	Germany	Ref. [40]	“INTERNATIONAL ATOMIC ENERGY AGENCY, Site Evaluation for Nuclear Installations, IAEA Safety Standards Series No. NS-R-3 Rev. 1 , IAEA, Vienna (2003) (2015).”	In the frame of the IAEA Action Plan on Nuclear Safety, NS-R-3 was revised by amendment (DS462). Rev. 1 will be published this year.	X			
3	Germany	Ref. [45]	“INTERNATIONAL ATOMIC ENERGY AGENCY, Safety of Nuclear Power Plants Design, Specific Safety Requirements Series No. SSR-2/1 Rev. 1 , IAEA, Vienna (2012) (2015).”	In the frame of the IAEA Action Plan on Nuclear Safety, SSR-2/1 was revised by amendment (DS462). Rev. 1 will be published this year.	X			
3	Germany	Ref. [46]	“INTERNATIONAL ATOMIC ENERGY AGENCY, Safety of Nuclear Power Plants: Commissioning and Operation, Specific Safety Requirements Series No. SSR-2/2 Rev. 1 , IAEA, Vienna (2011) (2015).”	In the frame of the IAEA Action Plan on Nuclear Safety, SSR-2/2 was revised by amendment (DS462). Rev. 1 will be published this year.	X			
	Japan	Annex I Title (p.47)	<u>AN EXAMPLE OF CONSIDERATIONS ON PROTECTION OF THE ENVIRONMENT FOR NORMAL OPERATION OF FACILITIES AND ACTIVITIES</u>	Amendment to make the title of the document consistent with its official name.	X	An example was added to I-1		
	Australia	Annex I,	Replace “... is based in ICRP approach...”		X			

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		Para. I-1	with "... is based on the ICRP approach..."				
-	Sweden	Annex I, Para I-2	Delete <i>the assessment of</i>	It is not the assessment of the level of protection which provides protection – change the sentence	X		
	Australia	Annex I, Para. I-4	Replace "foresee" with " foreseen ". The sentence beginning "The IAEA recommends..." does not make sense. Revision recommended.		X		
-	Australia	Annex I, Para. I-6	Final sentence. Suggest two revisions to read "... sources in planned exposure situations, could be extrapolated from the assessment of the exposures of a reduced number of individual organisms of a species and used as a reference [I-6]. "			X	
	Canada	I-8/3	"I-8. ICRP defined criteria to assess and manage the radiological impact to flora and fauna in the form of derived consideration reference levels [I-1]. The derived consideration reference levels are a set of dose rate bands within which there is evidence some very low probability of deleterious effects of ionizing radiation to individuals of flora and fauna, which may have implications in the structures or populations. ... "	The phrase is incorrect. The DCRL's are evidence-based (mostly laboratory studies based on exposure to gamma radiation) and involve only some interpretation of the experimental results on the part of the ICRP. They represent actual effects of relevance to individual biota in terms of survival, reproduction, etc. and are not in any way "very low probability" outcomes.	X		
	Canada	Pg 48,	"Radiation quality factors, like those used for the	This recommendation is not	X	Footnote was modi-	

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		Footnote 37 (under I-10)	assessment of exposure to humans (resulting in effective doses expressed in Sv) <i>need to be applied to assess exposure to biota even though the key quantity are not applied to assess exposure to biota; the key quantity</i> for the exposure assessment of biota is the absorbed dose, which is defined as the amount of energy that is absorbed by a unit mass of tissue of an organ or organism, given in units of Joules per kilogram or Gray (Gy) [I-1].”	logical. It is contrary to current assessment practices which consider both absorbed dose and a “weighted dose”, essentially taking into account the relative biological effectiveness of different types of radiation for meaningful biological endpoints for biota. This is an absolutely critical issue for estimating the effects of alpha emitters. Even though ICRP recommendations for weighting factors to be used for biota versus humans has yet to be published, it is entirely conventional to use suggested weighting factors readily-available from the scientific literature I [3-5]. ICRP itself acknowledges the importance of weighting factors in Publication No. 108 [I-1].		fied		
-	USA	I-11 Line 3.	Add sentence after 1 st sentence: “However, such a result would likely warrant a closer examination of the possible impacts.”	Completeness	X			
-	Australia	Annex I, Para. I-18	Remove spurious “the” in “... environmental transfer parameters should be the relevant for flora and fauna...”		X			
	Canada	I-20/Table I-1 & throughout document	Other sources of information should be added to the table as well as throughout the document (e.g. UNSCEAR 2008).	The dose DCRLs for non-human biota were adopted directly from ICRP. It is recommended that discussion of other sources of information, such as UN-			X	

				SCEAR (2008) be added to the document. In addition, a discussion on radiation weighting factors (specifically relevant for α -emitters) for non-human biota should be included.				
2	Germany	Annex I, Table I-1	Terrestrial, Annelid, Reference earthworm: DCRL 0,1-1 <u>10-100</u> mGy/d	Correction to be in line with ICRP Publication 108.	X			
-	ENISS	Table I-1	<u>DCRL earth worm: 0,1-1 10-100 mGy/d</u>	To be in line with ICRP 124	X			
-	Australia	TABLE I-1		The DCRLs presented here show clearly that protecting humans will also protect the major species listed in this table.	X			
-	Australia	FIG. I-2		Again the logic appears to be faulty. The exposure pathways cannot be determined until the reference animals and plants have been selected. (Note: "again" refers to similar comment to Figure 2 by Australia)			X	See answer to comments to Figure 1
-	Australia	Annex I, Para. I-22	Terminology changes from "Reference" animals and plants to "Representative". While this is reasonable in environmental		X			

			protection methodologies (e.g. the ERICA integrated approach), the latter term does not seem to have been defined in this document.					
-	ENISS	I-23	In a generic assessment as presented in this Annex, if the dose rates to the selected representative animals and plants are below the lower <u>upper</u> boundary of the relevant derived consideration reference level band, impact on population of flora and fauna could be considered negligible and the level of protection of environment can be considered adequate. In the case where the estimated dose rates are within the bands the situation can still be acceptable, but the regulatory body could decide whether additional considerations (i.e. improvement in the level of details of the assessment) or practical mitigation measures would be needed, bearing in mind that derived consideration reference levels are reference points, not limits.	The corrections proposed are necessary because the choice of the bands are very conservative and define a protection objective towards an individual. To differentiate between the lower and upper boundary indicates a level of precision which not exists. Because of the uncertainty ICRP had proposed a band instead of a single value. Thus the protection aim is achieved when the assessed dose meets the band or is below.			X	As the methodology is very generic it is reasonable to use conservatively the criteria, e.g. the lower end of the band. Nevertheless, it is explained that the results could be within the band and the regulator could still decide it is acceptable.
-	France	I-24	The explicit consideration of the radiation exposures to flora and fauna in the prospective radiological environmental impact assessments, as described in this Annex, should be considered by States as an option to complement the environmental protection approach considering only human protection aspects which, ultimately, would reinforce the system of radiation protection considering the requirement of graded approach, i.e. that the efforts in this additional assessment should be commensurate to the expected level of risk.	In case the Annex I is kept then the context (prospective) must be specified and the graded approach remind to the reader. As mentioned before in the text this approach is not needed in the large majority of cases (as also demonstrated by calculation made in normal operation) and thus does not rein-			X	

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				force the system of radiation protection.				
-	France	I.25	However, a generic approach may not be appropriate for the assessment of the impact to flora and fauna in particular circumstances, for example when dealing with protected or endangered species or when very sensitive ecological niches are identified.	The word “ very sensitive ecological niches” should be precise. At that time , we propose to delete this detail.	X			
-	Canada	I-25	Add the text: “Caution in applying the existing framework may also be advisable in sensitive environments. There is an emerging weight of evidence from the field for a need to update dose-effect relationships for ecologically-relevant exposure time scales, species and endpoints [I-12].” Add the new reference quoted above [I-12] Garnier-Laplace, J., Alonzo, F., Adam-Guillermin, C., 2015. Establishing relationships between environmental exposures to radionuclides and the consequences for wildlife: inferences and weight of evidence. Annals of the ICRP 44, 295-303.	This recent ICRP Annals publication by an authoritative source should be quoted with appropriate caution provided, e.g. in the Discussion of this section. The evidence from Chernobyl for low-level radiation effects represents the most relevant data ever collected. These insights currently provide us with the only comprehensive data from the field to truly test whether the laboratory data (on which the DCRLs are almost entirely based) can be extrapolated to field conditions. The mismatch between field and laboratory studies has yet to be resolved, and hence caution is warranted in simply following ICRP DCRLs for any “sensitive environments”.			X	ICRP Publications 108 and 124 are considered the current applicable references. IAEA discussed with representatives from ICRP, IUR, EC, UNEP and it was agreed that the current approach by ICRP is conceptually and scientifically sound enough to be adopted in international safety guidance, particularly for planned exposures (see http://gnssn.iaea.org/RTWS/cgrpe/Shared%20Documents/Meeting%20Final%20Reports/Final%20Report%2005th%20Meeting%20(2013).pdf)
-	Canada	Pg 53, Footnote	Replace “which are compatible” with “which provide more explicit criteria and decision-making	To say that these approaches are “compatible” is an over-	X	Text modified		

		42 (under I-26)	tools relative to the use of” “ ⁴² Some States have defined and used their own radiological criteria to assess radiological impact to flora and fauna which provide more explicit criteria and decision-making tools relative to the use of which are compatible with the ICRP derived consideration reference levels [I-3 – I-5].”	simplification of fundamentally different approaches to biota dose assessment. The ICRP system is qualitative with very broad bands and great latitude for interpretation. The other systems are more quantitative and clearer in terms of risk estimation and hence decision-making.				
-	Canada	II-5/title and throughout document (4.13, 4.14, 5.42, footnote 26)	Replace the term” conceivable accident” using terminology consistent with other jurisdictions (e.g. probable accident).	The draft Guide uses the term conceivable accidents. This is not a well-defined term and more discussion about the term conceivable accidents would be useful	X			
-	Japan	Annex II II-6/1 (p.57)	<u>GSR Part3 BSS</u>	Typo.	X			
-	ENISS	II-8	Since the consequence of a radiation dose can be expressed as the increased probability of health effects (for example death from early cancer) ⁴⁶ , an indication of the risk can be evaluated by combining the probability p of <u>the end state of</u> scenario i occurring (pi) and the probability of the health effects if it occurs (Ci).	For clarification that not the scenario is meant but the end state of the scenario.	X			
-	ENISS	II-15	The dose to the most more exposed individual or individuals are then calculated by using a set of meteorological conditions and other environmental transfer conditions along with the probabilities of these conditions applying along with factors that affect the dose and their probabilities.	To be in line with footnote 24 where “the more highly exposed individuals” are mentioned.	X			
-	Finland	ANNEX		It would be better to			X	This will be dis-

		III		leave this annex out and add references into the paragraph 5.67. It's not clear what is the purpose of these examples. Should they be regarded as guidance or not.				cussed at WASSC/NUSSC/RASSC
	Japan	Page 67 III-29.	In addition, short term doses to thyroid are compared to 50 mSv thyroid equivalent dose (dose level for stable iodine administration).	Clarifying the description. It is necessary to identify whether 50 mSv is the effective dose or the thyroid equivalent dose.	X			
	India	1.17	NOTE: comments from India in pfd arrived 28/08/2015. It is mentioned "The prospective assessment of potential exposures for facilities and activities, as described in this Safety Guide, may require that accidents with very low probabilities of occurrence leading to radiological consequences for the public and the environment are considered and criteria for potential exposures are fulfilled." The low probability of occurrence may be specified as a cut off value.	Necessary in the framework of technologically neutral guidelines			X	A cut off probability for the accidents to be taken into account for the consideration of potential exposures was proposed in the initial drafts and it was rejected by NUSSC on the basis that a general approach is preferred.
	India	2.2	Both planned exposures and potential exposures caIL and should be _taken Jnto account-at -the-planning or design stage [6].	Planned is missing	X			
	India	2.14	Finally, GSR Part 3 introduction states that, the protection of the environment is an issue necessitating assessment, while allowing for flexibility in incorporating into decision making processes, the results of environmental	Corrected as per GSR Part 3(1.35)	X			

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			assessments that are commensurate with the radiation risks.					
	India	3.6	Requirement 12 of GSR Part 3 states that "the government or the regulatory body shall establish dose limits for occupational exposure and public exposure, and registrants and licensees shall apply these limits".	Occupational exposure is missing which is also important.			X	There is a reference to other Safety Guide covering occupational exposure in the Scope.
	India	Table 1	TABLE 1: EXAMPLES OF FACTORS AFFECTING THE REQUIRED LEVEL OF COMPLEXITY OF A RADIOLOGICAL ENVIRONMENTAL IMPACT ASSESSMENT Time as a factor with/without limits may be mentioned.	During an accident condition, the time, for which the release of radionuclide from the containment is significant and then tapers down (depending on the pressure in containment) would be required to be considered for analysis of dose.			X	This (delay of the release) is included in "types of safety barriers and engineering features".
	India	4.9	Once a site or a reduced number of sites are selected, shortlisted and the technology is more specified (e.g. the type of nuclear power plant is defined) a preliminary assessment for that particular location(s) is normally done using the available information.	For clarity	X			
	India	4.11	... this review should include the consideration of the type of facility and activity- and possible-changes in the assumptions ...	For clarity			X	It is implicit in the text
	India	4.14 (old 4.15)	... thresholds and/or criteria say in the form of effective dose to 'representative person' and/or absorbed dose rate to 'reference animals and plants*', 'representative organism' at a level of —j mSv and — mGy/h respectively.;	It will be of great help to member states if Agency suggests these thresholds and/or criteria.			X	It is preferred to keep general, particularly for EIA

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	India	5.2	The models should be appropriate [réf-erence] for the situation in which they are being applied, ensuring reasonable accuracy.	Reference to documents, containing examples of appropriate models, may be given here	X			
	India	5.5	For example, for an installation with low levels of discharges [reference] and/or low potential for accidents [reference] with consequences to the public and the environment, the use of detailed methods would not be necessary.	Reference to documents with quantified examples of low level discharges and low potential for accidents should be given here.			X	The Safety Guide is intended to be more general. The 'exemption' criterion is mentioned as an indication of low levels of discharges.
	India	5.5	"For these types of installations, regulatory bodies, vendors or professional associations may develop generic guidance with simple and conservative calculation methods that can be used for the assessments by the applicants."	We normally practice an approach which is inherently conservative in nature and hence is a better term to use in lieu of cautious.	X			
	India	5.8	The activity concentrations estimated in a number of environmental media are then combined with relevant habit data and time-occupation factors to calculate intakes of radionuclides (internal exposure) or external radiation (external exposure) to a representative person ²² .	The 'representative person' should be defined as a new footnote 22 and be linked. The numbers of the subsequent footnotes should be changed suitably.	X			
	India	5.24	"For installations requiring complex assessment, when at the initial stages of an authorization process, a preliminary estimation of the dispersion and transfer to the environment can be done using simple Conservative models and meteorologi-	We normally practice an approach which is inherently conservative in nature and hence is a better term to use in lieu of	X			

			cal/hydrological data generic to the region"	cautious.				
	India	5.57	"A representative person ²⁹ or persons, based on data from actual or postulated persons likely to be exposed in accident conditions should be identified for the consideration of potential exposures {49} •	The reference no. [49] only talks about light water reactors and emergency due to severe conditions at a LWR. It may be limited in scope for a PHWR.	X			
	India	5.65	For activities or facilities and activities needing a simple assessment and using a conservatively defined potential exposure scenario (i.e. installations with small inventories and sources with low capacity for accidental releases), a dose due to the defined conservative potential scenario is normally estimated and doses of 1 to a few mSv should be used as the decision criteria. For example, doses in the range of 1-5 mSv could be adopted as the range for establishing the criterion.	Examples (and/or limits) of small inventory, sources and low capacity, for accidental releases should be given here as footnotes for guidance to analysts and regulators			X	The Safety Guide is intended to be general. A TECDOC is planned to include this details.
	India	5.9	The source term inventories in addition to the normal operation inventories should also include the radionuclide inventory during low probability scenarios [^]	For full coverage			X	It is considered not necessary.
	India	1.13		Editorial	X			
	India	1.19		Editorial	X			
	India	1.21		Editorial	X			
	India	1.22		Editorial	X			
	India	1.23		Editorial	X			
	India	3.1		Editorial	X			
	India	3.13		Editorial	X			

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	India	4.1		Editorial	X			
	India	4.14		Editorial	X			
	India	4.21		Editorial	X			
	India	5.15		Editorial	X			
	India	AI, I-1		Editorial	X			
	India	AI, I-5		Editorial	X			
	India	AI, I-14		Editorial	X			
	India	AII, II-2		Editorial	X			